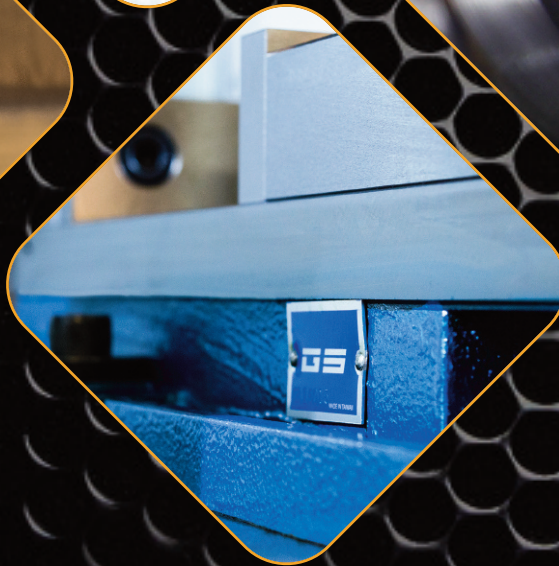


SOWA



METALWORKING SOLUTIONS

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About GS Holders

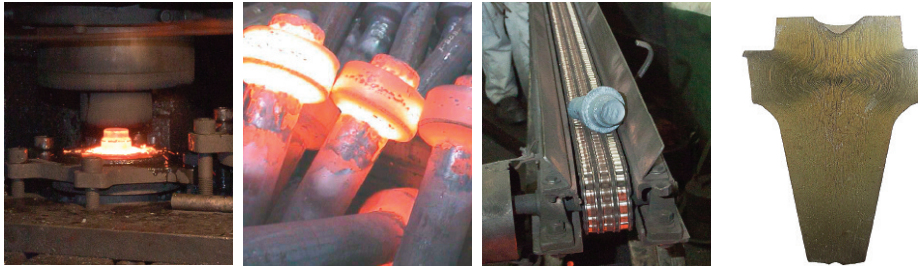
100% Forged Construction

Certified Balanced up to 30,000 rpm

DIN Coolant Through The Flange Standard

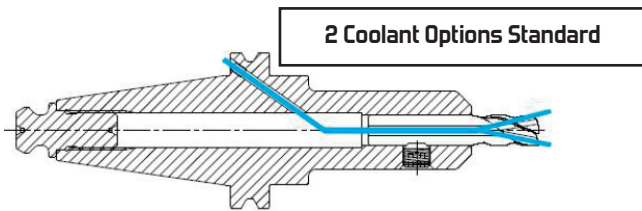
Best Added Value on Standard Holders In The Market!

• **100% Forged Construction** (Competitors - turned down bar stock)



Note: You can see the compression of the steel in the core of the tool holder during the forging process
= Strongest holder on the market

Traverse ground throughout



DIN Coolant through the flange standard (Most competitors standard holders do not offer this - need to order this as a special feature which is more expensive than GS standard holders)

- AT3 or better taper accuracy
- Material Low Carbon Chromium-Molybdenum Alloy Steel - SCM415 hardened to HRC 58-60
- Maximum TIR 0.0002" OD to ID
- Each holder balanced with Haimer machine
- Each holder comes with a certificate of inspection lab report

End Mill Holders Taper/RPM

- BT30 End Mill Holders balanced to 20,000rpm
- CAT/BT40 & HSK63 End Mill Holders balanced to 30,000rpm (Competitors - 15 to 25,000rpm)
- CAT/BT50 & HSK100 End Mill Holders balanced to 25,000rpm (Competitors - 15 to 25,000rpm)

Shrink Fit Holders RPM - Balanceable

- BT30 - 20,000rpm
- CAT/BT40 & HSK63 - 30,000rpm
- CAT50/HSK100 - 25,000rpm



ER Collet Chucks

100% Forged Construction

Certified Balanced up to 30,000 rpm with nut on holder

DIN Coolant through the flange standard

TIR 0.0003" at 4x Dia.

- **Balanced with nut on chuck** (Some competitors do not have this feature)
- **ER Collet Chucks** Taper 30-20,000rpm, 40-30,000rpm, 50-25,000rpm - 0.0003" TIR 4x Dia.
- **SA Collet Chucks** Taper 30/40-20,000rpm, 50-15,000rpm - 0.0001" TIR 4x Dia. (Equivalent to Nikken SK Chucks)
- **Milling Chucks** (Multi-Lock) - 0.0004" from nose
- **TG Single Angle Collet Chucks** Taper 30/40-20,000rpm, 50-15,000rpm - 0.0006" TIR 4x Dia.
- **DA Collet Chucks** Taper 30/40-20,000rpm, 50-15,000rpm - 0.0010" TIR from nose

ER Collets - Standard High Precision - Made in Taiwan



Alloy Steel over Carbon Steel

- **SCM440 (AISI4140) Alloy Steel** (Competitors are carbon steel) AISI 4140 alloy steel is chromium, molybdenum, manganese containing low alloy steel
- It has high fatigue strength, abrasion, and impact resistance, toughness, and torsional strength**
- Accuracy 0.0003" (high precision range)

- **Sealed Collets are steel sealed and collapse 0.003" (0.08mm)**



Alloy Steel over Carbon Steel

GS Holders are currently being used in U.S. Defense, Medical, and Oil Industries

Sample of notable repeat GS Tooling users:

Boeing, Apple, Harley Davidson, Caterpillar

Stocked in Ohio, Illinois, California



ASIMETO

Exactly what you need.

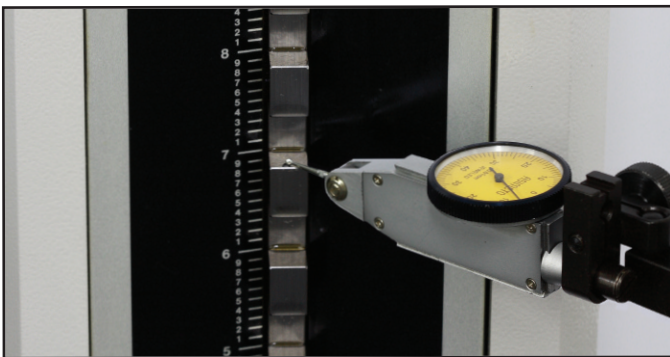
Everything we do is as exacting as the tools we make. Asimeto is the creator and manufacturer of high-precision measuring instruments - designed and registered exclusively in Germany. Asimeto tools are very competitively priced and are sold through the Asimeto distribution network. Our ultimate commitment to quality allows us to ensure strict production standards and reliable technical service for our global customers.



The quality and measuring accuracy of all Asimeto precision tools is guaranteed by the Asimeto Calibration Laboratory. All tools are inspected for conformance to the Asimeto design specifications and are then processed through the Asimeto calibration laboratory. Only the latest state of the art calibration equipment has been selected, from the leading global manufacturers, to ensure that the calibration costs are contained by increasing throughput, without compromising measurement accuracy or repeatability.

Every Asimeto tool is supplied with its own calibration certificate. All tools are calibrated by our ISO 17025 accredited lab at no extra charge to the customer.

To supplement the industry standard 12 month warranty an additional 12 month warranty is available by registering your individual purchase online at www.asimeto.com within 30 days from the date of purchase.





TOOLING

END MILL HOLDERS

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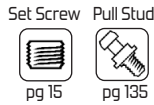
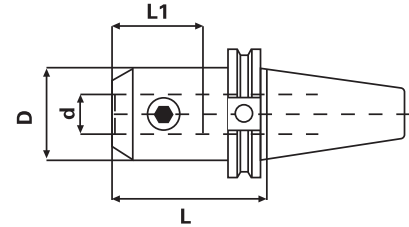




END MILL HOLDERS

CAT40 End Mill Holders

- 100% Forged Construction
- Certified balanced to 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard (not available on stubby models)



Complete with certificate

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
CT40	1/8"	1.35"*	0.63"	0.75"	8-32	531-069	107.80
CT40	1/8"	2.50"	0.63"	0.75"	8-32	531-070	107.80
CT40	1/8"	4.00"	0.63"	0.75"	8-32	531-071	145.60
CT40	3/16"	1.38"*	0.63"	0.75"	10-32	531-072	107.80
CT40	3/16"	2.50"	0.86"	0.75"	10-32	531-073	96.70
CT40	3/16"	4.00"	0.86"	0.75"	10-32	531-074	145.60
CT40	1/4"	1.38"*	1.18"	0.79"	1/4-28	531-000	100.80
CT40	1/4"	2.50"	1.10"	0.79"	1/4-28	531-002	100.80
CT40	1/4"	4.00"	1.10"	0.79"	1/4-28	531-004	110.70
CT40	1/4"	9.00"	1.10"	0.79"	1/4-28	531-005	219.50
CT40	5/16"	1.38"*	1.34"	0.87"	5/16-24	531-006	109.80
CT40	5/16"	2.50"	1.26"	0.87"	5/16-24	531-008	109.80
CT40	5/16"	4.00"	1.26"	0.87"	5/16-24	531-010	96.70
CT40	5/16"	9.00"	1.26"	0.87"	5/16-24	531-011	203.30
CT40	3/8"	1.38"*	1.34"	1.00"	3/8-24	531-012	109.80
CT40	3/8"	2.50"	1.26"	1.00"	3/8-24	531-014	109.80
CT40	3/8"	4.00"	1.26"	1.00"	3/8-24	531-016	110.70
CT40	3/8"	5.00"	1.26"	1.00"	3/8-24	531-018	122.40
CT40	3/8"	9.00"	1.26"	1.00"	3/8-24	531-031	203.30
CT40	7/16"	2.50"	1.50"	1.38"	7/16-20	531-020	96.70
CT40	7/16"	4.00"	1.50"	1.38"	7/16-20	531-022	96.70
CT40	7/16"	9.00"	1.50"	1.38"	7/16-20	531-033	203.30
CT40	1/2"	1.75"*	1.50"	1.38"	7/16-20	531-024	96.70
CT40	1/2"	2.50"	1.50"	1.38"	7/16-20	531-026	110.70
CT40	1/2"	4.00"	1.50"	1.38"	7/16-20	531-028	110.70
CT40	1/2"	5.00"	1.50"	1.38"	7/16-20	531-030	122.40
CT40	1/2"	9.00"	1.50"	1.38"	7/16-20	531-035	203.30
CT40	5/8"	1.75"*	1.61"	1.65"	9/16-18	531-032	98.10
CT40	5/8"	3.00"	1.61"	1.65"	9/16-18	531-034	110.70
CT40	5/8"	4.00"	1.61"	1.65"	9/16-18	531-036	110.70
CT40	5/8"	5.50"	1.61"	1.65"	9/16-18	531-038	118.50
CT40	5/8"	9.00"	1.61"	1.65"	9/16-18	531-037	203.30
CT40	3/4"	1.75"*	1.77"	1.89"	5/8-18	531-040	109.80
CT40	3/4"	3.00"	1.77"	1.75"	5/8-18	531-042	110.70
CT40	3/4"	4.00"	1.77"	1.75"	5/8-18	531-044	110.70
CT40	3/4"	5.50"	1.77"	1.75"	5/8-18	531-046	140.00
CT40	3/4"	9.00"	1.77"	1.75"	5/8-18	531-039	203.30
CT40	7/8"	1.75"*	2.08"	1.94"	5/8-18	531-048	99.00
CT40	7/8"	3.50"	2.08"	2.00"	5/8-18	531-050	107.80
CT40	7/8"	6.00"	2.08"	2.00"	5/8-18	531-052	140.00
CT40	7/8"	9.00"	2.08"	2.00"	5/8-18	531-041	232.60
CT40	1"	2.00"*	2.36"	2.25"	3/4-16	531-054	109.80
CT40	1"	4.00"	2.36"	2.36"	3/4-16	531-056	110.70
CT40	1"	6.00"	2.36"	2.36"	3/4-16	531-058	153.40
CT40	1"	9.00"	2.36"	2.36"	3/4-16	531-043	268.40
CT40	1-1/4"	2.00"*	2.28"	2.25"	3/4-16	531-060*	120.00
CT40	1-1/4"	4.00"	2.55"	2.48"	3/4-16	531-062	110.70
CT40	1-1/4"	6.00"	2.55"	2.48"	3/4-16	531-064	170.00
CT40	1-1/2"	4.50"	2.55"	2.99"	3/4-16	531-066	133.20
CT40	1-1/2"	6.00"	2.83"	2.99"	3/4-16	531-068	170.00

* Stubby Length

• Non-Coolant thru the flange



End Mill
Holders

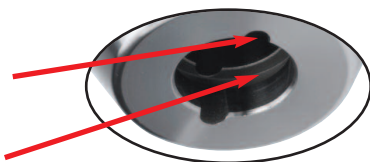
CAT40 DIRECT COOLANT End Mill Holders

NOW 3 COOLANT OPTIONS ALL IN ONE!

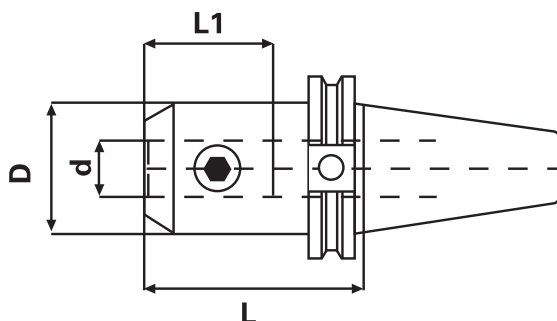
- 100% Forged Construction
- Certified balanced to 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard (not available on stubby models)
- Coolant thru the spindle
- Coolant thru the body

Coolant thru slots for directing coolant onto the tool.

O-Ring Seal for Non Direct Coolant Operations.



Complete with certificate



- Set Screw pg 15
- Pull Stud pg 135
- O-Ring pg 16

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
CT40	1/4"	1.38"*	1.18"	0.79"	1/4-28	522-014	131.10
CT40	1/4"	2.50"	1.10"	0.79"	1/4-28	522-016	131.10
CT40	1/4"	4.00"	1.10"	0.79"	1/4-28	522-018	144.00
CT40	5/16"	1.38"*	1.34"	0.87"	5/16-24	522-022	142.80
CT40	5/16"	2.50"	1.26"	0.87"	5/16-24	522-024	142.80
CT40	5/16"	4.00"	1.26"	0.87"	5/16-24	522-026	125.80
CT40	3/8"	1.38"*	1.34"	1.00"	3/8-24	522-030	142.80
CT40	3/8"	2.50"	1.26"	1.00"	3/8-24	522-032	142.80
CT40	3/8"	4.00"	1.26"	1.00"	3/8-24	522-034	144.00
CT40	3/8"	5.00"	1.26"	1.00"	3/8-24	522-036	159.20
CT40	1/2"	1.75"*	1.50"	1.38"	7/16-20	522-046	125.80
CT40	1/2"	2.50"	1.50"	1.38"	7/16-20	522-048	144.00
CT40	1/2"	4.00"	1.50"	1.38"	7/16-20	522-050	144.00
CT40	1/2"	5.00"	1.50"	1.38"	7/16-20	522-052	159.20
CT40	1/2"	9.00"	1.50"	1.38"	7/16-20	522-054	277.40
CT40	5/8"	1.75"*	1.61"	1.65"	9/16-18	522-056	127.60
CT40	5/8"	3.00"	1.61"	1.65"	9/16-18	522-058	144.00
CT40	5/8"	4.00"	1.61"	1.65"	9/16-18	522-060	144.00
CT40	5/8"	5.50"	1.61"	1.65"	9/16-18	522-062	157.80
CT40	3/4"	1.75"*	1.77"	1.89"	5/8-18	522-066	142.80
CT40	3/4"	3.00"	1.77"	1.75"	5/8-18	522-068	144.00
CT40	3/4"	4.00"	1.77"	1.75"	5/8-18	522-070	144.00
CT40	3/4"	5.50"	1.77"	1.75"	5/8-18	522-072	182.00
CT40	3/4"	9.00"	1.77"	1.75"	5/8-18	522-074	277.40
CT40	1"	2.00"*	2.36"	2.25"	3/4-16	522-080	142.80
CT40	1"	4.00"	2.36"	2.36"	3/4-16	522-082	144.00
CT40	1"	6.00"	2.36"	2.36"	3/4-16	522-084	165.70
CT40	1-1/4"	2.00"*	2.28"	2.25"	3/4-16	522-088	156.00
CT40	1-1/4"	4.00"	2.55"	2.48"	3/4-16	522-090	144.00
CT40	1-1/2"	4.50"	2.55"	2.99"	3/4-16	522-094	173.20

* Stubby Length

• Available only while quantities last



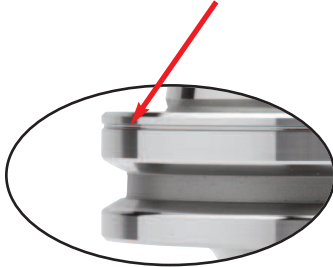
END MILL HOLDERS

CAT40 DUAL CONTACT End Mill Holders

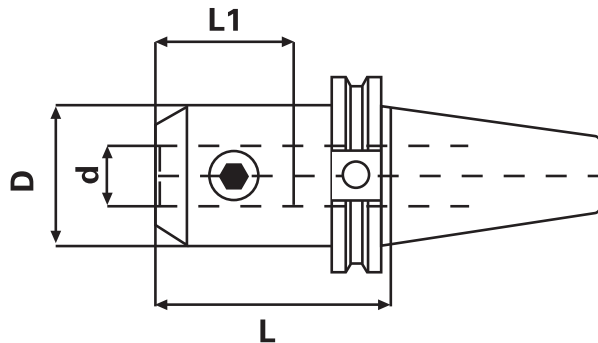
FOR DUAL CONTACT SPINDLES
(CAN ALSO BE USED ON STANDARD SPINDLES)



- 100% Forged Construction
- Certified balanced to 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Improves rigidity and reduces vibration allowing for increased feed rates and increased tool life.

Eliminates the gap between the flange and the spindle for increased rigidity



Complete with certificate



Set Screw  pg 15
Pull Stud  pg 135

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
CT40	1/2"	2.50"	1.50"	1.38"	7/16-20	521-026	132.90
CT40	1/2"	4.00"	1.50"	1.38"	7/16-20	521-028	132.90
CT40	1/2"	5.00"	1.50"	1.38"	7/16-20	521-030	146.90
CT40	5/8"	3.00"	1.61"	1.65"	9/16-18	521-034	132.90
CT40	5/8"	4.00"	1.61"	1.65"	9/16-18	521-036	132.90
CT40	5/8"	5.50"	1.61"	1.65"	9/16-18	521-038	142.20
CT40	3/4"	3.00"	1.77"	1.75"	5/8-18	521-042	132.90
CT40	3/4"	4.00"	1.77"	1.75"	5/8-18	521-044	132.90
CT40	3/4"	5.50"	1.77"	1.75"	5/8-18	521-046	168.00
CT40	1"	2.00"	2.36"	2.36"	3/4-16	521-054	131.80
CT40	1"	4.00"	2.36"	2.36"	3/4-16	521-056	132.90
CT40	1"	6.00"	2.36"	2.36"	3/4-16	521-058	184.10
CT40	1-1/4"	2.00"*	2.28"	2.25"	3/4-16	521-060*	144.00
CT40	1-1/4"	4.00"	2.55"	2.48"	3/4-16	521-062	132.90
CT40	1-1/4"	6.00"	2.55"	2.48"	3/4-16	521-064	204.00
CT40	1-1/2"	4.50"	2.55"	2.99"	3/4-16	521-066	159.90

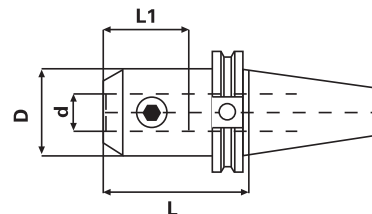
* Stubby Length

* Non-Coolant thru the flange

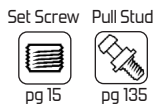


CAT50 End Mill Holders

- 100% Forged Construction
- Certified balanced to 25,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard (not available on stubby models)



Complete with certificate



Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
CT50	1/4"	1.38"*	1.10"	0.79"	1/4-28	531-082	127.80
CT50	1/4"	2.50"	1.10"	0.79"	1/4-28	531-084	135.00
CT50	1/4"	4.00"	1.10"	0.79"	1/4-28	531-086	150.30
CT50	1/4"	6.00"	1.10"	0.79"	1/4-28	531-088	181.80
CT50	1/4"	8.00"	1.10"	0.79"	1/4-28	531-090	224.50
CT50	5/16"	2.50"	1.26"	0.87"	5/16-24	531-092	135.00
CT50	5/16"	4.00"	1.26"	0.87"	5/16-24	531-094	150.30
CT50	5/16"	6.00"	1.26"	0.87"	5/16-24	531-096	181.80
CT50	3/8"	1.38"*	1.26"	1.00"	3/8-24	531-098	127.80
CT50	3/8"	2.50"	1.26"	1.00"	3/8-24	531-100	135.00
CT50	3/8"	4.00"	1.26"	1.00"	3/8-24	531-102	150.30
CT50	3/8"	6.00"	1.26"	1.00"	3/8-24	531-104	166.70
CT50	3/8"	8.00"	1.26"	1.00"	3/8-24	531-106	193.40
CT50	3/8"	14.00"	1.26"	1.00"	3/8-24	531-107	670.90
CT50	7/16"	2.50"	1.50"	1.38"	7/16-20	531-108	134.20
CT50	7/16"	4.00"	1.50"	1.38"	7/16-20	531-110	147.30
CT50	7/16"	6.00"	1.53"	1.38"	7/16-20	531-112	160.60
CT50	7/16"	8.00"	1.48"	1.38"	7/16-20	531-114	217.80
CT50	7/16"	14.00"	1.48"	1.38"	7/16-20	531-113	670.90
CT50	1/2"	1.75"*	1.50"	1.38"	7/16-20	531-116	127.80
CT50	1/2"	2.63"	1.50"	1.38"	7/16-20	531-118	127.80
CT50	1/2"	4.00"	1.50"	1.38"	7/16-20	531-120	150.30
CT50	1/2"	6.00"	1.50"	1.38"	7/16-20	531-122	172.80
CT50	1/2"	8.00"	1.48"	1.38"	7/16-20	531-124	198.90
CT50	1/2"	14.00"	1.48"	1.38"	7/16-20	531-125	670.90
CT50	9/16"	6.00"	1.61"	1.65"	9/16-18	531-133	164.70
CT50	5/8"	1.75"*	1.61"	1.65"	9/16-18	531-126	127.80
CT50	5/8"	3.00"	1.61"	1.65"	9/16-18	531-128	147.80
CT50	5/8"	4.00"	1.61"	1.65"	9/16-18	531-130	147.80
CT50	5/8"	6.00"	1.61"	1.65"	9/16-18	531-132	164.70
CT50	5/8"	8.00"	1.57"	1.65"	9/16-18	531-134	203.40
CT50	5/8"	14.00"	1.57"	1.65"	9/16-18	531-131	670.90
CT50	3/4"	1.75"*	1.77"	1.89"	5/8-18	531-136	128.70
CT50	3/4"	3.00"	1.77"	1.89"	5/8-18	531-138	128.70
CT50	3/4"	4.00"	1.77"	1.89"	5/8-18	531-140	150.30
CT50	3/4"	6.00"	1.77"	1.89"	5/8-18	531-142	170.00
CT50	3/4"	8.00"	1.77"	1.89"	5/8-18	531-144	196.70
CT50	3/4"	14.00"	1.77"	1.89"	5/8-18	531-145	670.90
CT50	7/8"	1.75"*	2.08"	2.00"	5/8-18	531-146	128.70
CT50	7/8"	3.75"	2.08"	2.00"	5/8-18	531-148	150.30
CT50	7/8"	6.00"	2.08"	2.00"	5/8-18	531-150	170.00
CT50	1"	2.00"*	2.36"	2.36"	3/4-16	531-152	139.40
CT50	1"	4.00"	2.36"	2.36"	3/4-16	531-154	150.30
CT50	1"	6.00"	2.36"	2.36"	3/4-16	531-156	153.40
CT50	1"	8.00"	2.36"	2.36"	3/4-16	531-158	177.80
CT50	1"	14.00"	2.36"	2.36"	3/4-16	531-159	914.80
CT50	1-1/4"	2.00"*	2.55"	2.75"	3/4-16	531-160	170.00
CT50	1-1/4"	4.00"	2.55"	2.48"	3/4-16	531-162	154.80
CT50	1-1/4"	6.00"	2.55"	2.48"	3/4-16	531-164	176.70
CT50	1-1/4"	8.00"	2.55"	2.48"	3/4-16	531-166	203.40
CT50	1-1/4"	14.00"	2.55"	2.48"	3/4-16	531-167	920.60
CT50	1-1/2"	2.25"*	2.83"	2.75"	3/4-16	531-168	152.30
CT50	1-1/2"	4.50"	2.83"	2.99"	3/4-16	531-170	154.80
CT50	1-1/2"	7.00"	2.83"	2.99"	3/4-16	531-172	255.60
CT50	1-1/2"	9.00"	2.83"	2.99"	3/4-16	531-174	541.70
CT50	2"	3.63"*	3.34"	3.74"	1"-14	531-176	185.90
CT50	2"	5.37"	3.34"	3.74"	1"-14	531-178	192.30
CT50	2"	8.00"	3.34"	3.74"	1"-14	531-180	223.80
CT50	2"	10.00"	3.34"	3.74"	1"-14	531-182	243.40
CT50	2-1/2"	6.00"	3.66"	4.25"	1"-14	531-184	263.40

* Stubby Length

End Mill Holders



END MILL HOLDERS

CAT50 DIRECT COOLANT End Mill Holders

NOW 3 COOLANT OPTIONS ALL IN ONE!

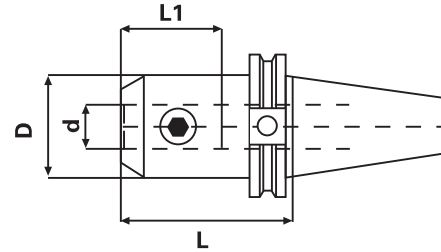
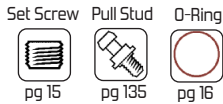
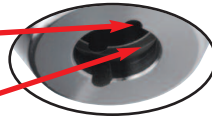
- 100% Forged Construction
- Certified balanced to 25,000 rpm
- Precision Ground Throughout
- Coolant thru the spindle
- DIN Coolant thru the flange - standard (not available on stubby models)
- Coolant thru the body



Complete with certificate

Coolant thru slots for directing coolant onto the tool.

O-Ring Seal for Non Direct Coolant Operations.



Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
CT50	1/4"	2.50"	1.10"	0.79"	1/4-28	522-102	175.50
CT50	1/4"	4.00"	1.10"	0.79"	1/4-28	522-104	195.40
CT50	1/4"	6.00"	1.10"	0.79"	1/4-28	522-106	221.60
CT50	5/16"	4.00"	1.26"	0.87"	5/16-24	522-112	195.40
CT50	5/16"	6.00"	1.26"	0.87"	5/16-24	522-114	221.60
CT50	3/8"	2.50"	1.26"	1.00"	3/8-24	522-118	175.50
CT50	3/8"	4.00"	1.26"	1.00"	3/8-24	522-120	195.40
CT50	3/8"	6.00"	1.26"	1.00"	3/8-24	522-122	216.80
CT50	3/8"	8.00"	1.26"	1.00"	3/8-24	522-124	251.50
CT50	7/16"	2.50"	1.50"	1.38"	7/16-20	522-128	185.90
CT50	7/16"	4.00"	1.50"	1.38"	7/16-20	522-130	188.50
CT50	1/2"	1.75"*	1.50"	1.38"	7/16-20	522-134	166.20
CT50	1/2"	2.63"	1.50"	1.38"	7/16-20	522-136	166.20
CT50	1/2"	4.00"	1.50"	1.38"	7/16-20	522-138	195.40
CT50	1/2"	6.00"	1.50"	1.38"	7/16-20	522-140	224.70
CT50	1/2"	8.00"	1.48"	1.38"	7/16-20	522-142	258.60
CT50	5/8"	1.75"*	1.61"	1.65"	9/16-18	522-148	166.20
CT50	5/8"	3.00"	1.61"	1.65"	9/16-18	522-150	192.20
CT50	5/8"	4.00"	1.61"	1.65"	9/16-18	522-152	192.20
CT50	5/8"	6.00"	1.61"	1.65"	9/16-18	522-154	214.20
CT50	3/4"	1.75"*	1.77"	1.89"	5/8-18	522-158	167.40
CT50	3/4"	3.00"	1.77"	1.89"	5/8-18	522-160	167.40
CT50	3/4"	4.00"	1.77"	1.89"	5/8-18	522-162	195.40
CT50	3/4"	6.00"	1.77"	1.89"	5/8-18	522-164	221.00
CT50	3/4"	8.00"	1.77"	1.89"	5/8-18	522-166	255.80
CT50	1"	2.00"*	2.36"	2.36"	3/4-16	522-176	212.70
CT50	1"	4.00"	2.36"	2.36"	3/4-16	522-178	195.40
CT50	1"	6.00"	2.36"	2.36"	3/4-16	522-180	199.50
CT50	1"	8.00"	2.36"	2.36"	3/4-16	522-182	231.20
CT50	1"	12.00"	2.36"	2.36"	3/4-16	522-183	285.00
CT50	1-1/4"	2.00"*	2.55"	2.75"	3/4-16	522-186	221.00
CT50	1-1/4"	4.00"	2.55"	2.48"	3/4-16	522-188	201.30
CT50	1-1/4"	6.00"	2.55"	2.48"	3/4-16	522-190	229.80
CT50	1-1/2"	2.25"*	2.83"	2.75"	3/4-16	522-196	198.00
CT50	1-1/2"	4.50"	2.83"	2.99"	3/4-16	522-198	201.30
CT50	2"	3.63"*	3.34"	3.74"	1"-14	522-204	238.10
CT50	2"	5.37"	3.34"	3.74"	1"-14	522-206	250.00
CT50	2"	8.00"	3.34"	3.74"	1"-14	522-208	286.60
CT50	2"	10.00"	3.34"	3.74"	1"-14	522-210	311.70

* Stubby Length

* Available only while quantities last



CAT50 DUAL CONTACT End Mill Holders

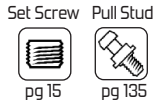
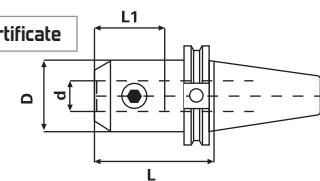
FOR DUAL CONTACT SPINDLES
(CAN ALSO BE USED ON STANDARD SPINDLES)

- 100% Forged Construction
- Certified balanced to 25,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Improves rigidity and reduces vibration allowing for increased feed rates and increased tool life.

Eliminates the gap between the flange and the spindle for increased rigidity



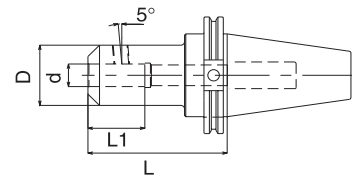
Complete with certificate



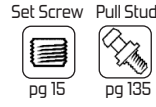
Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
CT50	1/2"	4.00"	1.50"	1.38"	7/16-20	521-120	180.40
CT50	1/2"	6.00"	1.50"	1.38"	7/16-20	521-122	207.40
CT50	5/8"	4.00"	1.61"	1.65"	9/16-18	521-130	177.40
CT50	5/8"	6.00"	1.61"	1.65"	9/16-18	521-132	197.70
CT50	3/4"	3.00"	1.77"	1.89"	5/8-18	521-138	154.50
CT50	3/4"	4.00"	1.77"	1.89"	5/8-18	521-140	180.40
CT50	3/4"	6.00"	1.77"	1.89"	5/8-18	521-142	204.00
CT50	1"	4.00"	2.36"	2.36"	3/4-16	521-154	180.40
CT50	1"	6.00"	2.36"	2.36"	3/4-16	521-156	184.10
CT50	1"	8.00"	2.36"	2.36"	3/4-16	521-158	213.40
CT50	1-1/4"	4.00"	2.55"	2.48"	3/4-16	521-162	185.80
CT50	1-1/4"	6.00"	2.55"	2.48"	3/4-16	521-164	212.10
CT50	1-1/4"	8.00"	2.55"	2.48"	3/4-16	521-166	244.10
CT50	1-1/2"	4.50"	2.83"	2.99"	3/4-16	521-170	185.80
CT50	1-1/2"	7.00"	2.83"	2.99"	3/4-16	521-172	306.80
CT50	2"	5.37"	3.34"	3.74"	1"-14	521-178	230.80

CAT50 Aerospace End Mill Holders

- 100% Forged Construction
- Certified balanced to 25,000 rpm
- Precision Ground Throughout
- DIN Coolant option - standard
- Accepts end mills with 5° angled shanks



Complete with certificate



Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
CAT50	1/2"	2.73"	1.68"	1.63"	3/8-24	531-706*	184.90
CAT50	1/2"	6.60"	1.68"	1.63"	3/8-24	531-710*	239.00
CAT50	5/8"	2.66"	1.74"	1.81"	1/2-20	531-712*	184.90
CAT50	5/8"	6.53"	1.74"	1.81"	1/2-20	531-716*	239.00
CAT50	3/4"	2.63"	2.01"	2.00"	1/2-20	531-718*	184.90
CAT50	1"	3.00"	2.27"	2.63"	3/4-16	531-730*	194.20
CAT50	1"	6.50"	2.27"	2.63"	3/4-16	531-734*	251.40
CAT50	1-1/4"	3.00"	2.27"	2.87"	3/4-16	531-736*	210.80
CAT50	1-1/4"	4.50"	2.27"	2.87"	3/4-16	531-738*	233.00
CAT50	1-1/2"	4.00"	2.27"	3.25"	3/4-16	531-742*	234.50
CAT50	2"	5.35"	3.38"	4.00"	3/4-16	531-744*	283.50
CAT50	2"	7.35"	3.38"	4.00"	3/4-16	531-746*	311.00

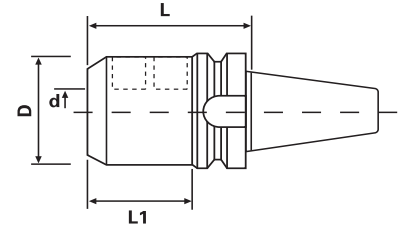
* Available only while quantities last.



END MILL HOLDERS

BT30 End Mill Holders

- 100% Forged Construction
- Certified balanced to 20,000 rpm
- Precision Ground Throughout



Complete with certificate



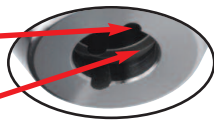
Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
BT30	1/8"	2.36"	0.63"	0.75"	8-32	532-001	75.60
BT30	3/16"	2.36"	0.87"	0.75"	10-32	532-003	75.60
BT30	1/4"	2.36"	1.10"	0.79"	1/4-28	532-000	75.60
BT30	5/16"	2.36"	1.26"	0.87"	5/16-24	532-002	75.60
BT30	3/8"	2.36"	1.26"	1.00"	3/8-24	532-004	75.60
BT30	7/16"	2.36"	1.50"	1.38"	7/16-20	532-006	75.60
BT30	1/2"	2.36"	1.50"	1.38"	7/16-20	532-008	75.60
BT30	5/8"	2.50"	1.61"	1.65"	9/16-18	532-010	75.60
BT30	3/4"	3.00"	1.77"	1.88"	5/8-18	532-012	75.60
BT30	7/8"	3.54"	2.09"	2.00"	5/8-18	532-014	79.80
BT30	1"	3.54"	2.36"	2.36"	3/4-16	532-016	79.80

BT30 DIRECT COOLANT End Mill Holders

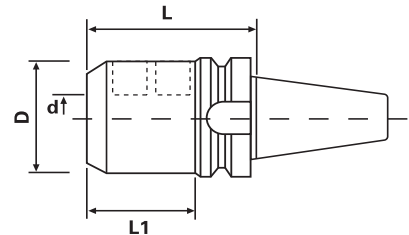
NOW 3 COOLANT OPTIONS ALL IN ONE!

- 100% Forged Construction
- Certified balanced to 20,000 rpm
- Precision Ground Throughout
- Coolant thru the spindle
- DIN Coolant thru the flange - standard
- Coolant thru the body

Coolant thru slots for directing coolant onto the tool.
O-Ring Seal for Non Direct Coolant Operations.



Complete with certificate



Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
BT30	1/4"	2.36"	1.10"	0.79"	1/4-28	522-218	98.30
BT30	5/16"	2.36"	1.26"	0.87"	5/16-24	522-220	98.30
BT30	3/8"	2.36"	1.26"	1.00"	3/8-24	522-222	98.30
BT30	1/2"	2.36"	1.50"	1.38"	7/16-20	522-224	98.30

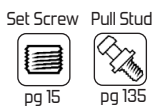
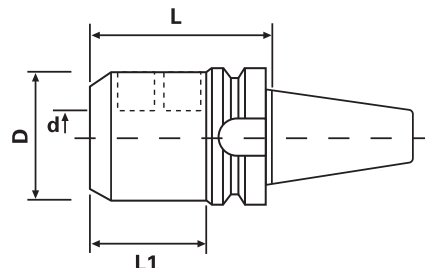


BT40 End Mill Holders

- 100% Forged Construction
- Certified balanced to 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard (not available on stubby models)



Complete with certificate



Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
BT40	1/8"	1.38"*	0.63"	1.75"	8-32	531-019	118.60
BT40	1/8"	2.50"	0.63"	0.75"	8-32	531-021	118.60
BT40	1/8"	4.00"	0.63"	0.75"	8-32	531-023	160.20
BT40	3/16"	1.38"*	0.63"	0.75"	10-32	531-025	118.60
BT40	3/16"	2.50"	0.86"	0.75"	10-32	531-027	106.40
BT40	3/16"	4.00"	0.86"	0.75"	10-32	531-029	160.20
BT40	1/4"	1.38"*	1.18"	0.79"	1/4-28	532-018	110.90
BT40	1/4"	2.50"	1.10"	0.79"	1/4-28	532-020	110.90
BT40	1/4"	4.00"	1.10"	0.79"	1/4-28	532-022	121.80
BT40	5/16"	1.38"*	1.38"	0.87"	5/16-24	532-024	120.80
BT40	5/16"	2.50"	1.26"	0.87"	5/16-24	532-026	120.80
BT40	5/16"	4.00"	1.26"	0.87"	5/16-24	532-028	106.40
BT40	3/8"	1.38"*	1.38"	1.00"	3/8-24	532-030	120.80
BT40	3/8"	2.50"	1.26"	1.00"	3/8-24	532-032	120.80
BT40	3/8"	4.00"	1.26"	1.00"	3/8-24	532-034	121.80
BT40	7/16"	2.50"	1.53"	1.38"	7/16-20	532-036	106.40
BT40	1/2"	1.75"*	1.57"	1.38"	7/16-20	532-038	106.40
BT40	1/2"	2.50"	1.50"	1.38"	7/16-20	532-040	121.80
BT40	1/2"	4.00"	1.57"	1.38"	7/16-20	532-042	121.80
BT40	5/8"	1.75"*	1.61"	1.65"	9/16-18	532-044	108.00
BT40	5/8"	2.50"	1.61"	1.65"	9/16-18	532-046	121.80
BT40	5/8"	4.00"	1.61"	1.65"	9/16-18	532-048	121.80
BT40	3/4"	1.75"*	1.77"	1.89"	5/8-18	532-050	120.80
BT40	3/4"	2.50"	1.77"	1.89"	5/8-18	532-052	121.80
BT40	3/4"	4.00"	1.77"	1.89"	5/8-18	532-054	121.80
BT40	7/8"	3.38"	2.08"	2.00"	5/8-18	532-056	118.60
BT40	7/8"	6.00"	2.08"	2.00"	5/8-18	532-058	154.00
BT40	1"	2.00"*	2.28"	2.25"	3/4-16	532-060	120.80
BT40	1"	3.56"	2.36"	2.36"	3/4-16	532-062	121.80
BT40	1"	6.00"	2.36"	2.36"	3/4-16	532-064	168.80
BT40	1-1/4"	2.00"*	2.16"	2.25"	3/4-16	532-066	132.00
BT40	1-1/4"	3.56"	2.56"	2.48"	3/4-16	532-068	121.80
BT40	1-1/4"	6.00"	2.56"	2.48"	3/4-16	532-070	187.00
BT40	1-1/2"	4.50"	2.83"	2.99"	3/4-16	532-072	146.60
BT40	1-1/2"	6.00"	2.83"	2.99"	3/4-16	532-074	187.00

* Stubby Length



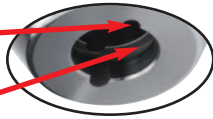
END MILL HOLDERS

BT40 DIRECT COOLANT End Mill Holders

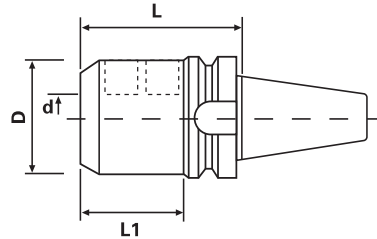
NOW 3 COOLANT OPTIONS ALL IN ONE!

- 100% Forged Construction
- Certified balanced to 30,000 rpm
- Precision Ground Throughout
- Coolant thru the spindle
- DIN Coolant thru the flange - standard (not available on stubby models)
- Coolant thru the body

Coolant thru slots for directing coolant onto the tool.
O-Ring Seal for Non Direct Coolant Operations.



Complete with certificate



- Set Screw pg 15
- Pull Stud pg 135
- O-Ring pg 16

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
BT40	1/4"	2.50"	1.10"	0.79"	1/4-28	522-244	144.30
BT40	1/4"	4.00"	1.10"	0.79"	1/4-28	522-246	158.40
BT40	3/8"	2.50"	1.26"	1.00"	3/8-24	522-256	157.10
BT40	3/8"	4.00"	1.26"	1.00"	3/8-24	522-258	158.40
BT40	1/2"	2.50"	1.50"	1.38"	7/16-20	522-264	158.40
BT40	1/2"	4.00"	1.57"	1.38"	7/16-20	522-266	158.40
BT40	3/4"	2.50"	1.77"	1.89"	5/8-18	522-276	158.40
BT40	3/4"	4.00"	1.77"	1.89"	5/8-18	522-278	158.40
BT40	1"	2.00"*	2.28"	2.25"	3/4-16	522-282	157.10

* Stubby Length

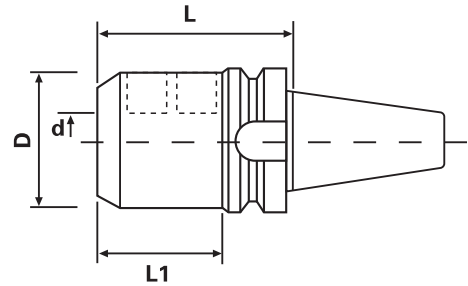
* Available only while quantities last

BT50 End Mill Holders

- 100% Forged Construction
- Certified balanced to 25,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard



Complete with certificate



- Set Screw pg 15
- Pull Stud pg 135

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
BT50	3/8"	2.50"	1.26"	1.00"	3/8-24	532-075	142.50
BT50	3/8"	5.31"	3.82"	1.00"	3/8-24	532-076	158.40
BT50	1/2"	2.75"	1.50"	1.38"	7/16-20	532-077	142.50
BT50	1/2"	5.31"	3.82"	1.38"	7/16-20	532-078	158.40
BT50	5/8"	3.00"	1.61"	1.65"	9/16-18	532-079	142.50
BT50	5/8"	5.31"	3.82"	1.65"	9/16-18	532-081	188.10
BT50	3/4"	3.00"	1.46"	1.75"	5/8-18	532-083	142.50
BT50	3/4"	6.00"	1.77"	1.75"	5/8-18	532-085	158.40
BT50	1"	4.00"	2.64"	2.36"	3/4-16	532-087	142.50
BT50	1"	6.00"	4.41"	2.36"	3/4-16	532-089	158.40
BT50	1-1/4"	4.00"	2.64"	2.48"	3/4-16	532-091	158.40
BT50	1-1/4"	6.00"	2.55"	2.48"	3/4-16	532-093	175.80
BT50	1-1/2"	4.13"	2.83"	2.99"	3/4-16	532-095	158.40
BT50	1-1/2"	7.00"	2.83"	2.99"	3/4-16	532-097	173.30
BT50	2"	4.72"	3.23"	3.86"	1"-14	532-099	235.50



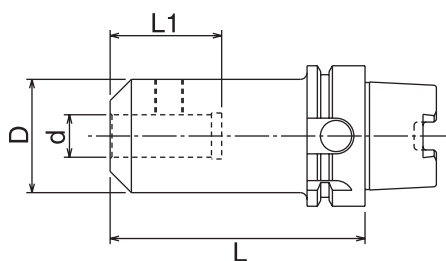
HSK63A End Mill Holders

- 100% Forged Construction
- Certified balanced to 30,000 rpm
- Precision Ground Throughout
- High rigidity & torque transmission
- Wrench not included

See page 16 for Coolant tubes and Coolant tube wrenches



Complete with certificate



Set Screw



pg 15

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
HSK63A	3/16"	3.00"	0.866"	0.748"	10-32X1/4	536-002	275.40
HSK63A	3/16"	5.00"	0.866"	0.748"	10-32X1/4	536-004	275.40
HSK63A	1/4"	3.00"	1.102"	0.787"	1/4-28X1/4	536-006	275.40
HSK63A	1/4"	5.00"	1.102"	0.787"	1/4-28X1/4	536-008	275.40
HSK63A	5/16"	3.00"	1.417"	0.874"	5/16-24X1/4	536-010	275.40
HSK63A	5/16"	5.00"	1.417"	0.874"	5/16-24X1/4	536-012	275.40
HSK63A	3/8"	3.50"	1.574"	1.380"	3/8-24X5/16	536-014	275.40
HSK63A	3/8"	5.00"	1.574"	1.380"	3/8-24X5/16	536-016	275.40
HSK63A	7/16"	4.00"	1.771"	1.378"	7/16-20X3/8	536-018	286.30
HSK63A	7/16"	5.00"	1.771"	1.378"	7/16-20X3/8	536-020	275.40
HSK63A	1/2"	4.00"	1.771"	1.378"	7/16-20X3/8	536-022	275.40
HSK63A	1/2"	5.00"	1.771"	1.378"	7/16-20X3/8	536-024	275.40
HSK63A	5/8"	4.00"	1.889"	1.654"	9/16-18X1/2	536-026	275.40
HSK63A	3/4"	4.50"	1.968"	1.889"	5/8-18X1/2	536-030	275.40
HSK63A	3/4"	6.00"	1.968"	1.889"	5/8-18X1/2	536-032	275.40
HSK63A	1"	4.50"	2.755"	2.363"	3/4-16X11/16 (2)	536-034	275.40
HSK63A	1-1/4"	4.50"	2.952"	2.88"	3/4-16X11/16 (2)	536-038	275.40

• Available only while quantities last



END MILL HOLDERS

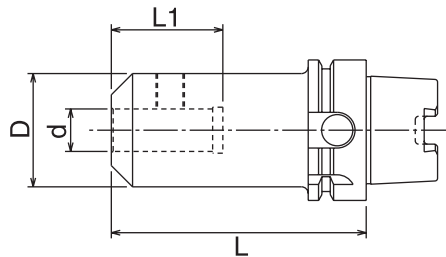
HSK100A End Mill Holders

- 100% Forged Construction
- Certified balanced to 25,000 rpm
- Precision Ground Throughout
- High rigidity & torque transmission
- Wrench not included

See page 16 for Coolant tubes and Coolant tube wrenches



Complete with certificate



Set Screw



pg 15

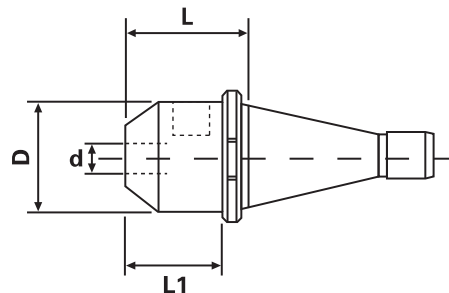
Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
HSK100A	3/16"	4.00"	0.867"	0.748"	10-32X1/4	536-042	335.70
HSK100A	3/16"	6.00"	0.867"	0.748"	10-32X1/4	536-044	367.20
HSK100A	1/4"	4.00"	1.102"	0.787"	1/4-28X1/4	536-046	335.70
HSK100A	1/4"	6.00"	1.102"	0.787"	1/4-28X1/4	536-048	367.20
HSK100A	5/16"	4.00"	1.220"	0.866"	5/16-24X1/4	536-050	335.70
HSK100A	5/16"	6.00"	1.220"	0.866"	5/16-24X1/4	536-052	367.20
HSK100A	3/8"	4.00"	1.260"	1.380"	3/8-24X5/16	536-054	335.70
HSK100A	3/8"	6.00"	1.260"	1.380"	3/8-24X5/16	536-056	367.20
HSK100A	7/16"	4.00"	1.496"	1.378"	7/16-20X3/8	536-058	391.60
HSK100A	1/2"	4.00"	1.575"	1.378"	7/16-20X3/8	536-062	335.70
HSK100A	1/2"	6.00"	1.575"	1.378"	7/16-20X3/8	536-064	367.20
HSK100A	5/8"	4.00"	1.693"	1.654"	9/16-18X1/2	536-066	335.70
HSK100A	3/4"	4.00"	1.969"	1.890"	5/8-18X1/2	536-070	335.70
HSK100A	3/4"	6.00"	1.969"	1.890"	5/8-18X1/2	536-072	367.20
HSK100A	1"	4.00"	2.559"	2.362"	3/4-16X11/16 (2)	536-074	335.70
HSK100A	1"	6.00"	2.559"	2.362"	3/4-16X11/16 (2)	536-076	367.20
HSK100A	1-1/4"	4.00"	2.559"	2.480"	3/4-16X11/16 (2)	536-078	335.70
HSK100A	1-1/4"	6.00"	2.559"	2.480"	3/4-16X11/16 (2)	536-080	367.20

• Available only while quantities last



NMTB40 End Mill Holders

- 100% Forged Construction
- Precision Ground Throughout



Set Screw



pg 15

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
NMTB40	1/4"	2.31"	1.10"	0.79"	1/4-28	534-000	103.00
NMTB40	5/16"	2.31"	1.26"	0.87"	5/16-24	534-002	103.00
NMTB40	3/8"	2.31"	1.26"	1.00"	3/8-24	534-004	103.00
NMTB40	1/2"	2.31"	1.50"	1.38"	7/16-20	534-008	103.00
NMTB40	5/8"	2.31"	1.61"	1.65"	9/16-18	534-010	103.00
NMTB40	3/4"	2.31"	1.77"	1.89"	5/8-18	534-012	103.00
NMTB40	7/8"	2.94"	2.09"	2.01"	5/8-18	534-014	103.00
NMTB40	1"	3.37"	2.36"	2.36"	3/4-16	534-016	103.00
NMTB40	1-1/4"	3.69"	2.56"	2.48"	3/4-16	534-018	103.00
NMTB40	1-1/2"	3.95"	2.56"	2.99"	3/4-16	534-019	106.00



11pc CAT40 Rotary Tooling Package

- 100% Forged Construction
- Certified balanced up to 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard

Pack contents:

- CAT40 ER32 - 0.75" Collet Chuck - 4pcs (531-401)
- CAT40 1/4 - 2.5" End Mill Holder - 1pc (531-002)
- CAT40 3/8 - 2.5" End Mill Holder - 1pc (531-014)
- CAT40 1/2 - 2.5" End Mill Holder - 1pc (531-026)
- CAT40 3/4 - 3.00" End Mill Holder - 1pc (531-042)
- CAT40 1" - 4.00" End Mill Holder - 1pc (531-056)
- CAT40 3/4 - 1.75" Shell Mill Holder - 1pc (531-192)
- ER32 Stubby Collet Chuck Wrench - 1pc (337-381)



Code No: 500-237
Total value \$ 1,520.30

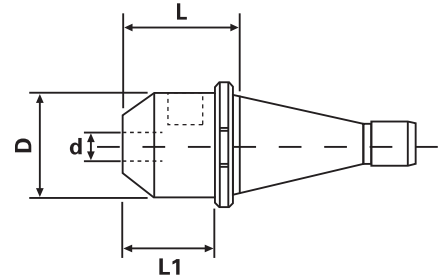
CALL TODAY FOR A QUOTE



END MILL HOLDERS

NMTB50 End Mill Holders

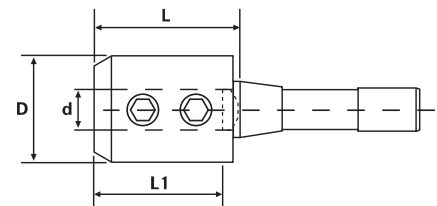
- 100% Forged Construction
- Precision Ground Throughout



Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
NMTB50	1/4"	2.75"	1.10"	0.79"	1/4-28	534-020	141.70
NMTB50	3/8"	2.75"	1.26"	1.00"	3/8-24	534-022	141.70
NMTB50	3/8"	4.50"	1.26"	1.00"	3/8-24	534-024	141.70
NMTB50	1/2"	2.75"	1.50"	1.38"	7/16-20	534-026	141.70
NMTB50	1/2"	4.50"	1.50"	1.38"	7/16-20	534-028	148.70
NMTB50	5/8"	2.75"	1.61"	1.65"	9/16-18	534-030	141.70
NMTB50	5/8"	4.50"	1.61"	1.65"	9/16-18	534-032	148.70
NMTB50	3/4"	2.88"	1.77"	1.89"	5/8-18	534-034	141.70
NMTB50	3/4"	4.50"	1.77"	1.89"	5/8-18	534-036	148.70
NMTB50	7/8"	2.88"	2.09"	2.01"	5/8-18	534-038	147.10
NMTB50	7/8"	4.50"	2.09"	2.01"	5/8-18	534-040	154.30
NMTB50	1"	3.50"	2.36"	2.36"	3/4-16	534-042	151.40
NMTB50	1"	5.50"	2.36"	2.36"	3/4-16	534-044	158.60
NMTB50	1-1/4"	3.50"	2.56"	2.48"	3/4-16	534-046	169.90
NMTB50	1-1/4"	5.50"	2.56"	2.48"	3/4-16	534-048	178.20
NMTB50	1-1/2"	4.00"	2.83"	2.99"	3/4-16	534-050	174.90
NMTB50	1-1/2"	6.00"	2.83"	2.99"	3/4-16	534-052	183.30
NMTB50	2"	4.69"	3.34"	3.74"	1-14	534-054	202.80

• Available only while quantities last

R8 End Mill Holders

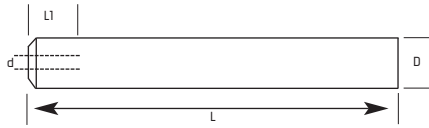


Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
R8	1/4"	1.33"	1.10"	0.79"	1/4-28	534-056	58.10
R8	5/16"	1.75"	1.26"	0.87"	5/16-24	534-058	58.10
R8	3/8"	1.33"	1.26"	1.00"	3/8-24	534-060	58.10
R8	7/16"	1.33"	1.50"	1.38"	7/16-20	534-062	58.10
R8	1/2"	1.33"	1.50"	1.38"	7/16-20	534-064	58.10
R8	5/8"	1.50"	1.61"	1.65"	9/16-18	534-066	58.10
R8	3/4"	2.37"	1.77"	1.89"	5/8-18	534-068	66.60
R8	1"	3.25"	2.76"	2.36"	3/4-16	534-072	74.10
R8	1-1/4"	3.25"	2.56"	2.48"	3/4-16	534-074	77.70

• Available only while quantities last



Straight Shank End Mill Holders



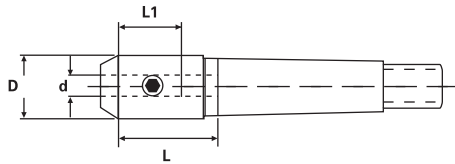
Set Screw



pg 15

Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
1/4"	6.00"	1.10"	.750"	1/4-28	534-078	74.50
5/16"	6.00"	1.26"	.750"	5/16-24	534-080	70.60
3/8"	6.00"	1.26"	1.00"	3/8-24	534-082	75.30
1/2"	6.00"	1.49"	1.00"	1/4-28	534-084	75.30

Morse Taper End Mill Holders



Set Screw



pg 15

Taper	Hole Dia. (d)	Gage Length (L)	L1	D	Set Screw	Code No.	Price \$
MT2	5/16"	1.50"	1.26"	0.87"	5/16-24	534-088•	45.20
MT3	1/4"	1.50"	1.07"	0.79"	1/4-28	534-094•	55.70
MT3	1/2"	1.94"	1.50"	1.38"	7/16-20	534-100•	71.40
MT4	3/4"	2.75"	1.77"	1.89"	5/8-18	534-108•	99.40

• Available only while supplies last

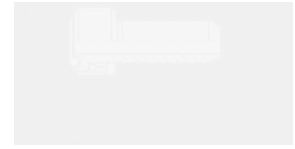
Replacement Set Screws



Size	Size of Holder	Code No.	Price \$
8-32 x 5/16	1/8	534-109	0.50
10-32 x 5/16	3/16	534-111	0.50
1/4-28 x 1/4	1/4"	534-110	2.30
5/16-24 x 1/4	5/16"	534-112	2.30
3/8-24 x 5/16	3/8", 7/16"	534-114	3.50
7/16-20 x 3/8	1/2"	534-116	4.20
9/16-18 x 1/2	5/8"	534-118	2.50
5/8-18 x 1/2	3/4", 7/8"	534-120	5.70
3/4-16 x 9.5mm	1", 1-1/4", 1-1/2"	534-119	4.30
3/4-16 x 11/16	1", 1-1/4", 1-1/2"	534-122	6.20
1-14 x 7/8	2"	534-124	20.40

HSK Coolant Tubes

- Designed specifically to be used with HSK holders
- Leak-proof screwed connection



Used with Taper	d1	G	l1	l2	Code No.	Price \$
HSK63A	12	M18x1	36.5	11.5	536-600	13.90
HSK100A	16	M24x1.5	44.0	15.5	536-602	15.00

O-Rings For DIRECT COOLANT Holders

- Can be used in all tapers of Direct Coolant Holders



Holder Size	Code No.	Price \$
1/4"	522-390	1.50
5/16"	522-391	1.50
3/8"	522-392	1.50
1/2"	522-393	1.50
5/8"	522-394	1.50
3/4"	522-395	1.50
1"	522-396	1.50
1-1/4"	522-397	1.50

Coolant Tube Wrenches

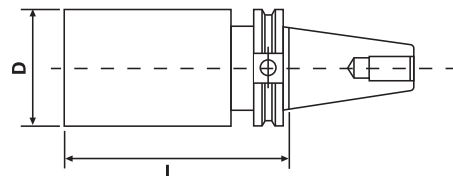


Description	Used with Taper	Code No.	Price \$
Coolant Tube Wrench	HSK63A	536-604	25.00
Coolant Tube Wrench	HSK100A	536-606	29.10

Blank Bars

Blank bars are suitable for all applications, including deep boring. While the tapers are ground and hardened, the projections are not.

- Traverse ground shank to obtain optimum accuracy
- Meets or exceeds ANSI specifications
- Material to be machined - SNCM 415H



Pull Stud



pg 135

Taper	L	D	Code No.	Price \$
CAT Taper				
CAT 40	13"	2.50"	531-592	268.20
CAT 50	13"	3.88"	531-594	301.80
NMTB Taper				
NMTB50	13"	3.88"	534-602	277.10



TOOLING

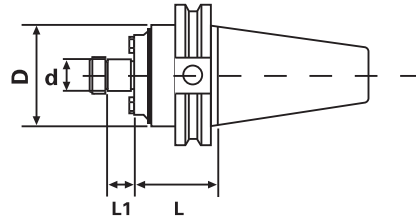
SHELL MILL HOLDERS & MILLING ARBORS

CAT40 Shell Mill Holders	18
CAT40 Dual Contact Shell Mill Holders	18
CAT50 Shell Mill Holders	19
CAT50 Dual Contact Shell Mill Holders	19
CAT50 Face Mill Holders	20
BT Taper Shell Mill Holders	20
HSK Shell Mill Holders	21
NMTB Taper Shell Mill Holders	21
NMTB 50 Face Mill Holder	22
R8 Shell Mill Holders	22
Replacement Drive Keys & Arbor Screws	23
CAT Taper Stub Arbors	24
Replacement Stub Arbor Nuts & Spacers	24

www.sowatool.com

CAT40 Shell Mill Holders

- 100% Forged Construction
- Precision Ground Throughout
- DIN Coolant thru the flange - standard



- Pull Stud pg 135
 Drive Key pg 23
 Arbor Screw pg 23

Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
CT40	1/2"	1.75"	1.38"	0.57"	1/4"	1/4"-28	531-190	144.50
CT40	3/4"	1.75"	1.75"	0.67"	5/16"	3/8"-24	531-192	131.10
CT40	3/4"	4.00"	1.75"	0.67"	5/16"	3/8"-24	531-194	176.70
CT40	3/4"	6.00"	1.75"	0.67"	5/16"	3/8"-24	531-195	198.90
CT40	1"	1.75"	2.38"	0.67"	3/8"	1/2"-20	531-196	131.10
CT40	1"	4.00"	2.38"	0.67"	3/8"	1/2"-20	531-198	176.70
CT40	1"	6.00"	2.38"	0.67"	3/8"	1/2"-20	531-199	198.90
CT40	1-1/4"	2.00"	2.88"	0.67"	1/2"	5/8"-18	531-200	140.00
CT40	1-1/4"	4.00"	2.88"	0.67"	1/2"	5/8"-18	531-202	198.90
CT40	1-1/4"	6.00"	2.88"	0.67"	1/2"	5/8"-18	531-203	204.50
CT40	1-1/2"	2.00"	3.80"	0.93"	5/8"	3/4"-16	531-204	155.60
CT40	1-1/2"	4.00"	3.80"	0.93"	5/8"	3/4"-16	531-206	222.30

CAT40 DUAL CONTACT Shell Mill Holders

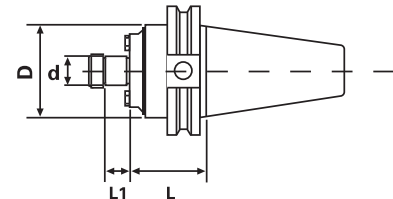
FOR DUAL CONTACT SPINDLES

(CAN ALSO BE USED ON STANDARD SPINDLES)

- 100% Forged Construction
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Improves rigidity and reduces vibration allowing for increased feed rates and increased tool life.



Eliminates the gap between the flange and the spindle for increased rigidity



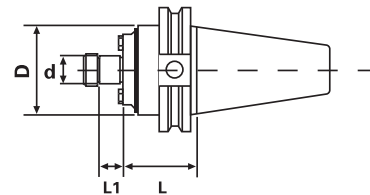
- Pull Stud pg 135
 Drive Key pg 23
 Arbor Screw pg 23

Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
CT40	3/4"	1.75"	1.75"	0.67"	5/16"	3/8"-24	521-192	157.40
CT40	3/4"	4.00"	1.75"	0.67"	5/16"	3/8"-24	521-194	212.10
CT40	3/4"	6.00"	1.75"	0.67"	5/16"	3/8"-24	521-195	238.70
CT40	1"	1.75"	2.38"	0.67"	3/8"	1/2"-20	521-196	157.40
CT40	1"	4.00"	2.38"	0.67"	3/8"	1/2"-20	521-198	212.10
CT40	1"	6.00"	2.38"	0.67"	3/8"	1/2"-20	521-199	238.70
CT40	1-1/4"	2.00"	2.88"	0.67"	1/2"	5/8"-18	521-200	168.00
CT40	1-1/4"	4.00"	2.88"	0.67"	1/2"	5/8"-18	521-202	238.70
CT40	1-1/2"	2.00"	3.80"	0.93"	5/8"	3/4"-16	521-204	186.80
CT40	1-1/2"	4.00"	3.80"	0.93"	5/8"	3/4"-16	521-206	266.80



CAT50 Shell Mill Holders

- 100% Forged Construction
- Precision Ground Throughout
- DIN Coolant thru the flange - standard



Pull Stud Drive Key Arbor Screw



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Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
CT50	3/4"	1.75"	2.00"	0.67"	5/16"	3/8"-24	531-208	157.80
CT50	3/4"	4.00"	2.00"	0.67"	5/16"	3/8"-24	531-210	204.50
CT50	3/4"	6.00"	2.00"	0.67"	5/16"	3/8"-24	531-212	263.40
CT50	3/4"	8.00"	2.00"	0.67"	5/16"	3/8"-24	531-214	326.70
CT50	1"	1.75"	2.75"	0.69"	3/8"	1/2"-20	531-216	163.40
CT50	1"	4.00"	2.75"	0.69"	3/8"	1/2"-20	531-218	222.30
CT50	1"	6.00"	2.75"	0.69"	3/8"	1/2"-20	531-220	286.70
CT50	1"	8.00"	2.75"	0.69"	3/8"	1/2"-20	531-222	326.70
CT50	1-1/4"	1.75"	2.88"	0.69"	1/2"	5/8"-18	531-224	186.70
CT50	1-1/4"	4.00"	2.88"	0.69"	1/2"	5/8"-18	531-226	222.20
CT50	1-1/4"	6.00"	2.88"	0.69"	1/2"	5/8"-18	531-228	286.70
CT50	1-1/4"	8.00"	2.88"	0.69"	1/2"	5/8"-18	531-230	348.90
CT50	1-1/2"	2.00"	3.80"	0.93"	5/8"	3/4"-16	531-232	187.60
CT50	1-1/2"	4.00"	3.80"	0.93"	5/8"	3/4"-16	531-234	222.20
CT50	1-1/2"	6.00"	3.80"	0.93"	5/8"	3/4"-16	531-236	286.70
CT50	1-1/2"	8.00"	3.80"	0.93"	5/8"	3/4"-16	531-238	372.30
CT50	2"	2.00"	4.38"	0.93"	3/4"	1"-14	531-240	234.40
CT50	2"	4.00"	4.38"	0.93"	3/4"	1"-14	531-242	421.20
CT50	2"	6.00"	4.38"	0.93"	3/4"	1"-14	531-244	257.70

CAT50 DUAL CONTACT Shell Mill Holders

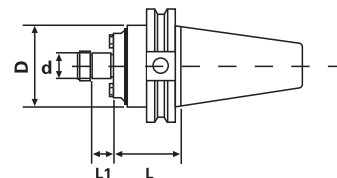
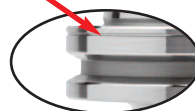
FOR DUAL CONTACT SPINDLES

(CAN ALSO BE USED ON STANDARD SPINDLES)

- 100% Forged Construction
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Improves rigidity and reduces vibration allowing for increased feed rates and increased tool life.



Eliminates the gap between the flange and the spindle for increased rigidity



Pull Stud Drive Key Arbor Screw



pg 135



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pg 23

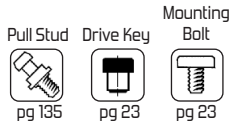
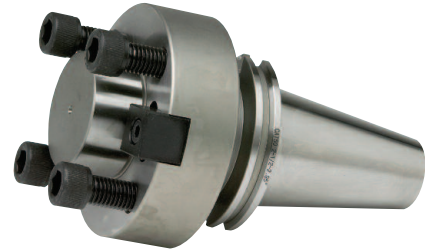
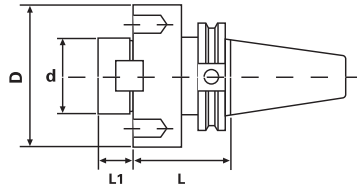
Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
CT50	3/4"	1.75"	2.00"	0.67"	5/16"	3/8"-24	521-208	189.40
CT50	3/4"	4.00"	2.00"	0.67"	5/16"	3/8"-24	521-210	245.40
CT50	3/4"	6.00"	2.00"	0.67"	5/16"	3/8"-24	521-212	316.10
CT50	1"	1.75"	2.75"	0.69"	3/8"	1/2"-20	521-216	196.10
CT50	1"	4.00"	2.75"	0.69"	3/8"	1/2"-20	521-218	266.80
CT50	1"	6.00"	2.75"	0.69"	3/8"	1/2"-20	521-220	344.10
CT50	1"	8.00"	2.75"	0.69"	3/8"	1/2"-20	521-222	392.10
CT50	1-1/4"	1.75"	2.88"	0.69"	1/2"	5/8"-18	521-224	224.10
CT50	1-1/4"	4.00"	2.88"	0.69"	1/2"	5/8"-18	521-226	266.70
CT50	1-1/4"	6.00"	2.88"	0.69"	1/2"	5/8"-18	521-228	344.10
CT50	1-1/4"	8.00"	2.88"	0.69"	1/2"	5/8"-18	521-230	418.70
CT50	1-1/2"	2.00"	3.80"	0.93"	5/8"	3/4"-16	521-232	225.20
CT50	1-1/2"	4.00"	3.80"	0.93"	5/8"	3/4"-16	521-234	266.70
CT50	1-1/2"	6.00"	3.80"	0.93"	5/8"	3/4"-16	521-236	344.10
CT50	1-1/2"	8.00"	3.80"	0.93"	5/8"	3/4"-16	521-238	446.80
CT50	2"	2.00"	4.38"	0.93"	3/4"	1"-14	521-240	281.30
CT50	2"	4.00"	4.38"	0.93"	3/4"	1"-14	521-242	505.50



SHELL MILL HOLDERS

CAT50 Face Mill Holders

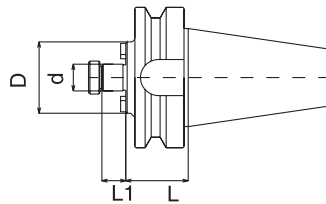
- 100% Forged Construction
- Precision Ground Throughout



Taper	d	L	D	L1	Key Size	Code No.	Price \$
CT50	2"	2.95"	5.06"	0.86"	3/4"	531-246	253.10
CT50	2-1/2"	2.95"	5.00"	1.18"	1"	531-248	260.60

BT Taper Shell Mill Holders

- 100% Forged Construction
- Precision Ground Throughout
- DIN Coolant thru the flange - standard



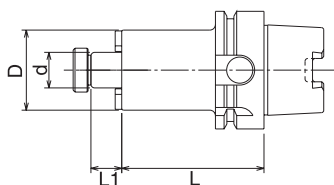
Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
BT30								
BT30	1/2"	1.19"	1.38"	0.57"	1/4"	1/4"-28	532-080 •	128.90
BT30	3/4"	1.19"	2.00"	0.67"	5/16"	3/8"-24	532-082 •	128.90
BT30	1"	1.77"	2.38"	0.69"	3/8"	1/2"-20	532-084 •	111.10
BT40								
BT40	1/2"	1.75"	1.38"	0.57"	1/4"	1/4"-28	532-086	159.00
BT40	3/4"	1.75"	1.75"	0.67"	5/16"	3/8"-24	532-088	144.30
BT40	3/4"	4.00"	1.75"	0.67"	5/16"	3/8"-24	532-111	194.40
BT40	3/4"	6.00"	1.75"	0.67"	5/16"	3/8"-24	532-114	218.80
BT40	1"	1.75"	2.38"	0.67"	3/8"	1/2"-20	532-090	144.30
BT40	1"	4.00"	2.38"	0.67"	3/8"	1/2"-20	532-115	194.40
BT40	1"	6.00"	2.38"	0.67"	3/8"	1/2"-20	532-117	218.80
BT40	1-1/4"	2.00"	2.88"	0.67"	1/2"	5/8"-18	532-092	154.00
BT40	1-1/4"	4.00"	2.88"	0.67"	1/2"	5/8"-18	532-119	218.80
BT40	1-1/4"	6.00"	2.88"	0.67"	1/2"	5/8"-18	532-121	225.00
BT40	1-1/2"	2.00"	3.80"	0.92"	5/8"	3/4"-16	532-094	171.20
BT50								
BT50	1"	1.75"	2.75"	0.69"	3/8"	1/2"-20	532-101	156.50
BT50	1-1/4"	1.75"	2.88"	0.69"	1/2"	5/8"-18	532-103	167.70
BT50	1-1/2"	1.75"	3.80"	0.92"	5/8"	3/4"-16	532-105	205.00
BT50	2"	1.75"	4.38"	0.92"	3/4"	1"-14	532-107	186.00

• Non-Coolant thru the flange



HSK Shell Mill Holders

- 100% Forged Construction
- Precision Ground Throughout
- High rigidity & torque transmission



Drive Key Arbor Screw



pg 23



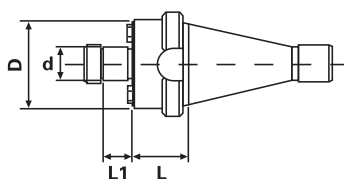
pg 23

Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
HSK63A								
HSK63A	3/4"	3.00"	1.693"	0.669"	5/16"	3/8"-24	536-082	317.70
HSK63A	3/4"	5.00"	1.693"	0.669"	5/16"	3/8"-24	536-084	321.30
HSK63A	1"	3.00"	2.165"	0.669"	3/8"	1/2"-20	536-086	317.70
HSK63A	1"	5.00"	2.165"	0.669"	3/8"	1/2"-20	536-088	317.70
HSK63A	1-1/4"	3.00"	2.756"	0.669"	1/2"	5/8"-18	536-090	317.70
HSK63A	1-1/4"	5.00"	2.756"	0.669"	1/2"	5/8"-18	536-092	317.70
HSK100A								
HSK100A	3/4"	4.00"	1.693"	0.669"	5/16"	3/8"-24	536-094	369.90
HSK100A	3/4"	6.00"	1.693"	0.669"	5/16"	3/8"-24	536-096	396.90
HSK100A	1"	4.00"	2.165"	0.669"	3/8"	1/2"-20	536-098	369.90
HSK100A	1"	6.00"	2.165"	0.669"	3/8"	1/2"-20	536-100	396.90
HSK100A	1-1/4"	4.00"	2.756"	0.669"	1/2"	5/8"-18	536-102	391.60
HSK100A	1-1/4"	6.00"	2.756"	0.669"	1/2"	5/8"-18	536-104	421.80
HSK100A	1-1/2"	4.00"	3.504"	0.902"	5/8"	3/4"-16	536-106	383.40
HSK100A	1-1/2"	6.00"	3.504"	0.902"	5/8"	3/4"-16	536-108	430.20

* Available only while quantities last

NMTB Taper Shell Mill Holders

- 100% Forged Construction
- Precision Ground Throughout



Drive Key Arbor Screw



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pg 23

Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
NMTB40								
NMTB40	1/2"	0.87"	1.38"	0.57"	1/4"	1/4"-28	534-130	127.00
NMTB40	3/4"	0.87"	1.94"	0.67"	5/16"	3/8"-24	534-132	127.00
NMTB40	1"	1.31"	2.38"	0.67"	3/8"	1/2"-20	534-134	127.00
NMTB40	1-1/4"	1.50"	2.88"	0.67"	1/2"	5/8"-18	534-136	127.00
NMTB40	1-1/2"	1.63"	3.50"	0.93"	5/8"	3/4"-16	534-138	127.00
NMTB50								
NMTB50	3/4"	1.25"	2.00"	0.67"	5/16"	3/8"-24	534-140	159.90
NMTB50	1"	1.88"	2.38"	0.67"	3/8"	1/2"-20	534-142	164.70
NMTB50	1-1/4"	1.88"	2.88"	0.67"	1/2"	5/8"-18	534-144	167.80
NMTB50	1-1/2"	1.88"	3.50"	0.93"	5/8"	3/4"-16	534-146	184.40
NMTB50	2"	1.88"	4.38"	0.93"	3/4"	1"-14	534-148	186.10

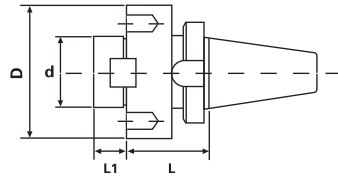
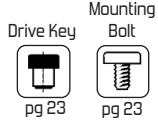


SHELL MILL HOLDERS

NMTB50 Face Mill Holder

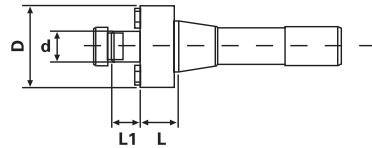
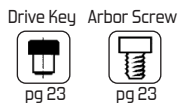
- 100% Forged Construction
- Precision Ground Throughout

End Mill Holders



Taper	d	L	D	L1	Key Size	Code No.	Price \$
NMTB50	2-1/2"	3.00"	5.00"	1.18"	1"	534-152	186.10

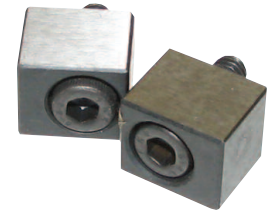
R8 Shell Mill Holders



Taper	d	L	D	L1	Key Size	Arbor Thread	Code No.	Price \$
R8	1/2"	1.00"	1.38"	0.57"	1/4"	1/4"-28	534-154	76.20
R8	3/4"	1.00"	2.00"	0.69"	5/16"	3/8"-24	534-156	76.20
R8	1"	1.00"	2.38"	0.69"	3/8"	1/2"-20	534-158	79.70
R8	1-1/4"	1.00"	2.88"	0.69"	1/2"	5/8"-18	534-160	81.80
R8	1-1/2"	1.75"	3.50"	0.94"	5/8"	3/4"-16	534-162	91.40

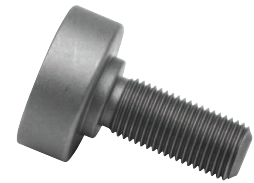


Replacement Drive Keys



Spigot Dia.	Description	Code No.	Price \$
1/2"	Two 1/4"	534-164	12.60
3/4"	Two 5/16"	534-166	15.40
1"	Two 3/8"	534-168	18.20
1-1/4"	Two 1/2"	534-170	20.10
1-1/2"	Two 5/8"	534-172	21.80
2"	Two 3/4"	534-174	26.80
2-1/2"	Two 1"	534-176	23.00

Replacement Arbor Screws



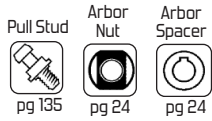
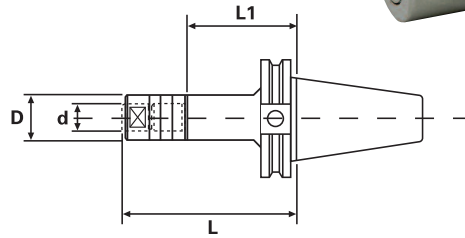
Thread Size	Size of Holder	Code No.	Price \$
5/8-11	Face Mill Mounting Bolt	534-178	11.80
1/4-28	1/2"	534-180	11.80
3/8-24	3/4"	534-182	12.80
1/2-20	1"	534-184	14.20
5/8-18	1-1/4"	534-186	16.10
3/4-16	1-1/2"	534-188	25.90
1-14	2"	534-190	36.70



SHELL MILL HOLDERS

CAT Taper Stub Arbors

• Each arbor equipped with 1/8, 1/4, 3/8, 1/2 spacers



Taper	d	L	D	L1	Code No.	Price \$
CAT40						
CT40	1"	6.17"	1.50"	4.00"	531-580	142.70
CT40	1-1/4"	6.29"	1.75"	4.00"	531-582	145.80
CT40	1-1/2"	6.60"	2.12"	4.00"	531-584	150.20
CAT50						
CT50	1"	6.17"	1.50"	4.00"	531-586	212.60
CT50	1-1/4"	6.28"	1.75"	4.00"	531-588	217.00
CT50	1-1/2"	6.60"	2.12"	4.00"	531-590	223.50

Replacement Stub Arbor Spacers



Description	Code No.	Price \$
1/8" Spacer for 3/4" Holder	534-568	9.00
1/4" Spacer for 3/4" Holder	534-570	9.00
3/8" Spacer for 3/4" Holder	534-572	9.00
1/2" Spacer for 3/4" Holder	534-574	9.00
1/8" Spacer for 1" Holder	534-576	9.20
3/8" Spacer for 1" Holder	534-580	9.20
1/2" Spacer for 1" Holder	534-582 •	9.20
1/8" Spacer for 1-1/4" Holder	534-584	10.00
1/4" Spacer for 1-1/4" Holder	534-586 •	10.10
3/8" Spacer for 1-1/4" Holder	534-588	10.00
1/2" Spacer for 1-1/4" Holder	534-590 •	10.10
1/8" Spacer for 1-1/2" Holder	534-592	10.40
1/4" Spacer for 1-1/2" Holder	534-594 •	10.40
3/8" Spacer for 1-1/2" Holder	534-596	10.40
1/2" Spacer for 1-1/2" Holder	534-598	10.40

• Available only while quantities last

Replacement Stub Arbor Nuts



Holder Size	Code No.	Price \$
1"	534-562 •	25.40
1-1/4"	534-564 •	29.10
1-1/2"	534-566 •	27.50

• Available only while quantities last



TOOLING

COLLET CHUCKS & COLLETS

CAT, BT, HSK, NMTB & R8 ER Collet Chucks	26-31
ER Collet Chuck Extensions	31
ER Collets	32-44
ER Collet Sets	45-47
ER Chuck Nuts, Wrenches, Backup Screws	48
SA Collet Chucks	49-50
SA Collets	51-52
TG Collet Chucks	53-55
TG 75, 100, 150 Collets & Sets	56-61
Milling Chucks & Collets	62-66
DA Collet Chucks	67-68
DA Collets	69-72
DA Chuck Parts	73
Type 25 & 32 Collet Chuck Sets	74
Type 25 & Type 32 Collets	75
5C Collets & Set	76
R8 Collets & Set	76

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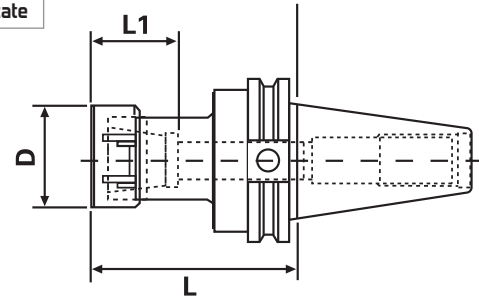
COLLET CHUCKS

CAT40 ER Collet Chucks

- 100% Forged Construction
- Certified balanced 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Threaded through holes for a back-up screw (tool stop) or coolant through when removed
- TIR, 0.0003" at 4xDia.
- Wrench not included



Complete with certificate



Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT40	ER11**	.019-.275"	2.50"	0.65"	0.75"	29.8	531-400	166.70
CT40	ER11**	.019-.275"	4.00"	0.65"	0.75"	29.8	531-402	211.20
CT40	ER11**	.019-.275"	6.00"	0.65"	0.75"	29.8	531-404	189.90
CT40	ER16**	.019-.413"	2.50"	0.87"	1.26"	56.9	531-406	169.20
CT40	ER16**	.019-.413"	3.50"	0.87"	1.26"	56.9	531-408	169.20
CT40	ER16**	.019-.413"	4.00"	0.87"	1.26"	56.9	531-405	171.00
CT40	ER16**	.019-.413"	6.00"	0.87"	1.26"	56.9	531-410	189.90
CT40	ER16**	.019-.413"	9.00"	0.87"	1.26"	56.9	531-411	213.30
CT40	ER20**	.019-.551"	2.50"	1.06"	1.38"	81.3	531-412	168.30
CT40	ER20**	.019-.551"	4.00"	1.06"	1.38"	81.3	531-414	171.90
CT40	ER20**	.019-.551"	6.00"	1.06"	1.38"	81.3	531-416	198.00
CT40	ER20**	.019-.551"	9.00"	1.06"	1.38"	81.3	531-417	207.00
CT40	ER25	.059-.675"	2.50"	1.18"	1.65"	128.8	531-418	169.20
CT40	ER25	.059-.675"	4.00"	1.18"	1.65"	128.8	531-420	183.60
CT40	ER25	.059-.675"	6.00"	1.18"	1.65"	128.8	531-422	189.90
CT40	ER32	.078-.787"	.750"				531-401*	147.80
CT40	ER32	.078-.787"	2.50"	1.34"	1.97"	169.5	531-421	180.90
CT40	ER32	.078-.787"	3.13"	1.34"	1.97"	169.5	531-424	189.90
CT40	ER32	.078-.787"	4.00"	1.34"	1.97"	169.5	531-423	180.90
CT40	ER32	.078-.787"	5.00"	1.34"	1.97"	169.5	531-426	180.90
CT40	ER32	.078-.787"	6.00"	1.34"	1.97"	169.5	531-425	206.10
CT40	ER32	.078-.787"	9.00"	1.34"	1.97"	169.5	531-419	231.30
CT40	ER40	.118-1.023"	2.50"	1.50"	2.48"	219.6	531-427	189.90
CT40	ER40	.118-1.023"	3.13"	1.50"	2.48"	219.6	531-428	189.90
CT40	ER40	.118-1.023"	4.00"	1.50"	2.48"	219.6	531-429	189.90
CT40	ER40	.118-1.023"	5.00"	1.50"	2.48"	219.6	531-430	189.90
CT40	ER40	.118-1.023"	6.00"	1.50"	2.48"	219.6	531-431	222.30

** Hex Nut

* ER Shorty collet chuck - Non-Coolant thru the flange

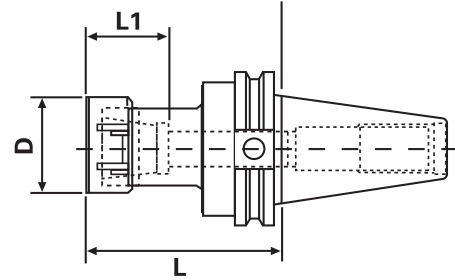


CAT50 ER Collet Chucks

- 100% Forged Construction
- Certified balanced 25,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Threaded through holes for a back-up screw (tool stop) or coolant through when removed
- TIR, 0.0003" at 4xDia.
- Wrench not included



Complete with certificate



- Pull Stud pg 135
- Nut pg 48
- Wrench pg 48
- ER Collet pg 32-47

Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT50	ER16**	.019-.413"	4.12"	0.87"	1.26"	56.9	531-432	210.60
CT50	ER16**	.019-.413"	6.00"	0.87"	1.26"	56.9	531-434	229.50
CT50	ER16**	.019-.413"	8.00"	0.87"	1.26"	56.9	531-436	293.40
CT50	ER16**	.019-.413"	12.00"	0.87"	1.26"	56.9	531-437	474.50
CT50	ER20**	.019-.551"	2.50"	1.06"	1.38"	81.3	531-438	170.10
CT50	ER20**	.019-.551"	4.00"	1.06"	1.38"	81.3	531-440	215.10
CT50	ER20**	.019-.551"	6.00"	1.06"	1.38"	81.3	531-442	213.30
CT50	ER20**	.019-.551"	8.00"	1.06"	1.38"	81.3	531-444	255.60
CT50	ER20**	.019-.551"	12.00"	1.06"	1.38"	81.3	531-445	474.50
CT50	ER25	.059-.675"	2.50"	1.18"	1.65"	128.8	531-446	207.00
CT50	ER25	.059-.675"	4.00"	1.18"	1.65"	128.8	531-448	207.00
CT50	ER25	.059-.675"	6.00"	1.18"	1.65"	128.8	531-450	221.20
CT50	ER25	.059-.675"	8.00"	1.18"	1.65"	128.8	531-452	293.40
CT50	ER32	.078-.787"	.750"				531-403*	249.00
CT50	ER32	.078-.787"	4.00"	1.34"	1.97"	169.5	531-454	206.10
CT50	ER32	.078-.787"	6.00"	1.34"	1.97"	169.5	531-456	238.50
CT50	ER32	.078-.787"	8.00"	1.34"	1.97"	169.5	531-458	284.40
CT50	ER32	.078-.787"	12.00"	1.34"	1.97"	169.5	531-459	474.50
CT50	ER40	.118-1.023"	4.00"	1.50"	2.48"	219.6	531-460	218.70
CT50	ER40	.118-1.023"	6.00"	1.50"	2.48"	219.6	531-462	245.60
CT50	ER40	.118-1.023"	8.00"	1.50"	2.48"	219.6	531-464	274.50

** Hex Nut

* ER Shorty collet chuck - Non-Coolant thru the flange



COLLET CHUCKS

CAT40 DUAL CONTACT ER Collet Chucks

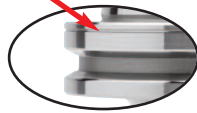
FOR DUAL CONTACT SPINDLES

(CAN ALSO BE USED ON STANDARD SPINDLES)

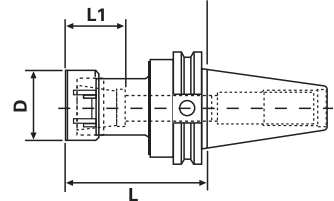
- 100% Forged Construction
- Certified balanced 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- TIR, 0.0003" at 4xDia.



Eliminates the gap between the flange and the spindle for increased rigidity



Complete with certificate



Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT40	ER16**	.019-.413"	2.50"	0.87"	1.26"	56.9	521-406	203.10
CT40	ER16**	.019-.413"	4.00"	0.87"	1.26"	56.9	521-405	205.20
CT40	ER16**	.019-.413"	6.00"	0.87"	1.26"	56.9	521-410	227.90
CT40	ER32	.078-.787"	3.13"	1.34"	1.97"	169.5	521-424	227.90
CT40	ER32	.078-.787"	4.00"	1.34"	1.97"	169.5	521-423	217.10
CT40	ER32	.078-.787"	6.00"	1.34"	1.97"	169.5	521-425	247.40

** Hex Nut

CAT50 DUAL CONTACT ER Collet Chucks

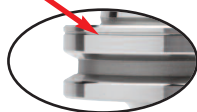
FOR DUAL CONTACT SPINDLES

(CAN ALSO BE USED ON STANDARD SPINDLES)

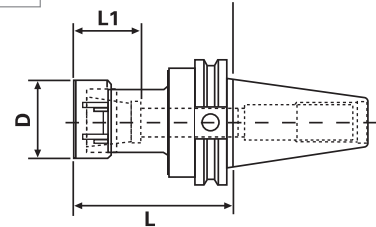
- 100% Forged Construction
- Certified balanced 25,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- TIR, 0.0003" at 4xDia.



Eliminates the gap between the flange and the spindle for increased rigidity



Complete with certificate



Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT50	ER16**	.019-.413"	4.12"	0.87"	1.26"	56.9	521-432	252.80
CT50	ER16**	.019-.413"	6.00"	0.87"	1.26"	56.9	521-434	275.40
CT50	ER16**	.019-.413"	8.00"	0.87"	1.26"	56.9	521-436	352.10
CT50	ER32	.078-.787"	4.00"	1.34"	1.97"	169.5	521-454	247.40
CT50	ER32	.078-.787"	6.00"	1.34"	1.97"	169.5	521-456	286.20
CT50	ER32	.078-.787"	8.00"	1.34"	1.97"	169.5	521-458	341.30

** Hex Nut

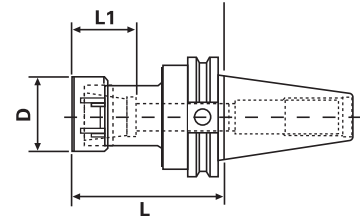


BT Taper ER Collet Chucks

- 100% Forged Construction
- Certified balanced up to 25 - 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Threaded through holes for a back-up screw (tool stop) or coolant through when removed
- Wrench not included



Complete with certificate



- Pull Stud pg 135
- Nut pg 48
- Wrench pg 48
- ER Collet pg 32-47

Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
BT30								
BT30	ER11**	.019-.275"	2.00"	0.65"	0.75"	29.8	532-150*	117.00
BT30	ER11**	.019-.275"	4.00"	0.65"	0.75"	29.8	532-152*	118.90
BT30	ER16**	.019-.413"	2.36"	0.87"	1.26"	56.9	532-154*	117.00
BT30	ER16**	.019-.413"	4.00"	0.87"	1.26"	56.9	532-156*	118.90
BT30	ER16**	.019-.413"	5.00"	0.87"	1.26"	56.9	532-158*	123.30
BT30	ER16**	.019-.413"	6.00"	0.87"	1.26"	56.9	532-160*	136.80
BT30	ER20**	.019-.551"	2.50"	1.06"	1.38"	81.3	532-162*	117.00
BT30	ER20**	.019-.551"	4.00"	1.06"	1.38"	81.3	532-164*	118.90
BT30	ER25	.059-.675"	2.00"	1.18"	1.65"	128.8	532-166*	143.10
BT30	ER25	.059-.675"	4.00"	1.18"	1.65"	128.8	532-168*	143.10
BT30	ER32	.078-.787"	3.00"	1.34"	1.97"	169.5	532-170*	120.60
BT30	ER32	.078-.787"	5.00"	1.34"	1.97"	169.5	532-172*	146.70

** Hex Nut

* Non-Coolant thru the flange



BT40

BT40	ER11**	.019-.275"	4.00"	0.65"	0.75"	29.8	532-176	232.40
BT40	ER11**	.019-.275"	6.00"	0.65"	0.75"	29.8	532-178	208.90
BT40	ER16**	.019-.413"	3.50"	0.87"	1.26"	56.9	532-180	186.20
BT40	ER16**	.019-.413"	5.00"	0.87"	1.26"	56.9	532-182	208.90
BT40	ER20**	.019-.551"	2.50"	1.06"	1.38"	81.3	532-184	185.20
BT40	ER20**	.019-.551"	4.00"	1.06"	1.38"	81.3	532-186	189.10
BT40	ER20**	.019-.551"	6.00"	1.06"	1.38"	81.3	532-188	217.80
BT40	ER25	.059-.675"	2.25"	1.18"	1.65"	128.8	532-190	186.20
BT40	ER25	.059-.675"	4.00"	1.18"	1.65"	128.8	532-192	202.00
BT40	ER25	.059-.675"	6.00"	1.18"	1.65"	128.8	532-194	208.90
BT40 ER32								
BT40	ER32	.078-.787"	1.06"				532-191*	162.60
BT40	ER32	.078-.787"	3.13"	1.34"	1.97"	169.5	532-196	208.90
BT40	ER32	.078-.787"	5.00"	1.34"	1.97"	169.5	532-198	199.00
BT40	ER40	.118-1.023"	3.13"	1.50"	2.50"	219.6	532-200	208.90
BT40	ER40	.118-1.023"	5.00"	1.50"	2.50"	219.6	532-202	208.90

** Hex Nut

* ER Shorty collet chuck - Non-Coolant thru the flange



BT50

BT50	ER16**	.019-.413"	2.50"	0.87"	1.26"	56.9	532-203	222.30
BT50	ER16**	.019-.413"	4.00"	0.87"	1.26"	56.9	532-204	222.30
BT50	ER25	.059-.675"	4.00"	1.18"	1.65"	128.8	532-206	222.30

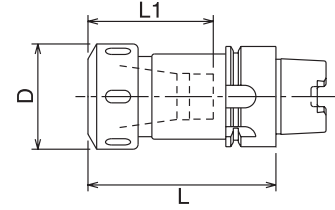
** Hex Nut



COLLET CHUCKS

HSK63 ER Collet Chucks

- 100% Forged Construction
- Certified balanced 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- High rigidity & torque transmission
- Wrench not included

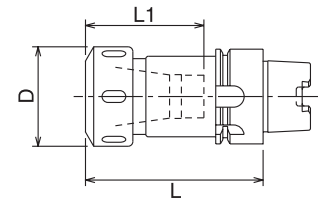


Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
HSK63A	ER16**	.019-.413"	3.00"	0.866"	1.260"	56.9	536-114	260.10
HSK63A	ER16**	.019-.413"	5.00"	0.866"	1.260"	56.9	536-116	260.10
HSK63A	ER20**	.019-.551"	3.00"	1.062"	1.378"	81.3	536-118	260.10
HSK63A	ER20**	.019-.551"	5.00"	1.062"	1.378"	81.3	536-120	260.10
HSK63A	ER25	.059-.675"	3.00"	1.181"	1.654"	128.8	536-122	260.10
HSK63A	ER25	.059-.675"	5.00"	1.181"	1.654"	128.8	536-124	260.10
HSK63A	ER32	.078-.787"	4.00"	1.260"	1.969"	169.5	536-126	260.10
HSK63A	ER32	.078-.787"	6.00"	1.260"	1.969"	169.5	536-128	303.30
HSK63A	ER40	.118-1.023"	4.00"	1.496"	2.480"	219.6	536-130	260.10
HSK63A	ER40	.118-1.023"	6.00"	1.496"	2.480"	219.6	536-132	369.90

** Hex Nut

HSK100 ER Collet Chucks

- 100% Forged Construction
- Certified balanced 25,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- High rigidity & torque transmission
- Wrench not included



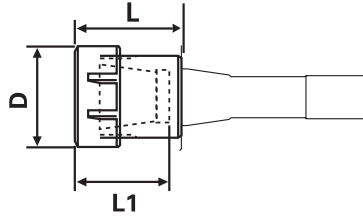
Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
HSK100A	ER16**	.019-.413"	4.00"	0.866"	1.260"	56.9	536-134	383.40
HSK100A	ER16**	.019-.413"	6.00"	0.866"	1.260"	56.9	536-136	453.60
HSK100A	ER20**	.019-.551"	4.00"	1.062"	1.378"	81.3	536-138	313.30
HSK100A	ER20**	.019-.551"	6.00"	1.062"	1.378"	81.3	536-140	495.90
HSK100A	ER25	.059-.675"	4.00"	1.181"	1.654"	128.8	536-142	313.30
HSK100A	ER25	.059-.675"	6.00"	1.181"	1.654"	128.8	536-144	495.90
HSK100A	ER32	.078-.787"	4.00"	1.260"	1.969"	169.5	536-146	383.40
HSK100A	ER32	.078-.787"	6.00"	1.260"	1.969"	169.5	536-148	411.30
HSK100A	ER40	.118-1.023"	4.00"	1.496"	2.480"	219.6	536-150	383.40
HSK100A	ER40	.118-1.023"	6.00"	1.496"	2.480"	219.6	536-152	411.30

** Hex Nut

• Available only while quantities last



R8 Taper ER Collet Chucks

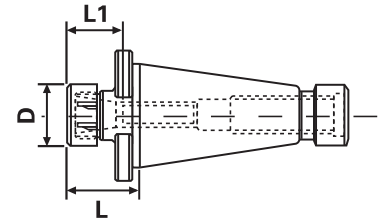


Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
R8	ER16**	.019-.413"	1.25"	2.83"	1.25"	56.9	534-360	95.90
R8	ER20**	.019-.551"	2.00"	1.50"	1.38"	81.3	534-362	95.90
R8	ER25	.059-.675"	2.50"	1.64"	1.66"	128.8	534-364	99.50

** Hex Nut

NMTB Taper ER Collet Chucks

• Wrench not included



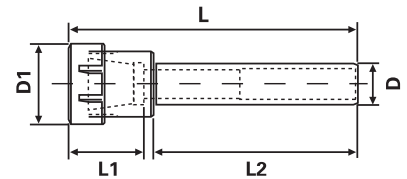
Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
NMTB40								
NMTB40	ER11**	.019-.275"	2.00"	0.65"	0.75"	29.8	534-350 •	125.30
NMTB40	ER16**	.019-.413"	1.77"	0.87"	1.26"	56.9	534-352	125.30
NMTB40	ER25	.059-.675"	2.00"	1.18"	1.65"	128.8	534-354	130.90
NMTB40	ER32	.078-.787"	2.00"	-	-	-	534-260	119.70
NMTB50								
NMTB50	ER16**	.019-.413"	2.00"	0.87"	1.26"	56.9	534-356	150.80
NMTB50	ER25	.059-.675"	2.00"	1.18"	1.65"	128.8	534-358 •	189.00

** Hex Nut

• Available only while quantities last

ER Collet Chuck Extensions

• Wrench not included



Collet Series	Collet Range	Shank Dia. (D)	D1	L	L1	L2	Tightening Torque (Nm)	Code No.	Price \$
ER11**	.019-.275"	1/2	.740"	6.11"	.091"	5.00"	29.8	534-368	131.20
ER11**	.019-.275"	5/8	.740"	6.11"	.091"	5.00"	29.8	534-370	131.20
ER11**	.019-.275"	3/4	.740"	5.65"	.091"	5.00"	29.8	534-372	131.20
ER16**	.019-.413"	5/8	1.26"	6.48"	1.28"	5.00"	56.9	534-374	131.20
ER16**	.019-.413"	3/4	1.26"	6.48"	1.28"	5.00"	56.9	534-376	131.20
ER16**	.019-.413"	1	1.26"	5.89"	1.28"	5.00"	56.9	534-378	140.50
ER20**	.019-.551"	3/4	1.38"	6.67"	1.48"	5.00"	81.3	534-380	131.20
ER20**	.019-.551"	1	1.38"	6.40"	1.48"	5.00"	81.3	534-382	140.50
ER20**	.019-.551"	1-1/4	1.38"	6.40"	1.48"	5.00"	81.3	534-384	140.50
ER25	.059-.675"	3/4	1.65"	6.85"	1.65"	5.00"	128.8	534-386	140.90
ER25	.059-.675"	1	1.65"	6.85"	1.65"	5.00"	128.8	534-388	140.90
ER25	.059-.675"	1-1/4	1.65"	6.00"	1.65"	5.00"	128.8	534-390	140.90
ER32	.078-.787"	1	1.97"	7.09"	1.85"	5.00"	169.5	534-392	147.10
ER32	.078-.787"	1-1/4	1.97"	6.30"	2.13"	4.00"	169.5	337-805	184.70
ER32	.078-.787"	1-1/4	1.97"	7.09"	1.85"	5.00"	169.5	534-394	149.20

** Hex Nut



COLLET CHUCKS

Introducing...

EXTREME PRECISION 5 MICRON COLLETS

Nothing else compares.

Collet Chucks

DIN 6343 Precision collets have a runout of 20-30 microns (0.02 - 0.03mm).
 GS High Precision collets have a runout of 10 microns (0.01mm).
 The new GS Extreme Precision AA Collets have a runout of only 5 microns (0.005mm).

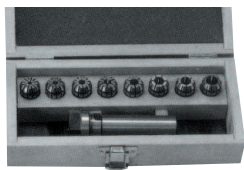
Features & Benefits:

- Maximized Concentricity
- Increased Tool Life
- Evenly distributed cutting edges for high performance machining
- Minimized variation of cutting edges
- Consistent cutting profiles ensure the job stays within desired tolerances
- Improve system performance and lower cost per piece when used with quality GS chucks

The result of an improved AA collet in a quality chuck is increased gripping force, improved rigidity, decreased runout, and a renewed confidence in your collet chuck system.

ER Collet Chuck Sets

• Wrench included



	Shank	Collet Set	Code No.	Price \$
ER-16	3/4 x 4	10 collets (.019 - .393)	337-700	321.70
	3/4 x 6	10 collets (.019 - .393)	337-705	346.00
	R-8	10 collets (.019 - .393)	337-710	346.00
ER-20	3/4 x 4	12 collets (.039 - .511)	337-715	396.70
	3/4 x 6	12 collets (.039 - .511)	337-720	423.20
ER-32	1-1/4 x 4	11 collets (.080 - .787)	337-730	439.70
	150-30	11 collets (.080 - .787)	337-735	439.70
	R-8	11 collets (.080 - .787)	337-740	564.70
ER-40	R-8	15 collets (.120 - 1.020)	337-745	480.00
	150-30	15 collets (.120 - 1.020)	337-750	599.30
	150-40	15 collets (.120 - 1.020)	337-755	712.80
	150-50	23 collets (.120 - 1.020)	337-760	885.80

ER 8 Collets

- Alloy Steel
- Size range: 1 mm - 5 mm (0.039" - 0.196")



Metric

Size (mm)	Size (dec.)	Code No.	Price \$
0.5-1.0	.019-.039"	337-635	26.10
1.0-1.5	.039-.059"	337-637	26.10
1.5-2.0	.059-.078"	337-633	26.10
2.0-2.5	.078-.098"	337-641	26.10
2.5-3.0	.098-.118"	337-643	26.10
3.0-3.5	.118-.137"	337-645	26.10
3.5-4.0	.137-.157"	337-647	26.10
4.0-4.5	.157-.177"	337-648	26.10
4.5-5.0	.177-.196"	337-649	26.10

Inch

Size (mm)	Code No.	Price \$
1/16	337-629	26.10
1/8	337-631	26.10
3/16	337-625	26.10



ER 11 Collets

- Alloy Steel
- Size range: 0.5 mm - 7 mm (0.019" - 0.275")
- ER11 collets collapse approximately 1/64" with full accuracy

AA Collets have a runout of only 5 microns (0.005mm)



* Case may not be as shown

Metric

Size (mm)	Size (dec.)	Code No.	Price \$	AA Code No.	Price \$
0.5-1	.019-.039"	337-650	25.20	336-700	38.70
1-1.5	.039-.059"	337-652	25.20	336-702	38.70
1.5-2	.059-.078"	337-654	25.20	336-705	38.70
2-2.5	.078-.098"	337-656	25.20	336-707	38.70
2.5-3	.098-.118"	337-658	20.70	336-709	34.20
3-3.5	.118-.137"	337-660	20.70	336-711	34.20
3.5-4	.137-.157"	337-662	20.70	336-714	34.20
4-4.5	.157-.177"	337-664	20.70	336-716	34.20
4.5-5	.177-.196"	337-666	20.70	336-718	34.20
5-5.5	.196-.216"	337-668	20.70	336-720	34.20
5.5-6	.216-.236"	337-670	20.70	336-723	34.20
6-6.5	.236-.255"	337-672	20.70	336-725	34.20
6.5-7	.255-.275"	337-674	20.70	336-727	34.20
13pc Set	1 - 7mm	337-379	283.50	336-986	459.00

Inch

Size (in)	Code No.	Price \$	AA Code No.	Price \$	
3/64	337-609	26.10	336-701	38.70	
1/16*	337-610	26.10	336-703	38.70	
5/64	337-611	26.10	336-704	38.70	
3/32*	337-613	25.20	336-706	38.70	
7/64	337-614	25.20	336-708	38.70	
1/8*	337-615	20.70	336-710	34.20	
9/64	337-617	20.70	336-712	34.20	
5/32*	337-618	20.70	336-713	34.20	
11/64	337-619	20.70	336-715	34.20	
3/16*	337-651	20.70	336-717	34.20	
13/64	337-653	20.70	336-719	34.20	
7/32*	337-655	20.70	336-721	34.20	
15/64	337-657	20.70	336-722	34.20	
1/4*	337-659	20.70	336-724	34.20	
17/64	337-661	20.70	336-726	34.20	
9/32	337-627	25.20	336-728	34.20	
7pc Set	1/16-1/4	337-401	151.70	336-992	246.20

* Part of set

ER 11 Sealed Collets

- Alloy Steel
- Sealed for coolant through applications
- Pressure resistance tested to 500 psi



* Case may not be as shown

	Size (in/mm)	Code No.	Price \$
Inch	3/16	337-622	34.10
	13/64	337-624	34.10
	7/32	337-626	34.10
	15/64	337-628	34.10
	1/4	337-630	34.10
	17/64	337-632	34.10
	6pc Set	3/16-17/64 x 64ths	337-929
Metric	4.0	337-634	34.10
	4.5	337-636	34.10
	5.0	337-638	34.10
	5.5	337-640	34.10
	6.0	337-642	34.10
	6.5	337-644	34.10
	7.0	337-646	34.10
	7pc Set	4.0-7.0mm x 0.5mm	337-930



COLLETS

ER 16 Collets

- Alloy Steel
- ER 16 collets collapse approximately 1/32" with full accuracy

AA Collets have a runout of only 5 microns (0.005mm)



* Case may not be as shown

Collet Chucks

Metric

Size (mm)	Size (dec.)	Code No.	Price \$	AA Code No.	Price \$
0.5-1	.019-.039"	337-302	27.90	336-729	41.40
1-1.5	.039-.059"	337-303	27.90	336-730	41.40
1.5-2	.059-.078"	337-304	27.90	336-732	41.40
2-2.5	.078-.098"	337-307	27.90	336-734	41.40
2.5-3	.098-.118"	337-306	20.70	336-735	34.20
3-3.5	.118-.137"	337-311	20.70	336-737	34.20
3.5-4	.137-.157"	337-308	20.70	336-740	34.20
4-4.5	.157-.177"	337-313	20.70	336-741	34.20
4.5-5	.177-.196"	337-310	20.70	336-743	34.20
5-5.5	.196-.217"	337-315	20.70	336-744	34.20
5.5-6	.217-.236"	337-312	20.70	336-746	34.20
6-6.5	.236-.256"	337-317	20.70	336-748	34.20
6.5-7	.256-.275"	337-314	20.70	336-749	34.20
7-7.5	.275-.295"	337-319	20.70	336-751	34.20
7.5-8	.295-.314"	337-316	20.70	336-753	34.20
8-8.5	.314-.335"	337-322	20.70	336-754	34.20
8.5-9	.335-.354"	337-318	20.70	336-756	34.20
9-9.5	.354-.374"	337-325	20.70	336-757	34.20
9.5-10	.374-.393"	337-320	20.70	336-759	34.20
10pc Set	1 - 10mm	337-380	211.50	336-987	346.50

Inch

Size (in)	Code No.	Price \$	AA Code No.	Price \$	
1/16	337-531	27.90	336-731	41.40	
3/32	337-532	27.90	336-733	41.40	
1/8	337-533	20.70	336-736	34.20	
9/64**	337-529	20.70	336-738	34.20	
5/32	337-534	20.70	336-739	34.20	
3/16	337-535	20.70	336-742	34.20	
7/32	337-536	20.70	336-745	34.20	
1/4	337-537	20.70	336-747	34.20	
9/32	337-538	20.70	336-750	34.20	
5/16	337-540	20.70	336-752	34.20	
11/32	337-541	20.70	336-755	34.20	
3/8	337-542	20.70	336-758	34.20	
13/32**	337-543	20.70	336-760	34.20	
11pc Set	1/16-3/8	337-403	238.10	336-993	386.10

** Not part of set

ER 16 Tap Collets

- Alloy Steel
- For synchronous, rigid tapping operations using ER collet chuck
- Collet bore is exact tool diameter with square drive for accuracy and rigidity
- See page 89 for rigid tapping holders



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	337-850	38.70
8	M4	.168"	.131"	337-851	38.70
10	M4.5, M5	.194"	.152"	337-852	38.70
12		.220"	.165"	337-853	38.70
1/4	M6, M6.3	.255"	.191"	337-854	38.70
5/16	M7, M8	.318"	.238"	337-855	38.70
3/8	M10	.381"	.286"	337-824	38.70
7/16		.323"	.242"	337-839	38.70
1/2	M12, M12.5	.367"	.275"	337-838	38.70
9pc Set	#6 - 1/2			337-343	331.20



ER 16 Steel Sealed Collets

- Alloy Steel
- Sealed for coolant through applications
- Pressure resistance tested to 2000 psi



	Size (in/mm)	Code No.	Price \$	
Inch	1/8	337-841	37.80	
	5/32	337-842	37.80	
	3/16	337-843	37.80	
	13/64	337-826	37.80	
	7/32	337-844	37.80	
	15/64	337-827	37.80	
	1/4	337-845	37.80	
	17/64	337-828	37.80	
	9/32	337-846	37.80	
	19/64	337-829	37.80	
	5/16	337-847	37.80	
	21/64	337-831	37.80	
	11/32	337-848	37.80	
	23/64	337-832	37.80	
	3/8	337-849	37.80	
	25/64	337-833	37.80	
	13/32	337-834	37.80	
	10pc Set	1/8-13/32 x 32nds	337-931	378.00
	Metric	3.0	338-290	37.80
		3.5	338-291	37.80
4.0		338-292	37.80	
4.5		338-294	37.80	
5.0		338-296	37.80	
5.5		338-298	37.80	
6.0		338-300	37.80	
6.5		338-302	37.80	
7.0		338-304	37.80	
7.5		338-305	37.80	
8.0		338-306	37.80	
8.5		338-307	37.80	
9.0		338-308	37.80	
9.5		338-309	37.80	
10.0		338-310	37.80	
13pc Set		4.0-10.0m x 0.5mm	337-932	491.40

ER 16 Quick Change Floating Tap Collets

With Axial Compensation

- For use with any ER collet chuck, these tapping collets help prevent tap breakage on machines requiring axial compensation. Friction-free ball-bearing drive.



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	338-750	51.30
8	M4	.168"	.131"	338-751	51.30
10	M4.5, M5	.194"	.152"	338-752	51.30



COLLETS

ER 20 Collets

- Alloy Steel
- ER 20 collets collapse approximately 1/32" with full accuracy

AA Collets have a runout of only 5 microns (0.005mm)



* Case may not be as shown

Collet Chucks

Metric

Size (mm)	Size (dec.)	Code No.	Price \$	AA Code No.	Price \$
1-1.5	.039-.059"	337-446	27.90	336-761	41.40
1.5-2*	.059-.078"	337-473	27.90	336-763	41.40
2-2.5	.078-.098"	337-447	27.90	336-765	41.40
2.5-3*	.098-.118"	337-474	23.00	336-766	36.50
3-3.5	.118-.137"	337-471	23.00	336-768	36.50
3.5-4*	.137-.157"	337-475	23.00	336-770	36.50
4-4.5	.157-.177"	337-448	23.00	336-771	36.50
4.5-5*	.177-.196"	337-476	23.00	336-773	36.50
5-5.5	.196-.217"	337-449	23.00	336-774	36.50
5.5-6*	.217-.236"	337-477	23.00	336-776	36.50
6-6.5	.236-.256"	337-451	23.00	336-778	36.50
6.5-7*	.256-.275"	337-478	23.00	336-779	36.50
7-7.5	.275-.295"	337-453	23.00	336-781	36.50
7.5-8*	.295-.314"	337-479	23.00	336-783	36.50
8-8.5	.314-.335"	337-455	23.00	336-784	36.50
8.5-9*	.335-.354"	337-480	23.00	336-786	36.50
9-9.5	.354-.374"	337-457	23.00	336-787	36.50
9.5-10*	.374-.393"	337-481	23.00	336-789	36.50
10-10.5	.393-.413"	337-459	23.00	336-791	36.50
10.5-11*	.413-.433"	337-482	23.00	336-792	36.50
11-11.5	.433-.452"	337-469	23.00	336-794	36.50
11.5-12*	.452-.472"	337-483	23.00	336-796	36.50
12-12.5	.472-.492"	337-463	23.00	336-797	36.50
12.5-13*	.492-.511"	337-484	23.00	336-799	36.50
13-13.5	.511-.531"	337-465	23.00	336-800	36.50
13.5-14	.531-.551"	337-467	23.00	336-801	36.50
12pc Set	2 - 13mm	337-382	288.90	336-988	450.90

* Part of set

Inch

Size (in)	Code No.	Price \$	AA Code No.	Price \$	
1/16	337-621	27.90	336-762	41.40	
3/32	337-623	27.90	336-764	41.40	
1/8	337-663	23.00	336-767	36.50	
5/32	337-665	23.00	336-769	36.50	
3/16	337-667	23.00	336-772	36.50	
7/32	337-669	23.00	336-775	36.50	
1/4	337-671	23.00	336-777	36.50	
9/32	337-673	23.00	336-780	36.50	
5/16	337-675	23.00	336-782	36.50	
11/32	337-676	23.00	336-785	36.50	
3/8	337-677	23.00	336-788	36.50	
13/32	337-678	23.00	336-790	36.50	
7/16	337-679	23.00	336-793	36.50	
15/32	337-681	23.00	336-795	36.50	
1/2	337-682	23.00	336-798	36.50	
15pc Set	1/16-1/2	337-404	354.20	336-994	556.70

ER 20 Tap Collets

- Alloy Steel
- For synchronous, rigid tapping operations using ER collet chuck
- Collet bore is exact tool diameter with square drive for accuracy and rigidity
- See page 89 for rigid tapping holders



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	337-869	38.70
8	M4	.168"	.131"	337-870	38.70
10	M4.5, M5	.194"	.152"	337-871	38.70
12		.220"	.165"	337-872	38.70
1/4	M6, M6.3	.255"	.191"	337-873	38.70
5/16	M7, M8	.318"	.238"	337-874	38.70
3/8	M10	.381"	.286"	337-875	38.70
7/16		.323"	.242"	337-876	38.70
1/2	M12, M12.5	.367"	.275"	337-877	38.70
9pc Set	#6 - 1/2			337-345	331.20



ER 20 Steel Sealed Collets

- Alloy Steel
- Sealed for coolant through applications
- Pressure resistance tested to 2000 psi



	Size (in/mm)	Code No.	Price \$	
Inch	1/8	337-856	42.30	
	5/32	337-857	42.30	
	3/16	337-858	42.30	
	7/32	337-859	42.30	
	1/4	337-860	42.30	
	9/32	337-861	42.30	
	5/16	337-862	42.30	
	11/32	337-863	42.30	
	3/8	337-864	42.30	
	13/32	337-865	42.30	
	7/16	337-866	42.30	
	15/32	337-867	42.30	
	1/2	337-868	42.30	
	12pc Set	5/32-1/2 x 32nds	337-933	510.30
	Metric	4.0	338-325	42.30
4.5		338-299	42.30	
5.0		338-330	42.30	
5.5		338-334	42.30	
6.0		338-336	42.30	
6.5		338-337	42.30	
7.0		338-338	42.30	
7.5		338-339	42.30	
8.0		338-340	42.30	
8.5		338-341	42.30	
9.0		338-342	42.30	
9.5		338-343	42.30	
10.0		338-344	42.30	
10.5		338-345	42.30	
11.0		338-346	42.30	
11.5		338-347	42.30	
12.0		338-348	42.30	
12.5	338-349	42.30		
13.0	338-350	42.30		
17pc Set	5.0-13.0mm x 0.5mm	337-935	723.30	

ER 20 Quick Change Floating Tap Collets

With Axial Compensation

- For use with any ER collet chuck, these tapping collets help prevent tap breakage on machines requiring axial compensation. Friction-free ball-bearing drive.



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	338-753	51.30
8	M4	.168"	.131"	338-754	51.30
10	M4.5, M5	.194"	.152"	338-755	51.30
12		.220"	.165"	338-756	51.30
1/4	M6, M6.3	.255"	.191"	338-757	51.30



COLLETS

ER 25 Collets

• Alloy Steel

AA Collets have a runout of only 5 microns (0.005mm)



* Case may not be as shown

Metric

Size (mm)	Size (dec.)	Code No.	Price \$	AA Code No.	Price \$
1.5-2*	.059-.078**	337-330	28.80	336-802	42.30
2-2.5	.078-.098**	337-274	28.80	336-804	42.30
2.5-3*	.098-.118**	337-332	24.30	336-805	37.80
3-3.5	.118-.137**	337-333	24.30	336-807	37.80
3.5-4*	.137-.157**	337-334	24.30	336-809	37.80
4-4.5	.157-.177**	337-486	24.30	336-810	37.80
4.5-5*	.177-.196**	337-336	24.30	336-812	37.80
5-5.5	.196-.217**	337-487	24.30	336-813	37.80
5.5-6*	.217-.236**	337-338	24.30	336-815	37.80
6-6.5	.236-.256**	337-488	24.30	336-816	37.80
6.5-7*	.256-.275**	337-340	24.30	336-818	37.80
7-7.5	.275-.295**	337-489	24.30	336-820	37.80
7.5-8*	.295-.314**	337-342	24.30	336-822	37.80
8-8.5	.314-.335**	337-490	24.30	336-823	37.80
8.5-9*	.335-.354**	337-344	24.30	336-825	37.80
9-9.5	.354-.374**	337-491	24.30	336-826	37.80
9.5-10*	.374-.393**	337-346	24.30	336-828	37.80
10-10.5	.393-.413**	337-492	24.30	336-830	37.80
10.5-11*	.413-.433**	337-348	24.30	336-831	37.80
11-11.5	.433-.452**	337-349	24.30	336-833	37.80
11.5-12*	.452-.472**	337-350	24.30	336-835	37.80
12-12.5	.472-.492**	337-493	24.30	336-836	37.80
12.5-13*	.492-.511**	337-352	24.30	336-838	37.80
13-13.5	.511-.531**	337-494	24.30	336-840	37.80
13.5-14*	.531-.551**	337-354	24.30	336-841	37.80
14-14.5	.551-.571**	337-495	24.30	336-843	37.80
14.5-15*	.571-.590**	337-356	24.30	336-844	37.80
15-15.5	.590-.610**	337-497	24.30	336-846	37.80
15.5-16*	.610-.629**	337-358	24.30	336-848	37.80
16-16.5	.629-.650**	337-499	45.00	336-849	37.80
16.5-17	.650-.669**	337-301	45.00	336-850	37.80
15pc Set	2 - 16mm	337-383	369.00	336-989	571.50

* Part of set

Inch

Size (in)	Code No.	Price \$	AA Code No.	Price \$	
3/32	337-602	33.30	336-803	42.30	
1/8	337-683	24.30	336-806	37.80	
5/32	337-684	24.30	336-808	37.80	
3/16	337-685	24.30	336-811	37.80	
7/32	337-686	24.30	336-814	37.80	
1/4	337-687	24.30	336-817	37.80	
9/32	337-688	24.30	336-819	37.80	
5/16	337-689	24.30	336-821	37.80	
11/32	337-691	24.30	336-824	37.80	
3/8	337-692	24.30	336-827	37.80	
13/32	337-693	24.30	336-829	37.80	
7/16	337-694	24.30	336-832	37.80	
15/32	337-696	24.30	336-834	37.80	
1/2	337-697	24.30	336-837	37.80	
17/32	337-698	24.30	336-839	37.80	
9/16	337-699	24.30	336-842	37.80	
19/32	337-701	24.30	336-845	37.80	
5/8	337-702	24.30	336-847	37.80	
17pc Set	1/8-5/8	337-405	398.70	336-995	684.90

ER 25 Tap Collets

- Alloy Steel
- For synchronous, rigid tapping operations using ER collet chuck
- Collet bore is exact tool diameter with square drive for accuracy and rigidity
- See page 89 for rigid tapping holders



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	337-895	43.20
8	M4	.168"	.131"	337-896	43.20
10	M4.5, M5	.194"	.152"	337-897	43.20
12		.220"	.165"	337-898	43.20
1/4	M6, M6.3	.255"	.191"	337-899	43.20
5/16	M7, M8	.318"	.238"	337-900	43.20
3/8	M10	.381"	.286"	337-901	43.20
7/16		.323"	.242"	337-902	43.20
1/2	M12, M12.5	.367"	.275"	337-903	43.20
9/16	M14	.429"	.322"	337-904	43.20
5/8	M16	.480"	.360"	337-905	43.20
NPT					
1/16, 1/8-SS (small shank)		.3125"	.234"	337-909	43.20
1/8-LS (large shank)		.4375"	.328"	337-910	43.20
11pc Set	#6 - 5/8			337-347	454.50



ER 25 Steel Sealed Collets

- Alloy Steel
- Sealed for coolant through applications
- Pressure resistance tested to 2000 psi



* Case may not be as shown

Inch Size	Code No.	Price \$	Metric Size	Code No.	Price \$		
1/8	337-878	44.10	3.0	338-297	44.10		
5/32	337-879	44.10	3.5	338-326	44.10		
3/16	337-880	44.10	4.0	338-327	44.10		
7/32	337-881	44.10	5.0	338-329	44.10		
1/4	337-882	44.10	5.5	338-331	44.10		
17/64	338-352	44.10	6.0	338-360	44.10		
9/32	337-883	44.10	6.5	338-362	44.10		
19/64	338-354	44.10	7.0	338-364	44.10		
5/16	337-884	44.10	7.5	338-366	44.10		
21/64	338-356	44.10	8.0	338-368	44.10		
11/32	337-885	44.10	8.5	338-370	44.10		
23/64	338-358	44.10	9.0	338-372	44.10		
3/8	337-886	44.10	9.5	338-374	44.10		
25/64	337-916	44.10	10.0	338-376	44.10		
13/32	337-887	44.10	10.5	338-378	44.10		
27/64	337-917	44.10	11.0	338-380	44.10		
7/16	337-888	44.10	11.5	338-382	44.10		
29/64	337-918	44.10	12.0	338-384	44.10		
15/32	337-889	44.10	12.5	338-386	44.10		
31/64	337-919	44.10	13.0	338-388	44.10		
1/2	337-890	44.10	13.5	338-390	44.10		
33/64	337-920	44.10	14.0	338-392	44.10		
17/32	337-891	44.10	14.5	338-394	44.10		
35/64	337-921	44.10	15.0	338-396	44.10		
9/16	337-892	44.10	15.5	338-398	44.10		
37/64	337-922	44.10	16.0	338-400	44.10		
19/32	337-893	44.10					
39/64	337-923	44.10					
5/8	337-894	44.10					
13pc Set	1/4-5/8 x 32nds	337-938	577.50	21pc Set	6.0-16.0mm x 0.5mm	337-939	882.00

ER 25 Quick Change Floating Tap Collets

With Axial Compensation

- For use with any ER collet chuck, these tapping collets help prevent tap breakage on machines requiring axial compensation. Friction-free ball-bearing drive.



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	338-758	54.00
8	M4	.168"	.131"	338-759	54.00
10	M4.5, M5	.194"	.152"	338-760	54.00
12		.220"	.165"	338-761	54.00
1/4	M6, M6.3	.255"	.191"	338-762	54.00
5/16	M7, M8	.318"	.238"	338-763	54.00
7/16		.323"	.242"	338-764	54.00
1/2	M12, M12.5	.367"	.275"	338-765	54.00



COLLETS



* Case may not be as shown

ER 32 Collets

• Alloy Steel

AA Collets have a runout of only 5 microns (0.005mm)

Metric * Part of set

Size (mm)	Size (dec.)	Code No.	Price \$	AA Code No.	Price \$
2-2.5	.078-.098"	337-415	24.30	336-852	37.80
2.5-3*	.098-.118"	337-361	24.30	336-853	37.80
3-3.5	.118-.137"	337-359	24.30	336-855	37.80
3.5-4*	.137-.157"	337-362	24.30	336-857	37.80
4-4.5	.157-.177"	337-217	24.30	336-858	37.80
4.5-5*	.177-.196"	337-363	24.30	336-860	37.80
5-5.5	.196-.217"	337-218	24.30	336-861	37.80
5.5-6*	.217-.236"	337-364	24.30	336-863	37.80
6-6.5	.236-.256"	337-219	24.30	336-864	37.80
6.5-7*	.256-.275"	337-365	24.30	336-866	37.80
7-7.5	.275-.295"	337-289	24.30	336-868	37.80
7.5-8*	.295-.314"	337-366	24.30	336-870	37.80
8-8.5	.314-.335"	337-221	24.30	336-871	37.80
8.5-9*	.335-.354"	337-367	24.30	336-873	37.80
9-9.5	.354-.374"	337-222	24.30	336-874	37.80
9.5-10*	.374-.393"	337-368	24.30	336-876	37.80
10-10.5	.393-.413"	337-223	24.30	336-878	37.80
10.5-11*	.413-.433"	337-369	24.30	336-879	37.80
11-11.5	.433-.452"	337-357	24.30	336-881	37.80
11.5-12*	.452-.472"	337-370	24.30	336-883	37.80
12-12.5	.472-.492"	337-227	24.30	336-884	37.80
12.5-13*	.492-.511"	337-371	24.30	336-886	37.80
13-13.5	.511-.531"	337-229	24.30	336-888	37.80
13.5-14*	.531-.551"	337-372	24.30	336-889	37.80
14-14.5	.551-.571"	337-249	24.30	336-891	37.80
14.5-15*	.571-.590"	337-373	24.30	336-892	37.80
15-15.5	.590-.610"	337-255	24.30	336-894	37.80
15.5-16*	.610-.629"	337-374	24.30	336-896	37.80
16-16.5	.629-.650"	337-256	24.30	336-897	37.80
16.5-17*	.650-.669"	337-375	24.30	336-899	37.80
17-17.5	.669-.689"	337-272	24.30	336-901	37.80
17.5-18*	.689-.708"	337-376	24.30	336-902	37.80
18-18.5	.708-.728"	337-215	24.30	336-904	37.80
18.5-19*	.728-.748"	337-377	24.30	336-905	37.80
19-19.5	.748-.767"	337-355	24.30	336-907	37.80
19.5-20*	.767-.787"	337-378	24.30	336-909	37.80
18pc Set	3 - 20mm	337-384	437.40	336-990	680.40

Inch

Size (in)	Code No.	Price \$	AA Code No.	Price \$	
3/32	337-607	33.30	336-851	46.80	
1/8	337-703	24.30	336-854	37.80	
5/32	337-704	24.30	336-856	37.80	
3/16	337-706	24.30	336-859	37.80	
7/32	337-707	24.30	336-862	37.80	
1/4	337-708	24.30	336-865	37.80	
9/32	337-709	24.30	336-867	37.80	
5/16	337-711	24.30	336-869	37.80	
11/32	337-712	24.30	336-872	37.80	
3/8	337-713	24.30	336-875	37.80	
13/32	337-714	24.30	336-877	37.80	
7/16	337-716	24.30	336-880	37.80	
15/32	337-717	24.30	336-882	37.80	
1/2	337-718	24.30	336-885	37.80	
17/32	337-719	24.30	336-887	37.80	
9/16	337-721	24.30	336-890	37.80	
19/32	337-722	24.30	336-893	37.80	
5/8	337-723	24.30	336-895	37.80	
21/32	337-724	24.30	336-898	37.80	
11/16	337-725	24.30	336-900	37.80	
23/32	337-726	24.30	336-903	37.80	
3/4	337-727	24.30	336-906	37.80	
25/32	337-605	24.30	336-908	37.80	
21pc Set	1/8-3/4	337-407	510.30	336-996	793.80

ER 32 Tap Collets

- Alloy Steel
- For synchronous, rigid tapping operations using ER collet chuck
- Collet bore is exact tool diameter with square drive for accuracy and rigidity
- See page 89 for rigid tapping holders



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	338-221	45.90
8	M4	.168"	.131"	338-222	45.90
10	M4.5, M5	.194"	.152"	338-223	45.90
12		.220"	.165"	338-224	45.90
1/4	M6, M6.3	.255"	.191"	338-225	45.90
5/16	M7, M8	.318"	.238"	338-226	45.90
3/8	M10	.381"	.286"	338-227	45.90
7/16		.323"	.242"	338-228	45.90
1/2	M12, M12.5	.367"	.275"	338-229	45.90
9/16	M14	.429"	.322"	338-230	45.90
5/8	M16	.480"	.360"	338-231	45.90
11/16	M18	.542"	.406"	338-232	45.90
3/4		.590"	.442"	338-233	45.90
13/16	M20	.652"	.489"	338-234	45.90
16pc Set	#6 - 13/16			337-351	734.40
NPT					
1/16, 1/8-55 (small shank)		.3125"	.234"	338-235	45.90
1/8-15 (large shank)		.4375"	.328"	338-236	45.90
1/4		.5625"	.421"	338-237	45.90



ER 32 Steel Sealed Collets

- Alloy Steel
- Sealed for coolant through applications
- Pressure resistance tested to 2000 psi



* Case may not be as shown

Inch Size	Code No.	Price \$	Metric Size	Code No.	Price \$		
1/8	338-200	47.70	3.0	338-335	47.70		
5/32	338-201	47.70	3.5	338-351	47.70		
3/16	338-202	47.70	4.0	338-353	47.70		
7/32	338-203	47.70	4.5	338-333	47.00		
1/4	338-204	47.70	5.0	338-355	47.70		
17/64	338-301	47.70	5.5	338-363	47.70		
9/32	338-205	47.70	6.0	338-320	47.70		
19/64	338-303	47.70	6.5	338-365	47.70		
5/16	338-206	47.70	7.0	338-357	47.70		
21/64	338-311	47.70	7.5	338-367	47.70		
11/32	338-207	47.70	8.0	338-324	47.70		
23/64	338-312	47.70	8.5	338-369	47.70		
3/8	338-208	47.70	9.0	338-359	47.70		
25/64	338-313	47.70	9.5	338-361	47.70		
13/32	338-209	47.70	10.0	338-328	47.70		
27/64	338-314	47.70	10.5	338-404	47.70		
7/16	338-210	47.70	11.0	338-406	47.70		
29/64	338-315	47.70	11.5	338-371	47.70		
15/32	338-211	47.70	12.0	338-332	47.70		
31/64	338-316	47.70	12.5	338-408	47.70		
1/2	338-212	47.70	13.0	338-410	47.70		
33/64	338-317	47.70	13.5	338-412	47.70		
17/32	338-213	47.70	14.0	338-414	47.70		
35/64	338-318	47.70	14.5	338-416	47.70		
9/16	338-214	47.70	15.0	338-418	47.70		
37/64	338-319	47.70	15.5	338-420	47.70		
19/32	338-215	47.70	16.0	338-422	47.70		
39/64	338-321	47.70	16.5	338-424	47.70		
5/8	338-216	47.70	17.0	338-426	47.70		
41/64	337-924	54.90	17.5	338-428	47.70		
21/32	338-217	47.70	18.0	338-430	47.70		
43/64	337-925	54.90	18.5	338-432	47.70		
11/16	338-218	47.70	19.0	338-434	47.70		
45/64	337-926	54.90	19.5	338-436	47.70		
23/32	338-219	47.70	20.0	338-438	47.70		
47/64	337-927	54.90					
3/4	338-220	47.70					
49/64	337-928	54.90					
25/32	338-322	47.70					
17pc Set	1/4-3/4 x 32nds	337-940	803.30	20pc Set	10.0-20.0mm x 0.5mm	337-942	954.00

Collet Chucks

ER 32 Quick Change Floating Tap Collets

With Axial Compensation

- For use with any ER collet chuck, these tapping collets help prevent tap breakage on machines requiring axial compensation. Friction-free ball-bearing drive.



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	338-766	58.50
8	M4	.168"	.131"	338-767	58.50
10	M4.5, M5	.194"	.152"	338-768	58.50
12		.220"	.165"	338-769	58.50
1/4	M6, M6.3	.255"	.191"	338-770	58.50
5/16	M7, M8	.318"	.238"	338-771	58.50
3/8	M10	.381"	.286"	338-772	58.50
7/16		.323"	.242"	338-773	58.50
1/2	M12, M12.5	.367"	.275"	338-774	58.50
9/16	M14	.429"	.322"	338-775	58.50
NPT					
1/16, 1/8-55		.3125"	.234"	338-776	58.50
1/8-15		.4375"	.328"	338-777	58.50



COLLETS

ER 40 Collets

• Alloy Steel

AA Collets have a runout of only 5 microns (0.005mm)



* Case may not be as shown

Metric

Size (mm)	Size (dec.)	Code No.	Price \$	AA Code No.	Price \$
3-3.5	.118-.137"	337-545	27.00	336-911	40.50
3.5-4*	.137-.157"	337-501	27.00	336-913	40.50
4-4.5	.157-.177"	337-546	27.00	336-914	40.50
4.5-5*	.177-.196"	337-502	27.00	336-916	40.50
5-5.5	.196-.216"	337-547	27.00	336-917	40.50
5.5-6*	.216-.236"	337-503	27.00	336-919	40.50
6-6.5	.236-.256"	337-548	27.00	336-920	40.50
6.5-7*	.256-.275"	337-505	27.00	336-922	40.50
7-7.5	.275-.295"	337-549	27.00	336-924	40.50
7.5-8*	.295-.314"	337-506	27.00	336-926	40.50
8-8.5	.314-.335"	337-554	27.00	336-927	40.50
8.5-9*	.335-.354"	337-507	27.00	336-929	40.50
9-9.5	.354-.374"	337-557	27.00	336-930	40.50
9.5-10*	.374-.393"	337-509	27.00	336-932	40.50
10-10.5	.393-.413"	337-558	27.00	336-934	40.50
10.5-11*	.413-.433"	337-510	27.00	336-935	40.50
11-11.5	.433-.452"	337-498	27.00	336-937	40.50
11.5-12*	.452-.472"	337-511	27.00	336-939	40.50
12-12.5	.472-.492"	337-559	27.00	336-940	40.50
12.5-13*	.492-.511"	337-513	27.00	336-942	40.50
13-13.5	.511-.531	337-562	27.00	336-944	40.50
13.5-14*	.531-.551"	337-514	27.00	336-945	40.50
14-14.5	.551-.571"	337-563	27.00	336-947	40.50
14.5-15*	.571-.590"	337-515	27.00	336-948	40.50
15-15.5	.590-.610"	337-564	27.00	336-950	40.50
15.5-16*	.610-.629"	337-517	27.00	336-952	40.50
16-16.5	.629-.650"	337-567	27.00	336-953	40.50
16.5-17*	.650-.669"	337-518	27.00	336-955	40.50
17-17.5	.669-.689"	337-568	27.00	336-957	40.50
17.5-18*	.689-.708"	337-519	27.00	336-958	40.50
18-18.5	.708-.728"	337-569	27.00	336-960	40.50
18.5-19*	.728-.748"	337-521	27.00	336-961	40.50
19-19.5	.748-.767"	337-496	27.00	336-963	40.50
19.5-20*	.767-.787"	337-522	27.00	336-965	40.50
20-20.5	.787-.807"	337-572	27.00	336-966	40.50
20.5-21*	.807-.826"	337-523	27.00	336-968	40.50
21-21.5	.826-.846"	337-573	27.00	336-970	40.50
21.5-22*	.846-.866"	337-524	27.00	336-971	40.50
22-22.5	.866-.886"	337-574	27.00	336-973	40.50
22.5-23*	.886-.905"	337-525	27.00	336-974	40.50
23-23.5	.905-.925"	337-577	27.00	336-976	40.50
23.5-24*	.925-.944"	337-526	27.00	336-978	40.50
24-24.5	.944-.965"	337-578	27.00	336-979	40.50
24.5-25*	.965-.984"	337-527	27.00	336-981	40.50
25-25.5	.984-1.004"	337-579	27.00	336-983	40.50
25.5-26*	1.004-1.023"	337-528	27.00	336-984	40.50
23pc Set	3.5-26mm	337-386	621.00	336-991	931.50

* Part of set

Inch

Size (in)	Code No.	Price \$	AA Code No.	Price \$
1/8	337-728	27.00	336-910	40.50
5/32	337-729	27.00	336-912	40.50
3/16	337-731	27.00	336-915	40.50
7/32	337-732	27.00	336-918	40.50
1/4	337-733	27.00	336-921	40.50
9/32	337-734	27.00	336-923	40.50
5/16	337-736	27.00	336-925	40.50
11/32	337-737	27.00	336-928	40.50
3/8	337-738	27.00	336-931	40.50
13/32	337-739	27.00	336-933	40.50
7/16	337-741	27.00	336-936	40.50
15/32	337-742	27.00	336-938	40.50
1/2	337-743	27.00	336-941	40.50
17/32	337-744	27.00	336-943	40.50
9/16	337-746	27.00	336-946	40.50
19/32	337-747	27.00	336-949	40.50
5/8	337-748	27.00	336-951	40.50
21/32	337-749	27.00	336-954	40.50
11/16	337-751	27.00	336-956	40.50
23/32	337-752	27.00	336-959	40.50
3/4	337-753	27.00	336-962	40.50
25/32	337-754	27.00	336-964	40.50
13/16	337-756	27.00	336-967	40.50
27/32	337-757	27.00	336-969	40.50
7/8	337-758	27.00	336-972	40.50
29/32	337-759	27.00	336-975	40.50
15/16	337-761	27.00	336-977	40.50
31/32	337-762	27.00	336-980	40.50
1	337-763	27.00	336-982	40.50
29pc Set	1/8-1	337-409	783.00	
15pc Set	1/8-1			336-997 607.50

Metric

Size (mm)	Code No.	Price \$
6.0	338-441	52.20
6.5	338-435	52.20
7.0	338-443	52.20
7.5	338-437	52.20
8.0	338-445	52.20
8.5	338-439	52.20
9.0	338-447	52.20
9.5	338-449	52.20
10.0	338-440	52.20
10.5	338-442	52.20
11.0	338-444	52.20
11.5	338-446	52.20
12.0	338-448	52.20
12.5	338-450	52.20
13.0	338-452	52.20
13.5	338-454	52.20
14.0	338-456	52.20
14.5	338-458	52.20
15.0	338-460	52.20
15.5	338-462	52.20
16.0	338-464	52.20
16.5	338-468	52.20
17.0	338-470	52.20
17.5	338-472	52.20
18.0	338-474	52.20
18.5	338-476	52.20
19.0	338-478	52.20
19.5	338-480	52.20
20.0	338-482	52.20
20.5	338-484	52.20
21.0	338-486	52.20
21.5	338-488	52.20
22.0	338-490	52.20
22.5	338-492	52.20
23.0	338-494	52.20
23.5	338-496	52.20
24.0	338-498	52.20
24.5	338-500	52.20
25.0	338-502	52.20
25.5	338-504	52.20
26.0	338-506	52.20
33pc Set 10.0-26.0mm x 0.5mm	337-944	1,714.60

COLLETS



ER 40 Steel Sealed Collets

- Alloy Steel
- Sealed for coolant through applications
- Pressure resistance tested to 2000 psi



Inch

Size (in.)	Code No.	Price \$
1/8	338-238	52.20
5/32	338-239	52.20
3/16	338-240	52.20
7/32	338-241	52.20
1/4	338-242	52.20
9/32	338-243	52.20
5/16	338-244	52.20
11/32	338-245	52.20
3/8	338-246	52.20
13/32	338-247	52.20
7/16	338-248	52.20
15/32	338-249	52.20
1/2	338-250	52.20
17/32	338-251	52.20
9/16	338-252	52.20
19/32	338-253	52.20
5/8	338-254	52.20
21/32	338-255	52.20
11/16	338-256	52.20
23/32	338-257	52.20
3/4	338-258	52.20
25/32	338-259	52.20
13/16	338-260	52.20
27/32	338-261	52.20
7/8	338-262	52.20
29/32	338-263	52.20
15/16	338-264	52.20
31/32	338-265	52.20
1	338-266	52.20

Collet Chucks

ER 40 Tap Collets

- For synchronous, rigid tapping operations using ER collet chuck
- Collet bore is exact tool diameter with square drive for accuracy and rigidity
- See page 89 for rigid tapping holders



• Alloy Steel

ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	338-267	54.00
8	M4	.168"	.131"	338-268	54.00
10	M4.5, M5	.194"	.152"	338-269	54.00
12		.220"	.165"	338-270	54.00
1/4	M6, M6.3	.255"	.191"	338-271	54.00
5/16	M7, M8	.318"	.238"	338-272	54.00
3/8	M10	.381"	.286"	338-273	54.00
7/16		.323"	.242"	338-274	54.00
1/2	M12, M12.5	.367"	.275"	338-275	54.00
9/16	M14	.429"	.322"	338-276	54.00
5/8	M16	.480"	.360"	338-277	54.00
11/16	M18	.542"	.406"	338-278	54.00
3/4		.590"	.442"	338-279	54.00
13/16	M20	.652"	.489"	338-280	54.00
7/8	M22	.697"	.523"	338-281	54.00
15/16	M24	.760"	.570"	338-282	54.00
1	M25	.800"	.600"	338-283	54.00
21pc Set #6 - 1				337-353	1,118.70
NPT					
1/16, 1/8-SS (small shank)		.3125"	.234"	338-284	69.60
1/8-LS (large shank)		.4375"	.328"	338-285	69.60
1/4		.5625"	.421"	338-286	54.00
3/8		.7000"	.531"	338-287	54.00
1/2		.875"	.515"	338-288	54.00



COLLETS

ER 50 Collets

- Alloy Steel
- ER50 collets collapse approximately 5/64" with full accuracy



* Case may not be as shown

Collet Chucks

Size (mm)	Size (in.)	Code No.	Price \$
10-12	.394-.472	337-450	50.40
12-14	.472-.551	337-452	50.40
14-16	.551-.630	337-454	50.40
16-18	.630-.709	337-456	50.40
18-20	.709-.789	337-458	50.40
20-22	.789-.866	337-460	50.40
22-24	.866-.945	337-461	50.40
24-26	.945-1.024	337-462	50.40
26-28	1.024-1.102	337-464	50.40
28-30	1.102-1.181	337-466	50.40
30-32	1.181-1.260	337-468	50.40
32-34	1.260-1.339	337-470	50.40
34-36 *	1.339-1.4173	337-472	50.40
12pc Set	10-34mm	.394-1.390	337-387 550.00
Inch Collets			
13/32		337-764	50.40
7/16		337-778	50.40
15/32		337-779	50.40
1/2		337-781	50.40
17/32		337-782	50.40
9/16		337-783	50.40
19/32		337-784	50.40
5/8		337-786	50.40
21/32		337-787	50.40
11/16		337-788	50.40
23/32		337-789	50.40
3/4		337-794	50.40
25/32		337-795	50.40
13/16		337-796	50.40
27/32		337-797	50.40
7/8		337-798	50.40
29/32		337-799	50.40
15/16		337-801	50.40
31/32		337-802	50.40
1		337-803	50.40
1-1/32		337-804	50.40
1-1/16		337-806	50.40
1-3/32		337-807	50.40
1-3/16		337-808	50.40
1-5/32		337-809	50.40
1-3/16		337-811	50.40
1-7/32		337-812	50.40
1-1/4		337-813	50.40
1-9/32		337-814	50.40
1-5/16		337-816	50.40

* Not in Set



ER Metric Collet Sets



* Case may not be as shown



• Alloy Steel

Collet Chucks

ER11 / 13 Pieces		ER16 / 10 Pieces		ER20 / 12 Pieces		ER25 / 15 Pieces	
Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
337-379	283.50	337-380	211.50	337-382	288.90	337-383	369.00
Code No.	Size	Code No.	Size	Code No.	Size	Code No.	Size
337-650	.019-.039	337-302	.019-.039	337-473	.059-.078	337-330	.059-.078
337-652	.039-.059	337-304	.059-.078	337-474	.098-.118	337-332	.098-.118
337-654	.059-.078	337-306	.098-.118	337-475	.137-.157	337-334	.137-.157
337-656	.078-.098	337-308	.137-.157	337-476	.177-.196	337-336	.177-.196
337-658	.098-.118	337-310	.177-.196	337-477	.217-.236	337-338	.217-.236
337-660	.118-.137	337-312	.217-.236	337-478	.256-.275	337-340	.256-.275
337-662	.137-.157	337-314	.256-.275	337-479	.295-.314	337-342	.295-.314
337-664	.157-.177	337-316	.295-.314	337-480	.335-.354	337-344	.335-.354
337-666	.177-.196	337-318	.335-.354	337-481	.374-.393	337-346	.374-.393
337-668	.196-.216	337-320	.374-.393	337-482	.413-.433	337-348	.413-.433
337-670	.216-.236			337-483	.452-.472	337-350	.452-.472
337-672	.236-.255			337-484	.492-.511	337-352	.492-.511
337-674	.255-.275					337-354	.531-.551
						337-356	.571-.590
						337-358	.610-.629

ER32 / 18 Pieces		ER40 / 23 Pieces		ER50 / 12 Pieces	
Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
337-384	437.40	337-386	621.00	337-387	550.00
Code No.	Size	Code No.	Size	Code No.	Size
337-361	.098-.118	337-501	.118-.157	337-450	.394-.472
337-362	.137-.157	337-502	.177-.196	337-452	.472-.551
337-363	.177-.196	337-503	.216-.236	337-454	.551-.630
337-364	.217-.236	337-505	.256-.275	337-456	.630-.709
337-365	.256-.275	337-506	.295-.314	337-458	.709-.789
337-366	.295-.314	337-507	.335-.354	337-460	.789-.866
337-367	.335-.354	337-509	.374-.393	337-461	.866-.945
337-368	.374-.393	337-510	.413-.433	337-462	.945-1.024
337-369	.413-.433	337-511	.452-.472	337-464	1.024-1.102
337-370	.452-.472	337-513	.492-.511	337-466	1.102-1.181
337-371	.492-.511	337-514	.531-.551	337-468	1.181-1.260
337-372	.531-.551	337-515	.571-.590	337-470	1.260-1.339
337-373	.571-.590	337-517	.610-.629		
337-374	.610-.629	337-518	.650-.669		
337-375	.650-.669	337-519	.689-.708		
337-376	.689-.708	337-521	.728-.748		
337-377	.728-.748	337-522	.767-.787		
337-378	.767-.787	337-523	.807-.826		
		337-524	.846-.866		
		337-525	.886-.905		
		337-526	.925-.944		
		337-527	.965-.984		
		337-528	1.004-1.023		



COLLETS

ER Inch Collet Sets



* Case may not be as shown



• Alloy Steel

ER11 / 7 Pieces		ER16 / 11 Pieces		ER20 / 15 Pieces		ER25 / 17 Pieces		ER32 / 21 Pieces		ER40 / 29 Pieces	
Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
337-401	151.70	337-403	238.10	337-404	354.20	337-405	398.70	337-407	510.30	337-409	783.00
Code No.	Size	Code No.	Size	Code No.	Size	Code No.	Size	Code No.	Size	Code No.	Size
337-610	1/16	337-531	1/16	337-621	1/16	337-683	1/8	337-703	1/8	337-728	1/8
337-613	3/32	337-532	3/32	337-623	3/32	337-684	5/32	337-704	5/32	337-729	5/32
337-615	1/8	337-533	1/8	337-663	1/8	337-685	3/16	337-706	3/16	337-731	3/16
337-618	5/32	337-534	5/32	337-665	5/32	337-686	7/32	337-707	7/32	337-732	7/32
337-651	3/16	337-535	3/16	337-667	3/16	337-687	1/4	337-708	1/4	337-733	1/4
337-655	7/32	337-536	7/32	337-669	7/32	337-688	9/32	337-709	9/32	337-734	9/32
337-659	1/4	337-537	1/4	337-671	1/4	337-689	5/16	337-711	5/16	337-736	5/16
		337-538	9/32	337-673	9/32	337-691	11/32	337-712	11/32	337-737	11/32
		337-540	5/16	337-675	5/16	337-692	3/8	337-713	3/8	337-738	3/8
		337-541	11/32	337-676	11/32	337-693	13/32	337-714	13/32	337-739	13/32
		337-542	3/8	337-677	3/8	337-694	7/16	337-716	7/16	337-741	7/16
				337-678	13/32	337-696	15/32	337-717	15/32	337-742	15/32
				337-679	7/16	337-697	1/2	337-718	1/2	337-743	1/2
				337-681	15/32	337-698	17/32	337-719	17/32	337-744	17/32
				337-682	1/2	337-699	9/16	337-721	9/16	337-746	9/16
						337-701	19/32	337-722	19/32	337-747	19/32
						337-702	5/8	337-723	5/8	337-748	5/8
								337-724	21/32	337-749	21/32
								337-725	11/16	337-751	11/16
								337-726	23/32	337-752	23/32
								337-727	3/4	337-753	3/4
										337-754	25/32
										337-756	13/16
										337-757	27/32
										337-758	7/8
										337-759	29/32
										337-761	15/16
										337-762	31/32
										337-763	1

ER Collet Sets

**QUALITY
IMPORT**

• Shipped as set, no plastic container



Collet	Description	Range	Code No.	Price \$
ER16	Inch 11pc Collet Set	1/16"-3/8" x 32nds	337-440	194.00
ER25	Inch 17pc Collet Set	1/8"-5/8" x 32nds	337-442	215.90
ER32	Inch 21pc Collet Set	1/8"-3/4" x 32nds	337-444	381.40



ER Steel Sealed Collet Sets

- Alloy Steel
- Sealed (ER11 rubber sealed) for coolant through applications
- Pressure resistance tested to 2000 psi (ER11 to 500psi)



Collet	Description	Range	Code No.	Price \$
ER11	Inch 6pc Sealed Collet Set	3/16-17/64 x 64ths	337-929	204.60
ER11	Metric 7pc Sealed Collet Set	3.9-7.0mm x 0.5mm	337-930	238.70
ER16	Inch 10pc Sealed Collet Set	1/8-13/32 x 32nds	337-931	378.00
ER16	Metric 13pc Sealed Collet Set	4.0-10.0mm x 0.5mm	337-932	491.40
ER20	Inch 12pc Sealed Collet Set	5/32-1/2 x 32nds	337-933	510.30
ER20	Metric 17pc Sealed Collet Set	5.0-13.0mm x 0.5mm	337-935	723.30
ER25	Inch 13pc Sealed Collet Set	1/4-5/8 x 32nds	337-938	577.50
ER25	Metric 21pc Sealed Collet Set	6.0-16.0mm x 0.5mm	337-939	882.00
ER32	Inch 17pc Sealed Collet Set	1/4-3/4 x 32nds	337-940	803.30
ER32	Metric 20pc Sealed Collet Set	10.0-20.0mm x 0.5mm	337-942	954.00
ER40	Metric 33pc Sealed Collet Set	10.0-26.0mm x 0.5mm	337-944	1,714.60

ER Tap Collet Sets

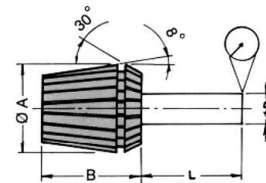
- For synchronous, rigid tapping operations using ER collet chucks
- Collet bore is exact tool diameter with square drive for accuracy and rigidity
- See page 89 for rigid tapping holders



Collet	Description	Range	Code No.	Price \$
ER16	Inch 9pc Tap Collet Set	#6 - 1/2	337-343	331.20
ER20	Inch 9pc Tap Collet Set	#6 - 1/2	337-345	331.20
ER25	Inch 11pc Tap Collet Set	#6 - 5/8	337-347	454.50
ER32	Inch 16pc Tap Collet Set	#6 - 13/16	337-351	734.40
ER40	Inch 21pc Tap Collet Set	#6 - 1"	337-353	1,118.70

ER Spring Collet Dimensional Data

ER collet system is made of special elastic steel material under excellent heat treatment and precise grinding process, so it has precise accuracy, powerful clamping ability, and is durable. This collet can clamp for a specific standard size and its next size. It can be widely used for boring, milling, drilling and tapping as well as for grinding operation, and is available for all sizes.



Type	A (mm)	B (mm)	L (mm)	øD (mm)	DIN 6343 Precision	GS Precision	GS Extreme Precision AA
ER-11	11.5	18			0.02	0.010	0.005
ER-16	17	27	6	1.0-1.4	0.02	0.010	0.005
ER-20	21	31	10	1.5-2.9	0.02	0.010	0.005
ER-25	26	35	16	3.0-5.9	0.02	0.010	0.005
ER-32	33	40	25	6.0-9.9	0.02	0.010	0.005
ER-40	41	46	40	10.0-17.9	0.03	0.010	0.005
ER-50	52	60	50	18.0-26.9	0.03	0.010	-

Mounting instructions for ER collets

- Place collet inside nut and rotate the nut to engage with the extractor spiral in collet groove
 - Only then mount nut and collet together into the collet holder or machine spindle

Note: Always use the collet size that will collapse down to the desired size, e.g. for 12mm it is better to use 12-12.5mm rather than 11.5-12mm.



COLLETS

Replacement ER Chuck Nuts



Collet Nut for ER32 Shorty Collet Chucks

Description	Tightening Torque (Nm)	Steam Oxide		Balanced & Bright	
		Code No.	Price \$	Code No.	Price \$
ER11 Nut (Hex)	29.8	337-680	32.40	534-790	54.00
ER16 Nut (Hex)	56.9	337-389	32.40	534-792	56.60
ER20 Nut (Hex)	81.3	337-391	32.40	534-794	59.20
ER25 Nut (Notched)	128.8	337-390	36.00	534-796	61.70
ER32 Nut (Notched)	169.5	337-392	35.10	534-798	64.00
ER40 Nut (Notched)	219.6	337-393	38.70	534-800	66.90
ER50 Nut (Notched)		337-385	86.40		
ER32 Shorty Collet Nut					
Fits ER32 Shorty Chucks (M40 x 1.5 Thread)				337-411	72.90

ER Chuck Nut Wrenches



Wrench for ER32 Shorty Collet Chucks

Description	Code No.	Price \$
Fits ER11 Chucks (Hex)	337-388	34.20
Fits ER16 Chucks (Hex)	337-395	34.20
Fits ER20 Chucks (Hex)	337-397	34.20
Fits ER25 Chucks (Notched)	337-396	22.50
Fits ER32 Chucks (Notched)	337-398	28.80
Fits ER40 Chucks (Notched)	337-399	23.40
ER32 Shorty Chuck Wrench		
Fits ER32 Shorty Chucks	337-381	78.70

Replacement Backup Screws



Description	Code No.	Price \$
ER11 Backup Screws	534-814	7.70
ER16 Backup Screws	534-816	7.70
ER20 Backup Screws	534-818	7.70
ER25 Backup Screws	534-820	7.70
ER40 Backup Screws	534-824	8.20



CAT Taper SA High Precision Collet Chucks

FEATURES:

- 100% Forged Construction
- Certified balanced up to 15 - 20,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Run out accuracy is > 5µm at 4xD of the cutting tool shank
- 8° tapered collet seats deeper in the body of the holder providing increased rigidity. This results in concentricity and stronger gripping power.
- Each chuck comes with a collet extractor
- Wrench not included



Complete with certificate



- Pull Stud
 pg 135
- Nut
 pg 50
- Wrench
 pg 50
- SA Collet
 pg 51-52

Taper	Collet Series	Collet Range	Gage Length	Code No.	Price \$
CAT40					
CT40	SA10*	.069-.394"	3.54"	531-756	228.70
CT40	SA10*	.069-.394"	4.72"	531-758	240.70
CT40	SA16	.108-.630"	3.54"	531-762	239.70
CT40	SA16	.108-.630"	4.72"	531-764	259.90
CT40	SA16	.108-.630"	5.91"	531-766	288.90
CT40	SA25	.630-1.00"	3.54"	531-768	261.50

*Hex Nut

• Available only while quantities last



Taper	Collet Series	Collet Range	Gage Length	Code No.	Price \$
CAT50					
CT50	SA10*	.069-.394"	4.13"	531-776	316.10
CT50	SA16	.108-.630"	4.13"	531-782	317.70
CT50	SA25	.630-1.00"	4.13"	531-788	352.50

*Hex Nut

Collet Chucks



COLLET CHUCKS

Replacement SA Collet Nuts



Description	Code No.	Price \$
SA10 Nut (Hex)	536-588	54.60
SA16 Nut (Notched)	536-590	58.70
SA25 Nut (Notched)	536-592	60.90

SA Collet Chuck Wrenches



Description	Code No.	Price \$
Fits SA10	536-580	23.10
Fits SA16	536-582	23.10
Fits SA25	536-584	23.10

SA Collet Extractors



Description	Code No.	Price \$
SA10	536-572	9.80
SA16	536-574	12.40
SA25	536-576	17.10

Collet Chucks



SA6 Collets



Size	Collapse Range (mm)	Collapse Range (in.)	Code No.	Price \$
Inch				
1/8	-	-	338-528	61.40
3/16	-	-	338-530	61.40
Metric				
1.0mm	0.9-1.0	0.035-0.039	338-532	61.40
1.25mm	1.15-1.25	0.045-0.049	338-534	61.40
1.5mm	1.3-1.5	0.051-0.059	338-536	61.40
1.75mm	1.5-1.75	0.059-0.068	338-538	61.40
2.0mm	1.8-2.0	0.070-0.078	338-540	61.40
2.25mm	2.05-2.25	0.080-0.088	338-542	61.40
2.5mm	2.3-2.5	0.090-0.098	338-544	61.40
2.75mm	2.55-2.75	0.100-0.108	338-546	61.40
3.0mm	2.8-3.0	0.110-0.118	338-548	61.40
3.5mm	3.0-3.5	0.118-0.137	338-550	54.70
4.0mm	3.5-4.0	0.137-0.157	338-552	54.70
4.5mm	4.0-4.5	0.157-0.177	338-554	54.70
5.0mm	4.5-5.0	0.177-0.196	338-556	54.70
5.5mm	5.0-5.5	0.196-0.216	338-558	54.70
6.0mm	5.5-6.0	0.216-0.236	338-560	54.70

SA16 Collets



Size	Collapse Range (mm)	Collapse Range (in.)	Code No.	Price \$
Inch				
1/8	-	-	338-674	61.40
3/16	-	-	338-676	61.40
1/4	-	-	338-678	61.40
5/16	-	-	338-680	61.40
3/8	-	-	338-682	61.40
7/16	-	-	338-684	61.40
1/2	-	-	338-686	61.40
9/16	-	-	338-688	61.40
5/8	-	-	338-690	61.40
Metric				
2.0mm	-	-	338-614	61.40
2.5mm	-	-	338-616	61.40
3.0mm	2.75-3.0	0.108-0.118	338-618	61.40
3.5mm	3.0-3.5	0.118-0.137	338-620	61.40
4.0mm	3.5-4.0	0.137-0.157	338-622	61.40
4.5mm	4.0-4.5	0.157-0.177	338-624	61.40
5.0mm	4.5-5.0	0.177-0.196	338-626	61.40
5.5mm	5.0-5.5	0.196-0.216	338-628	61.40
6.0mm	5.5-6.0	0.216-0.236	338-630	61.40
6.5mm	6.0-6.5	0.236-0.255	338-632	61.40
7.0mm	6.5-7.0	0.255-0.275	338-634	61.40
7.5mm	7.0-7.5	0.275-0.295	338-636	61.40
8.0mm	7.5-8.0	0.295-0.314	338-638	61.40
8.5mm	8.0-8.5	0.314-0.334	338-640	61.40
9.0mm	8.5-9.0	0.334-0.354	338-642	61.40
9.5mm	9.0-9.5	0.354-0.374	338-644	61.40
10.0mm	9.5-10.0	0.374-0.393	338-646	61.40
10.5mm	10.0-10.5	0.393-0.413	338-648	61.40
11.0mm	10.5-11.0	0.413-0.433	338-650	61.40
11.5mm	11.0-11.5	0.433-0.452	338-652	61.40
12.0mm	11.5-12.0	0.452-0.472	338-654	61.40
12.5mm	12.0-12.5	0.472-0.492	338-656	61.40
13.0mm	12.5-13.0	0.492-0.511	338-658	61.40
13.5mm	13.0-13.5	0.511-0.531	338-660	61.40
14.0mm	13.5-14.0	0.531-0.551	338-662	61.40
14.5mm	14.0-14.5	0.551-0.570	338-664	61.40
15.0mm	14.5-15.0	0.570-0.590	338-666	61.40
15.5mm	15.0-15.5	0.590-0.610	338-668	61.40
16.0mm	15.5-16.0	0.610-0.629	338-670	61.40



COLLETS

SA10 Collets



Size	Collapse Range (mm)	Collapse Range (in.)	Code No.	Price \$
Inch				
1/8	-	-	338-602	54.70
3/16	-	-	338-604	54.70
1/4	-	-	338-606	54.70
5/16	-	-	338-608	54.70
3/8	-	-	338-610	54.70
Metric				
2.0mm	1.75-2.0	0.068-0.078	338-564	61.40
2.25mm	2.0-2.25	0.078-0.088	338-566	61.40
2.5mm	2.25-2.5	0.088-0.098	338-568	61.40
3.0mm	2.75-3.0	0.108-0.118	338-572	54.70
3.5mm	3.0-3.5	0.118-0.137	338-574	54.70
4.0mm	3.5-4.0	0.137-0.157	338-576	54.70
4.5mm	4.0-4.5	0.157-0.177	338-578	54.70
5.0mm	4.5-5.0	0.177-0.196	338-580	54.70
5.5mm	5.0-5.5	0.196-0.216	338-582	54.70
6.0mm	5.5-6.0	0.216-0.236	338-583	54.70
6.5mm	6.0-6.5	0.236-0.255	338-584	54.70
7.0mm	6.5-7.0	0.255-0.275	338-586	54.70
7.5mm	7.0-7.5	0.275-0.295	338-588	54.70
8.0mm	7.5-8.0	0.295-0.314	338-590	54.70
8.5mm	8.0-8.5	0.314-0.334	338-592	54.70
9.0mm	8.5-9.0	0.334-0.354	338-594	54.70
9.5mm	9.0-9.5	0.354-0.374	338-596	54.70
10.0mm	9.5-10.0	0.374-0.393	338-598	54.70

SA25 Collets



Size	Collapse Range (mm)	Collapse Range (in.)	Code No.	Price \$
Inch				
1/4	-	-	338-736	75.00
5/16	-	-	338-738	75.00
3/8	-	-	338-740	75.00
7/16	-	-	338-742	75.00
1/2	-	-	338-744	75.00
5/8	-	-	338-746	75.00
3/4	-	-	338-748	75.00
Metric				
16.5mm	16.0-16.5	0.629-0.649	338-694	75.00
17.0mm	16.5-17.0	0.649-0.669	338-696	75.00
17.5mm	17.0-17.5	0.669-0.688	338-698	75.00
18.0mm	17.5-18.0	0.688-0.708	338-700	75.00
18.5mm	18.0-18.5	0.708-0.728	338-702	75.00
19.0mm	18.5-19.0	0.728-0.748	338-704	75.00
19.5mm	19.0-19.5	0.748-0.767	338-706	75.00
20.0mm	19.5-20.0	0.767-0.787	338-708	75.00
20.5mm	20.0-20.5	0.787-0.807	338-710	75.00
21.0mm	20.5-21.0	0.807-0.826	338-712	75.00
21.5mm	21.0-21.5	0.826-0.846	338-714	75.00
22.0mm	21.5-22.0	0.846-0.866	338-716	75.00
22.5mm	22.0-22.5	0.866-0.885	338-718	75.00
23.0mm	22.5-23.0	0.885-0.905	338-720	75.00
23.5mm	23.0-23.5	0.905-0.925	338-722	75.00
24.0mm	23.5-24.0	0.925-0.944	338-724	75.00
24.5mm	24.0-24.5	0.944-0.964	338-726	75.00
25.0mm	24.5-25.0	0.964-0.984	338-728	75.00
25.4mm	25.0-25.4	0.984-1.000	338-730	75.00

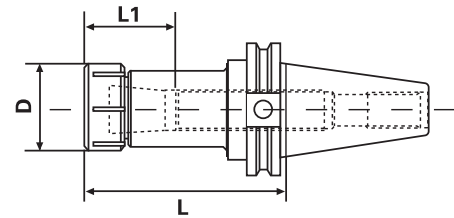


CAT Taper TG Collet Chucks

- 100% Forged Construction
- Certified balanced up to 15 - 20,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Shank traverse ground to obtain optimum accuracy
- Meets or exceeds ANSI specifications
- .0002" or better ensures the best possible cutting tool life
- Threaded through holes for a back-up screw (tool stop) or coolant through when removed
- TIR, 0.0006"
- Wrench not included



Complete with certificate



- Pull Stud pg 135
- Nut pg 061
- Wrench pg 61
- TG Collet pg 56-60

Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CAT40								
CT40	75TG	3/64-3/4"	3.00"	1.61"	1.89"	81.3	531-284	179.00
CT40	75TG	3/64-3/4"	5.00"	1.61"	1.89"	81.3	531-286	141.20
CT40	100TG	3/64-1"	3.00"	2.13"	2.50"	81.3	531-288	143.10
CT40	100TG	3/64-1"	3.50"	2.13"	2.50"	81.3	531-290	143.10
CT40	100TG	3/64-1"	5.50"	2.13"	2.50"	81.3	531-292	143.10
CT40	150TG	1/2-1-1/2"	6.00"	2.88"	3.50"	94.9	531-294	159.00



Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CAT50								
CT50	75TG	3/64-3/4"	3.50"	1.61"	1.89"	81.3	531-296	204.30
CT50	75TG	3/64-3/4"	5.50"	1.61"	1.89"	81.3	531-298	200.40
CT50	100TG	3/64-1"	3.50"	2.13"	2.50"	81.3	531-300	204.30
CT50	100TG	3/64-1"	5.50"	2.13"	2.50"	81.3	531-302	232.30
CT50	100TG	3/64-1"	7.50"	2.13"	2.50"	81.3	531-304	321.20
CT50	100TG	3/64-1"	10.00"	2.13"	3.50"	81.3	531-306	321.20
CT50	150TG	1/2-1-1/2"	3.50"	2.88"	3.50"	94.9	531-308	227.00
CT50	150TG	1/2-1-1/2"	6.00"	2.88"	3.50"	94.9	531-310	232.30

• Available only while quantities last

Collet Chucks



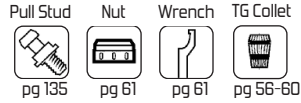
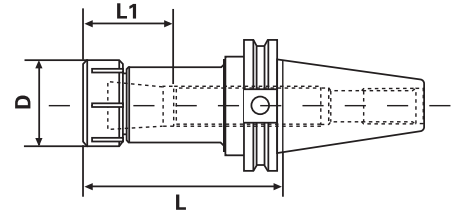
COLLET CHUCKS

BT Taper TG Collet Chucks

- 100% Forged Construction
- Certified balanced up to 15 - 20,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard
- Shank traverse ground to obtain optimum accuracy
- Meets or exceeds ANSI specifications
- .0002" or better ensures the best possible cutting tool life
- Threaded through holes for a back-up screw (tool stop) or coolant through when removed
- TIR, 0.0008"
- Wrench not included



Complete with certificate



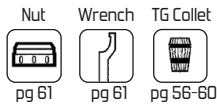
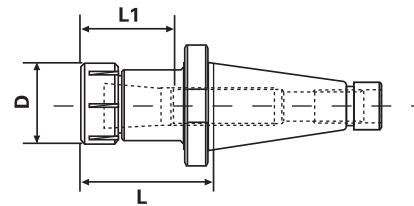
Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
BT30								
BT30	75TG	3/64-3/4"	2.50"	1.61"	1.89"	81.3	532-128*	113.40
BT30	100TG	3/64-1"	3.94"	2.24"	2.50"	81.3	532-130	113.40
BT40								
BT40	75TG	3/64-3/4"	3.00"	1.61"	1.89"	81.3	532-132	196.90
BT40	100TG	3/64-1"	3.50"	2.13"	2.50"	81.3	532-134	157.50
BT40	100TG	3/64-1"	5.50"	2.13"	2.50"	81.3	532-136	157.50

* Non-Coolant thru the flange



Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
BT50								
BT50	100TG	3/64-1"	4.00"	2.13"	2.50"	81.3	532-139	154.10
BT50	100TG	3/64-1"	6.00"	2.13"	2.50"	81.3	532-140	203.30

NMTB Taper TG Collet Chucks

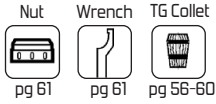
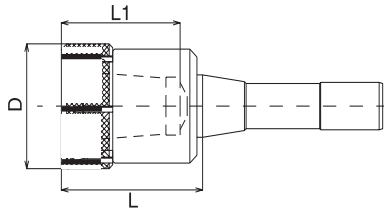


Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
NMTB40	100TG	3/64-1"	3.00"	2.12"	2.50"	81.3	534-304	100.40
NMTB40	150TG	1/2-1-1/2"	5.00"	2.87"	3.50"	94.9	534-306 •	90.20
NMTB50	75TG	3/64-3/4"	3.00"	1.61"	1.89"	81.3	534-308 •	121.50
NMTB50	100TG	3/64-1"	3.50"	2.12"	2.50"	81.3	534-310	160.50
NMTB50	150TG	1/2-1-1/2"	5.00"	2.87"	3.50"	94.9	534-312 •	177.10

• Available only while quantities last

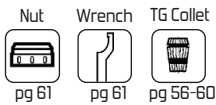
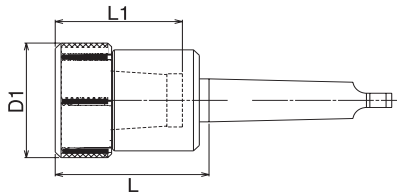


R8 Taper TG Collet Chuck



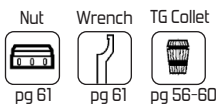
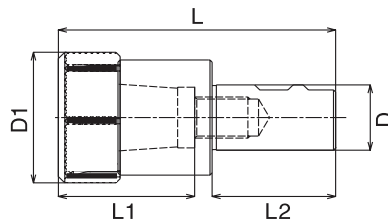
Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
R8	100TG	3/64-1"	3.25"	2.17"	2.50"	81.3	534-314	109.00

Morse Taper TG Collet Chucks



Taper	Collet Series	Collet Range	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
MT3	100TG	3/64-1"	3.25"	2.73"	2.50"	81.3	534-322	172.70
MT4	100TG	3/64-1"	3.25"	2.73"	2.50"	81.3	534-324	181.70

Straight Shank TG Collet Chucks



Shank Dia.	Collet Series	Collet Range	L	L1	L2	D1	Tightening Torque (Nm)	Code No.	Price \$
1-1/4"	100TG	3/64-1"	5.33"	2.73"	2.28"	2.50"	81.3	534-318	105.60
1-1/2"	100TG	3/64-1"	9.00"	2.73"	6.00"	2.50"	81.3	534-320	129.30

• Available only while quantities last



COLLET CHUCKS

TG 75 Standard & Sealed Collets

- 1/64" collapse per collet
- 0.0005" in T.I.R. precision per DIN 6341
- 80 ft/lbs maximum tightening torque

Sealed Collets

- Sealed for coolant-through applications
- Pressure resistance tested to 1000 psi
- Sealed with rubber



Regular



Sealed

Size (in.)	Regular		Sealed	
	Code No.	Price \$	Code No.	Price \$
3/64	334-790	22.50	-	
1/16	334-791	22.50	-	
5/64	334-792	22.50	-	
3/32	334-800	22.50	-	
7/64	334-801	22.50	-	
1/8	334-802	22.50	334-843	43.80
9/64	334-803	22.50	334-844	43.80
5/32	334-804	22.50	334-845	43.80
11/64	334-805	22.50	334-846	43.80
3/16	334-806	22.50	334-847	43.80
13/64	334-807	22.50	334-848	43.80
7/32	334-808	22.50	334-849	43.80
15/64	334-809	22.50	334-850	43.80
1/4	334-810	22.50	334-851	43.80
17/64	334-811	22.50	334-852	43.80
9/32	334-812	22.50	334-853	43.80
19/64	334-813	22.50	334-854	43.80
5/16	334-814	22.50	334-855	43.80
21/64	334-815	22.50	334-856	43.80
11/32	334-816	22.50	334-857	43.80
23/64	334-817	22.50	334-858	43.80
3/8	334-818	22.50	334-859	43.80
25/64	334-819	22.50	334-860	43.80
13/32	334-820	22.50	334-861	43.80
27/64	334-821	22.50	334-862	43.80
7/16	334-822	22.50	334-863	43.80
29/64	334-823	22.50	334-864	43.80
15/32	334-824	22.50	334-865	43.80
31/64	334-825	22.50	334-866	43.80
1/2	334-826	22.50	334-867	43.80
33/64	334-827	22.50	334-868	43.80
17/32	334-828	22.50	334-869	43.80
35/64	334-829	22.50	334-870	43.80
9/16	334-830	22.50	334-871	43.80
37/64	334-831	22.50	334-872	43.80
19/32	334-832	22.50	334-873	43.80
39/64	334-833	22.50	334-874	43.80
5/8	334-834	22.50	334-875	43.80
41/64	334-835	22.50	334-876	43.80
21/32	334-836	22.50	334-877	43.80
43/64	334-837	22.50	334-878	43.80
11/16	334-838	22.50	334-879	43.80
45/64	334-839	22.50	334-880	43.80
23/32	334-840	22.50	334-881	43.80
47/64	334-841	22.50	334-882	43.80
3/4	334-842	22.50	334-883	43.80



TG 75 Tapping Collets

- For synchronous, rigid tapping operations using TG collet chuck
- Collet bore is exact tool diameter with square drive for accuracy and rigidity



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	334-884	24.30
8	M4	.168"	.131"	334-885	24.30
10	M4.5, M5	.194"	.152"	334-886	24.30
12		.220"	.165"	334-887	24.30
1/4	M6, M6.3	.255"	.191"	334-888	24.30
5/16	M7, M8	.318"	.238"	334-889	24.30
3/8	M10	.381"	.286"	334-890	24.30
7/16		.323"	.242"	334-891	24.30
1/2	M12, M12.5	.367"	.275"	334-892	24.30
9/16	M14	.429"	.322"	334-893	24.30
5/8	M16	.480"	.360"	334-894	24.30
11/16	M18	.542"	.406"	334-895	24.30
3/4		.590"	.442"	334-896	24.30
NPT					
1/16, 1/8 NPT-SS (small shank)		.3125"	.234"	334-897	24.30
1/8 NPT-LS (large shank)		.4375"	.328"	334-898	24.30
1/4 NPT		.5625"	.421"	334-899	24.30

Standard TG 75 Collet Sets



No. of Pieces	Range (in.)	Increment (in.)	Code No.	Price \$
43	3/32-3/4	1/64	334-900	928.80
41	1/8-3/4	1/64	334-901	885.60
33	1/4-3/4	1/64	334-902	712.80
25	3/8-3/4	1/64	334-903	540.00
22	3/32-3/4	1/32	334-904	475.20
13	3/8-3/4	1/32	334-905	280.80
11	1/8-3/4	1/16	334-906	237.60



COLLETS

TG 100 Standard & Sealed Collets

- 1/64" collapse per collet
- 0.0005" in T.I.R. precision per DIN 6341
- 90 ft/lbs maximum tightening torque

Sealed Collets

- Sealed for coolant-through applications
- Pressure resistance tested to 1000 psi
- Sealed with rubber



Regular



Sealed

Size (in.)	Regular Code No.	Price \$	Sealed Code No.	Price \$
3/64	334-418	23.40	-	
5/64	334-423	23.40	-	
3/32	334-425N	23.40	-	
7/64	334-426	23.40	-	
1/8	334-427N	23.40	-	
9/64	334-428	23.40	-	
5/32	334-429N	23.40	334-907	48.60
11/64	334-430	23.40	334-908	48.60
3/16	334-431N	23.40	334-909	48.60
13/64	334-432	23.40	334-910	48.60
7/32	334-433N	23.40	334-911	48.60
15/64	334-434	23.40	334-912	48.60
1/4	334-435N	23.40	334-913	48.60
17/64	334-436	23.40	334-914	48.60
9/32	334-437N	23.40	334-915	48.60
19/64	334-438	23.40	334-916	48.60
5/16	334-439N	23.40	334-917	48.60
21/64	334-440	23.40	334-918	48.60
11/32	334-441N	23.40	334-919	48.60
23/64	334-442	23.40	334-920	48.60
3/8	334-443N	23.40	334-921	48.60
25/64	334-444	23.40	334-922	48.60
13/32	334-445N	23.40	334-923	48.60
27/64	334-446	23.40	334-924	48.60
7/16	334-447N	23.40	334-925	48.60
29/64	334-448	23.40	334-926	48.60
15/32	334-449N	23.40	334-927	48.60
31/64	334-450	23.40	334-928	48.60
1/2	334-451N	23.40	334-929	48.60
33/64	334-452	23.40	334-930	48.60
17/32	334-453N	23.40	334-931	48.60
35/64	334-454	23.40	334-932	48.60
9/16	334-455N	23.40	334-933	48.60
37/64	334-456	23.40	334-934	48.60
19/32	334-457N	23.40	334-935	48.60
39/64	334-458	23.40	334-936	48.60
5/8	334-459N	23.40	334-937	48.60
41/64	334-460	23.40	334-938	48.60
21/32	334-461N	23.40	334-939	48.60
43/64	334-462	23.40	334-940	48.60
11/16	334-463N	23.40	334-941	48.60
45/64	334-464	23.40	334-942	48.60
23/32	334-465N	23.40	334-943	48.60
47/64	334-466	23.40	334-944	48.60
3/4	334-467N	23.40	334-945	48.60
49/64	334-468	23.40	334-946	48.60
25/32	334-469N	23.40	334-947	48.60
51/64	334-470	23.40	334-948	48.60
13/16	334-471N	23.40	334-949	48.60
53/64	334-472	23.40	334-950	48.60
27/32	334-473N	23.40	334-951	48.60
55/64	334-474	23.40	334-952	48.60
7/8	334-475N	23.40	334-953	48.60
57/64	334-476	23.40	334-954	48.60
29/32	334-477N	23.40	334-955	48.60
59/64	334-478	23.40	334-956	48.60
15/16	334-479N	23.40	334-957	48.60
61/64	334-480	23.40	334-958	48.60
31/32	334-481N	23.40	334-959	48.60
63/64	334-482	23.40	334-960	48.60
1	334-483N	23.40	334-961	48.60



TG 100 Tapping Collets

- For synchronous, rigid tapping operations using TG collet chuck
- Collet bore is exact tool diameter with square drive for accuracy and rigidity



ANSI Tap Inch	ANSI Tap Metric	Shank Dia.	Size of Square	Code No.	Price \$
0-6	M1.6-M3.5	.141"	.110"	334-963	25.80
8	M4	.168"	.131"	334-964	25.80
10	M4.5, M5	.194"	.152"	334-965	25.80
12		.220"	.165"	334-966	25.80
1/4	M6, M6.3	.255"	.191"	334-967	25.80
5/16	M7, M8	.318"	.238"	334-968	25.80
3/8	M10	.381"	.286"	334-969	25.80
7/16		.323"	.242"	334-970	25.80
1/2	M12, M12.5	.367"	.275"	334-971	25.80
9/16	M14	.429"	.322"	334-972	25.80
5/8	M16	.480"	.360"	334-973	25.80
11/16	M18	.542"	.406"	334-974	25.80
3/4		.590"	.442"	334-975	25.80
13/16	M20	.652"	.489"	334-976	25.80
7/8	M22	.697"	.523"	334-977	25.80
15/16	M24	.760"	.570"	334-978	25.80
1	M25	.800"	.600"	334-979	25.80
NPT					
1/16, 1/8 NPT-SS (small shank)		.3125"	.234"	334-980	25.80
1/8 NPT-LS (large shank)		.4375"	.328"	334-981	25.80
1/4 NPT		.5625"	.421"	334-982	25.80
3/8 NPT		.7000"	.531"	334-983	25.80
1/2 NPT		.8875"	.515"	334-984	25.80

Standard TG 100 Collet Sets



No. of Pieces	Range (in.)	Increment (in.)	Code No.	Price \$
59	3/32-1	1/64	334-575	1,327.50
41	3/8-1	1/64	334-570	922.50
30	3/32-1	1/32	334-565	675.00
21	3/8-1	1/32	334-560	472.50
15	1/8-1	1/16	334-561	340.00



COLLETS

TG 150 Standard Collets

- Unique 8° taper design affords highest gripping power
- True double angle, for extreme concentricity
- 16 jaws giving powerful gripping and parallel clamping
- A unique self releasing system is built into the collet and clamping nut to eliminate cutting tools sticking in collets
- 1/64" collapse per collet
- 0.0005" in TIR precision per DIN 6341



Collet Chucks

Size (in.)	Code No.	Price \$
33/64	334-486	34.20
17/32	334-487N	34.20
35/64	334-488	34.20
9/16	334-489N	34.20
37/64	334-490	34.20
19/32	334-491N	34.20
39/64	334-492	34.20
5/8	334-493N	34.20
41/64	334-494	34.20
21/32	334-495N	34.20
43/64	334-496	34.20
11/16	334-497N	34.20
45/64	334-498	34.20
23/32	334-499N	34.20
47/64	334-500	34.20
3/4	334-501N	34.20
49/64	334-502	34.20
25/32	334-503N	34.20
51/64	334-504	34.20
13/16	334-505N	34.20
53/64	334-506	34.20
27/32	334-507N	34.20
55/64	334-508	34.20
7/8	334-509N	34.20
57/64	334-510	34.20
29/32	334-511N	34.20
59/64	334-512	34.20
15/16	334-513N	34.20
61/64	334-514	34.20
31/32	334-515N	34.20
63/64	334-516	34.20
1	334-517N	34.20
1-1/64	334-518	34.20
1-1/32	334-519N	34.20
1-3/64	334-520	34.20
1-1/16	334-521N	34.20
1-5/64	334-522	34.20
1-3/32	334-523N	34.20
1-7/64	334-524	34.20
1-1/8	334-525N	34.20
1-9/64	334-526	34.20
1-5/32	334-527N	34.20
1-11/64	334-528	34.20
1-3/16	334-529N	34.20
1-13/64	334-530	34.20
1-7/32	334-531N	34.20
1-15/64	334-532	34.20
1-1/4	334-533N	34.20
1-17/64	334-534	34.20
1-9/32	334-535N	34.20
1-19/64	334-536	34.20
1-5/16	334-537N	34.20
1-21/64	334-538	34.20
1-11/32	334-539N	34.20
1-23/64	334-540	34.20
1-3/8	334-541N	34.20
1-25/64	334-542	34.20
1-13/32	334-543N	34.20
1-27/64	334-544	34.20
1-7/16	334-545N	34.20
1-29/64	334-546	34.20
1-15/32	334-547N	34.20
1-31/64	334-548	34.20
1-1/2	334-549N	34.20



Standard TG 150 Collet Sets



No. of Pieces	Range (in.)	Increment (in.)	Code No.	Price \$
17	1/2-1-1/2	1/16	334-580	581.40
33	1/2-1-1/2	1/32	334-585	1,128.60

Replacement TG Chuck Nuts



Description	Tightening Torque (Nm)	Code No.	Price \$
*75TG Nut	81.3	534-760	40.50
*100TG Nut	81.3	534-762	40.50
*150TG Nut	94.9	534-764	67.80
75TG Nut, Solid	81.3	534-830	64.00
100TG Nut, Solid	81.3	534-832	66.90

* Photo Shown / This style is supplied with chuck

TG Chuck Wrenches



Description	Code No.	Price \$
Fits 75TG Chuck	534-772	33.00
Fits 100TG Chuck	534-774	35.40
Fits 150TG Chuck	534-776	44.30

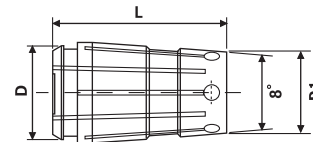
Replacement TG Backup Screws



Description	Code No.	Price \$
75TG	534-778	7.30
75TG Coolant	534-780 •	7.90
100TG	534-782	7.30
100TG Coolant	534-784 •	7.90
150TG	534-786	8.30
150TG Coolant	534-788	9.50

• Available only while quantities last

TG Collet Dimensional Data



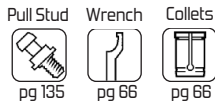
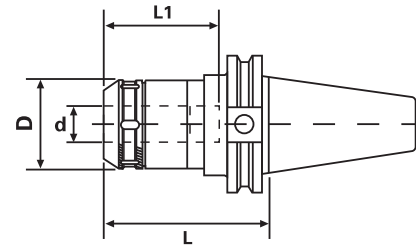
Style	D	D1	L	Collet Range
25TG	0.425"	0.325"	0.709"	3/64-1/4"
50TG	0.760"	0.594"	1.437"	1/8-1/2"
75TG	1.063"	0.871"	1.844"	3/64-3/4"
100TG	1.278"	1.121"	2.386"	3/64-1"
150TG	1.875"	1.678"	3.000"	1/2-1-1/2"



COLLET CHUCKS

CAT40 Milling Chucks

- DIN coolant thru the flange at no extra charge
- Rough milling or 'hogging' operations
- Improved tool life over regular end mill holders
- 360° gripping contact
- Extreme rigidity over taper collets
- 0.0002" TIR for maximum tool life and accuracy

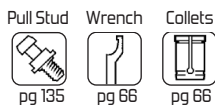
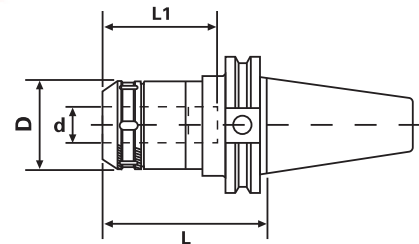


Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT40	GS 3/4"	.125-.750"	.750"	3.54"	3.15"	2.05"	50-70	531-253	315.90
CT40	GS 3/4"	.125-.750"	.750"	4.14"	3.15"	2.05"	50-70	531-250	315.90
CT40	GS 3/4"	.125-.750"	.750"	4.73"	3.15"	2.05"	50-70	531-252	261.90
CT40	GS 1"	.125-1.00"	1.00"	3.54"	3.15"	2.41"	50-70	531-255*	315.90
CT40	GS 1"	.125-1.00"	1.00"	4.14"	3.15"	2.41"	50-70	531-254	315.90
CT40	GS 1-1/4"	.187-1.25"	1.25"	3.54"	3.34"	2.88"	60-80	531-257*	315.90
CT40	GS 1-1/4"	.187-1.25"	1.25"	4.14"	3.34"	2.88"	60-80	531-256	315.90
CT40	GS 1-1/4"	.187-1.25"	1.25"	5.32"	4.73"	2.88"	60-80	531-258	385.00

* Non-Coolant thru the flange
• Available only while quantities last

CAT50 Milling Chucks

- DIN coolant thru the flange at no extra charge
- Rough milling or 'hogging' operations
- Improved tool life over regular end mill holders
- 360° gripping contact
- Extreme rigidity over taper collets
- 0.0002" TIR for maximum tool life and accuracy



Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT50	GS 3/4"	.125-.750"	.750"	4.14"	3.15"	2.05"	50-70	531-260	394.70
CT50	GS 3/4"	.125-.750"	.750"	5.32"	3.15"	2.05"	50-70	531-262	452.00
CT50	GS 3/4"	.125-.750"	.750"	6.49"	3.15"	2.05"	50-70	531-263	497.00
CT50	GS 1"	.125-1.00"	1.00"	4.14"	3.15"	2.41"	50-70	531-264	452.00
CT50	GS 1-1/4"	.187-1.25"	1.25"	3.54"	4.73"	2.88"	60-80	531-265	499.00
CT50	GS 1-1/4"	.187-1.25"	1.25"	4.14"	4.73"	2.88"	60-80	531-266	457.00
CT50	GS 1-1/4"	.187-1.25"	1.25"	5.32"	4.73"	2.88"	60-80	531-268	457.00
CT50	GS 1-1/4"	.187-1.25"	1.25"	6.49"	4.73"	2.88"	60-80	531-269	507.80



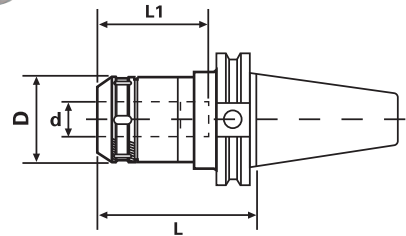
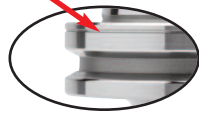
CAT40 DUAL CONTACT Milling Chucks

FOR DUAL CONTACT SPINDLES

- Improves rigidity and reduces vibration allowing for increased feed rates and increased tool life.
- DIN coolant thru the flange at no extra charge
- Rough milling or 'hogging' operations
- Improved tool life over regular end mill holders
- 360° gripping contact
- Extreme rigidity over taper collets
- 0.0002" TIR for maximum tool life and accuracy



Eliminates the gap between the flange and the spindle for increased rigidity



- Pull Stud
pg 135
- Wrench
pg 66
- Collets
pg 66

Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT40	GS 3/4"	.125-.750"	.750"	3.54"	3.15"	2.05"	50-70	521-253	379.10
CT40	GS 1"	.125-1.00"	1.00"	3.54"	3.15"	2.41"	50-70	521-255*	379.10
CT40	GS 1-1/4"	.187-1.25"	1.25"	3.54"	3.34"	2.88"	60-80	521-257*	379.10

* Non-Coolant thru the flange

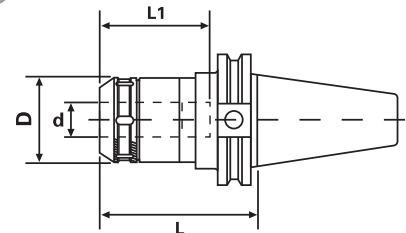
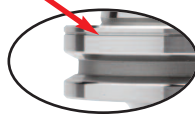
CAT50 DUAL CONTACT Milling Chucks

FOR DUAL CONTACT SPINDLES

- Improves rigidity and reduces vibration allowing for increased feed rates and increased tool life.
- DIN coolant thru the flange at no extra charge
- Rough milling or 'hogging' operations
- Improved tool life over regular end mill holders
- 360° gripping contact
- Extreme rigidity over taper collets
- 0.0002" TIR for maximum tool life and accuracy



Eliminates the gap between the flange and the spindle for increased rigidity



- Pull Stud
pg 135
- Wrench
pg 66
- Collets
pg 66

Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
CT50	GS 3/4"	.125-.750"	.750"	4.14"	3.15"	2.05"	50-70	521-260*	458.10
CT50	GS 1"	.125-1.00"	1.00"	4.14"	3.15"	2.41"	50-70	521-264*	458.10
CT50	GS 1-1/4"	.187-1.25"	1.25"	4.14"	4.73"	2.88"	60-80	521-266	548.40

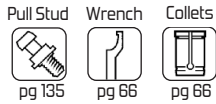
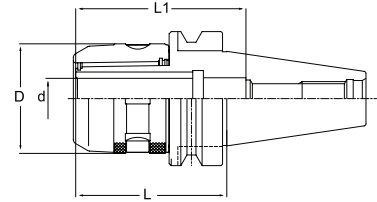
* Available only while quantities last



COLLET CHUCKS

BT30 Milling Chucks

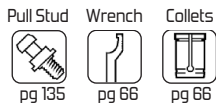
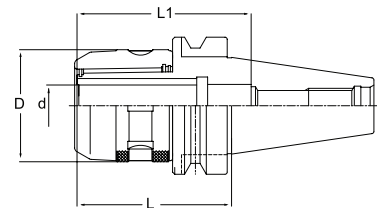
- Rough milling or 'hogging' operations
- Improved tool life over regular end mill holders
- 360° gripping contact
- Extreme rigidity over taper collets
- 0.0002" TIR for maximum tool life and accuracy



Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
BT30	GS 3/4"	.125-.750"	.750"	3.55"	3.15"	2.05"	50-70	532-096	248.70

BT40 Milling Chucks

- DIN coolant thru the flange at no extra charge
- Rough milling or 'hogging' operations
- Improved tool life over regular end mill holders
- 360° gripping contact
- Extreme rigidity over taper collets
- 0.0002" TIR for maximum tool life and accuracy



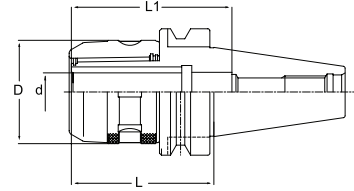
Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
BT40	GS 3/4"	.125-.750"	.750"	4.14"	3.15"	2.05"	50-70	532-098	347.50
BT40	GS 3/4"	.125-.750"	.750"	4.73"	3.15"	2.05"	50-70	532-100	288.10
BT40	GS 1"	.125-1.00"	1.00"	4.14"	3.15"	2.41"	50-70	532-102	347.50
BT40	GS 1-1/4"	.187-1.25"	1.25"	4.14"	3.34"	2.88"	60-80	532-104	347.50

• Available only while quantities last



BT50 Milling Chucks

- DIN coolant thru the flange at no extra charge
- Rough milling or 'hogging' operations
- Improved tool life over regular end mill holders
- 360° gripping contact
- Extreme rigidity over taper collets
- 0.0002" TIR for maximum tool life and accuracy



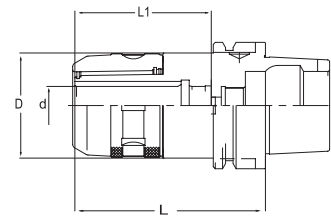
- Pull Stud
pg 135
- Wrench
pg 66
- Collets
pg 66

Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
BT50	GS 3/4"	.125-.750"	.750"	3.60"	3.15"	2.05"	50-70	532-109	310.60
BT50	GS 1-1/4"	.187-1.25"	1.25"	4.20"	3.34"	2.88"	60-80	532-113	315.80

HSK Milling Chucks

HSK Advantages:

- High rigidity and torque transmission (almost double the rigidity of V-flange holders)
- Extreme concentricity enhances tool life performance
- Coolant thru capabilities



- Wrench
pg 66
- Collets
pg 66

Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
HSK63A									
HSK63A	GS3/4	0.125-0.750"	0.750"	3.740"	2.480"	2.047"	50-70	536-154	454.50
HSK63A	GS1	0.125-1.000"	1.000"	5.118"	3.150"	2.362"	50-70	536-160	454.50
HSK63A	GS1-1/4	0.187-1.250"	1.250"	4.331"	3.268"	2.717"	60-80	536-162	596.70
HSK63A	GS1-1/4	0.187-1.250"	1.250"	5.118"	3.189"	2.717"	60-80	536-164	596.70
HSK63A	GS32	3mm - 32mm	32mm	5.118"	4.055"	2.717"	80-100	536-166 •	679.60
HSK100A									
HSK100A	GS3/4	0.125-0.750"	0.750"	5.315"	3.150"	2.047"	50-70	536-170 •	842.60
HSK100A	GS32	3mm - 32mm	32mm	5.315"	4.055"	2.717"	80-100	536-180	615.60
HSK100A	GS2	1.000-2.000"	2.000"	4.921"	3.543"	4.134"	150-170	536-182	1,103.10

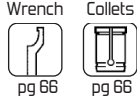
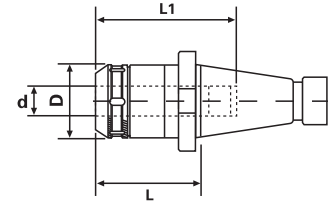
• Available only while quantities last



COLLET CHUCKS

NMTB Taper Milling Chucks

- Shank traverse ground to obtain optimum accuracy
- Meets or exceeds ANSI specifications
- .0002" or better TIR ensures the best possible cutting tool life



Taper	Collet Series	Collet Range	d	L	L1	D	Tightening Torque (Nm)	Code No.	Price \$
NMTB50	GS 1-1/4"	.187-1.25"	1.25"	3.35"	4.72"	2.88"	60-80	534-206	311.30

• Available only while quantities last

GS Milling Collets



I.D.	GS 3/4"		GS 1"		GS 1-1/4"	
	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
Inch						
1/8"	534-650	35.10	534-682	27.20		
3/16"	331-469N	35.10	534-684	27.20	331-481N	31.70
1/4"	331-470N	24.40	534-686	27.20	331-482N	31.70
5/16"	331-472N	24.40	534-688	35.10	331-484N	31.70
3/8"	331-474N	24.40	534-690	27.20	331-486N	31.70
7/16"	534-660	24.40	534-692	27.20	534-726	31.70
1/2"	331-476N	24.40	534-694	27.20	331-488N	31.70
9/16"	331-477N	24.40	-	-	331-489N	31.70
5/8"	331-478N	24.40	534-696	27.20	331-490N	31.70
3/4"	-	-	534-698	27.20	331-492N	31.70
7/8"	-	-	534-700	27.20	331-494N	31.70
1"	-	-	-	-	331-496N	35.10
Metric						
6mm	534-668	24.40	534-702	27.20	534-740	31.70
7mm	534-670	24.40	-	-	--	--
8mm	534-672	24.40	534-704	27.20	534-742	31.70
10mm	534-674	24.40	534-706	27.20	534-744	31.70
12mm	534-676	24.40	534-708	27.20	534-746	31.70
14mm	534-678	24.40	534-710	27.20	534-748	31.70
16mm	534-680	24.40	534-712	27.20	534-750	31.70
18mm	-	-	534-714	27.20	-	-
20mm	-	-	534-716	27.20	534-752	31.70
25mm	-	-	-	-	534-754	35.10

Milling Chuck Wrenches



Chuck Cap.	Code No.	Price \$
3/4"	534-208	37.80
1"	534-210	37.80
1-1/4"	534-212	37.80

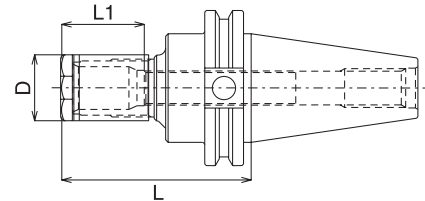


CAT40 DA Collet Chucks

- 100% Forged Construction
- Certified balanced 20,000 rpm
- DIN coolant thru the flange
- TIR 0.0010"
- All Ground Body



Complete with certificate



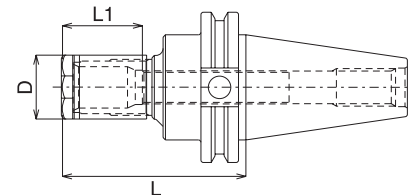
Taper	Collet Series	Collet Range	L	L1	D	Code No.	Price \$
CT40	DA100	3/64-9/16"	3.50"	1.15"	1.06"	531-270	143.80
CT40	DA100	3/64-9/16"	6.00"	1.15"	1.06"	531-272	154.70
CT40	DA180	3/64-3/4"	4.00"	1.50"	1.44"	531-273	143.80
CT40	DA180	3/64-3/4"	6.00"	1.50"	1.44"	531-274	154.70
CT40	DA200	3/64-3/8"	3.00"	1.03"	0.86"	531-275	143.80
CT40	DA300	3/64-1/4"	3.00"	0.84"	0.55"	531-276	138.30

CAT50 DA Collet Chucks

- 100% Forged Construction
- Certified balanced 15,000 rpm
- DIN coolant thru the flange
- TIR 0.0010"
- All Ground Body



Complete with certificate



Taper	Collet Series	Collet Range	L	L1	D	Code No.	Price \$
CT50	DA180	3/64-3/4"	4.00"	1.50"	1.44"	531-278	202.00
CT50	DA180	3/64-3/4"	6.00"	1.50"	1.44"	531-280	202.00

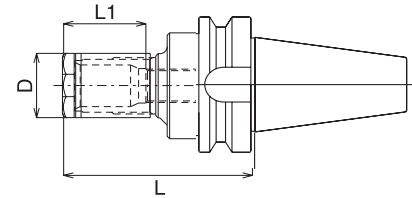
Collet Chucks



COLLET CHUCKS

BT30 DA Collet Chucks

- 100% Forged Construction
- Certified balanced 20,000 rpm
- DIN coolant thru the flange
- TIR 0.0010"
- All Ground Body



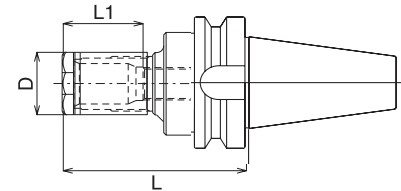
Complete with certificate



Taper	Collet Series	Collet Range	L	L1	D	Code No.	Price \$
BT30	DA100	3/64-9/16"	3.00"	1.15"	1.06"	532-108	136.80
BT30	DA180	3/64-3/4"	3.00"	1.51"	1.44"	532-110	136.80
BT30	DA200	3/64-3/8"	3.00"	1.03"	0.86"	532-112	136.80
BT30	DA300	3/64-1/4"	3.00"	1.04"	0.55"	532-125	138.30

BT40 DA Collet Chucks

- 100% Forged Construction
- Certified balanced 20,000 rpm
- DIN coolant thru the flange
- TIR 0.0010"
- All Ground Body



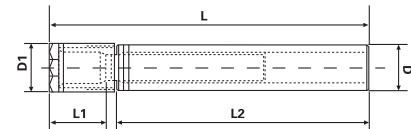
Complete with certificate



Taper	Collet Series	Collet Range	L	L1	D	Code No.	Price \$
BT40	DA100	3/64-9/16"	6.00"	1.15"	1.06"	532-118	170.20
BT40	DA180	3/64-3/4"	4.00"	1.51"	1.44"	532-120	158.20
BT40	DA180	3/64-3/4"	6.00"	1.51"	1.44"	532-122	170.20
BT40	DA200	3/64-3/8"	3.00"	1.03"	0.86"	532-124	158.20

• Available only while quantities last

DA Collet Chuck Extensions



Collet Series	Collet Range	Shank Dia. (D)	O.A.L. L	L1	L2	D1	Code No.	Price \$
DA100	3/64-9/16"	1"	5.00"	1.66"	3.00"	1.06"	534-220	142.40
DA100	3/64-9/16"	1"	7.50"	1.66"	5.50"	1.06"	534-222	156.40
DA180	3/64-3/4"	1-1/4"	5.00"	1.83"	3.00"	1.44"	534-224	140.30
DA180	3/64-3/4"	1-1/4"	7.50"	1.83"	5.50"	1.44"	534-226	156.40
DA200	3/64-3/8"	3/4"	4.50"	1.34"	3.00"	0.86"	534-228	143.70
DA200	3/64-3/8"	3/4"	7.00"	1.34"	5.50"	0.86"	534-230	156.40

• Available only while quantities last



DA 100 Collets

- Collapse - 1/32"
- .001" TIR collet accuracy
- Made from 4140 alloy steel for improved strength, hardness, wear resistance, and corrosion resistance
- For most drilling, reaming and tapping applications.



Fractional Inch	Decimal (in.)	Code No.	Price \$
3/64	.047	331-323	12.20
1/16	.062	331-325	12.20
5/64	.078	331-327	12.20
3/32	.094	331-329	12.20
7/64	.109	331-333	12.20
1/8	.125	331-335	12.20
9/64	.141	331-337	12.20
5/32	.156	331-339	12.20
11/64	.172	331-341	12.20
3/16	.188	331-343	12.20
13/64	.203	331-345	12.20
7/32	.219	331-347	12.20
15/64	.234	331-349	12.20
1/4	.250	331-351	12.20
17/64	.266	331-353	12.20
9/32	.281	331-355	12.20
19/64	.297	331-357	12.20
5/16	.312	331-359	12.20
21/64	.328	331-503	12.20
11/32	.344	331-505	12.20
23/64	.359	331-507	12.20
3/8	.375	331-322	12.20
25/64	.391	331-509	12.20
13/32	.406	331-324	12.20
27/64	.422	331-511	12.20
7/16	.438	331-326	12.20
29/64	.453	331-513	12.20
15/32	.469	331-328	12.20
31/64	.484	331-515	12.20
1/2	.500	331-330	12.20
33/64	.516	331-517	12.20
17/32	.531	331-332	12.20
35/64	.547	331-519	12.20
9/16	.562	331-521	12.20

DA 100 Collets Sets

Collet	Pieces	Range	Code No.	Price \$
DA100	8pc	1/8-9/16 x 16ths	331-356	91.80
DA100	11pc	1/4-9/16 x 32nds	331-358	126.30
DA100	15pc	1/8-9/16 x 32nds	331-362	169.20
DA100	17pc	1/16-9/16 x 32nds	331-384	191.80
DA100	21pc	1/4-9/16 x 64ths	331-385	236.70
DA100	29pc	1/8-9/16 x 64ths	331-386	326.70
DA100	33pc	1/16-9/16 x 64ths	331-387	379.80



COLLETS

DA 180 Collets



- Collapse - 1/32"
- .001" TIR collet accuracy
- Made from 4140 alloy steel for improved strength, hardness, wear resistance, and corrosion resistance
- For most drilling, reaming and tapping applications.

Collet Chucks

Fractional Inch	Decimal (in.)	Code No.	Price \$
3/64	.046	331-523	15.30
1/16	.062	331-525	15.30
5/64	.078	331-527	15.30
3/32	.094	331-529	15.30
7/64	.109	331-533	15.30
1/8	.125	331-535	15.30
9/64	.141	331-537	15.30
5/32	.156	331-539	15.30
11/64	.172	331-541	15.30
3/16	.188	331-543	15.30
13/64	.203	331-545	15.30
7/32	.219	331-547	15.30
15/64	.234	331-549	15.30
1/4	.250	331-551	15.30
17/64	.266	331-553	15.30
9/32	.281	331-555	15.30
19/64	.297	331-557	15.30
5/16	.312	331-559	15.30
21/64	.328	331-561	15.30
11/32	.344	331-563	15.30
23/64	.359	331-565	15.30
3/8	.375	331-567	15.30
25/64	.391	331-569	15.30
13/32	.406	331-571	15.30
27/64	.422	331-573	15.30
7/16	.438	331-575	15.30
29/64	.453	331-577	15.30
15/32	.469	331-579	15.30
31/64	.484	331-581	15.30
1/2	.500	331-583	15.30
33/64	.516	331-585	15.30
17/32	.531	331-587	15.30
35/64	.547	331-589	15.30
9/16	.562	331-334	15.30
37/64	.578	331-595	15.30
19/32	.594	331-336	15.30
39/64	.609	331-597	15.30
5/8	.625	331-338	15.30
41/64	.641	331-601	15.30
21/32	.656	331-340	15.30
43/64	.672	331-603	15.30
11/16	.688	331-342	15.30
45/64	.703	331-605	15.30
23/32	.719	331-344	15.30
47/64	.734	331-607	15.30
3/4	.750	331-346	15.30

DA 180 Collets Sets

Collet	Pieces	Range	Code No.	Price \$
DA180	9pc	1/4-3/4 x 16ths	331-388	128.70
DA180	17pc	1/4-3/4 x 32nds	331-389	243.00
DA180	21pc	1/8-3/4 x 32nds	331-390	299.70
DA180	33pc	1/4-3/4 x 64ths	331-391	470.70
DA180	41pc	1/8-3/4 x 64ths	331-392	584.10



DA 200 Collets

- Collapse - 1/32"
- .001" TIR collet accuracy
- Made from 4140 alloy steel for improved strength, hardness, wear resistance, and corrosion resistance
- For most drilling, reaming and tapping applications.



Fractional Inch	Decimal (in.)	Code No.	Price \$
3/64	.047	331-297	12.20
1/16	.062	331-299	12.20
5/64	.078	331-301	12.20
3/32	.094	331-303	12.20
7/64	.109	331-305	12.20
1/8	.125	331-307	12.20
9/64	.141	331-309	12.20
5/32	.156	331-311	12.20
11/64	.172	331-313	12.20
3/16	.188	331-315	12.20
13/64	.203	331-302	12.20
7/32	.219	331-304	12.20
15/64	.234	331-306	12.20
1/4	.250	331-308	12.20
17/64	.266	331-310	12.20
9/32	.281	331-312	12.20
19/64	.297	331-314	12.20
5/16	.312	331-316	12.20
21/64	.328	331-318	12.20
11/32	.344	331-320	12.20
23/64	.359	331-317	12.20
3/8	.375	331-319	12.20
25/64	.391	331-321	12.20

DA 200 Collets Set

Collet	Pieces	Range	Code No.	Price \$
DA200	9pc	1/8-3/8 x 32nds	331-393	128.70
DA200	11pc	1/16-3/8 x 32nds	331-394	127.00
DA200	17pc	1/8-3/8 x 64ths	331-395	196.20
DA200	21pc	1/16-3/8 x 64ths	331-396	242.10



COLLETS

DA 300 Collets

- Collapse - 1/32"
- .001" TIR collet accuracy
- Made from 4140 alloy steel for improved strength, hardness, wear resistance, and corrosion resistance
- For most drilling, reaming and tapping applications.



Collet Chucks

Fractional Inch	Decimal (in.)	Code No.	Price \$
3/64	.047	331-277	12.20
1/16	.062	331-283	12.20
5/64	.078	331-285	12.20
3/32	.094	331-287	12.20
7/64	.109	331-290	12.20
1/8	.125	331-292	12.20
9/64	.141	331-294	12.20
5/32	.156	331-296	12.20
11/64	.172	331-298	12.20
3/16	.188	331-300	12.20
13/64	.203	331-289	12.20
7/32	.219	331-291	12.20
15/64	.234	331-293	12.20
1/4	.250	331-295	12.20

DA 300 Collets Sets

Collet	Pieces	Range	Code No.	Price \$
DA300	7pc	1/16-1/4 x 32nds	331-397	80.60
DA300	9pc	1/8-1/4 x 64ths	331-398	109.80
DA300	13pc	1/16-1/4 x 64ths	331-399	149.60
DA300	14pc	3/64-1/4 x 64ths	331-400	161.10



Replacement DA Chuck Nuts



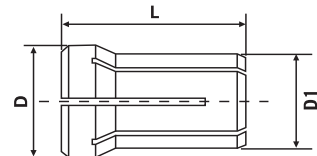
Description	Code No.	Price \$
DA100 Nut, Complete Replacement	534-264	59.90
DA180 Nut, Complete Replacement	534-270	62.10
DA200 Nut, Complete Replacement	534-276	59.60
DA300 Nut, Complete Replacement	534-277	62.10

• Available only while quantities last

Backup Screws For DA Collet Chucks

Description	Code No.	Price \$
All CAT, BT, NMTB DA180 chucks	534-288	15.40
DA180 Chuck Extensions	534-290	17.30
BT30 DA200 Chucks	534-296	13.20
CAT, BT DA300 chucks	534-297	14.40

DA Collet Dimensional Data



Collet	D	D1	L	Collet Range
100DA	0.769"	0.635"	1.441"	3/64-9/16"
180DA	1.035"	0.873"	1.637"	3/64-3/4"
200DA	0.539"	0.453"	1.193"	3/64-3/8"
300DA	0.375"	0.300"	1.000"	3/64-1/4"



COLLETS

Type 25 & Type 32 Collet Chuck Sets

Set includes:

1 chuck, 1 wrench, 1 each collet and fitted case

Type 25

- 1/8", 3/16", 1/4", 5/16", 3/8", 1/2", 5/8", 3/4", 7/8", 1"

Type 32

- 1/4", 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 15/16", 1", 1-1/8", 1-1/4"



Collet Chucks

Chuck	Code No.	Price \$
COLLET SETS CONSIST OF 10 COLLETS 1/8" - 1" (TYPE 25)		
ISA-30	334-600	439.60
ISA-40	334-605	439.60
ISA-50	334-608	541.40
M.T.3	334-610	439.60
M.T.4	334-615	439.60
R-8	334-620	439.60
COLLET SETS CONSIST OF 15 COLLETS 1/4" - 1-1/4" (TYPE 32)		
ISA-40	334-625	1,066.60
ISA-50	334-630	1,105.50
M.T.5	334-635	1,103.80

Component Parts For 1" Type 25 Sets

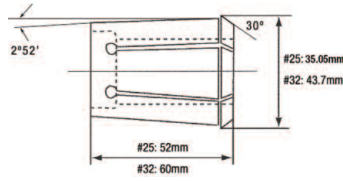
Description	Type 25	Code No.	Price \$
Wrench	1" (Type 25)	334-650	10.80
Nuts	1" (Type 25)	334-645	68.50
Fitted Case	1" (Type 25)	334-640	20.60
Chuck ISA-30	1" (Type 25)	334-655	203.20
Chuck ISA-40	1" (Type 25)	334-660	203.20
Chuck ISA-50	1" (Type 25)	334-663	279.40
Chuck MT 3	1" (Type 25)	334-665	203.20
Chuck MT 4	1" (Type 25)	334-670	203.20
Chuck R-8	1" (Type 25)	334-675	203.20

Component Parts For 1-1/4" Type 32 Sets

Description	Type 32	Code No.	Price \$
Wrench	1-1/4" (Type 32)	334-690	29.40
Nuts	1-1/4" (Type 32)	334-685	92.30
Fitted Case	1-1/4" (Type 32)	334-680	20.60
Chuck ISA-40	1-1/4" (Type 32)	334-695	279.40
Chuck ISA-50	1-1/4" (Type 32)	334-700	330.20
Chuck MT 5	1-1/4" (Type 32)	334-705	317.50



Type 25 & Type 32 Collets



Collet Chucks

Size (in.)	Type 25		Type 32	
	Code No.	Price \$	Code No.	Price \$
Inch				
1/8"	336-400	24.90	-	-
3/16"	336-402	24.90	-	-
1/4"	336-404	24.90	336-430	50.70
5/16"	336-406	24.90	336-432	50.70
3/8"	336-408	24.90	336-434	50.70
7/16"	336-409	24.90	336-436	50.70
1/2"	336-410	24.90	336-438	50.70
9/16"	336-411	24.90	336-440	50.70
5/8"	336-412	24.90	336-442	50.70
11/16"	-	-	336-444	50.70
3/4"	336-414	24.90	336-446	50.70
13/16"	-	-	336-448	50.70
7/8"	336-416	24.90	336-450	50.70
15/16"	-	-	336-452	50.70
1"	336-418	24.90	336-454	50.70
1-1/8"	-	-	336-456	50.70
1-1/4"	-	-	336-458	50.70
Metric				
3 mm	336-504	24.90	-	-
4 mm	336-506	24.90	-	-
5 mm	336-508	24.90	336-549	50.70
6 mm	336-510	24.90	336-550	50.70
7 mm	336-512	24.90	336-552	50.70
8 mm	336-514	24.90	336-554	50.70
9 mm	336-516	24.90	336-556	50.70
10 mm	336-518	24.90	336-560	50.70
11 mm	336-520	24.90	336-562	50.70
12 mm	336-522	24.90	336-564	50.70
13 mm	336-524	24.90	336-566	50.70
14 mm	336-526	24.90	336-568	50.70
15 mm	336-528	24.90	336-570	50.70
16 mm	336-530	24.90	336-572	50.70
17 mm	336-532	24.90	336-574	50.70
18 mm	336-534	24.90	336-576	50.70
19 mm	336-536	24.90	336-578	50.70
20 mm	336-538	24.90	336-580	50.70
21 mm	336-540	24.90	336-582	50.70
22 mm	336-542	24.90	336-584	50.70
23 mm	336-544	24.90	336-586	50.70
24 mm	336-546	24.90	336-588	50.70
25 mm	336-548	24.90	336-590	50.70
26 mm			336-592	50.70
28 mm			336-596	50.70
29 mm			336-597	50.70
30 mm			336-598	50.70
32 mm			336-600	50.70



TOOLING

SHRINK FIT TOOLING

GS Balanceable Shrink Fit Tooling	78
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www.sowatool.com



GS BALANCEABLE SHRINK FIT TOOLING

Requires using a balancing machine

FEATURES AND BENEFITS

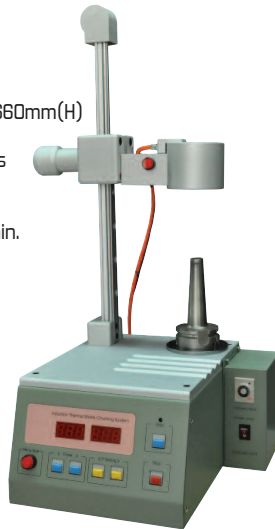
- With threaded holes in order to balance with supplied balancing screws
- Improved concentricity
- Improved balance design with no moving pieces
- Low Centrifugal Forces due to low holder mass
- For maximum gripping power with exceptional concentricity.
- Concentricity of $\leq .0001''$ with tool shrunk in holder.
- Chip load distributed evenly along cutting edge of tool which results in longer tool life.
- Constructed of double tempered Tool Steel for exceptional durability and cycle life. With proper use, toolholder life should exceed that of standard end mill holders.
- Tool is gripped 360° along the entire length of bore resulting in an evenly distributed clamping force.
- Short projections are possible because no mechanical clamping devices are used. This results in greater rigidity and resistance to bending.
- Simple and fast to use. The total time elapsed to remove one cutting tool and insert another is less than 10 seconds.
- Through-spindle coolant capability.
- Coolant through holders require no special backup screws or seals. The interference fit between the ID of the tool holder and cutting tool shank forms the seal, preventing the coolant from flowing anywhere else except through the coolant grooves. The use of Heat Shrink Tooling allows for greater speeds and feeds, better finishes, increased tool life, and increased productivity due to its High Speed Machining capability and simplicity of use.



Shrink Fit Machines

Model GTS-306 LUXE

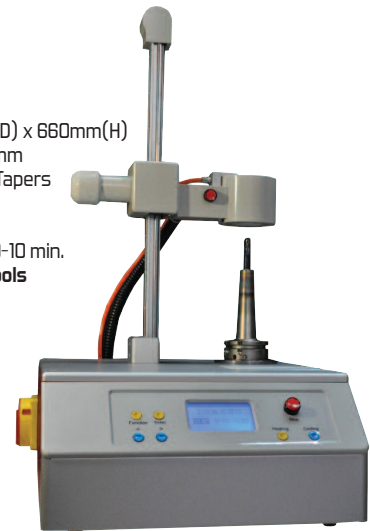
- Heating: Induction
- Shrinking Time: 6-15 seconds
- Power: 220VAC 50/60HZ single phase
- Rated Ampere: 20A
- Power Consumption: 4KW
- Dimensions: 292mm(W) x 302mm(D) x 660mm(H)
- Induction Head Inside Diameter: 35mm
- Taper support: All HSK, BT, CAT & SK Tapers
- Display: LED
- Max. Tool Diameter 25mm
- Cooling: Shop air attached to head 0-10 min.
- For use with Carbide tools only



Model	Code No.	Price \$
GTS306MC	536-650	7,775.90

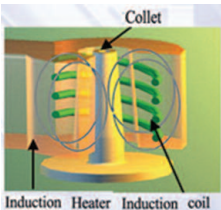
Model GTS-9000M

- Heating: Induction
- Shrinking Time: 3-5 seconds
- Power: 220VAC 50/60HZ 3 phase
- Rated Ampere: 27A
- Power Consumption: 10KW
- Dimensions: 350mm(W) x 400mm(D) x 660mm(H)
- Induction Head Inside Diameter: 35mm
- Taper support: All HSK, BT, CAT & SK Tapers
- Display: LCD
- Max. Tool Diameter 25mm
- Cooling: Shop air attached to head 0-10 min.
- For use with Carbide, HSCO & HSS tools

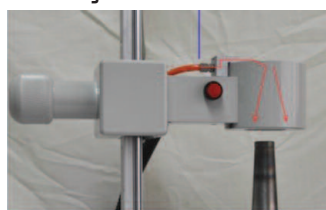


Model	Code No.	Price \$
GTS9000M	536-655	14,233.40

Heat generated by high frequency magnetic field



Air Cooling



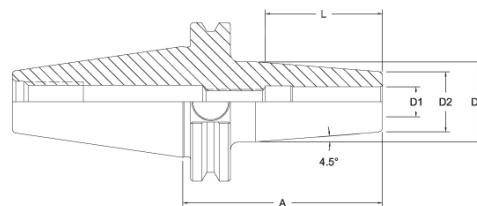


CAT40 Balanceable Shrink Fit Holders

- With threaded holes in order to balance with supplied balancing screws
- Pre-Balanced up to 30,000 rpm
- Coolant thru the spindle capability
- For maximum gripping power with exceptional concentricity.
- Concentricity of $\leq .0001''$ with tool shrunk in holder.
- Tool is gripped 360° along the entire length of bore resulting in an evenly distributed clamping force.
- Back up screws are available on request



Complete with certificate



Taper	Hole Dia. (D1)	Gage Length (A)	D2	D3	L	Code No.	Price \$
Inch							
CAT40	1/8	3.15"	0.39"	0.75"	0.35"	531-838	237.60
CAT40	3/16	3.15"	0.39"	0.75"	0.47"	531-840	237.60
CAT40	1/4	3.15"	0.83"	1.06"	1.42"	531-842	237.60
CAT40	1/4	6.30"	0.83"	1.06"	1.42"	531-844	279.90
CAT40	5/16	3.15"	0.83"	1.06"	1.42"	531-846	237.60
CAT40	5/16	6.30"	0.83"	1.06"	1.42"	531-848	279.90
CAT40	3/8	3.15"	0.94"	1.26"	1.65"	531-850	237.60
CAT40	3/8	6.30"	0.94"	1.26"	1.65"	531-852	279.90
CAT40	1/2	3.15"	0.94"	1.26"	1.65"	531-854	237.60
CAT40	1/2	6.30"	0.94"	1.26"	1.65"	531-856	279.90
CAT40	5/8	3.15"	1.06"	1.34"	1.97"	531-858	237.60
CAT40	5/8	6.30"	1.06"	1.34"	1.97"	531-860	279.90
CAT40	3/4	3.15"	1.30"	1.65"	2.05"	531-862	237.60
CAT40	3/4	6.30"	1.30"	1.65"	2.05"	531-864	279.90
CAT40	1	3.94"	1.73"	2.09"	2.28"	531-866	237.60
CAT40	1	6.30"	1.73"	2.09"	2.28"	531-868	279.90
CAT40	1-1/4	3.94"	1.73"	2.09"	2.28"	531-870	237.60
CAT40	1-1/4	6.30"	1.73"	2.09"	2.28"	531-872	354.60
Metric							
CAT40	4	80	10	19.6	12	531-802	237.60
CAT40	6	80	21	27	36	531-806	237.60
CAT40	6	160	21	27	36	531-808	279.90
CAT40	8	80	21	27	36	531-810	237.60
CAT40	8	160	21	27	36	531-812	279.90
CAT40	10	80	24	32	42	531-814	237.60
CAT40	10	160	24	32	42	531-816	279.90
CAT40	12	80	24	32	47	531-818	237.60
CAT40	12	160	24	32	47	531-820	279.90
CAT40	16	80	27	34	50	531-822	237.60
CAT40	16	160	27	34	50	531-824	279.90
CAT40	20	80	33	42	52	531-826	237.60

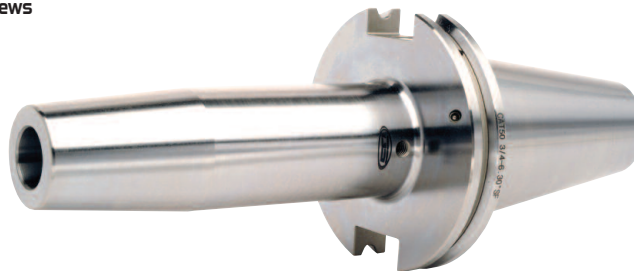
* Available only while quantities last



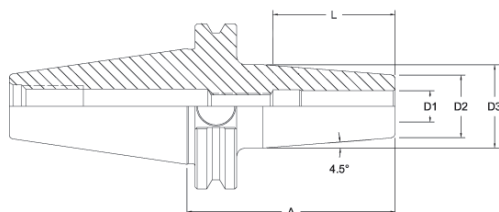
SHRINK FIT TOOLING

CAT50 Balanceable Shrink Fit Holders

- With threaded holes in order to balance with supplied balancing screws
- Pre-Balanced up to 25,000 rpm
- Coolant thru the spindle capability
- For maximum gripping power with exceptional concentricity.
- Concentricity of ≤ 0.0001 " with tool shrunk in holder.
- Tool is gripped 360° along the entire length of bore resulting in an evenly distributed clamping force.
- Back up screws are available on request



Complete with certificate



Taper	Hole Dia. (D1)	Gage Length (A)	D2	D3	L	Code No.	Price \$
Inch							
CAT50	1/4	3.15"	0.83"	1.06"	1.42"	531-932	226.80
CAT50	1/4	6.30"	0.83"	1.06"	1.42"	531-934	354.60
CAT50	5/16	3.15"	0.83"	1.06"	1.42"	531-936	226.80
CAT50	3/8	3.15"	0.94"	1.26"	1.65"	531-940	264.60
CAT50	3/8	6.30"	0.94"	1.26"	1.65"	531-942	354.60
CAT50	1/2	3.15"	0.94"	1.26"	1.65"	531-944	264.60
CAT50	1/2	6.30"	0.94"	1.26"	1.65"	531-946	354.60
CAT50	5/8	3.15"	1.06"	1.34"	1.97"	531-948	264.60
CAT50	5/8	6.30"	1.06"	1.34"	1.97"	531-950	412.20
CAT50	3/4	3.15"	1.30"	1.65"	2.05"	531-952	303.30
CAT50	3/4	6.30"	1.30"	1.65"	2.05"	531-954	378.90
CAT50	1	3.94"	1.73"	2.09"	2.28"	531-956	303.30
CAT50	1	6.30"	1.73"	2.09"	2.28"	531-958	378.90
CAT50	1-1/4	3.94"	1.73"	2.09"	2.28"	531-960	303.30
CAT50	1-1/4	6.30"	1.73"	2.09"	2.28"	531-962	449.10
Metric							
CAT50	6	80	21	27	36	531-900	303.30
CAT50	6	160	21	27	36	531-902	383.40
CAT50	8	80	21	27	36	531-904	303.30
CAT50	8	160	21	27	36	531-906	383.40
CAT50	10	80	24	32	42	531-908	303.30
CAT50	10	160	24	32	42	531-910	383.40
CAT50	12	80	24	32	47	531-912	303.30
CAT50	12	160	24	32	47	531-914	383.40
CAT50	16	80	27	34	50	531-916	303.30
CAT50	25	100	44	53	58	531-924	332.10
CAT50	32	100	44	53	58	531-928	332.10

• Available only while quantities last

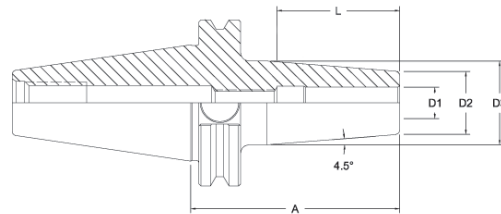


BT30 Balanceable Shrink Fit Holders

- With threaded holes in order to balance with supplied balancing screws
- Pre-Balanced up to 20,000 rpm
- Coolant thru the spindle capability
- For maximum gripping power with exceptional concentricity.
- Concentricity of $\leq .0001$ " with tool shrunk in holder.
- Tool is gripped 360° along the entire length of bore resulting in an evenly distributed clamping force.
- Back up screws are available on request



Complete with certificate



Taper	Hole Dia. (D1)	Gage Length (A)	D2	D3	L	Code No.	Price \$
Inch							
BT30	1/8	3.15"	0.39"		0.35"	532-414	232.20
BT30	3/16	3.15"	0.39"		0.47"	532-416	232.20
BT30	1/4	3.15"	0.83"	1.06"	1.42"	532-418	232.20
BT30	3/8	3.15"	0.94"	1.26"	1.65"	532-422	232.20
BT30	1/2	3.15"	0.94"	1.26"	1.65"	532-424	232.20
Metric							
BT30	4	80	10		12	532-402	232.20



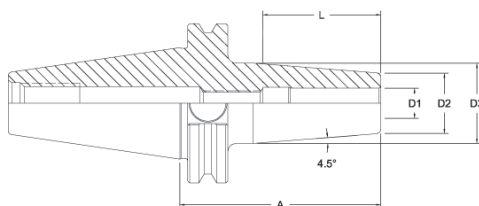
SHRINK FIT TOOLING

BT40 Balanceable Shrink Fit Holders

- With threaded holes in order to balance with supplied balancing screws
- Pre-Balanced up to 30,000 rpm
- Coolant thru the spindle capability
- For maximum gripping power with exceptional concentricity.
- Concentricity of ≤ 0.001 " with tool shrunk in holder.
- Tool is gripped 360° along the entire length of bore resulting in an evenly distributed clamping force.
- Back up screws are available on request



Complete with certificate



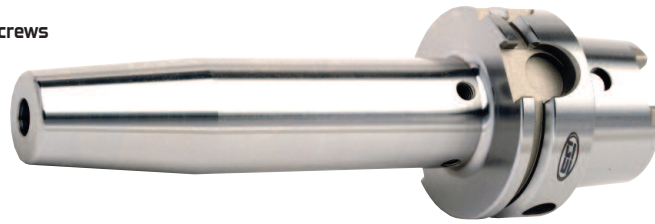
Taper	Hole Dia. (D1)	Gage Length (A)	D2	D3	L	Code No.	Price \$
Inch							
BT40	1/8	3.54"	0.39"		0.35"	532-464 •	279.90
BT40	3/16	3.54"	0.39"		0.47"	532-466	279.90
BT40	1/4	3.54"	0.83"	1.06"	1.42"	532-468	279.90
BT40	1/4	6.30"	0.83"	1.06"	1.42"	532-470	299.50
BT40	5/16	3.54"	0.83"	1.06"	1.42"	532-472 •	279.90
BT40	3/8	3.54"	0.94"	1.26"	1.65"	532-476	237.60
BT40	3/8	6.30"	0.94"	1.26"	1.65"	532-478 •	279.90
BT40	1/2	3.54"	0.94"	1.26"	1.65"	532-480	237.60
BT40	1/2	6.30"	0.94"	1.26"	1.65"	532-482	279.90
BT40	5/8	3.54"	1.06"	1.34"	1.97"	532-484 •	279.90
BT40	3/4	3.54"	1.30"	1.65"	2.05"	532-488	279.90
BT40	3/4	6.30"	1.30"	1.65"	2.05"	532-490	279.90
BT40	1	3.94"	1.73"	2.09"	2.28"	532-492	279.90
BT40	1-1/4	3.94"	1.73"	2.09"	2.28"	532-496	279.90
Metric							
BT40	6	90	21	27	36	532-432	279.90
BT40	8	90	21	27	36	532-436	237.60

• Available only while quantities last

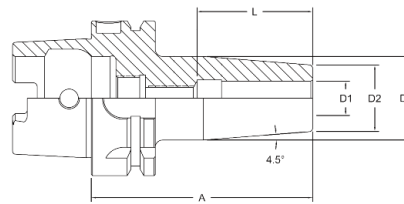


HSK 63A Balanceable Shrink Fit Holders

- With threaded holes in order to balance with supplied balancing screws
- Pre-Balanced up to 30,000 rpm
- Coolant thru the spindle capability
- For maximum gripping power with exceptional concentricity.
- Concentricity of $\leq .0001$ " with tool shrunk in holder.
- Tool is gripped 360° along the entire length of bore resulting in an evenly distributed clamping force.
- Back up screws are available on request



Complete with certificate



Taper	Hole Dia. (D1)	Gage Length (A)	D2	D3	L	Code No.	Price \$
Inch							
HSK63A	1/8	3.15"	0.39"		0.35"	536-338	288.90
HSK63A	3/16	3.15"	0.39"		0.47"	536-340	288.90
HSK63A	1/4	3.15"	0.83"	1.06"	1.42"	536-342	288.90
HSK63A	1/4	6.30"	0.83"	1.06"	1.42"	536-344	374.40
HSK63A	5/16	3.15"	0.83"	1.06"	1.42"	536-346	288.90
HSK63A	5/16	6.30"	0.83"	1.06"	1.42"	536-348	374.40
HSK63A	3/8	3.35"	0.94"	1.26"	1.65"	536-350	288.90
HSK63A	3/8	6.30"	0.94"	1.26"	1.65"	536-352	374.40
HSK63A	1/2	3.54"	0.94"	1.26"	1.65"	536-354	288.90
HSK63A	1/2	6.30"	0.94"	1.26"	1.65"	536-356	374.40
HSK63A	5/8	3.74"	1.06"	1.34"	1.97"	536-358	288.90
HSK63A	5/8	6.30"	1.06"	1.34"	1.97"	536-360	374.40
HSK63A	3/4	3.94"	1.30"	1.65"	2.05"	536-362	288.90
HSK63A	3/4	6.30"	1.30"	1.65"	2.05"	536-364	374.40
HSK63A	1	4.53"	1.73"	2.09"	2.28"	536-366	288.90
HSK63A	1	6.30"	1.73"	2.09"	2.28"	536-368	374.40
HSK63A	1-1/4	4.72"	1.73"	2.09"	2.28"	536-370	288.90
HSK63A	1-1/4	6.30"	1.73"	2.09"	2.28"	536-372	374.40
Metric							
HSK63A	4	80	10		12	536-302	288.90
HSK63A	5	80	10		15	536-304	288.90
HSK63A	6	80	21	27	36	536-306	288.90
HSK63A	8	80	21	27	36	536-310	288.90
HSK63A	10	85	24	32	42	536-314	288.90
HSK63A	12	90	24	32	47	536-318	288.90
HSK63A	16	95	27	34	50	536-322	288.90
HSK63A	20	100	33	42	52	536-326	288.90
HSK63A	25	115	44	53	58	536-330	288.90
HSK63A	32	120	44	53	58	536-334	288.90

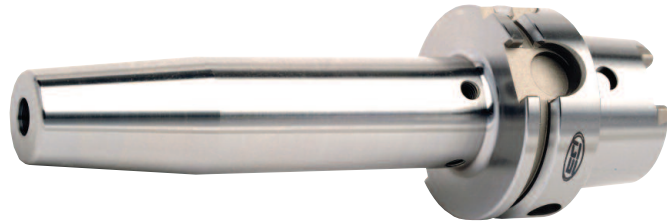
• Available only while quantities last



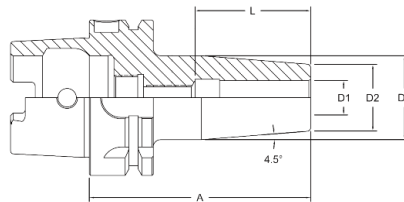
SHRINK FIT TOOLING

HSK 100A Balanceable Shrink Fit Holders

- With threaded holes in order to balance with supplied balancing screws
- Pre-Balanced up to 25,000 rpm
- Coolant thru the spindle capability
- For maximum gripping power with exceptional concentricity.
- Concentricity of $\leq 0.0001''$ with tool shrunk in holder.
- Tool is gripped 360° along the entire length of bore resulting in an evenly distributed clamping force.
- Back up screws are available on request



Complete with certificate



Taper	Hole Dia. (D1)	Gage Length (A)	D2	D3	L	Code No.	Price \$
Inch							
HSK100A	1/4	3.35"	0.83"	1.06"	1.42"	536-432	426.60
HSK100A	5/16	3.35"	0.83"	1.06"	1.42"	536-436	426.60
HSK100A	3/8	3.54"	0.94"	1.26"	1.65"	536-440	426.60
HSK100A	3/8	6.30"	0.94"	1.26"	1.65"	536-442	468.90
HSK100A	1/2	3.74"	0.94"	1.26"	1.65"	536-444	426.60
HSK100A	1/2	6.30"	0.94"	1.26"	1.65"	536-446	468.90
HSK100A	5/8	3.94"	1.06"	1.34"	1.97"	536-448	426.60
HSK100A	5/8	6.30"	1.06"	1.34"	1.97"	536-450	468.90
HSK100A	3/4	4.13"	1.30"	1.65"	2.05"	536-452	426.60
HSK100A	3/4	6.30"	1.30"	1.65"	2.05"	536-454	468.90
HSK100A	1	4.53"	1.73"	2.09"	2.28"	536-456	426.60
HSK100A	1	6.30"	1.73"	2.09"	2.28"	536-458	468.90
HSK100A	1-1/4	4.72"	1.73"	2.09"	2.28"	536-460	426.60
HSK100A	1-1/4	6.30"	1.73"	2.09"	2.28"	536-462	468.90



TOOLING

TAPPING CHUCKS & COLLETS

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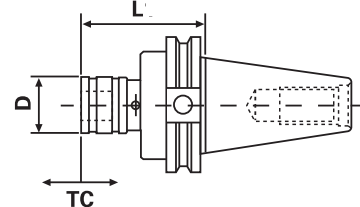






TAPPING CHUCKS

CAT Taper Tension/Compression Tap Holders

- Quick-change - push back on the holder sleeve and the adapter with tool is removable
- Press on the end of the adapter nose and the tool is removable - all in a few seconds.
- Smooth stroke - even under full torque load, the tension-compression stroke is full and free.
- Interchangeability - our adapters and holders are interchangeable with Universal-Bilz quick change holders and adapters

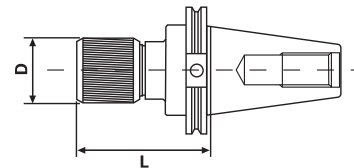




Pull Stud  Collets 
pg 135 pg 91-92

Taper	Tap Range Hand	Tap Range Pipe	System	L (in.)	D (in.)	T/C (in.)	Code No.	Price \$
CAT40								
CT40	#0-9/16	1/8	#1	2.93	1.43	0.29/0.29	531-543	279.90
CT40	#0-9/16	1/8	#1	4.00	1.43	0.29/0.29	531-540	279.90
CT40	#0-9/16	1/8	#1	4.47	1.25	0.79/0.39	531-542	279.90
CT40	5/16-7/8	1/4-1/2	#2	4.50	2.09	0.49/0.49	531-544	317.20
CT40	5/16-7/8	1/4-1/2	#2	6.66	2.00	0.85/0.49	531-546	353.00
CT40	13/16-1-3/8	3/4-1	#3	5.75	3.07	0.79/0.79	531-549	592.00
CT40	13/16-1-3/8	3/4-1	#3	8.00	3.07	0.79/0.79	531-548	658.00
CT40	13/16-1-3/8	3/4-1	#3	9.19	2.87	0.98/0.59	531-550	692.70
CAT50								
CT50	#0-9/16	1/8	#1	4.00	1.43	0.29/0.29	531-552	374.40
CT50	#0-9/16	1/8	#1	5.02	1.25	0.79/0.39	531-554	374.40
CT50	5/16-7/8	1/4-1/2	#2	4.50	2.09	0.49/0.49	531-556	413.10
CT50	5/16-7/8	1/4-1/2	#2	5.66	2.00	0.85/0.49	531-558	413.10
CT50	13/16-1-3/8	3/4-1	#3	6.25	3.07	0.79/0.79	531-560	625.50
CT50	13/16-1-3/8	3/4-1	#3	7.72	2.87	0.98/0.59	531-562	625.50

CAT Taper Rigid Tap Holders

- Quick-change - push back on the holder sleeve and the adapter with tool is removable
- Press on the end of the adapter nose and the tool is removable - all in a few seconds.
- Interchangeability - our adapters and holders are interchangeable with Universal-Bilz quick change holders and adapters



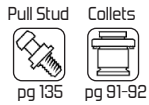
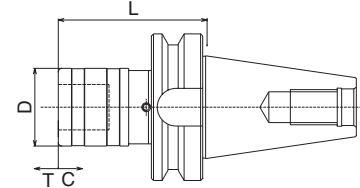
Pull Stud  Collets 
pg 135 pg 91-92

Taper	Tap Range Hand	Tap Range Pipe	System	L (in.)	D (in.)	Code No.	Price \$
CAT40							
CT40	#0-9/16	1/8	#1	3.02	1.25	531-564	192.60
CT40	5/16-7/8	1/4-1/2	#2	3.66	2.00	531-566	216.90
CT40	13/16-1-3/8	3/4-1	#3	4.72	2.87	531-568	242.10
CAT50							
CT50	#0-9/16	1/8	#1	3.02	1.25	531-570	265.50
CT50	5/16-7/8	1/4-1/2	#2	3.91	2.00	531-572	285.30
CT50	13/16-1-3/8	3/4-1	#3	4.98	2.87	531-574	338.40



BT Taper Tension/Compression Tap Holders

- Quick-change - push back on the holder sleeve and the adapter with tool is removable
- Press on the end of the adapter nose and the tool is removable - all in a few seconds.
- Smooth stroke - even under full torque load, the tension-compression stroke is full and free.
- Interchangeability - our adapters and holders are interchangeable with Universal-Bilz quick change holders and adapters

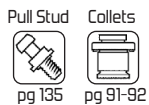
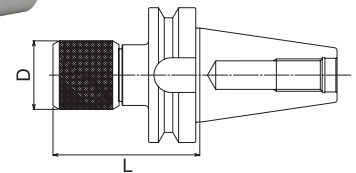


Taper	Tap Range Hand	Tap Range Pipe	System	L (in.)	D (in.)	T/C (in.)	Code No.	Price \$
BT30								
BT30	#0-9/16	1/8	#1	2.40	1.43	0.29/0.29	532-261	305.10
BT30	#0-9/16	1/8	#1	4.25	1.43	0.29/0.29	532-260	305.10
BT30	#0-9/16	1/8	#1	4.92	1.25	0.79/0.39	532-262	305.10
BT40								
BT40	#0-9/16	1/8	#1	2.62	1.43	0.29/0.29	532-267	307.90
BT40	#0-9/16	1/8	#1	3.80	1.43	0.29/0.29	532-264	307.90
BT40	#0-9/16	1/8	#1	4.33	1.25	0.79/0.39	532-266	307.90
BT40	5/16-7/8	1/4-1/2	#2	4.50	2.09	0.49/0.49	532-268	349.00
BT40	5/16-7/8	1/4-1/2	#2	6.34	2.00	0.85/0.49	532-270	388.30
BT40	13/16-1-3/8	3/4-1	#3	7.50	3.07	0.79/0.79	532-272	723.80
BT40	13/16-1-3/8	3/4-1	#3	9.00	2.87	0.98/0.59	532-274	762.00
BT50								
BT50	#0-9/16	1/8	#1	4.33	1.25	0.79/0.39	532-275	407.70
BT50	5/16-7/8	1/4-1/2	#2	6.34	2.00	0.85/0.49	532-277	467.10
BT50	13/16-1-3/8	3/4-1	#3	7.50	3.07	0.79/0.79	532-279	906.70

Tap/Drill Chucks

BT Taper Rigid Tap Holders

- Quick-change - push back on the holder sleeve and the adapter with tool is removable
- Press on the end of the adapter nose and the tool is removable - all in a few seconds.
- Interchangeability - our adapters and holders are interchangeable with Universal-Bilz quick change holders and adapters



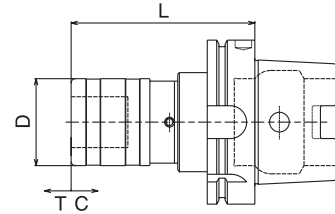
Taper	Tap Range Hand	Tap Range Pipe	System	L (in.)	D (in.)	Code No.	Price \$
BT30							
BT30	#0-9/16	1/8	#1	2.44	1.25	532-276	242.10
BT40							
BT40	#0-9/16	1/8	#1	3.02	1.25	532-278	211.90
BT40	5/16-7/8	1/4-1/2	#2	3.66	2.00	532-280	238.60
BT40	13/16-1-3/8	3/4-1	#3	4.73	2.87	532-282	266.40
BT50							
BT50	#0-9/16	1/8	#1	3.02	1.25	532-281	257.40
BT50	5/16-7/8	1/4-1/2	#2	3.66	2.00	532-283	467.10
BT50	13/16-1-3/8	3/4-1	#3	4.73	2.87	532-284	330.50



TAPPING CHUCKS

HSK Tension/Compression Tap Holders

- Quick-change - push back on the holder sleeve and the adapter with tool is removable
- Press on the end of the adapter nose and the tool is removable - all in a few seconds.
- Smooth stroke - even under full torque load, the tension-compression stroke is full and free.
- Interchangeability - our adapters and holders are interchangeable with Universal-Bilz quick change holders and adapters



Collets

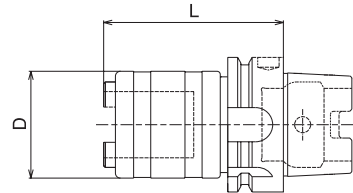


pg 91-92

Taper	Tap Range Hand	Tap Range Pipe	System	L (in.)	D (in.)	T/C (in.)	Code No.	Price \$
HSK63								
HSK63	#0-9/16	1/8	#1	5.30	1.43	0.29/0.29	536-196	706.20
HSK63	5/16-7/8	1/4-1/2	#2	6.10	2.09	0.49/0.49	536-198	786.40
HSK100								
HSK100	#0-9/16	1/8	#1	5.30	1.43	0.29/0.29	536-202	1,043.20
HSK100	5/16-7/8	1/4-1/2	#2	6.30	2.09	0.49/0.49	536-204	1,123.50

HSK Rigid Tap Holders

- Quick-change - push back on the holder sleeve and the adapter with tool is removable
- Press on the end of the adapter nose and the tool is removable - all in a few seconds.
- Interchangeability - our adapters and holders are interchangeable with Universal-Bilz quick change holders and adapters



Collets



pg 91-92

Taper	Tap Range Hand	Tap Range Pipe	System	L (in.)	D (in.)	Code No.	Price \$
HSK63							
HSK63	#0-9/16	1/8	#1	3.34	1.26	536-184	457.50
HSK63	5/16-7/8	1/4-1/2	#2	4.00	1.97	536-186	481.50
HSK63	13/16-1-3/8	1/2-1	#3	5.00	2.83	536-188	564.70
HSK100							
HSK100	#0-9/16	1/8	#1	3.54	1.43	536-190	658.10
HSK100	5/16-7/8	1/4-1/2	#2	3.74	2.09	536-192	818.50
HSK100	13/16-1-3/8	3/4-1	#3	5.00	3.07	536-194	1,093.40

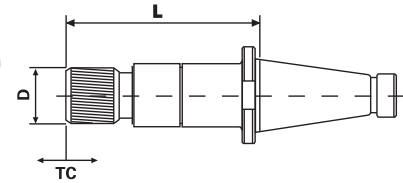


NMTB Taper Tension/Compression Tap Holders

Collets



pg 91-92



Taper	Tap Range Hand	Tap Range Pipe	System	L (in.)	D (in.)	T/C (in.)	Code No.	Price \$
NMTB40								
NMTB40	#0-9/16	1/8	#1	3.90	1.25	0.79/0.39	534-500	282.30
NMTB50								
NMTB50	13/16-1-3/8	3/4-1	#3	7.73	2.87	0.98/0.59	534-508	641.90

* Available only while quantities last

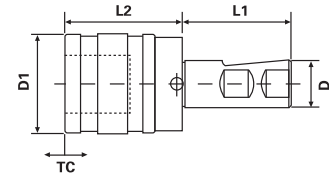
Weldon Shank Tension/Compression Tap Holders

- Precision ground surfaces
- Compact length
- Provide additional mating flexibility
- Provides axial float
- Adjustable entry force

Collets



pg 91-92



Tap Range Hand	Tap Range Pipe	System	Shank Dia. D	D1	L1	L2	T/C	Code No.	Price \$
#0-9/16	1/8	#1	1	1.25	2.28	4.13	0.79/0.39	534-520	299.10
#0-9/16	1/8	#1	1	1.43	2.28	1.53	0.79/0.39	534-522	299.10
#0-9/16	1/8	#1	1-1/2	1.25	2.69	4.13	0.79/0.39	534-532	302.50
5/16-7/8	1/4-1/2	#2	1-1/4	2.00	2.28	5.55	0.85/0.49	534-530	350.00
5/16-7/8	1/4-1/2	#2	1-1/2	2.00	2.69	5.55	0.85/0.49	534-534	350.00

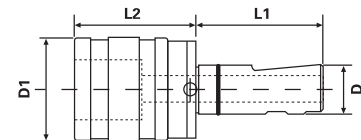
Weldon Shank Rigid Tap Holders

- Precision ground surfaces
- Compact length
- Provide additional mating flexibility
- Provides axial float
- Adjustable entry force

Collets



pg 91-92



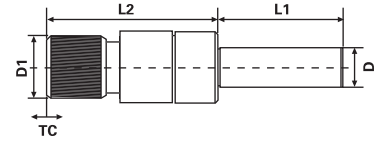
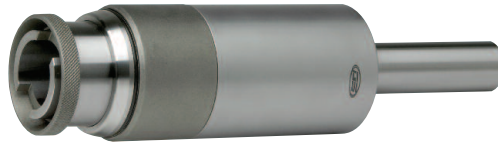
Tap Range Hand	Tap Range Pipe	System	Shank Dia. D	D1	L1	L2	Code No.	Price \$
#0-9/16	1/8	#1	1	1.26	2.28	1.46	534-540	121.50
5/16-7/8	1/4-1/2	#2	1	1.97	2.28	2.12	534-542	143.40
13/16-1-3/8	3/4-1	#3	1-1/2	2.83	2.69	3.27	534-544	339.40



TAPPING CHUCKS

Straight Shank Tension/Compression Tap Holders

- Straight shank tooling may be used to extend tooling reach for extended length operations
- This option is less costly than extended length integral shank tooling
- They may be used with any size machining center or lathe
- When loaded into larger holders, their reduced D.D. permits tapping applications within large holes or whenever tight clearances are encountered



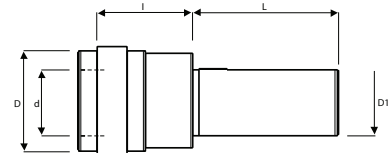
Collets
pg 91-92

Tap Range Hand	Tap Range Pipe	System	Shank Dia. D	D1	L1	L2	T/C	Code No.	Price \$
#0-9/16	1/8	#1	1	1.25	3.50	4.13	0.79/0.39	534-510	269.60
#0-9/16	1/8	#1	1-1/4	1.25	4.00	4.13	0.79/0.39	534-514	269.60
5/16-7/8	1/4-1/2	#2	1	2.00	3.50	5.55	0.85/0.49	534-512	305.70

Straight Shank Tension/Compression Tapping Chucks



- Precision ground surfaces
- Compact length
- Provides axial float
- Plastic collar to protect chuck from coolant
- Roller cage construction
- Adjustable entry force



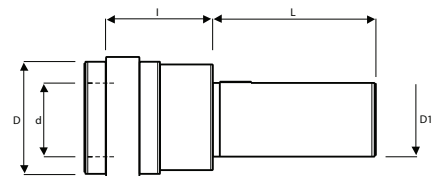
Collets
pg 91-92

Description	System	Shank D1	d	D	l	L	Tap Capacity	Tension & Compression		Code No.	Price \$
								T	C		
1" shank	#1	1.00	.748	1.50	1.76	1.95	#0 - 9/16	.35	.35	339-100	499.00
1" shank	#2	1.00	1.220	2.17	2.52	2.00	5/16 - 7/8	.59	.59	339-105	616.70
1-1/2" shank	#2	1.50	1.220	2.17	2.52	3.50	5/16 - 7/8	.59	.59	339-110	1,069.30
1-1/2" shank	#3	1.50	1.890	3.09	3.85	3.50	13/16 - 1-3/8	.94	.94	339-115	1,229.10

Straight Shank Rigid Tapping Chucks



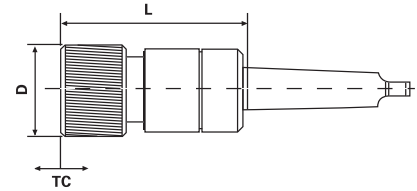
- Precision ground surfaces
- Compact length
- No float for synchronous tapping
- Coolant through spindle capability



Description	System	Shank D1	d	D	l	L	Tap Capacity	Code No.	Price \$
1" shank	#1	1.00	.748	1.30	1.60	1.95	#0 - 9/16	339-120	256.70
1" shank	#2	1.00	1.220	2.00	2.50	2.00	5/16 - 7/8	339-125	328.00
1-1/2" shank	#3	1.50	1.890	2.84	3.44	3.50	13/16 - 1-3/8	339-130	790.60



Morse Taper Tension/Compression Tap Holders



Morse Taper	Tap Range Hand	Tap Range Pipe	System	D (in.)	L (in.)	T/C (in.)	Code No.	Price \$
2	#0-9/16	1/8	#1	1.25	5.725	0.79/0.39	534-546	213.70
3	#0-9/16	1/8	#1	1.25	4.750	0.79/0.39	534-550	230.00
3	5/16-7/8	1/4-1/2	#2	2.00	5.870	0.85/0.49	534-552	235.00
4	#0-9/16	1/8	#1	1.25	4.72	0.79/0.39	534-554	220.20
4	5/16-7/8	1/4-1/2	#2	2.00	5.94	0.85/0.49	534-556	224.70

• Available only while quantities last

Torque Control Tap Collets & Sets

Tap System #1

- Tap Collets are fully compatible with Bilz System #1. Size Range: #0 - 9/16" hand tap and 1/8" pipe tap

Tap System #2

- Tap Collets are fully compatible with Bilz System #2. Size Range: 5/16"-7/8" hand tap and 1/4"-1/2" pipe tap



Tap Size	Tap System	D	Tap Shank	Square	Code No.	Price \$
#0-#6	1	.748	0.141	0.110	337-260	87.30
#8	1	.748	0.168	0.131	337-261	87.30
#10	1	.748	0.194	0.152	337-262	87.30
#12	1	.748	0.220	0.165	337-263	87.30
1/4	1	.748	0.255	0.191	337-264	87.30
5/16	1	.748	0.318	0.238	337-265	87.30
3/8	1	.748	0.381	0.286	337-266	87.30
7/16	1	.748	0.323	0.110	337-267	87.30
1/2	1	.748	0.367	0.110	337-268	87.30
9/16	1	.748	0.429	0.332	337-269	87.30
NPT 1/8P	1	.748	0.313	0.234	337-270	87.30
5/16	2	1.220	0.318	0.238	337-275	111.60
3/8	2	1.220	0.381	0.286	337-276	111.60
7/16	2	1.220	0.323	0.242	337-277	111.60
1/2	2	1.220	0.367	0.275	337-278	111.60
9/16	2	1.220	0.429	0.322	337-279	111.60
5/8	2	1.220	0.480	0.360	337-280	111.60
11/16	2	1.220	0.542	0.406	337-281	111.60
3/4	2	1.220	0.590	0.442	337-282	111.60
13/16	2	1.220	0.652	0.489	337-283	111.60
7/8	2	1.220	0.697	0.523	337-284	111.60
NPT 1/4P	2	1.220	0.562	0.421	337-285	111.60
3/8P	2	1.220	0.700	0.531	337-286	111.60
1/2P	2	1.220	0.687	0.515	337-287	111.60
Sets	Type #1 - 11 pc	#0-9/16, 1/8NPT			337-271	889.20
	Type #2 - 13 pc	5/16-7/8, 1/4, 3/8, 1/2 NPT			337-288	1,450.00



TAPPING CHUCKS

Positive Drive Tap Collets, Reducers & Sets

Tap System #1

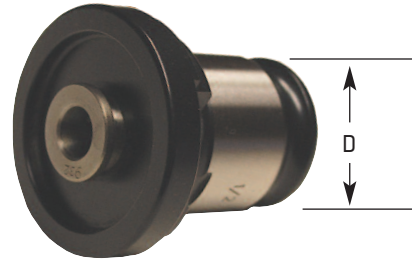
- Tap Collets are fully compatible with Bilz System #1. Size Range: #0 - 9/16" hand tap and 1/8" pipe tap

Tap System #2

- Tap Collets are fully compatible with Bilz System #2. Size Range: 5/16" - 7/8" hand tap and 1/4" - 1/2" pipe tap

Tap System #3

- Tap Collets are fully compatible with Bilz System #3. Size Range: 13/16" - 1-3/8" hand tap and 3/4" - 1" pipe tap



Tap Size	Tap System	D	Tap Shank	Square	Code No.	Price \$
#0-#6	1	.748	0.141	0.110	337-052	33.00
#8	1	.748	0.168	0.131	337-054	33.00
#10	1	.748	0.194	0.152	337-056	33.00
#12	1	.748	0.220	0.165	337-058	33.00
1/4	1	.748	0.255	0.191	337-060	33.00
5/16	1	.748	0.318	0.238	337-062	33.00
3/8	1	.748	0.381	0.286	337-064	33.00
7/16	1	.748	0.323	0.242	337-066	33.00
1/2	1	.748	0.367	0.275	337-068	33.00
9/16	1	.748	0.429	0.322	337-070	33.00
NPT1/8P	1	.748	0.438	0.328	337-072	33.00
5/16	2	1.220	0.318	0.238	337-074	44.70
3/8	2	1.220	0.381	0.286	337-076	44.70
7/16	2	1.220	0.323	0.242	337-078	44.70
1/2	2	1.220	0.367	0.275	337-080	44.70
9/16	2	1.220	0.429	0.322	337-082	44.70
5/8	2	1.220	0.480	0.360	337-084	44.70
11/16	2	1.220	0.542	0.406	337-086	44.70
3/4	2	1.220	0.590	0.442	337-088	44.70
13/16	2	1.220	0.652	0.489	337-090	44.70
7/8	2	1.220	0.697	0.523	337-092	44.70
NPT						
1/4P	2	1.220	0.562	0.421	337-094	44.70
3/8P	2	1.220	0.700	0.531	337-096	44.70
1/2P	2	1.220	0.687	0.515	337-098	44.70
3/8	3	1.891	0.381	0.286	337-111	119.40
1/2	3	1.891	0.367	0.275	337-089	119.40
9/16	3	1.891	0.429	0.322	337-091	119.40
5/8	3	1.891	0.480	0.360	337-093	119.40
11/16	3	1.891	0.542	0.406	337-095	119.40
3/4	3	1.891	0.590	0.442	337-097	119.40
13/16	3	1.891	0.652	0.489	337-100	119.40
7/8	3	1.891	0.697	0.523	337-102	119.40
15/16	3	1.891	0.760	0.570	337-104	119.40
1	3	1.891	0.800	0.600	337-106	119.40
1-1/8	3	1.891	0.896	0.672	337-108	119.40
1-1/4	3	1.891	1.021	0.766	337-110	119.40
1-3/8	3	1.891	1.108	0.831	337-112	119.40
NPT						
1/2P	3	1.891	0.687	0.515	337-113	119.40
3/4P	3	1.891	0.906	0.679	337-114	119.40
1P	3	1.891	1.125	0.843	337-116	119.40
Reducers						
	Type #2 - #1				337-118	83.00
	Type #3 - #2				337-119	166.00
Sets						
	Type #1 - 11 pc	#0-9/16, 1/8NPT			337-073	359.90
	Type #2 - 13 pc	5/16-7/8, 1/4, 3/8, 1/2 NPT			337-099	579.10
	Type #3 - 9 pc	13/16-1-3/8, 3/4, 1" NPT			337-117	1,073.00

Tap/Drill Chucks



SYNCHROLIZE TAPPING SYSTEM FOR RIGID TAPPING

Features:

- The Synchrolize tapping chuck is the better solution, it gives you the possibility to work with axial compensation
- Tap capacity: M3-M12, M6-M20, M14-M33
- Triple life of tap in comparison to a traditional tapping system
- Quick change of the tap and of the adapter
- Suitable for rigid tapping with micro compensation
- Uses ER Tap Collets full and free.



- Up to 9" of gage length can be obtained when using the extension system
- No need for tap collets due to the opposing set screws in the tap adapters

CAT Taper Synchrolize Tap Chucks

- Slim nose design
- Up to 200% increase in tap life

Pull Stud



pg 0



Taper	Tap Range Hand	System	Nose Dia. (in.)	Gage Length (in.)	Code No.	Price \$
40	#0 - 1/2"	1	1.693	2.087	531-610	460.70
40	3/8" - 3/4"	2	2.323	2.874	531-614	572.70
50	#0 - 1/2"	1	1.690	2.402	531-612	492.70
50	3/8" - 3/4"	2	2.323	2.874	531-616	713.40

Synchrolize Quick Change Tap Adapters

- Opposing set screws to secure tap, NO NEED for Tap Collets
- Designed for perfect hole alignment



System	Tap Range	Collet Style	Length	Nose Dia.	Code No.	Price \$
1	#0 - 1/2"	ER16	24mm	28mm	338-120	207.80
2	3/8" - 3/4"	ER25	28mm	42mm	338-122	243.00

BT Taper Synchrolize Tap Chucks

- Slim nose design
- Up to 200% increase in tap life

Pull Stud



pg 0



Taper	Tap Range Hand	System	Nose Dia. (in.)	Gage Length (in.)	Code No.	Price \$
40	#0 - 1/2"	1	1.690	2.402	532-310	364.70

Synchrolize Quick Change Tap Adapters - Ext.

- Opposing set screws to secure tap, NO NEED for Tap Collets
- Designed for perfect hole alignment



System	Tap Range	Collet Style	L	Nose Dia.	Code No.	Price \$
1	#0 - 1/2"	ER16	55mm	28mm	338-126	553.00
2	3/8" - 3/4"	ER25	86mm	42mm	338-128	591.40

HSK Synchrolize Tap Chucks

- Slim nose design
- Up to 200% increase in tap life



Taper	Tap Range Hand	System	Nose Dia. (in.)	Gage Length (in.)	Code No.	Price \$
HSK50A	#0 - 1/2"	1	1.693	2.756	536-210	460.70
HSK50A	3/8" - 3/4"	2	2.362	3.819	536-218	572.70
HSK63A	#0 - 1/2"	1	1.693	2.520	536-212	460.70
HSK63A	3/8" - 3/4"	2	2.362	3.819	536-214	572.70
HSK100A	3/8" - 3/4"	2	2.362	3.583	536-216	860.60

- See page 34-35 for ER16 Tap Collets
- See page 38-39 for ER25 Tap Collets
- See page 42-43 for ER40 Tap Collets



TAPPING CHUCKS

SYNCHROLIZE EXTENSION SYSTEM



Up to 9" of gage length

Synchrolize Tap Adapter Bodies



System	Length Added	Code No.	Price \$
1	5mm	338-132	271.80
2	7mm	338-134	303.70

Synchrolize Extensions



System	Length	Code No.	Price \$
1	25mm	338-144	73.60
1	50mm	338-146	86.40
2	50mm	338-148	111.90
2	100mm	338-150	127.90

Synchrolize Terminals



System	Tap Range	Collet Style	Length	Code No.	Price \$
1	#0 - 1/2"	ER16	50mm	338-138	281.30
2	3/8" - 3/4"	ER25	79mm	338-140	287.70

Synchrolize Assembly Supports



System	Code No.	Price \$
1	338-156	134.30
2	338-158	147.10

- See page 34-35 for ER16 Tap Collets
- See page 38-39 for ER25 Tap Collets
- See page 42-43 for ER40 Tap Collets



Reverse Tapping Heads

Guaranteed Depth Control Within ±0.004"

Features:

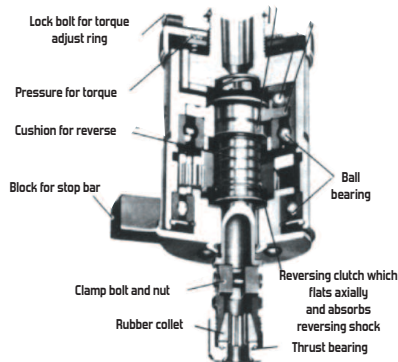
- Chatter-free clutch has positive engagement which allows for a smoother, more accurate tapping operation and more rapid reversal
- Guaranteed Depth Control to ± 0.004"
- Radial Float is SELF-CENTERING to compensate for hole center misalignment to 0.005"
- Unique Double Spring Mechanism produces Automatic Feed and Cushion Drive. There are two springs for the feed and two springs for the reversal. Each set gives you double smoothness for ULTRA accurate tapping applications (not possible with this type of tapping head in the past)
- Pre-set Torque Control permits easy operation of tap brake torque control

FOR DEPTH CONTROL:

Tapping Depth	2.00"
Clockwise Expansion (B)	-0.14"
Hold Machine spindle travel	1.86"

Set your machine travel to feed up to 1.86", then stop your machine travel, the tap holding spindle will continue to feed out (self-feed) up to 0.14" (clockwise expansion B), the drive clutch will go into the neutral zone and stop automatically. We guarantee this Depth Control within ± 0.004" (0.1 mm).

- For NC machine, set torque as high as possible within the safe limits of the tap. NC machine Cutting Feed equals (tap pitch x spindle rpm). Reverse Feed equals 2 x (tap pitch x spindle rpm)



Mount JT No.	Tapping Cap. Steel	Standard Collet Code No.	Rec. Max. Speed	Gear Ratio	Clockwise Comp. (A)	Expansion (B)	Code No.	Price \$
YSN7								
		354-032						
J-6	#0 - 1/4	(#0 - 10)	1,500rpm	1:1.6	0.197"	0.14"	354-002	472.50
	M2 - M7	354-034						
		(#10 - 1/4)						
YSN12								
		354-036						
	#8 - 1/2	(#8 - 1/4)						
J-6	M4 - M12	354-038	1,000rpm	1:1.75	0.197"	0.16"	354-012	575.30
	1/8 NPT	(1/4 - 1/2)						
YSN20								
		354-042						
	5/16 - 3/4	(5/16 - 5/8)						
M20	M8 - M20	354-044	600rpm	1:1.7	0.236"	0.24"	354-022	669.90
	1/8, 1/4 NPT	(9/16 - 3/4)						

Tap/Drill Chucks

Shanks For YSN20 Tapping Head

Description	Code No.	Price \$
Morse Taper 3-M20	354-062	40.20
Morse Taper 4-M20	354-064	40.20
R8-M20	354-066	56.30

Rubber Flex Collets



Capacity	Approximate Dimensions (in.) Large Dia. x Small Dia. x OAL	Code No.	Price \$
#0 - 10	.590 x .350 x .440	354-032	39.40
#10 - 1/4	.590 x .350 x .440	354-034	39.40
#8 - 1/4	.818 x .508 x .522	354-036	39.40
1/4 - 1/2	.818 x .508 x .522	354-038	39.40
5/16 - 5/8	1.038 x .665 x .610	354-042	39.40
9/16 - 3/4	1.038 x .665 x .610	354-044	39.40

Clamp, Bolt And Nut Assemblies

Model	Description	Code No.	Price \$
YSN7	#21,22 & 44 Screw Pair	354-085	3.20
YSN12	#21,22 & 44 Clamp, Bolt & Nut	354-075	26.50
YSN20	#21,22 & 44 Clamp, Bolt & Nut	354-080	24.80

Collet Nuts

Model	Description	Code No.	Price \$
YSN7	#23, 24 & 45 Collet Nut	354-084	24.90
YSN12	#23, 24 & 45 Collet Nut	354-074	26.50
YSN20	#23, 24 & 45 Collet Nut	354-079	27.30

DELUXE STARTER PACKAGES

- CAT40 Taper Tooling Balanced to 30,000 RPM
- CAT50 Taper Tooling Balanced to 25,000 RPM
- DIN Coolant Option - Standard
- All Ground Body
- 100% Forged Construction

FREE HSS TiAIN Tip Drill Set
With Each Package Purchased



Tap/Drill Chucks



1/16-1/2 x 64ths HSS
TiAIN Tip 118° split point

CAT40 PACKAGE

Total value \$ 1,082.90

Promo # 500-738

Code No.	Qty.	Description
531-002	1 pc.	CAT40-1/4-2.50" End Mill Holder
531-014	1 pc.	CAT40-3/8-2.50" End Mill Holder
531-026	1 pc.	CAT40-1/2-2.50" End Mill Holder
531-042	1 pc.	CAT40-3/4-3.00" End Mill Holder
531-056	1 pc.	CAT40-1"-4.00" End Mill Holder
531-196	1 pc.	CAT40-1"-1.75" Shell Mill Holder
531-421	2 pcs.	CAT40 ER32-2.5" Collet Chuck

CAT50 PACKAGE

Total value \$ 1,514.80

Promo # 500-739

Code No.	Description
531-120	1 pc. CAT50 1/2-4.00" End Mill Holder
531-130	1 pc. CAT50 5/8-4.00" End Mill Holder
531-140	1 pc. CAT50 3/4-4.00" End Mill Holder
531-154	1 pc. CAT50 1"-4.00" End Mill Holder
531-162	1 pc. CAT50 1-1/4-4.00" End Mill Holder
531-224	1 pc. CAT50 1-1/4-1.75" Shell Mill Holder
531-454	2 pcs. CAT50 ER32-4.00" Collet Chuck

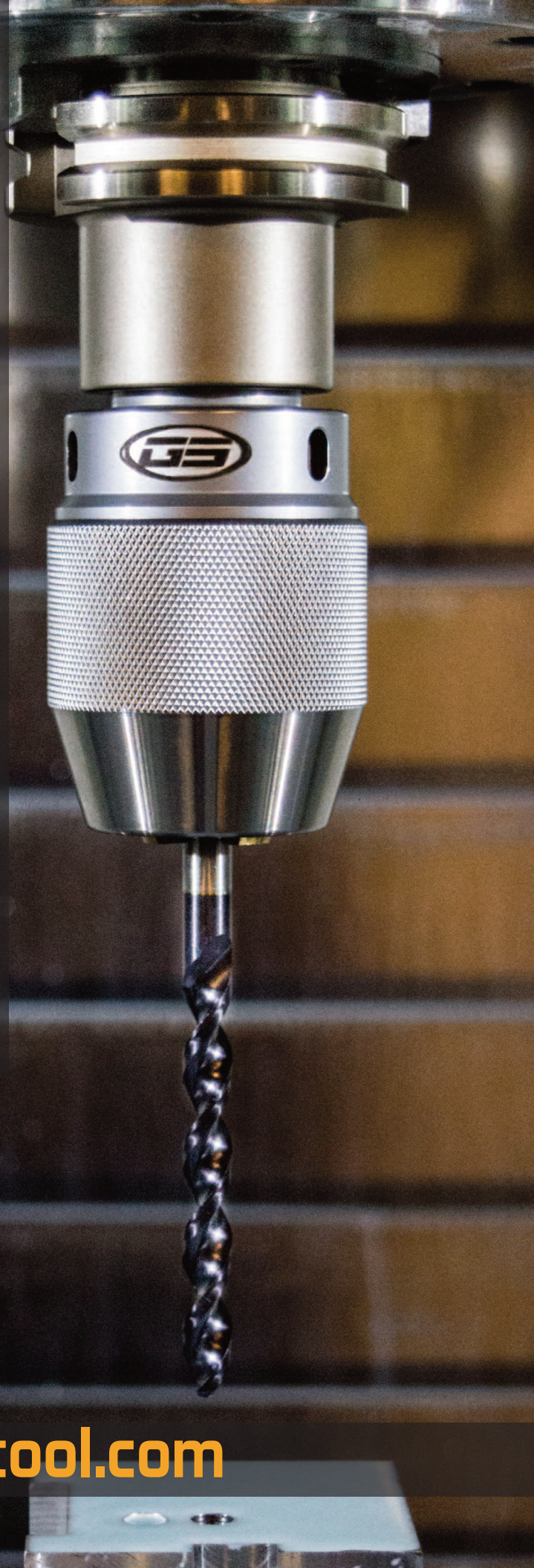
CALL TODAY FOR A QUOTE



TOOLING

DRILL CHUCKS & TAPER ADAPTERS

Integral Keyless Drill Chucks	98-100
Replacement Drill Chucks & Wrenches	100
Ball/Plain Bearing & Keyless Drill Chucks	101
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DRILL CHUCKS



DRILL CHUCKS



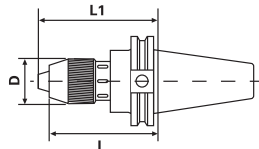
- **HIGH PRECISION**
- **PREMIUM TOLERANCE**
- **TIN COATED JAWS FOR IMPROVED LIFE**
- **GS Keyless Drill Chucks designed to achieve the highest accuracy and rigidity possible**
- **GS Super Heavy Duty Ball Bearing Drill Chucks are made to the highest tolerances in the market**

Tap/Drill Chucks

CAT Taper Integral Keyless Drill Chucks

These chucks provide exceptionally high torque - up to three times the gripping strength of conventional drill chuck / taper holder combinations. The design eliminates any possibility of chuck / holder misalignment, and it ensures separation safety

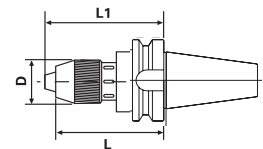
- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.



BT Taper Integral Keyless Drill Chucks

These chucks provide exceptionally high torque - up to three times the gripping strength of conventional drill chuck / taper holder combinations. The design eliminates any possibility of chuck / holder misalignment, and it ensures separation safety

- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.



Taper	Cap.	L	L1	D	Code No.	Price \$
CAT40						
CT40	1/4"	2.559"	2.795"	1.3"	531-480	251.00
CT40	1/2"	4.527"	4.992"	1.97"	531-482	265.00
CT40	5/8"	4.724"	5.236"	2.24"	531-483	391.30
CAT50						
CT50	1/2"	3.54"	3.996"	1.97"	531-484	306.80
CT50	5/8"	3.7"	4.134"	2.24"	531-485	429.30

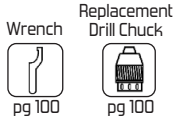
Taper	Cap.	L	L1	D	Code No.	Price \$
BT30						
BT30	1/4"	3.15"	3.38"	1.3"	532-210	251.00
BT30	1/2"	3.55"	4.02"	1.97"	532-212	265.00
BT40						
BT40	1/4"	2.95"	3.19"	1.3"	532-214	251.00
BT40	1/2"	3.74"	4.18"	1.97"	532-216	265.00
BT50						
BT50	5/8"	5.12"	5.59"	2.24"	532-219	346.70



NMTB Taper Integral Keyless Drill Chucks

These chucks provide exceptionally high torque - up to three times the gripping strength of conventional drill chuck / taper holder combinations. The design eliminates any possibility of chuck / holder misalignment, and it ensures separation safety

- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.

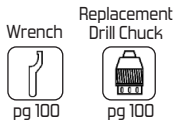


Taper	Cap.	Gage Length (Open)	Gage Length (Closed)	Chuck Dia.	Code No.	Price \$
NMTB40						
NMTB40	1/4"	2.36"	2.60"	1.3"	534-404	251.00
NMTB40	1/2"	3.75"	4.20"	1.97"	534-406	303.50
NMTB50						
NMTB50	1/2"	3.35"	3.74"	1.97"	534-408	306.80

Morse Taper Integral Keyless Drill Chucks

These chucks provide exceptionally high torque - up to three times the gripping strength of conventional drill chuck / taper holder combinations. The design eliminates any possibility of chuck / holder misalignment, and it ensures separation safety

- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.

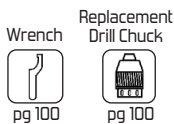


Shank	Gripping Dia. (mm)	Chuck Dia.	Gage Length	Code No.	Price \$
M.T. 4	0-13	51	100	337-426	131.70
M.T. 4	3-16	57	120	337-428	139.40

R8 Integral Keyless Drill Chucks

These chucks provide exceptionally high torque - up to three times the gripping strength of conventional drill chuck / taper holder combinations. The design eliminates any possibility of chuck / holder misalignment, and it ensures separation safety

- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.



Shank	Gripping Dia. (mm)	Chuck Dia.	Gage Length	Draw Bar	Code No.	Price \$
R-8	0-13	51	100	7/16-20	337-430	190.00
R-8	3-16	57	120	7/16-20	337-432	215.30

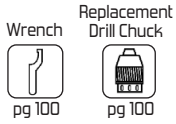
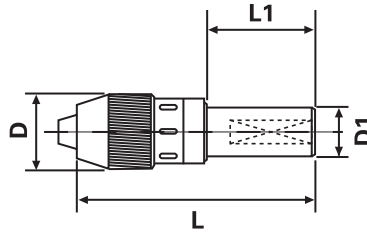


DRILL CHUCKS

Straight Shank Integral Keyless Drill Chucks

These chucks provide exceptionally high torque - up to three times the gripping strength of conventional drill chuck / taper holder combinations. The design eliminates any possibility of chuck / holder misalignment, and it ensures separation safety

- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.



Capacity	D1	L	L1	D	Code No.	Price \$
1/4"	3/4"	5.87"	2.56"	1.34"	534-410	111.00
1/2"	1-1/4"	6.06"	2.56"	1.97"	534-414	146.50

Replacement Drill Chucks



Description	Code No.	Price \$
1/4" chuck	534-422	109.20
1/2" chuck for BT 40	534-424	121.30
1/2" chuck for Cat 40 / NMTB 40	534-425	121.30
5/8" chuck for Cat 40	534-427	152.00

Replacement Chuck Wrenches



Description	Code No.	Price \$
Fits 1/4" chucks	534-418	4.80
Fits 1/2" chucks	534-420	4.80
Fits 5/8" chucks	534-431	6.60



Super Heavy Duty Ball Bearing Drill Chucks

GS Ball Bearing Chucks are specially designed for HEAVY DUTY drilling applications on production drilling machines, jig borers, milling machines, lathes and radials. The ideal choice for those jobs that require close tolerance drilling. The ball thrust bearing reduces friction in the chuck's closing mechanism, so the operator can apply more gripping power on the twist drill shank.

- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.



Chuck Model	Capacity (in.)	Mount	Code No.	Price \$
13BXH	1/64-1/2	JT6	536-500	84.50
16BXH	1/64-5/8	JT3	536-502	105.70
19BXH	1/64-3/4	JT4	536-504	137.30

Drill Chuck Keys



Chuck Model	Key No.	Code No.	Price \$
6GH 1/4	P1	536-544	2.30
10GH 3/8	P2	536-546	2.30
13GH 1/2 JT33	P6	536-548	3.30
13GH 1/2 JT6	P6	536-548	3.30
16GH 5/8	P7	536-550	3.30
19GH 3/4	P7	536-550	3.30
13BXH	P6	536-548	3.30
16BXH	P7	536-550	3.30
19BXH	P7	536-550	3.30

Plain Bearing Drill Chucks

GS Plain Bearing Chucks are specially designed for stationary drilling, turning, milling, and woodworking machines.

- Sleeve design eliminates the possibility of tooth breakage
- Hardened jaws and body help to avoid wear and lengthen the life of the chuck
- Each chuck supplied with a key



Chuck Model	Capacity (in.)	Mount	Code No.	Price \$
6GH	1/64-1/4	JT1	536-506	29.40
10GH	1/64-3/8	JT2	536-512	30.50
13GH	1/64-1/2	JT33	536-514	34.40
13GH	1/64-1/2	JT6	536-516	34.40
13GH	1/64-1/2	1/2-20	536-518	34.40
16GH	1/64-5/8	JT3	536-520	40.20
19GH	1/8-3/4	JT4	536-522	79.30

Super Precision Keyless Drill Chucks

These chucks provide exceptionally high torque - up to three times the gripping strength of conventional drill chuck / taper holder combinations. The design eliminates any possibility of chuck / holder misalignment, and it ensures separation safety

- High precision, premium tolerance
- The jaws feature a TiN coated surface treatment to ensure durability.



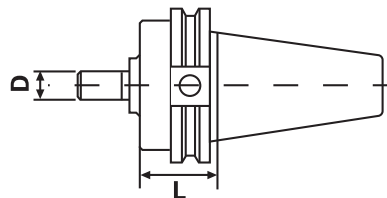
Chuck Model	Capacity (in.)	Mount	Code No.	Price \$
6XH	1/64-1/4	JT1	536-524	82.80
6XH	1/64-1/4	3/8-24	536-526	65.90
10XH	1/64-3/8	JT2	536-528	97.10
10XH	1/64-3/8	JT33	536-530	97.10
13XH	1/64-1/2	JT6	536-534	111.50
13XH	1/64-1/2	JT33	536-536	161.30
13XH	1/64-1/2	1/2-20	536-538	74.40
16XH	1/8-5/8	JT6	536-540	125.00
16XH	1/8-5/8	JT33	536-542	125.00



ADAPTERS

CAT Taper Jacobs Taper Adapters

- Shank traverse ground to obtain optimum accuracy
- Meets or exceeds ANSI specifications
- .0002" or better TIR ensures the best possible cutting tool life



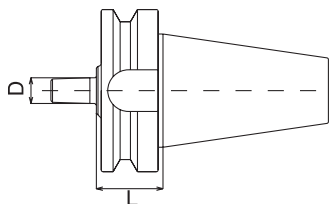
Pull Stud



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Taper	JT Size	L	D	Code No.	Price \$
CAT40					
CT40	JT#2	1.61"	.560"	531-490	102.60
CT40	JT#3	1.58"	.812"	531-492	102.60
CT40	JT#4	1.49"	1.13"	531-494	102.60
CT40	JT#6	1.61"	.677"	531-496	102.60
CT40	JT#33	1.61"	.625"	531-498	102.60
CAT50					
CT50	JT#2	1.61"	.560"	531-500	135.40
CT50	JT#3	1.58"	.812"	531-502	135.40
CT50	JT#4	1.49"	1.13"	531-504	135.40
CT50	JT#6	1.61"	.677"	531-506	135.40
CT50	JT#33	1.61"	.625"	531-508	135.40

BT Taper Jacobs Taper Adapters



Pull Stud



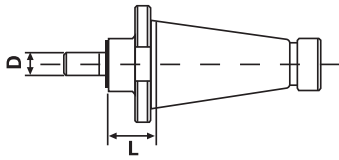
pg 135

Taper	JT Size	L	D	Code No.	Price \$
BT30					
BT30	JT#2	1.02"	.560"	532-220	71.10
BT30	JT#3	0.98"	.812"	532-222	79.20
BT30	JT#6	1.02"	.677"	532-224	71.10
BT30	JT#33	1.02"	.625"	532-226	71.10
BT40					
BT40	JT#2	1.61"	.560"	532-230	112.90
BT40	JT#3	1.57"	.812"	532-232	112.90
BT40	JT#6	1.61"	.677"	532-234	112.90
BT40	JT#33	1.61"	.625"	532-236	112.90
BT50					
BT50	JT#6	1.77"	.677"	532-237	127.80

• Available only while quantities last



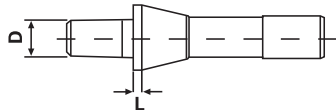
NMTB Taper Jacobs Taper Adapters



Taper	JT Size	L	D	Code No.	Price \$
NMTB40					
NMTB40	JT#1	0.69"	.385"	534-440 •	96.20
NMTB40	JT#2	0.65"	.560"	534-442 •	96.20
NMTB40	JT#3	0.61"	.812"	534-444 •	96.20
NMTB40	JT#6	0.65"	.677"	534-446 •	96.20
NMTB40	JT#33	0.65"	.625"	534-448 •	96.20
NMTB50					
NMTB50	JT#3	1.30"	.812"	534-452 •	134.30
NMTB50	JT#4	1.22"	1.13"	534-454 •	134.30
NMTB50	JT#6	1.34"	.677"	534-456 •	134.30
NMTB50	JT#33	1.34"	.625"	534-458 •	134.30

• Available only while quantities last

R8 Jacobs Taper Adapters

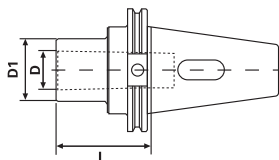


Taper	JT Size	L	D	Code No.	Price \$
R8	JT#2	0.13"	.560"	534-462 •	66.00
R8	JT#3	0.13"	.812"	534-464 •	66.00
R8	JT#6	0.13"	.677"	534-466 •	66.00
R8	JT#33	0.13"	.625"	534-468 •	66.00

CAT Morse Taper Adapters

- Shank traverse ground to obtain optimum accuracy
- Meets or exceeds ANSI specifications
- .0002" or better TIR ensures the best possible cutting tool life

Pull Stud
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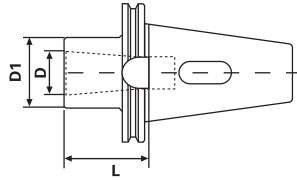
Taper	Size	L	D	D1	Code No.	Price \$
CAT40						
CT40	MT#1	1.75"	.475"	1.00"	531-510 •	107.80
CT40	MT#2	2.36"	.700"	1.25"	531-512 •	107.80
CT40	MT#3	3.00"	.938"	1.57"	531-514 •	107.80
CT40	MT#4	3.54"	1.23"	1.97"	531-516 •	107.80
CAT50						
CT50	MT#2	1.75"	.700"	1.25"	531-518 •	146.80
CT50	MT#3	1.75"	.938"	1.57"	531-520 •	158.60
CT50	MT#4	3.00"	1.23"	1.97"	531-522 •	158.60
CT50	MT#5	4.13"	1.75"	2.75"	531-524 •	178.50



ADAPTERS

BT Morse Taper Adapters

- Shank traverse ground to obtain optimum accuracy
- Meets or exceeds ANSI specifications
- .0002" or better TIR ensures the best possible cutting tool life

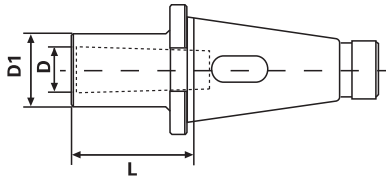


Pull Stud

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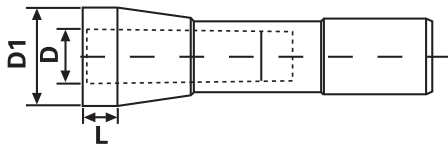
Taper	Size	L	D	D1	Code No.	Price \$
BT30						
BT30	MT#1	1.75"	.475"	1.00"	532-238	86.40
BT30	MT#2	2.36"	.700"	1.25"	532-240	86.40
BT40						
BT40	MT#1	1.75"	.475"	1.00"	532-242	118.60
BT40	MT#2	2.36"	.700"	1.25"	532-244	118.60
BT40	MT#3	3.00"	.938"	1.57"	532-246	118.60
BT40	MT#4	3.54"	1.23"	1.97"	532-248	118.60
BT50						
BT50	MT#2	1.75"	.700"	1.25"	532-241	153.00
BT50	MT#3	1.75"	.928"	1.57"	532-243	153.00
BT50	MT#4	3.00"	1.231"	1.89"	532-245	172.80
BT50	MT#5	4.00"	1.748"	2.48"	532-247	175.50

NMTB Morse Taper Adapters



Taper	Size	L	D	D1	Code No.	Price \$
NMTB40						
NMTB40	MT#2	1.75"	0.70"	1.25"	534-472	103.00
NMTB40	MT#3	2.25"	0.94"	1.57"	534-474	103.00
NMTB40	MT#4	3.00"	1.23"	1.97"	534-476	103.00
NMTB50						
NMTB50	MT#2	1.88"	0.70"	1.25"	534-478	151.60
NMTB50	MT#3	2.38"	0.94"	1.57"	534-480	156.10
NMTB50	MT#4	3.25"	1.23"	1.97"	534-482	160.60
NMTB50	MT#5	4.63"	1.75"	2.75"	534-484	175.70

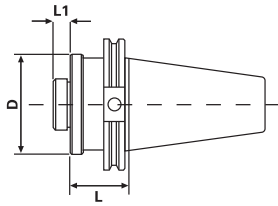
R8 Morse Taper Adapters



Taper	Size	L	D	D1	Code No.	Price \$
R8	MT#1	0.44"	0.48"	1.00"	534-486	68.00
R8	MT#2	0.44"	0.70"	1.25"	534-488	68.00
R8	MT#3	2.56"	0.94"	1.57"	534-490	74.70



CAT Taper Boring Head Holders

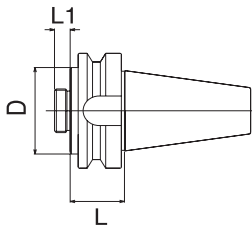


Pull Stud
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Taper	Thread	L	L1	D	Code No	Price \$
CAT40						
CT40	7/8" - 20	1.75"	0.44"	1.75"	531-526	85.60
CT40	1-1/2" - 18	1.75"	0.50"	2.96"	531-528	87.30
CAT50						
CT50	1-1/2" - 18	1.75"	0.50"	2.96"	531-532	122.80

BT Taper Boring Head Holders



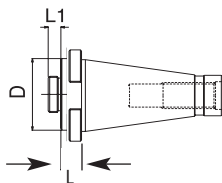
Pull Stud
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Taper	Thread	L	L1	D	Code No.	Price \$
BT30						
BT30	1-1/2"-18	1.75"	0.50"	2.96"	532-252	86.50
BT40						
BT40	7/8"-20	1.75"	0.44"	1.75"	532-254 •	86.60
BT40	1-1/2"-18	1.75"	0.50"	2.96"	532-256 •	88.80

• Available only while quantities last

NMTB Taper Boring Head Holders



Taper	Thread	L	L1	D	Code No.	Price \$
NMTB40						
NMTB40	7/8"-20	1.75"	0.44"	1.75"	534-492	83.60
NMTB40	1-1/2"-18	1.75"	0.50"	2.96"	534-494 •	84.50
NMTB50						
NMTB50	7/8"-20	1.75"	0.44"	1.75"	534-496	122.80
NMTB50	1-1/2"-18	1.75"	0.50"	2.94"	534-498	123.10

• Available only while quantities last



Simple Tool Setting Stands

Quick and easy way to change cutters and pull studs. Protects the taper of holder with protective insert.

Available in all tapers.

- This is an excellent helping tool for simple, rapid and safe tool holding
- For Cat, BT & NMTB Tapers

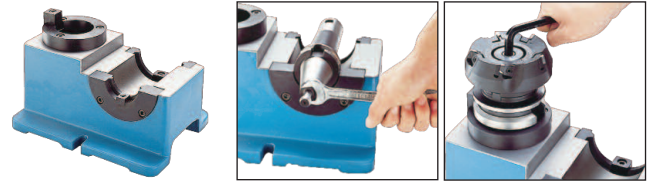


Model	Code No.	Price \$
TL-30	335-200	245.20
TL-35	335-205	245.20
TL-40	335-210	245.20
TL-50	335-220	245.20

Deluxe Tool Setting Stands

Quick and easy way to change cutters and pull studs. Protects the taper of holder with protective insert. Available in all tapers.

- Select between horizontal or vertical tool holding; quick and simple operation
- For Cat, BT & NMTB Tapers



Vertical	Horizontal	Code No.	Price \$
TL40 Taper	40 Taper x 2 (only BT & NMTB)	335-250	456.10
TL50 Taper	50 Taper x 2 (only BT & NMTB)	335-260	456.10
TL50 Taper	50 Taper x 1 / 40 Taper x 1	335-240	456.10
TL40 Taper	50 Taper x 1 / 40 Taper x 1	335-230	456.10

Tool Holder Locking Devices

- For Cat, BT & NMTB Tapers



Description	Code No.	Price \$
30 Taper	335-270	252.30
40 Taper	335-275	252.30
50 Taper (Only CAT50 & NMTB50)	335-280	252.30

HSK Tool Holder Locking Fixture

- Weight: 4.5 kg

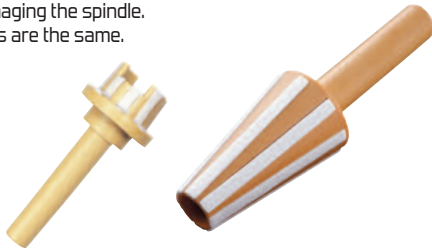


Description	Code No.	Price \$
HSK63	335-225	545.40

Spindle Taper Wipers

Features:

- For easily and quickly cleaning spindle holes.
- Plastic body, the taper wiper is made of special cotton material therefore not damaging the spindle.
- The BT & DIN tapers are the same.



Model No.	Taper	Total Length	Code No.	Price \$
VTW-30	#30	168mm	326-210	25.40
VTW-40	#40	159mm	326-215	25.40
VTW-50	#50	265mm	326-220	36.90
VTW-50H	HSK50	159mm	326-225	116.20
VTW-63H	HSK63	167mm	326-230	116.20

NC/CNC Trolleys

Complete Tool Trolley with

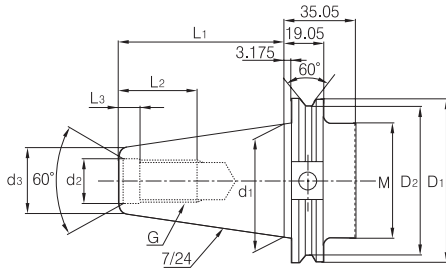
- 4 Tool Trays and Inserts.
- Trays bolt in
- (W)1002mm x (D)650mm x (H)830mm
- Weight: 51kgs



Desc.	Taper Type	Inserts Per Tray	Replacement Plastic Inserts Code No.	Price \$	Tool Cart Code No.	Price \$
Trolley, 4 trays hold 28 inserts	40	7	326-986	5.00	326-985	799.60
Trolley, 4 trays hold 20 inserts	50	5	326-996	4.80	326-995	799.60

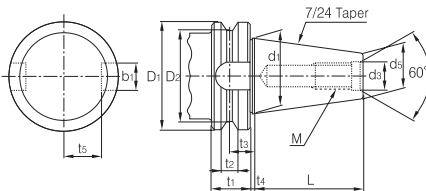


CAT Taper Dimensions



Shank No.	D1	D2	M	d1	d2	d3	L1	L2	L3	G
CAT40	63.5	56.36	44.45	44.45	16.28	21.84	68.25	28.45	4.78	5/8-11
CAT45	82.55	75.41	57.15	57.15	19.46	27.69	82.55	38.1	4.78	3/4-10
CAT50	98.43	91.29	69.85	69.85	26.19	35.05	101.6	44.45	6.35	1-8

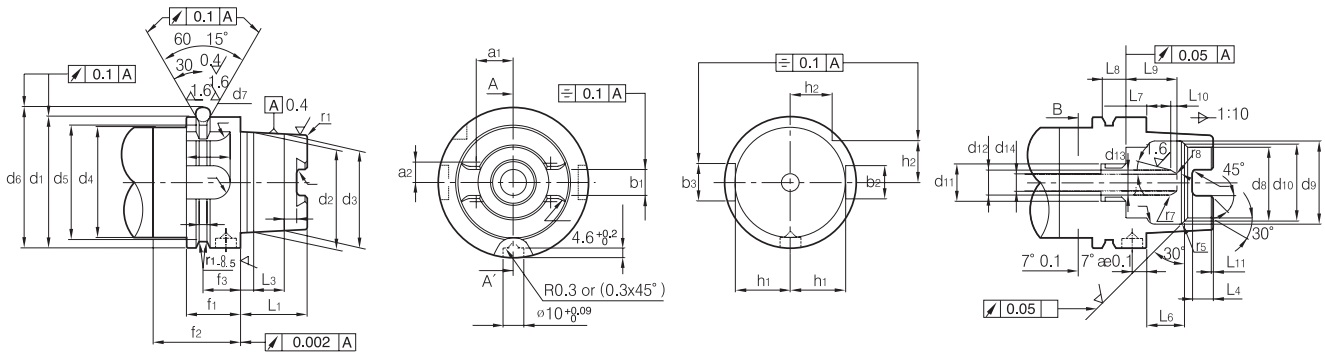
BT Taper Dimensions



BT No.	D1	D2	t1	t2	t3	t4	d1	d3	L	M	b1	t5	d5
35	53	43	22	10	14.6	2	38.1	13	56.5	M12x1.75	16.1	19.6	21.62
40	63	52	25	10	16.6	2	44.45	17	65.4	M16x2	16.1	22.6	25.3
45	85	73	30	12	21.2	3	57.15	21	82.8	M20x2.5	9.3	29.1	33.1
50	100	85	35	15	23.2	3	69.85	25	101.8	M24x3	25.7	35.4	40.1
60	155	135	45	20	28.2	3	107.95	31	161.8	M30x3.5	25.7	60.1	60.7

Tap/Drill Chucks

HSK Taper Dimensions



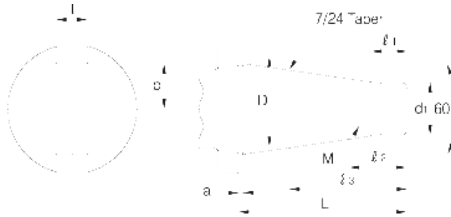
Shank No.	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
HSK50	10.54	12	14	50	38	36.9	42	43	59.3	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.5	16	14	63	48	46.53	53	55	72.3	7	34	40	37	M18X1	12	8	8.4	17.862	9.25
100	20	20	14	100	75	72.80	85	92	109.75	7	53	63	58	M24X1.5	16	12	12	27.329	15

Shank No.	f1	f2	f3	f4	b1	b2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	r1	r2	r3	r4	r5	r6	r7	r8
HSK50	26	42	18	3.75	2	15.5	25	5	11	7.5	4.5	14.13	10	10	23	3	1	19	1	1.5	2.38	6	0.5	1	2	6
63	26	42	18	3.75	28.5	20	32	6.3	14.7	10	6	18.13	10	12	24.5	3	1	21	1.2	1.5	3	8	0.6	1.5	3	8
100	29	45	20	3.75	44	31.5	50	10	24	15	10	28.56	12.5	16	28	3	1.5	24	2	2	3	12	1	1.5	3	10



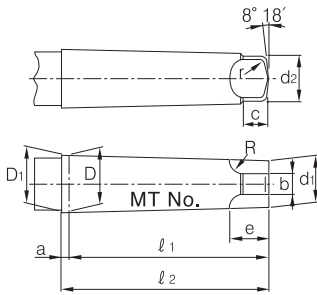
TECH DATA

NMTB Taper Dimensions



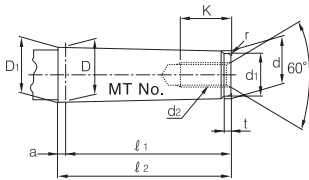
MT NO.	D	d1	L	1	M	2	3	a	t	b
30	1-1/4"-31.75	17.40(-0.29/-0.36)	70	20	UNC-1/2"	24	50	1.6	15.9	6
40	1-3/4"-44.45	25.32(-0.30/-0.387)	95	25	UNC-5/8"	30	60	1.6	15.9	22.5
50	2-3/4"-69.85	39.60(-0.31/-0.41)	130	25	UNC-1"	45	90	3.2	25.4	35
60	4-1/4"-107.95	60.20(-0.34/-0.46)	210	45	UNC1/4"	56	110	3.2	25.4	60

Morse Taper With Tang



MT No.	Taper	Taper Angle(a)	D	a	D1	d1	1	2	d2	b	c	e	R	r
0	1/19.212	1°29'27"	9.045	3	9.201	6.104	56.5	59.5	6	3.9	6.5	10.5	4	1
1	1/20.047	1°25'43"	12.065	3.5	12.24	8.972	62	65.5	8.7	5.2	8.5	13.5	5	1.2
2	1/20.020	1°25'50"	17.78	5	18.03	14.034	75	80	13.5	6.3	10	16	6	1.6
3	1/19.922	1°26'16"	23.825	5	24.076	19.107	94	99	18.5	7.9	13	20	7	2
4	1/19.254	1°29'15"	31.267	6.5	31.605	25.164	117.5	124	24.5	11.9	16	24	8	2.5
5	1/19.002	1°30'26"	44.399	6.5	4.741	36.531	149.5	156	35.7	15.9	19	29	10	3
6	1/19.180	1°29'36"	63.348	8	63.765	52.399	210	218	51	19	27	40	13	4
7	1/19.231	1°29'22"	83.058	10	83.578	68.186	286	296	66.8	28.6	35	54	19	5

Morse Taper Screw Type



MT No.	Taper	Taper Angle(a)	D	a	D1	d1	1	2	d1	d2	k	t	r
0	1/19.212	1°29'27"	9.045	3	9.201	6.442	50	53	6	-	-	4	0.2
1	1/20.047	1°25'43"	12.065	3.5	12.23	9.396	53.5	57	9	M6	16	5	0.2
2	1/20.020	1°25'50"	17.78	5	18.03	14.583	64	69	14	M10	24	5	0.2
3	1/19.922	1°26'16"	23.825	5	24.076	19.759	81	86	19	M12	28	7	0.6
4	1/19.254	1°29'15"	31.267	6.5	31.605	25.943	2.5	109	25	M16	32	9	1
5	1/19.002	1°30'26"	44.399	6.5	4.741	37.584	129.5	136	35.7	M20	40	9	2.5
6	1/19.180	1°29'36"	63.348	8	63.765	53.859	182	190	51	M24	50	12	4
7	1/19.231	1°29'22"	83.058	10	83.578	70.058	250	260	65	M33	80	18.5	5



WORKHOLDING SOLUTIONS

**BUILD YOUR OWN
TOOLING PACKAGE
AND SAVE!**

GS Premium Balanced Rotary Tooling

- *DIN Coolant option - standard*
- *All Ground Body*
- *100% Forged Construction*
- *Balanced up to 30,000 rpm*



**GUARANTEED TO MATCH ALL
COMPETITORS PRICES ON EQUIVALENT PRODUCTS**

CAT40 End Mill Holders

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction



CAT 40
Premium
Balanced
30x
RPM

Taper	Hole Dia.	Gage Length	Code No.	Select
CT40	1/8"	1.35"*	531-069	<input type="checkbox"/>
CT40	1/8"	2.50"	531-070	<input type="checkbox"/>
CT40	1/8"	4.00"	531-071	<input type="checkbox"/>
CT40	3/16"	1.38"*	531-072	<input type="checkbox"/>
CT40	3/16"	2.50"	531-073	<input type="checkbox"/>
CT40	3/16"	4.00"	531-074	<input type="checkbox"/>
CT40	1/4"	1.38"*	531-000	<input type="checkbox"/>
CT40	1/4"	2.50"	531-002	<input type="checkbox"/>
CT40	1/4"	4.00"	531-004	<input type="checkbox"/>
CT40	1/4"	9.00"	531-005	<input type="checkbox"/>
CT40	5/16"	1.38"*	531-006	<input type="checkbox"/>
CT40	5/16"	2.50"	531-008	<input type="checkbox"/>
CT40	5/16"	4.00"	531-010	<input type="checkbox"/>
CT40	5/16"	9.00"	531-011	<input type="checkbox"/>
CT40	3/8"	1.38"*	531-012	<input type="checkbox"/>
CT40	3/8"	2.50"	531-014	<input type="checkbox"/>
CT40	3/8"	4.00"	531-016	<input type="checkbox"/>
CT40	3/8"	5.00"	531-018	<input type="checkbox"/>
CT40	3/8"	9.00"	531-031	<input type="checkbox"/>
CT40	7/16"	2.50"	531-020	<input type="checkbox"/>
CT40	7/16"	4.00"	531-022	<input type="checkbox"/>
CT40	7/16"	9.00"	531-033	<input type="checkbox"/>
CT40	1/2"	1.75"*	531-024	<input type="checkbox"/>
CT40	1/2"	2.50"	531-026	<input type="checkbox"/>
CT40	1/2"	4.00"	531-028	<input type="checkbox"/>
CT40	1/2"	5.00"	531-030	<input type="checkbox"/>
CT40	1/2"	9.00"	531-035	<input type="checkbox"/>
CT40	5/8"	1.75"*	531-032	<input type="checkbox"/>
CT40	5/8"	3.00"	531-034	<input type="checkbox"/>
CT40	5/8"	4.00"	531-036	<input type="checkbox"/>
CT40	5/8"	5.50"	531-038	<input type="checkbox"/>
CT40	5/8"	9.00"	531-037	<input type="checkbox"/>
CT40	3/4"	1.75"*	531-040	<input type="checkbox"/>
CT40	3/4"	3.00"	531-042	<input type="checkbox"/>
CT40	3/4"	4.00"	531-044	<input type="checkbox"/>
CT40	3/4"	5.50"	531-046	<input type="checkbox"/>
CT40	3/4"	9.00"	531-039	<input type="checkbox"/>
CT40	7/8"	1.75"*	531-048	<input type="checkbox"/>
CT40	7/8"	3.50"	531-050	<input type="checkbox"/>
CT40	7/8"	6.00"	531-052	<input type="checkbox"/>
CT40	7/8"	9.00"	531-041	<input type="checkbox"/>
CT40	1"	2.00"*	531-054	<input type="checkbox"/>
CT40	1"	4.00"	531-056	<input type="checkbox"/>
CT40	1"	6.00"	531-058	<input type="checkbox"/>
CT40	1"	9.00"	531-043	<input type="checkbox"/>
CT40	1-1/4"	2.00"*	531-060†	<input type="checkbox"/>
CT40	1-1/4"	4.00"	531-062	<input type="checkbox"/>
CT40	1-1/4"	6.00"	531-064	<input type="checkbox"/>
CT40	1-1/2"	4.50"	531-066	<input type="checkbox"/>
CT40	1-1/2"	6.00"	531-068	<input type="checkbox"/>

* Stubby Length

‡ Not DIN Coolant

CAT40 Shell Mill Holders

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction



Taper	Dia.	Gage Length	Code No.	Select
CT40	1/2"	1.75"	531-190	<input type="checkbox"/>
CT40	3/4"	1.75"	531-192	<input type="checkbox"/>
CT40	3/4"	4.00"	531-194	<input type="checkbox"/>
CT40	3/4"	6.00"	531-195	<input type="checkbox"/>
CT40	1"	1.75"	531-196	<input type="checkbox"/>
CT40	1"	4.00"	531-198	<input type="checkbox"/>
CT40	1"	6.00"	531-199	<input type="checkbox"/>
CT40	1-1/4"	2.00"	531-200	<input type="checkbox"/>
CT40	1-1/4"	4.00"	531-202	<input type="checkbox"/>
CT40	1-1/4"	6.00"	531-203	<input type="checkbox"/>
CT40	1-1/2"	2.00"	531-204	<input type="checkbox"/>
CT40	1-1/2"	4.00"	531-206	<input type="checkbox"/>

CAT40 ER Collet Chucks

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction
- Factory Balanced to save spindle life, tool life and increase productivity
- Threaded through holes for a back-up screw (tool stop) or coolant through when removed
- Wrench not included



CAT 40
Premium
Balanced
30x
RPM

Taper	Collet Series	Collet Range	Gage Length	Code No.	Select
CT40	ER11	.019-.275"	2.50"	531-400	<input type="checkbox"/>
CT40	ER11	.019-.275"	4.00"	531-402	<input type="checkbox"/>
CT40	ER11	.019-.275"	6.00"	531-404	<input type="checkbox"/>
CT40	ER16	.019-.406"	2.50"	531-406	<input type="checkbox"/>
CT40	ER16	.019-.406"	3.50"	531-408	<input type="checkbox"/>
CT40	ER16	.019-.406"	4.00"	531-405	<input type="checkbox"/>
CT40	ER16	.019-.406"	6.00"	531-410	<input type="checkbox"/>
CT40	ER16	.019-.406"	9.00"	531-411	<input type="checkbox"/>
CT40	ER20	.039-.511"	2.50"	531-412	<input type="checkbox"/>
CT40	ER20	.039-.511"	4.00"	531-414	<input type="checkbox"/>
CT40	ER20	.039-.511"	6.00"	531-416	<input type="checkbox"/>
CT40	ER20	.039-.511"	9.00"	531-417	<input type="checkbox"/>
CT40	ER25	.039-.629"	2.50"	531-418	<input type="checkbox"/>
CT40	ER25	.039-.629"	4.00"	531-420	<input type="checkbox"/>
CT40	ER25	.039-.629"	6.00"	531-422	<input type="checkbox"/>
CT40	ER32	.078-.787"	.750"	531-401*	<input type="checkbox"/>
CT40	ER32	.078-.787"	2.50"	531-421	<input type="checkbox"/>
CT40	ER32	.078-.787"	3.13"	531-424	<input type="checkbox"/>
CT40	ER32	.078-.787"	4.00"	531-423	<input type="checkbox"/>
CT40	ER32	.078-.787"	5.00"	531-426	<input type="checkbox"/>
CT40	ER32	.078-.787"	6.00"	531-425	<input type="checkbox"/>
CT40	ER32	.078-.787"	9.00"	531-419	<input type="checkbox"/>
CT40	ER40	.118-1.023"	2.50"	531-427	<input type="checkbox"/>
CT40	ER40	.118-1.023"	3.13"	531-428	<input type="checkbox"/>
CT40	ER40	.118-1.023"	4.00"	531-429	<input type="checkbox"/>
CT40	ER40	.118-1.023"	5.00"	531-430	<input type="checkbox"/>
CT40	ER40	.118-1.023"	6.00"	531-431	<input type="checkbox"/>

* ER Shorty collet chuck

Company: _____

Contact: _____

Phone: _____

Fax: _____

e-mail: _____

Notes: _____

ER Collet Sets



* Case may not be as shown



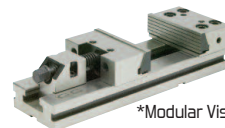
• Alloy Steel

Collet	Description	Range	Code No.	Select
ER11	Inch Size 7pc Collet Set	1/16-1/4 x 32nds	337-401	<input type="checkbox"/>
ER11	Decimal 13pc Collet Set	.019"-.271"	337-379	<input type="checkbox"/>
ER16	Inch Size 11pc Collet Set	1/16-3/8 x 32nds	337-403	<input type="checkbox"/>
ER16	Decimal 10pc Collet Set	.019"-.393"	337-380	<input type="checkbox"/>
ER20	Inch Size 15pc Collet Set	1/16-1/2 x 32nds	337-404	<input type="checkbox"/>
ER20	Decimal 12pc Collet Set	.039"-.510"	337-382	<input type="checkbox"/>
ER25	Inch Size 17pc Collet Set	1/8-5/8 x 32nds	337-405	<input type="checkbox"/>
ER25	Decimal 15pc Collet Set	.039"-.629"	337-383	<input type="checkbox"/>
ER32	Inch Size 21pc Collet Set	1/8-3/4 x 32nds	337-407	<input type="checkbox"/>
ER32	Decimal 18pc Collet Set	.078"-.787"	337-384	<input type="checkbox"/>
ER40	Inch Size 29pc Collet Set	1/8-1" x 32nds	337-409	<input type="checkbox"/>
ER40	Decimal 23pc Collet Set	.118"-1.023"	337-386	<input type="checkbox"/>

GS Modular & Milling Machine Vises

• Vises are Matched

*Milling Machine Vise



*Modular Vise



Model	Jaw Width	Jaw Opening	Code No.	Select
GS675	6	7.5	327-275M	<input type="checkbox"/>
GS890	6	8.9	327-290M	<input type="checkbox"/>
GS810	8	10.0	327-300	<input type="checkbox"/>
#3 Modular	6	8	382-015	<input type="checkbox"/>

NC/CNC Trolley

Complete Tool Trolley with 4 Tool Trays and Inserts.

- Trays bolt in
- (W) 39.45"
- (D) 25.59"
- (H) 32.68"
- Weight: 112.20 lbs



Desc.	Taper Type	Trays x Inserts	Code No.	Select
Trolley	40	4 x 7	326-985	<input type="checkbox"/>
Trolley	50	4 x 5	326-995	<input type="checkbox"/>



CAT50 TOOLING PACKAGE QUOTE REQUEST FORM



Fax back to **SOWA** Toll Free Fax: 1-866-511-7692 Fax: 519-748-9304

CAT50 End Mill Holders

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction



CAT50 Shell Mill Holders

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction



Taper	Hole Dia.	Gage Length	Code No.	Select
CT50	1/4"	1.38"	531-082	<input type="checkbox"/>
CT50	1/4"	2.50"	531-084	<input type="checkbox"/>
CT50	1/4"	4.00"	531-086	<input type="checkbox"/>
CT50	1/4"	6.00"	531-088	<input type="checkbox"/>
CT50	1/4"	8.00"	531-090	<input type="checkbox"/>
CT50	5/16"	2.50"	531-092	<input type="checkbox"/>
CT50	5/16"	4.00"	531-094	<input type="checkbox"/>
CT50	5/16"	6.00"	531-096	<input type="checkbox"/>
CT50	3/8"	1.38"	531-098	<input type="checkbox"/>
CT50	3/8"	2.50"	531-100	<input type="checkbox"/>
CT50	3/8"	4.00"	531-102	<input type="checkbox"/>
CT50	3/8"	6.00"	531-104	<input type="checkbox"/>
CT50	3/8"	8.00"	531-106	<input type="checkbox"/>
CT50	3/8"	14.00"	531-107	<input type="checkbox"/>
CT50	7/16"	2.50"	531-108	<input type="checkbox"/>
CT50	7/16"	4.00"	531-110	<input type="checkbox"/>
CT50	7/16"	6.00"	531-112	<input type="checkbox"/>
CT50	7/16"	8.00"	531-114	<input type="checkbox"/>
CT50	7/16"	14.00"	531-113	<input type="checkbox"/>
CT50	1/2"	1.75"	531-116	<input type="checkbox"/>
CT50	1/2"	2.63"	531-118	<input type="checkbox"/>
CT50	1/2"	4.00"	531-120	<input type="checkbox"/>
CT50	1/2"	6.00"	531-122	<input type="checkbox"/>
CT50	1/2"	8.00"	531-124	<input type="checkbox"/>
CT50	1/2"	14.00"	531-125	<input type="checkbox"/>
CT50	9/16	6.00"	531-133	<input type="checkbox"/>
CT50	5/8"	1.75"	531-126	<input type="checkbox"/>
CT50	5/8"	3.00"	531-128	<input type="checkbox"/>
CT50	5/8"	4.00"	531-130	<input type="checkbox"/>
CT50	5/8"	6.00"	531-132	<input type="checkbox"/>
CT50	5/8"	8.00"	531-134	<input type="checkbox"/>
CT50	5/8"	14.00"	531-131	<input type="checkbox"/>
CT50	3/4"	1.75"	531-136	<input type="checkbox"/>
CT50	3/4"	3.00"	531-138	<input type="checkbox"/>
CT50	3/4"	4.00"	531-140	<input type="checkbox"/>
CT50	3/4"	6.00"	531-142	<input type="checkbox"/>
CT50	3/4"	8.00"	531-144	<input type="checkbox"/>
CT50	3/4"	14.00"	531-145	<input type="checkbox"/>
CT50	7/8"	1.75"	531-146	<input type="checkbox"/>
CT50	7/8"	3.75"	531-148	<input type="checkbox"/>
CT50	7/8"	6.00"	531-150	<input type="checkbox"/>
CT50	1"	2.00"	531-152	<input type="checkbox"/>
CT50	1"	4.00"	531-154	<input type="checkbox"/>
CT50	1"	6.00"	531-156	<input type="checkbox"/>
CT50	1"	8.00"	531-158	<input type="checkbox"/>
CT50	1"	14.00"	531-159	<input type="checkbox"/>
CT50	1-1/4"	2.00"	531-160	<input type="checkbox"/>
CT50	1-1/4"	4.00"	531-162	<input type="checkbox"/>
CT50	1-1/4"	6.00"	531-164	<input type="checkbox"/>
CT50	1-1/4"	8.00"	531-166	<input type="checkbox"/>
CT50	1-1/4"	14.00"	531-167	<input type="checkbox"/>
CT50	1-1/2"	2.25"	531-168	<input type="checkbox"/>
CT50	1-1/2"	4.50"	531-170	<input type="checkbox"/>
CT50	1-1/2"	7.00"	531-172	<input type="checkbox"/>
CT50	1-1/2"	9.00"	531-174	<input type="checkbox"/>
CT50	2"	3.63"	531-176	<input type="checkbox"/>
CT50	2"	5.37"	531-178	<input type="checkbox"/>
CT50	2"	8.00"	531-180	<input type="checkbox"/>
CT50	2"	10.00"	531-182	<input type="checkbox"/>
CT50	2-1/2"	6.00"	531-184	<input type="checkbox"/>

Taper	Dia.	Gage Length	Code No.	Select
CT50	3/4"	1.75"	531-208	<input type="checkbox"/>
CT50	3/4"	4.00"	531-210	<input type="checkbox"/>
CT50	3/4"	6.00"	531-212	<input type="checkbox"/>
CT50	3/4"	8.00"	531-214	<input type="checkbox"/>
CT50	1"	1.75"	531-216	<input type="checkbox"/>
CT50	1"	4.00"	531-218	<input type="checkbox"/>
CT50	1"	6.00"	531-220	<input type="checkbox"/>
CT50	1"	8.00"	531-222	<input type="checkbox"/>
CT50	1-1/4"	1.75"	531-224	<input type="checkbox"/>
CT50	1-1/4"	4.00"	531-226	<input type="checkbox"/>
CT50	1-1/4"	6.00"	531-228	<input type="checkbox"/>
CT50	1-1/4"	8.00"	531-230	<input type="checkbox"/>
CT50	1-1/2"	2.00"	531-232	<input type="checkbox"/>
CT50	1-1/2"	4.00"	531-234	<input type="checkbox"/>
CT50	1-1/2"	6.00"	531-236	<input type="checkbox"/>
CT50	1-1/2"	8.00"	531-238	<input type="checkbox"/>
CT50	2"	2.00"	531-240	<input type="checkbox"/>
CT50	2"	4.00"	531-242	<input type="checkbox"/>
CT50	2"	6.00"	531-244	<input type="checkbox"/>

CAT50 ER Collet Chucks

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction
- Wrench not included



Taper	Collet Series	Collet Range	Gage Length	Code No.	Select
CT50	ER16	.019-.406"	4.12"	531-432	<input type="checkbox"/>
CT50	ER16	.019-.406"	6.00"	531-434	<input type="checkbox"/>
CT50	ER16	.019-.406"	8.00"	531-436	<input type="checkbox"/>
CT50	ER16	.019-.406"	12.00"	531-437	<input type="checkbox"/>
CT50	ER20	.039-.511"	2.50"	531-438	<input type="checkbox"/>
CT50	ER20	.039-.511"	4.00"	531-440	<input type="checkbox"/>
CT50	ER20	.039-.511"	6.00"	531-442	<input type="checkbox"/>
CT50	ER20	.039-.511"	8.00"	531-444	<input type="checkbox"/>
CT50	ER20	.039-.511"	12.00"	531-445	<input type="checkbox"/>
CT50	ER25	.039-.629"	2.50"	531-446	<input type="checkbox"/>
CT50	ER25	.039-.629"	4.00"	531-448	<input type="checkbox"/>
CT50	ER25	.039-.629"	6.00"	531-450	<input type="checkbox"/>
CT50	ER25	.039-.629"	8.00"	531-452	<input type="checkbox"/>
CT50	ER32	.078-.787"	.750"	531-403*	<input type="checkbox"/>
CT50	ER32	.078-.787"	4.00"	531-454	<input type="checkbox"/>
CT50	ER32	.078-.787"	6.00"	531-456	<input type="checkbox"/>
CT50	ER32	.078-.787"	8.00"	531-458	<input type="checkbox"/>
CT50	ER32	.078-.787"	12.00"	531-459	<input type="checkbox"/>
CT50	ER40	.118-1.023"	4.00"	531-460	<input type="checkbox"/>
CT50	ER40	.118-1.023"	6.00"	531-462	<input type="checkbox"/>
CT50	ER40	.118-1.023"	8.00"	531-464	<input type="checkbox"/>
CT50	ER40	.118-1.023"	12.00"	531-465	<input type="checkbox"/>

* ER Shortly collet chuck

Company: _____

Contact: _____

Phone: _____

Fax: _____

e-mail: _____

Notes: _____

ER Collet Sets



* Case may not be as shown



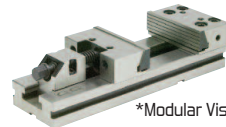
• Alloy Steel

Collet	Description	Range	Code No.	Select
ER11	Inch Size 7pc Collet Set	1/16-1/4 x 32nds	337-401	<input type="checkbox"/>
ER11	Decimal 13pc Collet Set	.019"-.271"	337-379	<input type="checkbox"/>
ER16	Inch Size 11pc Collet Set	1/16-3/8 x 32nds	337-403	<input type="checkbox"/>
ER16	Decimal 10pc Collet Set	.019"-.393"	337-380	<input type="checkbox"/>
ER20	Inch Size 15pc Collet Set	1/16-1/2 x 32nds	337-404	<input type="checkbox"/>
ER20	Decimal 12pc Collet Set	.039"-.510"	337-382	<input type="checkbox"/>
ER25	Inch Size 17pc Collet Set	1/8-5/8 x 32nds	337-405	<input type="checkbox"/>
ER25	Decimal 15pc Collet Set	.039"-.629"	337-383	<input type="checkbox"/>
ER32	Inch Size 21pc Collet Set	1/8-3/4 x 32nds	337-407	<input type="checkbox"/>
ER32	Decimal 18pc Collet Set	.078"-.787"	337-384	<input type="checkbox"/>
ER40	Inch Size 29pc Collet Set	1/8-1" x 32nds	337-409	<input type="checkbox"/>
ER40	Decimal 23pc Collet Set	.118"-1.023"	337-386	<input type="checkbox"/>

GS Modular & Milling Machine Vises

• Vises are Matched

*Milling Machine Vise



*Modular Vise



Model	Jaw Width	Jaw Opening	Code No.	Select
GS675	6	7.5	327-275M	<input type="checkbox"/>
GS890	6	8.9	327-290M	<input type="checkbox"/>
GS810	8	10.0	327-300	<input type="checkbox"/>
#3 Modular	6	8	382-015	<input type="checkbox"/>

NC/CNC Trolley

Complete Tool Trolley with 4 Tool Trays and Inserts.

- Trays bolt in
- (W) 39.45"
- (D) 25.59"
- (H) 32.68"
- Weight: 112.20 lbs



Desc.	Taper Type	Trays x Inserts	Code No.	Select
Trolley	40	4 x 7	326-985	<input type="checkbox"/>
Trolley	50	4 x 5	326-995	<input type="checkbox"/>



BT40 End Mill Holders

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction



BT 40
Premium
Balanced
30x
RPM

Taper	Hole Dia.	Gage Length	Code No.	Select
BT40	1/8"	1.38"	531-019	<input type="checkbox"/>
BT40	1/8"	2.50"	531-021	<input type="checkbox"/>
BT40	1/8"	4.00"	531-023	<input type="checkbox"/>
BT40	3/16"	1.38"	531-025	<input type="checkbox"/>
BT40	3/16"	2.50"	531-027	<input type="checkbox"/>
BT40	3/16"	4.00"	531-029	<input type="checkbox"/>
BT40	1/4"	1.38"	532-018	<input type="checkbox"/>
BT40	1/4"	2.50"	532-020	<input type="checkbox"/>
BT40	1/4"	4.00"	532-022	<input type="checkbox"/>
BT40	5/16"	1.38"	532-024	<input type="checkbox"/>
BT40	5/16"	2.50"	532-026	<input type="checkbox"/>
BT40	5/16"	4.00"	532-028	<input type="checkbox"/>
BT40	3/8"	1.38"	532-030	<input type="checkbox"/>
BT40	3/8"	2.50"	532-032	<input type="checkbox"/>
BT40	3/8"	4.00"	532-034	<input type="checkbox"/>
BT40	7/16"	2.50"	532-036	<input type="checkbox"/>
BT40	1/2"	1.75"	532-038	<input type="checkbox"/>
BT40	1/2"	2.50"	532-040	<input type="checkbox"/>
BT40	1/2"	4.00"	532-042	<input type="checkbox"/>
BT40	5/8"	1.75"	532-044	<input type="checkbox"/>
BT40	5/8"	2.50"	532-046	<input type="checkbox"/>
BT40	5/8"	4.00"	532-048	<input type="checkbox"/>
BT40	3/4"	1.75"	532-050	<input type="checkbox"/>
BT40	3/4"	2.50"	532-052	<input type="checkbox"/>
BT40	3/4"	4.00"	532-054	<input type="checkbox"/>
BT40	7/8"	3.38"	532-056	<input type="checkbox"/>
BT40	7/8"	6.00"	532-058	<input type="checkbox"/>
BT40	1"	2.00"	532-060	<input type="checkbox"/>
BT40	1"	3.56"	532-062	<input type="checkbox"/>
BT40	1"	6.00"	532-064	<input type="checkbox"/>
BT40	1-1/4"	2.00"	532-066	<input type="checkbox"/>
BT40	1-1/4"	3.56"	532-068	<input type="checkbox"/>
BT40	1-1/4"	6.00"	532-070	<input type="checkbox"/>
BT40	1-1/2"	4.50"	532-072	<input type="checkbox"/>
BT40	1-1/2"	6.00"	532-074	<input type="checkbox"/>

BT40 Shell Mill Holders

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction



Taper	Dia.	Gage Length	Code No.	Select
BT40	1/2"	1.75"	532-086	<input type="checkbox"/>
BT40	3/4"	1.75"	532-088	<input type="checkbox"/>
BT40	3/4"	4.00"	532-111	<input type="checkbox"/>
BT40	3/4"	6.00"	532-114	<input type="checkbox"/>
BT40	1"	1.75"	532-090	<input type="checkbox"/>
BT40	1"	4.00"	532-115	<input type="checkbox"/>
BT40	1"	6.00"	532-117	<input type="checkbox"/>
BT40	1-1/4"	2.00"	532-092	<input type="checkbox"/>
BT40	1-1/4"	4.00"	532-119	<input type="checkbox"/>
BT40	1-1/4"	6.00"	532-121	<input type="checkbox"/>
BT40	1-1/2"	2.00"	532-094	<input type="checkbox"/>

BT TAPER ER COLLET CHUCKS

- DIN Coolant option - standard
- All Ground Body
- 100% Forged Construction
- Factory Balanced to save spindle life, tool life and increased productivity
- Threaded through holes for a back-up screw (tool stop) or coolant through when removed
- Wrench not included



BT 40
Premium
Balanced
30x
RPM

Taper	Collet Series	Collet Range	Gage Length	Code No.	Select
BT40	ER11	.019-.275"	2.50"	532-174	<input type="checkbox"/>
BT40	ER11	.019-.275"	4.00"	532-176	<input type="checkbox"/>
BT40	ER11	.019-.275"	6.00"	532-178	<input type="checkbox"/>
BT40	ER16	.019-.406"	3.50"	532-180	<input type="checkbox"/>
BT40	ER16	.019-.406"	5.00"	532-182	<input type="checkbox"/>
BT40	ER20	.039-.511"	2.50"	532-184	<input type="checkbox"/>
BT40	ER20	.039-.511"	4.00"	532-186	<input type="checkbox"/>
BT40	ER20	.039-.511"	6.00"	532-188	<input type="checkbox"/>
BT40	ER25	.039-.629"	2.25"	532-190	<input type="checkbox"/>
BT40	ER25	.039-.629"	4.00"	532-192	<input type="checkbox"/>
BT40	ER25	.039-.629"	6.00"	532-194	<input type="checkbox"/>
BT40	ER32	.078-.787"	1.06"	532-191*	<input type="checkbox"/>
BT40	ER32	.078-.787"	3.13"	532-196	<input type="checkbox"/>
BT40	ER32	.078-.787"	5.00"	532-198	<input type="checkbox"/>
BT40	ER40	.118-1.023"	3.13"	532-200	<input type="checkbox"/>
BT40	ER40	.118-1.023"	5.00"	532-202	<input type="checkbox"/>

* ER Shorty collet chuck

Company: _____

Contact: _____

Phone: _____

Fax: _____

e-mail: _____

Notes: _____

ER Collet Sets



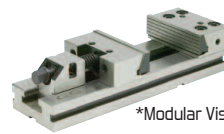
* Case may not be as shown

Collet	Description	Range	Code No.	Select
ER11	Inch Size 7pc Collet Set	1/16-1/4 x 32nds	337-401	<input type="checkbox"/>
ER11	Decimal 13pc Collet Set	.019"-.271"	337-379	<input type="checkbox"/>
ER16	Inch Size 11pc Collet Set	1/16-3/8 x 32nds	337-403	<input type="checkbox"/>
ER16	Decimal 10pc Collet Set	.019"-.393"	337-380	<input type="checkbox"/>
ER20	Inch Size 15pc Collet Set	1/16-1/2 x 32nds	337-404	<input type="checkbox"/>
ER20	Decimal 12pc Collet Set	.039"-.510"	337-382	<input type="checkbox"/>
ER25	Inch Size 17pc Collet Set	1/8-5/8 x 32nds	337-405	<input type="checkbox"/>
ER25	Decimal 15pc Collet Set	.039"-.629"	337-383	<input type="checkbox"/>
ER32	Inch Size 21pc Collet Set	1/8-3/4 x 32nds	337-407	<input type="checkbox"/>
ER32	Decimal 18pc Collet Set	.078"-.787"	337-384	<input type="checkbox"/>
ER40	Inch Size 29pc Collet Set	1/8-1" x 32nds	337-409	<input type="checkbox"/>
ER40	Decimal 23pc Collet Set	.118"-1.023"	337-386	<input type="checkbox"/>

GS Modular & Milling Machine Vises

• Vises are Matched

*Milling Machine Vise



*Modular Vise



Model	Jaw Width	Jaw Opening	Code No.	Select
GS675	6	7.5	327-275M	<input type="checkbox"/>
GS890	6	8.9	327-290M	<input type="checkbox"/>
GS810	8	10.0	327-300	<input type="checkbox"/>
#3 Modular	6	8	382-015	<input type="checkbox"/>

NC/CNC Trolley

Complete Tool Trolley with 4 Tool Trays and Inserts.

- Trays bolt in
- (W) 39.45"
- (D) 25.59"
- (H) 32.68"
- Weight: 112.20 lbs



Desc.	Taper Type	Trays x Inserts	Code No.	Select
Trolley	40	4 x 7	326-985	<input type="checkbox"/>
Trolley	50	4 x 5	326-995	<input type="checkbox"/>





TOOLING

ANGLE HEADS & SPINDLE SPEEDERS

RIGHT ANGLE HEADS

GFX07 ER 11 Fixed 90° Right Angle Heads	116
GFX07L ER 11 Fixed 90° Right Angle Heads	117
GFX10 ER 16 Fixed 90° Right Angle Heads	118
GFX10L ER 16 Fixed 90° Right Angle Heads	119
GFX16 ER 25 Fixed 90° Right Angle Heads	120
GFX16L ER 25 Fixed 90° Right Angle Heads	121
GFX20 ER 32 Fixed 90° Right Angle Head	122
GFX20L ER 32 Fixed 90° Right Angle Head	123
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GPV13 ER 20 Pivoting Angle Heads	125
GPV16 ER 25 Pivoting Angle Heads	126
GPV20 ER 32 Pivoting Angle Heads	127

DRIVEN TOOLS

128-129

SPINDLE SPEEDERS

CAT Taper Spindle Speeders	131
BT Taper Spindle Speeders	132
HSK Spindle Speeders	133
NMTB Taper Spindle Speeders	134

Pull Studs

135



ANGLE HEADS

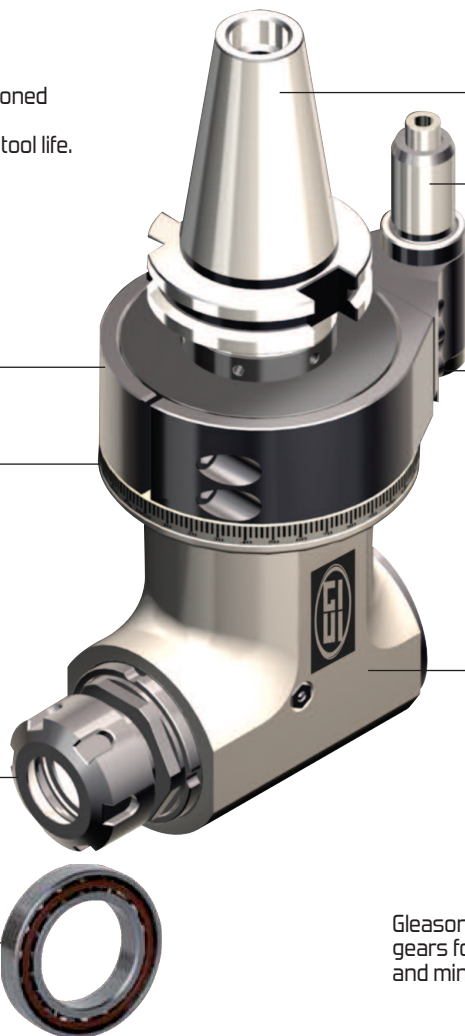
ATC Series

MADE IN ITALY 

Designed for Automatic Tool Change Machines

Design

The compact design, along with mentioned specifications allows for the highest performances, high speeds, and long tool life.



Case hardened and ground shank and shaft

Positioning pin with automatic release

Standard 10Bar coolant through pin

Treated steel head body with 360° position and internal air pressure, maximum rigidity, and corrosion resistant. Minimum thermal expansion

Modular antirotation group

Graduated ring

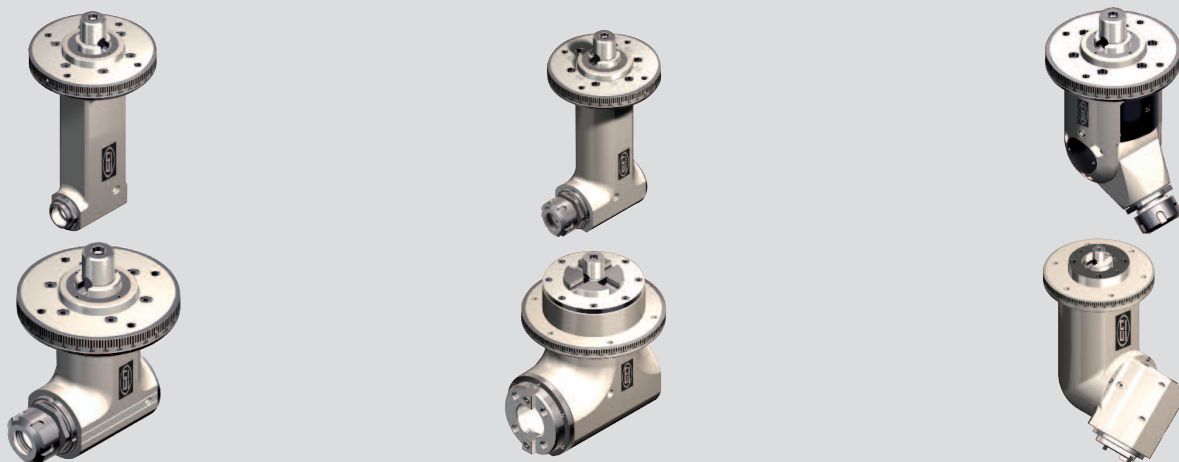
Output
- ER Collet (Standard)
- Weldon
- Shell mill holder
- Special

Angular contact preloaded ball bearings of precision class ABE 7/9

Gleason ground spiral bevel gears for maximum performance and minimum vibration

Angle Heads & Speeders

Also Available: MTC Manual Fixed & Pivoting Heads



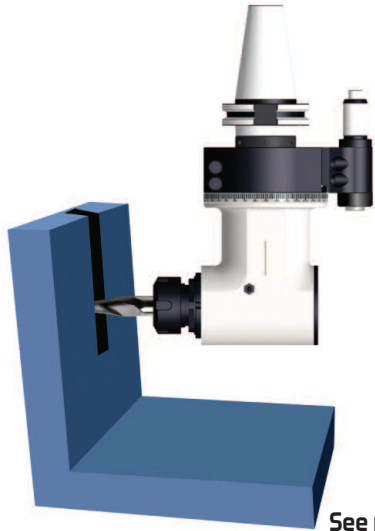
We invite all inquiries



ATC Series

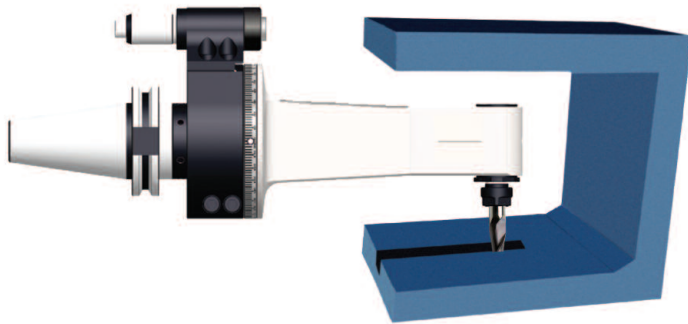
MADE IN ITALY 

Designed for Automatic Tool Change Machines



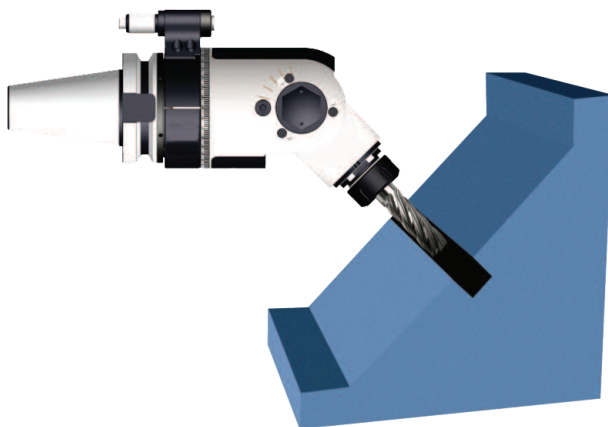
See page: 122

Standard Series Right Angle (GFX20)
Ideal for milling, drilling, tapping at 90°



See page: 121

Long Series Right Angle (GFX16L)
for machining in deep positions



See page: 126

Pivoting Angle Head Series (GPV16)
Adjustable with in a 90° range for tilt drilling, milling, and tapping.
Quick positioning pin.

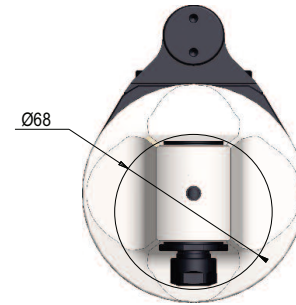
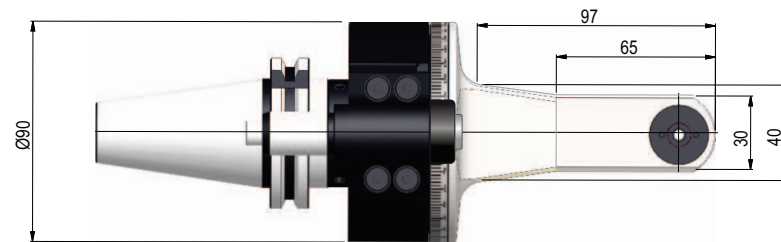
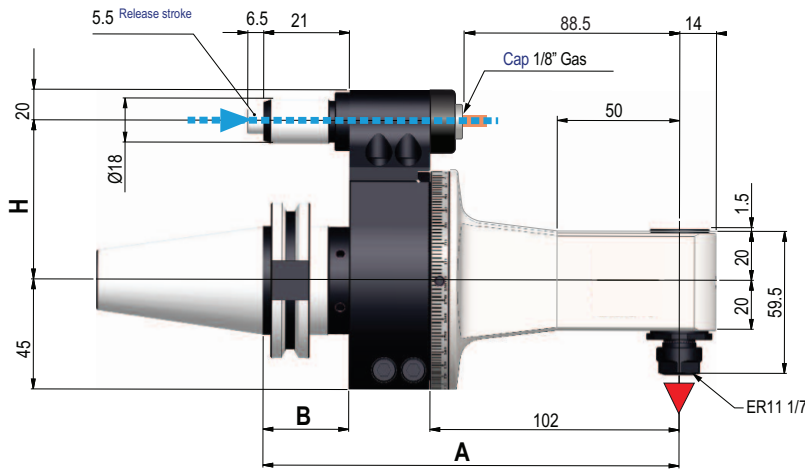
Angle Heads & Speeders



ANGLE HEADS

GFX07 ER 11 Fixed 90° Right Angle Heads

MADE IN ITALY



▼ Direction of rotation is opposite to the machine spindle

Pull Stud



pg 135

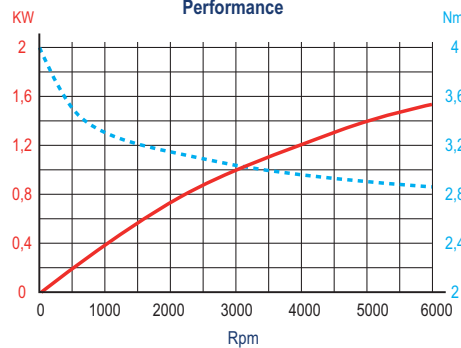
Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GFX07	ER 11	170	35	65	7	M6	10,000	4	381-002	7,388.80
CAT 50	GFX07	ER 11	170	35	80	7	M6	10,000	4	381-004	7,388.80
BT 40	GFX07	ER 11	170	35	65	7	M6	10,000	4	381-006	8,410.10
BT 50	GFX07	ER 11	176	41	80	7	M6	10,000	4	381-008	8,410.10
HSK63	GFX07	ER 11	177	42	65	7	M6	10,000	4	381-010	8,815.50
HSK100	GFX07	ER 11	180	45	80	7	M6	10,000	4	381-012	9,018.10

Other tapers available please inquire

Technical Data

		GFX 7
Ratio		1:1
RPM Max		10,000
Max axial load	N	120
Torque	Nm	5
Weight	Kg.	4
Collet	mm	ER11 1mm - 7mm

Performance



Standard Features & Equipment Included:

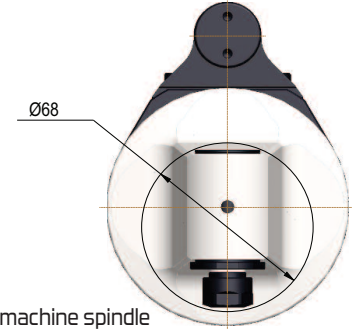
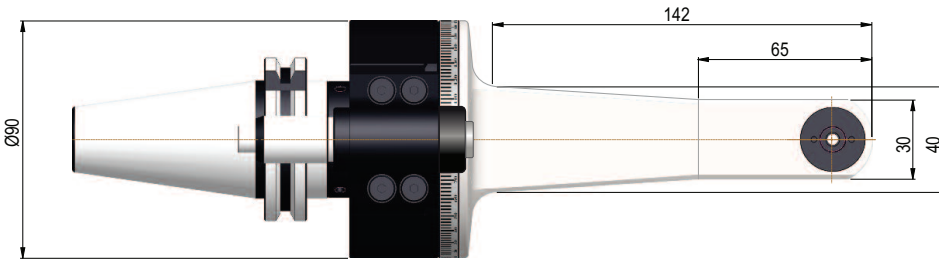
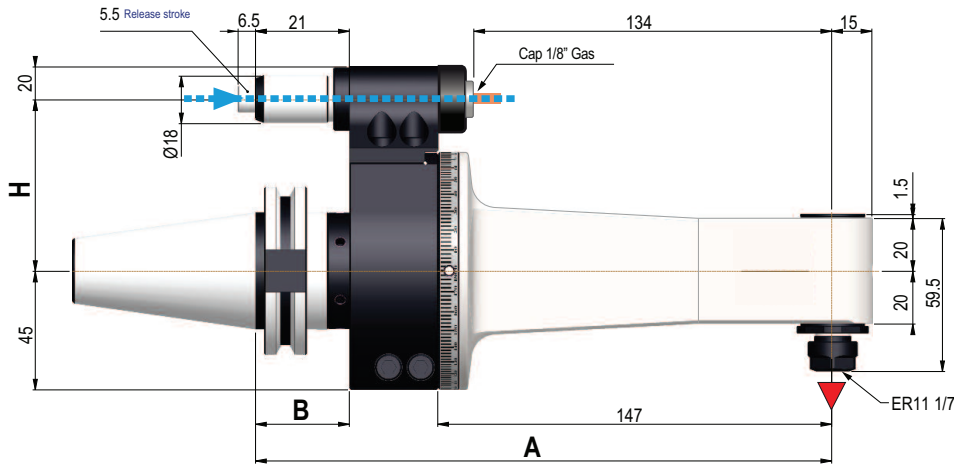
- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report





GFX07L ER 11 Long Fixed 90° Right Angle Heads

MADE IN ITALY



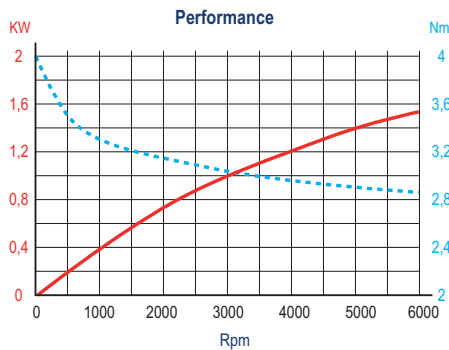
▼ Direction of rotation is opposite to the machine spindle

Pull Stud
 pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GFX07L	ER 11	215	35	65	7	M6	10,000	4.3	381-302	8,848.00
CAT 50	GFX07L	ER 11	215	35	80	7	M6	10,000	4.3	381-304	8,848.00
BT 40	GFX07L	ER 11	215	35	65	7	M6	10,000	4.3	381-306	8,848.00
BT 50	GFX07L	ER 11	221	41	80	7	M6	10,000	4.3	381-308	8,848.00
HSK63	GFX07L	ER 11	222	42	65	7	M6	10,000	4.3	381-310	9,346.40
HSK100	GFX07L	ER 11	225	45	80	7	M6	10,000	4.3	381-312	9,451.90

Other tapers available please inquire

Technical Data		GFX 7L
Ratio		1:1
RPM Max		10,000
Max axial load	N	120
Torque	Nm	5
Weight	Kg.	4.3
Collet	mm	ER11 1mm - 7mm



Standard Features & Equipment Included:

- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report

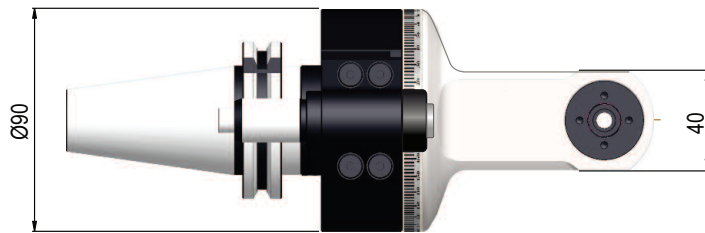
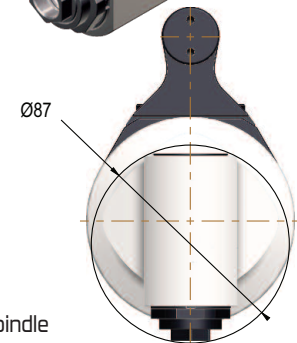
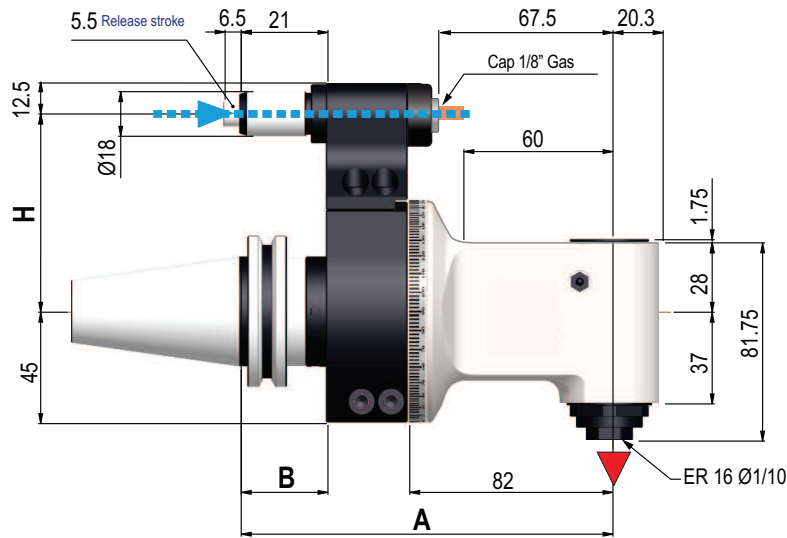




ANGLE HEADS

GFX10 ER 16 Fixed 90° Right Angle Heads

MADE IN ITALY



▼ Direction of rotation is opposite to the machine spindle

Pull Stud

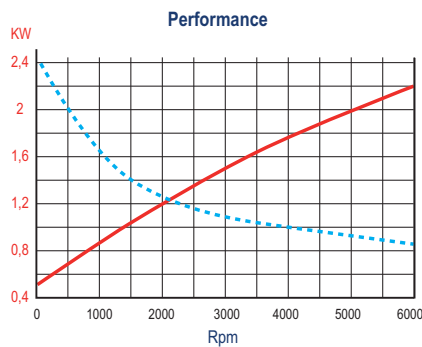


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GFX10	ER 16	150	35	65	10	M8	10,000	4.3	381-020	5,674.30
CAT 50	GFX10	ER 16	150	35	80	10	M8	10,000	4.3	381-022	5,674.30
BT 40	GFX10	ER 16	150	35	65	10	M8	10,000	4.3	381-024	5,674.30
BT 50	GFX10	ER 16	156	41	80	10	M8	10,000	4.3	381-026	5,674.30
HSK63	GFX10	ER 16	157	42	65	10	M8	10,000	4.3	381-028	6,079.60
HSK100	GFX10	ER 16	160	45	80	10	M8	10,000	4.3	381-030	6,282.30

Other tapers available please inquire

Technical Data		GFX10L
Ratio		1:1
RPM Max		10,000
Max axial load	N	250
Torque	Nm	10
Weight	Kg.	4.3
Collet	mm	ER16 1mm - 10mm



Standard Features & Equipment Included:

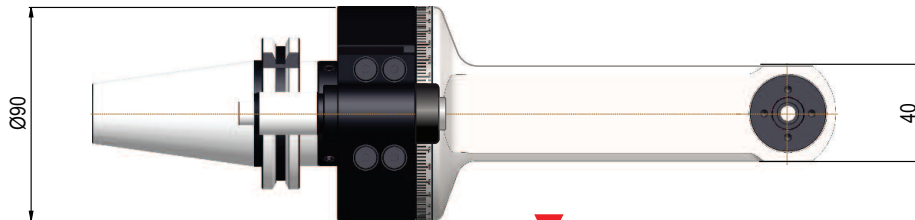
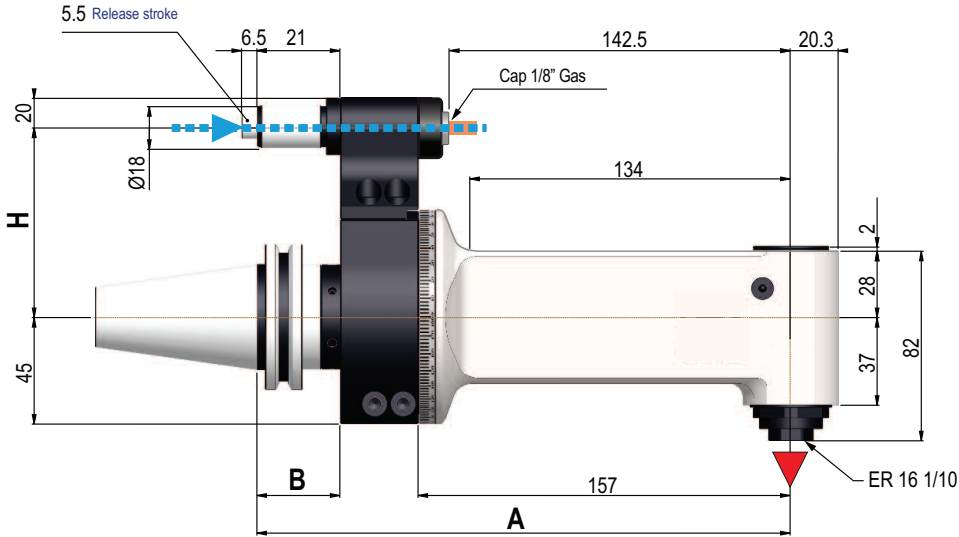
- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report





GFX10L ER 16 Long Fixed 90° Right Angle Heads

MADE IN ITALY



Direction of rotation is opposite to the machine spindle

Pull Stud

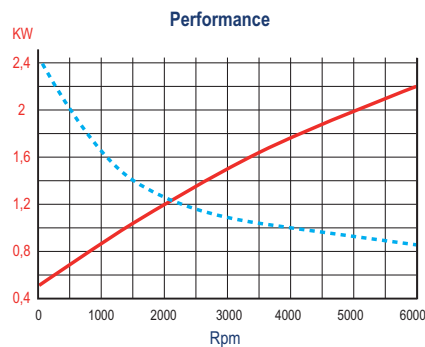


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GFX10L	ER 16	225	35	65	10	M8	10,000	5.2	381-320	9,249.20
CAT 50	GFX10L	ER 16	225	35	80	10	M8	10,000	5.2	381-322	9,249.20
BT 40	GFX10L	ER 16	225	35	65	10	M8	10,000	5.2	381-324	9,249.20
BT 50	GFX10L	ER 16	231	41	80	10	M8	10,000	5.2	381-326	9,249.20
HSK63	GFX10L	ER 16	232	42	65	10	M8	10,000	5.2	381-328	9,747.70
HSK100	GFX10L	ER 16	235	45	80	10	M8	10,000	5.2	381-330	9,853.00

Other tapers available please inquire

Technical Data		GFX10L
Ratio		1:1
RPM Max		10,000
Max axial load	N	250
Torque	Nm	10
Weight	Kg.	5.2
Collet	mm	ER16 1mm - 10mm



Standard Features & Equipment Included:

- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report

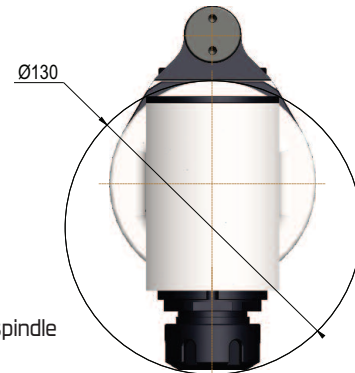
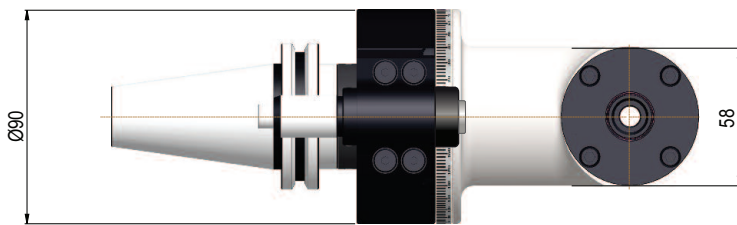
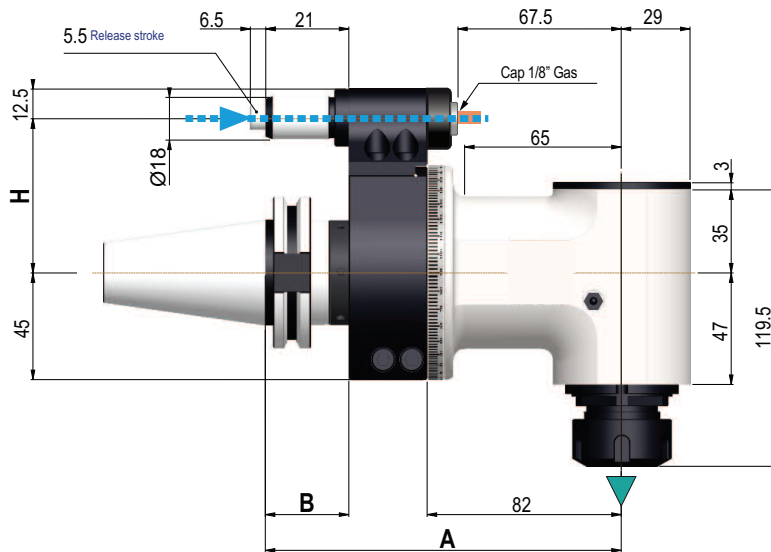




ANGLE HEADS

GFX16 ER 25 Fixed 90° Right Angle Heads

MADE IN ITALY



▼ Direction of rotation is the same as the machine spindle

Pull Stud

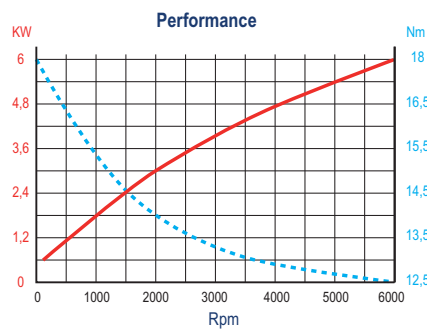


pg 135

Taper	Model	System Collet	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GFX16	ER 25	150	35	65	16	M12	8,000	5.4	381-100	6,586.30
CAT 50	GFX16	ER 25	150	35	80	16	M12	8,000	5.4	381-102	6,586.30
BT 40	GFX16	ER 25	150	35	65	16	M12	8,000	5.4	381-104	6,586.30
BT 50	GFX16	ER 25	156	41	80	16	M12	8,000	5.4	381-106	6,586.30
HSK63	GFX16	ER 25	157	42	65	16	M12	8,000	5.4	381-108	6,991.60
HSK100	GFX16	ER 25	160	45	80	16	M12	8,000	5.4	381-110	7,194.20

Other tapers available please inquire

Technical Data		GFX16
Ratio		1:1
RPM Max		8,000
Max axial load	N	510
Torque	Nm	24
Weight	Kg.	5.4
Collet	mm	ER25 2mm - 16mm



Standard Features & Equipment Included:

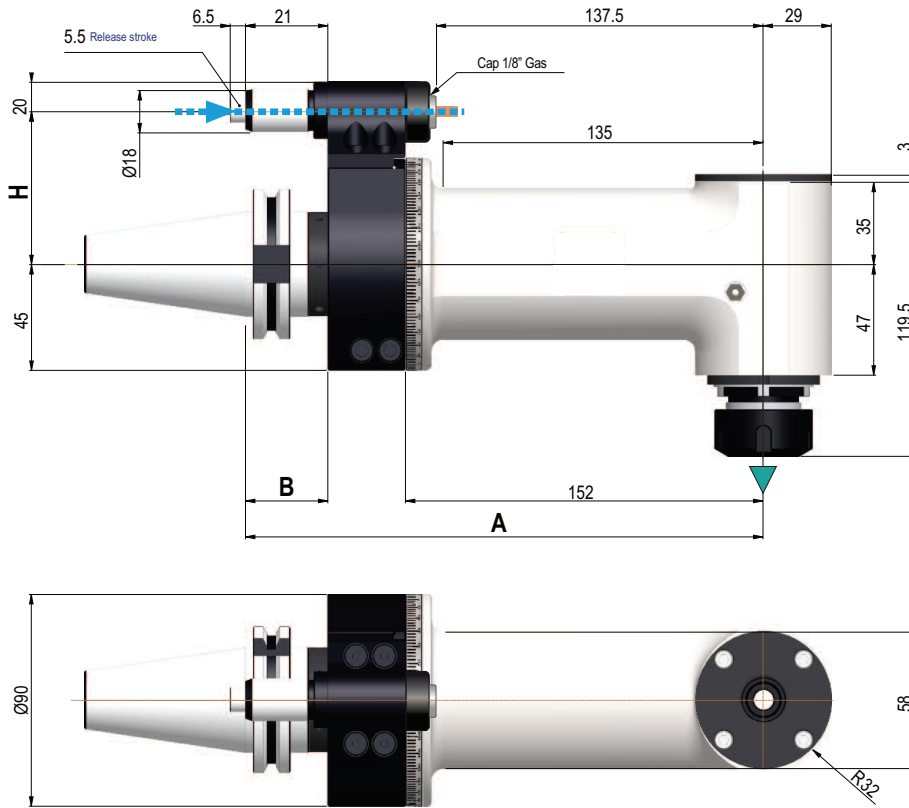
- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report





GFX16L ER 25 Long Fixed 90° Right Angle Heads

MADE IN ITALY



▼ Direction of rotation is the same as the machine spindle

Angle Heads & Speeders

Pull Stud

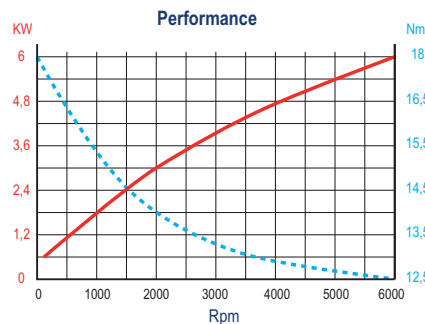


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GFX16L	ER 25	220	35	65	16	M12	8,000	6.7	381-400	11,117.60
CAT 50	GFX16L	ER 25	220	35	80	16	M12	8,000	6.7	381-402	11,117.60
BT 40	GFX16L	ER 25	220	35	65	16	M12	8,000	6.7	381-404	11,117.60
BT 50	GFX16L	ER 25	226	41	80	16	M12	8,000	6.7	381-406	11,117.60
HSK63	GFX16L	ER 25	227	42	65	16	M12	8,000	6.7	381-408	11,620.80
HSK100	GFX16L	ER 25	230	45	80	16	M12	8,000	6.7	381-410	11,725.60

Other tapers available please inquire

Technical Data		GFX16L
Ratio		1:1
RPM Max		8,000
Max axial load	N	510
Torque	Nm	24
Weight	Kg.	6.7
Collet	mm	ER25 2mm - 16mm



Standard Features & Equipment Included:

- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report

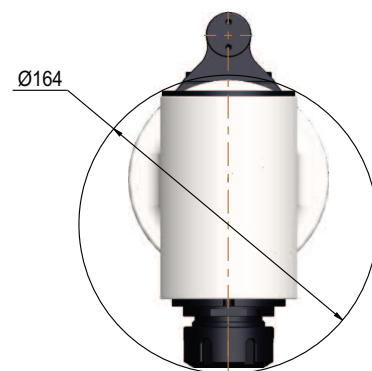
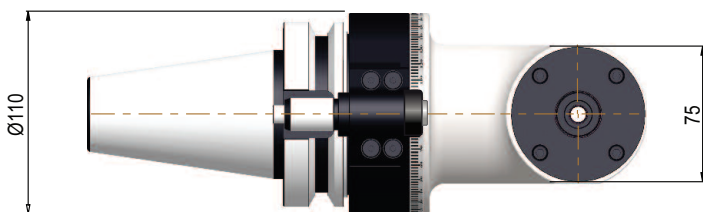
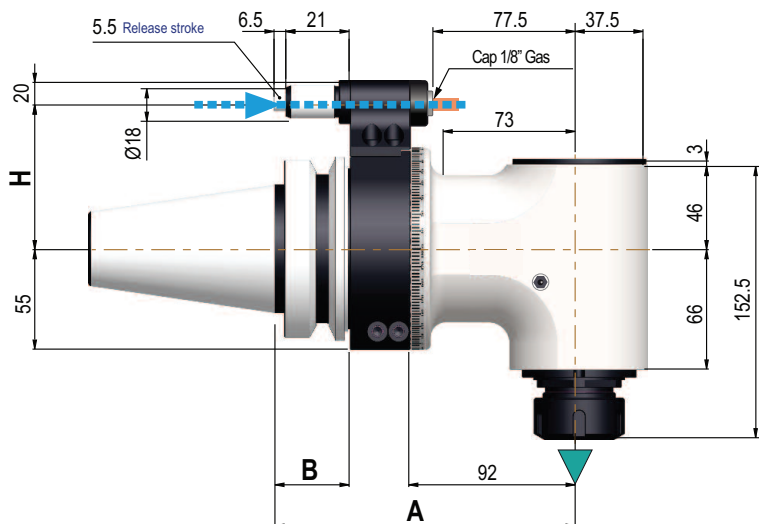




ANGLE HEADS

GFX20 ER 32 Fixed 90° Right Angle Head

MADE IN ITALY 



▼ Direction of rotation is the same as the machine spindle

Pull Stud

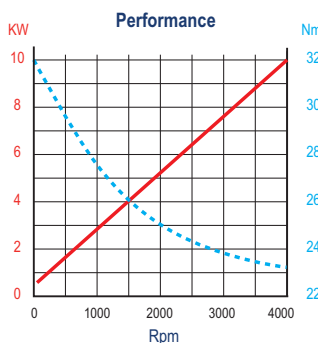


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price 5
CAT 50	GFX20	ER 32	160	35	80	20	M16	4,000	11	381-148	7,295.60

Other tapers available please inquire

Technical Data		GFX20
Ratio		1:1
RPM Max		4,000
Max axial load	N	1250
Torque	Nm	40
Weight	Kg.	11
Collet	mm	ER32 2.5mm - 20mm



Standard Features & Equipment Included:

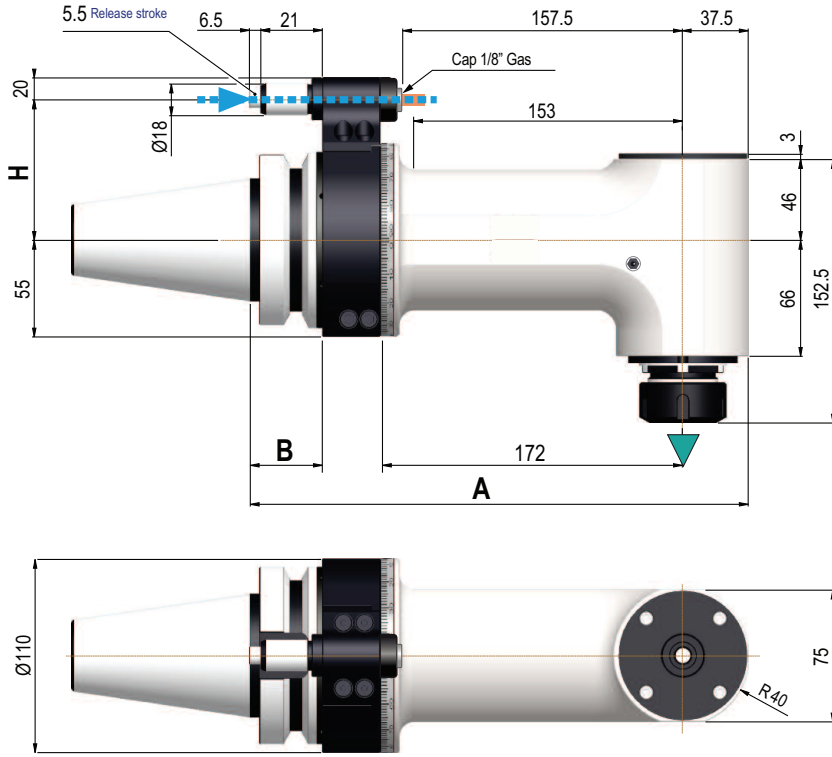
- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report



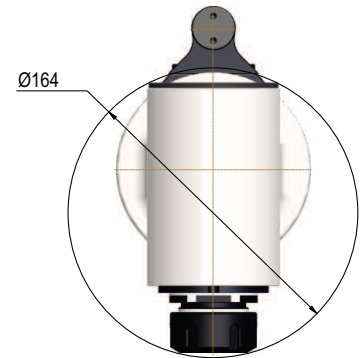


GFX20L ER 32 Long Fixed 90° Right Angle Head

MADE IN ITALY



▼ Direction of rotation is the same as the machine spindle



Angle Heads & Speeders

Pull Stud

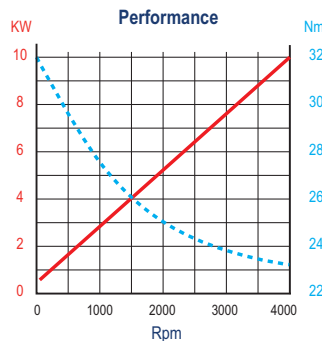


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 50	GFX20L	ER 32	240	35	80	20	M16	4,000	13.8	381-448	11,920.10

Other tapers available please inquire

Technical Data		GFX20L
Ratio		1:1
RPM Max		4,000
Max axial load	N	1250
Torque	Nm	40
Weight	Kg.	13.8
Collet	mm	ER32 2.5mm - 20mm



Standard Features & Equipment Included:

- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report

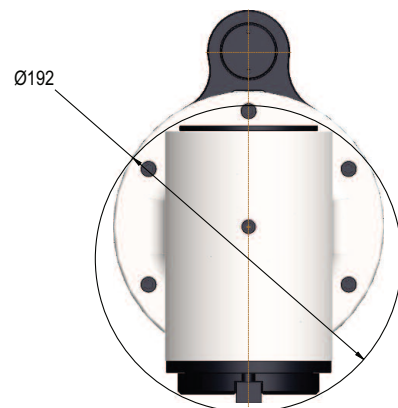
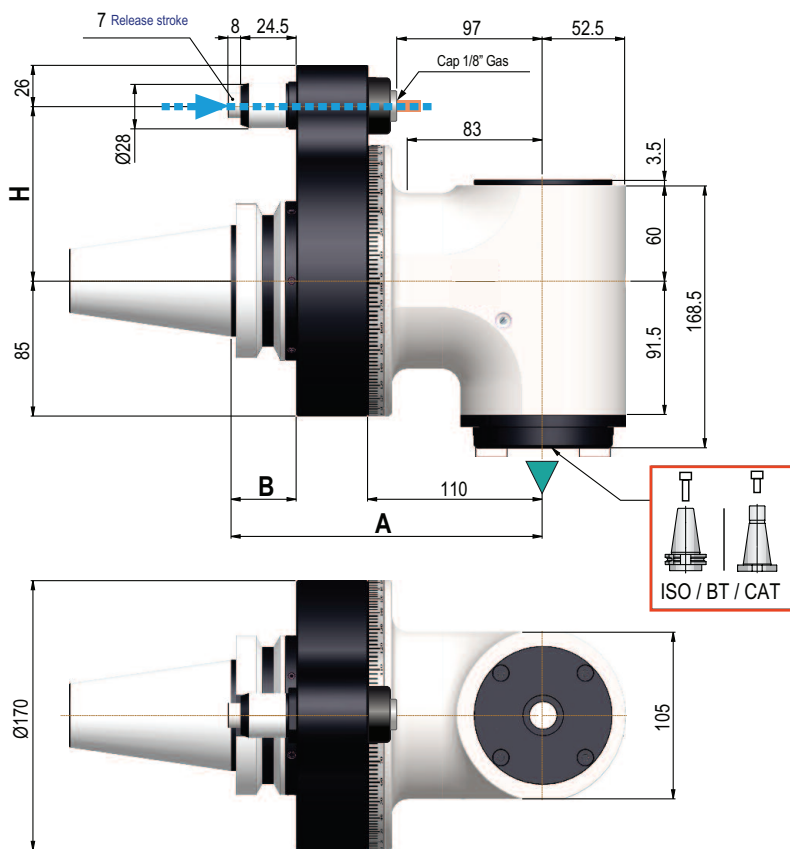




ANGLE HEADS

GFX S40 Fixed 90° Right Angle Heads

MADE IN ITALY



Note: Accepts CAT40, BT40, SK40 and NMTB 40 Taper Tooling

▼ Direction of rotation is the same as the machine spindle

Pull Stud

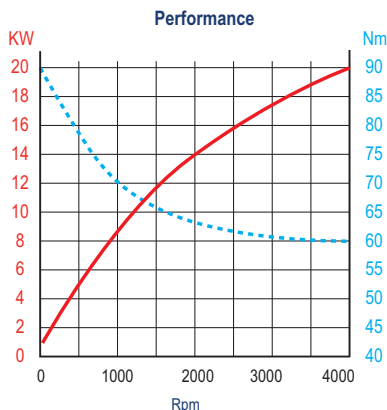


pg 135

Taper	Model	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 50	GFX S40	190	35	110	26	M20	4,000	22	381-121	9,322.10
BT 50	GFX S40	196	41	110	26	M20	4,000	22	381-123	9,322.10
HSK100	GFX S40	200	45	110	26	M20	4,000	22	381-125	9,930.00

Other tapers available please inquire

Technical Data		GFX S40	
Ratio		1:1	
RPM Max		4,000	
Max axial load	N	1800	
Torque	Nm	140	
Weight	Kg.	22	
Drill / Tap	mm	26mm / M20	



Standard Features & Equipment Included:

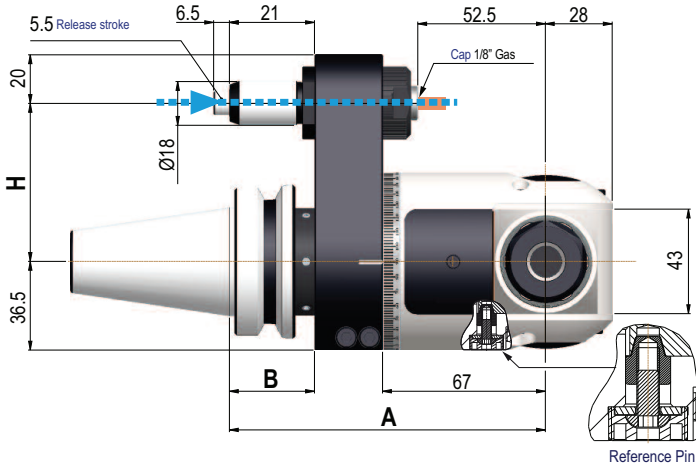
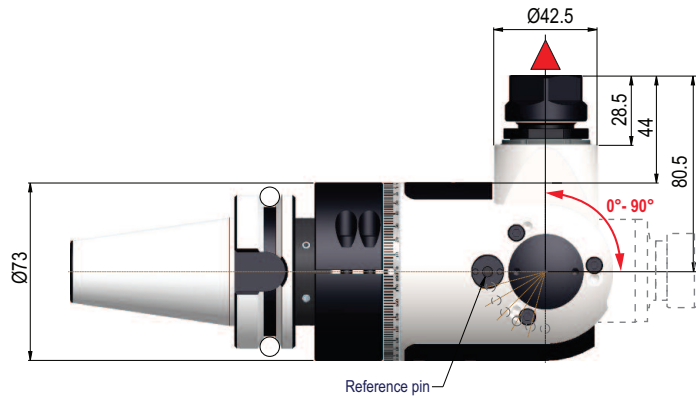
- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Grease tube
- Instruction book & Inspection report





GPV13 ER 20 Pivoting Angle Heads

MADE IN ITALY



▼ Direction of rotation is opposite to the machine spindle

Pull Stud

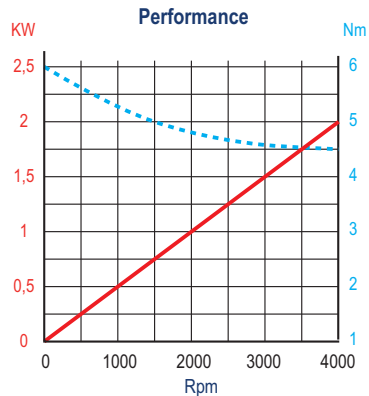


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GPV13	ER 20	130	35	65	13	M10	4,000	4.2	381-198	7,092.90
CAT 50	GPV13	ER 20	130	35	80	13	M10	4,000	4.2	381-200	7,092.90
BT 40	GPV13	ER 20	130	35	65	13	M10	4,000	4.2	381-202	7,092.90
BT 50	GPV13	ER 20	136	41	80	13	M10	4,000	4.2	381-204	7,092.90
HSK63	GPV13	ER 20	137	42	65	13	M10	4,000	4.2	381-206	7,498.20
HSK100	GPV13	ER 20	140	45	80	13	M10	4,000	4.2	381-208	7,700.90

Other tapers available please inquire

Technical Data		GPV13
Ratio		1:1
RPM Max		4,000
Max axial load	N	450
Torque	Nm	6
Weight	Kg.	4.2
Collet	mm	ER20 1mm-13mm



Standard Features & Equipment Included:

- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report

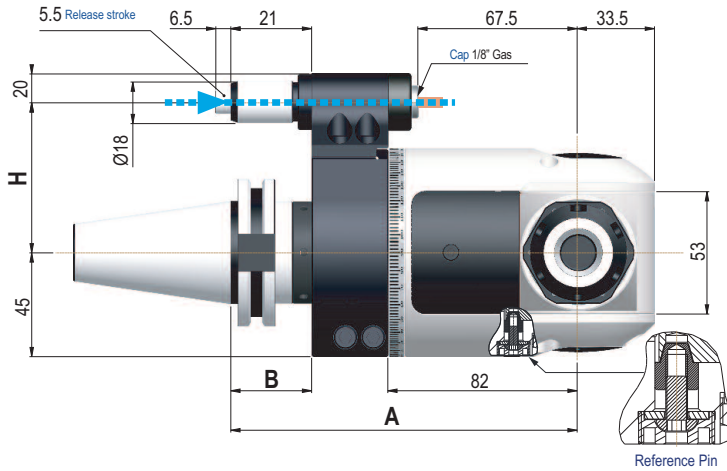
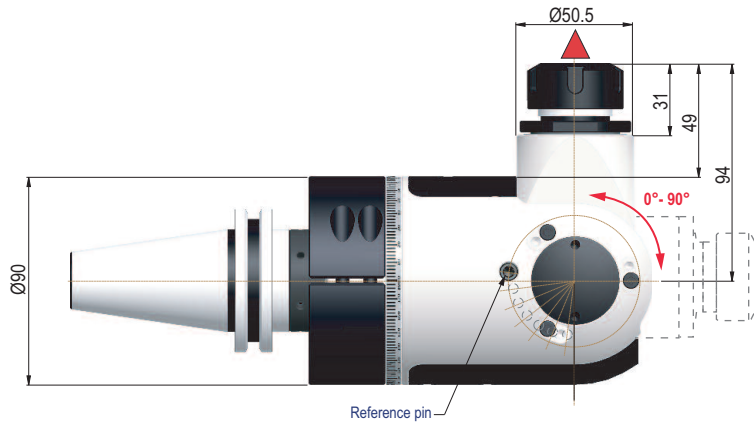




ANGLE HEADS

GPV16 ER 25 Pivoting Angle Heads

MADE IN ITALY



▼ Direction of rotation is opposite to the machine spindle

Pull Stud

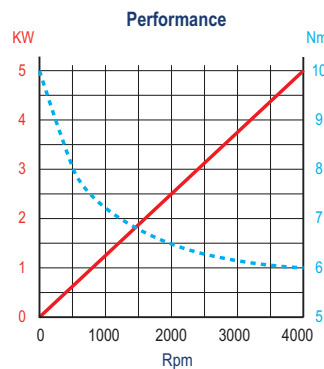


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 40	GPV16	ER 25	150	35	65	16	M12	4,000	6.8	381-270	7,660.40
CAT 50	GPV16	ER 25	150	35	80	16	M12	4,000	6.8	381-272	7,660.40
BT 40	GPV16	ER 25	150	35	65	16	M12	4,000	6.8	381-274	7,660.40
BT 50	GPV16	ER 25	156	41	80	16	M12	4,000	6.8	381-276	7,660.40
HSK63	GPV16	ER 25	157	42	65	16	M12	4,000	6.8	381-278	8,167.00
HSK100	GPV16	ER 25	160	45	80	16	M12	4,000	6.8	381-280	8,227.80

Other tapers available please inquire

Technical Data		GPV16
Ratio		1:1
RPM Max		4,000
Max axial load	N	480
Torque	Nm	18
Weight	Kg.	6.8
Collet	mm	ER25 2mm-16mm



Standard Features & Equipment Included:

- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report

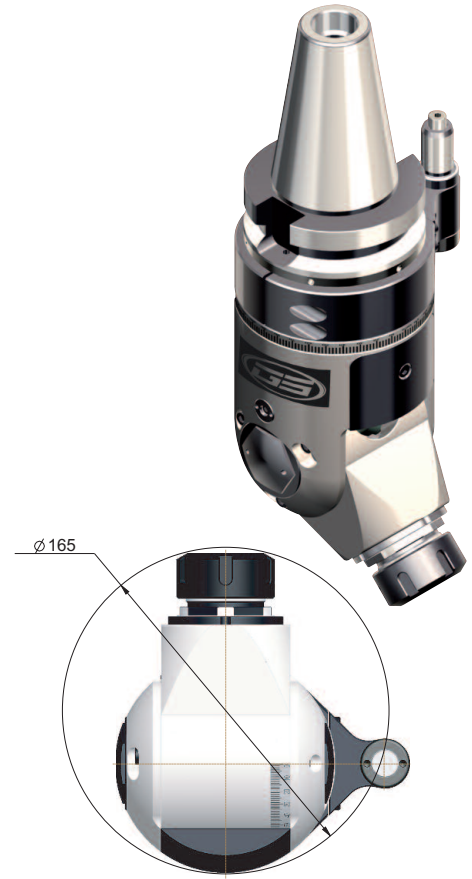
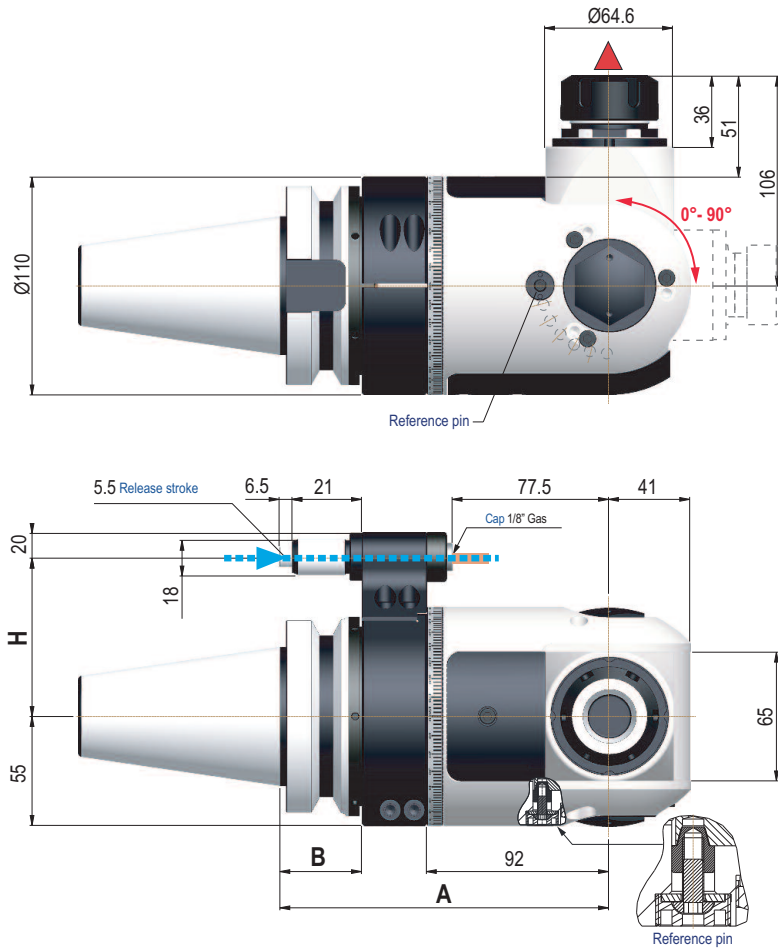


Angle Heads & Speeders



GPV20 ER 32 Pivoting Angle Heads

MADE IN ITALY



▼ Direction of rotation is opposite to the machine spindle

Pull Stud

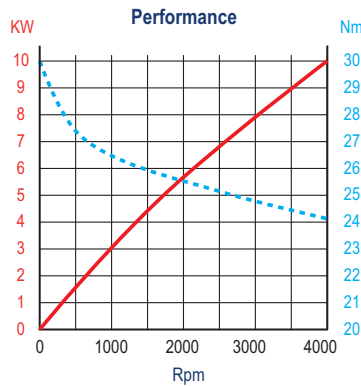


pg 135

Taper	Model	Collet System	A (mm)	B (mm)	H (mm)	End Mill & Drill Cap. (mm)	Tap Size Capacity	Max R.P.M.	Weight (Kg.)	Code No.	Price \$
CAT 50	GPV20	ER 32	160	35	80	20	M16	4,000	13	381-150	9,727.40
BT 50	GPV20	ER 32	166	41	80	20	M16	4,000	13	381-154	9,727.40
HSK100	GPV20	ER 32	170	45	80	20	M16	4,000	13	381-158	10,335.40

aOther tapers available please inquire

Technical Data		GPV20
Ratio		1:1
RPM Max		4,000
Max axial load	N	715
Torque	Nm	32
Weight	Kg.	13
Collet	mm	ER32 3mm-20mm



Standard Features & Equipment Included:


- External coolant thru positioning pin
- Internal air pressure
- Retaining block
- Wrenches
- Grease tube
- Instruction book & Inspection report



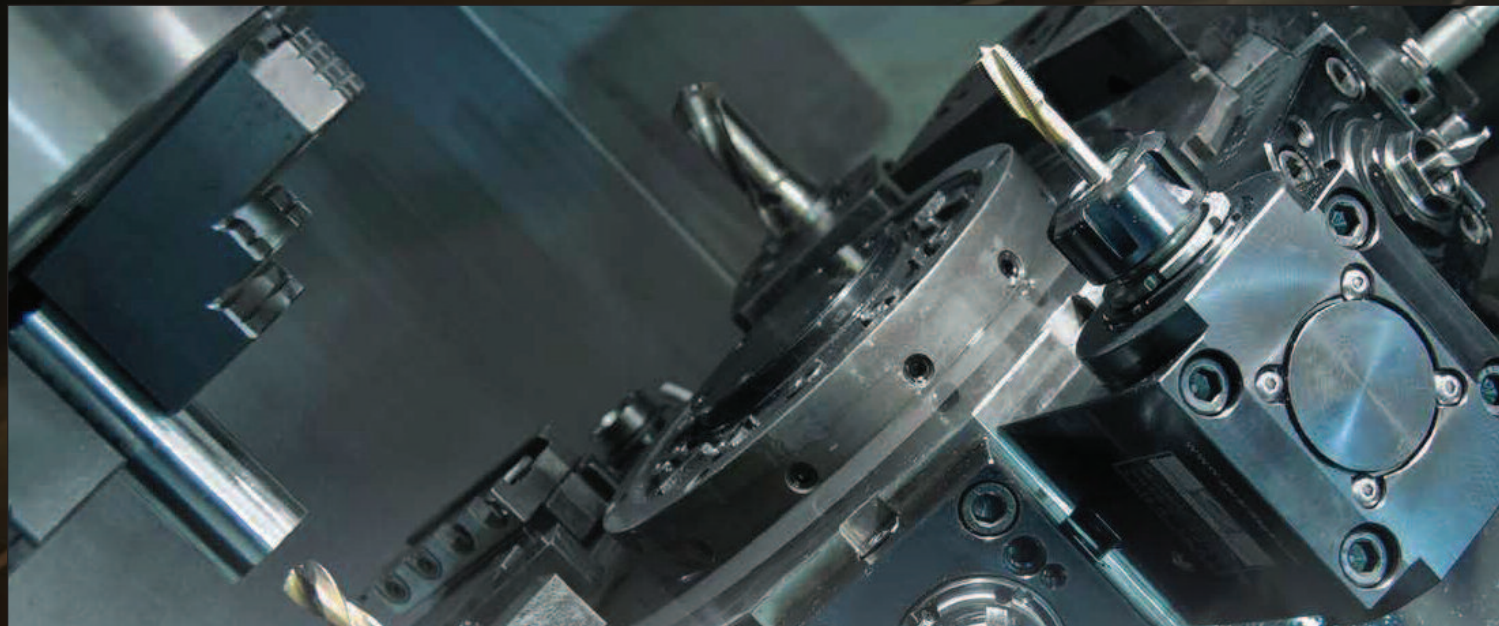


ANGLE HEADS

INTRODUCING

MADE IN ITALY 

DRIVEN TOOLS



Angle Heads & Speeders

NOW STOCKED IN THE U.S.A.



DMG MORI



DOOSAN



HAAS



MAZAK

WE INVITE INQUIRIES FOR OKUMA, NAKAMURA, MIYANO, BIGLIA



Driven tools for CNC turning centers allow milling, drilling, and tapping operations on the lathes without additional parts handling. GS can supply a wide range of types in order to equip the CNC lathes and turrets of the most popular builders on the market with an unbeatable price/quality ratio.

Main technical features

- Main body designed to maximize rigidity and reduce vibration
- Specially treated corrosion resistant steel body
- Angular contact bearings + taper roller bearings on output spindle for better rigidity and longer life
- Gleason spiral bevel gears with completely ground involute form

- Internal coolant option - up to 100bar
- Designed, manufactured and assembled in Italy
- 2 Year guarantee

- ▼ Direction of rotation is opposite to the machine spindle
- ▲ Direction of rotation is the same as the machine spindle

Driven Tools For DMG MORI Lathes



Model	Orient	Rotation	Turret	Output	Int. Coolant	Nm	Rpm	Gage Length	Code No.	Price \$
99.MS.A59	AX	▲	NL60	ER-32	-	60	10,000	Max 89.9	381-504	2,081.50
99.MS.A60	AX	▲	NL60	ER-32	• 80bar	60	10,000	Max 89.9	381-505	3,079.80
99.MS.A72	RD	▼	NL60	ER-32	-	60	10,000	90	381-506	4,460.30
99.MS.A73	RD	▼	NL60	ER-32	• 80bar	60	10,000	90	381-507	4,991.20



Driven Tools For DOOSAN Lathes



Model	Orient	Rotation	Turret	Output	Int. Coolant	Nm	Rpm	Gage Length	Code No.	Price \$
99.DS.A01	AX	▲	BMT55	ER-25	-	40	8,000	57.2	381-512	1,805.40
99.DS.A02	AX	▲	BMT55	ER-25	• 80bar	40	8,000	57.2	381-513	2,070.90
99.DS.A11	RD	▼	BMT55	ER-25	-	40	8,000	70	381-514	3,398.40
99.DS.A12	RD	▼	BMT55	ER-25	• 80bar	40	8,000	70	381-515	4,014.30
99.DS.A41	AX	▲	BMT65	ER-32	-	70	6,000	72.5	381-516	2,124.00
99.DS.A42	AX	▲	BMT65	ER-32	• 70bar	70	6,000	72.5	381-517	2,442.50
99.DS.A51	RD	▼	BMT65	ER-32	-	70	6,000	72	381-518	3,568.20
99.DS.A52	RD	▼	BMT65	ER-32	• 70bar	70	6,000	72	381-519	4,226.70



Driven Tools For HAAS Lathes



Model	Orient	Rotation	Turret	Output	Int. Coolant	Nm	Rpm	Gage Length	Code No.	Price \$
99.HA.590082	AX	▲	VDI40	ER-32	-	63	6,000	82.1	381-500	1,571.80
99.HA.590082B	AX	▲	VDI40	ER-32	• 25bar	63	6,000	82.1	381-501	1,964.70
99.HA.590084	RD	▼	VDI40	ER-32	-	63	6,000	Max. 75	381-502	2,952.40
99.HA.590084B	RD	▼	VDI40	ER-32	• 25bar	63	6,000	Max. 75	381-503	3,734.60



Driven Tools For MAZAK Lathes



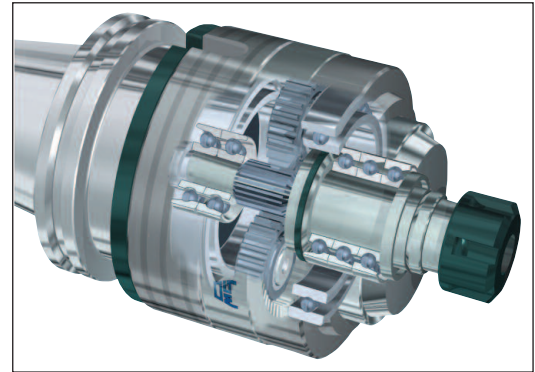
Model	Orient	Rotation	Turret	Output	Int. Coolant	Nm	Rpm	Gage Length	Code No.	Price \$
99.MZ.A58	Off-AX	▲	QTN2-40	ER-32	-	80	6,000	50	381-508	2,761.10
99.MZ.A59	Off-AX	▲	QTN2-40	ER-32	• 80bar	80	6,000	116	381-509	4,247.90
99.MZ.A65	RD	▼	QTN2-40	ER-32	-	80	6,000	130	381-510	2,950.50
99.MZ.A66	RD	▼	QTN2-40	ER-32	• 80bar	80	6,000	130	381-511	3,893.90





Spindle Speeders

MADE IN ITALY 



These Spindle Speeders have been designed and developed to offer a product that ensures maximum reliability and precision in milling and drilling. From design to static and dynamic testing of the finished product.

- Max. 22,000 continuous revs (higher ratings on request)
- Used in particular for finishing operations
- Manual or automatic mounting option
- Allow the machine to rotate at low rpm
- Possibility of using hard metal tools

The compact construction, the heat-treated steel parts, and the ground gears on the involute guarantee transmission of high power ratings with amazingly low noise levels. The spindle is supported by a set of preloaded precision ball bearings with oblique contact that ensure greater strength and rotation precision within 0.01 mm.

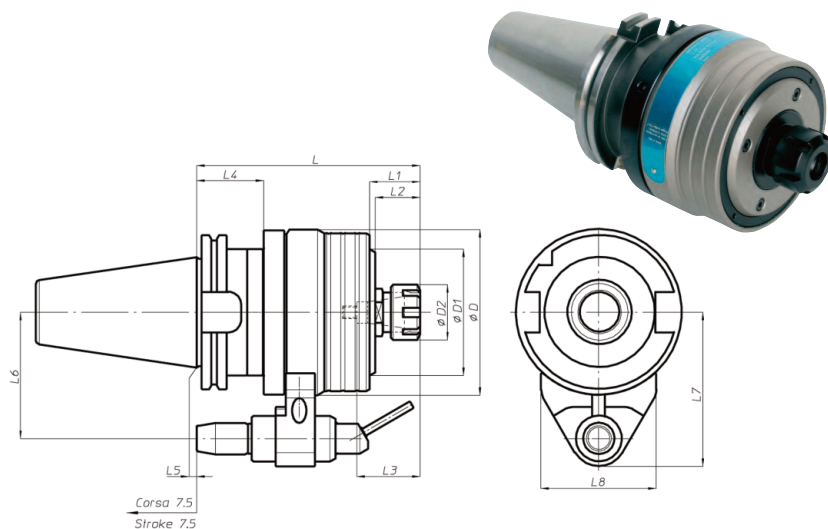
- Two or three planetary gears for high transmission power ratings
- Special tool attachment on request (Komet, DIN 1835, etc.)
- Coolant through the tool centre, on request
- Machine connection, on request (Morse Cone, DIN 69880 etc.)
- Interchangeable anti-rotation pin which can therefore be customized by the buyer
- Can be mounted on traditional machines and on machines with automatic tool change.
- Lubricated with a long-life synthetic grease that is practically maintenance free.

The test certificate attached to each Spindle Speeder guarantees the quality of the product.



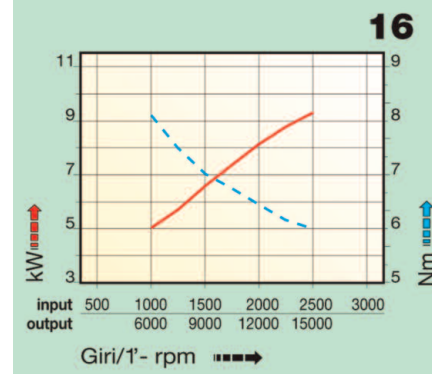
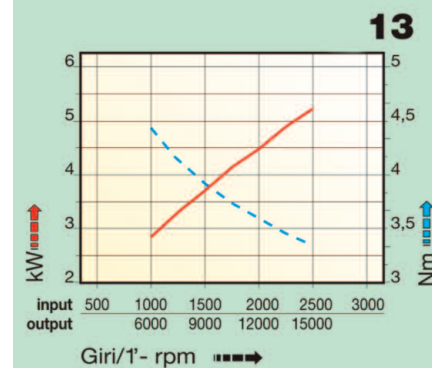
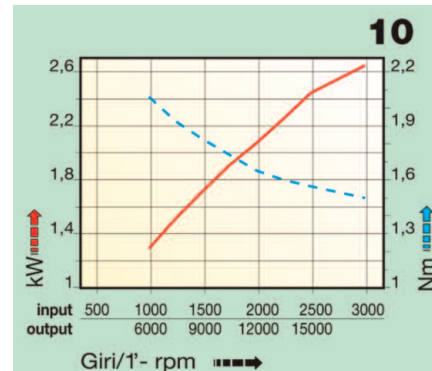
CAT TAPER SPINDLE SPEEDERS

MADE IN ITALY



Type	10		13		16				
Shank DIN	30	40	45	50	40	45	50	45	50
Shank CAT	40		50		40		50		50
Ratio	1 - 6		1 - 6		1 - 6		1 - 6		1 - 6
RPM	22.000 *		15.000 *		15.000 *		12.000 *		12.000 *
Weight	3,3	3,7	4,3	6,5	5,8	6,7	8	9	10
Collet	ER 20 max Ø 13		ER 25 max Ø 16		ER 25 max Ø 16		ER 32 max Ø 20		ER 32 max Ø 20
D	84		105		105		123		123
D1	65		80		80		100		100
D2	35		42		42		50		50
L	131.5		143		143		158.5		158.5
L1	32		32		32		34		34
L2	31.5		32		32		36		36
L3	41		44		44		50		50
L4	35	42	35	42	35	42	35	42	35
L5	0		0		0		0		0
L6	65	80	80	80	80	80	80	80	80
L7	82.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5
L8	71		73		73		75		75
Axial thrust	60 daN		90 daN		90 daN		110 daN		110 daN

* speed at 100% duty cycle



Angle Heads & Speeders

CAT Taper Spindle Speeders

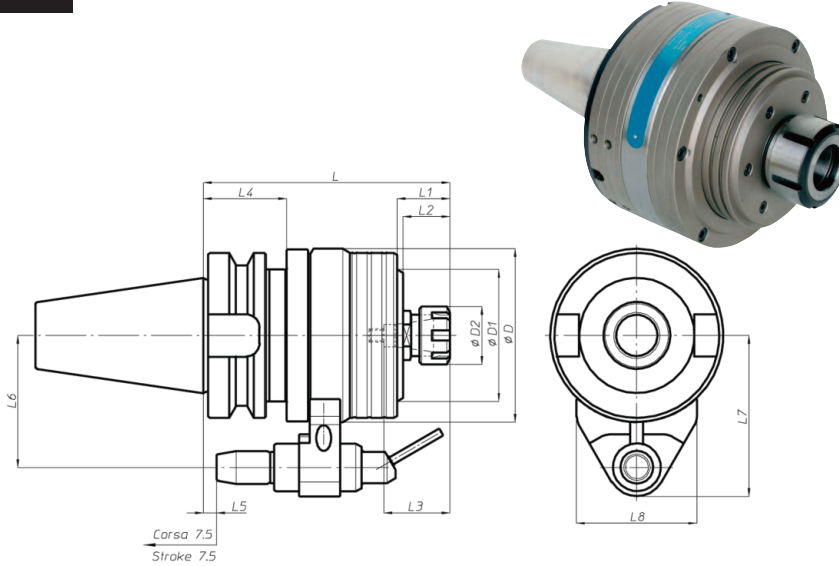
Series	CAT 40		CAT 50	
	Code No.	Price \$	Code No.	Price \$
CT10/ER20	384-214	8,838.00	384-216	9,931.00
CT13/ER25	384-218	9,874.50	384-220	10,722.40
CT16/ER32			384-222	12,569.20



SPINDLE SPEEDERS

BT TAPER SPINDLE SPEEDERS

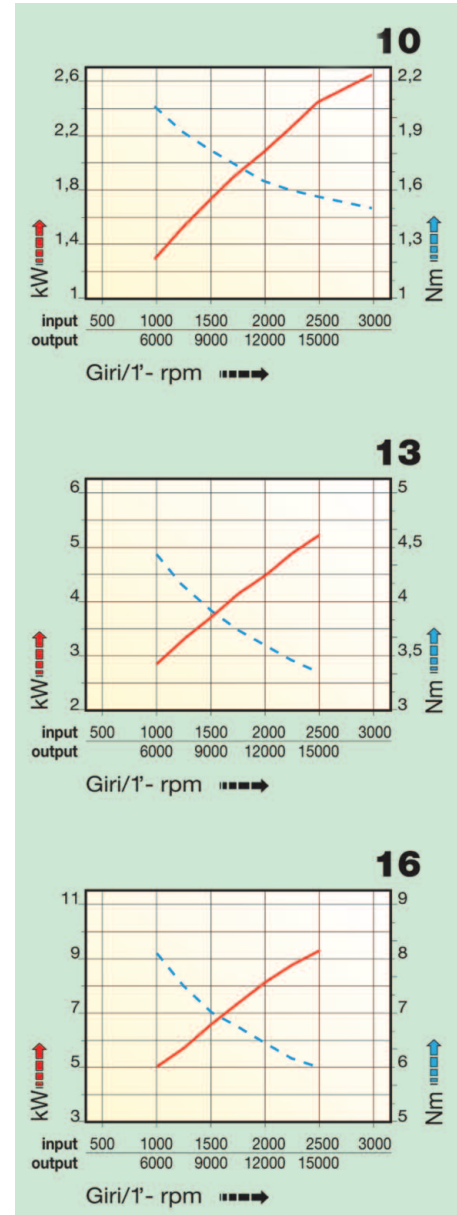
MADE IN ITALY



Corsa 7.5
Stroke 7.5

Type	10			13		16	
Shank	30	40	50	40	50	50	
Ratio	1 - 6			1 - 6		1 - 6	
RPM	22.000*			15.000*		12.000*	
Weight	3,3	3,7	6,5	5,8	8	10	
Collet	ER 20 max Ø 13			ER 25 max Ø 16		ER 32 max Ø 20	
D	84			105		123	
D1	65			80		100	
D2	35			42		50	
L	131,5	139,5	143	151	164,5		
L1	32			32		34	
L2	31,5			32		36	
L3	41			44		50	
L4	35	50	35	50	50		
L5	0	8	0	8	7,5		
L6	65	80	80		80		
L7	82,5	97,5	97,5		97,5		
L8	71		73		75		
Axial thrust	60 daN			90 daN		110 daN	

* speed at 100% duty cycle



BT Taper Spindle Speeders

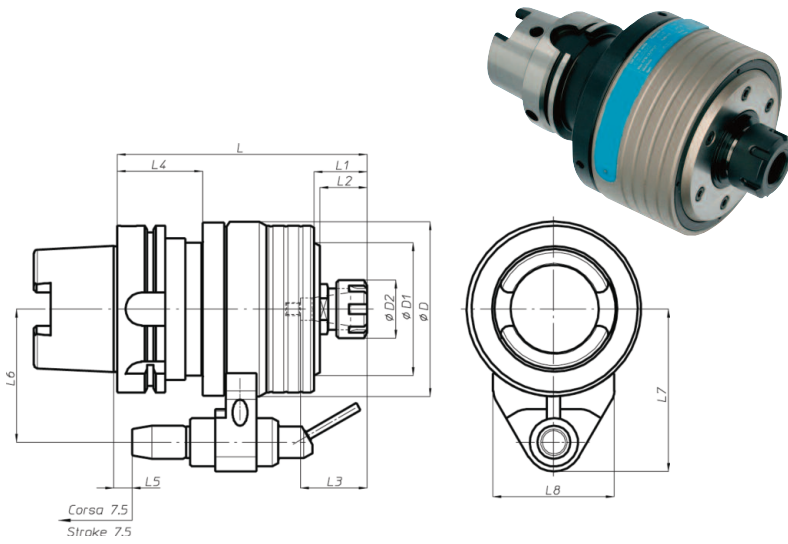
Series	BT 40 Code No.	Price €	BT 50 Code No.	Price €
BT10/ER20	384-236	8,611.90	384-238	9,535.30
BT13/ER25	384-240	9,836.80	384-242	10,289.00
BT16/ER32			384-244	11,340.50

Angle Heads & Speeders



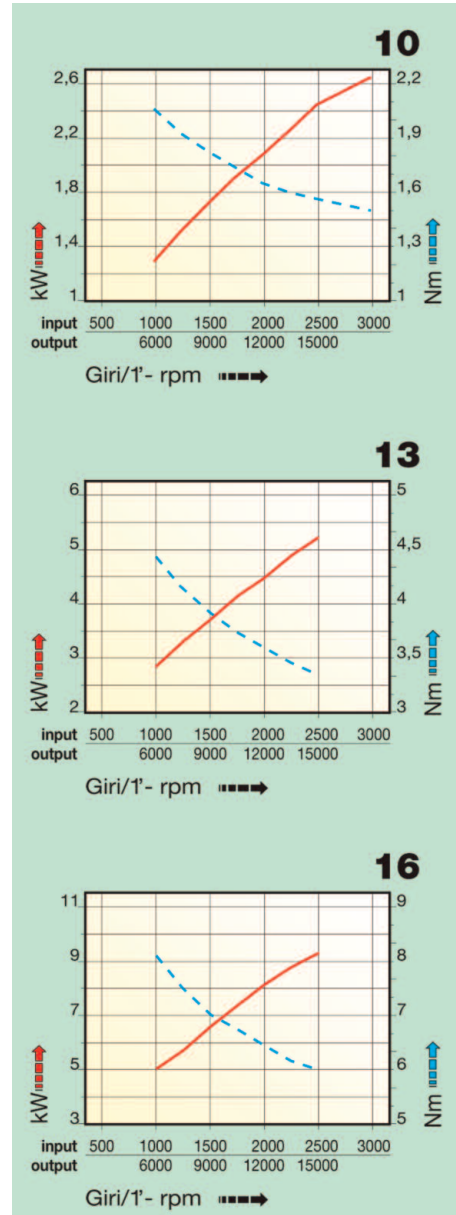
HSK SPINDLE SPEEDERS

MADE IN ITALY



Type	10			13			16		
Shank	63	80	100	63	80	100	80	100	
Ratio	1 - 6			1 - 6			1 - 6		
RPM	22.000 *			15.000 *			12.000 *		
Weight	3,3	3,7	6,5	5,8	8		10		
Collet	ER 20 max Ø 13			ER 25 max Ø 16			ER 32 max Ø 20		
D	84			105			123		
D1	65			80			85		
D2	35			42			50		
L	140,5	144,5		152	156		165,5		
L1	32			32			44		
L2	31,5			32			36		
L3	41			44			50		
L4	42	51		42	52		42	55	
L5	9			9			8,5		
L6	65	80		80			80		
L7	82,5	97,5		97,5			97,5		
L8	71			73			75		
Axial thrust	60 daN			90 daN			110 daN		

* speed at 100% duty cycle



Angle Heads & Speeders

HSK Spindle Speeders

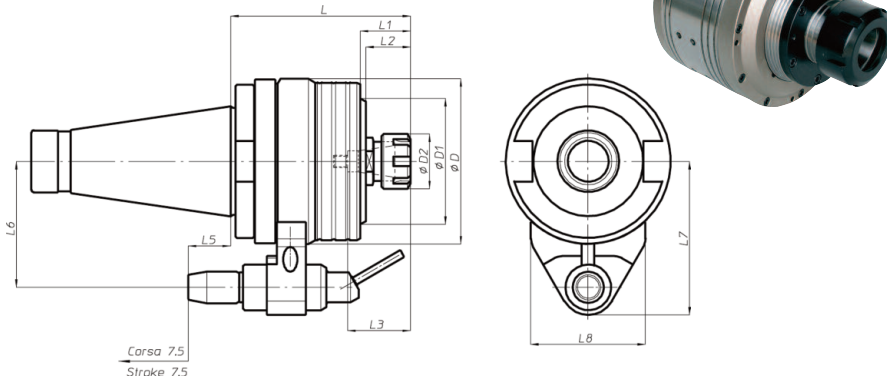
Series	HSK 63 Code No.	Price \$	HSK 80 Code No.	Price \$	HSK 100 Code No.	Price \$
HSK10/ER20	384-246	10,100.60	384-248	10,590.50	384-250	10,590.50
HSK13/ER25	384-252	10,590.50	384-254	11,174.70	384-256	11,174.70
HSK16/ER32			384-258	12,248.90	384-260	12,248.90



SPINDLE SPEEDERS

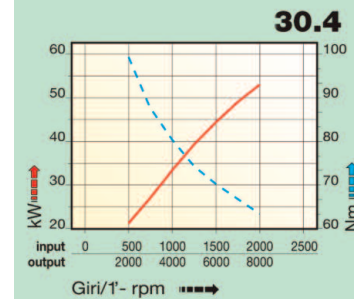
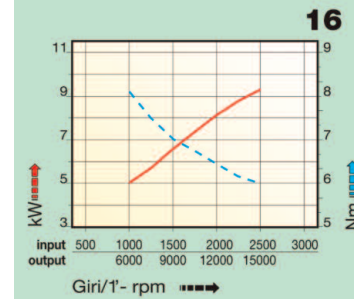
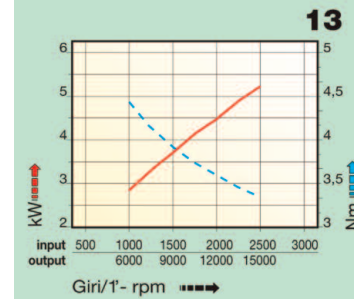
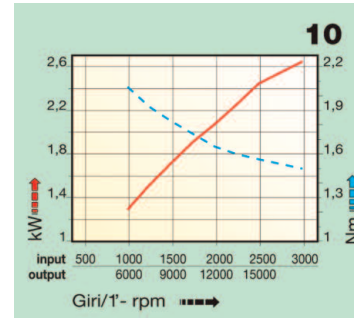
NMTB TAPER SPINDLE SPEEDERS

MADE IN ITALY



Type	10			13			16			30.4	
Shank DIN	40	45	50	40	45	50	40	45	50	50	
Shank NMTB	40	50		40	50		50			50	
Ratio	1 - 6			1 - 6			1 - 6			1 - 4	
RPM	22.000 *			15.000 *			12.000 *			8.000 *	
Weight	3	3	4,8	6,3	5	6	7,3	7,4	8	9,3	30
Collet	ER 20 max Ø 13			ER 25 max Ø 16			ER 32 max Ø 20			ER 50 max Ø 34	
D	84			105			123			185	
D1	65			80			100			114	
D2	35			42			50			78	
L	101	104,5	112,5	116	128	131,5					236
L1	32			32			34			85,5	
L2	31,5			32			36			60,5	
L3	41			44			50			90	
L5	14,5	11,5	13	9,5	15	12					
L6	65	80		80		80					
L7	82,5	97,5		97,5		97,5					
L8	71			73			75				
Axial thrust	60 daN			90 daN			110 daN			400 daN	

* speed at 100% duty cycle



NMTB Taper Spindle Speeders

Series	NMTB 40		NMTB 50	
	Code No.	Price \$	Code No.	Price \$
NMTB-10/ER20	384-224	8,517.70	384-226	8,687.20
NMTB-13/ER25	384-228	10,100.60	384-230	10,439.80
NMTB-16/ER32			384-232	12,474.90
NMTB-30/ER50			384-234	32,412.10



Pull Studs Cross-Reference Chart

Can't find your pull stud?

We invite your inquiries

Please have ready the following information when calling

- Taper of Machine
- Make & Model No. of the Machine
- Draw Bar Thread Dia & Pitch
- Taper Angle required underneath head of stud



Retention Knob Supply	Collis No.	Parlec No.	Command No.	Lyndex No.	Code No.	Price \$
BT-30 (M12 x 1.75 Draw Bar Thread)						
311-09	64723	3003TRK	RB2M-0001	B30-4500	366-000	22.70
311-09A	64721	3004TRK	RB2M-0002	B30-6000	366-002	22.70
BT-40 (M16 x 2 Draw Bar Thread)						
329-12			RS4M-0205	B40-1500	366-003	30.80
329-13	69101	P329-13	RS4M-0205C		366-004	34.10
311-13	64711	4003TRK	RB4M-0001	B40-4500	366-006	27.60
311-13A	64713	4004TRK	RB4M-0002	B40-6000	366-008	27.60
311013B	69059	4002TRK	RB4M-0003	B40-9000	366-010	27.60
311-13D		4003TRKC	RB4M-0001-C	B40-4500*	366-012	32.40
311-13E		4004TRKC	RB4M-0002-C	B40-6000*	366-014	32.40
311-13F		4002TRKC	RB4M-0003-C	B40-9000*	366-016	32.40
111-26	69047	F40TRK	RS4M-0115		366-018	26.00
111-22A	69980	A40TRK	RS4M-0105		366-020	26.00
312-25					366-022	30.80
111-26A		F40TRKC	RS4M-0115C		366-024	30.80
					366-026	32.40
350-00V		MH40TRK			366-028	29.20
171-26					366-030	29.20
171-27					366-032	35.70
CT-40 (5/8-11 Draw Bar Thread)						
711-23		4030TRK	RS4E-0114-C		366-034	32.40
					366-036	22.70
312-26	69007				366-038	26.00
111-22	67751	40TRK	RC4E-0001	C40-STD*	366-040	22.70
111-23	64724	40NTRK	RC4E-0002	C40-STD	366-042	22.70
312-22	64732		RB4E-0100	C40-MAZAK	366-044	26.00
126-22	69978				366-046	26.00
316-16		4008TRK	RS4E-0212	C40-1500	366-048	29.20
311-14	64712	4009TRK		C40S-4500	366-050	26.00
311-14A	64714	4014TRK	RB4E-0002	C40S-6000	366-052	26.00
311-14B	64683	4001TRK	RB4E-0003	C40S-9000	366-054	26.00
316-17	64730	4008TRKC	RS4E-0212-C	C40-1500*	366-056	32.40
315-14		4009TRKC		C40S-4500*	366-058	30.80
318-14A		4014TRKC	RB4E-0002-C	C40S-6000*	366-060	30.80
360-30		4001TRKC	RB4E-0003-C	C40S-9000*	366-062	30.80
171-22	64725	C400TRK	RS4E-0104		366-064	27.60
171-23	69029	C400TRKC	RS4E-0104-C		366-066	34.10
321-14	64729	4005TRK	RB4E-0001	C40-4500	366-068	27.60
				C40-6000	366-070	27.60
				C40-9000	366-072	27.60
				C40-4500*	366-074	32.40
				C40-6000*	366-076	32.40
				C40-9000*	366-078	32.40
CT-45 (3/4-10 Draw Bar Thread)						
111-33	67752	45TRK	RC5E-0001	C45STD*	366-080	26.00
BT-50 (M24 x 3 Draw Bar Thread)						
111-44A		A50TRK	RS6M-0105		366-082	34.10
311-17	69995	5003TRK	RS6M-0001	B50-4500	366-084	39.00
311-17A		5004TRK	RB6M-0002	B50-6000	366-086	39.00
311-17B	64719	5002TRK	RB6M-0003	B50-9000	366-088	39.00
316-43		5003TRKC	RB6M-0001-C	B50-4500*	366-090	45.40
CT-50 (1"-8 Draw Bar Thread)						
111-46	69993	50NTRK	RC6E-0002	C50-STD	366-092	30.80
312-46	64737	M50TRK			366-094	35.70
111-44	57753	50TRK	RC6E-0001	C50-STD*	366-096	30.80
311-18	64720	5005TRK	RB6E-0001	C50-4500	366-098	37.30
311-18A	64722	5014TRK	RB6E-0002	C50-6000	366-100	37.30
311-18B	69057	5001TRK	RB6E-0003	C50-9000	366-102	37.30
316-45	64731	5005TRKC	RB6E-0001-C	C50-4500*	366-104	43.70
318-44A	69057	5014TRKC	RB6E-0002-C	C50-6000*	366-106	43.70
342-18B		5001TRKC	RB6E-0003-C	C50-9000	366-108	43.70

*Coolant Thru

Angle Heads & Speeders

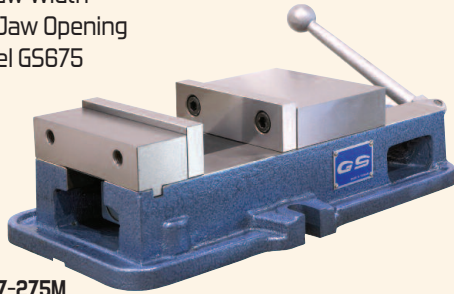
MACHINE VISE + PARALLEL SET



- Vises are matched
- An integral key and large fasteners reduce reflection
- Chip cover protects lead screw
- Moveable jaw does not lift off the bed
- Interchangeable soft jaws
- 6" Jaw Width
- 7.5" Jaw Opening
- Model GS675

- Thin style, 1/8" thick
- Matched pairs
- Made of high grade steel alloy
- Hardened and ground
- Tolerance $\pm 0.0003"$
- Length: 6"
- Height:
1/2, 5/8, 3/4, 7/8, 1,
1-1/8, 1-1/4, 1-3/8,
1-1/2, 1-5/8

Code No.:
500-778



327-275M



230-863

CALL TODAY FOR A QUOTE

DOUBLE CLAMP VISE WITH FREE ALUMINUM SOFT JAWS

- One handle simultaneously operates two moveable jaws and clamps 2 pieces of workpiece of same or different size or one large workpiece
- The moveable jaw ANTI-LIFT mechanism provides alignment to workpiece without jaw lift
- There are 6 kinds of clamping ways to meet workpieces of different shapes and sizes
- The whole body is precisely ground and height tolerance is within $\pm 0.025\text{mm}$ ($\pm 0.001"$), therefore several vises can be lined up for production
- The rigid construction prevents base distortion



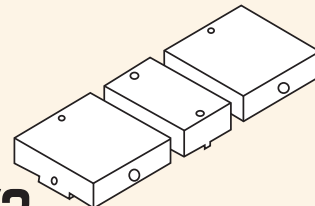
Code: 382-600

- Model TLD-60G/HV
- 6" jaw width
- 4.9" jaw openings



FREE

6" Aluminum Soft Jaws
Code: 382-602



Promo Code: 500-273

CALL TODAY FOR A QUOTE



TOOLING

VICES, LIVE CENTERS, BORING & FACING HEADS

GS

GS Precision Milling Machine Vises	139-140
GS Modular Vises & Accessories/Parts	140-142
GS Multi-tasking 5th Axis Vises	143
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STM

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Bench Vises	147-148
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Drill Press Vises	148-150
EDM Tool Maker Vises	150

LIVE CENTERS

Skoda & STM Heavy Duty Live Centers	152
Skoda Extra Heavy Duty Live Centers	153
Skoda Precision CNC Live Centers	154
Skoda Extended Point Live Centers	155
Skoda Bull Nose Live Centers	155
Skoda Live Center Parts	156

Narex Universal Boring & Facing Heads & Accessories	157-164
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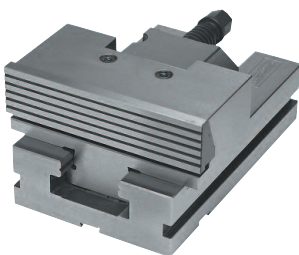
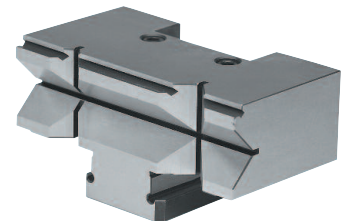
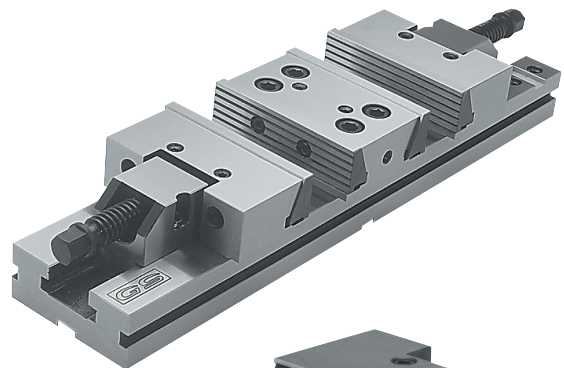
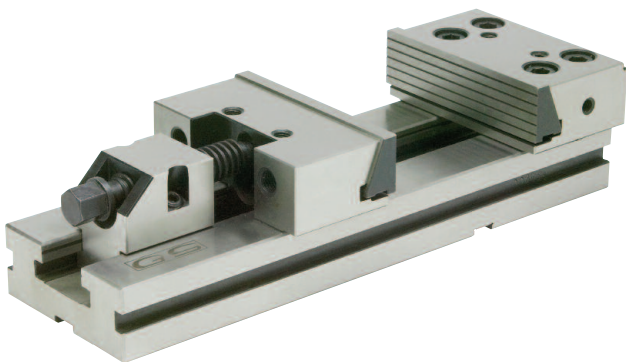


VISES



Precision Clamping Systems for all Applications

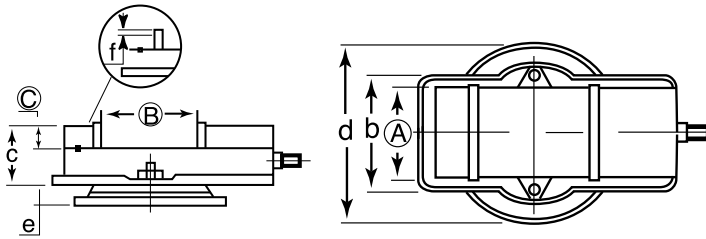
High Quality and Accuracy





GS 6" Precision Milling Machine Vises

- Vises are Matched
- An integral key and large fasteners reduce deflection by 50%
- 4 jaw plate positions allow extra capacity with the jaw plates in the outside position
- The swivel base is graduated 360° in one degree increments
- Chip cover protects leadscrew from damage
- The quality movable jaw does not lift off the bed, and the deflection of the stationary jaw is minimized



(Inch)

Model	Jaw		C	O.A.L.	b	c	d	e	f	Plain Ship	Code No.	Price \$
	Width	Open										
GS675	6	7.5	1.77	17.2	9.13	4.6	12	1.65	.39	80lbs	327-275M	662.20
GS890	6	8.9	1.5	17.2	8.3	4.6	12	1.7	.2	80lbs	327-290M	741.30
Jaw Plates for GS675 & GS890											327-287	117.60
Swivel base only											327-280	156.10
Replacement Handle											327-285	66.90
Main Screw, Collar & Collar Set Screw for GS675											327-284	105.70
Main Screw, Collar & Collar Set Screw for GS890											327-291	142.30
Chip Cover for GS675											327-289	17.50
Chip Cover for GS890											327-294	6.10
Vise Nut for GS675											327-288	144.20
Vise Nut & Brush Set for GS890											327-293	137.60
Jaw Plate Screws (4pcs) for GS675 & GS890											327-286	17.30
Ball Bearing Thrust Collar for GS675 & GS890											327-292	19.70

Capacity

	I	II	III	IV
GS 675	0-7-1/2" 0-192mm	2-1/8" - 10-1/4" 54-262mm	5" - 13-1/8" 125-333mm	7" - 15-7/8" 177-403mm
GS 890	0-8.89" 0-226mm	2.125" - 11.65" 54-296mm	5" - 14.44" 125-367mm	6.97" - 17.24" 177-437mm

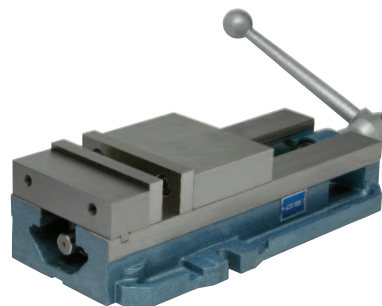
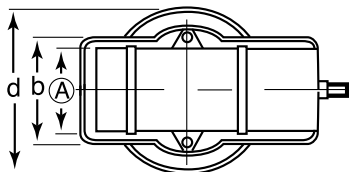
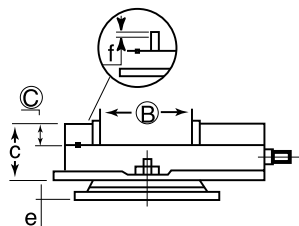
Vises & Live Centers



VICES

GS 8" Precision Milling Machine Vises

- Vises are Matched
- An integral key and large fasteners reduce deflection by 50%
- 4 jaw plate positions allow extra capacity with the jaw plates in the outside position
- The swivel base is graduated 360° in one degree increments
- Chip cover protects leadscrew from damage
- The quality movable jaw does not lift off the bed, and the deflection of the stationary jaw is minimized



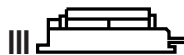
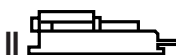
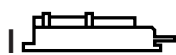
(Inch)

Model	Jaw Width A	Jaw Open B	C	O.A.L.	b	c	d	e	f	Plain Ship Wt	Code No.	Price \$
GS810	8	10.0	2.25	21.8	11.62	5.55	15.0	1.85	.43	158lbs	327-300	1,497.00
Swivel base only											327-310	303.90
Jaw Plates											327-311	200.40
Replacement Handle											327-305	75.90

Parts For GS 8" Precision Milling Machine Vises

Description	Code No.	Price \$
Main Screw, Collar & Collar Set Screw	327-306	240.70
Ball Bearing Thrust Collar	327-292	19.70
Needle Bearing Thrust Collar	327-307	54.20
Chip Cover	327-308	8.70
Vise Nut	327-309	343.80
Jaw Plate Screws (4pcs)	327-312	13.10

Capacity



GS 810

0-10.43"
0-265mm

2.36" - 3.66"
60-347mm

6.25" - 16.61"
159-422mm

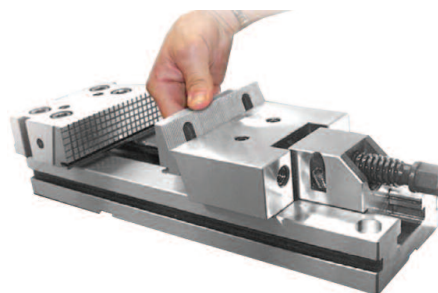
8.58" - 20.79"
218-528mm

Modular Vise w/ Quick Interchangeable Pulldown Jaws

- No tools needed for quick hand change of downward jaw plates



Soft Jaws



Description	Code No.	Price \$
6 x 8 Modular Vise	382-896	1,429.80
Pair Soft Jaws	382-897	229.80

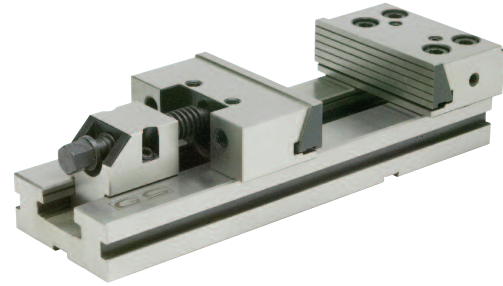


GS Plain Base Modular Vises

Manufactured under rigid quality control. As a result of the high standard construction, GS Vises can be depended upon to maintain their accuracy under the most severe operating conditions. The modular design and the concept of interchangeability makes possible a wide variety of set up combinations.

Features/Benefits:

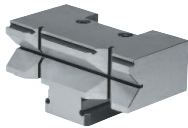
- High accuracy
- Unlimited clamping range
- High quality alloy steel
- High clamping pressure
- No jaw lift
- All vises are matched



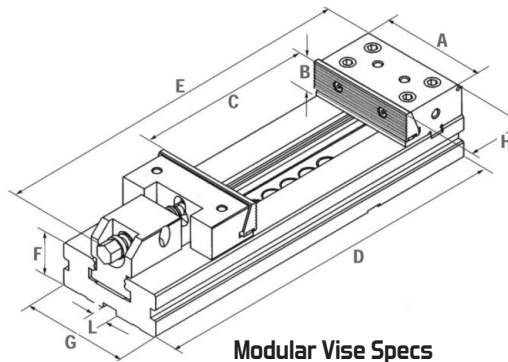
(Inch)

Model	Jaw Width (A)	Opening (C)	Jaw Height (B)	Code No.	Price \$
1	4	4	1.2	382-005	982.40
2	5	6	1.6	382-010	1,047.90
3	6	8	1.97	382-015	1,277.20
3	6	12	1.97	382-017	1,777.40
4	7	8	2.4	382-020	1,801.00
4	7	12	2.4	382-025	1,964.70
4	7	16	2.4	382-030	2,224.20
4	7	20	2.4	382-032	2,619.50
5	8	8	2.6	382-035	2,285.90
5	8	12	2.6	382-040	2,409.40
5	8	16	2.6	382-045	2,656.50
5	8	20	2.6	382-050	3,027.20
5	8	24	2.6	382-052	3,994.70
6	12	8	3.2	382-055	3,634.50
6	12	12	3.2	382-060	4,027.40
6	12	16	3.2	382-065	4,714.90
6	12	20	3.2	382-070	5,189.40
6	12	24	3.2	382-075	5,664.40
6	12	28	3.2	382-080	6,582.70
6	12	32	3.2	382-085	7,334.40

Prismatic Jaws



Model No.	Code No.	Price \$
#3	382-890	393.00
#4	382-892	524.00
#5	382-894	655.00



Modular Vise Specs

(Inch)

Vise Size	Code No.	D	E	F	G	H	I	Kgs
4 x 4	382-005	10.45	12.5	1.38	2.95	3.07	.628	6.8
5 x 6	382-010	13.8	16.4	1.6	3.8	3.04	.64	12.9
6 x 8	382-015	16.8	20.86	1.97	4.92	3.574	.64	25.5
6 x 12	382-017	20.47	20.86	1.97	4.92	3.574	.64	29
7 x 8	382-020	17.91	24.80	2.32	5.8	3.876	.64	37
7 x 12	382-025	21.85	24.80	2.32	5.8	3.876	.64	42
7 x 16	382-030	25.78	24.80	2.32	5.8	3.876	.64	47
7 x 20	382-032	29.72	24.80	2.32	5.8	3.876	.64	52
8 x 8	382-035	22.9	28.74	2.8	6.8	4.536	.64	64
8 x 12	382-040	26.8	28.74	2.8	6.8	4.536	.64	69
8 x 16	382-045	30.7	28.74	2.8	6.8	4.536	.64	74
8 x 20	382-050	34.6	28.74	2.8	6.8	4.536	.64	79
8 x 24	382-052	38.6	28.74	2.8	6.8	4.536	.64	84
12 x 8	382-055	24.8	32.67	3.07	7.67	4.74	.64	95
12 x 12	382-060	28.7	32.67	3.07	7.67	4.74	.64	105
12 x 16	382-065	32.7	32.67	3.07	7.67	4.74	.64	115
12 x 20	382-070	36.6	32.67	3.07	7.67	4.74	.64	125
12 x 24	382-075	40.5	32.67	3.07	7.67	4.74	.64	135
12 x 28	382-080	44.5	32.67	3.07	7.67	4.74	.64	145
12 x 32	382-085	48.5	32.67	3.07	7.67	4.74	.64	155

6" Soft Jaw Assembly



Model No.	Code No.	Price \$
#3	382-895	339.80

Vises & Live Centers

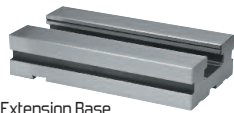


VISES

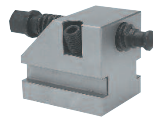
Parts & Accessories For GS Modular Vises



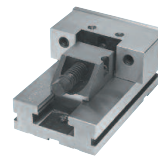
Swivel Base



Extension Base



Mechanical Blocking Device

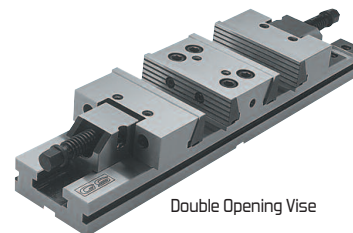


Moveable Jaw Section and Base

Part Description	#1 Code No.	Price \$	#2 Code No.	Price \$	#3 Code No.	Price \$	#4 Code No.	Price \$	#5 Code No.	Price \$	#6 Code No.	Price \$
Swivel Base	382-380	458.70	382-385	524.00	382-390	622.30	382-395	687.80	382-400	917.00	382-405	1,146.20
Extension Base	382-260	524.00	382-265	589.50	382-270	655.00	382-275	720.40	382-280	903.80	382-285	1,113.40
Mechanical Blocking Device	382-470	229.40	382-475	235.90	382-480	262.00	382-485	272.00	382-490	321.50	382-495	491.30
Moveable Jaw	382-412	229.40	382-417	294.80	382-422	393.00	382-427	586.00	382-432	884.30	382-437	1,309.90
Fixed Jaw	382-410	229.40	382-415	294.80	382-420	393.00	382-425	586.00	382-430	884.30	382-435	1,309.90
Main Screw	382-850	53.90	382-852	76.30	382-854	78.10	382-856	78.10	382-858	117.40	382-860	117.40
T-Wrench	382-820	14.40	382-822	14.40	382-824	19.20	382-826	19.20	382-828	22.00	382-830	22.00
Box Wrench	382-874	13.20	382-876	27.50	382-878	32.90	382-880	32.90	382-882	46.60	382-884	46.60
Vise Holding Jaws	382-685	41.20	382-690	41.20	382-695	59.70	382-700	59.70	382-705	67.40	382-710	67.40
Positioning Keys	382-655	40.40	382-660	40.40	382-665	40.40	382-670	40.40	382-675	40.40	382-680	40.40
Work Stop	382-770	58.80	382-775	58.80	382-780	58.80	382-785	58.80	382-790	61.00	382-795	66.80
Jaw Plate for Fixed Jaw	382-862	78.80	382-864	104.90	382-866	164.50	382-868	179.00	382-870	190.00	382-872	214.40
Jaw Plate for Moveable Jaw	382-863	78.80	382-865	104.90	382-867	164.50	382-869	179.00	382-871	185.20	382-873	214.40
Lock Screw for Blocking Device	382-471	8.00	382-476	8.00	382-481	9.60	382-486	9.60	382-491	15.90	382-496	15.90
	M6x1 x 25mm		M12x1 x 25mm		M14x2 x 35mm		M16x2 x 60mm		M20x2.5 x 60mm		M20x2.5mm x 50mm	
	382-472	1.40			382-482	3.20						
	M8x1.25 x 25mm				M12x1.75 x 30mm							
Chrome Locking Ball for Blocking Device	382-473	2.90	382-477	4.90	382-483	7.40	382-483	7.40	382-492	24.60	382-492	24.60
	9/16" dia.		3/4" dia.		7/8" dia.		7/8" dia.		1-1/8" dia.		1-1/8" dia.	
Pre-Assembled Groups												
Overall Length	5.5"		6.30"		9"		10"		12"		13.75"	
Leadscrew Overhang	2.08"		2.3"		2.8"		2.0"		3"		2.16"	
Moveable Jaw Section and Base Assembly	382-290	648.50	382-295	720.40	382-300	1,310.00	382-305	1,047.90	382-310	1,571.80	382-315	2,193.90

GS Modular Vises - Single & Double Opening

- High accuracy
- Unlimited clamping range
- High quality alloy steel
- High clamping pressure
- Mechanical and pneumohydraulic blocking devices
- No length limitations
- No jaw lift
- Low profile
- All vises are matched
- Extra long base



Double Opening Vise

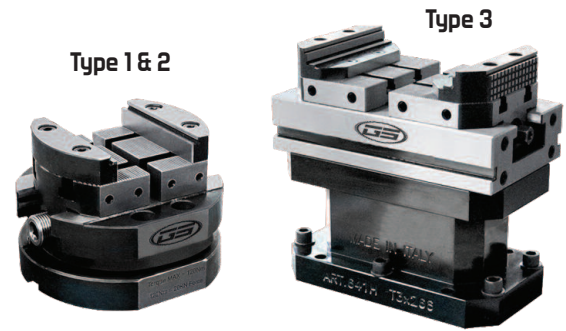
Model	Opening	O.A.L.	Jaw Width	Weight (kg)	Code No.	Price \$
Single Opening Modular Vise						
1	11.4	18	4	10	382-101	1,277.20
2	12.6	20.5	5	17	382-102	1,670.00
3	14.7	23	6	31	382-103	2,128.30
3	18.11	27	6	34	382-104	2,423.00
4	16	26	7	46	382-105	2,357.50
4	20	30	7	51	382-106	2,685.00
5	24	36	8	92	382-110	4,191.00
Double Opening Modular Vise						
3	2 x 4.3	23	6	38	382-153	2,235.80
3	2 x 6.3	27	6	41	382-154	2,851.50
4	2 x 6.7	30	7	63	382-156	3,077.90
5	2 x 10	40	8	107	382-172	5,789.70
6	2 x 6.3	35	12	154	382-175	7,237.00
6	2 x 16	55	12	194	382-180	12,395.20



GS Multi-tasking Modular Vises For 5-Axis Machining Centers

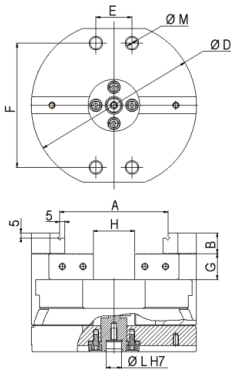
The MULTITASKING range of vises has been specially designed for 5-axis machines. Working on 5 sides of the workpiece, it allows the best optimization of the machining cycle. Thanks to the compact design this kind of vise can be installed on all machining centers. The use of GRIP jaws is strongly recommended with multitasking vises.

- Self-centering or eccentric
- Eccentric jaw adjustment in steps of 2mm
- Highest accuracy in positioning and alignment ($\pm 0.02\text{mm}$) due to ground rack teeth on both the base and the fixed jaws
- Minimum deflection
- Solid, rigid construction and maximum clamping ratio to the total length
- Positioning through ground holes or keyways
- All case hardened to HRC60 for durability

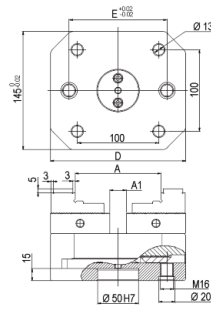
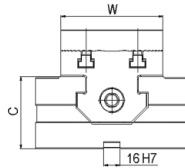


Vise shown with riser

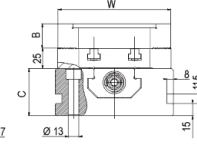
MADE IN ITALY



Type 1 & 2



Type 3



	Type 1	Type 2	Type 3x166	Type 3x266
Code No.	382-520	382-522	382-524	382-526
Price \$	2,541.50	3,388.50	3,896.90	4,066.40
A	74	104	108	208
A1	-	-	20	60
W	74	99	138	138
B	15	20	30	30
C	50	70	58	58
ØD/Ø	120	160	166	266
E	5	35	120	200
F	92	120	-	-
G	20	25	-	-
H	20	40	-	-
ØL H7	20	20	-	-
M	9	11	-	-
kg	4.9	11	13	20
kN	16	20	30	30

Risers

- Allow greater access to machine hard to reach areas of the workpiece

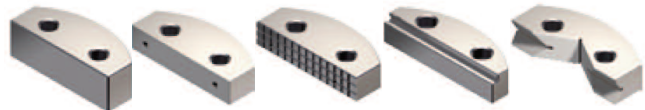


Type 1



Type 3x166

Also available: Smooth, Soft, Serrated, Step, Prismatic, and Grip Jaws



Alternate slide designs are available by request. Risers also available in 50, 75, & 100mm heights.

Call today for more information or to receive a quote.

Model	Length (mm)	Width (mm)	Height (mm)	Code No	Price \$
Type 1	Ø 119	-	130	382-521	1,244.90
Type 2	Ø 158	-	130	382-523	1,791.90
Type 3x166	166	145	145	382-525	2,611.50
Type 3x266	266	125	145	382-527	3,351.70



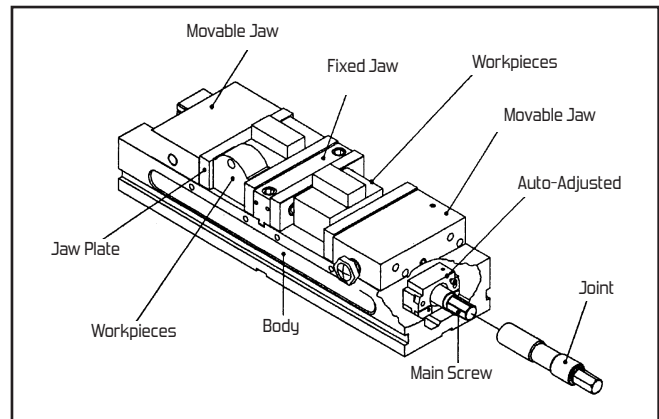
VICES

DOUBLE CLAMP VISES

- Double clamp set ~ one handle can simultaneously operate two moveable jaws and clamps 2 workpieces of same or different size or one large workpiece
- This model can increase efficiency and productivity of CNC machines
- The movable jaw ANTI-LIFT mechanism provides alignment to workpiece without jaw lift
- There are 6 kinds of clamping ways to meet workpieces of different shapes and sizes
- The whole body is precisely ground and height tolerance is within $\pm 0.025\text{mm}$ ($\pm 0.001''$), therefore several vises can be lined up for production
- The vise is made of FDC-80,000 PSI (55kg/cm²) Ductile iron, and slide ways are hardened to HRC45
- The rigid construction prevents base distortion
- Precision made to high accuracy standard



GS Double Clamp Vise
(TLD-40G/HV, TLD-60G/HV)

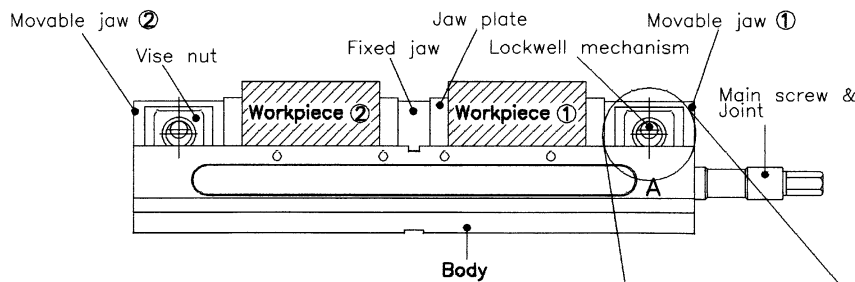


Double Clamp Vises

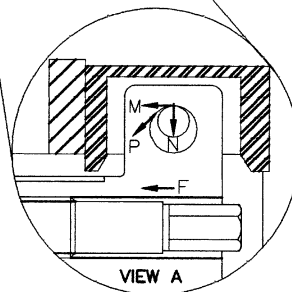
Model No.	Code No.	Price 5
4" - TLD-40G/HV	382-610	2,041.10
6" - TLD-60G/HV	382-600	2,273.80

Feature:

ANTI-LIFT MECHANISM



- Clamping force equalization and ANTI-LIFT mechanism features virtually eliminate the deflection of fixed center jaw and movable jaw lift
- Clamping range for clamping 2 workpieces simultaneously is 125 mm (4.9") each or 275 mm (10.8") for one large workpiece
- Double clamp seat

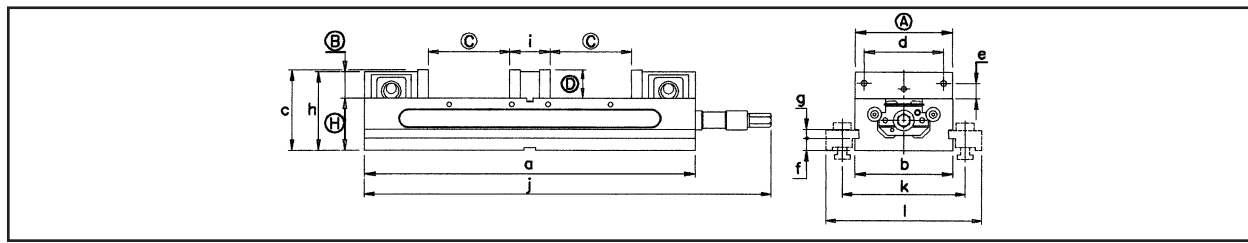


ANTI-LIFT Mechanism



CLAMPING EXAMPLES FOR DIFFERENT APPLICATIONS:

<p>Clamping 2 pieces of same size workpieces. Max. Capacity: 90mm (3.5") 125mm (4.9")</p>	<p>Clamping 2 pieces of different size of workpieces. Max. Capacity: 90mm (3.5") 125mm (4.9")</p>	<p>Large workpieces are able to be clamped after moving fixed jaw. Max. Capacity: 237mm (9.3") 1315mm (12.4")</p>
<p>Stepped jaw plate for thin workpiece. Max. Capacity: 215mm (8.4") 275mm (10.8")</p>	<p>Clamping 2 different workpieces. Max. Capacity: 215mm (8.4") 275mm (10.8")</p>	<p>Large thin workpiece is able to be clamped after removing jaw plate on fixed jaw. Max. Capacity: 405mm (15.9") 520mm (20.5")</p>



Dimensional Information For Double Clamp Vises
(mm/in.)

Model No.	A	B	C	D	a	b	c	d	e	f	g	h	H	i	j	k	l	Guide Block	Weight (kg/lb)
TLD-40G	103	33	90	38	405	104	101.5	63.5	17.5	13	31	96.5	63.5	55	430	143	195	18	20
(TLD-40HV)	4.05	1.29	3.54	1.49	15.9	4.09	3.99	2.5	0.68	0.51	1.22	3.79	2.5	2.16	16.9	5.62	7.67	0.709	44
TLD-60G	152	41.5	125	44.5	520	154	123.5	98.42	23.8	18	16	126.5	82.55	64	639	193	245	18	48
(TLD-60HV)	5.98	1.6	4.9	1.75	20.47	6	4.98	3.87	0.94	0.7	0.63	4.86	3.25	2.52	25.15	7.59	9.64	0.709	105.6

TLD-40G, TLD-60G; match vise, TLD-40HV, TLD-60H (horizontal and vertical 2 way)

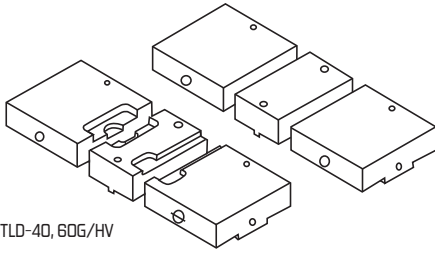
Inspection Specification:

	<p>Parallelism: running face to bottom of bed. Guaranteed: 0.01 mm (0.0004")</p>		<p>Parallelism: keyways on bottom of bed to jaw plate. Guaranteed: 0.02 mm (0.0008")</p>
	<p>Squareness: between running face and jaw plate. Guaranteed: 0.03 mm (0.0012")</p>		<p>Squareness: keyways on bottom of bed to jaw plate. Guaranteed: 0.02 mm (0.0008")</p>
	<p>Squareness both sides to fixed jaw plate. Guaranteed: 0.02 mm (0.0008")</p>		<p>Parallelism: running face of the test block to bottom. Guaranteed: 0.02 mm (0.0008")</p>



VISES

Machinable Fixture Jaws



Soft Jaws for TLD-40, 60G/HV

Description	Code No.	Price \$
4" aluminum soft jaws	382-612	545.80
4" step jaws	382-614	245.90
6" aluminum soft jaws	382-602	833.90
6" step jaws	382-604	282.20

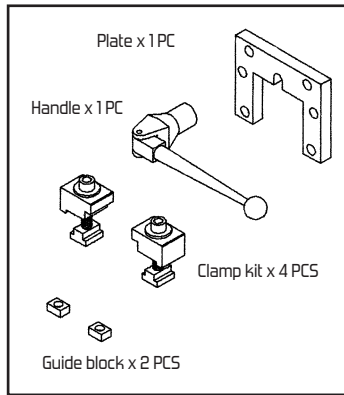
Steel Jaw Sets

Model No.	Code No.	Price \$
4" steel jaw set for TLD40	382-615	332.00
6" steel jaw set for TLD60	382-605	420.80

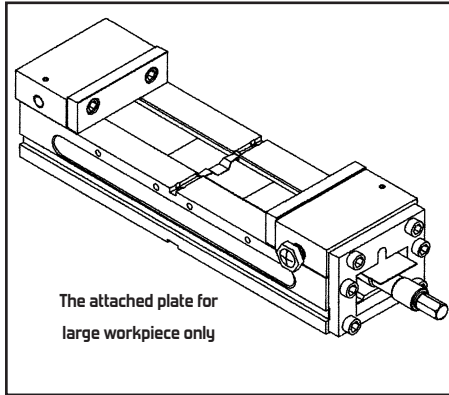
Steel Jaw Plates

Description	Code No.	Price \$
6" steel jaw plate set (4) for TLD60	382-617	278.90

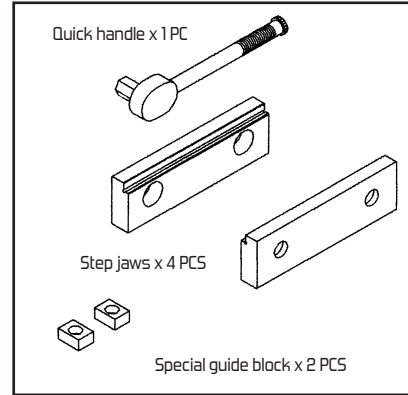
Standard Accessories



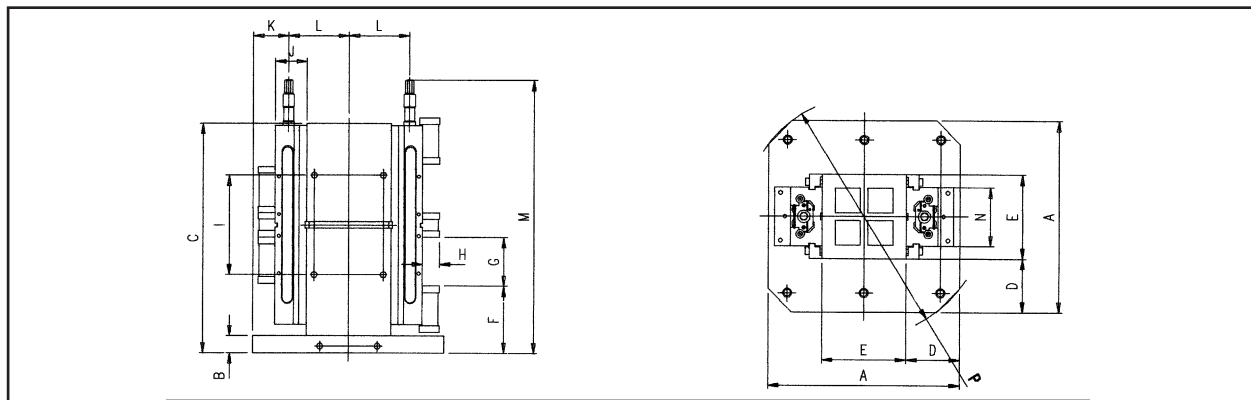
Usage of "Plate"



Optional Accessories



JIG BLOCK



Jig Block Dimensional Specifications

(mm/in.)

Model NO.	Use Vise	Pallet Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Weight (kg/lb)
GS-40-4C	TLD-40	400 x 400	400	40	500	110	180	168	90	38	203	63.5	75.5	124.5	543	104	506	118
GS-40-4C	TLD-40	400 x 400	15.74	1.57	19.68	4.33	7.08	6.61	3.54	1.49	7.99	2.5	2.907	4.90	21.3	4.09	19.92	259.6
GS-60-4C	TLD-60	500 x 500	500	45	600	140	220	175	125	44.5	260	82.5	92	158	714	154	628	233
GS-60-4C	TLD-60	500 x 500	19.68	1.77	23.62	5.51	8.66	6.88	4.92	1.75	10.23	3.25	3.62	6.25	28.11	6.02	24.72	512.6



Toolmaker Vises

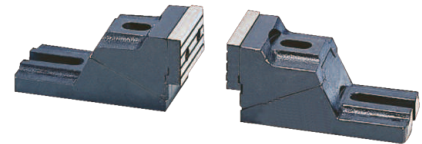
- Solid one piece body
- Square and parallel within 0.0002" and 0.0003"
- Angled centre channel provides extra jaw capacity



Model No.	Length (mm)	Width (mm)	Jaw Opening (mm)	Jaw Height (mm)	Code No.	Price \$
YCT-VB20	140	48	65	25	230-815	110.90
YCT-VB25	170	63	90	35	230-820	134.80
YCT-VB30	180	73	90	35	230-825	146.30
YCT-VB35	225	88	125	45	230-830	224.50
YCT-VB40	225	98	125	45	230-835	296.40
YCT-VB50	287	125	150	50	230-836	447.30

Free Style Vises

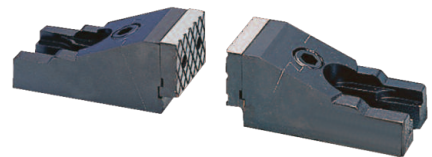
- Free style clamping
- Light duty



Model	Dimensions WxHxL	Clamping Capacity HxL	Weight (2pcs) (kg)	Code No.	Price \$
FV-350	75x67x150mm	140x350mm	7.5	326-450	263.10
FV-450	100x90x200mm	180x450mm	14	326-455	313.00
FV-550	125x120x250mm	250x550mm	23	326-460	450.90

Heavy Duty Free Style Vises

- Free style clamping
- Heavy duty



Model	Height (mm)	Width (mm)	Length (mm)	Weight (2pcs) (kg)	Code No.	Price \$
SV-62	59.5-80.5	64	139	5.8	326-465	364.40
SV-85	86-110	86.5	192	11	326-470	579.60
SV-125	84-117	127	218	21	326-475	808.50

Heavy Duty Bench Vises With Swivel

Manufactured from high quality grey iron castings - a very strong material with excellent shock absorbing capacity and immense strength under compression, these rigid & robust vises, machined to close tolerances, are designed for smooth operation and reliability.



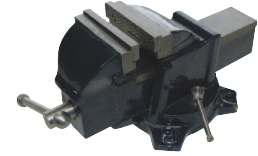
Jaw Size	Code No.	Price \$
4	231-400	143.60
5	231-405	208.40
6	231-410	277.80

Vises & Live Centers



Bench Vises With Swivel

- Steel serrated jaws
- Heavy duty cast iron body



Jaw Size	Code No.	Price \$
4	326-785	55.20
5	326-790	86.90
6	326-795	170.00

Multi-Purpose Bench & Pipe Vises

- Ground anvil, two axis
- Jaws can be rotated 360°, stop every 45°
- Steel Pipe Jaws



Jaw Size	Code No.	Price \$
4	326-770	167.40
5	326-775	189.00
6	326-780	302.50

Milling Machine Vise For Round Workpieces

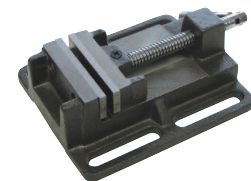
These vises are used for clamping round workpieces with diameters from 25/64" to 6-1/3" for use on a milling machine or drill press.



Jaw Width	Shaft Capacity	Weight (lb)	Code No.	Price \$
6	2 to 6-1/2	165	401-003	3,961.80

Drill Press Vises

- High tensile iron casting
- Cold rolled screw thread
- Plain jaws of special steel

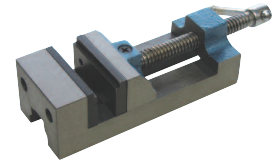


Jaw Width	Opening (in.)	Jaw Depth	Weight (lb)	Code No.	Price \$
3	3	1-1/8	6	370-206	43.20
4	4	1-3/8	10	370-211	56.40
5	5	1-1/2	17-1/2	370-216	99.30
6	6	1-1/2	23	370-221	115.60



Drill Press Vise P250

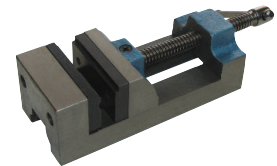
- High tensile iron casting
- Jaw plates – one grooved and one plain
- Accurate machining and assembling
- Four sides and one end machined



Jaw Width	Jaw Depth	Opening (in.)	Length	Weight (lb)	Code No.	Price \$
2-1/2	1-1/2	2-9/16	7-1/4	5-1/2	370-226	50.20

Drill Press Vises P350 & P400

- Rugged 3 inch and 4 inch
- Precision cut Acme thread screw
- Hexagonal screw head for tight clamping



Jaw Width	Jaw Depth	Opening (in.)	Length	Weight (lb)	Code No.	Price \$
3	1-3/4	3	9-1/4	9-3/4	370-236	59.10
4	1-3/4	4	10-3/4	17	370-241	92.30

Piston Vises

- Easy and speedy
- Quick grip drill press vises



Model No.	Jaw Width	Jaw Depth	Opening (in.)	Code No.	Price \$
V-75	3	1-1/4	3	326-485	318.30
V-100	4	1-15/16	4-11/16	326-490	378.50

Heavy Duty Drill Press Vises

- A vise designed especially for the professionals who require a heavy vise
- Manufactured from close grained cast iron, this vise offers a ground vise bed for smooth & consistent jaw movement
- Jaws are hardened & ground with cross-patterned 90° V-grooves in the stationary jaw facilitating holding of round jobs both horizontally & vertically
- Rugged design makes these vises perfect for even the most difficult drilling, tapping & reaming operations



Model No.	Jaw Width	Opening (in.)	Jaw Depth	Code No.	Price \$
DPV/60/BU	2-7/16	2-11/16	1	370-900	126.10
DPV/80/BU	3-3/16	3-1/2	1	370-905	204.00
DPV/100/BU	4	4	1-1/4	370-910	228.10
DPV/120/BU	4-3/4	5-13/16	1-11/16	370-915	390.10
DPV/150/BU	6	6-5/8	2	370-920	510.00



Unigrip Drill Press Vises

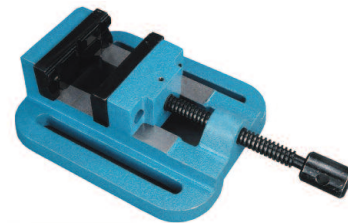
- Manufactured from graded cast iron, these vises have a precision ground base and vise bed for smooth lateral movement of the movable jaw.
- Longitudinal and transversal prisms in the fixed jaw allow for firm gripping of round jobs of different sizes both horizontally and vertically. Special seat in jaws facilitates retaining of flat work pieces.
- Vises are equipped with a convenient unigrip mechanism. Spindle moves inside the hollow hand grip allowing the vise to be used at a location away from the table edge. This feature increases the scope of application of this range of vises.
- This vise is also available with 3 mounting options via 2 additional precisely ground surfaces: end face and side face. This allows for drilling along all axes with a single setting of the job and holding of long workpieces which are cumbersome and difficult to manage in regular vises.



Model No.	Jaw Width	Opening (in.)	Jaw Depth	Code No.	Price \$
DPV/UG-75	3	2-3/4	13/16	370-925	83.50
DPV/UG-100	4	3-1/2	13/16	370-930	97.30
DPV/UG-125	5	4-15/32	1-3/8	370-935	148.30
3 WAY Drill Press Vise					
DPV/UG/3/100	4	3-1/2	13/16	370-940	132.00

SG Iron Unigrip Drill Press Vise

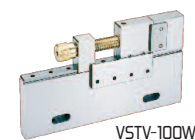
- Manufactured from SG Iron makes them amongst the strongest vises in the market - virtually unbreakable.
- Only Drill Vise that can also be used as a milling vise
- Equipped with long mounting slots for easy adjustment on the machine table
- Fixed jaw has horizontal and vertical V slots for holding round jobs
- Both jaws have a seat for retaining flat & low height work pieces
- Movable steel jaw is supported by a jaw seat imparting rigidity and further strength



Model No.	Jaw Width	Opening (in.)	Code No.	Price \$
DPV/SG-80	3-3/16	3-9/64	370-945	100.10

EDM Tool Maker Vises

- Parallelism: $\pm 0.002\text{mm}/100\text{mm}$
- Squareness: $\pm 0.002\text{mm}/100\text{mm}$
- Stainless Steel



Model	Max Opening	Thickness	Jaw Depth	Weight (kg)	Code No.	Price \$
VSTV-50W	55mm	27mm	25mm	1.0	230-840	575.20
VSTV-100W	100mm	24mm	50mm	4.9	230-842	1,492.30



SKODA LIVE CENTERS



Vises &
Live Centers



Skoda Heavy Duty Live Centers - CSN 243324/CSN 243324M

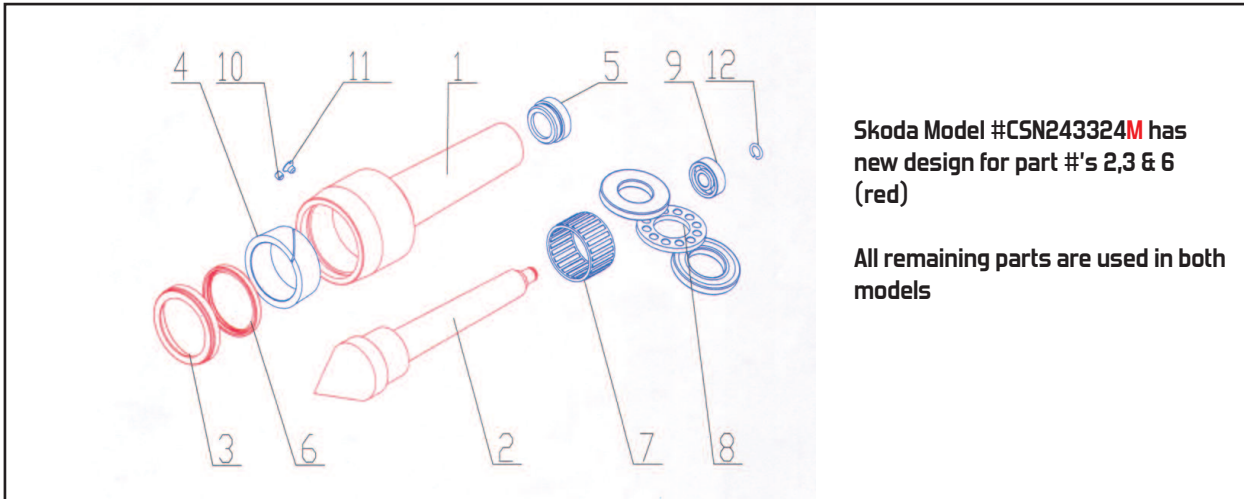
Features

- The rotating spindle is extended right through the tapered shank
- Two specially designed adjustable needle-roller bearings carry all radial loads
- A heavy duty ball thrust bearing takes all axial thrust
- Complete protection of bearings from the ingress of coolant, dirt or swarf is provided by the built-in oil-seal, which also prevents loss of lubricant



Morse Taper	Center Point Angle	Body Dia. (in)	Body Dia. (in)	Body Length (in)	Maximum Maximum RPM	Weight of Work Piece	SKODA Code No.	Price \$	STM Code No.	Price \$
1	60°	5/8	1-3/8	4-3/8	6,000	200 lb	310-105	106.20	320-105	75.20
2	60°	7/8	1-1/2	5	6,000	748 lb	310-110	158.40	320-110	132.90
3	60°	1-1/8	1-7/8	6-1/4	5,000	880 lb	310-115	198.00	320-115	154.00
4	60°	1-1/2	2-3/16	7-1/2	4,000	2860 lb	310-120	251.00	320-120	174.40
5	60°	1-3/4	2-3/4	9-1/2	3,500	4400 lb	310-125	347.70	320-125	225.00
6	60°	2-3/8	3-1/2	12-3/4	2,500	8800 lb	310-130	602.60	320-130	439.40

PARTS FOR HEAVY DUTY LIVE CENTERS



Skoda Model #CSN243324M has new design for part #'s 2,3 & 6 (red)

All remaining parts are used in both models

Parts For Heavy Duty Live Centers

Morse Taper	2-Point		2-Point M Model		3-Ring		3-Ring M Model		4-Sleeve		5-End Plug		6-Seal		6-Seal M Model	
	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
2	310-205	81.00	310-205M	83.60	310-210	10.20	310-210M	11.10	310-215	52.90	310-220	6.90	310-225	8.40	310-225M	15.10
3	310-305	84.40	310-305M	86.50	310-310	18.10	310-310M	18.80	310-315	61.90	310-320	9.10	310-325	8.40	310-325M	18.60
4	310-405	111.40	310-405M	113.30	310-410	21.50	310-410M	23.10	310-415	65.30	310-420	9.10	310-425	8.40	310-425M	17.50
5	310-505	164.20	310-505M	169.20	310-510	23.80	310-510M	26.30	310-515	91.10	310-520	10.20	310-525	9.70	310-525M	19.60
6	310-605	306.90	310-605M	313.40	310-610	75.40	310-610M	76.20	310-615	120.30	310-620	22.60	310-625	9.70	310-625M	29.00

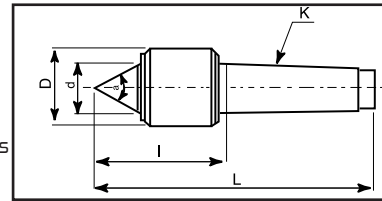
Morse Taper	7-Roller Bearing		8-Thrust Bearing		9-Ball Bearing		10-Set Screw		11-Slot Screw		12-Ring	
	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
2	310-230	34.90	310-235	34.90	310-240	21.50	310-245	1.00	310-250	1.20	310-255	0.80
3	310-330	52.90	310-335	40.50	310-340	22.60	310-345	1.00	310-350	1.20	310-355	1.00
4	310-430	59.70	310-435	46.20	310-440	23.80	310-445	1.00	310-450	1.20	310-455	1.50
5	310-530	72.00	310-535	57.40	310-540	28.20	310-545	1.00	310-550	1.20	310-555	1.50
6	310-630	126.00	310-635	92.30	310-640	33.80	310-645	1.50	310-650	1.50	310-655	1.50



Skoda Extra Heavy Duty Live Centers - CSN 243325

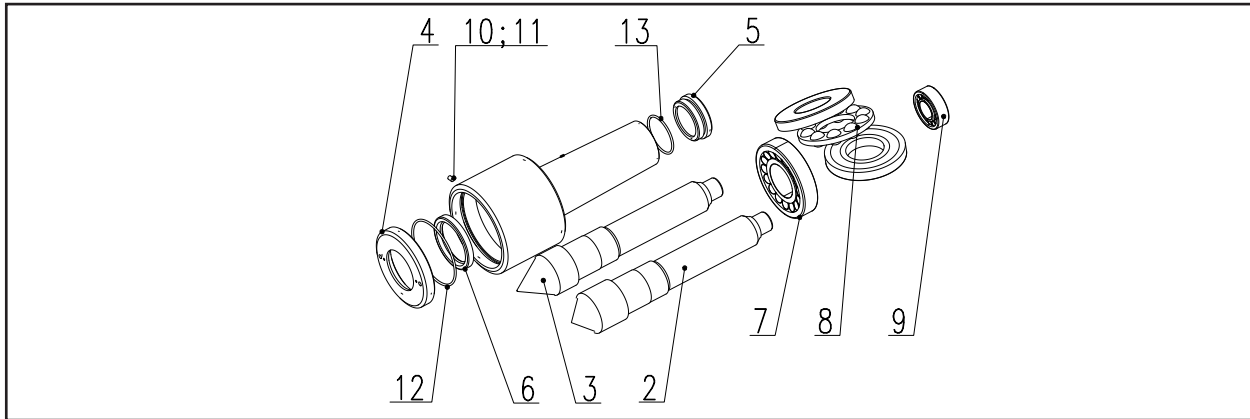
For clamping of heavy workpieces at lathes.

- The rigid structure and seating of the turning part is characterized by long service life
- The model EXTRA is commonly used for work at grinding machines
- Centers with the apex angle of 60° for reduction of deformations of the machine (tailstock, bed, headstock) from axial clamping forces
- The live centers are provided with shanks according to DIN 228 and ISO 296 (without clamping thread)



Morse Taper	D (in.)	d (in.)	a	l (in.)	L (in.)	Max. RPM	Load (lb)	Weight (lb)	Code No.	Price \$
4	3.14	1.58	60°	4.10	7.85	3,200	3300	5	310-920	1,142.70
5	3.54	1.65	60°	5.60	9.48	2,700	5500	9	310-925	1,409.50
6	4.92	2.16	60°	6.42	13.38	1,900	11000	27	310-930	2,666.60
7	5.70	2.56	60°	7.80	15.25	1,600	17600	45	310-935	4,636.40

SPARE PARTS FOR EXTRA HEAVY DUTY LIVE CENTERS



Spare Parts For Extra Heavy Duty Live Centers

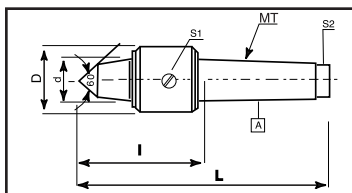
Parts No.	Description	Code No.	Price \$
MT 4-02	90° Point	310-802	376.20
4-03	60° Point	310-803	387.20
4-04	Ring	310-804	153.60
4-05	End Plug	310-805	5.40
4-06	Sealing	310-806	7.80
4-07	Roller Bearing	310-807	111.10
4-08	Thrust Bearing	310-808	156.60
4-09	Radial Bearing	310-809	177.60
4-10	Lock Screw	310-810	1.40
4-11	Packing Piece	310-811	50.70
4-12	Packing Ring	310-812	2.00
4-13	Packing Ring	310-813	1.60
MT 5-02	90° Point	310-816	468.10
5-03	60° Point	310-817	448.70
5-04	Ring	310-818	204.90
5-05	End Plug	310-819	14.00
5-06	Sealing	310-820	11.00
5-07	Roller Bearing	310-821	166.00
5-08	Thrust Bearing	310-822	186.10
5-09	Radial Bearing	310-823	186.70
5-10	Lock Screw	310-824	1.40
5-11	Packing Piece	310-825	109.00
5-12	Packing Ring	310-826	2.50
5-13	Packing Ring	310-827	1.60

Parts No.	Description	Code No.	Price \$
MT 6-02	90° Point	310-830	1,095.30
6-03	60° Point	310-831	1,135.70
6-04	Ring	310-832	127.60
6-05	End Plug	310-833	107.10
6-06	Sealing	310-834	14.00
6-07	Roller Bearing	310-835	241.60
6-08	Thrust Bearing	310-836	386.90
6-09	Radial Bearing	310-837	289.50
6-10	Lock Screw	310-838	2.20
6-11	Packing Piece	310-839	222.70
6-12	Packing Ring	310-840	5.20
6-13	Packing Ring	310-841	1.40



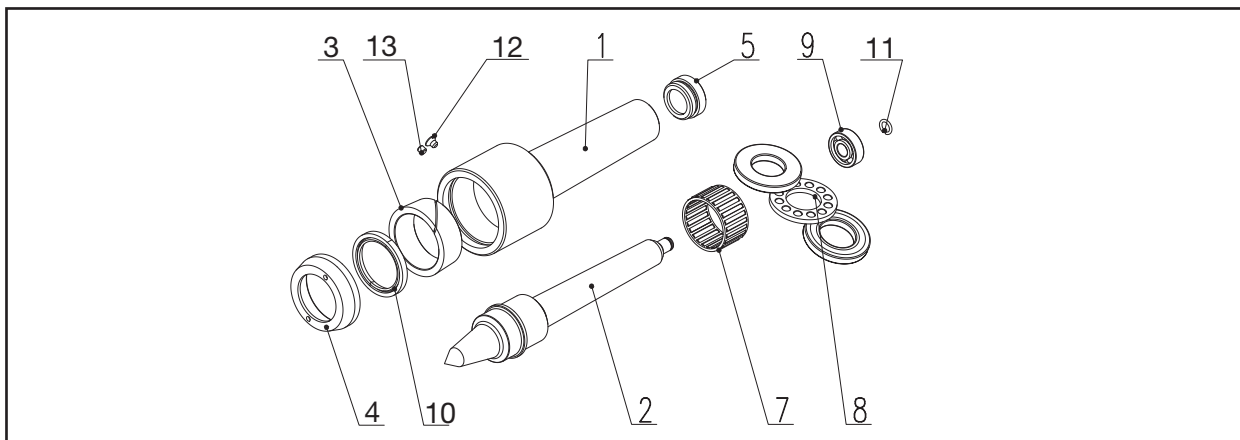
Skoda Precision CNC Live Centers - CSN 243327-II

- The centers are intended for NC lathes. Their face parts are formed to allow easy access of the tool to the workpiece, which is an advantage with workpieces of complex shapes
- A special ring is used to set the radial clearance of the center. It also prevents cutting lubricant from leaking into the center bearing space, and so extends the operational life of the center
- Spindle-like point extends into shank where it is supported by a needle bearing, increasing rigidity, reducing point deflection and dampening vibration



Morse Taper	D (in.)	d (in.)	L (in.)	l (in.)	Max. RPM	Load (lb)	Code No.	Price \$
2	1.5	.695	5.25	2.65	6,000	594	310-010	315.20
3	1.85	.750	6.75	3.50	5,000	704	310-015	334.30
4	2.20	1.125	8.15	3.95	4,000	2200	310-020	389.60
5	3.10	1.375	10.50	4.85	3,500	3520	310-025	490.20

SPARE PARTS FOR CNC LIVE CENTERS



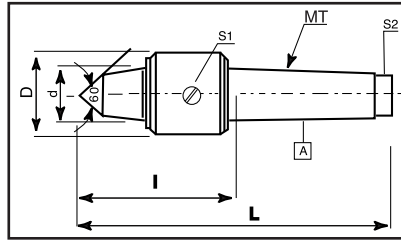
Spare Parts For CNC Live Centers

Parts No.	Description	Code No.	Price \$	Parts No.	Description	Code No.	Price \$
MT 2-02	Point	310-855	279.60	MT 4-02	Point	310-882	398.00
2-03	Ring	310-857	105.70	4-03	Ring	310-884	136.00
2-04	Set Ring	310-856	34.90	4-04	Set Ring	310-883	39.70
2-05	End Plug	310-858	8.00	4-05	End Plug	310-885	9.10
2-07	Needle Bearing	310-860	34.90	4-07	Needle Bearing	310-887	59.70
2-08	Thrust Bearing	310-861	40.50	4-08	Thrust Bearing	310-888	52.90
2-09	Radial Bearing	310-862	67.50	4-09	Radial Bearing	310-889	75.40
2-10	Packing Piece	310-859	33.80	4-10	Packing Piece	310-886	36.10
2-11	Snap Ring	310-865	6.90	4-11	Snap Ring	310-892	8.00
2-12	Countersink Screw	310-863	1.10	4-12	Countersink Screw	310-890	1.50
2-13	Lock Screw	310-864	1.20	4-13	Lock Screw	310-891	1.20
MT 3-02	Point	310-869	362.00	MT 5-02	Point	310-895	508.80
3-03	Ring	310-871	106.70	5-03	Ring	310-897	91.10
3-04	Set Ring	310-870	37.20	5-04	Set Ring	310-896	45.10
3-05	End Plug	310-872	9.10	5-05	End Plug	310-898	10.20
3-07	Needle Bearing	310-874	52.90	5-07	Needle Bearing	310-900	73.10
3-08	Thrust Bearing	310-875	47.30	5-08	Thrust Bearing	310-901	64.10
3-09	Radial Bearing	310-876	69.80	5-09	Radial Bearing	310-902	111.40
3-10	Packing Piece	310-873	34.90	5-10	Packing Piece	310-899	38.30
3-11	Snap Ring	310-879	6.90	5-11	Snap Ring	310-905	10.20
3-12	Countersink Screw	310-877	1.50	5-12	Countersink Screw	310-903	1.50
3-13	Lock Screw	310-878	1.20	5-13	Lock Screw	310-904	1.20



Skoda Extended Point Live Centers - CSN 243328

- Designed to keep dust, chips and coolant from coming inside the bearings
- Hardened and ground to 61-65 Rockwell
- Concentricity within .0002"



Morse Taper	D (in.)	d (in.)	L (in.)	l (in.)	Max. RPM	Load (lb)	Weight (lb)	Point Angle	Code No.	Price \$
2	1.417	.866	5.059	2.560	6,000	594	.79	60°	310-160	174.30
3	1.850	1.181	6.575	3.386	5,000	704	1.85	60°	310-165	206.70
4	2.165	1.378	8.169	4.094	4,000	2200	3.19	60°	310-170	259.80
5	2.736	1.772	10.197	5.078	3,500	3520	7.04	60°	310-175	358.80
6	3.504	2.362	13.425	6.319	2,500	7040	17.05	60°	310-180	631.90

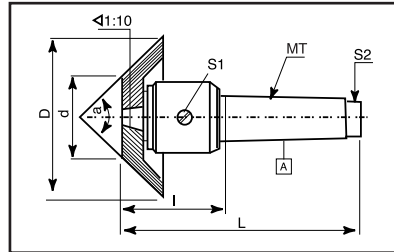
Extended Points



Morse Taper	Code No.	Price \$
2	310-200	103.50
3	310-300	114.70
4	310-400	150.70
5	310-500	205.80
6	310-600	346.30

Skoda Heavy Duty Bull Nose Live Centers - CSN 243319

- Designed to hold pipe and hollow work. Pipe head can be used as an all-round center for light work. Two matched angular contact bearings preloaded at the factory. This achieves good thrust and radial capacities. Bearings are protected by a combination steel shield and neoprene seal.
- Accuracy: ±0.0001"



Morse Taper	a	D (in.)	d (in.)	L (in.)	l (in.)	Max. RPM	Load (lb)	Weight (lb)	Code No.	Price \$
3	60°	3.150	1.378	6.380	3.189	5,000	880	4.62	310-140	688.50
4	60°	4.527	1.732	7.637	3.622	4,000	2860	9.68	310-145	1,110.50
5	60°	5.314	1.811	9.449	4.331	3,500	4400	17.60	310-150	1,571.50
6	60°	6.693	2.520	12.125	4.961	2,500	8800	51.70	310-155	3,764.20



Skoda Live Center Sets - CSN 243326

Features

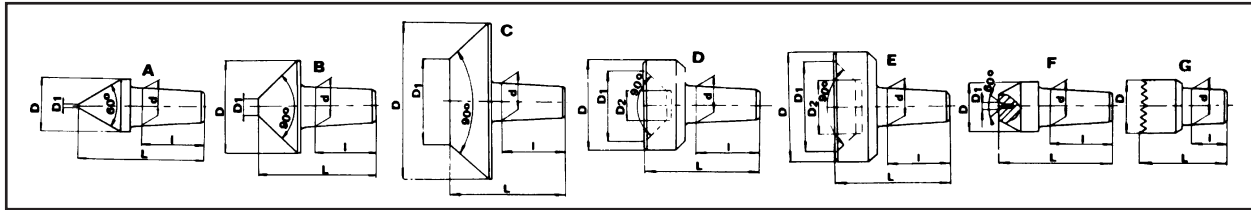
- The rotating spindle is extended right through the tapered shank
- Two specially designed adjustable needle-roller bearings carry all radial loads
- A heavy duty ball thrust bearing takes all axial thrust
- Complete protection of bearings from the ingress of coolant, dirt or swarf is provided by the built-in oil-seal, which also prevents loss of lubricant



Morse Taper	All	A	B-G	A	B	C	D	E	F	G	Code No.	Price \$									
	d	L	L	D	D1	D	D1	D	D1	D	D1	D									
3	.590	.984	1.968	1.771	.787	.019	1.417	.236	2.480	1.299	1.417	1.102	.472	1.771	1.496	.866	.787	.098	.984	310-705	717.40
4	.784	1.181	2.362	2.086	.984	.019	1.771	.393	2.755	1.378	1.771	1.456	.669	2.480	2.086	1.181	.984	.196	1.259	310-710	848.00
5	.984	1.496	2.874	2.559	1.259	.039	2.204	.551	3.149	1.496	2.204	1.732	.787	2.775	2.362	1.417	1.259	.196	1.771	310-715	1,239.20
6	1.181	1.811	3.543	3.149	1.417	.039	2.755	.708	3.937	1.968	2.755	2.283	.950	3.937	3.464	2.126	1.417	.315	2.204	310-720	1,785.40

Morse Taper	Max Load (lb)
3	880
4	2860
5	4400
6	8800

Maximum weight of workpiece is independent of the individual point being used.

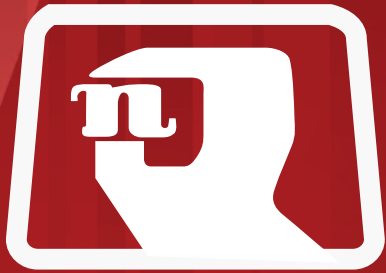


Parts For Skoda Live Center Sets

Morse Taper	Part A	Part B	Part C	Part D	Part E	Part F	Part G
	Code No.	Code No.	Code No.	Code No.	Code No.	Code No.	Code No.
3	310-724	310-726	310-728	310-730	310-732	310-734	310-736
4	310-744	310-746	310-748	310-750	310-752	310-754	310-756
5	310-764	310-766	310-768	310-770	310-772	310-774	310-776
6	310-784	310-786	310-788	310-790	310-792	310-794	310-796

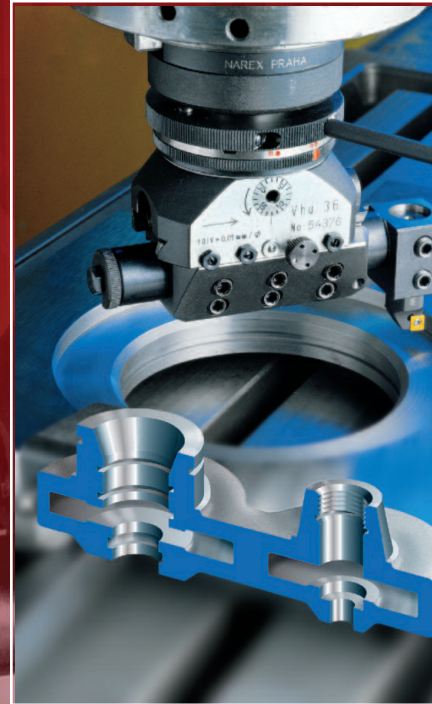
Additional Items For Skoda Live Center Sets

Morse Taper	Live Center Only	Internal Point	Wooden Case	Drift Key
	Code No.	Code No.	Code No.	Code No.
3	310-722	310-723	310-738	310-740
4	310-742	310-743	310-758	310-760
5	310-762	310-763	310-778	310-780
6	310-782	310-783	310-798	310-800



narex

**BORING &
FACING HEADS**



**Vises &
Live Centers**



Universal Boring And Facing Masterheads

Solve ALL Your Boring and Facing Problems

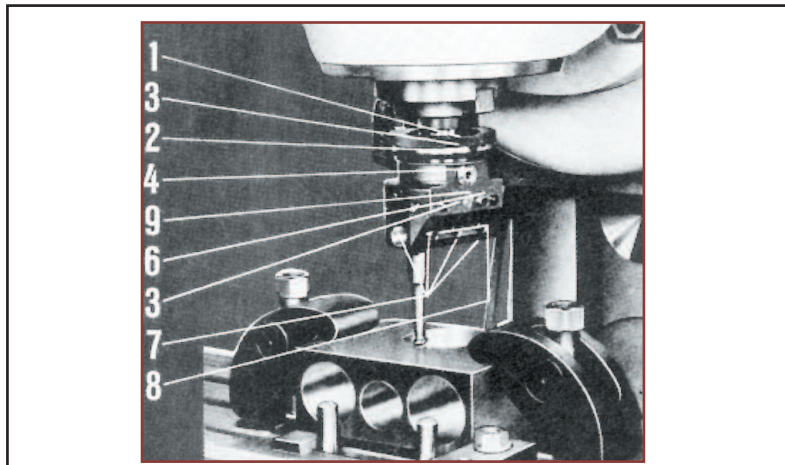


Model No.	1-3/8		2-1/8		3-1/8		4-7/8		5-3/4	
	VHU 36	Price \$	VHU 56	Price \$	VHU 80	Price \$	VHU 125	Price \$	VHU 160	Price \$
Code No.	300-007	3,717.90	300-055	4,732.30	300-105	4,999.80	300-155	6,605.10	300-205	7,162.60
QUICK RETURN MOVEMENT QUICK RETURN ADJUSTMENT THROUGH SLIDE SETTING SCREW										
Operating Accuracy	± .0002		± .0002		± .0002		± .0002		± .0002	
Boring and facing range from 0 up to	9		13		16		24		31	
Max. adjustability of slide	1.375		2.125		3.125		4.875		5.750	
Max. dia. of slide	2.750		4.250		6.250		9.750		11.500	
Various automatic slide – feeds per revolution	.0016		.004		.004		.004		.004	
	.0032		.006		.006		.006		.006	
	.0048		.008		.008		.008		.008	
1 graduation of sensitive adjustments ins. on dia.	.0005		.0005		.0005		.0005		.0005	
1 Revolution of sensitive adjustment	.016		.016		.016		.016		.016	
Quick return per revolution	.030		.120		.120		.160		.160	
Diameter of tool post holes in slide	5/8		1		1		1-1/4		1-1/4	
Height of Head without shank	3.125		4.350		4.350		5.000		5.000	
Width of Head	2.875		4.500		5.500		7.000		8.725	
Weight of head without shank	4 lb		12 lb		16 lb		26.6 lb		31 lb	
Accessories	300-003	768.50	300-053	1,428.00	300-104	1,428.00			300-202*	1,864.00
Head only	300-004	3,118.70	300-054	3,550.60	300-103	3,763.50	300-154	4,759.60	300-203	5,122.50
Case only	300-006*	303.70	300-052	179.80	300-102	479.00	300-204	584.70	300-204	584.70
Shank M.T. 2	300-010	294.90								
Shank M.T. 3	300-015	310.90								
Shank M.T. 4	300-020	358.80								
Shank M.T. 5			300-115	483.70	300-115	483.70	300-115	483.70	300-115	483.70
Shank M.T. 6					300-165	589.70	300-165	589.70	300-165	589.70
Shank ISA - 30	300-025	272.20								
Shank ISA - 40	300-030	294.90	300-070	339.40	300-070	339.40				
Shank ISA - 50			300-075	416.40	300-075	416.40	300-075	416.40	300-075	416.40
Shank R - 8	300-035	237.40	300-080	269.30						
Shank Straight 3/4"	300-039	150.00								
Shank Straight 1"	300-040	195.70								
Shank Cat - 40	300-033	397.60	300-073	458.00						
Shank Cat - 50			300-076	483.70	300-076	483.70	300-076	483.70	300-076	483.70
Shank BT - 40	300-034	397.60	300-074	451.70						
Shank BT - 50			300-077	483.70	300-077	483.70	300-077	483.70	300-077	483.70
Tang M.T. 2	300-245	43.10								
Tang M.T. 3	300-250	56.60								
Tang M.T. 4	300-255	78.10	300-255	78.10	300-255	78.10				
Tang M.T. 5			300-260	94.20	300-260	94.20	300-260	94.20	300-260	94.20
Tang M.T. 6					300-265	105.00	300-265	105.00	300-265	105.00

* Available only while supplies last.

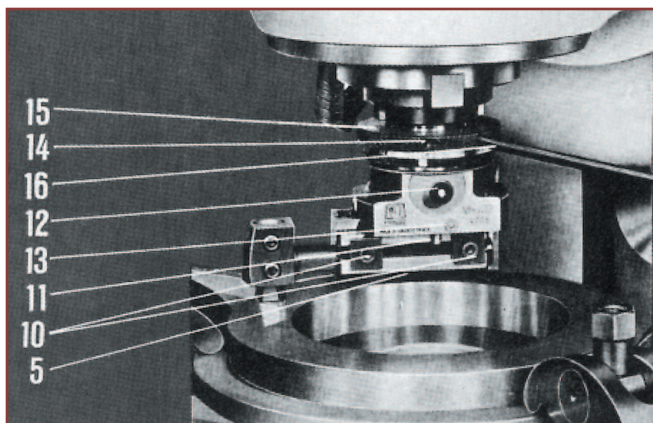
Standard Equipment Supplied With The Master Head In Case

Boring bars	3/8 2 pcs.	1 x 4	1 x 4	1-1/4 x 6	1-1/4 x 6
Boring bars	5/8 2 pcs.	1 x 6	1 x 6	1-1/4 x 9-3/4	1-1/4 x 9-3/4
Boring bar holders		*1 x 5-1/2	*1 x 5-1/2	*1-1/4 x 6-5/16	*1-1/4 x 6-5/16
		*2 pcs.	*2 pcs.	*2 pcs.	*2 pcs.
Extension holder	5/8 x 3-7/8	1 x 6-7/8	1 x 6-5/8	1-1/4 x 11-13/16	1-1/4 x 11-13/16
Complete set of reinforcing rings	5/8	1	1	1-1/4	1-1/4
Carbide round tool bits	*5/8	*1	*1	*1-1/4	*1-1/4
		*4 pcs.	*4 pcs.	*4 pcs.	*4 pcs.
HSS square tool bits		*5/16 x 1-3/16	*5/16 x 1-3/16	*3/8 x 1-13/32	*3/8 x 1-13/32
		*4 pcs.	*4 pcs.	*4 pcs.	*4 pcs.
Reducing sleeve	5/8 x 3/8	1 x 3/4	1 x 3/4	1-1/4 x 3/4	1-1/4 x 3/4
Reducing sleeve		1 x 5/8	1 x 5/8	1-1/4 x 5/8	1-1/4 x 5/8



Principal Component Part of Head Vhu-36

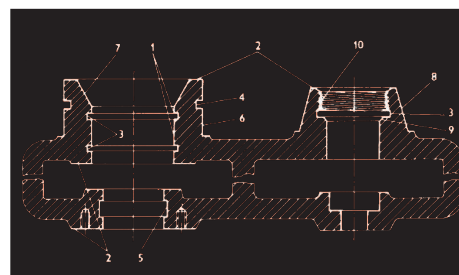
- | | |
|--|---|
| 1. Braking ring | 10. Stop dog |
| 2. Engaging ring | 11. Stop dog pin |
| 3. Control ring | 12. Knob for rapid traverse control (only in Vhu 1-1/4) |
| 4. Scale | 13. Lubricator |
| 5. Slide | 14. Screw for clutch adjustment |
| 6. Setting screw | 15. Clutch |
| 7. Holes for tools | 16. Retaining rod |
| 8. Clamping screws | |
| 9. Screw for locking slide in position | |



Vises & Live Centers

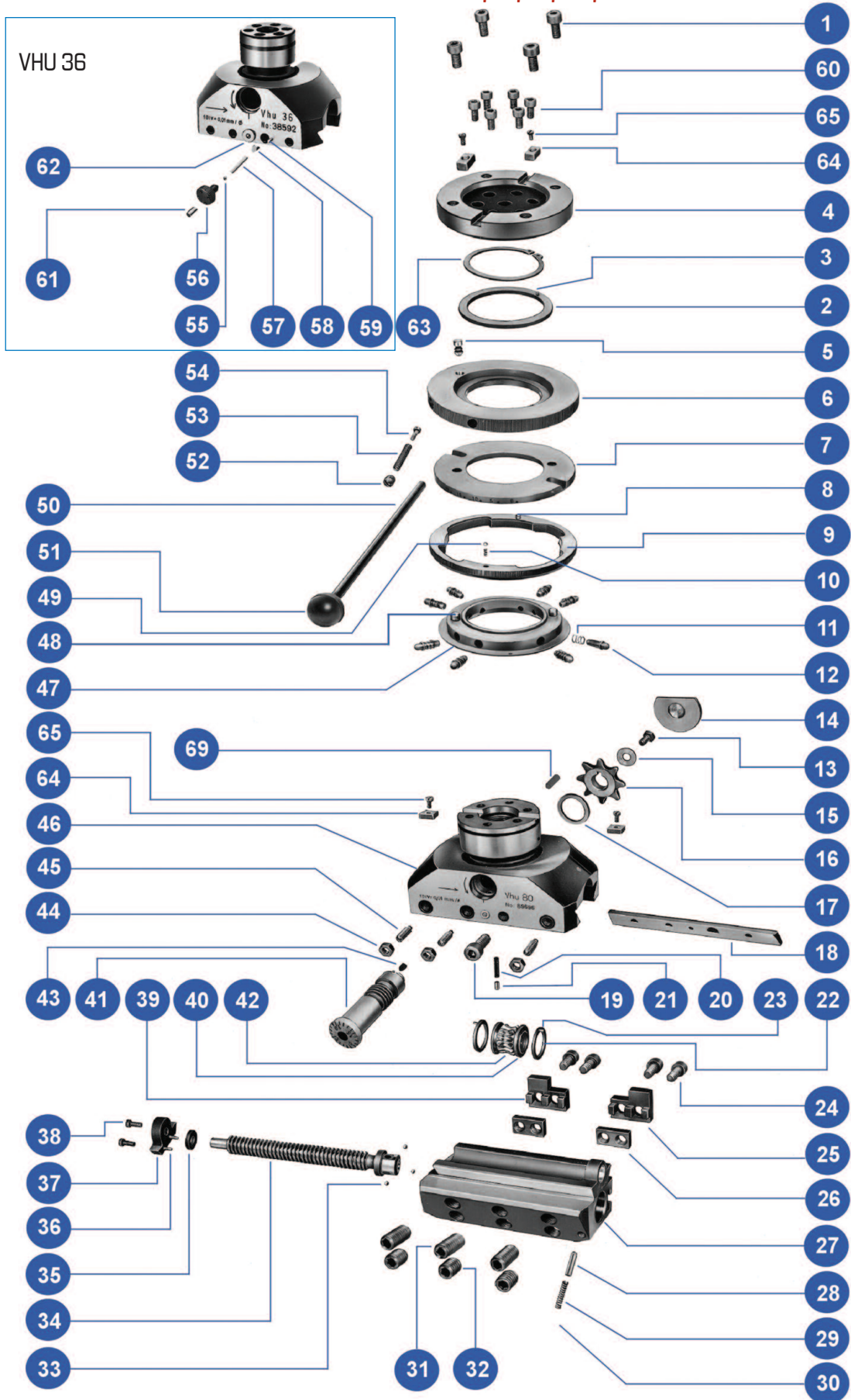
Basic machining operations shown for the Vhu type universal boring heads:

- | | |
|---|--------------------------------|
| 1. Boring of holes | 6. External diameter machining |
| 2. Spotfacing of small end large-diameter end faces | 7. Boring of tapered holes |
| 3. Recessing inside holes | 8. External machining of taper |
| 4. Recessing on surfaces of parts | 9. Facing of rear end faces |
| 5. Free recessing | 10. Thread cutting |





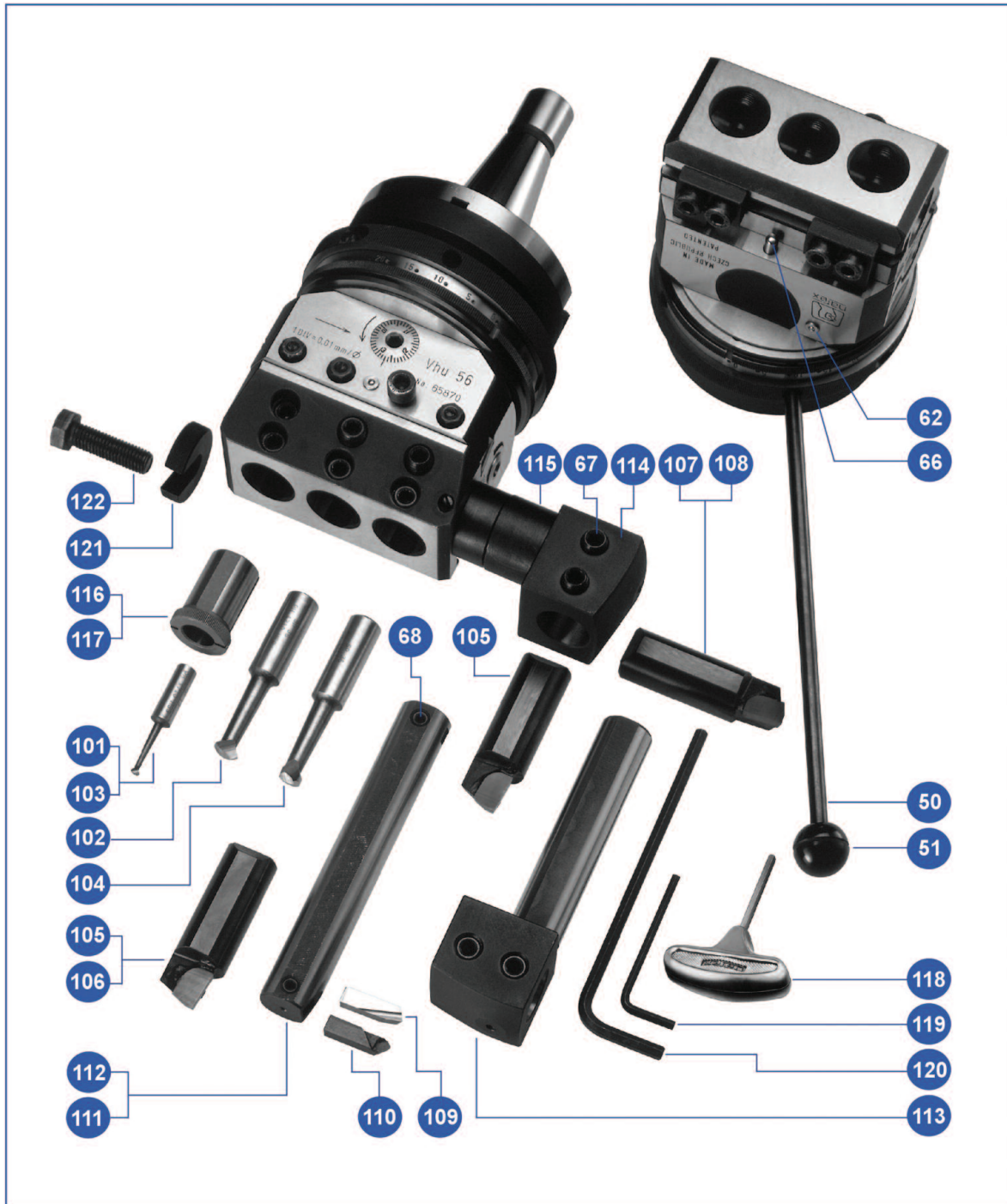
NAREX BORING HEAD PARTS BREAKDOWN FOR VHU 36, 56, 80, 125, 160



Vises &
Live Centers



NAREX BORING HEAD PARTS BREAKDOWN FOR VHU 36, 56, 80, 125, 160 CONTINUED



Vises & Live Centers



Narex Boring And Facing Head Parts

New ID No.	Description	VHU-36 (1-3/8")			VHU-56 (2-1/8") VHU-80 (3-1/8")			VHU-125 (4-7/8") VHU-160 (6-1/4")		
		pcs	Code No.	Price \$	pcs	Code No.	Price \$	pcs	Code No.	Price \$
1	Cap Screw	4	300-770	1.00	4	300-588	1.60	4	300-588	1.60
2	Ring	1	300-702	44.90	1	300-503	166.90	1	300-603	89.20
3	Pin	1	300-736	1.00	1	300-551	1.00	1	300-655	1.00
4	Flange (Hold-Ring)	1	300-771	300.70	1	300-480(vhu-56)	315.20	1	300-691	556.30
					1	300-591(vhu-80)	519.10			
5	Clutch Pin (Safety pin)	1	300-726	37.10	1	300-505	48.50	1	300-605	48.50
6	Hold Ring (Brake ring)	1	300-703	215.20	1	300-504	407.90	1	300-604	370.90
7	Set Ring	1	300-704	204.00	1	300-506	270.90	1	300-606	304.30
8	Pin	2	300-736	1.00	2	300-554	0.70	2	300-658	0.70
9	Ring (Control Ring)	1	300-705	144.70	1	300-507	282.20	1	300-607	330.10
10	Spring	2	300-720	1.00	1	300-540	1.30	1	300-640	1.30
11	Spring	6	300-707	1.00	8	300-511	0.70	8	300-611	0.70
12	Pin	6	300-708	18.10	8	300-509	44.60	8	300-609	44.60
13	Cap Screw	1	300-764	1.00	1	300-546	11.30	1	300-650	11.30
14	Cover (Lid)	1	300-716	23.90	1	300-518	18.10	1	300-618	28.90
15	Washer	1	300-765	9.00	1	300-541	13.20	1	300-646	13.20
16	Star Gear (Ratchet Wheel)	1	300-715	63.30	1	300-520	78.20	1	300-620	81.90
17	Washer (Ring)	1	300-718	44.90	1	300-522	75.80	1	300-622	75.80
18	Slideguide	1	300-710	111.30	1	300-413(vhu-56)	134.00	1	300-613	185.40
					1	300-513(vhu-80)	141.10			
19	Screw				1	300-577	3.10	1	300-653	1.60
20	Spring				1	300-536	1.30	1	300-670	1.30
21	Brake				1	300-521	13.20	1	300-621	13.20
22	Washer (Ring)	2	300-722	52.10	2	300-525	63.30	2	300-625	63.30
23	Pin	2	300-769	0.70	2	300-551	1.00	2	300-655	1.00
24	Stop Screw	2	300-739	1.00	4	300-549	1.60	4	300-644	1.60
25	Stop (Dog) - L.H. Stop	2	300-728	66.90	1	300-515	100.30	1	300-615	100.30
26	Stop Nut (Insert)	2	300-742	41.80	2	300-514	30.20	2	300-614	30.20
27	Slide	1	300-713	2,079.20	1	300-402(vhu-56)	2,382.70	1	300-602	3,108.80
					1	300-502(vhu-80)	2,530.90	1	300-680	3,760.30
28	Pin (Bar)	1	300-747	17.40	1	300-524	17.40	1	300-624	21.70
29	Spring	1	300-746	0.70	1	300-570	2.00	1	300-670	1.30
30	Set Screw	1	300-774	1.00	1	300-508	1.30	1	300-671	1.00
31	Set Screw	3	300-735	5.00	3	300-568	9.90	3	300-674	9.90
								5	300-674	9.90
32	Set Screw	3	300-741	5.00	3	300-567	9.90	3	300-673	9.90
								5	300-673	9.90
33	Ball	3	300-775	0.70	3	300-558	0.70	3	300-661	0.70
34	Worm Rod (Screw)	1	300-712	482.20	1	300-423(vhu-56)	593.30	1	300-623	815.70
					1	300-523(vhu-80)	741.60	1	300-692	927.00
35	Washer (Distance Ring) - Spacer	1	300-727	44.90	1	300-537	44.90	1	300-637	44.90
36	Pin	2	300-777	1.00	2	300-553	1.00	2	300-657	0.70
37	End Stop (Back Bearing)	1	300-717	59.70	1	300-538	52.10	1	300-638	63.30
38	End Screw	2	300-776	1.00	2	300-543	1.00	2	300-648	1.00
39	Stop (Dog) - R.H. Stop				1	300-516	100.30	1	300-616	100.30
40	Gear Ring	2	300-721	52.10	2	300-526	52.10	2	300-626	52.10
41	Spindle (Worm)	1	300-709	330.10	1	300-512	445.00	1	300-612	482.20
42	Worm Gear (Worm Wheel)	1	300-723	423.20	1	300-417	511.90	1	300-617	445.30
43	Pin (Parallel Key)	1	300-766	9.00	1	300-519	9.00	1	300-619	9.00
44	Head Nut	3	300-749	1.00	3	300-572	1.00	4	300-647	1.00
45	Head Screw	3	300-748	1.00	3	300-545	1.60	4	300-649	1.60
47	Ring (Control Ring)	1	300-706	256.00	1	300-510	407.90	1	300-610	445.00
48	Pin	2	300-738	0.70	2	300-556	3.10	2	300-659	3.10
49	Ball	2	300-744	0.70	2	300-558	0.70	2	300-661	0.70
50	Stop Rod (Bar)	1	300-734	17.40	1	300-535	32.70	1	300-635	43.60
51	Knob (Ball)				1	300-559	2.40	1	300-662	2.40
52	Screw	1	300-763	1.00	1	300-547	1.00	1	300-651	1.00
53	Spring	1	300-724	1.00	1	300-529	1.00	1	300-629	1.00
54	Pin Point	1	300-725	30.20	1	300-530	37.10	1	300-630	37.10
55	Ball	1	300-751	0.70						
56	Cap Screw	1	300-740	48.50						
57	Pin	1	300-732	13.20						
58	Pin	1	300-719	13.20						
59	Pin	1	300-779	0.70						



Narex Boring And Facing Head Parts

New ID No.	Description	VHU-36 (1-3/8")			VHU-56 (2-1/8") VHU-80 (3-1/8")			VHU-125 (4-7/8") VHU-160 (6-1/4")		
		pcs	Code No.	Price \$	pcs	Code No.	Price \$	pcs	Code No.	Price \$
60	Cap Screw	6	300-770	1.00	6	300-481(vhu-56) 300-589(vhu-80)	1.60 1.00	6	300-689	1.60
61	Pin	1	300-778	0.70						
62	Plug	2	300-780	5.30	2	300-592	5.30	2	300-694	5.30
63	Ring Clip (Circlip)	1	300-750	2.50	1	300-560	9.00	1	300-663	11.60
64	Parallel key				4	300-587	25.90	4	300-687	25.90
65	Screw				4	300-590	1.00	4	300-690	1.00
66	Pin	1	300-781	8.40	1	300-593	12.60	1	300-695	12.00
67	Set Screw	2	300-741	5.00	2	300-567	9.90	2	300-673	9.90
68	Screw				2	300-548	5.00	2	300-652	5.00
69	Pin	1	300-782	1.00	1	300-594	1.00	1	300-696	1.00
101	Boring tool Ø5mmx3/8"x60mm	1	300-754	194.90						
102	Boring tool Ø13mmx5/8"x90mm	1	300-752	200.40						
103	Internal corner tool Ø5mmx3/8"x60	1	300-755	284.00						
104	Internal corner tool Ø13mmx5/8"x90	1	300-753	267.20						
105	Right hand tool S20	1	300-759	83.70	1	300-565	117.10	1	300-668	156.10
106	Right hand tool H10	1	300-758	83.70	1	300-575	117.10	1	300-677	156.10
107	Left hand tool S20	1	300-757	83.70	1	300-566	117.10	1	300-666	156.10
108	Left hand tool H10	1	300-756	83.70	1	300-576	117.10	1	300-676	156.10
109	Tool HSS				2	300-564	59.70	2	300-667	70.60
110	Tool S20				2	300-563	41.10	2	300-669	113.50
111	Extension (Boring bar)				1	300-528	200.40	1	300-628	322.80
112	Extension (Boring bar)				1	300-527	200.40	1	300-627	345.00
113	Toolholder (Holder with screw)				2	L=185 300-534	547.20	2	300-634	577.50
114	Toolholder (Holder with screw)	1	300-731	407.90	1	L=220 300-533	577.50	1	L=350 300-633	653.40
115	Collar Set (Set of spacing tubes)	1	300-730	52.10	1	300-532	83.70	1	300-632	104.10
116	Reducer (Reduction sleeve)	1	300-733	144.70	1	300-542	166.90	1	300-641	200.40
117	Reducer (Reduction sleeve)				1	300-544	166.90	1	300-608	204.00
118	Allen (Hexagon) Wrench "NAREX"	1	300-773	53.40						
119	Allen (Hexagon) Wrench 4	1	300-760	41.10	1	300-561	41.10	1	300-664	41.10
120	Hexagon wrench 6				1	300-562	50.20	1	300-665	129.80
121	Washer	1	300-729	32.00	1	300-531	48.50	1	300-631	48.50
122	Hex Screw	1	300-743	1.00	1	300-550	2.30	1	300-654	2.30
27P	Slide-set									
	consists of parts: 27+36+37+38+28+29+30+31+32									
34P	Screw-set									
	consists of parts: 34+42+40+22+35+23									
42P	Worm wheel-set									
	consists of: 42+40+22+23									

Vises & Live Centers

Boring Bar Sets for Boring & Facing Heads



Diameter	Pieces	Code No	Price \$
5/8	6	300-835	922.60
1	6	300-837	1,076.00
1-1/4	6	300-839	1,319.60

Individual Bars

Model	Shank Dia.	Style	O.A.L.	Boring Head	Code No.	Price \$
R5/8-0945	5/8"	SCBCR	50mm	VHU-36	300-840	257.40
R5/8-0946	5/8"	SCBCL	50mm	VHU-36	300-845	257.40
L5/8-0947	5/8"	SCACR	50mm	VHU-36	300-850	257.40
L5/8-0948	5/8"	SCACL	50mm	VHU-36	300-855	257.40
R5/8-0949	5/8"	SCBCR	90mm	VHU-36	300-860	358.80
R5/8-0950	5/8"	SCACR	90mm	VHU-36	300-865	358.80
R1-0951	1"	SCBCR	80mm	VHU-56, VHU-80	300-870	323.20
R1-0952	1"	SCBCL	80mm	VHU-56, VHU-80	300-875	323.20
L1-0953	1"	SCACR	80mm	VHU-56, VHU-80	300-880	323.20
L1-0954	1"	SCACL	80mm	VHU-56, VHU-80	300-885	323.20
R1-0955	1"	SCBCR	150mm	VHU-56, VHU-80	300-890	358.80
R1-0956	1"	SCACR	150mm	VHU-56, VHU-80	300-895	358.80
R1-1/4-0957	1-1/4"	SCBCR	100mm	VHU-125, VHU-160	300-900	435.90
R1-1/4-0958	1-1/4"	SCBCL	100mm	VHU-125, VHU-160	300-905	435.90
L1-1/4-0959	1-1/4"	SCACR	100mm	VHU-125, VHU-160	300-910	435.90
L1-1/4-0960	1-1/4"	SCACL	100mm	VHU-125, VHU-160	300-915	435.90
R1-1/4-0961	1-1/4"	SCBCR	180mm	VHU-125, VHU-160	300-920	459.60
R1-1/4-0962	1-1/4"	SCACR	180mm	VHU-125, VHU-160	300-925	459.60



Precision Boring Heads

- Ideal for mill or jig bore operation
- These heads readily adapt to many different machines due to interchangeable shanks



Head Dia.	Hole Size	Offset	Code No.	Price \$
2	1/2	1/2	356-001	117.30
3	3/4	3/4	356-002	156.40
4	1	1	356-003	234.50

Shanks for Precision Boring Heads



Size	Thread	Code No.	Price \$
R8	1-1/2 - 18TPI	356-010	62.60
ISA40	1-1/2 - 18TPI	356-012	78.20
MT3	1-1/2 - 18TPI	356-014	62.60
ISA30	1-1/2 - 18TPI	356-016	33.00
3/4" S.S.	1-1/2 - 18TPI	356-018	46.90
MT4	1-1/2 - 18TPI	356-020	70.40
1" S.S.	1-1/2 - 18TPI	356-025	46.90

Vises &
Live Centers

CAT40 TOOLING PACKAGES

- 100% Forged Construction
- Balanced up to 30,000 rpm
- All Traverse Ground
- DIN Coolant option - standard



CAT40 ER16 Package

Contents:

- 2pcs 2.5" ER16 Collet Chucks
- 1pc 3/8" x 2.5" End Mill Holder
- 1pc 1/2" x 2.5" End Mill Holder
- 1pc 3/4" x 3.0" End Mill Holder
- 1pc 1" x 2.0" End Mill Holder

Code: 500-726

Total value \$ 779.40

CAT40 ER32 Package

Contents:

- 2pcs 2.5" ER32 Collet Chucks
- 1pc 3/8" x 2.5" End Mill Holder
- 1pc 1/2" x 2.5" End Mill Holder
- 1pc 3/4" x 3.0" End Mill Holder
- 1pc 1" x 2.0" End Mill Holder

Code: 500-727

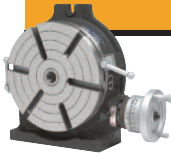
Total value \$ 802.80

CALL TODAY FOR A QUOTE



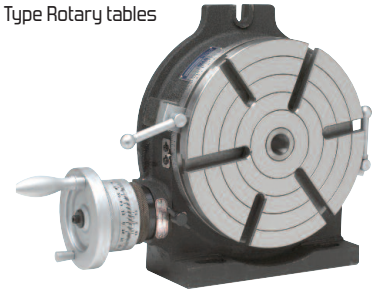
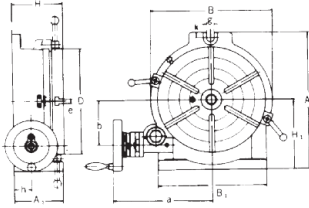
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Horizontal & Vertical Rotary And Dividing Tables (HV)

- This HV Type Rotary Table is so designed as to permit machining operations at a higher dimension than that of RT Type Rotary tables
- The base can be used in a vertical position to enable to carry out center work



Model	Table OD		Height		Base Dim.		T-Slot Width	Bolt Slots	Center Sleeve	Weight (kg/lb)	Worm Gear	Table		Tailstock		Indexing Plates	
	A1	D	H	H1	A	B						Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
HV-4	70	110	80	85	145	115	11	12	MT-2	7.5	90:1	326-498	552.50	326-552	235.00	326-549	181.40
	2.76	4.33	3.15	3.35	5.71	4.53	0.43	0.47		16.50							
HV-6	78	150	80	100	200	160	11	15	MT-2	12	90:1	326-500	552.50	326-552	235.00	326-549	181.40
	3.07	5.91	3.11	3.94	7.87	6.30	0.43	0.59		26.4							
HV-8	100	200	105	135	265	220	14	17	MT-3	30.0	90:1	326-505	855.20	326-553	235.00	326-550	246.70
	3.94	7.87	4.13	5.31	10.43	8.66	0.55	0.67		66.1							
HV-10	110	250	115	165	325	280	14	17	MT-3	45.0	90:1	326-510	1,062.80	326-554	238.60	326-551	246.70
	4.33	9.84	4.53	6.50	12.80	11.02	0.55	0.67		99.0							
HV-12	130	300	135	195	388	330	16	18	MT-4	85	90:1	326-515	1,323.30	326-554	238.60	326-551	246.70
	5.12	11.81	5.32	7.68	15.27	12.99	0.63	0.71		187.0							
HV-14	130	350	140	230	450	380	16	18	MT-4	100	90:1	326-520	1,692.70	326-555	238.60	326-551	246.70
	5.12	13.78	5.51	9.06	17.72	14.95	0.63	0.71		220.0							
HV-16	150	406	155	255	500	430	16	18	MT-4	135	90:1	326-525	2,498.50	326-555	238.60	326-551	246.70
	5.90	15.98	6.10	10.03	19.69	16.93	0.63	0.71		297							

Tailstocks for Rotary Tables

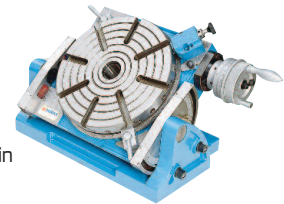


Model No.	Adjustable		For Models	Net Weight (kg)	Code No.	Price \$
	Highest (mm)	Lowest (mm)				
TS-1	108	80	HV-4, HV-6, BS-0	3.9	326-552	235.00
TS-2	145	115	HV-8, CC-6, SX-6, BS-1, BS-2	5.5	326-553	235.00
TS-3	200	130	HV-10, HV-12, CC-8, SX-8, BS-2	8.1	326-554	238.60
TS-4	260	190	HVa-14, HV-16	11.9	326-555	238.60

Universal Tilting Rotary Table

Model

- Tilting range 90° from horizontal to vertical position,
- 1 rotation of handle equals 3 degrees, 5 minutes tilting reading.
- 10 Second vernier scale
- Table Dial 1 minute graduations
- Fast degrees: Dividing notch pin & 24 holes in 15° around, insures rapid accurate spacing
- Minimum set-up time
- Rugged construction

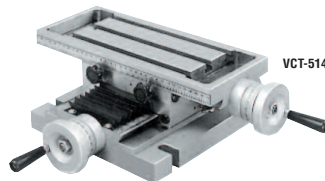


		VU-150	Price \$
Code No.		326-562	1,202.40

Specifications

Size	6"
Table Height	150mm
Table O/A Height (Vertical)	140mm
Center Hole	216mm
Center Height (Vertical)	90mm
Direct Indexing	24-div.
Gear Ratio	90:1
Weight (approx)	121 kg

Precision Cross Slide Tables



Model VCT-830, Model VCT-514

- A heavy, rugged slide in all kinds of positioning, milling, drilling, microscopic viewing and staging
- Adjustable bases for heavy loads, small jig boring, precision cut-off

Model No.	Table (mm)	Height (mm)	Travel (mm)	Base (mm)	Dial Grad. (mm)	Net Weight (kg)	Code No.	Price \$
VCT-514	350 x 150	130	175 x 150	300 x 220	0.02	38	230-9501	962.50
VCT-830	210 x 730	150	350 x 165	360 x 285	0.02	80	230-955	2,176.80

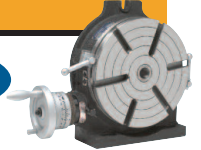
Cross Table VCT-512

Applied in general machines such as compounding machine, drilling machine, etc., or large objects of special shape which cannot be clamped by common vises.

- Lateral moving travel on surface: 11"
- Longitude moving travel on surface: 6"



Model No.	Table (mm)	Height (mm)	Travel (mm)	Base (mm)	Dial Grad. (mm)	Net Weight (kg)	Code No.	Price \$
VCT-512	300 x 140	115	200 x 125	225 x 200	0.03	16.6	230-965	710.40



Simple Index

The Simple Index is a heavy-duty base on which is mounted a hardened and ground precision turntable. It can be used in either a horizontal and vertical position. Using one of the masking plates provided the index can carry out many dividing functions. Indexing of 2, 3, 4, 6, 8, 12 and 24 divisions can be rapidly and simply carried out. The specially-made 3-jaw scroll chuck also simplifies the indexing of long workpieces.

Optional equipment: Master indexing plate with 20 or 30 notches can be supplied to special order. When used with the suitable masking plates dividing into 2, 4, 5, 10, and 2, 3, 5, 6, 10, 15 are possible.

Special Accessories

- 3-jaw scroll chuck dia. 8" 1 piece
- Adjustable tailstock
- Face plate 10" (maximum)
- Masking plates 2, 3, 4, 6, 8, 12 one piece of each

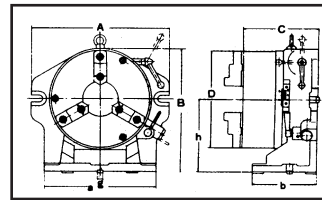
Standards of Accuracy (Tolerances):

Testing Objective

1. Parallelism of table surface to base .00 (.0004)
2. True running of axial movement of table surface .0008
3. True running of center boss .0006
4. Squareness of base to angle face .0008
5. True running of chuck center .0016
6. Dividing accuracy individual spacing error $\pm .35''$

Tolerances Unit (max. in. permit)

- per 12" .0008
per 12" .0006
per 12" .0016
 $\pm .35''$



Options

Description	Code No.	Price \$
Optional Tailstock for CC-6	326-553	235.00
Optional Tailstock for CC-8	326-554	238.60
Optional Dividing Plates	326-152	246.70

No. of Dividing	Outer Dia.	Chuck Inner Jaw	Outer Jaw	Inner Hold	A	B	C	D	a	b	h	g	Weight kg/lb	Shipping Meas. cu.ft.	Code No.	Price \$
2,3,4,6, 8,12,24	165	3-62	60-120	1.34	260	218	138	166	220	130	130	16	35	0.64	CC-6	
	6.5	0.12-2.44	2.36-4.72	1.34	10.24	8.58	5.43	6.54	8.66	5.12	5.12	0.63	771		326-136	1,164.50
2,3,4,6, 8,12,24	210	3-100	10-220	63	312	257.25	169.3	210	258	48	149.2	16	54	1.8	CC-8	
	8.27	0.12-3.94	0.39-8.66	2.48	12.28	10.13	6.67	8.27	10.16	5.83	5.87	0.63	119.0		326-138	1,620.70

Super Dex

This index combines the advantages of the Simple Index with those of a worm-gear index. When mounted on a milling, boring or other machine tool it can carry out single-purpose indexing and indirect indexing using the worm-drive mechanism.

Disengaging the worm drive the 24-notch master plate permits 2, 3, 4, 6, 8, 12 and 24 dividing. When the chuck is removed the unit can be used as a horizontal and vertical type rotary table. The operating handle to rotary table worm gear reduction ratio is 1:90. The operating handle collar is graduated in minutes, and readings down to ten seconds can be set on the vernier.



Ordering Specs. and Dimensions

(Dividing Plates not included)

Model No.	Chuck Outer Diameter	Code No.	Price \$
SX-8	8"	326-142	2,100.90

Options

Description	Code No.	Price \$
Optional Tailstock for SX-8	326-554	238.60
Optional Dividing Plates	326-152	246.70



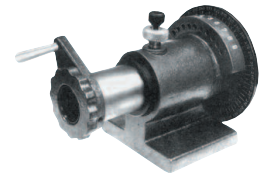
Number of holes	Plate A	Plate B
	26, 30, 34, 38, 41, 44, 47, 51, 57	61, 67, 71, 77, 81, 87, 91, 97
	28, 32, 37, 39, 43, 46, 49, 53, 59	63, 69, 73, 79, 83, 89, 92, 99

5C Spin Index

Accepts 5C Collets to 1-1/8" Capacity

A multi-purpose accessory

- Vernier setting to 1 degree
- 2-1/16" spindle travel for flute grinding
- Index plate has precise (10°) 36 hole circle



Model No.	Code No.	Price \$
C1-310	326-110	127.70

Specifications

- True running of dividing spindle flange surface 0.0004"
- True running of cylindrical center bore per 1" 0.0012"
- Parallelism of spindle center line to base 0.0008"

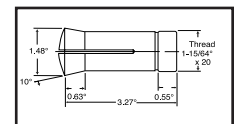
Max. Variation Inches

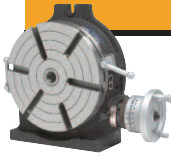
- 0.0004"
- 0.0012"
- 0.0008"

5C Collets

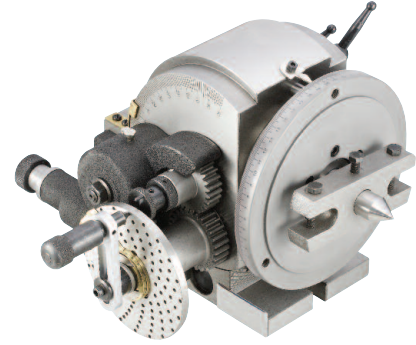
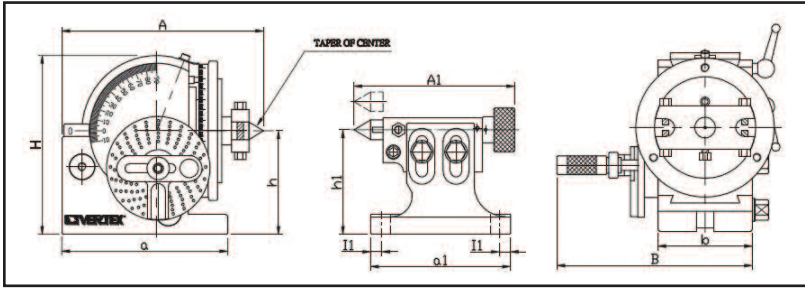
Size	GS		STM	
	Code No.	Price \$	Code No.	Price \$
1/8"	325-317	19.90	325-315	13.20
3/16"	325-322	19.90	325-320	13.20
1/4"	325-327	19.90	325-325	13.20
5/16"	325-332	19.90	325-330	13.20
3/8"	325-337	19.90	325-335	13.20
7/16"	325-342	19.90	325-340	13.20
1/2"	325-347	19.90	325-345	13.20
9/16"	325-352	19.90	325-350	13.20
5/8"	325-357	19.90	325-355	13.20
11/16"	325-362	19.90	325-360	13.20
3/4"	325-367	19.90	325-365	13.20
13/16"	325-372	19.90	325-370	13.20
7/8"	325-377	19.90	325-375	13.20
15/16"	325-382	19.90	325-380	13.20
1"	325-387	19.90	325-385	13.20
5C Collet Set 1/8-1"			325-310	198.00

• Made of tool steel, hardened and ground to maintain original accuracy





Universal Dividing Head



This Universal Index Center has been designed to carry out all types of gear-cutting, precision dividing and spiral work (except Type BS-0, and BS-1) with greater precision and efficiency than has been possible before. The center face can be tilted from a horizontal position of 90° down to -10° from vertical, and inclinations can be read off a scale graduated in degrees. The center is built to highest engineering standards and is factory-inspected and tested to assure complete satisfaction. The ratio of worm to gear is 1:40.

Applicable Chuck: 6", 7" or 8"

Model	Machine Body			Center h	Base Length a	Base Width b	Bolt Slots g	Center Taper	Weight Screw	Ship Weight (kg/lb)	cu.ft.	Code No.	Price \$	Flange Only Code No.	Price \$
	Height H	Length A	Width B												
BS-2	236	365	272	132.7	213	134	16	MT4	M55 x P3	65	3.4	326-054	2,140.50	326-055	297.00
	9.29	14.37	10.71	5.22	8.39	5.28	0.63			143					

Semi-Universal Index Centers BS-0 & BS-1

Standards of Accuracy (Tolerances):

Testing Objective

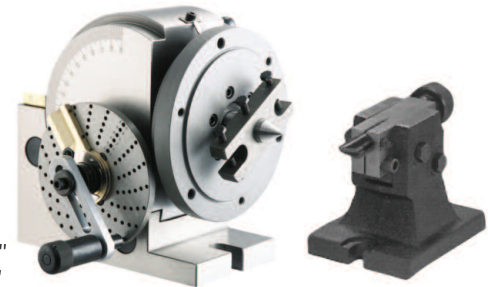
1. True running of center:
2. True running of inside taper of dividing spindle:
 - Measured at spindle nose
 - Measured at arbor 8" long
3. Axial movement of dividing spindle
4. Dividing accuracy of worm drive, maximum cumulative spacing error

Tolerances Unit (max. in. permit)

- .0006
- .0004
- .0012
- .0004
- 1'30"

Note:

- BS 0 applicable chuck: 4" or 5"
- BS 1 applicable chuck: 5" or 6"



Model	Machine Body			Center h	Base Length a	Base Width b	Bolt Slots g	Center Taper	Weight Screw	Ship Weight (kg/lb)	cu.ft.	Code No.	Price \$	Flange Only Code No.	Price \$
	Height H	Length A	Width B												
BS-0	173	177	188	100	160	91	16	MT2	M30 x P3	20	0.8	326-050	957.20	326-051	130.70
	6.81	6.97	7.40	3.94	6.30	3.58	0.63			44					
BS-1	220	245	230	128	205	114	16	MT3	M40 x P3	33	1.3	326-052	1,242.30	326-053	132.60
	8.66	9.65	9.06	5.04	8.07	4.49	0.63			72.6					

Screw Jack Sets

Features:

- Material: S45C
- Suitable for irregular workpieces.
- Rapid Setting & Fixed
- Max Capacity: 700kg

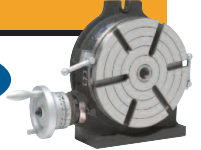


Sets

Model No.	Set Includes	Code No.	Price \$
VSJ-A	VSJ-70 70-85mm Adj. Capacity Screw Jack - 2 pcs. VSJ-150 100-150mm Adj. Capacity Screw Jack - 2 pcs. Pads included: 1A, 2A, 3A, 4A, 5A, 6A - 1 ea.	333-400	226.30
VSJ-B	VSJ-150 100-150mm Adj. Capacity Screw Jack - 2 pcs. VSJ-250 140-230mm Adj. Capacity Screw Jack - 2 pcs. Pads included: 1A, 2A, 3A, 4A, 5A, 6A - 1 ea.	333-410	374.80

Pads

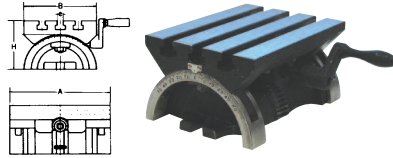
Model No.	Code No.	Price \$
1A	333-415	34.60
2A	333-420	28.80
3A	333-425	24.90
4A	333-430	32.60
5A	333-435	24.90
6A	333-440	23.00



Angle Plates

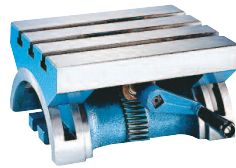
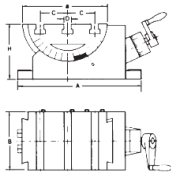
BRA-250 BRA-380

- Low profile
- Micro reading 5 min.
- Adjustable 45° each side
- Special design for angle setting on various machine tools



Model No.	Table			T-Slot E	Weight (kg)	Code No.	Price \$
	B	A	H				
BRA-250	178	250	133	12	22.5 kg	326-122	750.20
BRA-380	260	380	185	16	69 kg	326-124	1,226.80

Adjustable Swivel Angle Plates



Special Features:

- The CL Adjustable Swivel Angle Plate is mainly used for precise angle finishing, suitable for wide purposes
- CL-1 is Bolt Lock Style

Model No.	A	a	B	C	D	H	T-Slots	Code No.	Price \$
CL-1	252	180	125	55	14	115	3	326-126	791.70
CL-2	300	240	180	65	16	150	3	326-128	817.00

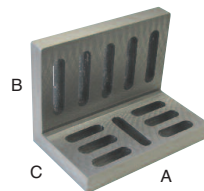
Slotted Angle Plates - Webbed & Open

Made of high-tensile cast iron seasoned against distortion, skillfully machined square and parallel, these plates are supplied in two types, Type A and Type B, the former having side webs.

Type A-Webbed: Machined on outside surfaces and edges only.

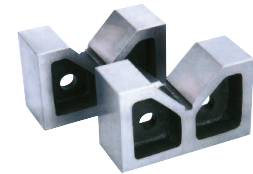
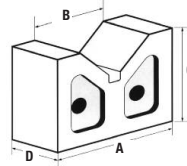
Type B-Opened: Machined all over, except slots.

QUALITY IMPORT



A	B	C	Webbed Code No.	Price \$	Open Code No.	Price \$
3	2-1/2	2	370-306	50.10	-	-
3-1/2	3	2-1/2	370-311	56.40	-	-
4-1/2	3-1/2	3	370-316	64.20	370-356	79.80
6	5	4-1/2	370-321	101.70	370-361	117.30
7	5-1/2	4-1/2	370-326	123.50	370-366	150.10
8	6	5	370-331	158.70	370-371	175.20
9	7	6	370-336	197.70	370-376	241.50
10	8	6	370-341	243.90	370-381	273.60
12	9	8	370-346	374.40	370-386	415.80

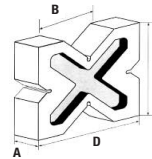
Vee Blocks - Cast Iron



- Made from close grained cast iron, these blocks are precisely ground and machined square and parallel.
- The vees are 90° centered in true.
- The blocks are manufactured and supplied in numbered pairs and come in handy for holding large jobs where clamping is not necessary.
- Squareness and Parallelism of Vee grooves: within 0.0012" (30 microns)

Width (A) (in.)	Vee Width (B) (in.)	Height (C) (in.)	Thickness (D) (in.)	Model No.	Code No.	Price \$
3	1-3/4	2-3/8	1-5/16	VB/C-3	231-102	44.30
4	2-3/16	2-9/16	1-9/16	VB/C-4	231-104	57.50
5	2-7/16	3-1/8	2	VB/C-5	231-106	78.50
6	3-1/16	3-1/2	2-7/16	VB/C-6	231-108	125.60
8	4-1/2	5-1/2	4	VB/C-8	231-110	304.30
10	5	6-1/2	5	VB/C-10	231-112	539.60
12	5-1/8	8	6	VB/C-12	231-114	790.60

4 Way Vee Blocks - Cast Iron



- Made from close grained cast iron, these Vee Blocks are precisely ground and machined square and parallel.
- Each Block incorporates four different sized vees thereby supporting a wide range of sizes.
- Manufactured and supplied in matched and numbered pairs, these are very useful for marking and checking of cylindrical parts.
- The larger sizes incorporate a cavity on either side for convenience in handling during usage.

Thickness (A) (mm)	Block Width (D) (mm)	Height (C) (mm)	Vee Cap. (B) (mm)	Code No.	Price \$
35	95	70	20 x 30 x 40 x 50	231-116	77.20
30	100	100	20 x 30 x 40 x 50	231-118	83.40
35	120	120	30 x 40 x 50 x 60	231-120	113.60

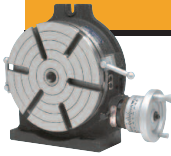
Vee Blocks - Cast Iron

QUALITY IMPORT

Supplied in matched and numbered pairs, these vee blocks and manufactured from high quality castings, properly seasoned against distortion, and are accurately machined square and parallel. The 90° vee is centered in true.



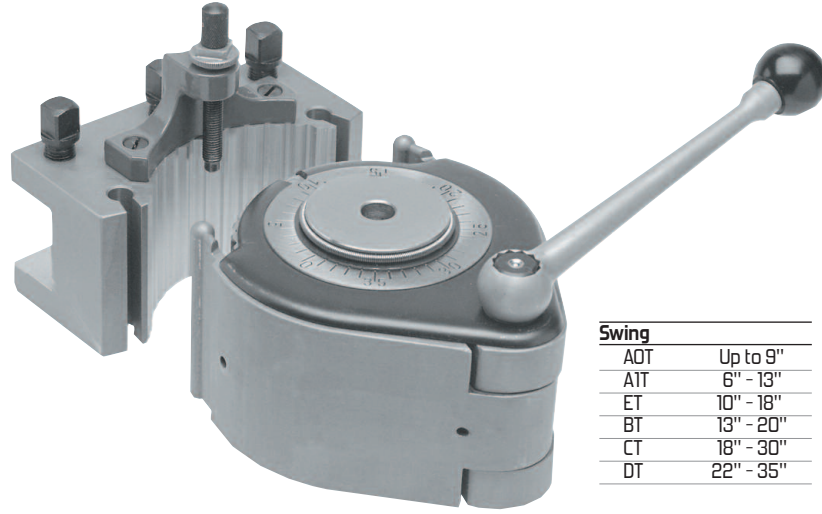
Vee Width (in.)	Vee Depth (in.)	Width (in.)	Height (in.)	Thickness (in.)	Weight (lb)	Code No.	Price \$
1	1/2	2	1-1/4	1-7/8	0.9	370-556	36.80
1-3/4	7/8	3	2-3/8	2-5/8	2.5	370-561	44.90
2-1/8	1	4	2-5/8	3-1/4	5	370-566	60.80
2-3/8	1-1/8	5	3-1/8	4	8	370-571	91.10
3-1/8	1-9/16	6	3-1/2	5	15	370-576	123.10
3-5/8	1-13/16	7	4-1/2	6	28	370-581	190.20
4-1/2	2-1/4	8	5-1/2	8	44	370-586	262.00
5	2-1/2	10	6-5/8	10	69	370-591	445.60
5-1/8	2-1/2	12	8	12	132	370-596	865.60



40 Position Quick Change Tool Post And Holders

Sets Include:

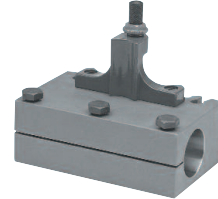
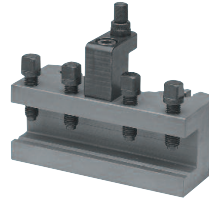
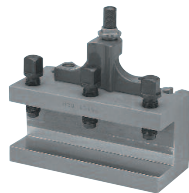
- 1 piece toolpost
- 3 piece "D" holder
- 1 piece "B" holder



Tool Post Sets

Sets (5 piece)	Code No.	Price \$
AIT	388-405	784.10
EST	388-410	1,154.50
B2T	388-415	1,196.10
C3T	388-420	2,120.80
D4T	388-425	3,713.80

Swing	
AOT	Up to 9"
AIT	6" - 13"
ET	10" - 18"
BT	13" - 20"
CT	18" - 30"
DT	22" - 35"



*Dimensions in mm

‡ Denotes items found in the sets listed above

Quick Change Tool Posts & Holders

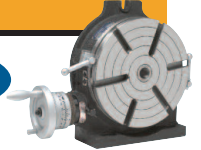
Toolpost Toolholder Size	Code No.	Price \$	Toolholder "D" Flat				Toolholder "B"				Toolholder "S"				Toolholder "A" Part Off	
			*NH	L	Code No.	Price \$	*NH	L	Code No.	Price \$	*D	L	Code No.	Price \$	Code No.	Price \$
AOT	388-005	300.90	12	50	388-010	91.00	12	50	388-015	97.00	15	50	388-020	146.40		
AIT	388-035‡	377.80	20	80	388-040‡	100.00	18	80	388-045‡	106.30	30	80	388-050	160.50	388-055	227.50
EST	388-100‡	480.80	20	100	388-105	134.40	30	100	388-115‡	156.20	30	100	388-120	197.80	388-130	258.70
			25	100	388-110‡	172.50										
			25	120	388-185‡	156.20										
			25	140	388-190	185.90										
B2T	388-180‡	549.30	32	120	388-195	159.40	32	130	388-205‡	178.20	40	120	388-210	256.30	388-215	290.80
			32	140	388-200	204.20										
			32	150	388-270	243.50										
			32	170	388-275	277.00										
C3T	388-265‡	1,029.90	40	150	388-280‡	265.40	32	160	388-295	284.20	40	150	388-305	405.50	388-315	343.70
			40	170	388-285	301.40	40	170	388-300‡	294.70	50	150	388-310	425.80		
			45	170	388-290	316.30										
D4T	388-375‡	1,708.90	40	180	388-380‡	450.70	50	180	388-395‡	652.80	63	180	388-400	690.50		
			50	180	388-385	481.00										
			63	180	388-390	524.30										

*Notch height

*Diameter

Quick Change Tool Posts Parts

Toolholder Size	Square Head Screw	Cheese Head Screw	Adjusting Top	Height Adj. Nut	Height Adj. Screw
AOT	388-501 2.50	388-502 1.10	388-503 6.00	388-504 5.80	388-505 2.50
AIT	388-506 2.50	388-507 1.10	388-508 6.20	388-509 5.80	388-510 2.50
B2T	388-511 2.50	388-512 1.50	388-513 9.40	388-514 5.80	388-515 3.30
C3T	388-516 4.70	388-517 1.50	388-518 9.80	388-519 7.00	388-520 3.70
D4T	388-521 5.40	388-522 2.80	388-523 10.80	388-524 7.90	388-525 3.90
EST	388-526 7.50	388-527 3.90	388-528 15.30	388-529 10.90	388-530 5.80



Turret Type Quick Change Tool Post

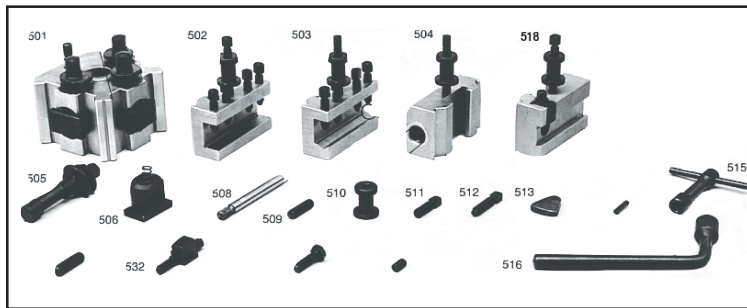
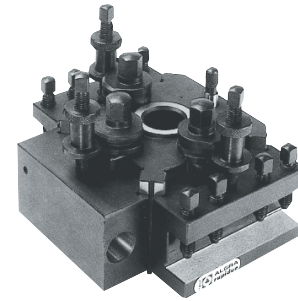
Production of a lathe machine, even of high capacity, is conditioned to the speed and time required for changing tools. Fast tool changing and simplicity increase machine production. Our turrets are designed and constructed to achieve these essential requirements.

Our Turrets offers these advantages:

- 1 - No chatter or vibrations.
- 2 - Save long set-up work for centering tool to center of rotation axle.
- 3 - No tool breakages, caused by poor or irregular setting of the tool on the shims.

Price of Set Includes:

- 3 Tool-holders of flat section
- 1 Tool-holder with V-seat for round tools
- 2 Standard spanners



Specifications:

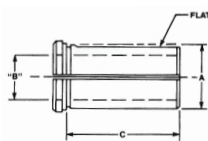
Main Block assembly is made of case-hardened steel rigidly secured by the Lathe carriage machine steel bolt. Main Block has four slide openings, for inserting the proper tool holder. These can be securely fastened by a simple and safe eccentric device, which also adjusts individual tool holder height. Tool shank is held securely by four hardened screws.

Quick Change Tool Posts & Holders

Size	Dimensions For Lathes with Swing (in.)	Max Height of Turret Body (in.)	Max. Square and Rect. Tools (in.)	Diameter Round Tool (in.)	Taper Shank	Max Adjust. Tool Holder (in.)	Sets Code No.	Price \$
M	7 - 10	2-3/4 x 2-3/4 x 1-3/4	5/8	1/2	1	1/2	385-105	609.90
A	10 - 14	3-7/8 x 3-7/8 x 2-3/8	3/4	5/8	2	9/16	385-110	701.00
B	14 - 18	4-5 x 5 x 3-3/8	1-1/8	13/16	3	15/16	385-115	901.30
C	18 - 24	5-5/8 x 5-5/8 x 3-3/4	1-1/4	15/16	4	1	385-120	1,151.90
D	over	6-7/8 x 6-7/8 x 4-3/4	1-1/2	1-1/4	4	1-1/2	385-125	2,910.70

Type B CNC Toolholder Bushings

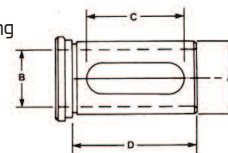
- Split style
- Shorter length
- Clamp on flat
- Bushing collapses to hold tool.
- Used for Drills, Boring Bars, and other tools



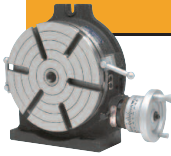
Bushing Type	Dia. (A)	Bore (B)	Length Under Head (C)	Code No.	Price \$
B	1-1/2"	1/2"	2-1/2"	470-510	54.00
B	1-1/2"	5/8"	2-1/2"	470-511	54.00
B	1-1/2"	3/4"	2-1/2"	470-512	54.00
B	1-1/2"	1"	2-1/2"	470-513	54.00
B	1-1/2"	1-1/4"	2-1/2"	470-514	54.00
B	2"	5/8"	3-1/2"	470-515	87.60
B	2"	3/4"	3-1/2"	470-516	87.60
B	2"	1"	3-1/2"	470-517	87.60
B	2"	1-1/4"	3-1/2"	470-518	87.60
B	2"	1-1/2"	3-1/2"	470-519	87.60
B	2"	1-3/4"	3-1/2"	470-520	87.60

Type C CNC Toolholder Bushings

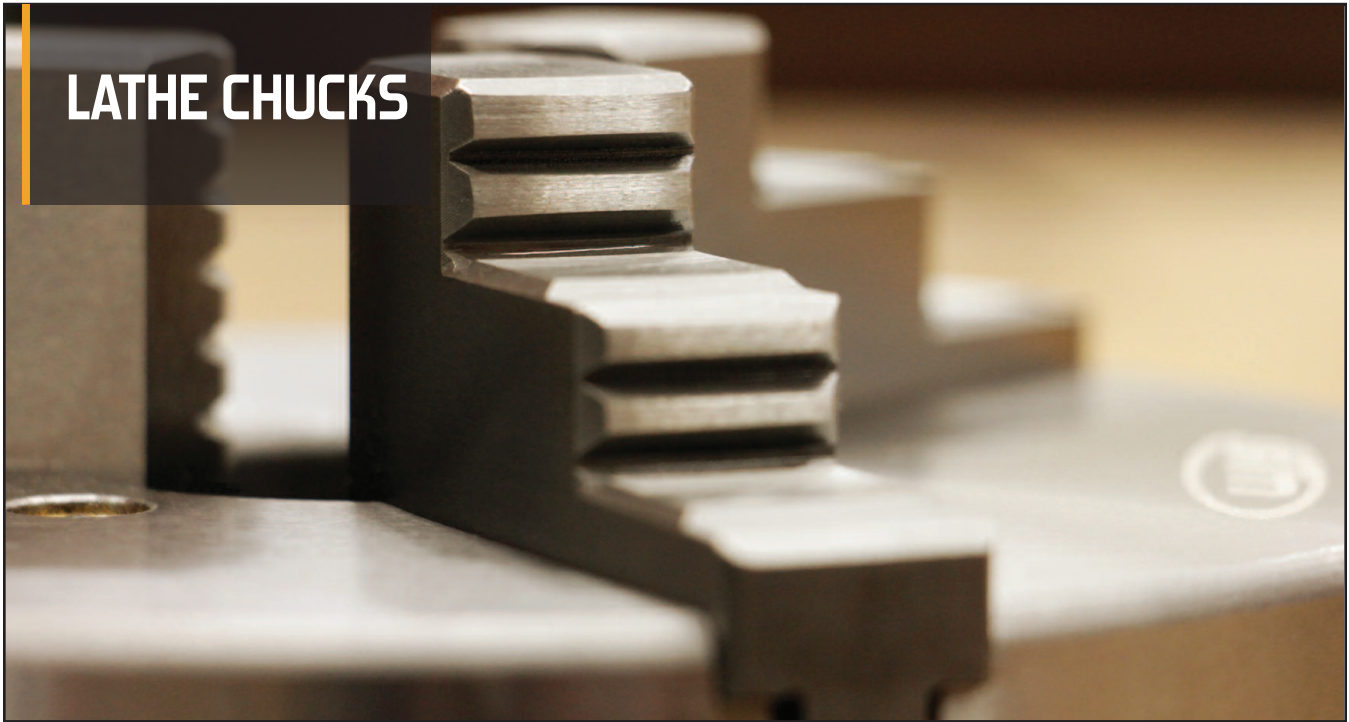
- Designed for use on all CNC Turning Machines
- Elongated slot
- For use with Drills, Boring Bars, Reamers, etc.
- Precision ground throughout



Bushing Type	Dia. (A)	Bore (B)	Length of Slot (C)	Length Under Head (D)	Code No.	Price \$
C	1-1/2"	1/2"	3"	3-3/8"	470-500	58.60
C	1-1/2"	5/8"	3"	3-3/8"	470-501	58.60
C	1-1/2"	3/4"	3"	3-3/8"	470-502	58.60
C	1-1/2"	1"	3"	3-3/8"	470-503	58.60
C	1-1/2"	1-1/4"	3"	3-3/8"	470-504	58.60
C	2"	3/4"	3-5/8"	4"	470-505	89.20
C	2"	1"	3-5/8"	4"	470-506	89.20
C	2"	1-1/4"	3-5/8"	4"	470-507	89.20
C	2"	1-1/2"	3-5/8"	4"	470-508	89.20
C	2"	1-3/4"	3-5/8"	4"	470-509	89.20



LATHE CHUCKS



3 Jaw Cast Iron Scroll Chucks - Hard Solid Jaws

Features:

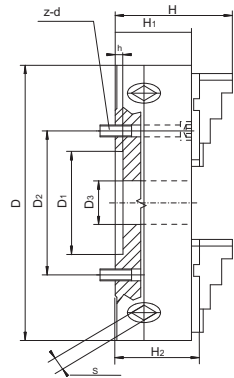
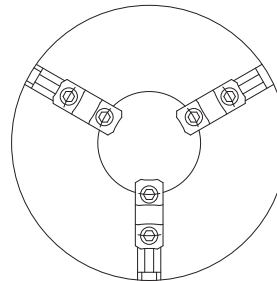
- 3 jaw, self-centering scroll chuck with manual gripping and a high quality cast iron body
- Smart design, allowing inner parts to be replaced quickly
- Mounted on the machine-tool spindle from the back of the chuck, using the adapter plate

Application:

- This chuck is designed for all types of workshop machining operations on conventional lathes and milling fixtures



Plain Back



Chuck Size D (in.)	D1 (in.)	D2 (in.)	D3 (in.)	H (in.)	H1 (in.)	H2 (in.)	h (in.)	S (in.)	z-d	Max. torque (ft/lbs)	Max Speed (r/min.)	Weight (lbs.)	Code No.	Price \$
3"	2.165"	2.598"	0.630"	2.598"	1.969"	-	0.138"	0.315"	3-M6	29.50	4,000	4.18	4440504	242.80
4"	2.835"	3.307"	0.866"	2.933"	2.165"	-	0.138"	0.315"	3-M6	44.26	3,500	7.04	4440505	254.00
5"	3.740"	4.252"	1.181"	3.307"	2.283"	-	0.157"	0.394"	3-M8	73.76	3,000	11.00	4440510	270.90
6"	5.118"	5.591"	1.575"	3.740"	2.559"	-	0.197"	0.394"	3-M8	118.02	2,500	19.36	4440515	386.00
8"	6.496"	7.087"	2.559"	4.291"	2.953"	-	0.197"	0.472"	3-M10	184.40	2,000	34.10	4440520	457.20
10"	8.110"	8.898"	3.150"	4.724"	3.150"	-	0.197"	0.472"	3-M12	236.03	1,600	56.54	4440525	610.20
12"	10.236"	11.22"	3.937"	5.787"	3.543"	-	0.236"	0.551"	3-M16	295.04	1,200	103.40	4440530	1,049.70



3 Jaw Cast Iron Body Scroll Chucks - 2PC Hard Rev. Jaws

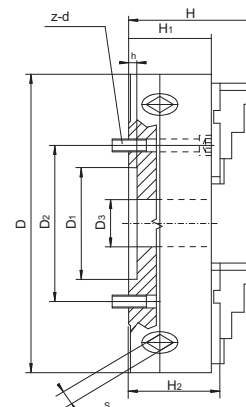
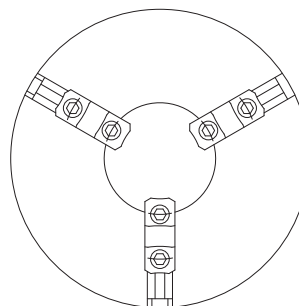
Features:

- 3 jaw, self-centering scroll chuck with manual gripping and a high quality cast iron body
- Smart design, allowing inner parts to be replaced quickly
- Mounted on the machine-tool spindle from the back of the chuck, using the adapter plate

Application:

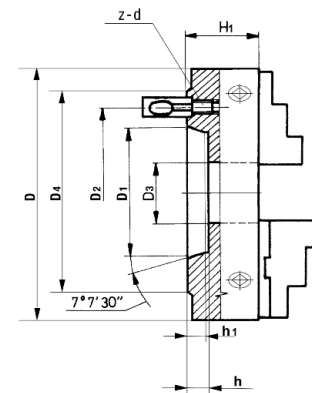
- This chuck is designed for all types of workshop machining operations on conventional lathes and milling fixtures

Plain Back



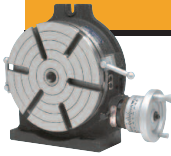
Chuck Size D (in.)	D1 (in.)	D2 (in.)	D3 (in.)	H (in.)	H1 (in.)	H2 (in.)	h (in.)	S (in.)	z-d	Max. torque (ft./lbs)	Max Speed (r/min.)	Weight (lbs.)	Code No.	Price \$
5"	3.740"	4.252"	1.181"	3.819"	2.283"	2.441"	0.157"	0.394"	3-M8	73.76	3,000	11.00	4440705	338.70
6"	5.118"	5.591"	1.575"	4.291"	2.559"	2.795"	0.197"	0.394"	3-M8	118.02	2,500	18.26	4440710	491.00
8"	6.496"	7.087"	2.559"	4.803"	2.953"	3.150"	0.197"	0.472"	3-M10	184.40	2,000	31.02	4440715	586.90
10"	8.110"	8.898"	3.150"	5.354"	3.150"	3.386"	0.197"	0.472"	3-M12	236.03	1,600	50.60	4440720	778.80
12"	10.236"	11.220"	3.937"	6.024"	3.543"	3.740"	0.236"	0.551"	3-M16	295.04	1,200	90.20	4440725	1,218.90
16"	13.386"	14.488"	5.433"	6.772"	3.937"	4.252"	0.236"	0.669"	3-M16	368.80	1,000	156.20	4440730	1,608.30
20"	17.323"	18.307"	8.268"	7.953"	4.528"	4.961"	0.236"	0.669"	6-M16	464.69	800	258.72	4440735	3,188.20
25"	22.047"	23.425"	10.63"	8.583"	5.256"	5.591"	0.276"	0.748"	6-M16	590.08	600	457.60	4440740	9,028.30

Camlock Mount



Chuck Size D (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)	H1 (in.)	h (in.)	h1 (in.)	z-d	Max. input torque (ft./lbs)	Max Speed r/min.	Weight (lbs.)	Code No.	Price \$
6" D1-4	2.501"	3.252"	1.575"	4.606"	2.756"	0.512"	0.394"	3-M10x1	118.02	2500	22.00	4440910	639.80
8" D1-4	2.501"	3.252"	1.969"	4.606"	3.386"	0.512"	0.394"	3-M10x1	184.40	2000	37.40	4440920	756.00
8" D1-5	3.251"	4.126"	1.969"	5.748"	3.386"	0.591"	0.472"	6-M12x1	184.40	2000	37.40	4440925	773.50
8" D1-6	4.188"	5.252"	1.969"	7.126"	3.386"	0.630"	0.512"	6-M16x1.5	184.40	2000	37.40	4440930	790.00
10" D1-6	4.188"	5.252"	2.756"	7.126"	3.858"	0.630"	0.512"	6-M16x1.5	236.03	1600	70.40	4440940	1,037.50
10" D1-8	5.501"	6.748"	3.150"	8.858"	3.858"	0.709"	0.551"	6-M20x1.5	236.03	1600	70.40	4440941	1,038.30
12" D1-6	4.188"	5.252"	3.937"	7.126"	4.075"	0.630"	0.512"	6-M16x1.5	295.04	1200	112.20	4440945	1,534.90
12" D1-8	5.501"	6.748"	4.134"	8.858"	4.075"	0.709"	0.551"	6-M20x1.5	295.04	1200	112.20	4440950	1,557.40
12" D1-11	7.751"	9.252"	4.135"	11.732"	4.075"	0.787"	0.630"	6-M22x1.5	295.04	1200	116.60	4440951	1,580.00
16" D1-8	5.501"	6.748"	5.118"	8.858"	4.646"	0.709"	0.551"	6-M20x1.5	368.80	1000	178.20	4440954	2,420.80
16" D1-11	7.751"	9.252"	5.315"	11.732"	4.646"	0.787"	0.630"	6-M22x1.5	368.80	1000	178.20	4440957	2,454.70

Accessories



3 Jaw Precision Steel Body Scroll Chucks - 2PC Hard Rev. Jaws

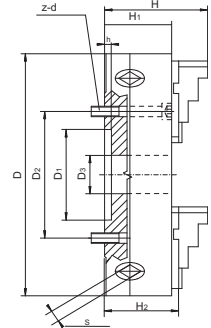
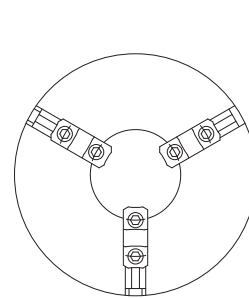
Features:

- 3 jaw, self-centering scroll chuck with manual gripping
- Steel body extends machine life while providing higher rigidity and greater wear resistance
- Hardened and ground working surfaces ensure longer life with maintained accuracy and repeatability
- Balanced scroll plate and chuck allows higher rotation speeds without excess vibration
- Mounted on the machine-tool spindle from the back of the chuck, using the adapter plate

Application:

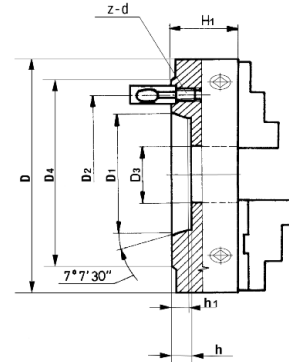
- This chuck is designed for all types of workshop machining operations on conventional lathes

Plain Back

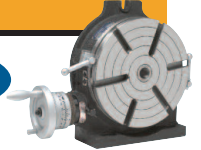


Chuck Size D (in.)	D1 (in.)	D2 (in.)	D3 (in.)	H (in.)	H1 (in.)	H2 (in.)	h (in.)	S (in.)	z-d	Max. torque (ft/lbs)	Max Speed (r/min.)	Weight (lbs.)	Code No.	Price \$
6"	5.118"	5.591"	1.575"	4.291"	2.559"	2.795"	0.197"	0.394"	3-M8	118.02	3800	18.26	4440755	874.70
8"	6.496"	7.087"	2.559"	4.803"	2.953"	3.150"	0.197"	0.472"	3-M10	184.40	3000	31.02	4440760	1,055.30
10"	8.110"	8.898"	3.150"	5.354"	3.150"	3.386"	0.197"	0.472"	3-M12	236.03	2400	50.60	4440765	1,326.20
12"	10.236"	11.220"	3.937"	6.024"	3.543"	3.740"	0.236"	0.551"	3-M16	295.04	1900	90.20	4440770	2,189.40
16"	13.386"	14.488"	5.433"	6.772"	3.937"	4.252"	0.236"	0.669"	3-M16	368.80	1500	156.20	4440775	3,075.30

Camlock Mount



Chuck Size D (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)	H1 (in.)	h (in.)	h1 (in.)	z-d	Max. input torque (ft/lbs)	Max Speed r/min.	Weight (lbs.)	Code No.	Price \$
6" D1-4	2.501"	3.252"	1.575"	4.606"	2.756"	0.512"	0.394"	3-M10x1	118.02	3800	22.00	4440965	1,126.80
8" D1-6	4.188"	5.252"	1.969"	7.126"	3.386"	0.630"	0.512"	6-M16x1.5	184.40	3000	37.40	4440980	1,337.40
10" D1-6	4.188"	5.252"	2.756"	7.126"	3.858"	0.630"	0.512"	6-M16x1.5	236.03	2400	70.40	4440985	1,743.70
10" D1-8	5.501"	6.748"	3.150"	8.858"	3.858"	0.709"	0.551"	6-M20x1.5	236.03	2400	70.40	4440990	1,743.70
12" D1-6	4.188"	5.252"	3.937"	7.126"	4.075"	0.630"	0.512"	6-M16x1.5	295.04	1900	112.20	4440992	2,494.20
12" D1-8	5.501"	6.748"	4.134"	8.858"	4.075"	0.709"	0.551"	6-M20x1.5	295.04	1900	112.20	4440994	2,511.00
16" D1-11	7.751"	9.252"	5.315"	11.732"	4.646"	0.787"	0.630"	6-M22x1.5	368.80	1500	178.20	4440998	4,051.50



4 Jaw Cast Iron Body Independent Chucks - Hard Solid Jaws

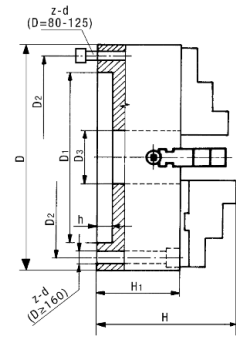
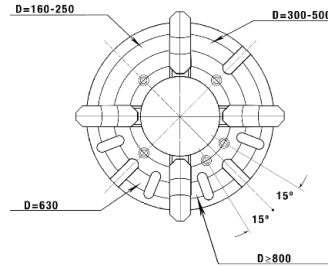
Features:

- 4 jaw, independent chuck with manual gripping, and a high quality cast iron body,
- Chuck bodies in sizes up to 6" diameter, are made from steel
- 4 jaws ensure the precise centering of square-shaped workpieces with maximum permitted gripping force
- Chucks with diameters 10" and above are equipped with additional t-slots, permitting the addition of extra jaws
- Mounted on the machine tool spindle from the back of the chuck, using the adapter plate

Application:

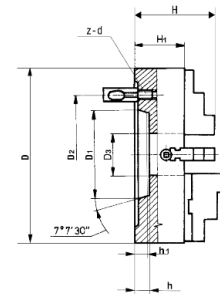
- This precision chuck, with increased gripping accuracy, is made for all types of very high precision workshop machining operations on conventional lathes
- Suitable for machining square and round workpieces

Plain Back

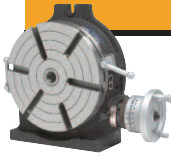


Chuck Size D (in.)	D1 (in.)	D2 (in.)	D3 (in.)	H (in.)	H1 (in.)	h (in.)	z-d	Max. input torque (ft/lbs)	Max Speed r/min.	Weight (lbs.)	Code No.	Price \$
3-1/2"	2.165"	2.598"	0.866"	2.205"	1.654"	0.138"	4-M6	18.44	4000	-	4445800	186.30
5"	3.740"	4.252"	1.181"	3.071"	2.205"	0.177"	4-M8	36.88	3000	11.00	4445803	231.40
6"	2.559"	3.740"	1.772"	3.661"	2.556"	0.197"	4-M10	51.63	2500	19.80	4445804	389.40
8"	3.150"	4.409"	2.205"	4.213"	2.953"	0.236"	4-M10	73.76	2000	33.00	4445805	457.70
10"	4.331"	5.118"	2.953"	4.724"	3.150"	0.236"	4-M12	110.64	1600	50.60	4445810	553.00
12"	5.984"	5.118"	2.953"	5.276"	3.543"	0.236"	4-M12	132.77	1200	85.80	4445815	790.00
16"	6.299"	7.283"	4.921"	5.630"	3.740"	0.315"	4-M16	206.53	1000	121.00	4445820	1,106.00
20"	7.874"	9.291"	6.299"	6.339"	4.173"	0.315"	4-M20	258.16	800	224.40	4445825	1,828.30
25"	8.661"	10.157"	7.087"	7.087"	4.646"	0.394"	4-M20	295.04	600	349.80	4445830	4,113.50
32"	9.843"	11.811"	8.268"	7.953"	5.197"	0.472"	8-M20	368.80	500	561.00	4445835	7,403.20

Camlock Mount

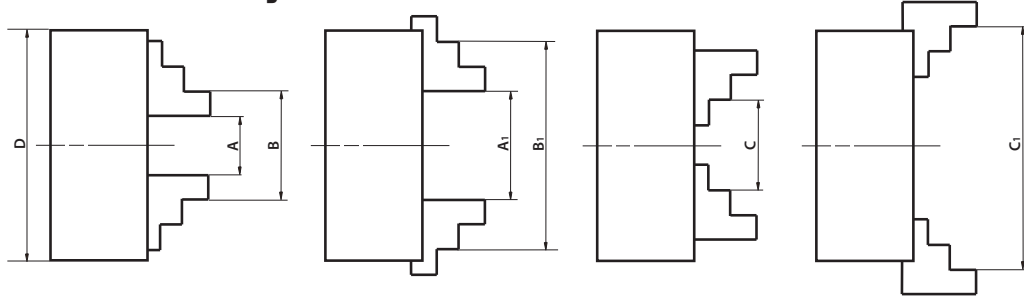


Chuck Size D (in.)	D1 (in.)	D2 (in.)	D3 (in.)	H (in.)	H1 (in.)	h (in.)	h1 (in.)	z-d	Max. input torque (ft/lbs)	Max Speed r/min.	Weight (lbs.)	Code No.	Price \$
6" D1-4	2.501"	3.252"	1.772"	3.740"	2.638"	0.512"	0.394"	3-M10x1	51.63	2500	19.80	4450100	451.50
8" D1-4	2.501"	3.252"	2.205"	4.213"	2.953"	0.512"	0.394"	3-M10x1	73.76	2000	33.00	4450110	570.00
8" D1-5	3.251"	4.126"	2.205"	4.213"	2.953"	0.591"	0.472"	6-M12x1	73.76	2000	33.00	4450115	610.70
10" D1-4	2.501"	3.252"	2.402"	4.724"	3.150"	-	0.394"	3-M10x1	110.64	1600	50.60	4450120	677.20
10" D1-6	4.188"	5.252"	2.953"	4.724"	3.150"	0.630"	0.512"	6-M16x1.5	110.64	1600	50.60	4450130	688.50
12" D1-6	4.188"	5.252"	3.740"	5.276"	3.543"	0.630"	0.512"	6-M16x1.5	132.77	1200	88.00	4450135	987.50
12" D1-8	5.501"	6.748"	3.740"	5.276"	3.543"	0.709"	0.551"	6-M20x1.5	132.77	1200	88.00	4450140	998.80
16" D1-6	4.188"	5.252"	3.740"	5.630"	3.740"	0.630"	0.512"	6-M16x1.5	206.53	1000	121.00	4450145	1,382.50
16" D1-8	5.501"	6.748"	4.921"	5.630"	3.740"	0.709"	0.551"	6-M20x1.5	206.53	1000	121.00	4450150	1,382.50
16" D1-11	7.751"	9.252"	4.921"	5.630"	3.740"	0.787"	0.630"	6-M22x1.5	206.53	1000	149.60	4450155	1,393.80
20" D1-8	5.501"	6.748"	5.354"	6.339"	4.173"	-	0.551"	6-M20x1.5	258.16	800	233.20	4450160	2,370.00
20" D1-11	7.751"	9.252"	6.299"	6.339"	4.173"	0.787"	0.630"	6-M22x1.5	258.16	800	224.40	4450165	2,375.70
25" D1-11	7.751"	9.252"	7.087"	7.087"	4.646"	0.787"	0.630"	6-M22x1.5	295.04	600	349.80	4450170	4,192.50



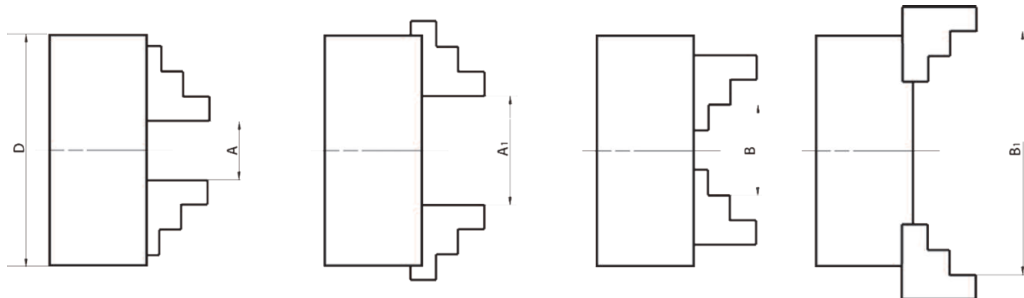
Clamping Ranges for 3 & 4 Jaw Chucks

Clamping Range - 3 Jaw Self-Centering Scroll Chucks

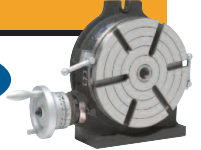


Chuck Size (in.)	Internal Jaws Clamping Range A-A1 (in.)	Internal Jaw Jamming Range B-B1 (in.)	External Jaws Clamping Range C-C1 (in.)
3"	0.079" - 0.866"	0.984" - 2.756"	0.866" - 2.480"
4"	0.079" - 1.181"	1.181" - 3.543"	1.181" - 3.150"
5"	0.098" - 1.575"	1.496" - 4.921"	1.496" - 4.331"
6"	0.118" - 2.165"	1.969" - 6.299"	2.165" - 5.709"
8"	0.157" - 3.346"	2.559" - 7.874"	2.559" - 7.874"
10"	0.236" - 4.331"	3.150" - 9.843"	3.543" - 9.843"
12"	0.394" - 5.512"	3.740" - 12.402"	3.937" - 12.402"
16"	0.591" - 8.268"	4.724" - 15.748"	4.724" - 15.748"
20"	0.984" - 11.024"	5.906" - 19.685"	5.906" - 19.685"
25"	1.969" - 13.780"	6.693" - 24.803"	6.693" - 24.803"

Clamping Range - 4 Jaw Independent Chucks



Chuck Size (in.)	Internal Jaws Clamping Range A-A1 (in.)	External Jaws Clamping Range B-B1 (in.)
3"	0.197" - 1.378"	1.378" - 3.150"
4"	0.236" - 1.772"	1.575" - 3.937"
5"	0.276" - 2.244"	1.890" - 4.921"
6"	.0315" - 3.150"	1.969" - 6.299"
8"	0.394" - 3.937"	2.480" - 7.874"
10"	0.591" - 5.118"	3.150" - 9.843"
12"	0.787" - 6.693"	3.937" - 12.402"
16"	0.984" - 9.843"	4.646" - 15.748"
20"	1.378" - 11.811"	4.921" - 19.685"
25"	1.969" - 15.748"	6.299" - 24.803"
32"	2.756" - 21.260"	7.874" - 31.496"



Spindle Runout For Self-Centering Scroll Chucks & 4 Jaw Independent Lathe Chucks

3 Jaw Self Centering

Diagram of test	Test item	Chuck diameter								
		≤6"				8"~10"		12"~16"		20"
		3"	4"	5"	6"	8"	10"	12"	16"	20"
	a. Radial run-out b. Axial run-out	a : 0.0002" b : 0.0002"								
	Radial run-out of chuck	0.0012"/				0.0016"/		0.0024"/		0.0031"/
	Axial run-out of chuck	0.0025"/ L=2.00"				0.0031"/ L=2" (8"), L=3" (10")		0.0039"/ L=3"		0.005"/ L=4"
	Radial run-out of test bar	0.0024"/				0.0024"/		0.0031"/		0.0039"/
	Radial run-out of test ring	0.0013"/				0.0016"/		0.0019"/		0.0025"/
	Axial run-out of test ring	0.0024"/				0.0024"/		0.0031"/		0.0039"/
	Radial run-out of test ring	0.0013"/				0.0016"/		0.0019"/		0.0025"/

4 Jaw Independent

Diagram of test	Test item	Chuck diameter								
		3"~5"		6"	8"~10"		12"	16"	20"~25"	
		3"	5"	6"	8"	10"	12"	16"	20"	25"
	a. Radial run-out b. Axial run-out	a : 0.0002" b : 0.0002"								
	Radial run-out of chuck	0.0013"/		0.0013"/	0.0024"/		0.0024"/	0.0024"/	0.0031"/	
	Axial run-out of chuck	0.0006"/		0.0006"/	0.0009"/		0.0009"/	0.0013"/	0.0013"/	
	Axial run-out of step of jaw	0.0009"/		0.0009"/	0.0013"/		0.0013"/	0.0016"/	0.0016"/	
	Linearity of front face of chuck	—		—	—		0.0013"/ (—)	0.0013"/ (—)	0.0016"/ (—)	

CAT40 / 50 AND BT40 TOOLING PACKAGES

- 100% Forged Construction
- Certified balanced up to 30,000 rpm
- Precision Ground Throughout
- DIN Coolant thru the flange - standard

CAT40 Package

- 2pcs 2.5" ER25 Collet Chucks (531-418)
- 2pcs 2.5" ER32 Collet Chucks (531-421)
- 1pc 1/4" x 2.5" End Mill Holder (531-002)
- 1pc 3/8" x 2.5" End Mill Holder (531-014)
- 1pc 1/2" x 2.5" End Mill Holder (531-026)
- 1pc 5/8" x 2.5" End Mill Holder (531-034)
- 1pc 3/4" x 3.0" End Mill Holder (531-042)
- ER25 17pc 1/8"-5/8" Collet Set (337-442)
- ER32 21pc 1/8"-3/4" Collet Set (337-444)
- ER25 Collet Wrench (337-396)
- ER32 Collet Wrench (337-398)

Code No: 500-268

Total value: \$ 1,891.50

BT40 Package

- 2pcs 3.50" ER16 Collet Chucks (532-180)
- 2pcs 3.13" ER32 Collet Chucks (532-196)
- 1pc 1/4" x 2.5" End Mill Holder (532-020)
- 1pc 3/8" x 2.5" End Mill Holder (532-032)
- 1pc 1/2" x 2.5" End Mill Holder (532-040)
- 1pc 5/8" x 2.5" End Mill Holder (532-046)
- 1pc 3/4" x 2.5" End Mill Holder (532-052)
- ER16 11pc 1/8"-5/8" Collet Set (337-440)
- ER32 21pc 1/8"-3/4" Collet Set (337-444)
- ER16 Collet Wrench (337-395)
- ER32 Collet Wrench (337-398)

Code No: 500-277

Total value: \$ 2,000.80



(Collets packaged individually)

CAT50 Package

- 2pcs 4.0" ER25 Collet Chucks (531-448)
- 2pcs 4.0" ER32 Collet Chucks (531-454)
- 1pc 3/8" x 2.5" End Mill Holder (531-100)
- 1pc 1/2" x 2.63" End Mill Holder (531-118)
- 1pc 5/8" x 3.0" End Mill Holder (531-128)
- 1pc 3/4" x 3.0" End Mill Holder (531-138)
- 1pc 1" x 4.0" End Mill Holder (531-154)
- ER25 17pc 1/8"-5/8" Collet Set (337-442)
- ER32 21pc 1/8"-3/4" Collet Set (337-444)
- ER25 Collet Wrench (337-396)
- ER32 Collet Wrench (337-398)

Code No: 500-269

Total value: \$ 2,164.40



(CAT40 Package Shown)

CALL TODAY FOR A QUOTE

ASIMETO

PRECISION TOOLS

Asimeto Precision Tools

Micrometers	180-215
Calipers	181-185
Indicators	186-193
Dial Bore Gages	194-198
Magnetic Bases	198
Height Gages	199
Spring Divider & Calipers	200-201
Telescoping Gages	201
Squares & Parallels	202
Gages, Gage Blocks & Pins	202-203
Surface Roughness Standards	204-208
Optical Equipment	207
Kits	208-210
	211-215

STM Precision Tools

Micrometers	216-226
Calipers	216-218
Dial Bore Gage Sets	219-220
Indicators & Accessories	220
Height Gages	220-221
Screw Pitch & Other Gages	222
Gage Blocks & Pins	223-224
Hardness Tester	225
1-2-3 & V-Blocks	225
Surface Plates	226
Pocket Reference Book	226





ASIMETO

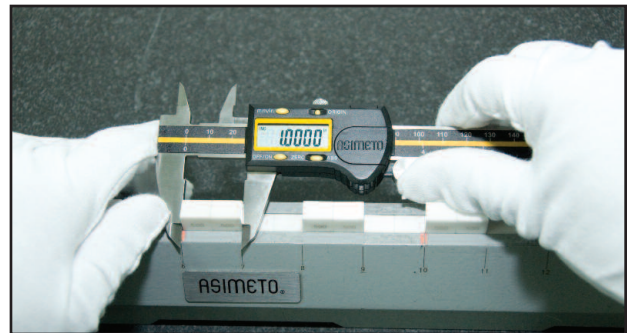
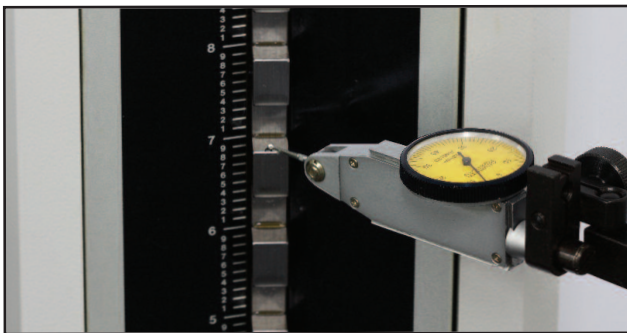
Empowering Possibilities

Precision is not only defined by degrees of exactness. It is defined by the vision and skill of engineers. By problems solved, challenges overcome and reputations made. The real value of precision is the power it gives engineers to turn plans into reality.

Asimeto was founded in 2007 by renowned German metrologist Manfred Eisinger. Since then, the company has rapidly established a reputation for manufacturing high-performance precision tools and solutions and delivering them at unexpectedly affordable prices.

Asimeto continues to win market share by applying German metrological design, American technological innovation and Asian manufacturing competitiveness across a broad range of integrated precision solutions, distributed through a global network. Every tool is ISO17025 certified for dependable accuracy and to ensure calibration is compliant with the regulatory requirements of each local market. Increasingly, Asimeto is the choice of engineers the world over including companies like Volkswagen, Guhring and Boeing. We invite you to discover why.

To supplement the industry standard 12 month warranty an additional 12 month warranty is available by registering your individual purchase online at www.asimeto.com within 30 days from the date of purchase.





IP65 Digital Outside Micrometers w/ SPC Output

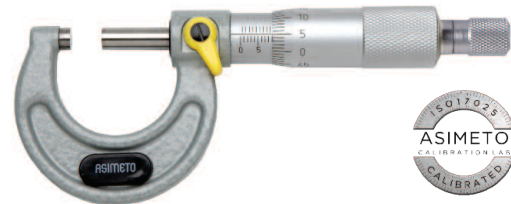
- Resolution:
Digital: .00005"/ 0.001mm
Scale: .0001"
- Dual Ratchet combines both the Ratchet Stop and Friction Thimble
- Protection level IP65
- Comes with long form calibration certificate
- Upon switch-on the display will read the actual absolute measuring position
- Automatic On/Off to maximize battery life
- Inch/Metric conversion
- Absolute or incremental measuring modes
- Carbide tipped measuring faces



Range	Accuracy	Thimble	Code No.	Price \$
0-1"/0-25mm	±.0001"/.002mm	Dual Ratchet	7105015	177.40
1-2"/25-50mm	±.0002"/.002mm	Dual Ratchet	7105025	206.30
2-3"/50-75mm	±.0002"/.003mm	Dual Ratchet	7105035	228.50
3-4"/75-100mm	±.0002"/.003mm	Dual Ratchet	7105045	251.70
4-5"/100-125mm	±.0002"/.003mm	Dual Ratchet	7105055	287.60
5-6"/125-150mm	±.0002"/.003mm	Dual Ratchet	7105065	318.40

Outside Micrometers

- Graduation:
Inch: 0.001" / .0001"
Metric: 0.01mm / 0.001mm
- Flatness: 0.000024" / 0.6 μm
- Carbide tipped measuring faces
- Ratchet Stop
- Grey painted steel frame
- Comes with long form calibration certificate



Range	Graduation	Accuracy	Thimble	Code No.	Price \$
0-1"	.001"	±.0001"	Ratchet Stop	7101011	61.10
1-2"	.001"	±.0002"	Ratchet Stop	7101021	65.30
1-2"	.001"	±.0002"	Friction	7103025	69.10
2-3"	.001"	±.0002"	Ratchet Stop	7101031	70.50
0-1"	.0001"	±.0001"	Ratchet Stop	7101013	61.10
1-2"	.0001"	±.0002"	Ratchet Stop	7101023	65.30
1-2"	.0001"	±.0001"	Friction	7103027	69.10
2-3"	.0001"	±.0002"	Ratchet Stop	7101033	70.50
3-4"	.0001"	±.0002"	Ratchet Stop	7101043	75.70
4-5"	.0001"	±.0002"	Ratchet Stop	7101053	92.30
5-6"	.0001"	±.0002"	Ratchet Stop	7101063	103.20
0-25mm	0.01mm	±0.004mm	Ratchet Stop	7101010	61.10
0-25mm	0.001mm	±0.004mm	Ratchet Stop	7101012	61.10
25-50mm	0.01mm	±0.004mm	Ratchet Stop	7101020	65.30

Outside Micrometer Sets

- Graduation:
Inch: .0001"
- Flatness: 0.000024" / 0.6μm
- Carbide tipped measuring faces
- Ratchet Stop
- Grey painted steel frame
- Comes with long form calibration certificate



Range	Graduation	Code No.	Price \$
0-3"	.0001"	7101637	203.00
0-4"	.0001"	7101647	276.30
0-6"	.0001"	7101667	463.10



Economic Digital Outside Micrometer

- Resolution: .00005" / 0.001mm
- Carbide tipped measuring faces
- Spindle dia.: 0.25"
- Painted frame
- Friction thimble
- Inch/Metric conversion
- Absolute or incremental measuring modes
- Automatic On/Off to maximize battery life
- Ball Anvil included.
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-1" / 0-25mm	±.00016" / ±0.004mm	7116011	133.90

Inside Micrometer

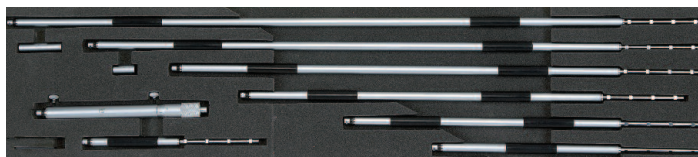
- Designed for the measurement of intricate internal characteristics
- Satin chrome finished
- Ratchet stop
- Comes with long form calibration certificate



Range	Graduation	Accuracy	Code No.	Price \$
0.2 - 1.18"	.001"	±.0001"	7203011	139.60

Inside Micrometers - Interchangeable Rod Type

- Graduation: .001"
- Rods marked with measuring range
- Satin chrome finish throughout
- All contact points hardened for extra long tool life
- With locking clamp
- Zero point can be readjusted by rotating the micrometer head sleeve
- Carbide tipped measuring faces
- 2-12" includes 2" Mic head and 10 rods
- 8-20" includes 8" Mic head and 3 rods
- 8-40" includes 8" Mic head and 8 rods
- Comes with long form calibration certificate



Range	Head Travel	Spacing Collar	Rod Dia.	Code No.	Price \$
2-8"	.50"	.500"	Ø.248"	7242081	286.20
2-12"	.50"	.500"	Ø.248"	7242121	315.10
8-20"	1.00"	1", 2"	Ø.355"	7242201	381.80
8-40"	1.00"	1", 2"	Ø.355"	7242401	1,179.30



Micrometer Head

- Graduation: .001"
- Satin chrome finish
- Ratchet stop
- Measuring face is spherical



Code No.	Price \$
7169055	65.30

Digital Micrometer Head

- Resolution: .00005"/0.001mm
- Scale: .0001"
- Ratchet stop
- Flat & carbide tipped face
- Absolute or incremental modes



Code No.	Price \$
7165011	274.90

Micrometer Stands

- Designed to allow bench top use with hand micrometers
- Painted Cast-Iron base (7109021)
- Painted Steel base (7109010)

Steel



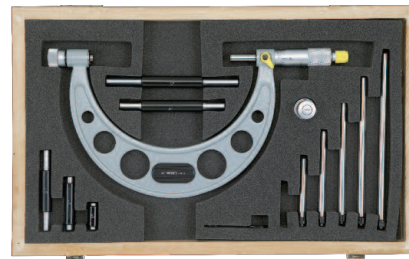
Cast-Iron Base



Description	Code No.	Price \$
Steel	7109010	48.30
Cast Iron	7109021	25.10

Interchangeable Anvil Micrometer

- Accuracy: $\pm 0.0002"$
- Ratchet stop
- Locking clamp
- Carbide measuring faces
- Satin chrome finish
- Comes with long form calibration certificate



Range	Graduation	Note	Code No.	Price \$
0-6"	.001"	with 6 Anvils & 5 Standards	7111061	387.00



Depth Micrometers

- Flat end
- Measuring rods must be kept as a set and are not interchangeable with other depth micrometer sets
- Ratchet stop
- Comes with long form calibration certificate



Range	Graduation	Accuracy	Base Length	Rods	Code No.	Price \$
0-6"	.001"	±.0002	2-1/2"	6	7201061	340.10
0-6"	.001"	±.0002	4"	6	7201063	340.10

Digit Depth Micrometer

- Resolution: .001"
- Thimble graduation: .0001"
- .157 dia. interchangeable rod lengths can be adjusted after wear on the measuring tip
- Ratchet Stop
- Satin Chrome finish throughout
- Comes with long form calibration certificate



Range	Graduation	Accuracy	Base Length	Rods	Code No.	Price \$
0-6"	.0001"	±.0002	4"	6	7202063	326.90

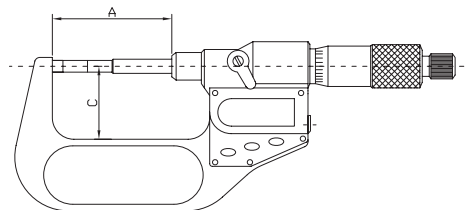
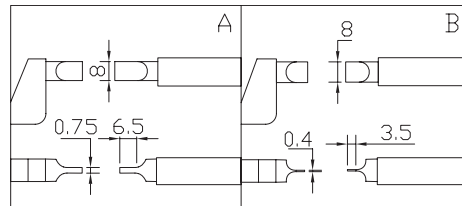


Digital Blade Micrometers

- Resolution:
Digital: .00005" / 0.001mm
Scale: .0001" / 0.01mm
- Ratchet stop
- Grey painted steel frame
- Inch/Metric conversion
- Automatic On/Off to maximize battery life
- Absolute or incremental measuring modes
- Comes with long form calibration certificate
- For measuring the groove diameter of shafts, keyways, and other hard to reach portions
- Non-rotating spindle
- Carbide tipped measuring faces
- Upon switching on the display will read the actual absolute measuring position



Range	Accuracy	Anvil Type	Code No.	Price \$
0-1"/0-25mm	±.0001/0.003mm	A	7117011	421.50
1-2"/25-50mm	±.0002"/0.003mm	A	7117021	447.50
2-3"/50-75mm	±.0002"/0.003mm	A	7117031	474.00
3-4"/75-100mm	±.0002"/0.004mm	A	7117041	509.00
0-1"/0-25mm	±.0001/0.003mm	B	7117013	421.50
1-2"/25-50mm	±.0002"/0.003mm	B	7117023	447.50



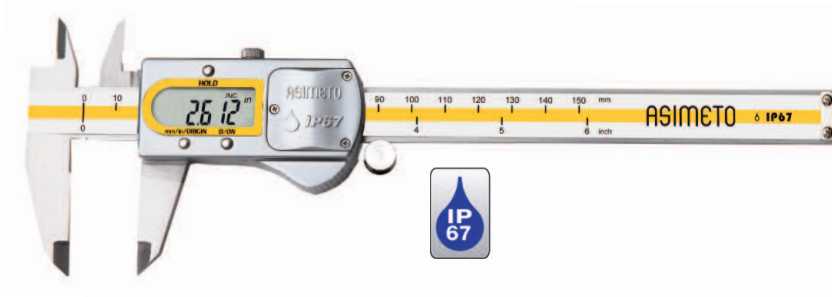
Dimension

Range Inch/Metric	A mm	C mm
0-1"/0-25mm	57	32
1-2"/25-50mm	82	44.5
2-3"/50-75mm	107	57
3-4"/75-100mm	132.6	69.5



IP67 Coolant Proof Digital Calipers

- Resolution: .0005" / 0.01mm
- Absolute function, there is no need to set the zero
- Hold function for easy reading
- Absolute and incremental measuring modes
- Inch/Metric conversion
- Metal Housing: the design will allow the caliper to be used in normal workshop conditions and is resistant to coolant, water, dust, and oil
- Auto power on/off
- Power: 3V lithium battery
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-6"/0-150mm	±.001"/±0.02mm	7305062	197.30
0-8"/0-200mm	±.0015"/±0.03mm	7305082	261.20
0-12"/0-300mm	±.0015"/±0.03mm	7305122	325.50

Digital Calipers

- Resolution: .0005" / 0.01mm
- Extra large LCD readout
- The origin position is retained through the on/off cycle
- Inch/Metric conversion
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-6"/0-150mm	±.001"/±0.02mm	7307065	87.60
0-8"/0-200mm	±.0015"/±0.03mm	7307085	126.30
0-12"/0-300mm	±.0015"/±0.03mm	7307125	177.00



Absolute Digital Calipers

- Resolution: .0005" / 0.01mm
- The caliper will be ready for measurements as soon as it is switched on with the LCD screen displaying the actual slider position. There is no need to set the zero position each time the caliper is used as the origin setting is retained even when the caliper is switched off
- Inch/Metric conversion
- A thumb wheel is provided for easy use
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-6"/0-150mm	±.001"/±0.02mm	7307563	112.20
0-8"/0-200mm	±.0015"/±0.03mm	7307583	146.20
0-12"/0-300mm	±.0015"/±0.03mm	7307623	208.70

IP67 Digital Calipers _ SYLVAC SYSTEM

- Resolution: .0005" / 0.01mm
- Conforms to the IP67 ratings
- Inch/Metric conversion
- Auto power on/off
- Sylvac system
- Comes with long form calibration certificate

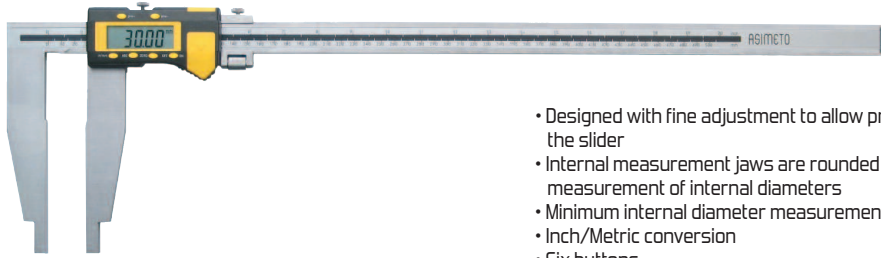


Range	Accuracy	Code No.	Price \$
0-6"/0-150mm	±.001"/±0.02mm	7301060	262.90
0-12"/0-300mm	±.0015"/±0.03mm	7301120	569.60

Precision Tools



Heavy Duty Digital Caliper



- Designed with fine adjustment to allow precise movement of the slider
- Internal measurement jaws are rounded to provide accurate measurement of internal diameters
- Minimum internal diameter measurement capability of 20mm
- Inch/Metric conversion
- Six buttons
- Zero setting at any position
- Without upper jaws
- Comes with long form calibration certificate



Range	Jaw Length	Accuracy	Code No.	Price \$
0-24"/600mm	150mm	±0.05mm	7315240	675.00

Digital Caliper With Adjustable Measuring Jaw



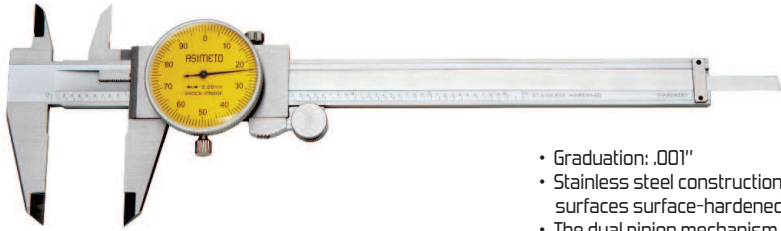
- Resolution: 0.005" / 0.01mm
- Stationary jaw on the beam is designed with vertical movement for the purpose of measuring various steps of different heights
- Inch/Metric conversion
- Zero setting at any position
- Comes with long form calibration certificate



Range	Jaw Length	Accuracy	Code No.	Price \$
0-6"/0-150mm	110mm	±.0015"/0.04mm	7317060	220.00



Dial Calipers

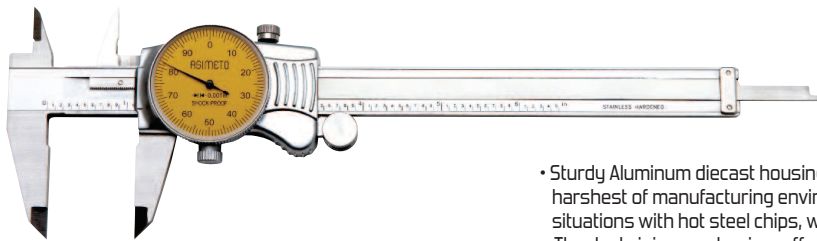


- Graduation: .001"
- Stainless steel construction with all measuring surfaces surface-hardened
- The dual pinion mechanism offers ultra smooth feel
- Preloaded pinion offers better repeatability
- Thumbwheel
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-4"	±.001"	7303041	53.50
0-6"	±.001"	7303061	76.20
0-8"	±.0015"	7303081	103.20
0-12"	±.0015"	7303121	196.40
0-150mm	±0.02mm	7303060	84.20

Dial Calipers - Aluminum Diecast



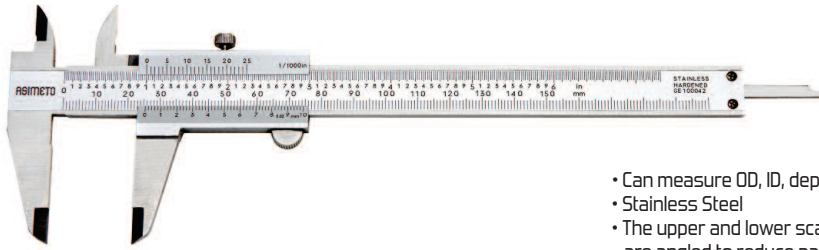
- Sturdy Aluminum diecast housing can be used in the harshest of manufacturing environments, including situations with hot steel chips, without damage
- The dual pinion mechanism offers ultra smooth feel
- Thumbwheel
- Graduation: .001"
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-6"	±.001"	7304065	90.90
0-8"	±.0015"	7304085	119.30
0-12"	±.0015"	7304125	204.40
0-150mm	±0.02mm	7304066	90.90
0-200mm	±0.03mm	7304086	119.30



Vernier Calipers - Plain Style

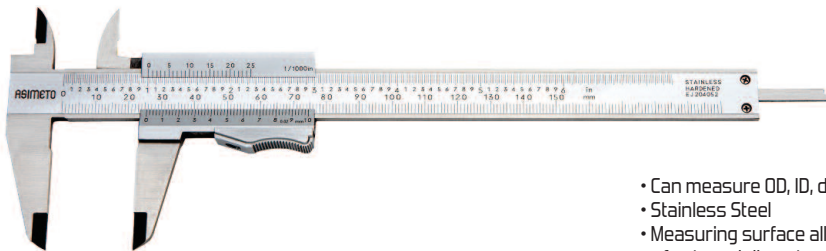


- Can measure OD, ID, depth and steps
- Stainless Steel
- The upper and lower scales on the slider are angled to reduce parallax error
- Upper lock
- Comes with long form calibration certificate



Upper/Lower Range	Upper/Lower Graduation	Accuracy	Code No.	Price \$
0-6"/0-6"	1/128" / .001"	±.001"	7341061	58.20
0-6"/0-150mm	1/128" / 0.05mm	±0.06mm	7341060	58.20
0-6"/0-150mm	0.001" / 0.02mm	±0.02mm	7341064	58.20
0-8"/0-200mm	0.001" / 0.02mm	±0.03mm	7341084	74.30

Vernier Calipers - Thumb Clamp



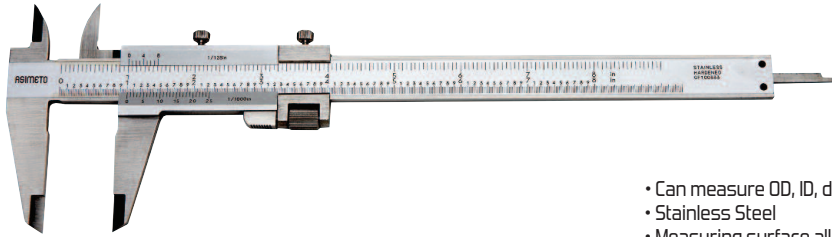
- Can measure OD, ID, depth and steps
- Stainless Steel
- Measuring surface allows for the measurement of external diameters, internal diameters, depths and steps
- Comes with long form calibration certificate



Upper/Lower Range	Upper/Lower Graduation	Accuracy	Code No.	Price \$
0-6"/0-150mm	0.001" / 0.02mm	±0.02mm	7351064	59.20
0-8"/0-200mm	0.001" / 0.02mm	±0.03mm	7351084	75.70



Vernier Caliper With Fine Adjustment



- Can measure OD, ID, depth and steps
- Stainless Steel
- Measuring surface allows for the measurement of external diameters, internal diameters depths and steps
- Comes with long form calibration certificate



Upper/Lower Range	Upper/Lower Graduation	Accuracy	Code No.	Price \$
0-7"/0-180mm	0.001"/0.02mm	±0.03mm	7361076	81.40

Digital Depth Calipers



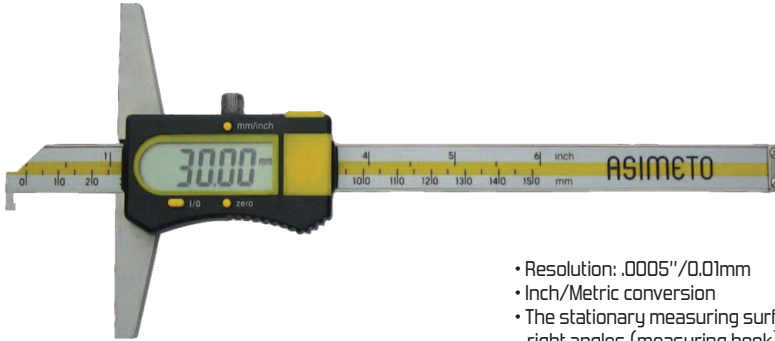
- Resolution: .0005"/0.01mm
- Inch/Metric conversion
- Both of the measuring surfaces are precision ground for accuracy
- Comes with long form calibration certificate



Range	Resolution	Accuracy	Code No.	Price \$
0-6"/0-150mm	.0005"/0.01mm	±.001"/±0.02mm	7327067	123.00
0-8"/0-200mm	.0005"/0.01mm	±.0015"/±0.03mm	7327087	144.30
0-12"/0.300mm	.0005"/0.01mm	±.0015"/±0.04mm	7327127	204.90



Digital Depth Caliper With Single Hook



- Resolution: .0005"/0.01mm
- Inch/Metric conversion
- The stationary measuring surface on the beam protrudes at right angles (measuring hook) to allow for the measurement of depths, internal groove positions, and other intricate characteristics
- Comes with long form calibration certificate



Range	Resolution	Accuracy	Code No.	Price \$
0-8"/0-200mm	.0005"/0.01mm	±.0015"/±0.03mm	7322087	153.80

Digital Depth Calipers With Double Hook



- Hooked measuring surfaces are used for measurement of internal or external grooves and other intricate workpiece characteristics
- All measuring surfaces are hardened
- Comes with long form calibration certificate



Range	Resolution	Accuracy	Code No.	Price \$
0-6"/0-150mm	.0005"/0.01mm	±.001"/±0.02mm	7323065 •	125.90
0-8"/0-200mm	.0005"/0.01mm	±.0015"/±0.04mm	7323125 •	227.10

•Available only while quantities last



Digital Tire Depth Gauge



- The origin point is retained throughout the life of the battery
- Inch/Metric conversion
- Spherical end anvil
- Base Length: 60mm
- Comes with long form calibration certificate



Range	Resolution	Accuracy	Code No.	Price \$
0-1.2"/0-30mm	.0005"/0.01mm	±.0015"/±0.03mm	7321010	90.40

Vertical Digital Scale



- Inch/Metric conversion
- Absolute or incremental measuring modes
- Units are supplied with the necessary mounting brackets required for most popular installations
- Resolution: .0005"/0.01mm
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-8"/200mm	±.0015"/±0.03mm	7326080	174.10



Digital Indicators



- Tolerance measurement feature
- Inch/Metric conversion
- SR44 battery
- Comes with long form calibration certificate

Range	Resolution	Accuracy	Code No.	Price \$
0-.5"/0-12.5mm	.0005"/0.01mm	±.0008"/±0.02mm	7405951	162.20
0-.5"/0-12.5mm	.00005"/0.001mm	±.0002"/±0.001mm	7405955	295.80
0-1"/0-25mm	.0005"/0.01mm	±.0012"/±0.02mm	7405011	172.20
0-2"/0-50mm	.0005"/0.01mm	±.0012"/±0.02mm	7405021	447.70

Digital Indicator With Analog Display



- Tolerance measurement feature
- Inch/Metric conversion
- SR44 battery
- Flat back (attached) and lug back supplied
- Comes with long form calibration certificate

Range	Resolution	Accuracy	Code No.	Price \$
0-1"/0-25mm	.00005"/0.002mm	±.0006"/±0.015mm	7406011	273.90



Ultra Precision Dial Gage



- Made in Germany, high precision dial gauge commonly used in the automotive industry for checking fixtures
- Limited dial gauge movement eliminates error caused by multiple rotations of the dial gauge that may be missed by the operator
- Effective shockproof system for gauge protection
- Pinions and shafts are jeweled to increase gauge longevity
- Easy zeroing of the dial to the gauge master
- Safety cap prevents unintentional movement
- Stem and spindle made of stainless steel and provide measurement sensitivity
- Tolerance markers are provided for easy reading interpretation
- Repeatability: .000025"/0.0005mm
- Stem diameter: 3/8 or 8mm
- Comes with long form calibration certificate

Range	Resolution	Accuracy	Code No.	Price \$
0.1mm	0.001mm	±0.0012mm	7422212	418.20

AGD1 Dial Indicators



- Dial face dia.: Ø1.61"/Ø42mm
- Jeweled
- Flat back (attached) and lug back supplied
- Stem diameter 3/8"
- Accuracy: ±.001"
- Comes with long form calibration certificate

Range	Graduation	Range/Rev	Dial Reading	Code No.	Price \$
.25"	.001"	.1"	0-100	7401061	93.50
.25"	.001"	.1"	0-50-0	7401063	93.50
.25"	.001"	.05"	0-25-0	7401065	93.50

Precision Tools



AGD2 Dial Indicators



- Graduation Inch: .0001", .0005", .001"
- Metric: 0.01mm
- Dial face dia.: Ø2.20" / Ø58mm
- Internal tolerance marker
- Flat back (attached) and lug back supplied
- With counter pointer
- Comes with long form calibration certificate

Range	Grad	Range /Rev	Dial Reading	Accuracy	Code No.	Price \$
.05"	.0001"	.01"	0-100	±.0007"	7402011	143.20
.05"	.0001"	.01"	0-50-0	±.0007"	7402013	143.20
.25"	.0005"	.05"	0-25-0	±.0015"	7402065	71.00
.25"	.001"	.1"	0-100	±.002"	7402061	71.00
.50"	.001"	.1"	0-100	±.002"	7402121	71.00
.50"	.0005"	.05"	0-50	±.002"	7402125	71.00
1"	.001"	.1"	0-100	±.002"	7402261	72.30
1"	.001"	.1"	0-50-0	±.002"	7402263	72.30
1"	.0005"	.05"	0-50	±.002"	7402265	72.30
2"	.001"	.1"	0-100	±.004"	7402511	165.00
10mm	0.01mm	1mm	0-100	±0.03mm	7402101	82.90
10mm	0.01mm	1mm	0-50-0	±0.03mm	7402103	82.90
25mm	0.01mm	1mm	0-50-0	±0.04mm	7402253	146.20

AGD2 IP54 Water Proof Dial Indicators



- Dial face dia.: Ø2.20" / Ø58mm
- Internal tolerance marker
- Flat back (attached) and lug back supplied
- With counter pointer
- IP54 rated
- Comes with long form calibration certificate

Range	Grad	Range /Rev	Dial Reading	Accuracy	Code No.	Price \$
0-0.4"	.001"	.1"	0-100	±.002"	7402267	118.90
0-0.4"	.0005"	.05"	0-50	±.0015"	7402269	118.90



Dial Test Indicators



Vertical

- Graduation: .0001"; .0005"
- Jeweled bearings
- Comes with Ø3/8" dovetail stems
- Easy to read yellow face
- Comes with long form calibration certificate
- Carbide tipped contact point
- 1.26" dia. dial face



Full Set



Carbide tipped point
DIA. 2mm

Steel point
DIA. 1mm

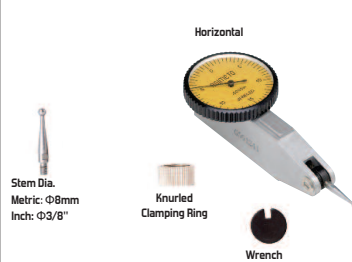
Stem Dia.
Metric 4mm
Inch .157"

Knurled
Clamping Ring

Swivel Clamp
Metric: for 04mm, 6 & 08mm Dia.
Inch: for 3/8", 6 & 157" Dia.

Holding Bar
Metric 9x9x100mm
Inch .25"x.5"x4"

Base Set



Stem Dia.
Metric: Ø8mm
Inch: Ø3/8"

Knurled
Clamping Ring

Wrench

Horizontal

Range	Graduation	Dial Reading	Accuracy	Type	Code No.	Price \$
.008"	.0001"	0-4-0	±.0001"	Horizontal	7501789	154.40
.03"	.0005"	0-15-0	±.0005"	Horizontal	7501733	121.90
.03"	.0005"	0-15-0	±.0005"	Horizontal	7501736	147.30
.03"	.0005"	0-15-0	±.0005"	Vertical	7501735	121.90
0.8mm	0.01mm	0-40-0	±0.01mm	Horizontal	7501080	103.00
Full Set						
.03"	.0005"	0-15-0	±.0005"	Horizontal	7501738	191.70

• Long point 1"

Extended Range Dial Test Indicator & Sets

STANDARD ACCESSORIES

- Height Gage Bar (1/4" x 1/2") w/ Swivel Clamp w/ 5/32", 7/32", 1/4" holes
- Axial support w/ 3/8" Stem and Dovetail
- Reduction sleeve 3/8" to 5/32"
- Two dovetail stems, 3/8" & 5/32"
- Three contact points: .04" (hardened steel), .08", .12" (Tungsten Carbide) x 5/8" long
- Doubles the range of most indicators
- Jeweled movement and easy to read dial



Range	Graduation	Dial Reading	Accuracy	Code No.	Price \$
.060"	.0005"	1.5"	±0.0012"	7504561	224.80
Set					
.060"	.0005"	1.0"	±0.0012"	7504813	272.00
.060"	.0005"	1.5"	±0.0012"	7504811	279.80



Centering Indicator



- Graduation: .0005" / 0.01mm
- Provides a simplified method of centering a work piece or fixture on horizontal for vertical machines, internal or external diameters. Face of indicator remains stationary in any desired position while the machine spindle rotates, leaving the operator with both hands free to accurately position the machine table
- Shank Dia.: Ø3/8" / Ø10mm
- Operating speed not to exceed 800rpm
- Range:
Internal: 5/32" - 12" / 4 - 300mm
External: Up to 12" / 300mm
- Comes with long form calibration certificate



Dial Range	Accuracy	Code No.	Price \$
0-.15"	±0002"	7469008	296.90

Dial Bore Gages



- Moveable probe pin with carbide ball
- .4-7" range is with plate guide and fixed anvils
.7-1.5" range is with canister and fixed anvils
Over 1.4" range is with wheel guide and inserting anvils
- Graduation is .0001"
- Comes with long form calibration certificate



.4-.74"
Plate guide



.7-1.4"
Canister guide



Over 1.4"
Wheel guide



Range	Dial Travel	Anvils	Spacers	Sub Anvils	Probe Depth	Code No.	Price \$
.4-7"	.5" (AGD1)	9	1	-	4"	7483121	301.80
.7-1.5"	.05" (AGD2)	10	2	-	6"	7483211	276.30
1.4-2.0"	.05" (AGD2)	6	4	-	6"	7483221	267.80
2.0-6.0"	.05" (AGD2)	11	4	1	6"	7483311	267.80
6.0-10.0"	.05" (AGD2)	6	6	1	10"	7483321	296.60



Articulating Arm Magnetic Bases



- Dial gages can be held by the 3/8" or 8mm diameter stem or by the lug backing plate
- Arm has 3 articulating joints that can be locked with the single hand knob
- The precision surfaces and the bottom V are securely fastened to the ferrous work piece or machine table when the rotary knob is in the on position
- Working angle 150°

Magnetic Power	Base	Height	Code No.	Price \$
30 kg	36x30x35mm	195mm	7602011	78.80
80 kg	60x50x55mm	350mm	7602021	89.90
80 kg	60x50x55mm	440mm	7602031	124.30

Magnetic Bases



- Accepts test indicators with dovetail clamping mechanism
- Dial gages can be held by the 3/8" or 8mm diameter stem or by the lug backing plate
- The rotary knob switches natural magnet on or off
- The precision surfaces and the bottom V are securely fastened to the ferrous work piece or machine table when the rotary knob is in the on position
- #7601021 with Fine Adjustment.

Magnetic Power	Base	Main Stem	Code No.	Price \$
80 kg	60x50x55mm	Ø12mm	7601011	40.30
80 kg	60x50x55mm	Ø12mm	7601021	40.30



Single Beam Digital Height Gages with Hand Wheel

- Resolution: .0005" / 0.01mm
- Large LCD display
- Hand wheel design for fine adjustment
- Metric/Inch conversion at any position
- Zero setting on any position
- Carbide tipped scriber provided
- Manual power On/Off
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-12"/0-300mm	±.0015"/±0.04mm	7626120	664.70
0-24"/0-600mm	±.0020"/±0.05mm	7626240	1,019.40

Digital Height Gages

- Resolution: .0005" / 0.01mm
- Origin memory eliminates the need to zero the reading each time the height gage is turned on
- Can be used with a test indicator and holder for precise measurement
- Inch/Metric conversion
- The fine-adjustment allows the slider to be precisely positioned
- The base is designed with a thermal heat isolation hand grip
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-12"/0-300mm	±.0015"/±0.04mm	7625120	563.00
0-24"/0-600mm	±.0020"/±0.07mm	7625240	850.40

Double Beam Digital Height Gage with Hand Wheel

- Resolution: .001" / 0.01mm
- Designed with hand wheel micro-adjustable rack and pinion for precision positioning
- Can be used with a test indicator and holder for precise measurement
- Zero setting at any position
- Manual power On/Off
- Metric/Inch system conversion
- Large LCD display
- Comes with long form calibration certificate

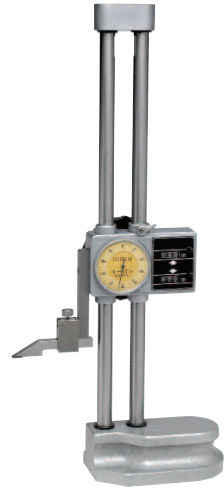


Range	Accuracy	Code No.	Price \$
0-24"/0-600mm	±.0020"/±0.05mm	7627240	1,119.90



Double Beam Digit Counter Height Gage

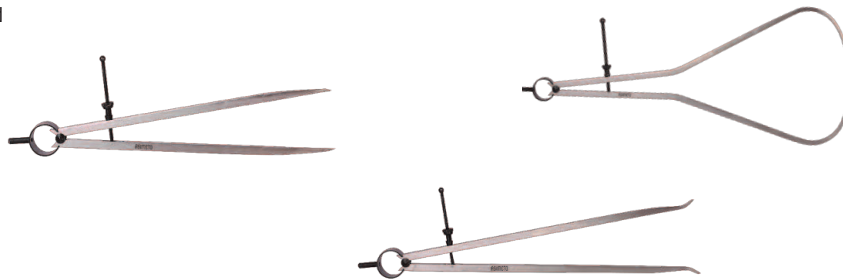
- Dial & digit counter reading
- Hand wheel for easier travel
- Carbide tipped scriber
- The digit counter provides bi-directional positioning and the capability of setting zero at any position
- Dial Graduation: .001"
- Counter Graduation: .1"
- Comes with long form calibration certificate



Range	Accuracy	Code No.	Price \$
0-18"	±.002"	7623181	742.20

Spring Divider & Calipers

- Manufactured from hardened, durable material
- Contact surfaces are rounded



Range	Style	Code No.	Price \$
24"	Spring Divider	7606370	35.10
24"	Outside Spring Caliper	7606372	35.10
24"	Inside Spring Caliper	7606374	35.10



Telescoping Gage Sets

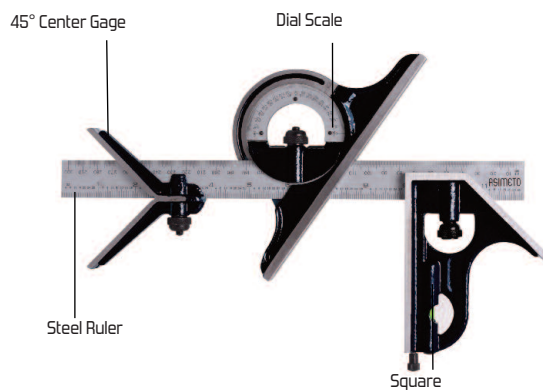
- Spring-loaded plunger expands within the bore (or groove), allowing determination of the internal diameter
- With a knurled clamp



Set	Inch	Metric	Code No.	Price \$
6pcs(A,B,C,D,E,F)	5/16"-6"	8-150mm	7487869	45.00
5pcs(B,C,D,E,F)	1/2"-6"	12.7-150mm	7487859	36.90
4pcs(A,B,C,D)	5/16"-2-1/8"	8-54mm	7487849	28.90

Combination Square Sets

- Graduations:
 - Protractor: 1°
 - Blades: 1mm, 64ths, 32nds, 1/2mm (E/M) 8ths, 16ths, 32nds, 64ths (4R)
- Blades are hardened and tempered for durability
- Micro-fine blade graduations
- Gauge heads are hardened cast finished in baked enamel with exception of the measurement faces



Description	Blade Length	Code No.	Price \$
2 pc Set (E/M ruler, Square)	12"/300mm	7490202	56.30
4 pc Set (With E/M ruler)	12"/300mm	7490204	106.00
4 pc Set (With 4R ruler)	12"/300mm	7490214	106.00



Steel Squares

- Made of precision ground hardened Stainless Steel
- Accuracy according to DIN875



Range	Accuracy	Code No.	Price \$
6"x4"	00	7639240	63.00
8"x5"	00	7639250	81.90

Precision Parallel Set

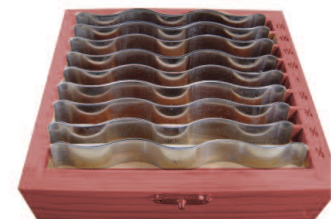
- Hardened and ground high grade alloy steel
- Hardness 52-58 HRC
- 6" Length
- Absolute heights are nominal
- Parallelism: $\pm 0.0002''$
- Paired Accuracy: $\pm 0.0002''$
- Width Accuracy: $\pm 0.0008''$
- Length Accuracy: $\pm 0.0006''$



Description	Thickness	Code No.	Price \$
10 Pair Parallel Set 1/2" - 1-5/8" x 1/8" increments	1/8"	7607100	111.30

Ultra Precision Wavy Parallel Set

- Made of high quality spring steel, hardened, stress relieved, and precision ground
- Parallel within $\pm 0.0002''$, paired $\pm 0.0002''$
- Includes 9 pairs 4-1/4" long with the following heights: 1/2, 5/8, 3/4, 7/8, 1, 1-1/8, 1-1/4, 1-3/8, 1-1/2"
- Shims can be compressed, which proves useful in the holding of thin parts



Description	Code No.	Price \$
Ultra Precision Wavy Parallel Set	7607660	121.30



Thread Pitch Gages

- Each individual gage is stamped with the thread pitch size
- See chart below for different thread forms



Unified Screw Pitch Gages (60°)

Range	No. of Leaves	Composition of Leaves	Code No.	Price \$
4-42 TPI	30	4, 4-1/2, 5, 5-1/2, 6, 7, 8, 9, 10, 11, 11-1/2, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42 TPI	7605502	15.70
4-84 TPI	51	4, 4-1/2, 5, 5-1/2, 6, 7, 8, 9, 10, 11, 11-1/2, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30 - 84 by 2, TPI	7605512	20.40

Metric and Unified Screw Pitch Gages (60°)

Range	No. of Leaves	Composition of Leaves	Code No.	Price \$
0.4-7mm	51	0.4, 0.5, 0.7, 0.75, 0.8, 0.9, 1, 1.25, 1.5, 1.75, 2-7mm by 0.5mm	7605508	18.50
4-42 TPI		Same sizes as 7605502		
0.5-6mm	28	0.5, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6mm	7605518	15.70
4-32 TPI		4, 6, 7, 8, 10, 11, 11-1/2, 12, 13, 16, 20, 28, 32 TPI		

Radius Gages

- Size is permanently marked on each gage leaf
- Gage profiles have both convex and concave radii



Range	Qty	Note	Code No.	Price \$
1/32-17/64"x64ths	16 pairs	90° arc	7605401	26.20
1/32-1/4"x64ths	15 pairs	180° arc	7605411	24.90
17/64-1/2"x64ths	16 pairs	180° arc	7605421	26.70
1/64-1/2"x64ths	25 pairs	-	7605441	62.20

Thickness Gage

- Each leaf is marked with its thickness
- Each leaf is detachable if necessary
- Blade length: 3"
- Blade width: 1/2", straight

Composition:

- .002" - .018" x .001" step
- .022" - .026", .028", .030", .032", .035"



Range	No. of Leaves	Code No.	Price \$
.002" - .035"	26 leaves	7605301*	22.50

* Available only while quantities last



American Standard & Wire Gages

- Made of heavy gauge hardened steel 62 HRC
- Satin chrome finish, no glare
- Gaging slots meet Federal Specifications
- Front face shows gage size, back shows decimal equivalents adjacent to each slot



Description	Code No.	Price \$
American Standard and B&S Gage for measuring wire diameter and non-ferrous sheets with copper, aluminum and wrought iron.	7607600*	35.90
U.S. Standard Gage for measuring steel, plate iron and uncoated sheet metal.	7607610*	35.90

• Available only while quantities last

Depth and Angle Gage

- Hardened steel head with 2-1/2" base
- Angles: 30°, 45°, 60° both sides
- Stainless steel blade: 6" x 7/32" with 32nds and 64ths graduations
- Rod: Non-graduated, for holes under 3/32" diameter



Range	Code No.	Price \$
Head With Blade and Rod	7607581*	15.40

• Available only while quantities last



Wiggler Set

- Versatile Center & Edge Finder with 4 interchangeable attachments which snap conveniently into the special chuck
- Ball swivel joint permits adjustments to an angular position or true concentricity
- Set includes offset indicator holder, ball contact attachment- 0.250" dia., disc contact attachment- 0.100" dia. and needle point attachment



Description	Code No.	Price \$
Includes 1 each of the following:	7607290	31.60
• Chuck		
• Needle Point Length Closed 2-3/8", Open: 4-1/8"		
• Ball Contact Shank Dia: 3/8", Ball Dia: 0.250"		
• Disc Contact 0.100" Dia		
• Offset Indicator Holder		

Digital Protractors - Level Type

- This protractor provides an immediate digital reading of any angle in a full circle with 0°-90°-0°-90°-0° readings
- ABS/ZERO button allows two measuring modes, Standard and Alternate Reference
- Four 90° quadrants for display purposes
- HOLD button for freezing a reading in an unreadable position
- V-grooves on top and bottom for use on curved surfaces
- Item #7490162 comes with magnetic bottom
- Accuracy: ±0.01"



Range	Resolution	Size	Code No.	Price \$
360°	0.1"	152x63.8x60mm	7490160	152.00
360°	0.1"	152x63.8x60mm	7490162	161.50



Rectangular Gage Block Set

- Individual serial numbers on each block, regardless of grade
- A complete certificate of calibration traceable to the N.I.S.T. or P.T.B. showing the deviation of each block
- Mirror polished surfaces provide superior wringing characteristics
- 81 (ASME) blocks per set

Blocks Included In Set

- 1 Block: 0.050"
- 10 Blocks: 0.1000"-0.1009" x 0.0001" step
- 49 Blocks: 0.101"-0.149" x 0.001" step
- 17 Blocks: 0.150"-0.950" x 0.0050" step
- 4 Blocks: 1.000"-4.000" x 1.000" step



Blocks	Grade	Code No.	Price \$
81	AS-2 (B)	7650012	402.80

Individual Rectangular Steel Gage Blocks

- ASME / DIN / JIS / GB Standard
- ASME Grade 0 is also available for Ceramic individuals



Size	Grade 0 Code No.	Price \$
0.05"	7651010	19.70
0.1"	7651150	19.70
1"	7651970	23.20

Surface Roughness Standards Set



- Used for the visual comparison of surface roughness
- Set of 30 specimens, 7/8" x 3/8" electro-formed, solid nickel

Code No.	Price \$
7506010	226.70



Pin Gage Sets

- For quick and accurate measurements. Measure hole size, slots widths, calculate distances between holes, use as Go/NoGo gauging, etc.
- Furnished in attractive molded plastic case
- Class ZZ guaranteed to 0.0002"/0.005mm tolerance limit
- Inspected with equipment which has been calibrated and is traceable to NIST
- Marked with size and direction of tolerance on gauges over 0.060"/1.5mm
- Hardened drill rod RC 60-62, 2inches long
- 10 micron finish or better
- Black oxide coating prevents corrosion and shows gauge wear
- Certificate of Accuracy included



Qty in Set	Range	Accuracy	Code No.	Price \$
84	0.833"-0.916"x0.001 step	+0.0002" -0"	7697150	533.50
84	0.833"-0.916"x0.001 step	-0.0002" +0"	7697152	533.50

12" Optical Comparator

- With 2 dial gauges (1" for vertical and 2" table travel)
- Large 12" x 3" t-slot stage with 6" horizontal and 2-1/2" vertical travel
- 12" diameter protractor screen
- Rotatable screen with fine adjustment
- Vernier resolution of 5 minutes
- Overlay clips
- Selectable high and low intensity profile illumination switch
- Digital indicator and V-Blocks are not included



Model	Description	Code No.	Price \$
Type 1	Lens 10X	7641090	2,961.40



Vertical Profile Projector

- Designed to provide excellent quality images with accurate magnification
- The error of the contour measuring is under 0.08% deviation
- Convenient foot switch transfers the coordinate data to the data processing system
- Provides the data processing system and foot-switch which are convenient to output and gather the data.
- Data Processing System:
DC-300 multi-function data processing system: Coordinate skew, mm/inch conversion, ABS/INC conversion, Zero setting, calculation, 0°, 90°, 270°, 360° conversion, linear compensation



Standard Accessories

- Lens 1 pc
- Spring Fixture of screen 4 pcs
- 2m Power Cable 1 pc
- Instruction manual 1 pc
- Certification 1 pc
- 4A/5 x 20 Fuse 5 pcs
- 24V 150W Halogen bulb 2 pcs

Description	Code No.	Price \$
Vertical Profile Projector	7641010	16,028.40

Imaging Direction	Direct			
Working Table	Stage Size (mm)	340 x 152		
	Glass Table Size (mm)	196 x 96		
	X-Axis Travel (mm)	150		
	Y-Axis Travel (mm)	50		
	Z-Axis Travel (mm)	90 (for focusing)		
	Measuring Accuracy	4.0+L/25 μm L: Measuring Length (mm)		
Projector Screen	Resolution (X/Y-axis)	0.001mm (1 μm) or 0.0005mm (0.5μm)		
	Dimension	12" (ø312mm), usable range > ø300mm		
	Rotary Range	0° - 360°		
Objective Lens	Angle Resolution	1' or 0.01°		
	Magnification	10X (Standard)	20X (Option)	50X(Option)
	Object View (mm)	ø30	ø15	ø6
Illumination	Working Distance (mm)	77.7	44.3	38.4
	Transmission and reflection light source:	24V/150W - halogen lamp		
Power	110V/220V(AC), 50/60Hz, 400W total Power			
Light Source Cooling	Forced air cooling			
Instrument, dimension (mm)	770 X 550 X 1100			
Weight (kgs)	130			



Impact Hardness Tester

- Large screen (128×64 dot matrix LCD), allows for clear display of all functions and parameters
- Hardness test can be taken at any angle including inverted
- A wide measuring range supports the hardness of all metallic materials. Hardness results are directly displayed in HRB, HRC, HV, HB, HS, HL hardness scales
- Diameter of carbide ball: 3mm
- Large capacity memory storage of 500 sub groups. Stored information including single measured value, mean value, test data, impact direction, impact times, material, and hardness scale are available
- Five languages are supported: English, French, German, Italian, and Spanish
- Upper and lower limit can be preset. An audio alarm will automatically sound when the reading is outside of the preset limits
- Battery voltage information is displayed including the charge status.
- Calibration
- USB1.1 port allows for information to be uploaded directly to a PC.
- High speed thermal printer allows for the readings to be immediately printed.
- 6V Ni-MH rechargeable battery is supplied. The batteries can be charged with the integrated charger. Up to 150 hours of continuous operation battery life between charges. (eL off and no printing)
- Automatic power off after five minutes
- For testing a normal, smooth, flat surface



Standard Accessories

- Impact device 1 pc
- Hardness test block 1 pc
- Small support ring 1 pc
- Cleaning brush 1 pc
- Battery Charger 1 pc
- Paper for printing 1 pc
- Manual 1 pc
- DataPro software 1 pc
- Communication cable 1 pc

- **Range:** HLD (170-196)
HRC (17-68.5)
HB (19-651)
- **Accuracy:** HLD ±5
HRC ±1
HB ±4
- **Impact Device:** (D)
- **Impact Capacity:** 11 Nmm

Code No.	Price \$
7640171	3,150.70

Microscope XC-100L

- Sharp stereo erect image over a wide field of view. It is suitable for spot examination of machinery industry, paper making, print, and textile, etc. The product features small size, light weight, nice design, and easy operation
- Eyepiece: WF10X, Graduation 0.025mm
- Pen illumination
- Field of view: 1.6mm
- Working distance: 7mm

Standard Accessories:

- Eyepiece, Lamp, Instruction Manual



Graduation	Magnification	Objective	Code No.	Price \$
0.01mm	100X	10X	7642010	202.60



Ultimate Asimeto Metrology Kit

Kit contains:

- 6" x .001" Aluminum Diecast Dial Caliper (7304065)
- 6" x .0005" Absolute Digital Caliper (7307563)
- 0-1" x .001" Outside Micrometer (7101011)
- 0-1" IP65 Digital Micrometer (7105015)
- 1/2" x .001" 0-100 AGD2 Dial Indicator (7402121)
- 1/2" x .0005" Digital Indicator (7405951)
- .03" x .005" 0-15-0 Dial Test Indicator (7501733)
- Articulating Arm Magnetic Base (7602021)



Code No.
7285086

Price \$
1,074.60

Asimeto 5pc Precision Tool Kit

Kit contains:

- 6" x .0005" Sylvac Digital Caliper (7301060)
- .03" x .0005" Dial Test Indicator (7501733)
- 1" x .001" AGD2 Dial Indicator (7402261)
- 0-1" x .0001" Outside Micrometer (7101013)
- Articulating Arm Magnetic Base (7602021)

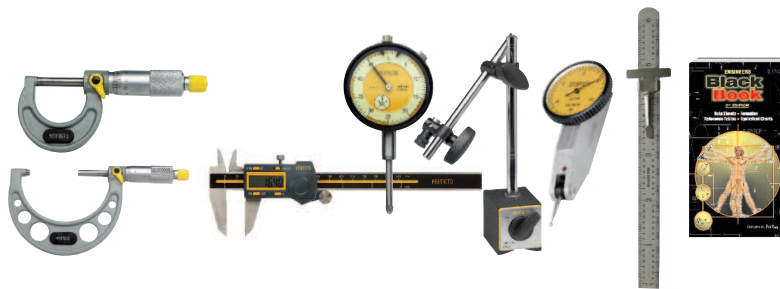


Code No.
7960161

Price \$
608.10

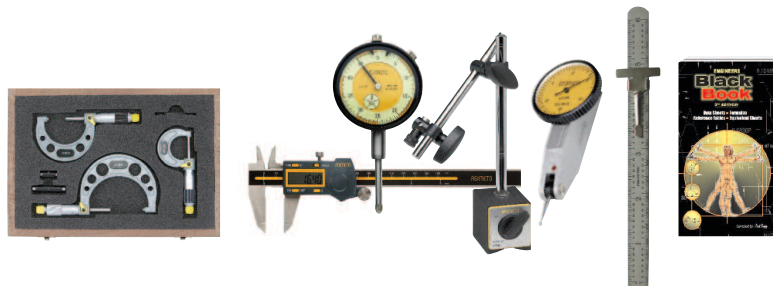


Asimeto Precision Tool Kit #1



Description	Code No.	Price \$
Includes 1 each of the following:	500-122	502.20
• 7101013 (0-1" micrometer .0001")		
• 7101023 (1-2" micrometer .0001")		
• 7307065 (6" digital caliper)		
• 7402261 (0-1" dial indicator .001")		
• 7601011 (magnetic base)		
• 7501733 (.0005" x .030" dial test indicator)		
• 7606009 (6" pocket rule)		
• 180-155 (Engineers Black Book)(Imperial)		

Asimeto Precision Tool Kit #2



Description	Code No.	Price \$
Includes 1 each of the following:	500-128	578.80
• 7101637 (0-3" .0001" outside micrometer set)		
• 7307065 (6" digital caliper)		
• 7402261 (0-1" dial indicator .001")		
• 7601011 (magnetic base)		
• 7501733 (.0005" x .030" dial test indicator)		
• 896-919 (6" pocket rule with Sowa logo)		
• 180-155 (Engineers Black Book)(Imperial)		



Asimeto Precision Tool Kit #3



Description	Code No.	Price \$
Includes 1 each of the following:	500-138	650.70
• 7101647 (0-4" .0001" micrometer set)		
• 7307065 (6" digital caliper)		
• 7402261 (0-1" dial indicator .001")		
• 7601011 (magnetic base)		
• 7501733 (.0005" x .03" horizontal dial test indicator)		
• 896-919 (6" pocket rule with Sowa logo)		
• 180-155 (Engineers Black Book)(Imperial)		

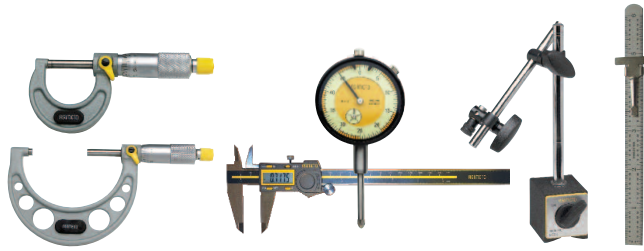
Asimeto Precision Tool Kit #4



Description	Code No.	Price \$
Includes 1 each of the following:	500-152	872.60
• 7101667 (0-6" .0001" micrometer set)		
• 7307065 (6" digital caliper)		
• 7402261 (0-1" dial indicator .001")		
• 7601011 (magnetic base)		
• 7501783 (.0001" x .008" dial test indicator)		
• 606-180 (6" pocket rule)		
• 180-155 (Engineers Black Book)(Imperial)		

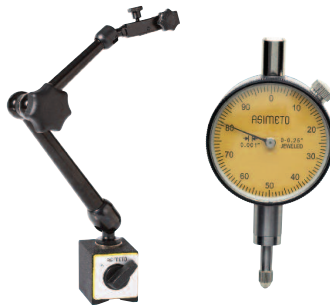


Asimeto Precision Tool Kit #5



Description	Code No.	Price \$
Includes 1 each of the following:	500-155	368.20
• 7101013 (0-1" micrometer .0001")		
• 7101023 (1-2" micrometer .0001")		
• 7307085 (8"/200mm digital caliper)		
• 7402261 (0-1" dial indicator .001")		
• 7601011 (magnetic base)		
• 606-180 (6" pocket rule)		

Asimeto Indicator/Mag Base Kit #1



Description	Code No.	Price \$
Includes 1 each of the following:	500-216	183.40
• 7602021 (Type II triple jointed magnetic base)		
• 7401061 (0-.25" .001" AGD1 dial indicator)		

Asimeto Indicator/Mag Base Kit #2



Description	Code No.	Price \$
Includes 1 each of the following:	500-730	196.60
• 7602031 (Type III triple jointed magnetic base)		
• 7402261 (0-1" .001" AGD2 dial indicator)		



Double Caliper Kit #1

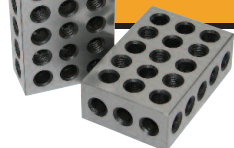


Description	Code No.	Price \$
Includes 1 each of the following:	500-246A	213.90
• 7307085 (8"/200mm digital caliper)		
• 7307065 (6"/150mm digital caliper)		

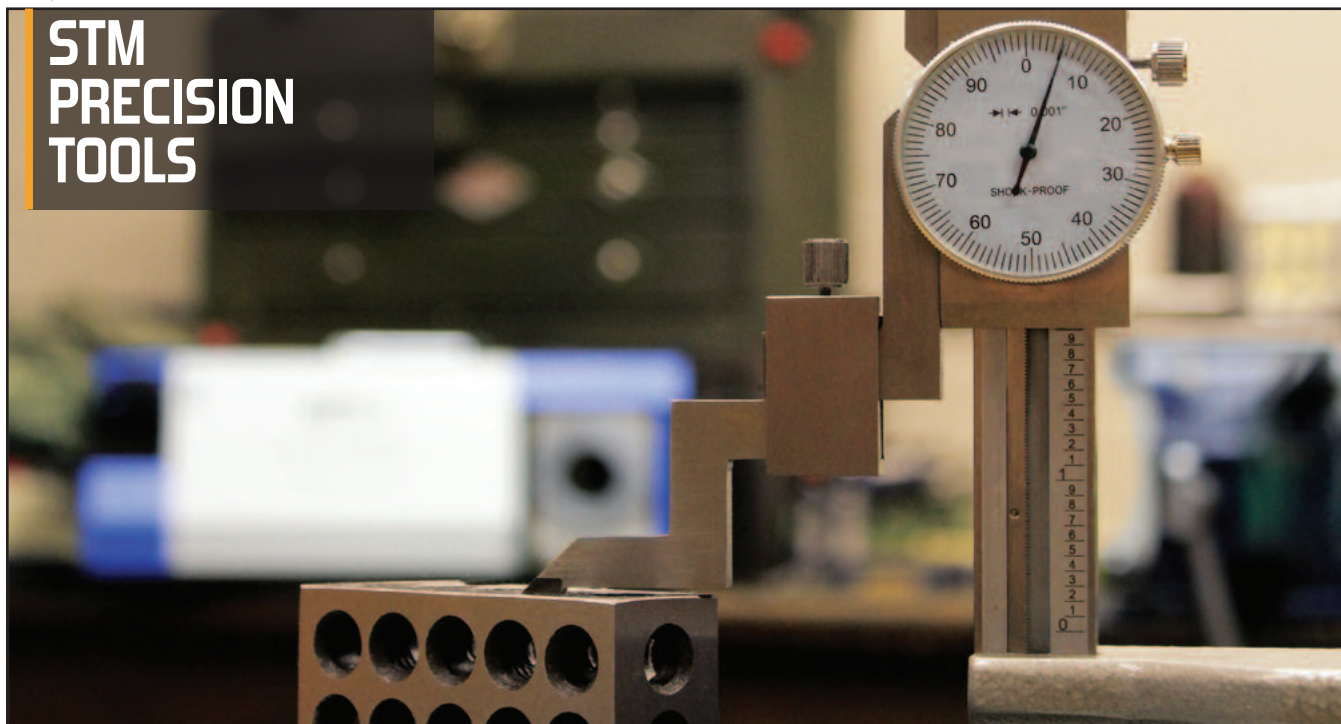
Double Caliper Kit #2



Description	Code No.	Price \$
Includes 1 each of the following:	500-246	202.50
• 7307085 (8"/200mm digital caliper)		
• 7303061 (6" dial caliper, Graduation: .001")		



STM PRECISION TOOLS



Outside Micrometers

- Deluxe heat insulated forged steel frame up to 4"
- Chrome clad
- Complete with standards (2" and up)
- Carbide faces
- Ratchet stop for exact and repetitive reading
- Fitted case



Range (in x mm)	Graduation (in x mm)	Code No.	Price \$
Inch			
0-1	.0001	200-570	25.70
1-2	.0001	200-572	28.10
2-3	.0001	200-574	31.10
3-4	.0001	200-576	34.10
4-5	.0001	200-577	39.60
5-6	.0001	200-579	46.40
6-7	.0001	200-082	54.30
7-8	.0001	200-084	61.00
8-9	.0001	200-086	67.10
9-10	.0001	200-088	73.80
10-11	.0001	200-090	79.90
11-12	.0001	200-092	86.60
Metric			
0-25	.01mm	201-002	25.70
25-50	.01mm	201-004	28.10
50-75	.01mm	201-006	31.10
75-100	.01mm	201-008	34.10
100-125	.01mm	201-010	39.60
125-150	.01mm	201-012	46.40
150-175	.01mm	201-013	64.60
175-200	.01mm	201-014	74.40
200-225	.01mm	201-015	50.30
250-275	.01mm	201-017	59.90

• Available only while supplies last

Outside Micrometer Sets

- Ratchet and lock nut
- Complete with standards (2" and up)
- Carbide faces
- Fitted wood case



Range (in x mm)	Graduation (in x mm)	Code No.	Price \$
Inch			
0-3	.0001	200-578	84.80
0-4	.0001	200-094	118.90
0-6	.0001	200-580	204.80
6-12	.0001	200-096	422.40
0-12	.0001	200-098	640.50
Metric			
0-75mm	.01mm	201-020	84.80
0-150mm	.01mm	201-022	204.80

Micrometer Stand



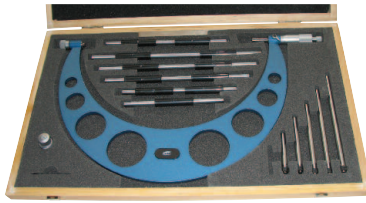
Code No.: 200-500

Price \$: 22.40



Interchangeable Anvil Outside Micrometers

- Blue enamel finish
- Perforated frame
- Carbide tipped spindle and anvils
- Ratchet stop and lock nut
- Setting standards included
- Complete with fitted case



Range (in x mm)	Graduation (in x mm)	Code No.	Price \$
Inch			
0-4	.001	200-025	159.80
0-6	.001	200-030	203.40
6-12	.001	200-035	256.00
12-16	.001	200-040	340.10
16-20	.001	200-045	304.80
Metric			
0-150 mm	.01 mm	200-050	203.40
150-300 mm	.01 mm	200-055	256.00
300-400 mm	.01 mm	200-060	340.10
400-500 mm	.01 mm	200-065	385.00

Spline Micrometers

- Ratchet stop and lock nut
- .0001"/.01mm graduation
- Complete with fitted case



Range (in x mm)	Code No.	Price \$
2-3	200-350	87.40
3-4	200-355	97.80
5-6	200-365	122.40
0-25 mm	200-370	75.10

Blade Micrometers

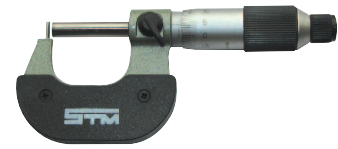
- Non-rotating spindle
- Positive locking clip
- Insulated frame
- Friction thimble
- Speeder on thimble
- Fitted case



Range (in x mm)	Graduation (in x mm)	Blade Thickness (in x mm)	Code No.	Price \$
Inch				
0-1	.0001	.030	200-225	190.70
1-2	.0001	.030	200-230	215.30
2-3	.0001	.030	200-235	239.90
3-4	.0001	.030	200-240	276.70
Metric				
25-50 mm	.01 mm	.75 mm	200-250	215.30
50-75 mm	.01 mm	.75 mm	200-255	239.90
75-100 mm	.01 mm	.75 mm	200-260	276.70

Tube Micrometers

- Ratchet stop
- Fitted case



Range (in x mm)	Anvil diameter (in x mm)	Graduation (in x mm)	Code No.	Price \$
0-1	0.19"	.0001	200-320	46.80
0-25 mm	18 mm	.01 mm	200-330	46.80
0-25 mm	48 mm	.01 mm	200-335	46.80

• Available only while supplies last

Point Micrometers

- Satin chrome finish on thimble
- Ratchet stop and lock nut
- Carbide tipped spindle and nut
- Complete with fitted case



Range (in.)	Graduation (in.)	Code No.	Price \$
0-1	.0001	200-380	75.10
1-2	.0001	200-385	81.20

Disc Micrometers

- Satin chrome finish on thimble and spindle
- Ratchet and lock nut
- Standards included
- Complete with fitted case



Range (in.)	Graduation (in.)	Disc Dia. (in.)	Code No.	Price \$
Inch				
0-1	.001	.787	200-160	164.30
1-2	.001	.787	200-165	177.20
2-3	.001	.787	200-170	190.00
3-4	.001	.787	200-175	202.80
4-5	.001	.787	200-180	217.50
Metric (mm)				
25-50 mm	.01 mm	20 mm	200-195	177.20

• Available only while supplies last

Ball Micrometers

- Ball anvil and flat spindle
- Insulated frame
- Ratchet stop and lock nut
- Fitted case



Range (in x mm)	Graduation (in x mm)	Code No.	Price \$
0-1	.0001	200-150	36.90
0-25 mm	.01mm	200-155	36.90



Screw Thread Micrometers

- For 60° thread
- .001" graduations
- Includes six anvils 64-48, 44-28, 24-14, 13-9, 8-5, 4.5-3.5



Range (in.)	Code No.	Price \$
0-1	200-410	217.40
1-2	200-415	227.80
2-3	200-420	246.30
3-4	200-425	257.40
4-5	200-430	278.30
5-6	200-435	298.50
Replacement Anvil Set	200-412	116.60

Pocket Thickness Gages

- Designed for carrying convenience
- Quick inspection of paper, leather, wire, plastic, sheet metal and similar materials
- Easy zero point adjustment bezel



Range (in./mm)	Graduation (in./mm)	Code No.	Price \$
0-0.5	.0005	200-860	58.20
0-10 mm	.01 mm	200-865	58.20

Dial Thickness Gage

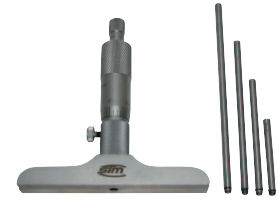
- This gage offers a quick and efficient means of inspection with the grip handle, thumb trigger and spring-loaded spindle



Range (mm)	Grad. (mm)	Capacity (mm)	Throat Depth (mm)	Anvil Dia. (mm)	Code No.	Price \$
0-10	.01	21.3	26	10.0	200-920	73.40

Depth Micrometers

- Base surface hardened and ground
- Satin chrome finish
- .001" graduations
- Complete with fitted case



Range (in./mm)	Graduation (in./mm)	Base (in./mm)	Code No.	Price \$
Inch				
0-4	.001	2-1/2	200-550	89.30
0-4	.001	4	200-552	89.30
0-6	.001	2-1/2	200-557	114.90
0-6	.001	4	200-555	114.90
Metric				
0-100 mm	.01 mm	64 mm	200-440	138.00
0-100 mm	.01 mm	100 mm	200-445	138.00
0-150 mm	.01 mm	64 mm	200-450*	165.50

* Available only while quantities last

Inside Micrometers

- Satin chrome finish
- With ratchet stop
- Complete with fitted case



Range (in./mm)	Graduation (in./mm)	Code No.	Price \$
Inch			
.2-1.2	.001	200-460	76.40
1-2	.001	200-465	82.80
Metric			
5-30 mm	.01 mm	200-470	76.40
25-50 mm	.01 mm	200-475	82.80

Surface Gages

- Base and scriber hardened
- Bottom grooved for cylindrical work
- Front recessed for depressing spindle below base level
- Has fine adjustment
- Base has 2 retractable gauge pins to set against edge of a surface plate



Description.	Code No.	Price \$
4" and 7" spindles (1 of each)	200-840	30.20
9" and 12" spindles (1 of each)	200-845	31.60
12" and 18" spindles (1 of each)	200-850	33.70



Coolant Proof Digital Calipers

Features:

- Coolant resistant
- Inside, outside, step and depth measurements
- Inch/Metric conversion
- Auto on, auto shutoff
- .0005"/.01mm resolution
- Zero button



Range (in x mm)	Resolution (in x mm)	Code No.	Price \$
0-6 x 150	.0005 x 0.01	200-945	172.20
0-8 X 200	.0005 x 0.01	200-950	242.40

Dial Calipers

Features:

- Covered rack
- Accurate to .001 per 6"
- Made of Stainless Steel
- Clamp for repetitive setting
- Deluxe case
- .100" Revolution



	Range (in.)	Graduation (in.)	Code No.	Price \$
Inch	0-4	.001	200-562	36.10
	0-6	.001	200-582	35.00
	0-8	.001	200-584	61.40
	0-12	.001	200-586	82.10
Metric (mm)		(mm)		
	150	.02	200-583	35.00
	200	.02	200-585	57.30
	300	.02	200-587	71.10

Digital Calipers

Features:

- Inside, outside, step and depth measurements
- Inch/Metric conversion
- Auto on, auto shutoff
- .0005"/.01mm resolution
- Zero button



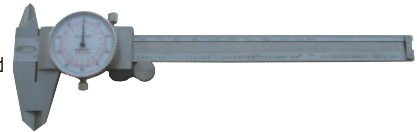
Range (in x mm)	Resolution (in x mm)	Code No.	Price \$
0-4 x 100	.0005 x 0.01	200-642	52.10
0-6 x 150	.0005 x 0.01	200-645	42.20
0-8 X 200	.0005 x 0.01	200-646	76.80
0-12 x 300	.0005 x 0.01	200-647	119.00
0-24 x 600	.0005 x 0.01	200-648**	400.90
0-40 x 1000	.0005 x 0.01	200-649**	601.40
0-6 x 150*	.0005 x 0.01	200-545	61.90

*Wooden Case

**no depth gauge

Dial Caliper - Inch/Metric Combination

- 6"/150mm
- Dial graduated in both inch (black dial) and metric (red dial)
- Outside dial-Inch
Inside dial-Metric
- Separate hands for inch and metric measurements
- Made of hardened stainless steel
- Complete with fitted case



Range	Dial Reading Grad.	Dial Reading Range/Rev.	Code No.	Price \$
6" / 150mm	.001" / .02mm	.100" / 2mm	200-900	67.70

Large Display Digital Calipers

Features:

- Large face for easy reading
- Inside, outside, step and depth measurements
- Inch/Metric conversion
- Auto on, auto shutoff
- .0005"/.01mm resolution
- Zero button



Range (in x mm)	Resolution (in x mm)	Code No.	Price \$
0-6 x 150	.0005 x 0.01	200-540	42.20
0-8 X 200	.0005 x 0.01	200-541	76.80
0-12 x 300	.0005 x 0.01	200-542	119.00

Heavy Duty Extra Long Vernier Calipers

- Satin chrome finish
- Adjustable vernier plates
- Longer jaws permit greater accessibility
- Accuracy meets U.S. Federal specifications
- Easy to read clear crisp black engraved graduations
- Made of hardened stainless steel throughout, ground and lapped for accuracy



Range (in x mm)	Graduation (in x mm)	Jaw Depth (in.)	Code No.	Price \$
0-12 x 300	1/1000 x 1/50	3	200-588	87.90
0-18 x 450	1/1000 x 1/50	3-1/2	200-590	140.70
0-24 x 600	1/1000 x 1/50	4	200-592	175.80
0-40 x 1000	1/1000 x 1/50	5-1/2	200-594	421.90
0-60 x 1500	1/1000 x 1/50	6-1/2	200-596	797.20
0-80 x 2000	1/1000 x 1/50	7-3/4	200-598	1,546.80



Vernier Calipers

- With thumb lock
- Satin chrome finish
- Made of fully hardened stainless steel throughout
- Has a depth scale which can be read directly on verniers
- Jaws designed for outside, inside, and step measurement
- Micro-fine black graduation on a satin chrome finish for easy reading
- All measuring surfaces are ground and lapped for extreme accuracy

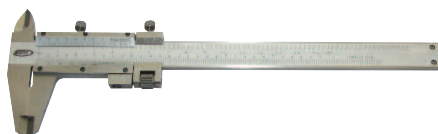


Range (in x mm)	Graduation (in x mm)	Code No.	Price \$
0-6 x 150	1/1000 x 1/20	200-210	34.40
0-8 x 200	1/1000 x 1/20	200-215	40.70

Vernier Calipers With Fine Adjustment

Precision Stainless Steel Vernier Calipers

- Satin chrome finish
- Extra long vernier to insure accuracy
- Made of fully hardened stainless steel throughout
- Jaws designed for outside, inside, and thread measurement
- All measurements can be read directly from vernier scale 1/1000" x 1/20 mm
- Raised sliding surfaces prevent defacement and wear of graduations: clear black engravings



Range (in x mm)	Graduation (in x mm)	Code No.	Price \$
0-6 x 150	1/1000 x 1/20	200-600	28.80
0-8 x 200	1/1000 x 1/20	200-605	35.80
0-12 x 300	1/1000 x 1/20	200-610	64.60

Dial Bore Gage Sets

Furnished with interchangeable anvils and necessary accessories to perform close tolerance I.D. measurements. The smallest range measurement is .24", the largest is 16".

The AGD Series 2 Dial Indicator furnished in each kit is a rugged top-quality unit.

- .0005" graduations
- Complete with fitted case



Range (in.)	Bore Depth (in.)	No. Anvils	Code No.	Price \$
0.24-0.4	1.56	9	200-650	156.30
0.4-0.7	2.4	9	200-651	149.90
0.7-1.4	4	8	200-652	118.00
1.4-2.0	6	6	200-653	114.80
2.0-6.0	6	11	200-654	118.00
6.4-10.0	16	6	200-655	156.30
10.0-16.0	16	6	200-656	169.00

Digital Scale Units



Range (in.)	Accuracy (in.)	Code No.	Price \$
0-150 mm/0-6	0-150 ±0.03	201-050	72.50
0-200 mm/0-8	0-200 ±0.03	201-055	92.40
0-300 mm/0-12	200-300 ±0.04	201-056	142.50

Coolant Proof Dial Indicator

- Water Resistant
- Reverse counter
- Stainless steel components
- Rotating bezel with clamp
- Lugback (1/4" hole)
- Interchangeable point
- Conforms to AGD 2 standards



Travel Range (in.)	Dial Reading (in.)	Grad. (in.)	Dial Colour	Code No.	Price \$
0-.4	0-50	.0005	White	200-075	57.20

AGD2 Dial Indicators

- Reverse counter
- Stainless steel components
- Rotating bezel with clamp
- Lugback (1/4" hole)
- Interchangeable point
- Conforms to AGD 2 standards



Travel Range (in.)	Dial Reading (in.)	Grad. (in.)	Dial Colour	Code No.	Price \$
1/4	0-100	.001	White	200-745	26.40
1/2	0-100	.001	White	200-718	26.40
1	0-100	.001	White	200-720	26.40
1	0-50	.0005	White	200-755	30.40
2	0-100	.001	White	200-725	59.90
1	0-100	.001	White	200-010*	31.70

Magnetic Back

For AGD2 series **200-722 16.00**

Bezel & Crystal Assembly

For 200-720 **200-721 5.20**

* Teclock Style

AGD2 Dial Indicators - Teclock

- Reverse counter
- Stainless steel components
- Rotating bezel with clamp
- Lugback (1/4" hole)
- Interchangeable point
- Conforms to AGD 2 standards

TECLOCK



A1-921

Model No.	Grad. (in.)	Range (in.)	Dial Reading	Dial Dia. (in.)	Stem Dia. (in.)	Code No.	Price \$
A1-911-Teclock Style	.001	.50	0-100	2-11/64	3/8	215-005	47.20
A1-921-Teclock	.001	1.00	0-100	2-11/64	3/8	215-010*	59.30

* Available only while quantities last



Test Indicators and Sets

- White face
- Available in bezel or dial
- Contact point adjustable through 230°
- Fully jeweled movement
- Extremely light contact pressure
- Clear, easy to read face
- Dovetails on top and back for all-around positioning
- Sets include 5/32" and 3/8" mounting shanks and 3/8" bar



Dial Dia. (in.)	Grad. (in.)	Range (in.)	Reading (in.)	Point Length (in.)	Code No.	Price \$
1.250	.0005	.030	0-15-0	.700	200-730	65.80
1.250	.0001	.008	0-4-0	.650	200-800	97.00
Inch Sets						
1.250	.0005	.030	0-15-0	.700	200-805	109.50
1.250	.0001	.008	0-4-0	.650	200-810	147.00

STM Magnetic Bases



	Standard Model BA-1 Code No.	Price \$	Fine Adj. Model BA-1F Code No.	Price \$	Flex Stem Model BA-1X Code No.	Price \$
Made In Taiwan	225-001	57.40	225-002	68.00	225-003	84.60
Made In China	225-705	27.20	225-700	28.00	-	-

Dial Test Indicator Holder

- Adapts immediately for fast and positive indicating
- Suitable for all popular indicators with 5/32" shank or dovetail
- Reach from 0-12" diameter
- 1-7/8" capacity



Description	Code No.	Price \$
Dial test indicator holder	200-815	24.00

Universal Magnetic Indicator Holder

- Two universal ball sockets permit adjustment to any angle or position
- Fine adjustment
- Dovetail clamp for test indicators
- 1/4" hole for 1/4" stem indicators



Description.	Code No.	Price \$
Universal magnetic indicator holder	200-825	22.00

Half Round Combination Holder

- Two-point adjustment
- 1/4" shank
- For dovetail and 5/32" stem indicators



Description	Code No.	Price \$
Half round combination holder	200-816	16.80

Select-A-Point Kit

The most useful accessory kit for all dial indicators - a complete set of 22 different points, increasing the versatility of your indicators.

- Fits all AGD 1, 2, 3, 4 drop style indicators, 4-48 threads



Description	Code No.	Price \$
Select-A-Point Kit	200-820	11.30

Single Action Dial Gage Holder

Articulated arm style magnetic base positions and locks easily; includes ON/OFF switch and central locking knob. One knob mechanically tightens both arms. Dial gage holder includes fine adjustment and full 360° swivel.



Description.	Code No.	Price \$
Dial gage holder	200-875	63.90



Twin Column Digital Height Gages

- Rigid twin column structure
- 6 digit LCD display and minus sign
- Functions include: Zero setting, inch/mm conversion, data hold, plus/minus processing
- Large size feed wheel
- Lock-on measuring slider
- Battery furnished
- Carbide tipped scriber
- Resolution .001"/0.01mm



Range (in x mm)	Accuracy	Code No.	Price \$
12/300 mm	±0.04mm	200-675	555.50
18/450 mm	±0.05mm	200-680	800.20
24/600 mm	±0.05mm	200-690	1,005.00
Replacement Battery		200-644	4.90

Twin Column Height Gages

- 0.01" dual reading digit counter
- Double digit counter can be zero-set at any height within range by depressing zero reset button
- Chrome plated double beams
- Carbide tipped scriber
- With fine adjusting wheel and lock



Range (in.)	Graduation (in.)	Code No.	Price \$
12	0.0005	200-707	264.50
18	0.0005	200-708	456.30
20	0.0005	200-709	462.90
24	0.0005	200-711	515.80

Dial Height Gages

- With fine adjustment and lock
- .001" graduations
- Has a carbide tipped scriber
- Made of Stainless Steel
- Shock proof
- Right hand type for easy use
- Complete with case



Range (in.)	Face	Code No.	Price \$
0-6	Black	200-660	127.00
0-8	Black	200-665	138.90
0-12	White	200-670	178.70

Precision Vernier Height Gages

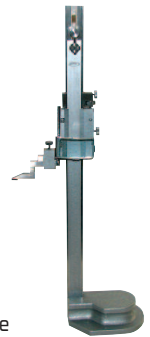
Chrome finished vernier height gages with cam-lock scriber mounting and magnifying glass.

Includes:

- Straight steel scriber
- Square holding bar
- Offset steel scriber
- Magnifying glass
- Fitted case

Special Features:

- Has adjusting for fine adjustment
- Column and base are extra heavy to insure stability
- Base and all measuring surfaces are hardened ground and micro lapped for accuracy
- Micro-fine black graduation on a satin chrome finish for easy reading and each 0.1" is numbered
- At zero setting, scriber point is flush with bottom base surface (no compensation calculation needed.)
- Moveable parts are fitted to extreme limits, eliminating all play
- Beam and measuring slide of stainless steel



Range (in./mm)	Graduation (in./mm)	Code No.	Price \$
0-12 x 0-300	1/1000 x 1/50	200-700	368.90
0-18 x 0-450	1/1000 x 1/50	200-702	315.80



Screw Pitch Gages

- With locking devices

U.S. set has the following pitches:

- 3-1/2, 4, 4-1/2, 5, 5-1/2, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 36, 40, 44, 48, 50, 56, 60, 64, 72, 80 and 84

Metric set has the following pitches:

- .25, .30, .35, .40, .45, .50, .55, .60, .65, .70, .75, .80, .85, .90, 1, 1.10, 1.20, 1.25, 1.30, 1.40, 1.50, 1.60, 1.70, 1.75, 1.80, 1.90, 2 and 2.50



Model No.	No. of Leaves	Ranges of Pitch	Code No.	Price \$
5651	51	4 to 84	225-315	41.40
156m	28	0.25 to 2.50 mm	225-320	22.20
5628	28	4 to 80	225-325	23.60
5617	18	.5 to 7.00mm	225-330	20.40
5629	28	4 to 56 .5-6.0mm	225-335	23.60

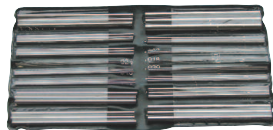
No. 272 Fillet or Radius Gage



Model No.	Specifications	Code No.	Price \$
272A	1/32-17/64 x 64ths	225-230	19.80

Thread Measuring Set

- 48 wires – 16 different sizes
- Measures all threads from 3 to 48 threads per inch
- Laminated chart included in case
- Furnished in vinyl case



Description	Code No.	Price \$
Thread Measuring Set	200-870	24.80

Radius Gages

Satin Finish Stainless Steel
No. L300 Series



Model No.	Specifications	Code No.	Price \$
L 300 CX	1/64-17/64 x 64ths 9/32-1/2 x 32nds	225-005	94.80
L 300 MX	0.5mm-13mm x 0.5mm	225-010	170.50
	1/64-17/64 x 64ths 9/32-1/2 x 32nd	230-015	51.40

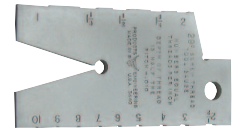
Center Gages

- Satin-chrome finish
- American National Standard



Model	Description	Code No.	Price \$
5031	U.S. Standard, 60°	225-410	10.00
5032	Metric Standard, 60°	225-415	10.00

Acme Gage



Description	Code No.	Price \$
1-10 TPI (29°)	225-450	26.90

Feeler Gage

- 26 tapered leaf thickness gages
- 3" long



Range (in.)	Code No.	Price \$
.0015 to .025"	606-050	21.40

Radius Gage Sets

- Used for measuring concave and convex surfaces

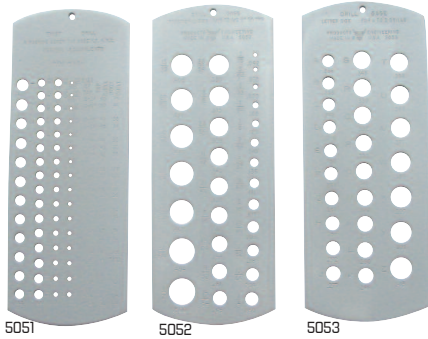


Sizes Consisting of:	Code No.	Price \$
.010, .015, .020, .025, .030, .040, .050, .060, .070, .080, .090, .100, .120, .140, .160, .180, .200, .220, .240, .260, .280, .300, .350, .400, .450 and .500" in vinyl case		
26 pc. set with holder	230-005	53.30
.5 to 13.0 mm x .5 mm increases		
26 pc. set with holder	230-010	53.30



Drill Gages

- Made of high quality steel
- Satin chrome finish
- Offer a quick and accurate way of checking drill and rod sizes



1-60 Drill/Machine Screw Tap Gage

- Tells at a glance the correct size tap drill for machine screw tap in "NF" National Fine or "NC" National Coarse thread series
- Shows the correct body size drill to use, 60 sizes shown with number and decimal equivalent of drill at each hole

Model No.	Description	Code No.	Price \$
5051	1-60 Drill/Machine Screw Tap Gage	606-314	29.20

1/16 - 1/2 Drill Gage

- Gage has 29 measuring holes for determining twist drill sizes from 1/16" to 1/2" in 1/64" increments
- Shows drill sizes in inches and decimal equivalents

Model No.	Description	Code No.	Price \$
5052	1/16-1/2 Drill Gage	606-316	28.40

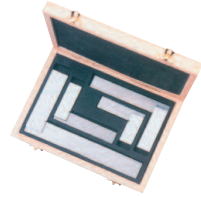
A-Z Drill Gage

- Used to select or check drill sizes from "A" to "Z"
- Each gage hole is marked by letter and its decimal equivalent from .234 inch diameter through .413 inch diameter

Model No.	Description	Code No.	Price \$
5053	A-Z Drill Gage	606-318	28.40

Engineer's Precision Squares

Hardened spring steel blades are permanently fixed to the stock by means of tapered self-locking rivets which ensure complete rigidity. Both the blade and stock are precisely ground to ensure straightness and parallelism.



Blade Length (in.)	Model No.	Code No.	Price \$
2	SS/A/2	231-000	15.00
3	SS/A/3	231-010	15.00
4	SS/A/4	231-015	20.70
6	SS/A/6	231-020	26.40
9	SS/A/9	231-030	66.10
12	SS/A/12	231-040	99.20
Set 1	SS/A/2-3-4-6	231-045	88.00
Set 2	SS/A/2-4-6	231-050	73.20

Set 1 contains one each of 2", 3", 4" and 6" Squares
Set 2 contains one each of 2", 4" and 6" Squares

Precision Square Levels



Model	Dimensions (mm)	Weight (kg)	Code No.	Price \$
VSL-200A	200x200x40	3.8	230-370	250.30
VSL-300A	250x250x40	5.8	230-380	368.00

Horizontal Leveling Instrument

- 0.02mm/100mm tolerance



Model	Dimensions (mm)	Weight (kg)	Code No.	Price \$
VLI-200A	200x50x45	2.1	230-390	259.50



Standard Rectangular Gage Block Set

Workshop Grade B

- All blocks are manufactured to the same high standards as our premium sets
- Each set is supplied with a certificate guaranteeing that each block is manufactured to meet or exceed federal spec GGG-G-15C, and is within tolerance (± 0.00050)
- This certificate does not show the individual deviation of each block
- Each set is provided in a fitted wooden case



No. Blocks	Blocks Included	Code No.	Price \$
81 piece set	9-.1001-.1009 in .0001 steps, 49-.101-.149 in .001 steps, 19-.050-.950 in .050 steps, 4-1.000-4.000 in 1.000 steps	200-715	212.90

STM Universal Angle Block Sets

- Set complete in fitted case
- Size 3" long by 1/4" thick
- Hardened steel, precision ground
- Accuracy $\pm .0001$ " per inch



DK33-006



DK32-027

Model No.	Description	Code No.	Price \$
DK 32-027	1 pc. each 1°, 2°, 3°, 4°, 5°, 10°, 15°, 30°	230-865	173.70
DK 33-006	1 pc. each 1°, 2°, 3°, 4°, 5°, 10°, 15°, 20°, 25°, 30°	230-867	90.20

Precision Steel Pin Gage Sets

- Hardness: heat treated to a hardness of 60-62 Rockwell C Drill Rod
- All members 2" long, centerless lapped
- Size Electro etched in each piece
- Finish: Each gage inspected and has 10 micron finish or better
- Deluxe box with insert
- Tolerance: Minus -.0002"/+.0000"



Gauge Set No.	Range	No. of Gauges	Minus Code No.	Price \$
P-0	.011-.060	50	255-145	60.70
P-1	.061-.250	190	255-040	130.50
P-2	.251-.500	250	255-045	250.70
P-3	.501-.625	125	255-150	243.40
P-4	.626-.750	125	255-155	255.20
P-5	.751-.832	82	255-160	288.70
P-6	.833-.916	84	255-165	398.70
P-7	.917-1.000	84	255-170	381.20

Telescoping Gages

- 4 or 6 piece set



Sizes Consisting of:	Code No.	Price \$
6pc 5/16-1/2, 1/2-3/4, 3/4-1-1/4, 1-1/4-2-1/8, 2-1/8-3-1/2, 3-1/2-6	200-710	31.90
4pc 5/16-2-1/8	200-712	19.80

Steel Parallel Set

All 10 Pairs Including Fitted Case

- Thin style, 1/8" thick
- Matched pairs
- Made of high grade steel alloy
- Hardened and ground
- Tolerance ± 0.0003 "



Code No.: 230-863		Price \$ 94.40	
Width	Height	Length	
1/8	1/2	6	
1/8	5/8	6	
1/8	3/4	6	
1/8	7/8	6	
1/8	1	6	
1/8	1-1/8	6	
1/8	1-1/4	6	
1/8	1-3/8	6	
1/8	1-1/2	6	
1/8	1-5/8	6	

STM Precision Hardness Tester

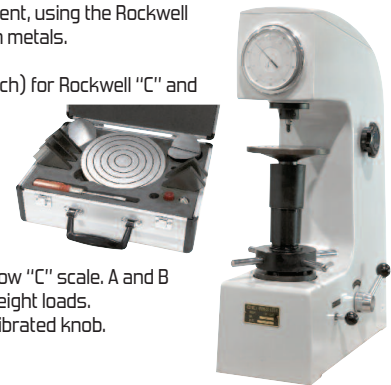
A high grade precision instrument, using the Rockwell method for testing hardness in metals.

Accessories:

- Hardness standards (one each) for Rockwell "C" and "B" scales and "A" scales
- Diamond penetrator
- Flat anvil
- "V" anvil
- Large flat anvil
- Rockwell standard block set

Note:

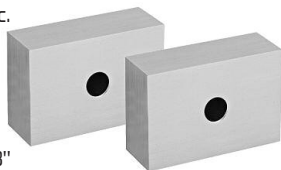
Consists of high, medium and low "C" scale. A and B masters. No need to change weight loads. Can be easily adjusted by a calibrated knob.



Total Load in KGf (Initial Load 10kgf)	60			100			150					
	Indenter	Test Scales	Suitable for hardened steel	Diamond 120°	Rockwell A	Test on case and non-ferrous metals	Ball 1/16"	Rockwell B	Annealed ferrous hardened and tempered or case hardened steel	Diamond 120°	Rockwell C	Annealed
Test Height	Throat Depth	L x W x H	Code No.	Price \$								
6-3/4	5-5/16	18-3/8 x 9-3/8 x 24-13/16	240-200	3,161.70								
Replacement Diamond Penetrator for Hardness Tester			240-201	363.20								

Precision 1-2-3 Blocks

- These blocks are very useful in mounting work for precision grinding, layout work, etc.
- Blocks are hardened to 58-60 RC and ground to surface finish 6-10 micro inches
- Tolerances are guaranteed to .0001" for squareness per inch
- .0002" for parallelism
- Blocks are matched and measure 1" x 2" x 3"
- Price includes fitted case



Description	Code No.	Price \$
2 Piece set	230-876	36.90

1-2-3 or 2-4-6 Blocks

- Heat treated and case hardened to HRC 55-60
- Precision ground and case hardened
- Squareness of all sides is within .0001"
- Parallel Accuracy 0.0003"
- Surface finish 6-16 micro inches
- 23 holes-5 are tapped in 3/8-16
- Supplied in pairs



Size	Description	Code No.	Price \$
1-2-3	23 Holes	230-870	34.40
2-4-6	23 Holes	230-872	278.40
1-2-3	No Hole (Pair)	230-874	37.80

Magnetic V-Block

Used to hold cylindrical workpieces for grinding. Will hold both itself and the work on any flat ferrous surface, including a permanent magnet chuck (without energizing the chuck.) There are two vees:

- The smaller for workpieces up to .750" diameter and the larger for workpieces up to 2.500" diameter
- Sold Individually

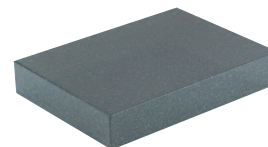


Description	Code No.	Price \$
Magnetic vee blocks	225-710	98.30

Black Granite Surface Plates O-Ledge

Imported Precision Toolroom Black Granite Surface Plates

These plates are made of the highest quality – True Black – Fine Grained – Non-porous – Jewel Hardness – Granite available to give years of long lasting service.



Specifications:

Compressive Strength 7329 lbs. / in²
Water Absorptivity 0.13%

Size (in.)	Thickness (in.)	Shipping Weight (lb)	(±)	Code No.	Price \$
Grade B-Tool Room- No Ledge					
9 x 12	3	40	.0001	255-100	48.90
12 x 18	3	110	.0001	255-105	83.00
18 x 24	4	189	.00015	255-110	271.60
24 x 36	4	475	.0002	255-115	453.50
36 x 48	6	1427	.0004	255-120	1,281.70
48 x 72	8	3300	.0007	255-125	3,997.10
Grade A-Inspection					
12 x 18	3	110	.000050	255-130	119.60
18 x 24	3	189	.000075	255-135	310.20
24 x 36	4	475	.0001	255-140	521.50

Magnetic V-Blocks

All Vee's and faces can be energized or de-energized simultaneously by turning the rotary action gun metal control knob. Gun metal construction of the knob ensures no interference with the magnetic field.

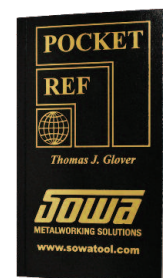


Block Length (in.)	Block Width (in.)	Block Height (in.)	Type	Model No.	Code No.	Price \$
4	3	3-3/4	Single	MVB/4S	231-084	246.60
4	3	3-3/4	Pair	MVB/4P	231-086	493.00
3-3/16	2-3/8	3-3/4	Single	MVB/5S	231-088	190.50
3-3/16	2-3/8	3-3/4	Pair	MVB/5P	231-090	380.90

Pocket Reference Book - 4th Edition

Information for do-it-yourselfers, engineers, craftsmen, students, teachers, managers, maintenance & industrial personnel, and travelers. The ultimate reference and problem solver. The uses for this book are endless! 864 pages of valuable information in an easy to use pocket reference book. 3.2" x 5.4" x 0.8"

- Automotive
- Steels & Metals
- Electrical
- Tools
- Weights & Properties of materials
- Geology
- Math
- Welding
- Conversion tables
- and much more



Description	Code No.	Price \$
Pocket Reference Book	180-175	19.60



CUTTING TOOLS

CARBIDE END MILLS

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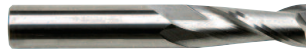
END MILLS



2 Flute Regular Length Carbide End Mills

A general purpose carbide end mill with maximum chip clearance added.

For: End milling Slotting Sinking
On: Variety of Steels, Cast Iron
 Non-Ferrous metals, Plastics, Abrasive type materials



Inch



Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	1/8	1-1/2	103-770	7.70	102-677	10.10
3/64	1/8	9/64	1-1/2	103-772	5.50	102-799	10.60
1/16	1/8	3/16	1-1/2	103-848	5.00	102-800	7.90
5/64	1/8	1/4	1-1/2	103-773	5.00	102-801	9.60
3/32	1/8	5/16	1-1/2	103-849	5.00	102-802	7.90
7/64	1/8	3/8	1-1/2	103-775	5.00	102-803	9.60
1/8	1/8	1/2	1-1/2	103-850	5.00	102-804	7.70
9/64	3/16	1/2	2	103-776	6.20	102-805	9.60
5/32	3/16	9/16	2	103-851	6.20	102-806	14.90
11/64	3/16	9/16	2	103-777	6.90	102-807	14.90
3/16	3/16	5/8	2	103-852	6.90	102-808	9.40
13/64	1/4	5/8	2-1/2	103-778	8.70	102-809	19.60
7/32	1/4	5/8	2-1/2	103-853	8.70	102-811	17.20
1/4	1/4	3/4	2-1/2	103-854	8.70	102-810	10.90
9/32	5/16	3/4	2-1/2	103-855	11.30	102-813	22.50
5/16	5/16	13/16	2-1/2	103-856	11.30	102-812	15.70
11/32	3/8	7/8	2-1/2	103-779	14.20	102-815	29.10
3/8	3/8	1	2-1/2	103-857	14.20	102-814	18.70
13/32	7/16	1	2-3/4	103-780	21.70	102-817	39.50
7/16	7/16	1	2-3/4	103-858	21.70	102-816	25.60
1/2	1/2	1	3	103-859	26.20	102-818	31.10
9/16	9/16	1-1/8	3-1/2	103-886	37.70	102-820	42.70
5/8	5/8	1-1/4	3-1/2	103-887	47.00	102-822	48.80
11/16	3/4	1-3/8	4	103-888	66.30	102-824	66.40
3/4	3/4	1-1/2	4	103-889	66.40	102-826	74.50
7/8	7/8	1-1/2	4	103-890	93.10	102-828	101.90
1	1	1-1/2	4	103-891	106.60	102-830	115.80

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
.5	3	1.5	39	101-552	18.20	102-819	20.80
1	3	3	39	101-553	13.30	102-821	14.00
1.5	3	5	39	101-432	8.60	102-823	10.70
2	3	7	39	102-696	5.30	102-825	8.50
2.5	3	7	39	102-697	5.30	102-827	8.50
3	3	9	39	102-698	5.30	102-829	7.40
3.5	4	12	51	102-699	6.30	102-853	12.00
4	4	14	51	102-700	6.30	102-855	12.00
4.5	5	14	51	102-701	7.70	102-857	13.30
5	5	16	51	102-702	7.70	102-859	13.30
6	6	19	64	102-703	9.20	102-861	15.60
7	8	19	64	102-704	11.90	102-863	18.90
8	8	21	64	102-705	11.90	102-865	18.90
9	10	22	70	102-706	17.80	102-867	30.80
10	10	22	70	102-707	17.80	102-869	30.80
11	11	25	70	102-708	27.50	102-871	37.80
12	12	25	76	102-709	27.50	102-873	37.80
14	14	30	89	102-711	39.70	102-875	65.20
16	16	32	89	102-712	49.60	102-881	70.60
18	18	35	102	102-713	64.10	102-883	105.20
20	20	38	102	102-714	77.00	102-885	130.80
22	22	38	102	101-451	168.40	102-887	192.00
25	25	38	102	102-715	117.60	102-889	172.70

6pc Set
Contains

1/4", 5/16", 3/8", 1/2", 5/8", 3/4"

Code No. Price \$
103-846 173.80

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum



2 Flute Stub Length Carbide End Mills

2 Flute stub has added strength and stability with the same geometry of our standard length series. Stub end mills are specifically designed for shallow milling and slotting in a variety of materials.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	5/64	1-1/2	101-220	13.00	102-202	14.10
3/64	1/8	3/32	1-1/2	101-221	9.20	102-221	11.90
1/16	1/8	1/8	1-1/2	101-222	8.20	102-222	10.90
5/64	1/8	1/8	1-1/2	101-223	9.20	102-223	11.40
3/32	1/8	3/16	1-1/2	101-224	8.20	102-224	13.70
7/64	1/8	7/32	1-1/2	101-225	9.20	102-225	11.40
1/8	1/8	1/4	1-1/2	101-226	7.90	102-226	12.00
9/64	3/16	9/32	2	101-227	9.20	102-227	11.40
5/32	3/16	5/16	2	101-228	11.60	102-228	14.20
3/16	3/16	3/8	2	101-229	10.70	102-229	13.10
7/32	1/4	7/16	2	101-230	11.90	102-203	17.10
1/4	1/4	1/2	2	101-231	12.10	102-231	18.00
5/16	5/16	1/2	2	101-232	17.40	102-204	25.60
3/8	3/8	5/8	2	101-233	24.60	102-233	31.30
7/16	7/16	5/8	2-1/2	101-234	31.50	102-206	38.80
1/2	1/2	5/8	2-1/2	101-235	39.50	102-235	45.00
5/8	5/8	3/4	3	101-236	61.30	102-207	77.00
3/4	3/4	1	3	101-237	95.10	102-237	113.20

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1	3	2	39	101-640	13.00	102-631	13.70
1.5	3	3	39	101-641	8.20	102-641	10.10
2	3	4	39	101-642	9.20	102-633	11.00
2.5	3	5	39	101-643	8.20	102-643	10.20
3	3	6	39	101-644	7.90	102-644	9.90
3.5	4	7	51	101-645	11.10	102-645	13.60
4	4	8	51	101-646	10.70	102-646	13.20
4.5	5	9	51	101-647	11.70	102-647	14.40
5	5	10	51	101-648	11.90	102-648	14.60
6	6	12	51	101-649	12.10	102-649	15.60
7	8	12	51	101-650	13.90	102-635	17.00
8	8	12	51	101-651	17.40	102-651	21.10
9	10	14	51	101-652	24.60	102-637	24.30
10	10	14	51	101-653	24.60	102-653	30.60
11	11	16	64	101-654	31.60	-	-
12	12	16	64	101-655	53.30	-	-

2 Flute Long Length Carbide End Mills

Long Length End mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill much thicker material in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	3/4	2-1/4	102-961	7.90	102-902	9.80
3/16	3/16	3/4	2-1/4	102-962	8.90	102-904	10.70
1/4	1/4	1-1/8	3	102-963	10.80	102-906	12.70
5/16	5/16	1-1/8	3	102-964	15.50	102-908	16.70
3/8	3/8	1-1/8	3	102-965	19.40	102-910	22.30
7/16	7/16	2	4	102-966	36.30	102-912	33.70
1/2	1/2	2	4	102-967	38.10	102-914	38.70
5/8	5/8	2-1/4	5	102-968	71.60	102-916	70.10
3/4	3/4	2-1/4	5	102-969	92.70	102-918	92.00
1	1	2-1/4	5	102-970	185.70	102-920	174.90

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
3	3	19	57	101-560	15.10	102-921	15.90
4	4	19	57	101-561	16.80	102-923	18.90
5	5	25	64	101-562	17.30	102-925	19.50
6	6	28	76	101-563	22.20	102-927	26.00
8	8	29	76	101-564	27.20	102-929	31.30
10	10	32	76	101-565	34.50	102-931	41.50
12	12	51	102	101-566	63.00	102-933	66.10
14	14	57	127	101-567	96.50	-	-
16	16	57	127	101-568	117.70	102-937	140.50
18	18	57	127	101-569	134.80	102-939	160.90
20	20	57	127	101-570	153.20	-	-
25	25	57	127	101-571	307.10	-	-

2 Flute Extra Long Length Carbide End Mills

Extra Long Length End mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill much thicker material in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	1	3	102-400	8.40	102-500	10.10
3/16	3/16	1-1/8	3	102-402	9.50	102-502	11.10
1/4	1/4	1-1/2	4	102-404	11.80	102-504	14.00
5/16	5/16	1-5/8	4	102-406	17.30	102-506	20.00
3/8	3/8	1-3/4	4	102-408	21.80	102-508	23.90
7/16	7/16	3	6	102-410	46.10	102-510	49.40
1/2	1/2	3	6	102-412	47.50	102-512	50.60
5/8	5/8	3	6	102-414	84.80	102-514	82.40
3/4	3/4	3	6	102-416	109.80	102-516	108.00
1	1	3	6	102-418	220.10	102-518	197.00

2 Flute Double End Stub Length

Double End end mills offer the same tool geometry as the single end stub end mill, but with two cutters in one tool. Economy is an added feature of this tool.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	5/64	1-1/2	102-260	7.00	102-360	8.90
1/16	1/8	1/8	1-1/2	102-262	7.00	102-362	8.90
3/32	1/8	3/16	1-1/2	102-264	7.00	102-364	8.90
1/8	1/8	1/4	1-1/2	102-266	6.60	102-366	8.70
5/32	3/16	5/16	2	102-268	9.40	102-368	11.10
3/16	3/16	3/8	2	102-270	16.80	102-370	11.20
7/32	1/4	1/2	2-1/2	102-272	11.60	102-372	13.10
1/4	1/4	1/2	2-1/2	102-274	11.60	102-374	13.10
5/16	5/16	1/2	2-1/2	102-276	17.10	102-376	20.00
3/8	3/8	1/2	2-1/2	102-278	18.00	102-378	21.10
7/16	7/16	9/16	2-3/4	102-280	25.80	102-380	28.50
1/2	1/2	5/8	3	102-282	31.10	102-382	33.50

Tolerances - Inch

Size	Diameter	Shank Diameter
3/32 thru 1"	+0.000"-0.002"	+0.0000"-0.0005"

Tolerances - Metric

Size	Diameter	Shank Diameter
1mm-25mm	+0.000mm-.051mm	+0.000mm-.013mm

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum

2 Flute Double End Regular Length

With maximum chip clearance, 2 Flute end mills are ideal for milling, sinking, profiling or slotting in a variety of materials.



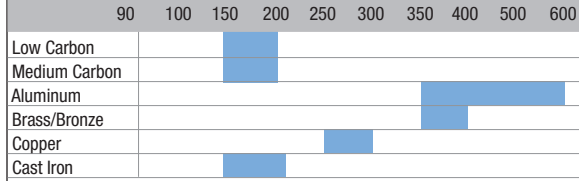
Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	3/8	3/8	3-1/16	101-300	30.90	102-001	37.90
5/32	3/8	7/16	3-1/8	101-301	29.20	102-003	43.00
3/16	3/8	1/2	3-1/4	101-302	32.70	102-005	39.10
7/32	3/8	9/16	3-3/8	101-303	34.20	102-007	41.20
1/4	3/8	5/8	3-3/8	101-304	36.70	102-009	44.30
9/32	3/8	11/16	3-3/8	101-305	41.10	102-011	49.10
5/16	3/8	3/4	3-1/2	101-306	42.30	102-013	50.60
11/32	3/8	3/4	3-1/2	101-307	47.40	-	-
3/8	3/8	3/4	3-1/2	101-308	47.20	102-017	55.10
7/16	1/2	7/8	4	101-309	70.10	102-019	83.90
1/2	1/2	1	4	101-310	73.70	102-021	86.50

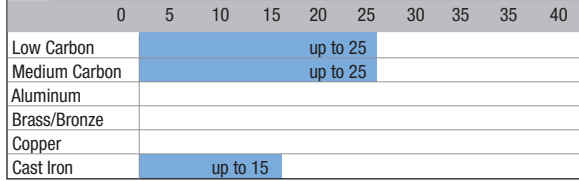
Cutting Conditions for Bright Carbide

Main Group	Sub-Group	Condition	Hardness (HRC)	Cutting Speed (SFM)
Low Carbon	1018, 1010, 1035	Normalized	<25	150-200
Medium Carbon	1045, 1050, 1065	Normalized	<25	150-200
Aluminum	Unalloyed, Cast	-	-	350-600
Brass/Bronze	-	-	-	350-400
Copper	-	-	-	250-300
Cast Iron	-	As Cast	<15	150-225

Cutting Speed (sfm)



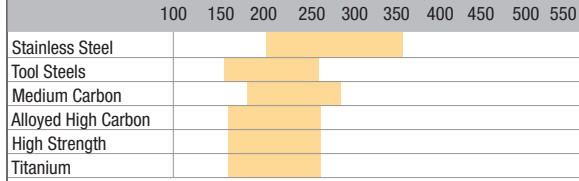
Hardness (hrc)



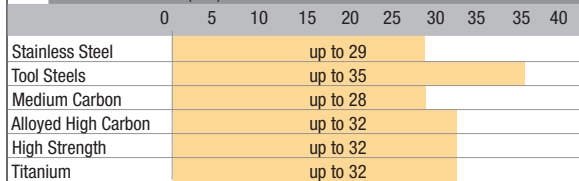
Cutting Conditions for TiAlN

Main Group	Sub-Group	Condition	Hardness (HRC)	Cutting Speed (SFM)
Stainless Steels	300 Series, 400 Series	Annealed	<29	200-350
Tool Steels	01, A-2, D-2, H-13, P-20	Annealed	<35	150-250
Medium Carbon	1030, 1035, 1038, 1040, 1045, 1050	Normalized	<28	190-275
Alloyed High Carbon	1065, 1070, 1080, 1090, 1095, 1561, 1572	Normalized	<32	150-250
High Strength	4140, 4340	Normalized	<32	150-250
Titanium	Commercially Pure	Annealed	<32	150-250

Cutting Speed (sfm)



Hardness (hrc)





2 Flute Corner Radius Regular Length Carbide End Mills

Two flute carbide end mill with corner radius allows more strength and minimizes chipping on corners. Two flute construction provides more chip space and clearance than three or four flute designs.



Inch

Cutting Dia. (in.)	Corner Radius	Shank Dia. (in.)	Flute Length (in.)	Overall Length (in.)	Bright		TiAlN	
					Code No.	Price \$	Code No.	Price \$
1/8	.015"	1/8	1/2	1-1/2	101-140	10.30	102-023	12.20
3/16	.020"	3/16	5/8	2	101-141	14.20	102-025	16.80
3/16	.030"	3/16	5/8	2	101-142	14.20	102-027	16.80
1/4	.020"	1/4	3/4	2-1/2	101-143	18.40	102-029	21.50
1/4	.030"	1/4	3/4	2-1/2	101-144	18.40	102-031	21.50
1/4	.045"	1/4	3/4	2-1/2	101-145	19.10	102-033	21.50
5/16	.020"	5/16	13/16	2-1/2	101-146	21.40	102-035	25.50
5/16	.030"	5/16	13/16	2-1/2	101-147	21.40	102-037	25.50
5/16	.045"	5/16	13/16	2-1/2	101-148	21.40	102-039	25.50
3/8	.020"	3/8	1	2-1/2	101-149	27.40	102-041	32.70
3/8	.030"	3/8	1	2-1/2	101-150	28.80	102-043	34.10
3/8	.045"	3/8	1	2-1/2	101-151	27.40	102-045	32.70
1/2	.020"	1/2	1	3	101-152	46.60	102-046	55.40
1/2	.030"	1/2	1	3	101-153	46.60	102-047	55.40
1/2	.045"	1/2	1	3	101-154	46.60	102-048	55.40
1/2	.060"	1/2	1	3	101-155	46.60	102-049	55.40
5/8	.020"	5/8	1-1/4	3-1/2	101-156	78.00	102-051	92.80
5/8	.030"	5/8	1-1/4	3-1/2	101-157	78.30	102-053	93.20
5/8	.045"	5/8	1-1/4	3-1/2	101-158	78.30	102-055	93.20
5/8	.060"	5/8	1-1/4	3-1/2	101-159	80.60	102-057	95.90
5/8	.090"	5/8	1-1/4	3-1/2	101-160	80.90	102-059	96.30
3/4	.020"	3/4	1-1/2	4	101-162	111.20	102-061	132.30
3/4	.030"	3/4	1-1/2	4	101-163	90.00	102-063	132.30
3/4	.045"	3/4	1-1/2	4	101-164	114.20	102-065	135.90
3/4	.060"	3/4	1-1/2	4	101-165	114.20	102-067	135.90
3/4	.090"	3/4	1-1/2	4	101-166	114.70	102-069	136.40
3/4	.125"	3/4	1-1/2	4	101-161	156.90	-	-
1	.020"	1	1-1/2	4	101-168	206.40	102-073	245.60
1	.030"	1	1-1/2	4	101-169	206.40	102-075	245.60
1	.045"	1	1-1/2	4	101-170	209.80	102-077	249.60
1	.060"	1	1-1/2	4	101-171	209.80	102-079	249.60
1	.090"	1	1-1/2	4	101-172	217.20	102-081	253.80
1	.125"	1	1-1/2	4	101-167	217.20	102-083	253.80

Carbide Drill Mills

- Drill Mills can be used for drilling, slotting, profile milling
- 2 Flute - 60° & 90° included point angle
- Made from submicron grain carbide
- Cutting diameter tolerance: +.000/-0.002



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright 60°		Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright 90°	
				Code No.	Price \$					Code No.	Price \$
1/16	1/8	3/16	1-1/2	153-187	16.30	1/16	1/8	3/16	1-1/2	153-186	15.70
3/32	1/8	3/8	1-1/2	153-189	16.30	3/32	1/8	3/8	1-1/2	153-188	16.30
1/8	1/8	1/2	1-1/2	153-191	15.20	1/8	1/8	1/2	1-1/2	153-190	15.20
3/16	3/16	5/8	2	153-193	21.80	3/16	3/16	5/8	2	153-192	21.80
1/4	1/4	3/4	2-1/2	153-195	27.90	1/4	1/4	3/4	2-1/2	153-194	27.90
5/16	5/16	13/16	2-1/2	153-197	33.50	5/16	5/16	13/16	2-1/2	153-196	35.10
3/8	3/8	1	2-1/2	153-199	43.80	3/8	3/8	1	2-1/2	153-198	43.80
7/16	7/16	1	2-3/4	153-201	48.50	7/16	7/16	1	2-3/4	153-200	57.50
1/2	1/2	1	3	153-203	72.50	1/2	1/2	1	3	153-202	72.50
5/8	5/8	1-1/4	3-1/2	153-205	139.70	5/8	5/8	1-1/4	3-1/2	153-204	139.70
3/4	3/4	1-1/2	4	153-207	222.80	3/4	3/4	1-1/2	4	153-206	222.80

2 Flute Ball Nose Regular Length

A general purpose carbide end mill with maximum chip clearance added.

For: End Milling, Slotting, Sinking, Contouring

On: Variety of Steels, Cast Iron, Non-Ferrous metals, Plastics, Abrasive type materials



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	1/2	1-1/2	103-872	6.20	102-862	8.80
3/16	3/16	5/8	2	103-873	9.00	102-864	11.20
1/4	1/4	3/4	2-1/2	103-874	11.30	102-866	13.10
5/16	5/16	13/16	2-1/2	103-877	13.10	102-868	17.30
3/8	3/8	1	2-1/2	103-875	17.60	102-870	21.70
1/2	1/2	1	3	103-876	29.00	102-872	33.70
9/16	9/16	1-1/8	3-1/2	103-892	45.70	102-874	47.40
5/8	5/8	1-1/4	3-1/2	103-893	55.20	102-876	55.70
11/16	3/4	1-3/8	4	103-894	77.70	102-877	92.80
3/4	3/4	1-1/2	4	103-895	77.40	102-878	80.40
7/8	7/8	1-1/2	4	103-896	107.40	102-879	149.50
1	1	1-1/2	4	103-897	123.60	102-880	124.70

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
.5	3	1.5	39	101-460	20.90	102-107	23.80
1	3	3	39	101-461	15.30	102-108	16.10
1.5	3	5	39	101-462	9.90	102-109	12.10
2	3	7	39	102-740	6.70	102-111	10.00
2.5	3	7	39	102-741	6.70	102-113	10.00
3	3	9	39	102-742	6.70	102-115	8.70
3.5	4	12	51	102-743	9.00	102-117	13.70
4	4	14	51	102-744	9.00	102-119	12.00
4.5	5	14	51	102-745	10.00	102-121	15.40
5	5	16	51	102-746	10.00	102-123	15.40
6	6	19	64	102-747	12.00	102-182	18.30
7	8	19	64	102-748	13.90	102-183	22.20
8	8	21	64	102-749	13.90	102-184	22.20
9	10	22	70	102-750	21.70	102-186	34.80
10	10	22	70	102-751	21.70	102-187	35.50
11	11	25	70	102-752	30.80	102-188	44.30
12	12	25	76	102-753	30.80	102-189	44.30
14	14	30	89	102-755	49.00	102-191	74.90
16	16	32	89	102-756	59.00	102-192	81.10
18	18	35	102	102-757	75.80	102-193	123.50
20	20	38	102	102-758	89.80	102-194	156.40
22	22	38	102	101-481	156.80	102-195	231.00
25	25	38	102	102-759	137.50	102-196	209.60

2 Flute Ball Nose Stub Length

This series has added strength and stability with the same geometry of our standard length series. Stub end mills are specifically designed for shallow milling, contour milling and slotting.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	5/64	1-1/2	101-240	16.50	102-197	17.40
3/64	1/8	3/32	1-1/2	101-241	10.60	102-198	12.80
1/16	1/8	1/8	1-1/2	101-242	9.40	102-199	11.60
5/64	1/8	5/32	1-1/2	101-243	10.60	102-201	12.70
3/32	1/8	3/16	1-1/2	101-244	9.40	102-239	11.50
7/64	1/8	7/32	1-1/2	101-245	10.60	102-241	13.10
1/8	1/8	1/4	1-1/2	101-246	9.10	102-243	11.90
9/64	3/16	9/32	2	101-247	10.60	102-245	13.10
5/32	3/16	5/16	2	101-248	13.40	102-247	16.00
3/16	3/16	3/8	2	101-249	12.40	102-249	15.20
7/32	1/4	7/16	2	101-250	13.70	102-251	16.90
1/4	1/4	1/2	2	101-251	13.90	102-252	19.40
5/16	5/16	1/2	2	101-252	19.90	102-253	27.50
3/8	3/8	5/8	2	101-253	28.30	102-254	36.90
7/16	7/16	5/8	2-1/2	101-254	36.30	102-255	44.20
1/2	1/2	5/8	2-1/2	101-255	45.50	102-256	53.20
5/8	5/8	3/4	3	101-256	70.50	102-257	80.40
3/4	3/4	1	3	101-257	109.80	102-258	125.10

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1	3	2	39	101-670	16.50	102-259	20.10
1.5	3	3	39	101-671	9.40	102-261	11.60
2	3	4	39	101-672	10.60	102-263	13.00
2.5	3	5	39	101-673	9.40	-	-
3	3	6	39	101-674	9.10	102-267	11.30
3.5	4	7	51	101-675	12.10	102-269	15.70
4	4	8	51	101-676	12.40	102-271	15.20
4.5	5	9	51	101-677	18.10	-	-
5	5	10	51	101-678	13.70	102-275	16.70
6	6	12	51	101-679	13.90	102-277	17.20
7	8	12	51	101-680	13.90	102-279	17.10
8	8	12	51	101-681	19.90	102-281	24.20
9	10	14	51	101-682	23.00	-	-
10	10	14	51	101-683	28.50	102-285	34.30
11	11	16	64	101-684	29.50	-	-
12	12	16	64	101-685	45.60	-	-

2 Flute Ball Nose Long Length Carbide End Mills

Long Length End mills combine added flute and overall lengths for greater reach when deep slotting or milling. These end mills have the capability to mill much thicker material in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	3/4	2-1/4	102-971	9.60	102-780	11.20
3/16	3/16	3/4	2-1/2	102-972	13.60	102-782	15.50
1/4	1/4	1-1/8	3	102-973	17.40	102-784	20.00
5/16	5/16	1-1/8	3	102-974	19.60	102-786	23.10
3/8	3/8	1-1/8	3	102-975	25.20	102-788	29.20
7/16	7/16	2	4	102-976	36.50	102-790	42.30
1/2	1/2	2	4	102-977	42.10	102-792	48.40
5/8	5/8	2-1/4	5	102-978	97.50	102-794	100.20
3/4	3/4	2-1/4	5	102-979	143.90	102-796	142.40
1	1	2-1/4	5	102-980	254.70	102-798	198.50

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
3	3	19	57	101-580	17.30	102-085	21.10
4	4	19	57	101-581	19.40	102-086	23.50
5	5	25	64	101-582	19.90	102-087	22.60
6	6	28	76	101-583	25.50	102-089	31.20
8	8	29	76	101-584	31.40	-	-
10	10	32	76	101-585	39.80	-	-
12	12	51	102	101-586	72.70	-	-
14	14	57	127	101-587	111.00	-	-
16	16	57	127	101-588	135.40	-	-
18	18	57	127	101-589	155.70	-	-
20	20	57	127	101-590	176.20	-	-
25	25	57	127	101-591	353.10	-	-



2 Flute Ball Nose Extra Long Length

Extra Long Length End mills combine added flute and overall lengths for greater reach when deep slotting or milling. These end mills have the capability to mill much thicker material in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	1	3	102-420	11.40	102-520	12.60
3/16	3/16	1-1/8	3	102-422	16.10	102-522	16.60
1/4	1/4	1-1/2	4	102-424	20.60	102-524	21.50
5/16	5/16	1-5/8	4	102-426	23.10	102-526	25.00
3/8	3/8	1-3/4	4	102-428	29.30	102-528	31.40
7/16	7/16	3	6	102-430	57.40	102-530	61.60
1/2	1/2	3	6	102-432	56.20	102-532	58.00
5/8	5/8	3	6	102-434	116.00	102-534	108.90
3/4	3/4	3	6	102-436	170.50	102-536	159.60
1	1	3	6	102-438	303.10	102-538	275.00

2 Flute 1/8" Shank Miniature End Mills

Designed for milling small precision components in a variety of materials.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
.015	1/8	.047	1-1/2	101-210	20.50	102-208	22.50
.020	1/8	.063	1-1/2	101-211	18.20	102-211	20.40
.025	1/8	.078	1-1/2	101-212	15.50	102-212	19.20
.030	1/8	.094	1-1/2	101-213	10.70	102-213	13.20
.035	1/8	.109	1-1/2	101-214	9.00	102-214	12.10
.040	1/8	.125	1-1/2	101-215	9.00	102-209	11.80
.045	1/8	.140	1-1/2	101-216	9.00	102-216	11.80
.050	1/8	.156	1-1/2	101-217	9.40	102-217	11.80
.055	1/8	.171	1-1/2	101-218	9.80	102-218	11.80
.060	1/8	.188	1-1/2	101-219	9.80	102-219	11.60

2 Flute Ball Nose Double End Stub Length

These end mills offer the same tool geometry as the single end stub end mill, but with two cutters in one tool.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	5/64	1-1/2	101-331	23.50	102-291	24.70
3/64	1/8	3/32	1-1/2	101-332	16.00	102-293	18.80
1/16	1/8	1/8	1-1/2	101-333	14.40	102-295	17.80
3/32	1/8	3/16	1-1/2	101-334	14.40	102-297	17.80
1/8	1/8	1/4	1-1/2	101-335	13.40	102-299	16.60
5/32	3/16	5/16	2	101-336	19.70	102-323	23.40
3/16	3/16	3/8	2	101-337	19.30	102-324	22.50
7/32	1/4	1/2	2-1/2	101-338	25.00	102-325	33.00
1/4	1/4	1/2	2-1/2	101-339	24.30	102-326	32.70
5/16	5/16	1/2	2-1/2	101-351	19.10	102-327	34.10
3/8	3/8	1/2	2-1/2	101-352	37.40	102-328	48.90
7/16	7/16	9/16	2-3/4	101-353	48.30	102-329	62.50
1/2	1/2	5/8	3	101-354	63.30	102-331	74.40

2 Flute Ball Nose Double End Reg. Length

With maximum chip clearance, 2fl. ball nose end mills are ideal for milling, sinking, profiling or slotting various steels, non-ferrous materials, cast iron or highly abrasive materials.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	3/8	3/8	3-1/16	101-320	35.60	102-333	42.70
5/32	3/8	7/16	3-1/8	101-321	37.60	102-335	45.30
3/16	3/8	1/2	3-1/4	101-322	35.80	102-337	42.00
7/32	3/8	9/16	3-3/8	101-323	41.50	102-339	49.90
1/4	3/8	5/8	3-3/8	101-324	40.10	102-341	47.10
9/32	3/8	11/16	3-3/8	101-325	47.20	102-343	56.60
5/16	3/8	3/4	3-1/2	101-326	46.30	102-345	53.80
11/32	3/8	3/4	3-1/2	101-327	54.30	102-347	65.10
3/8	3/8	3/4	3-1/2	101-328	54.50	102-349	59.80
7/16	1/2	7/8	4	101-329	81.00	-	-
1/2	1/2	1	4	101-330	85.10	102-352	97.20

3 Flute 60° High Helix End Mills

These end mills are designed for milling Stainless Steel, Titanium and other similar metals where high cutting forces are generated. The high helix angle increases length of cutting edge engaged in the cut, reducing cutting load variations and prolonging tool life. Excellent surface finish with high speed and feed capabilities are features of these tools.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	1/2	1-1/2	101-000	11.00	102-427	13.50
3/16	3/16	5/8	2	101-002	15.50	102-429	18.10
1/4	1/4	3/4	2-1/2	101-004	20.60	102-431	23.90
5/16	5/16	13/16	2-1/2	101-006	29.00	102-433	32.00
3/8	3/8	1	2-1/2	101-008	31.10	102-435	37.50
7/16	7/16	1	2-3/4	101-010	38.70	102-437	46.10
1/2	1/2	1	3	101-012	48.70	102-439	56.30
5/8	5/8	1-1/4	3-1/2	101-014	98.00	102-440	109.10
3/4	3/4	1-1/2	4	101-016	117.20	102-441	135.30
1	1	1-1/2	4	101-018	217.10	102-442	238.70

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$
6	6	19	64	101-730	29.20
8	8	21	64	101-731	32.80
10	10	25	70	101-732	50.60
12	12	25	76	101-733	59.00
14	14	29	89	101-734	63.60
16	16	32	89	101-735	113.20
18	18	38	102	101-736	152.80
20	20	38	102	101-737	178.00
25	25	38	102	101-738	228.50

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum

3 Flute Regular Length Carbide End Mills

3 flute carbide end mills offer maximum chip clearance therefore reducing chip packing.

For: End milling, Slotting, Sinking
On: Steels, Cast Iron, Aluminum, Copper, Brass, Plastics, and Abrasive type materials



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright		TiAlN	
				Code No.	Price \$	Code No.	Price \$
1/16	1/8	3/16	1-1/2	101-080	8.60	102-353	11.30
5/64	1/8	3/16	1-1/2	101-081	9.50	102-354	11.70
3/32	1/8	5/16	1-1/2	101-082	8.60	102-355	11.30
7/64	1/8	7/16	1-1/2	101-083	9.50	102-356	11.80
1/8	1/8	1/2	1-1/2	101-084	8.60	102-357	10.50
9/64	3/16	1/2	2	101-085	13.40	102-358	15.60
5/32	3/16	9/16	2	101-086	12.40	102-359	16.00
11/64	3/16	5/8	2	101-087	13.40	102-361	16.40
3/16	3/16	5/8	2	101-088	12.40	102-363	15.00
13/64	1/4	5/8	2-1/2	101-089	17.10	102-365	20.80
7/32	1/4	5/8	2-1/2	101-090	16.20	102-367	19.90
15/64	1/4	3/4	2-1/2	101-091	17.80	102-369	21.70
1/4	1/4	3/4	2-1/2	101-092	15.70	102-371	20.40
17/64	5/16	3/4	2-1/2	101-093	18.60	102-373	22.60
9/32	5/16	3/4	2-1/2	101-094	18.60	102-375	22.90
19/64	5/16	13/16	2-1/2	101-095	19.30	102-377	23.80
5/16	5/16	13/16	2-1/2	101-096	18.20	102-379	27.30
3/8	3/8	1	2-1/2	101-097	24.50	102-381	32.50
7/16	7/16	1	2-3/4	101-098	33.50	102-383	44.40
1/2	1/2	1	3	101-099	40.20	102-384	51.20
9/16	9/16	1-1/8	3-1/2	101-100	55.00	102-385	57.60
5/8	5/8	1-1/4	3-1/2	101-101	67.20	102-386	83.20
11/16	3/4	1-3/8	4	101-102	102.90	-	-
3/4	3/4	1-1/2	4	101-103	98.50	102-388	117.00
7/8	7/8	1-1/2	4	101-104	168.40	102-389	192.50
1	1	1-1/2	4	101-105	182.40	102-390	203.90

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright		TiAlN	
				Code No.	Price \$	Code No.	Price \$
1	3	3	39	101-490	13.30	102-391	14.00
1.5	3	5	39	101-491	8.60	102-392	10.70
2	3	7	39	101-492	9.50	102-393	11.00
2.5	3	8	39	101-493	9.50	-	-
3	3	10	39	101-494	9.10	-	-
3.5	4	12	51	101-495	11.90	102-396	14.40
4	4	14	51	101-496	13.10	-	-
4.5	5	14	51	101-497	13.10	102-398	15.50
5	5	16	51	101-498	13.10	102-399	15.50
6	6	19	64	101-499	15.70	102-401	19.40
7	8	19	64	101-500	17.80	102-403	22.10
8	8	21	64	101-501	18.20	102-405	22.60
9	10	22	70	101-502	21.00	102-407	30.80
10	10	25	70	101-503	24.50	102-409	30.40
11	11	25	70	101-504	33.70	-	-
12	12	25	76	101-505	40.40	102-413	47.30
14	14	30	89	101-506	54.80	102-415	64.80
16	16	32	89	101-507	67.50	102-417	78.70
18	18	35	102	101-508	87.10	102-419	105.20
20	20	38	102	101-509	98.90	102-421	130.80
22	22	38	102	101-510	168.40	102-423	202.60
25	25	38	102	101-511	183.00	102-425	220.10

3 Flute Ball Nose Reg. Length End Mills

3 flute carbide end mills offer maximum chip clearance therefore reducing chip packing.

For: End milling, Slotting, Sinking
On: Steels, Cast Iron, Aluminum, Copper, Brass, Plastics, and Abrasive type materials



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright		TiAlN	
				Code No.	Price \$	Code No.	Price \$
1/16	1/8	3/16	1-1/2	101-110	9.90	102-455	12.30
5/64	1/8	3/16	1-1/2	101-111	10.90	102-457	11.40
3/32	1/8	5/16	1-1/2	101-112	9.90	102-459	12.30
7/64	1/8	7/16	1-1/2	101-113	16.40	102-461	17.20
1/8	1/8	1/2	1-1/2	101-114	9.90	102-463	12.30
9/64	3/16	1/2	2	101-115	15.30	102-465	18.50
5/32	3/16	9/16	2	101-116	14.20	102-467	16.70
11/64	3/16	5/8	2	101-117	15.40	102-469	18.50
3/16	3/16	5/8	2	101-118	14.20	102-470	16.70
13/64	1/4	5/8	2-1/2	101-119	18.70	102-471	23.40
7/32	1/4	5/8	2-1/2	101-120	18.70	102-472	23.40
15/64	1/4	3/4	2-1/2	101-121	22.30	102-473	25.40
1/4	1/4	3/4	2-1/2	101-122	18.00	102-474	22.30
17/64	5/16	3/4	2-1/2	101-123	21.50	102-475	26.80
9/32	5/16	3/4	2-1/2	101-124	21.50	102-476	26.80
19/64	5/16	13/16	2-1/2	101-125	22.20	102-477	27.70
5/16	5/16	13/16	2-1/2	101-126	20.90	102-478	25.90
3/8	3/8	1	2-1/2	101-127	28.10	102-479	34.90
7/16	7/16	1	2-3/4	101-128	38.50	102-481	46.20
1/2	1/2	1	3	101-129	46.20	102-483	54.00
9/16	9/16	1-1/8	3-1/2	101-130	63.30	-	-
5/8	5/8	1-1/4	3-1/2	101-131	77.30	102-487	88.10
11/16	3/4	1-3/8	4	101-132	118.30	-	-
3/4	3/4	1-1/2	4	101-133	107.80	102-491	124.00
7/8	7/8	1-1/2	4	101-134	193.70	-	-
1	1	1-1/2	4	101-135	209.70	102-495	239.10

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright		TiAlN	
				Code No.	Price \$	Code No.	Price \$
1	3	3	39	101-520	15.30	102-497	16.10
1.5	3	5	39	101-521	9.90	102-499	12.20
2	3	7	39	101-522	10.90	102-501	13.00
2.5	3	8	39	101-523	9.40	102-503	11.70
3	3	10	39	101-524	9.40	102-505	11.70
3.5	4	12	51	101-525	13.70	102-507	16.70
4	4	14	51	101-526	14.20	102-509	16.80
4.5	5	14	51	101-527	15.10	102-511	18.50
5	5	16	51	101-528	15.10	102-513	17.60
6	6	19	64	101-529	18.00	102-515	22.30
7	8	19	64	101-530	28.90	-	-
8	8	21	64	101-531	21.00	102-519	26.00
9	10	22	70	101-532	24.10	102-521	34.80
10	10	25	70	101-533	28.20	102-523	34.40
11	11	25	70	101-534	31.30	-	-
12	12	25	76	101-535	46.40	102-527	54.30
14	14	30	89	101-536	63.00	102-529	75.50
16	16	32	89	101-537	77.60	102-531	88.50
18	18	35	102	101-538	100.20	102-533	119.70
20	20	38	102	101-539	113.20	102-535	136.90
22	22	38	102	101-540	193.70	102-537	232.90
25	25	38	102	101-541	170.40	102-539	253.10

Tolerances - Inch

Size	Diameter	Shank Diameter
3/32 thru 1"	+0.000"-.002"	+0.0000"-.0005"

Tolerances - Metric

Size	Diameter	Shank Diameter
1mm-25mm	+0.000mm-.051mm	+0.000mm-.013mm

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum



4 Flute Regular Length Carbide End Mills

The industry standard. Wear resistance and minimal deflection for excellent size control.

For: Slotting, Production milling, Profiling
On: Variety of Steels



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	1/8	1-1/2	103-781	7.70	102-899	10.10
3/64	1/8	9/64	1-1/2	103-782	5.50	102-831	10.60
1/16	1/8	3/16	1-1/2	103-870	5.00	102-832	7.90
5/64	1/8	1/4	1-1/2	103-783	4.90	102-833	9.60
3/32	1/8	5/16	1-1/2	103-871	5.00	102-834	7.90
7/64	1/8	3/8	1-1/2	103-784	5.00	102-835	9.60
1/8	1/8	1/2	1-1/2	103-860	5.00	102-836	7.70
9/64	3/16	1/2	2	103-785	6.20	102-837	9.60
5/32	3/16	9/16	2	103-861	6.20	102-839	14.90
11/64	3/16	9/16	2	103-786	6.90	102-841	15.00
3/16	3/16	5/8	2	103-862	6.90	102-838	9.40
13/64	1/4	5/8	2-1/2	103-787	8.70	102-843	19.60
7/32	1/4	5/8	2-1/2	103-863	8.70	102-845	18.10
1/4	1/4	3/4	2-1/2	103-864	8.70	102-840	10.90
9/32	5/16	3/4	2-1/2	103-865	11.30	102-847	22.50
5/16	5/16	13/16	2-1/2	103-866	11.30	102-842	15.70
11/32	3/8	7/8	2-1/2	103-789	14.20	102-849	29.10
3/8	3/8	1	2-1/2	103-867	14.20	102-844	18.70
13/32	7/16	1	2-3/4	103-790	21.70	102-851	39.50
7/16	7/16	1	2-3/4	103-868	21.70	102-846	25.60
1/2	1/2	1	3	103-869	26.20	102-848	31.10
9/16	9/16	1-1/8	3-1/2	103-933	37.70	102-850	42.70
5/8	5/8	1-1/4	3-1/2	103-934	47.00	102-852	48.80
11/16	3/4	1-3/8	4	103-935	66.30	102-854	69.80
3/4	3/4	1-1/2	4	103-936	66.30	102-856	74.50
7/8	7/8	1-1/2	4	103-937	93.10	102-858	101.90
1	1	1-1/2	4	103-938	106.60	102-860	115.80

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1	3	3	39	101-550	13.30	102-601	14.00
1.5	3	5	39	101-551	8.60	102-603	10.70
2	3	7	39	102-716	5.30	102-605	8.50
2.5	3	8	39	102-717	5.30	102-607	8.50
3	3	10	39	102-718	5.30	102-609	8.50
3.5	4	12	51	102-719	6.30	102-611	12.00
4	4	14	51	102-720	6.30	102-613	12.00
4.5	5	14	51	102-721	7.70	102-615	13.30
5	5	16	51	102-722	7.70	102-617	13.30
6	6	19	64	102-723	9.20	102-619	15.60
7	8	19	64	102-724	11.90	102-621	18.90
8	8	21	64	102-725	11.90	102-623	18.90
9	10	22	70	102-726	17.80	102-625	30.80
10	10	25	70	102-727	17.80	102-627	30.80
11	11	25	70	102-728	27.50	102-629	37.80
12	12	25	76	102-729	27.50	102-657	37.80
14	14	30	89	102-731	39.70	102-659	65.20
16	16	32	89	102-732	49.60	102-661	70.60
18	18	35	102	102-733	64.10	102-663	105.20
20	20	38	102	102-734	77.00	102-665	130.80
22	22	38	102	102-736	167.80	102-667	191.30
25	25	38	102	102-735	117.60	102-669	172.70

4 Flute Stub Length Carbide End Mills

Strength, rigidity and improved tool life can be obtained with this Stub Length End Mill. The premium micrograin carbide makes these mills tough enough to machine the very hard metals.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	5/64	1-1/2	101-260	13.00	102-540	14.10
3/64	1/8	3/32	1-1/2	101-261	9.20	102-541	11.90
1/16	1/8	1/8	1-1/2	101-262	8.20	102-542	10.90
5/64	1/8	5/32	1-1/2	101-263	7.60	102-543	11.60
3/32	1/8	3/16	1-1/2	101-264	8.20	102-544	13.70
7/64	1/8	7/32	1-1/2	101-265	9.20	102-545	11.20
1/8	1/8	1/4	1-1/2	101-266	7.90	102-546	12.00
9/64	3/16	9/32	2	101-267	9.30	102-547	11.30
5/32	3/16	5/16	2	101-268	15.70	-	-
3/16	3/16	3/8	2	101-269	10.70	102-549	13.10
7/32	1/4	7/16	2	101-270	11.90	102-551	17.10
1/4	1/4	1/2	2	101-271	12.10	102-553	18.00
5/16	5/16	1/2	2	101-272	17.40	102-555	25.60
3/8	3/8	5/8	2	101-273	24.60	102-557	31.30
7/16	7/16	5/8	2-1/2	101-274	30.00	102-559	38.80
1/2	1/2	5/8	2-1/2	101-275	39.50	102-561	45.00
5/8	5/8	3/4	3	101-276	61.30	102-563	77.00
3/4	3/4	1	3	101-277	95.10	102-565	113.20

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1	3	2	39	101-690	13.00	102-567	13.70
1.5	3	3	39	101-691	8.20	102-569	10.20
2	3	4	39	101-692	9.20	102-570	11.00
2.5	3	5	39	101-693	8.20	102-571	10.10
3	3	6	39	101-694	7.90	102-572	9.80
3.5	4	7	51	101-695	11.10	102-573	13.70
4	4	8	51	101-696	10.70	102-574	13.00
4.5	5	9	51	101-697	14.70	-	-
5	5	10	51	101-698	11.90	-	-
6	6	12	51	101-699	12.10	102-577	15.60
7	8	12	51	101-700	12.10	102-578	14.90
8	8	12	51	101-701	17.40	102-579	21.20
9	10	14	51	101-702	20.00	-	-
10	10	14	51	101-703	24.70	102-583	30.10
11	11	16	64	101-704	31.60	-	-
12	12	16	64	101-705	39.70	-	-

6pc-4 Fl Reg Length Carbide End Mill Set

The industry standard. Wear resistance and minimal deflection for excellent size control.

For: Slotting, Production milling, Profiling
On: Variety of Steels



6pc Set Contains	Code No.	Price \$
1/4", 5/16", 3/8", 1/2", 5/8", 3/4"	103-847	173.70

4 Flute Long Length Carbide End Mills

Long Length End Mills combine added flute and overall length for greater reach when deep slotting or milling. These end Mills have the capability to mill thicker material in one pass, eliminating the interrupted cut that may be present with regular length end Mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	3/4	2-1/4	102-981	7.90	102-922	9.80
3/16	3/16	3/4	2-1/4	102-982	8.90	102-924	10.60
1/4	1/4	1-1/8	3	102-983	10.80	102-926	12.70
5/16	5/16	1-1/8	3	102-984	15.50	102-928	20.00
3/8	3/8	1-1/8	3	102-985	19.40	102-930	22.30
7/16	7/16	2	4	102-986	32.20	102-932	33.70
1/2	1/2	2	4	102-987	38.10	102-934	38.70
5/8	5/8	2-1/4	5	102-988	97.50	102-936	70.10
3/4	3/4	2-1/4	5	102-989	92.70	102-938	96.60
1	1	2-1/4	5	102-990	185.70	102-940	174.90

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
3	3	19	57	101-600	15.10	102-901	15.90
4	4	19	57	101-601	16.80	102-903	18.90
5	5	25	64	101-602	17.30	102-905	19.50
6	6	28	76	101-603	22.20	102-907	26.00
8	8	29	76	101-604	27.20	102-909	31.30
10	10	32	76	101-605	34.50	102-911	42.30
12	12	51	102	101-606	63.00	102-913	66.10
14	14	57	127	101-607	96.20	102-915	114.90
16	16	57	127	101-608	128.60	-	-
18	18	57	127	101-609	134.80	102-919	153.70
20	20	57	127	101-610	152.60	102-917	173.90
25	25	57	127	101-611	307.10	-	-

4 Flute Extra Long Length End Mills

Extra Long Length End mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill much thicker material in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	1	3	102-450	8.40	102-550	10.10
3/16	3/16	1-1/8	3	102-452	9.50	102-552	11.10
1/4	1/4	1-1/2	4	102-454	11.80	102-554	14.00
5/16	5/16	1-5/8	4	102-456	17.30	102-556	21.70
3/8	3/8	1-3/4	4	102-458	21.80	102-558	23.90
7/16	7/16	3	6	102-460	46.10	102-560	49.40
1/2	1/2	3	6	102-462	47.50	102-562	50.60
5/8	5/8	3	6	102-464	84.80	102-564	82.40
3/4	3/4	3	6	102-466	109.80	102-566	108.00
1	1	3	6	102-468	220.10	102-568	204.50

4 Flute Double End Reg. Length End Mills

Four-flute configuration with center cutting permits plunging and milling on many ferrous and non-ferrous materials, and offers lower chip-load for size control and finish.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	3/8	3/8	3-1/16	101-340	30.90	102-589	37.90
5/32	3/8	7/16	3-1/8	101-341	32.90	-	-
3/16	3/8	1/2	3-1/4	101-342	32.70	102-593	38.90
7/32	3/8	9/16	3-3/8	101-343	36.10	102-595	43.80
1/4	3/8	5/8	3-3/8	101-344	36.70	102-597	44.30
9/32	3/8	11/16	3-3/8	101-345	40.90	102-599	48.90
5/16	3/8	3/4	3-1/2	101-346	42.30	102-671	50.50
11/32	3/8	3/4	3-1/2	101-347	47.40	-	-
3/8	3/8	3/4	3-1/2	101-348	47.20	102-675	55.10
7/16	1/2	7/8	4	101-349	96.60	-	-
1/2	1/2	1	4	101-350	70.20	102-679	83.10

4 Flute Double End Stub Length End Mills

These end mills have a shorter flute length which provides greater rigidity with less deflection for shallow milling or slotting. This series is ideal for use on high tensile alloys and heat treated steels.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/16	1/8	1/8	1-1/2	102-230	7.00	102-330	8.90
3/32	1/8	3/16	1-1/2	102-232	7.00	102-332	8.90
1/8	1/8	1/4	1-1/2	102-234	6.60	102-334	8.70
5/32	3/16	5/16	2	102-236	9.40	102-336	11.20
3/16	3/16	3/8	2	102-238	9.40	102-338	11.20
7/32	1/4	1/2	2-1/2	102-240	11.70	102-340	13.10
1/4	1/4	1/2	2-1/2	102-242	11.60	102-342	13.10
5/16	5/16	1/2	2-1/2	102-244	17.10	102-344	20.00
3/8	3/8	1/2	2-1/2	102-246	17.20	102-346	21.10
7/16	7/16	9/16	2-3/4	102-248	25.80	102-348	28.60
1/2	1/2	5/8	3	102-250	31.10	102-350	33.50

Tolerances - Inch

Size	Diameter	Shank Diameter
3/32 thru 1"	+ .000" - .002"	+ .0000" - .0005"

Tolerances - Metric

Size	Diameter	Shank Diameter
1mm-25mm	+ .000mm - .051mm	+ .000mm - .013mm

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum



4 Flute Corner Radius Regular Length Carbide End Mills

Four flute carbide end mills with corner radius allows more strength and minimizes chipping on corners. Four flute construction provides more strength than two or three flute and will also result in excellent surface finishes.



Inch

Cutting Dia. (in.)	Corner Radius	Shank Dia. (in.)	Flute Length (in.)	Overall Length (in.)	Bright		TiAlN	
					Code No.	Price \$	Code No.	Price \$
1/8	.015"	1/8	1/2	1-1/2	101-175	10.30	101-833	11.80
3/16	.020"	3/16	5/8	2	101-176	14.20	101-834	16.80
3/16	.030"	3/16	5/8	2	101-177	14.20	101-835	16.80
1/4	.020"	1/4	3/4	2-1/2	101-178	18.40	101-836	21.50
1/4	.030"	1/4	3/4	2-1/2	101-179	18.40	101-837	21.50
1/4	.045"	1/4	3/4	2-1/2	101-180	19.10	101-838	21.50
5/16	.020"	5/16	13/16	2-1/2	101-181	21.40	101-839	25.50
5/16	.030"	5/16	13/16	2-1/2	101-182	21.40	101-862	25.50
5/16	.045"	5/16	13/16	2-1/2	101-183	21.40	101-863	25.50
3/8	.020"	3/8	1	2-1/2	101-184	28.80	101-864	34.10
3/8	.030"	3/8	1	2-1/2	101-185	28.80	101-865	34.10
3/8	.045"	3/8	1	2-1/2	101-186	28.80	101-866	34.10
1/2	.020"	1/2	1	3	101-187	46.60	101-867	55.40
1/2	.030"	1/2	1	3	101-188	46.60	101-868	55.40
1/2	.045"	1/2	1	3	101-189	46.60	101-869	55.40
1/2	.060"	1/2	1	3	101-190	46.60	101-892	55.40
5/8	.020"	5/8	1-1/4	3-1/2	101-191	78.30	101-893	93.20
5/8	.030"	5/8	1-1/4	3-1/2	101-192	78.00	101-894	92.80
5/8	.045"	5/8	1-1/4	3-1/2	101-193	78.00	101-895	92.80
5/8	.060"	5/8	1-1/4	3-1/2	101-194	80.60	101-896	95.90
5/8	.090"	5/8	1-1/4	3-1/2	101-195	80.90	101-897	96.30
3/4	.020"	3/4	1-1/2	4	101-197	110.80	101-898	131.80
3/4	.030"	3/4	1-1/2	4	101-198	110.80	101-899	131.80
3/4	.045"	3/4	1-1/2	4	101-199	114.70	101-990	136.40
3/4	.060"	3/4	1-1/2	4	101-200	114.20	101-991	135.90
3/4	.090"	3/4	1-1/2	4	101-201	108.80	101-992	129.40
3/4	.125"	3/4	1-1/2	4	101-196	116.20	101-993	138.20
1	.020"	1	1-1/2	4	101-203	206.40	101-994	245.60
1	.030"	1	1-1/2	4	101-204	205.70	101-995	244.70
1	.045"	1	1-1/2	4	101-205	209.80	101-996	249.60
1	.060"	1	1-1/2	4	101-206	192.00	101-997	217.60
1	.090"	1	1-1/2	4	101-207	206.10	101-998	245.20
1	.125"	1	1-1/2	4	101-202	216.40	101-999	253.80

4 Flute Ball Nose Stub Length Carbide End Mills

Strength, rigidity and improved tool life can be obtained with this Stub Length End Mill.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright		TiAlN	
				Code No.	Price \$	Code No.	Price \$
1/32	1/8	5/64	1-1/2	101-280	16.50	102-681	19.00
3/64	1/8	3/32	1-1/2	101-281	10.60	102-683	12.80
1/16	1/8	1/8	1-1/2	101-282	9.40	102-685	11.60
5/64	1/8	5/32	1-1/2	101-283	10.60	102-687	13.60
3/32	1/8	3/16	1-1/2	101-284	9.40	102-689	11.50
7/64	1/8	7/32	1-1/2	101-285	10.60	102-691	13.20
1/8	1/8	1/4	1-1/2	101-286	9.10	102-693	11.90
9/64	3/16	9/32	2	101-287	13.40	102-694	16.50
5/32	3/16	5/16	2	101-288	13.40	102-695	16.00
3/16	3/16	3/8	2	101-289	12.40	102-781	15.20
7/32	1/4	7/16	2	101-290	13.70	102-783	16.90
1/4	1/4	1/2	2	101-291	13.90	102-785	19.40
5/16	5/16	1/2	2	101-292	19.90	102-787	27.50
3/8	3/8	5/8	2	101-293	28.30	102-789	36.90
7/16	7/16	5/8	2-1/2	101-294	36.30	102-791	45.10
1/2	1/2	5/8	2-1/2	101-295	45.60	102-793	53.20
5/8	5/8	3/4	3	101-296	70.50	102-795	80.40
3/4	3/4	1	3	101-297	109.80	102-797	125.10

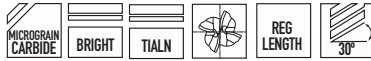
Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright		TiAlN	
				Code No.	Price \$	Code No.	Price \$
1	3	2	39	101-710	13.10	102-891	16.00
1.5	3	3	39	101-711	8.20	102-893	10.20
2	3	4	39	101-712	14.60	-	-
2.5	3	5	39	101-713	11.00	-	-
3	3	6	39	101-714	8.00	102-941	9.90
3.5	4	7	51	101-715	12.80	-	-
4	4	8	51	101-716	16.60	-	-
4.5	5	9	51	101-717	13.50	-	-
5	5	10	51	101-718	13.70	102-935	16.80
6	6	12	51	101-719	12.80	102-945	15.70
7	8	12	51	101-720	12.20	-	-
8	8	12	51	101-721	14.10	-	-
9	10	14	51	101-722	23.00	102-943	27.80
10	10	14	51	101-723	24.70	-	-
11	11	16	64	101-724	31.60	-	-
12	12	16	64	101-725	39.70	-	-

4 Flute Ball Nose Regular Length Carbide End Mills

The industry standard. Wear resistance and minimal deflection for excellent size control.

For: General purpose milling, Production milling, Contouring
On: Steels, Stainless Steels



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	1/2	1-1/2	103-880	6.20	102-882	8.80
3/16	3/16	5/8	2	103-881	9.00	102-884	11.20
1/4	1/4	3/4	2-1/2	103-882	11.30	102-886	13.10
5/16	5/16	13/16	2-1/2	103-883	13.10	102-888	17.30
3/8	3/8	1	2-1/2	103-884	17.60	102-890	21.70
1/2	1/2	1	3	103-885	29.00	102-892	33.70
9/16	9/16	1-1/8	3-1/2	103-939	45.70	102-894	47.40
5/8	5/8	1-1/4	3-1/2	103-940	55.20	102-896	55.70
11/16	3/4	1-3/8	4	103-941	77.40	102-895	108.70
3/4	3/4	1-1/2	4	103-942	77.40	102-898	84.40
7/8	7/8	1-1/2	4	103-943	107.40	102-897	184.10
1	1	1-1/2	4	103-944	123.60	102-900	130.90

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1	3	3	39	102-737	15.30	101-635	16.10
1.5	3	5	39	102-738	9.90	101-636	12.00
2	3	7	39	102-760	6.70	101-637	10.00
2.5	3	8	39	102-761	6.70	101-638	10.00
3	3	10	39	102-762	6.70	101-639	8.70
3.5	4	12	51	102-763	7.30	101-656	12.00
4	4	14	51	102-764	9.00	101-657	13.70
4.5	5	14	51	102-765	10.00	101-658	15.40
5	5	16	51	102-766	10.00	101-659	15.40
6	6	19	64	102-767	12.00	101-660	16.10
7	8	19	64	102-768	13.90	101-661	22.20
8	8	21	64	102-769	13.90	101-662	22.20
9	10	22	70	102-770	21.80	101-663	34.80
10	10	25	70	102-771	21.70	101-664	35.50
11	11	25	70	102-772	30.80	101-665	44.30
12	12	25	76	102-773	30.80	101-666	44.30
14	14	30	89	102-775	48.90	101-667	74.90
16	16	32	89	102-776	59.20	101-668	81.10
18	18	35	102	102-777	76.10	101-669	123.50
20	20	38	102	102-778	89.80	101-686	156.40
25	25	38	102	102-779	137.50	101-687	209.60

4 Flute Ball Nose Long Length End Mills

Added flute and overall length combine for greater reach when deep slotting or milling. These end mills have the capability to mill thicker material in one pass, eliminating the interrupted cut that may be present with regular length end mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	3/4	2-1/4	102-991	9.60	102-942	11.20
3/16	3/16	3/4	2-1/2	102-992	11.90	102-944	15.50
1/4	1/4	1-1/8	3	102-993	17.40	102-946	20.00
5/16	5/16	1-1/8	3	102-994	19.60	102-948	23.10
3/8	3/8	1-1/8	3	102-995	25.20	102-950	29.20
7/16	7/16	2	4	102-996	36.30	102-952	42.30
1/2	1/2	2	4	102-997	42.10	102-954	48.40
5/8	5/8	2-1/4	5	102-998	92.80	102-956	100.20
3/4	3/4	2-1/4	5	102-999	143.90	102-958	142.40
1	1	2-1/4	5	103-000	255.60	102-960	245.20

Multi-Flute Rougher - TiAlN Coated

These fine pitch roughing end mills have an excellent flute design for roughing applications in a variety of materials. TiAlN coating enhances speeds-feeds and tool life.

• 4 flutes



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	TiAlN Code No.	Price \$
1/4	1/4	3/4	2-1/2	102-185	30.00
5/16	5/16	3/4	2-1/2	102-190	35.10
3/8	3/8	1	2-1/2	102-200	40.10
1/2	1/2	1-1/4	3	102-205	53.30
5/8	5/8	1-1/4	3-1/2	102-210	87.60
3/4	3/4	1-5/8	4	102-215	103.10
1	1	1-3/4	4	102-220	201.70

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
3	3	19	57	101-620	17.30	101-764	18.20
4	4	19	57	101-621	19.30	101-765	24.30
5	5	25	64	101-622	19.90	101-766	22.60
6	6	28	76	101-623	25.50	101-767	31.20
8	8	29	76	101-624	31.30	101-768	37.60
10	10	32	76	101-625	39.70	101-769	46.30
12	12	51	102	101-626	72.70	101-770	76.30
14	14	57	127	101-627	111.00	-	-
16	16	57	127	101-628	135.40	101-772	152.40
18	18	57	127	101-629	155.70	-	-
20	20	57	127	101-630	175.50	101-774	200.10
25	25	57	127	101-631	353.10	-	-

Tolerances - Inch

Size	Diameter	Shank Diameter
3/32 thru 1"	+0.000"-.002"	+0.0000"-.0005"

Tolerances - Metric

Size	Diameter	Shank Diameter
1mm-25mm	+0.000mm-.051mm	+0.000mm-.013mm

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum



4 Flute Ball Nose Extra Long Length

Extra Long Length End mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill much thicker material in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	1/8	1	3	102-480	11.40	102-580	12.60
3/16	3/16	1-1/8	3	102-482	16.10	102-582	19.60
1/4	1/4	1-1/2	4	102-484	20.60	102-584	21.50
5/16	5/16	1-5/8	4	102-486	23.10	102-586	25.00
3/8	3/8	1-3/4	4	102-488	29.30	102-588	31.40
7/16	7/16	3	6	102-490	57.40	102-590	59.00
1/2	1/2	3	6	102-492	56.20	102-592	58.00
5/8	5/8	3	6	102-494	115.50	102-594	108.50
3/4	3/4	3	6	102-496	170.50	102-596	159.60
1	1	3	6	102-498	302.00	102-598	274.00

4 Flute Ball Nose Double End Reg. Length

The ball nose 4 flute centre cut design allows for excellent finish while contour milling.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/8	3/8	3/8	3-1/16	101-360	35.60	101-708	42.70
5/32	3/8	7/16	3-1/8	101-361	37.80	-	-
3/16	3/8	1/2	3-1/4	101-362	37.80	101-726	44.30
7/32	3/8	9/16	3-3/8	101-363	41.50	-	-
1/4	3/8	5/8	3-3/8	101-364	42.30	101-728	49.60
9/32	3/8	11/16	3-3/8	101-365	47.20	-	-
5/16	3/8	3/4	3-1/2	101-366	48.80	101-739	56.70
11/32	3/8	3/4	3-1/2	101-367	54.50	-	-
3/8	3/8	3/4	3-1/2	101-368	54.50	101-748	63.10
7/16	1/2	7/8	4	101-369	81.00	-	-
1/2	1/2	1	4	101-370	85.10	101-763	97.20

4 Flute Ball Nose Double End Stub Length

These end mills have a shorter flute length which provides greater rigidity with less deflection for shallow milling or slotting. This series is ideal for use on high tensile alloys and heat treated steels.



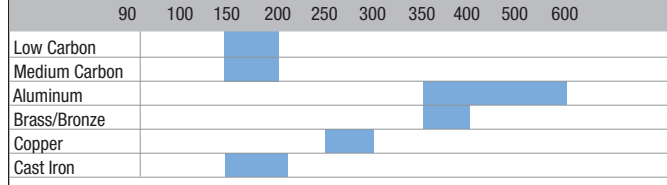
Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiAlN Code No.	Price \$
1/32	1/8	5/64	1-1/2	101-355	23.50	101-776	24.70
3/64	1/8	3/32	1-1/2	101-356	16.00	101-777	18.80
1/16	1/8	1/8	1-1/2	101-357	14.40	101-778	17.80
3/32	1/8	3/16	1-1/2	101-358	14.40	101-779	15.50
1/8	1/8	1/4	1-1/2	101-359	13.40	101-802	16.60
5/32	3/16	5/16	2	101-371	19.70	101-803	23.40
3/16	3/16	3/8	2	101-372	19.30	101-804	22.50
7/32	1/4	1/2	2-1/2	101-373	25.00	101-805	33.00
1/4	1/4	1/2	2-1/2	101-374	24.30	101-806	32.70
5/16	5/16	1/2	2-1/2	101-375	35.20	101-807	46.40
3/8	3/8	1/2	2-1/2	101-376	37.50	101-808	48.90
7/16	7/16	9/16	2-3/4	101-377	48.30	101-809	62.50
1/2	1/2	5/8	3	101-378	63.30	101-832	74.40

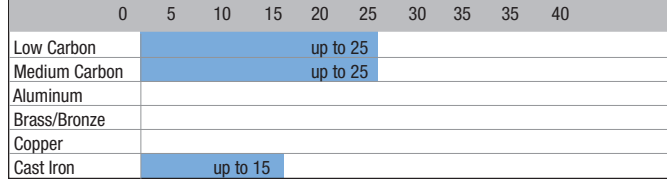
Cutting Conditions for Bright Carbide

Materials	Main Group	Sub-Group	Condition	Hardness (HRC)	Cutting Speed (SFM)
Low Carbon	1018, 1010, 1035		Normalized	<25	150-200
Medium Carbon	1045, 1050, 1065		Normalized	<25	150-200
Aluminum	Unalloyed, Cast		-	-	350-600
Brass/Bronze	-		-	-	350-400
Copper	-		-	-	250-300
Cast Iron	-	As Cast	-	<15	150-225

Cutting Speed (sfm)



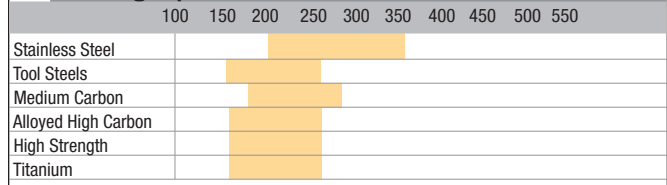
Hardness (hrc)



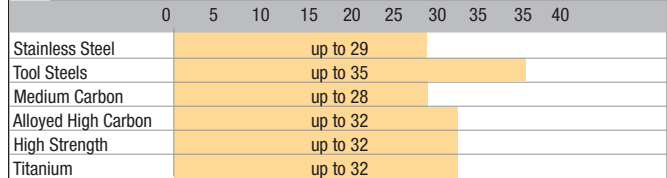
Cutting Conditions for TiAlN

Materials	Main Group	Sub-Group	Condition	Hardness (Hrc)	Cutting Speed (SFM)
Stainless Steels	300 Series, 400 Series		Annealed	<29	200-350
Tool Steels	01, A-2, D-2, H-13, P-20		Annealed	<35	150-250
Medium Carbon	1030, 1035, 1038, 1040, 1045, 1050		Normalized	<28	190-275
Alloyed High Carbon	1065, 1070, 1080, 1090, 1095, 1561, 1572		Normalized	<32	150-250
High Strength Titanium	4140, 4340 Commercially Pure		Normalized, Annealed	<32	150-250

Cutting Speed (sfm)



Hardness (hrc)



2 Flute Regular Length Typhoon End Mills

These end mills are manufactured with Premium Sub-Micron carbide and are designed to cut hardened materials. The unique geometry of the Typhoon end mill combined with its modified AlTiN coating make it an excellent choice for demanding applications.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/16	1/8	3/16	1-1/2	104-602	21.10
3/32	1/8	5/16	1-1/2	104-601	20.20
1/8	1/8	1/2	1-1/2	104-600	23.40
5/32	3/16	9/16	2	104-603	26.10
3/16	3/16	5/8	2	104-604	26.10
7/32	1/4	5/8	2-1/2	104-605	28.80
1/4	1/4	3/4	2-1/2	104-608	31.90
9/32	5/16	3/4	2-1/2	104-607	41.40
5/16	5/16	13/16	2-1/2	104-612	41.40
3/8	3/8	1	2-1/2	104-616	54.50
7/16	7/16	1	2-3/4	104-618	62.70
1/2	1/2	1	3	104-620	78.10
9/16	9/16	1-1/8	3-1/2	104-622	120.30
5/8	5/8	1-1/4	3-1/2	104-624	142.30
11/16	3/4	1-3/8	4	104-630	163.40
3/4	3/4	1-1/2	4	104-628	191.50
7/8	7/8	1-1/2	4	104-631	247.60
1	1	1-1/2	4	104-632	274.60

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1	3	3	39	101-780	19.30
1.5	3	5	39	101-781	16.90
2	3	7	39	101-782	17.70
2.5	3	8	39	101-783	17.70
3	3	10	39	101-784	17.70
3.5	4	12	51	101-785	23.80
4	4	14	51	101-786	23.80
4.5	5	14	51	101-787	21.30
5	5	16	51	101-788	26.10
6	6	19	64	101-789	34.10
7	8	19	64	101-790	35.70
8	8	21	64	101-791	45.90
9	10	22	70	101-792	53.70
10	10	25	70	101-793	62.90
11	12	25	70	101-794	77.40
12	12	25	76	101-795	73.90
14	14	30	89	101-796	100.40
16	16	32	89	101-797	115.80
18	18	35	102	101-798	163.50
20	20	38	102	101-799	197.20
22	22	38	102	101-800	248.30
25	25	38	102	101-801	287.40

2 Flute Long Length Typhoon End Mills

These Typhoon end mills have the added reach and depth of cut required for longer reach applications in hardened materials.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	3/4	2-1/4	104-815	27.80
3/16	3/16	3/4	2-1/4	104-816	29.80
1/4	1/4	1-1/8	3	104-818	37.90
5/16	5/16	1-1/8	3	104-820	54.70
3/8	3/8	1-1/8	3	104-822	58.90
1/2	1/2	2	4	104-824	83.70
5/8	5/8	2-1/4	5	104-826	206.90
3/4	3/4	2-1/4	5	104-830	326.20
1	1	2-1/4	5	104-831	338.60

2 Flute Corner Radius Typhoon End Mills

Typhoon end mills with corner radius allow more strength and minimize chipping on the corners in demanding applications.



Inch

Cutting Dia.	Corner Radius	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	.015"	1/8	1/2	1-1/2	102-602	27.50
3/16	.020"	3/16	5/8	2	102-610	27.70
1/4	.020"	1/4	3/4	2-1/2	102-616	27.60
1/4	.030"	1/4	3/4	2-1/2	102-618	29.20
5/16	.020"	5/16	13/16	2-1/2	102-620	49.10
3/8	.020"	3/8	1	2-1/2	102-628	52.70
3/8	.030"	3/8	1	2-1/2	102-630	52.70
1/2	.020"	1/2	1	3	102-636	75.20
1/2	.030"	1/2	1	3	102-638	75.20
1/2	.060"	1/2	1	3	102-640	100.90

2 Flute Ball Nose Reg. Length Typhoon

Typhoon ball nose end mills are designed for contour milling applications in hardened materials.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/16	1/8	3/16	1-1/2	104-649	30.70
3/32	1/8	5/16	1-1/2	104-651	29.80
1/8	1/8	1/2	1-1/2	104-650	28.90
5/32	3/16	9/16	2	104-653	31.20
3/16	3/16	5/8	2	104-654	31.20
7/32	1/4	5/8	2-1/2	104-655	41.80
1/4	1/4	3/4	2-1/2	104-658	43.80
9/32	5/16	3/4	2-1/2	104-657	56.40
5/16	5/16	13/16	2-1/2	104-662	57.10
3/8	3/8	1	2-1/2	104-666	66.70
7/16	7/16	1	2-3/4	104-668	72.00
1/2	1/2	1	3	104-670	100.90
9/16	9/16	1-1/8	3-1/2	104-672	122.90
5/8	5/8	1-1/4	3-1/2	104-674	140.30
3/4	3/4	1-1/2	4	104-678	230.10
7/8	7/8	1-1/2	4	104-681	281.50
1	1	1-1/2	4	104-682	315.70

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1	3	3	39	101-810	22.10
1.5	3	5	39	101-811	20.50
2	3	7	39	101-812	20.50
2.5	3	8	39	101-813	16.70
3	3	10	39	101-814	20.50
3.5	4	12	51	101-815	22.10
4	4	14	51	101-816	27.20
4.5	5	14	51	101-817	29.10
5	5	16	51	101-818	30.20
6	6	19	64	101-819	39.30
7	8	19	64	101-820	41.10
8	8	21	64	101-821	45.00
9	10	22	70	101-822	61.60
10	10	25	70	101-823	61.60
11	12	25	70	101-824	70.40
12	12	25	76	101-825	85.00
14	14	30	89	101-826	115.50
16	16	32	89	101-827	133.00
18	18	35	102	101-828	188.00
20	20	38	102	101-829	279.20
22	22	38	102	101-830	293.10
25	25	38	102	101-831	339.00



2 Flute Ball Nose Long Length Typhoon

Typhoon ball nose end mills are designed for contour milling in hardened materials. The long length allows milling tougher materials in longer reach applications.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	3/4	2-1/4	104-652	35.80
3/16	3/16	3/4	2-1/4	104-656	27.30
1/4	1/4	1-1/8	3	104-660	47.50
5/16	5/16	1-1/8	3	104-663	58.40
3/8	3/8	1-1/8	3	104-667	81.50
1/2	1/2	2	4	104-671	161.30
5/8	5/8	2-1/4	5	104-675	233.30
3/4	3/4	2-1/4	5	104-679	299.40
1	1	2-1/4	5	104-683	577.80

2 Flute Mold Mill Typhoon End Mills

The Typhoon Mold Mill offers excellent performance and tool life in mold milling applications on tougher materials.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	5/16	2-3/8	104-034	63.10
3/16	3/16	3/8	3-1/8	104-036	45.10
1/4	1/4	1/2	3-1/2	104-038	63.30
5/16	5/16	15/32	4	104-040 •	67.80
3/8	3/8	3/4	4	104-042	86.80
1/2	1/2	7/8	4-1/4	104-044	198.70
3/4	3/4	1-1/8	6	104-048 •	308.00
1	1	1-1/2	6	104-050 •	492.70

• Only available while quantities last

2 Flute Spherical Ball End Typhoon

- High performance ball nose plus end mills are used in the mold industry and have a full 220 degree arc cutting capability
- Modified AlTiN coated for improved tool life and increased production output
- Made from premium submicron grain carbide



Regular Length

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	3/32	1-1/2	153-110	28.70
3/16	3/16	9/64	2	153-112	29.00
1/4	1/4	3/16	2-1/2	153-114	42.20
3/8	3/8	9/32	2-1/2	153-116	59.40
1/2	1/2	3/8	3	153-118	87.90

Long Length

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	3/32	3	153-120	32.50
3/16	3/16	9/64	3	153-122	33.00
1/4	1/4	3/16	4	153-124	57.30
3/8	3/8	9/32	4	153-126	66.90
1/2	1/2	3/8	6	153-128	125.30

4 Flute Regular Length Typhoon End Mills

These end mills are manufactured with Premium Sub-Micron carbide and are designed to cut hardened materials. The unique geometry of the Typhoon end mill combined with its modified AlTiN coating make it an excellent choice for demanding applications.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/16	1/8	3/16	1-1/2	104-702	21.10
3/32	1/8	5/16	1-1/2	104-701	22.10
1/8	1/8	1/2	1-1/2	104-700	21.10
5/32	3/16	9/16	2	104-703	23.60
3/16	3/16	5/8	2	104-704	26.10
7/32	1/4	5/8	2-1/2	104-705	28.70
1/4	1/4	3/4	2-1/2	104-708	28.70
9/32	5/16	3/4	2-1/2	104-707	41.40
5/16	5/16	13/16	2-1/2	104-712	41.40
3/8	3/8	1	2-1/2	104-716	49.00
7/16	7/16	1	2-3/4	104-718	62.70
1/2	1/2	1	3	104-720	78.10
9/16	9/16	1-1/8	3-1/2	104-722	120.30
5/8	5/8	1-1/4	3-1/2	104-724	142.30
11/16	3/4	1-3/8	4	104-730	163.40
3/4	3/4	1-1/2	4	104-728	201.20
7/8	7/8	1-1/2	4	104-731	247.60
1	1	1-1/2	4	104-732	338.10

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1	3	3	39	101-840	19.30
1.5	3	5	39	101-841	17.70
2	3	7	39	101-842	17.70
2.5	3	8	39	101-843	17.70
3	3	10	39	101-844	17.70
3.5	4	12	51	101-845	23.80
4	4	14	51	101-846	23.80
4.5	5	14	51	101-847	26.10
5	5	16	51	101-848	26.10
6	6	19	64	101-849	34.10
7	8	19	64	101-850	44.00
8	8	21	64	101-851	48.20
9	10	22	70	101-852	62.90
10	10	25	70	101-853	66.00
11	12	25	70	101-854	77.40
12	12	25	76	101-855	90.90
14	14	30	89	101-856	123.50
16	16	32	89	101-857	142.80
18	18	35	102	101-858	163.50
20	20	38	102	101-859	242.80
22	22	38	102	101-860	427.60
25	25	38	102	101-861	287.40

4 Flute Long Length Typhoon End Mills

These end mills are manufactured with Premium Sub-Micron carbide and are designed to cut hardened materials. The unique geometry of the Typhoon end mill combined with its modified AlTiN coating make it an excellent choice for demanding and longer reach applications.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	3/4	2-1/4	104-832	27.80
3/16	3/16	3/4	2-1/4	104-834	29.80
1/4	1/4	1-1/8	3	104-836	37.90
5/16	5/16	1-1/8	3	104-838	54.70
3/8	3/8	1-1/8	3	104-840	65.70
1/2	1/2	2	4	104-842	103.00
5/8	5/8	2-1/4	5	104-844	179.30
3/4	3/4	2-1/4	5	104-846	312.30
1	1	2-1/4	5	104-848	711.20

4 Flute Corner Radius Typhoon End Mills

Typhoon end mills with corner radius provides greater strength and minimizes chipping on the corners in demanding applications.



Inch

Cutting Dia.	Corner Radius	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	.015"	1/8	1/2	1-1/2	102-652	34.40
3/16	.020"	3/16	5/8	2	102-660	34.00
1/4	.020"	1/4	3/4	2-1/2	102-666	34.00
1/4	.030"	1/4	3/4	2-1/2	102-668	34.00
5/16	.020"	5/16	13/16	2-1/2	102-670	49.10
5/16	.030"	5/16	13/16	2-1/2	102-672	49.10
3/8	.020"	3/8	1	2-1/2	102-678	52.70
3/8	.030"	3/8	1	2-1/2	102-680	52.70
1/2	.020"	1/2	1	3	102-686	92.60
1/2	.030"	1/2	1	3	102-688	92.60
1/2	.060"	1/2	1	3	102-690	100.90

4 Flute Ball Nose Reg. Length Typhoon

Typhoon ball nose end mills are designed for contour milling applications in hardened materials.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/16	1/8	3/16	1-1/2	104-752	30.70
3/32	1/8	5/16	1-1/2	104-751	29.80
1/8	1/8	1/2	1-1/2	104-750	32.00
5/32	3/16	9/16	2	104-753	34.60
3/16	3/16	5/8	2	104-754	31.20
7/32	1/4	5/8	2-1/2	104-755	48.80
1/4	1/4	3/4	2-1/2	104-758	43.80
9/32	5/16	3/4	2-1/2	104-757	59.30
5/16	5/16	13/16	2-1/2	104-762	57.10
3/8	3/8	1	2-1/2	104-766	66.70
7/16	7/16	1	2-3/4	104-768	72.00
1/2	1/2	1	3	104-770	100.90
9/16	9/16	1-1/8	3-1/2	104-772	122.90
5/8	5/8	1-1/4	3-1/2	104-774	172.60
11/16	3/4	1-3/8	4	104-780	196.30
3/4	3/4	1-1/2	4	104-778	196.30
7/8	7/8	1-1/2	4	104-781	312.70
1	1	1-1/2	4	104-782	315.70

4 Flute Spherical Ball End Typhoon

- High performance ball nose plus end mills are used in the mold industry and have a full 220 degree arc cutting capability
- Modified AlTiN coated for improved tool life and increased production output
- Made from premium submicron grain carbide



Regular Length

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	3/32	1-1/2	153-130	27.40
3/16	3/16	9/64	2	153-132	37.20
1/4	1/4	3/16	2-1/2	153-134	51.80
3/8	3/8	9/32	2-1/2	153-136	59.40
1/2	1/2	3/8	3	153-138	122.50

Long Length

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1/8	1/8	3/32	3	153-140	32.50
3/16	3/16	9/64	3	153-142	33.00
1/4	1/4	3/16	4	153-144	59.70
3/8	3/8	9/32	4	153-146	66.90
1/2	1/2	3/8	6	153-148	177.20

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$
1	3	3	39	101-870	22.10
1.5	3	5	39	101-871	20.50
2	3	7	39	101-872	20.50
2.5	3	8	39	101-873	20.50
3	3	10	39	101-874	20.50
3.5	4	12	51	101-875	27.20
4	4	14	51	101-876	27.20
4.5	5	14	51	101-877	28.70
5	5	16	51	101-878	30.20
6	6	19	64	101-879	39.30
7	8	19	64	101-880	50.60
8	8	21	64	101-881	55.70
9	10	22	70	101-882	61.60
10	10	25	70	101-883	61.60
11	12	25	70	101-884	70.40
12	12	25	76	101-885	104.60
14	14	30	89	101-886	115.50
16	16	32	89	101-887	133.00
18	18	35	102	101-888	188.00
20	20	38	102	101-889	226.80
22	22	38	102	101-890	293.10
25	25	38	102	101-891	339.00

Tolerances - Inch

Size	Diameter	Shank Diameter
3/32 thru 1"	+0.000"-.002"	+0.0000"-0.0005"

Tolerances - Metric

Size	Diameter	Shank Diameter
1mm-25mm	+0.000mm-.051mm	+0.000mm-.013mm

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum



4 Flute Ball Nose Long Length Typhoon

Typhoon ball nose end mills are designed for long reach contour milling applications in hardened materials.



Inch				SUB-MICRON CARBIDE		Mod AlTiN		LONG LENGTH	
Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Typhoon Code No.	Price \$				
1/8	1/8	3/4	2-1/4	104-833	37.50				
3/16	3/16	3/4	2-1/4	104-835	45.30				
1/4	1/4	1-1/8	3	104-837	57.60				
5/16	5/16	1-1/8	3	104-839	72.00				
3/8	3/8	1-1/8	3	104-841	81.50				
1/2	1/2	2	4	104-843	161.30				
5/8	5/8	2-1/4	5	104-845	287.20				
3/4	3/4	2-1/4	5	104-847	299.40				
1	1	2-1/4	5	104-849	577.80				

Roughers Regular Length Typhoon

This fine pitch rougher is designed for milling harder metals and has updated geometry in the design of this tool for higher feed rates with no vibration or chatter and chipbreakers to eliminate birdnesting.



Inch				SUB-MICRON CARBIDE		Mod AlTiN		REG LENGTH	
Cutting Dia.	Shank Dia.	Flute Length	Overall Length	No. of Flutes	Typhoon Code No.	Price \$			
1/4	1/4	3/4	2-1/2	3	104-800	38.70			
5/16	5/16	3/4	2-1/2	3	104-802	53.90			
3/8	3/8	7/8	2-1/2	3	104-804	63.70			
1/2	1/2	1	3	4	104-806	101.50			
5/8	5/8	1-1/4	3-1/2	4	104-810	185.00			
3/4	3/4	1-5/8	4	4	104-812	212.40			
1	1	1-3/4	4	5	104-814	344.40			

Multi-Flute Regular Length Typhoon

Multi Flute Typhoon end mill design allow them to be run at higher RPM than conventional end mills as well as increase tool life without chipping.



Inch				SUB-MICRON CARBIDE		Mod AlTiN		REG LENGTH		50°	
Cutting Dia.	Shank Dia.	Flute Length	Overall Length	No. of Flutes	Typhoon Code No.	Price \$					
1/8	1/8	1/2	1-1/2	4	101-050	20.50					
3/16	3/16	5/8	2	4	101-052	38.60					
1/4	1/4	3/4	2-1/2	6	101-054	58.30					
5/16	5/16	13/16	2-1/2	6	101-056	39.70					
3/8	3/8	1	2-1/2	6	101-058	65.40					
7/16	7/16	1	2-3/4	6	101-060	91.20					
1/2	1/2	1	3	6	101-062	105.70					
9/16	9/16	1-1/8	3-1/2	6	101-064	127.10					
5/8	5/8	1-1/4	3-1/2	6	101-066	142.60					
3/4	3/4	1-1/2	4	6	101-068	214.40					
7/8	7/8	1-1/2	4	6	101-070	272.30					
1	1	1-1/2	4	8	101-072	314.90					

4 Flute Carbide VariCut End Mills



VariCut is designed with a new patent pending core form and a new end geometry that uses unequal flute spacing to enable higher feed rates.



VariCut has reinforced corner geometry, using a chamfer which results in less power consumption during cutting.



Made in South Africa

- Sub-micron carbide grade of European origin
- Specially adapted TiAlN coating which further improves operational performance and tool life
- Cylindrical shank with h6 tolerance
- Chatter-free machining in a wide range of speeds, feeds, and applications which prevents chipping on cutting edges and corners resulting in excellent surface finish on milled parts.

Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Corner Chamfer 45°	Typhoon Code No.	Price \$
1/4"	1/4"	3/4"	2-1/2"	0.016	153-301	40.30
3/8"	3/8"	7/8"	2-1/2"	0.020	153-303	63.30
1/2"	1/2"	1-1/4"	3"	0.020	153-305	108.70
5/8"	5/8"	1-1/4"	3-1/2"	0.020	153-307	197.90
3/4"	3/4"	1-1/2"	4"	0.020	153-309	373.00
1"	1"	1-1/2"	4"	0.020	153-311	664.80

Tolerances - Inch

Size	Diameter	Shank Diameter
3/32 thru 1"	+0.000"-0.002"	+0.0000"-0.0005"

Tolerances - Metric

Size	Diameter	Shank Diameter
1mm-25mm	+0.000mm-0.051mm	+0.000mm-0.013mm

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum

4 Flute Variable Helix Carbide End Mill - Typhoon

- Helix changes along flutes
- Increased stability during cutting action
- Substantial increase in speed
- Small corner radius for added strength and smoother cutting action
- AlTiN coated for improved tool life and increased production output
- Made from premium submicron grain carbide



Cutting Dia. (in.)	Shank Dia. (in.)	Flute Length (in.)	Overall Length (in.)	Corner Radius	With Radius		Without Radius		Weldon Flat With Radius	
					Code No.	Price \$	Code No.	Price \$	Code No.	Price \$
1/8	1/8	1/2	1-1/2	.010-.015	153-000	11.60	153-250	9.30	-	-
3/16	3/16	3/8	1-1/2	.010-.015	153-001	14.30	-	-	-	-
3/16	3/16	5/8	2	.015-.020	153-002	14.30	153-252	14.30	-	-
1/4	1/4	1/2	2	.015-.020	153-004	17.40	153-254	17.40	-	-
1/4	1/4	3/4	2-1/2	.015-.020	153-006	19.70	153-256	19.70	-	-
1/4	1/4	1-1/8	3	.015-.020	153-008	27.60	153-258	27.60	-	-
5/16	5/16	1/2	2	.015-.020	153-010	26.50	153-260	26.50	-	-
5/16	5/16	13/16	2-1/2	.015-.020	153-012	27.40	153-262	27.40	-	-
5/16	5/16	1-1/8	3	.015-.020	153-014	30.10	153-264	29.30	-	-
3/8	3/8	5/8	2	.015-.020	153-016	28.60	153-266	28.60	153-500	34.30
3/8	3/8	1	2-1/2	.015-.020	153-018	28.10	153-268	30.90	153-502	37.90
3/8	3/8	1-1/8	3	.015-.020	153-020	38.00	153-270	38.00	153-504	44.70
7/16	7/16	1	2-3/4	.015-.020	153-022	44.10	153-272	44.10	153-506	49.80
1/2	1/2	5/8	2-1/2	.025-.030	153-024	44.60	153-274	44.60	153-508	50.00
1/2	1/2	1	3	.025-.030	153-026	46.70	153-276	46.10	153-510	52.00
1/2	1/2	1-1/4	3	.025-.030	153-027	51.40	153-277	55.50	153-512	79.00
1/2	1/2	2	4	.025-.030	153-028	58.10	153-278	63.90	153-514	67.00
5/8	5/8	3/4	3	.030-.035	153-030	76.30	153-280	76.30	153-516	86.50
5/8	5/8	1-1/4	3-1/2	.030-.035	153-032	82.70	153-282	82.70	-	-
5/8	5/8	2-1/4	5	.030-.035	153-034	105.30	153-284	106.80	153-518	112.60
3/4	3/4	1	3	.030-.035	153-036	109.90	153-286	108.90	153-520	115.50
3/4	3/4	1-1/2	4	.030-.035	153-038	111.80	153-288	113.30	-	-
3/4	3/4	2-1/4	5	.030-.035	153-040	174.30	153-290	174.30	153-522	178.80
1	1	1-1/2	4	.030-.035	153-042	216.40	153-292	201.00	153-526	181.70
1	1	2-1/4	5	.030-.035	153-041	292.10	153-293	292.10	153-524	314.30
1-1/4	1-1/4	2-1/4	5	.030-.035	153-043	671.80	153-294	537.40	-	-

5 Flute Variable Helix Carbide End Mill - Typhoon

- 25% increase in feed rates over 4 flute version
- Helix changes along flutes
- Increased stability during cutting action
- Substantial increase in speed
- Small corner radius for added strength and smoother cutting action
- Modified AlTiN coated for improved tool life and increase production output
- Made from premium submicron grain carbide



Cutting Dia. (in.)	Shank Dia. (in.)	Flute Length (in.)	Overall Length (in.)	Corner Radius	Typhoon Code No.	Price \$
1/4	1/4	3/4	2-1/2	.015-.020	153-100	27.70
3/8	3/8	1	2-1/2	.015-.020	153-102	36.00
1/2	1/2	1	3	.025-.030	153-104	64.10
5/8	5/8	1-1/4	3-1/2	.030-.035	153-106	118.10
3/4	3/4	1-1/2	4	.030-.035	153-108	165.80
1	1	1-1/2	4	.030-.035	153-109	255.00

Speeds & Feeds - 4 & 5 Flute Variable Helix End Mills

Material	SFM	1/8"	1/4"	1/2"	1"
Aluminum Alloys	1120	0.0010	0.0020	0.0040	0.0080
Carbon Steel	300-600	0.0010	0.0015	0.0030	0.0060
Cast Iron	350-550	0.0010	0.0015	0.0030	0.0060
Copper Alloys	500-900	0.0010	0.0020	0.0030	0.0060
Steel - Annealed	350-500	0.0010	0.0020	0.0030	0.0050
Steel - Rc 18-24	150-500	0.0004	0.0008	0.0015	0.0045
Steel - Rc 25-37	125-200	0.0003	0.0005	0.0010	0.0030
Stainless Steel - Free Machining	250-400	0.0005	0.0010	0.0020	0.0030
Stainless Steel - Other	150-300	0.0005	0.0010	0.0020	0.0030
Inconel/Monel	60-100	0.0005	0.0010	0.0015	0.0030
Titanium	175-300	0.0005	0.0008	0.0015	0.0030

* All speeds and feeds are suggested starting points. They may be increased or decreased depending on machine condition, depth of cut, finish required, coolant, etc.



2 Flute Carbide End Mills For Aluminum

This carbide aluminum end mill has been designed specially for milling aluminum and all non-ferrous materials. The unique geometry permits much higher speed and feed rates without loading. Spindle and feed rates can be increased by fifty percent for greater productivity with excellent piece/part finishes.



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Code No.	Price \$
1/4	1/4	3/4	2-1/2	101-020	30.70
1/4	1/4	1-1/2	4	101-022	46.90
5/16	5/16	13/16	2-1/2	101-024	37.00
5/16	5/16	1-5/8	4	101-026	54.80
3/8	3/8	1	2-1/2	101-028	42.70
3/8	3/8	1-3/4	4	101-030	64.20
1/2	1/2	1	3	101-032	69.80
1/2	1/2	2	4	101-034	91.30
5/8	5/8	1-1/4	3-1/2	101-036	104.10
5/8	5/8	2-1/4	5	101-038	169.00
3/4	3/4	1-1/2	4	101-040	168.70
3/4	3/4	2-1/4	5	101-042	234.40
1	1	2-1/4	5	101-044	335.50
1	1	3	6	101-046	400.40

Metric

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Code No.	Price \$
6	6	19	63	101-390	46.10
6	6	38	102	101-391	53.20
8	8	21	63	101-392	55.70
8	8	41	102	101-393	111.40
10	10	25	70	101-394	64.30
10	10	51	102	101-395	142.40
12	12	26	76	101-396	85.30
12	12	51	102	101-397	111.70
16	16	32	89	101-398	127.40
16	16	57	127	101-399	206.80
20	20	38	102	101-400	216.80
20	20	57	127	101-401	270.90
25	25	57	127	101-402	505.30
25	25	76	152	101-403	603.10

2 Flute Aluminum Speeds & Feeds

Side Milling

Slotting

Work Material	Aluminum		Aluminum		
	Aluminum		Aluminum		
Hardness					
Depth of Cut					
Mill Dia. (inch)	mm	V=660 SFM		V=660 SFM	
		Speed	Feed	Speed	Feed
		RPM	in/min	RPM	in/min
1/4	6	10000	60	10000	30
5/16	8	8000	64	8000	32
3/8	10	8000	80	8000	40
1/2	12	8000	96	8000	48
5/8	16	6000	84	6000	42
3/4	20	4000	64	4000	32
1	25	4000	64	4000	32

3 Flute 40° Helix Carbide End Mills

- Special geometry allows for high chip loads and feed rates.
- 3 flute design excellent for slotting and profiling at high speeds.
- Made from premium submicron grain carbide.
- Cutting diameter tolerance +.000/- .002



Inch

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Bright Code No.	Price \$	TiCN Code No.	Price \$
1/32	1/8	3/32	1-1/2	153-300	19.50	153-350	22.70
3/64	1/8	1/8	1-1/2	153-302	19.50	153-352	45.30
1/16	1/8	3/16	1-1/2	153-304	17.50	153-354	20.70
3/32	1/8	3/8	1-1/2	153-306	17.50	153-356	20.70
1/8	1/8	1/2	1-1/2	153-308	15.40	153-358	18.60
9/64	3/16	9/16	2	153-310	23.60	153-360	22.40
5/32	3/16	9/16	2	153-312	23.60	153-362	22.40
11/64	3/16	9/16	2	153-314	24.80	153-364	23.30
3/16	3/16	5/8	2	153-316	21.90	153-366	25.80
13/64	1/4	5/8	2-1/2	153-318	29.70	153-368	29.20
7/32	1/4	5/8	2-1/2	153-320	31.10	153-370	30.40
15/64	1/4	3/4	2-1/2	153-322	29.80	153-372	29.30
1/4	1/4	3/4	2-1/2	153-324	26.50	153-374	32.90
17/64	5/16	3/4	2-1/2	153-326	45.40	153-376	43.80
5/16	5/16	13/16	2-1/2	153-328	36.70	153-378	45.30
5/16	5/16	1-5/8	4	153-330	53.60	153-380	65.00
3/8	3/8	1	2-1/2	153-332	45.20	153-382	53.80
3/8	3/8	1-1/8	3	153-334	56.30	153-384	65.70
1/2	1/2	1	3	153-336	69.00	153-386	81.80
1/2	1/2	2	4	153-338	84.60	153-388	101.10
5/8	5/8	1-1/4	3-1/2	153-340	125.90	153-390	144.10
5/8	5/8	2-1/4	5	153-342	167.50	153-392	194.10
3/4	3/4	1-1/2	4	153-344	202.10	153-394	223.50

3 Flute Aluminum Speeds & Feeds

Chip load per tooth					
Material	SFM	1/8	1/4"	1/2"	1"
Aluminum Alloys	600/1200	.0010	.0020	.0040	.0080

RPM= 3.82 x sfm ÷ dia SFM= rpm x .262 ÷ dia
IPM= chip load x No. of teeth x rpm

Tolerances - Inch

Size	Diameter	Shank Diameter
3/32 thru 1"	+ .000"-.002"	+ .0000"-.0005"

Tolerances - Metric

Size	Diameter	Shank Diameter
1mm-25mm	+ .000mm-.051mm	+ .000mm-.013mm

Steel

Stainless Steel

Cast Iron/Hardened

Aluminum

2 Flute Corner Radius For Aluminum

- Special geometry allows for high chip loads and feed rates.
- Excellent for slotting and profiling at high speeds.
- Made from premium submicron grain carbide.
- Cutting diameter tolerance +.000/--.002



Regular Length



Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Corner Radius	Bright Code No.	Price \$	TiCN Code No.	Price \$
1/8	1/8	3/8	1-1/2	0.010	153-208	13.70	153-400	16.50
3/16	3/16	5/8	2	0.010	153-210	19.30	153-402	22.50
1/4	1/4	3/4	2-1/2	0.010	153-212	23.90	153-404	30.20
5/16	5/16	13/16	2-1/2	0.010	153-214	32.30	153-406	39.60
3/8	3/8	1	2-1/2	0.015	153-216	35.80	153-408	44.20
7/16	7/16	1	2-3/4	0.015	153-218	41.00	153-410	63.40
1/2	1/2	1	3	0.020	153-220	62.40	153-412	72.70
5/8	5/8	1-1/4	3-1/2	0.020	153-222	112.90	153-414	131.10
3/4	3/4	1-1/2	4	0.030	153-224	178.30	153-416	192.90
1	1	1-1/2	4	0.030	153-226	271.40	153-418	292.10

Long Length

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Corner Radius	Bright Code No.	Price \$	TiCN Code No.	Price \$
1/4	1/4	1-1/8	3	0.010	153-228	32.30	153-420	38.70
5/16	5/16	1-1/8	3	0.010	153-230	33.00	153-422	47.20
3/8	3/8	1-1/8	3	0.015	153-232	51.20	153-424	60.50
1/2	1/2	2	4	0.020	153-234	77.20	153-426	93.60
5/8	5/8	2-1/4	5	0.020	153-236	123.00	153-428	184.10
3/4	3/4	2-1/4	5	0.030	153-238	176.80	153-430	256.90
1	1	2-1/4	5	0.030	153-240	261.50	153-432	374.50

3 Flute Corner Radius For Aluminum

- Special geometry allows for high chip loads and feed rates.
- 3 flute design excellent for slotting and profiling at high speeds.
- Made from premium submicron grain carbide.
- Cutting diameter tolerance +.000/--.002



Regular Length



Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Corner Radius	Bright Code No.	Price \$	TiCN Code No.	Price \$
1/8	1/8	3/8	1-1/2	0.005	153-150	13.70	153-044	16.30
3/16	3/16	5/8	2	0.005	153-152	18.50	153-046	22.20
1/4	1/4	3/4	2-1/2	0.005	153-154	24.80	153-048	29.80
5/16	5/16	13/16	2-1/2	0.005	153-156	32.30	153-050	41.90
3/8	3/8	1	2-1/2	0.005	153-158	37.10	153-052	44.20
7/16	7/16	1	2-3/4	0.005	153-160	52.50	153-054	50.60
1/2	1/2	1-1/4	3	0.005	153-162	62.40	153-056	71.60
5/8	5/8	1-5/8	3-1/2	0.005	153-164	107.50	153-058	105.10
3/4	3/4	1-5/8	4	0.005	153-166	170.60	153-060	190.00
1	1	1-1/2	4	0.005	153-168	271.40	153-062	234.90

Long Length

Cutting Dia.	Shank Dia.	Flute Length	Overall Length	Corner Radius	Bright Code No.	Price \$	TiCN Code No.	Price \$
1/4	1/4	1-1/8	3	0.005	153-170	32.30	153-434	37.40
5/16	5/16	1-1/8	3	0.005	153-172	36.00	153-436	46.10
3/8	3/8	1-1/8	3	0.005	153-174	51.20	153-438	58.50
1/2	1/2	1-1/2	4	0.005	153-176	77.20	153-440	90.70
1/2	1/2	2	4	0.005	153-178	77.20	153-442	90.70
5/8	5/8	2-1/4	5	0.005	153-180	147.40	153-444	174.00
3/4	3/4	2-1/4	5	0.005	153-182	190.40	153-446	248.20
1	1	2-1/4	5	0.005	153-184	334.80	153-448	293.80

2 Fl. Corner Radius Aluminum Speeds & Feeds

Chip load per tooth

Material	SFM	1/8"	1/4"	1/2"	1"
Aluminum Alloys	600/1200	.0010	.0020	.0040	.0080

RPM= 3.82 x sfm ÷ dia SFM= rpm x .262 ÷ dia
 IPM= chip load x No. of teeth x rpm

3 Fl. Corner Radius Aluminum Speeds & Feeds

Chip load per tooth

Material	SFM	1/8"	1/4"	1/2"	1"
Aluminum Alloys	600/1200	.0010	.0020	.0040	.0080

RPM= 3.82 x sfm ÷ dia SFM= rpm x .262 ÷ dia
 IPM= chip load x No. of teeth x rpm



Speeds & Feeds - 2 & 3 Fl. Square End, 2 Fl. Corner Radius, & 2 Fl. Miniature Bright Carbide End Mills

Slot Milling – 2 fl. Reg Length, 2 fl. Stub Length, 2 fl. Double End Reg & Stub Length, 2 fl. Corner Radius

- Notes:
- Increase Speeds and Feeds 20% for 3 fl. Reg. Length
 - Reduce Speeds and Feeds 25% for 2 fl. Long Length
 - Reduce Speeds and Feeds 50% for 2 fl. Extra Long Length

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC					
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys			
Depth of Cut						$D < 1/8$ Ad $1/8 \leq D$ $0.3D$ $0.5D$							
Dia. (in)	(mm)	170 SFM		155 SFM		130 SFM		110 SFM		90 SFM		390 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	0.5	32,000	6.6	30,000	4.5	25,230	1.9	21,350	1.4	16,890	1.2	50,000	9.4
	0.8	20,790	6.6	18,950	4.5	15,900	1.9	13,450	1.4	10,640	1.2	47,700	9.4
	1	16,800	6.6	15,000	4.5	12,600	1.9	10,680	1.4	8,400	1.2	37,800	9.4
3/64	1.5	15,225	6.6	13,590	4.5	11,430	1.9	9,660	1.4	7,595	1.2	34,140	9.4
1/16	1.5	11,970	6.6	10,660	4.6	9,000	2.0	7,540	1.4	5,925	1.2	26,520	9.4
5/64	2	8,705	6.6	7,730	4.7	6,570	2.1	5,415	1.4	4,260	1.2	18,900	9.4
3/32	2	7,480	6.8	6,635	4.7	5,650	2.4	4,650	1.4	3,645	1.2	16,305	9.4
7/64	3	6,335	6.9	5,610	4.7	4,790	2.6	3,935	1.4	3,075	1.2	13,925	9.4
1/8	3	5,445	7.1	4,815	4.7	4,125	3.0	3,375	1.4	2,640	1.2	12,060	10.3
9/64	4	4,870	7.3	4,310	4.7	3,700	3.4	3,020	1.4	2,380	1.2	10,845	12.1
5/32	4	4,300	7.5	3,815	4.7	3,270	3.7	2,660	1.4	2,115	1.2	9,630	14.0
11/64	5	3,945	7.6	3,490	4.7	2,990	3.8	2,440	1.4	1,940	1.2	8,835	14.2
3/16	5	3,615	7.7	3,180	4.7	2,735	3.8	2,225	1.4	1,775	1.2	8,075	14.2
13/64	5	3,320	8.0	2,920	4.7	2,505	3.8	2,040	1.4	1,630	1.2	7,415	14.2
7/32	6	3,080	8.6	2,730	4.7	2,345	3.8	1,895	1.4	1,510	1.2	6,915	14.2
1/4	6	2,690	9.5	2,400	4.7	2,060	3.8	1,660	1.4	1,320	1.2	6,070	14.2
9/32	8	2,405	10.2	2,140	4.7	1,845	3.8	1,490	1.4	1,185	1.2	5,430	14.2
5/16	8	2,115	10.8	1,875	4.7	1,630	3.8	1,330	1.4	1,055	1.2	4,785	14.2
11/32	10	1,940	10.9	1,725	4.7	1,485	3.8	1,220	1.4	970	1.2	4,385	14.2
3/8	10	1,775	10.9	1,580	4.7	1,340	3.8	1,120	1.4	885	1.2	4,005	14.2
13/32	10	1,630	10.9	1,455	4.7	1,230	3.8	1,035	1.4	815	1.2	3,680	14.2
7/16	12	1,510	10.9	1,360	4.7	1,155	3.8	965	1.4	755	1.2	3,440	14.2
1/2	12	1,310	10.9	1,190	4.7	1,020	3.8	840	1.4	660	1.2	3,010	14.2
9/16	16	1,175	10.9	1,060	4.7	905	3.8	740	1.4	585	1.2	2,645	14.2
5/8	16	1,080	11.1	960	4.7	815	3.8	670	1.6	520	1.2	2,355	14.2
11/16	20	980	11.1	870	4.7	740	3.8	610	1.7	470	1.2	2,160	14.2
3/4	20	880	11.1	780	4.7	665	3.8	545	1.7	425	1.2	1,920	14.2
7/8	22	765	11.1	675	4.7	580	3.8	480	1.7	370	1.2	1,660	14.2
1	25	670	10.9	590	4.7	500	3.8	420	1.7	330	1.2	1,475	14.2

- For side milling, increase Feeds 25% or more.

Slot Milling – 2 fl. Miniature End Mills

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC							
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys		Aluminum Alloys		Copper Alloys	
Depth of Cut						$D < 0.04$ Ad $0.04 \leq D$ $0.1D$ $0.3D$									
Dia. (in)	(mm)	145 SFM		130 SFM		110 SFM		90 SFM		70 SFM		330 SFM		130 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
0.015	0.38	31,500	2.2	31,500	2.2	27,425	1.5	22,900	0.9	18,210	0.7	32,000	3.0	31,500	2.2
0.020	0.51	27,180	2.7	25,830	2.4	22,140	1.6	17,950	1.0	14,260	0.8	32,000	4.0	25,830	2.4
0.025	0.64	22,450	3.0	20,035	2.6	17,210	1.6	13,885	1.0	11,015	0.8	32,000	5.0	20,035	2.6
0.030	0.76	18,640	3.1	16,545	2.7	14,355	1.6	11,665	1.0	9,270	0.8	32,000	6.0	16,545	2.7
0.035	0.89	15,940	3.4	14,165	3.0	12,165	1.6	10,065	1.1	7,970	0.9	32,000	7.1	14,165	3.0
0.040	1.02	13,800	3.7	12,340	3.3	10,380	1.6	8,780	1.2	6,900	1.0	31,560	8.0	12,340	3.3
0.045	1.14	12,210	3.7	11,070	3.3	9,425	1.6	7,825	1.2	6,140	1.0	28,065	7.9	11,070	3.3
0.050	1.27	11,325	3.7	9,990	3.3	8,545	1.6	7,030	1.2	5,520	1.0	25,100	7.9	9,990	3.3
0.055	1.40	11,005	3.7	9,070	3.3	7,715	1.7	6,365	1.2	5,010	1.0	22,560	7.9	9,070	3.3
0.060	1.52	9,725	3.9	8,365	3.5	7,110	1.8	5,850	1.2	4,595	1.0	20,640	7.9	8,365	3.3

Cutting Tools

Speeds & Feeds - 4 Fl. Square End, 4 Fl. Corner Radius & 3 Fl. 60° Bright Carbide End Mills

Side Milling - 4 fl. Reg Length, 4 fl. Stub Length, 4 fl. Double End Reg & Stub Length, 4 fl. Corner Radius

- Notes:
- Reduce Speeds and Feeds 25% for 4 fl. LONG LENGTH
 - Reduce Speeds and Feeds 50% for 4 fl. EXTRA LONG LENGTH

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		Aluminum Alloys			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys			
Depth of Cut													
Dia. (in)	(mm)	160 SFM		175 SFM		130 SFM		120 SFM		95 SFM		470 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	0.5	32,000	23.9	32,000	11.8	25,240	10.9	23,300	4.5	19,400	3.5	50,000	39.4
	0.8	21,150	23.9	23,240	11.8	15,900	10.9	14,600	4.5	12,200	3.5	50,000	39.4
	1	15,600	23.9	17,400	11.8	12,600	10.9	11,400	4.5	9,000	3.5	44,400	39.4
3/64		14,140	23.9	15,680	11.8	11,390	10.9	10,305	4.5	8,145	3.5	40,275	39.4
1/16	1.5	11,115	23.9	12,105	11.8	8,895	10.9	8,045	4.5	6,390	3.5	31,710	39.4
5/64	2	8,090	23.9	8,535	11.8	6,395	10.9	5,780	4.5	4,625	3.5	23,135	39.4
3/32		6,970	23.9	7,320	12.6	5,495	10.9	4,965	4.4	3,960	3.4	19,820	40.6
7/64		5,920	23.9	6,200	13.5	4,660	10.9	4,205	4.3	3,340	3.4	16,725	41.8
1/8	3	5,090	24.6	5,330	14.4	4,005	10.9	3,610	4.3	2,870	3.3	14,370	42.9
9/64		4,545	26.3	4,785	15.4	3,580	10.9	3,225	4.3	2,585	3.3	12,935	43.8
5/32	4	4,000	28.0	4,240	16.4	3,150	10.9	2,850	4.3	2,295	3.3	11,505	44.8
11/64		3,670	28.1	3,885	16.9	2,895	11.2	2,620	4.3	2,100	3.3	10,565	45.2
3/16		3,360	28.1	3,555	17.2	2,655	11.6	2,405	4.3	1,910	3.3	9,660	45.6
13/64	5	3,090	28.1	3,260	17.6	2,445	11.8	2,205	4.3	1,750	3.3	8,880	46.0
7/32		2,870	28.1	3,020	17.9	2,285	11.8	2,045	4.3	1,630	3.3	8,280	46.3
1/4	6	2,520	28.1	2,640	18.2	2,000	11.8	1,775	4.3	1,430	3.3	7,280	46.8
9/32		2,260	28.1	2,380	18.3	1,785	11.8	1,580	4.3	1,295	3.3	6,520	47.0
5/16	8	1,995	28.1	2,115	18.4	1,570	11.8	1,390	4.3	1,150	3.3	5,760	47.2
11/32		1,820	28.3	1,940	19.4	1,445	11.8	1,290	4.3	1,055	3.3	5,280	47.2
3/8		1,655	28.6	1,775	20.4	1,325	11.8	1,200	4.3	965	3.3	4,830	47.2
13/32	10	1,515	28.9	1,630	21.0	1,220	11.8	1,110	4.3	885	3.3	4,430	48.0
7/16		1,420	29.1	1,510	21.1	1,140	11.8	1,035	4.3	825	3.3	4,120	49.8
1/2	12	1,250	30.9	1,310	22.5	995	12.2	900	4.3	720	3.3	3,585	52.0
9/16		1,120	34.3	1,175	24.9	880	13.1	795	4.3	635	3.3	3,170	52.0
5/8	16	1,005	35.5	1,055	25.7	790	13.8	720	4.3	570	3.3	2,840	52.0
11/16		915	38.4	960	25.9	720	13.9	650	4.3	515	3.3	2,595	52.0
3/4	20	820	39.4	860	26.3	640	13.9	580	4.1	465	3.3	2,340	52.0
7/8	22	710	35.5	750	23.6	560	12.6	510	3.7	405	3.0	2,015	49.1
1	25	630	31.2	660	20.7	490	10.9	440	3.3	360	2.6	1,775	43.5

• For slot milling, reduce Feeds 20% to 50%.

3 Flute 60° High Helix

Side Milling

Slotting

Work Material		Aluminum		Medium Carbon Steels Mild Steels		Pre-hardened Steels Stainless Steels Die & Alloy Steels		Pre-hardened Steels Stainless Steels Die & Alloy Steels		Hardened Steels		Medium Carbon Steels Mild Steels		Pre-hardened Steels Stainless Steels Die & Alloy Steels		Pre-hardened Steels Stainless Steels Die & Alloy Steels		Hardened Steels	
Hardness						< HRC35		HRC35-45		HRC45-55				< HRC35		HRC35-45		HRC45-55	
Depth of Cut																			
Mill Dia. (inch)	mm	390-460 SFM		130-164 SFM		Up to 100 SFM		Up to 66 SFM		Up to 50 SFM		110-140 SFM		Up to 85 SFM		Up to 56 SFM		Up to 43 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	6	6900	21.7	2400	10.6	1600	6.7	1060	3.0	800	1.2	2040	7.9	1360	4.7	900	2.0	680	0.8
5/16	8	5200	21.7	1800	10.6	1200	6.7	800	3.0	600	1.2	1530	7.9	1020	4.7	680	2.0	510	0.8
3/8	10	4200	23.6	1400	13.4	950	6.7	640	3.0	480	1.2	1190	9.1	810	4.7	540	2.0	410	0.8
1/2	12	3500	23.6	1200	14.2	800	7.1	530	3.0	400	1.2	1020	9.8	680	5.1	450	2.0	340	0.8
5/8	16	2600	23.6	900	15.7	600	7.1	400	3.0	300	1.2	760	10.6	510	5.1	340	2.0	260	0.8
3/4	20	2100	23.6	720	16.1	480	7.9	320	3.0	240	1.2	620	11.0	410	5.5	270	2.0	200	0.8
1	25	1700	23.6	580	13.8	380	7.1	250	3.0	190	1.2	500	9.4	320	5.1	210	2.0	160	0.8



Speeds & Feeds - 2, 3 & 4 Fl. Ball Nose Bright Carbide End Mills

Profiling – 2 fl. Reg Length, 2 fl. Stub Length, 2 fl. Double End Reg & Stub Length Ball Nose End Mills

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		Aluminum Alloys			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys			
Depth of Cut				$D < 1/8$ $1/8 \leq D$		Ad 0.1D 0.2D		Ad 0.3D 0.7D					
Dia. (in)	(mm)	160 SFM		160 SFM		120 SFM		100 SFM		80 SFM		490 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	0.5	31,000	4.8	31,000	4.5	23,300	2.5	19,400	1.2	15,500	0.9	50,000	6.8
	0.8	19,600	4.8	19,600	4.5	14,680	2.5	12,200	1.2	9,780	0.9	50,000	6.8
	1	15,600	5.0	15,600	4.7	11,400	2.8	9,540	1.4	7,620	0.9	38,400	7.1
3/64		14,140	5.2	14,140	4.8	10,305	3.0	8,620	1.5	6,885	1.0	35,535	8.0
1/16	1.5	11,115	5.8	11,115	5.1	8,045	3.4	6,720	1.7	5,360	1.2	29,585	9.8
5/64	2	8,090	6.3	8,090	5.4	5,780	3.7	4,810	1.8	3,840	1.4	23,630	11.7
3/32		6,970	6.5	6,970	5.7	4,965	3.9	4,140	1.9	3,290	1.4	20,420	11.8
7/64		5,920	6.7	5,920	6.0	4,205	4.1	3,520	1.9	2,795	1.4	17,325	11.8
1/8	3	5,090	7.2	5,090	6.1	3,610	4.3	3,030	1.9	2,400	1.4	14,945	11.8
9/64		4,545	7.9	4,545	6.2	3,225	4.3	2,690	1.9	2,140	1.4	13,470	11.8
5/32	4	4,000	8.6	4,000	6.3	2,850	4.3	2,360	1.9	1,875	1.4	11,990	11.8
11/64		3,670	9.2	3,670	6.6	2,620	4.3	2,160	1.9	1,725	1.4	11,020	12.7
3/16		3,360	9.6	3,360	6.9	2,405	4.4	1,970	1.9	1,580	1.4	10,090	13.6
13/64	5	3,090	10.1	3,090	7.1	2,205	4.4	1,810	1.9	1,455	1.4	9,275	14.2
7/32		2,870	10.4	2,870	7.1	2,045	4.3	1,690	1.9	1,360	1.4	8,630	14.2
1/4	6	2,520	11.3	2,520	6.9	1,775	4.2	1,490	1.9	1,205	1.4	7,570	14.6
9/32		2,260	12.5	2,260	6.4	1,580	4.1	1,350	1.9	1,080	1.4	6,785	15.5
5/16	8	1,995	13.6	1,995	5.9	1,390	4.0	1,200	1.9	960	1.4	6,000	16.4
11/32		1,820	13.7	1,820	5.8	1,290	4.0	1,100	1.9	880	1.4	5,495	16.5
3/8		1,655	13.7	1,655	5.7	1,200	4.0	1,005	1.9	800	1.4	5,020	16.5
13/32	10	1,515	13.7	1,515	5.6	1,110	3.9	920	1.9	735	1.4	4,610	16.9
7/16		1,420	13.7	1,420	5.4	1,035	3.7	855	1.9	690	1.4	4,300	17.8
1/2	12	1,250	13.7	1,250	5.2	900	3.5	750	1.9	600	1.4	3,750	18.9
9/16		1,120	13.9	1,120	5.2	795	3.5	660	1.9	530	1.4	3,290	18.5
5/8	16	1,005	13.9	1,005	5.2	720	3.5	590	1.9	470	1.4	2,960	16.7
11/16		915	13.9	915	5.2	650	3.5	540	1.9	430	1.4	2,715	16.5
3/4	20	820	12.9	820	5.2	580	3.5	485	1.9	380	1.4	2,415	16.5
7/8	22	710	11.2	710	5.2	510	3.5	425	1.8	335	1.4	2,100	16.5
1	25	630	9.8	630	5.1	440	3.5	370	1.6	300	1.4	1,830	16.3

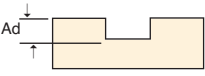
- Notes:
- Increase Speeds and Feeds 20% for 3 fl. Reg. Length
 - Reduce Speeds and Feeds 25% for 2 fl. Ball Nose Long Length
 - Reduce Speeds and Feeds 50% for 2 fl. Ball nose Extra Long Length

- Notes:
- Increase Speeds and Feeds 40% for 4fl. Ball Nose Reg. & Stub Length, also 4fl. Double End Reg. & Stub Length
 - Reduce Speeds 25% and Increase Feeds 10% for 4 fl. Ball Nose Long Length
 - Reduce Speeds 50% and Increase Feeds 10% for 4 fl. Ball Nose Extra Long Length

Speeds & Feeds - 2 Fl. Square End, TiAlN Coated Carbide End Mills

Slot Milling — 2 fl. Reg Length, 2 fl. Stub Length, 2 fl. Double End Reg & Stub Length

- Notes:
- Reduce Speeds and Feeds 25% for 2 fl. Long Length
 - Reduce Speeds and Feeds 50% for 2 fl. Extra Long Length

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		Aluminum Alloys			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys			
Depth of Cut				$D < 1/8$ $1/8 \leq D$		Ad 0.3D 0.5D							
Dia. (in)	(mm)	220 SFM		200 SFM		170 SFM		140 SFM		110 SFM		500 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	0.5	40,000	8.25	37,500	5.63	31,537	2.38	26,687	1.75	21,112	1.50	62,500	11.75
	0.8	25,987	8.25	23,687	5.63	19,875	2.38	16,812	1.75	13,300	1.50	59,625	11.75
	1	21,000	8.25	18,750	5.63	15,750	2.38	13,350	1.75	10,500	1.50	47,250	11.75
3/64		19,031	8.25	16,987	5.63	14,287	2.38	12,075	1.75	9,493	1.50	42,675	11.75
1/16	1.5	14,962	8.25	13,325	5.75	11,250	2.50	9,425	1.75	7,406	1.50	33,150	11.75
5/64	2	10,881	8.25	9,662	5.88	8,212	2.63	6,768	1.75	5,325	1.50	23,625	11.75
3/32		9,350	8.50	8,293	5.88	7,062	3.00	5,812	1.75	4,556	1.50	20,381	11.75
7/64		7,918	8.63	7,012	5.88	5,987	3.25	4,918	1.75	3,843	1.50	17,406	11.75
1/8	3	6,806	8.88	6,018	5.88	5,156	3.75	4,218	1.75	3,300	1.50	15,075	12.88
9/64		6,087	9.13	5,387	5.88	4,625	4.25	3,775	1.75	2,975	1.50	13,556	15.13
5/32	4	5,375	9.38	4,768	5.88	4,087	4.63	3,325	1.75	2,643	1.50	12,037	17.50
11/64		4,931	9.50	4,362	5.88	3,737	4.75	3,050	1.75	2,425	1.50	11,043	17.75
3/16		4,518	9.63	3,975	5.88	3,418	4.75	2,781	1.75	2,218	1.50	10,093	17.75
13/64	5	4,150	10.00	3,650	5.88	3,131	4.75	2,550	1.75	2,037	1.50	9,268	17.75
7/32		3,850	10.75	3,412	5.88	2,931	4.75	2,368	1.75	1,887	1.50	8,643	17.75
1/4	6	3,362	11.88	3,000	5.88	2,575	4.75	2,075	1.75	1,650	1.50	7,587	17.75
9/32		3,006	12.75	2,675	5.88	2,306	4.75	1,862	1.75	1,481	1.50	6,787	17.75
5/16	8	2,643	13.50	2,343	5.88	2,037	4.75	1,662	1.75	1,318	1.50	5,981	17.75
11/32		2,425	13.63	2,156	5.88	1,856	4.75	1,525	1.75	1,212	1.50	5,481	17.75
3/8		2,218	13.63	1,975	5.88	1,675	4.75	1,400	1.75	1,106	1.50	5,006	17.75
13/32	10	2,037	13.63	1,818	5.88	1,537	4.75	1,293	1.75	1,018	1.50	4,600	17.75
7/16		1,887	13.63	1,700	5.88	1,443	4.75	1,206	1.75	943	1.50	4,300	17.75
1/2	12	1,637	13.63	1,487	5.88	1,275	4.75	1,050	1.75	825	1.50	3,762	17.75
9/16		1,468	13.63	1,325	5.88	1,131	4.75	925	1.75	731	1.50	3,306	17.75
5/8	16	1,350	13.88	1,200	5.88	1,018	4.75	837	2.00	650	1.50	2,943	17.75
11/16		1,225	13.88	1,087	5.88	925	4.75	762	2.13	587	1.50	2,700	17.75
3/4	20	1,100	13.88	975	5.88	831	4.75	681	2.13	531	1.50	2,400	17.75
7/8	22	956	13.88	843	5.88	725	4.75	600	2.13	462	1.50	2,075	17.75
1	25	837	13.63	737	5.88	625	4.75	525	2.13	412	1.50	1,843	17.75

• For side milling, increase Feeds 25% or more.



Speeds & Feeds - 4 Fl. Square End, TiAlN Coated Carbide End Mills

Side Milling - 4 fl. Reg Length, 4 fl. Double End Stub Length

Notes: • Reduce Speeds and Feeds 25% for 4 fl. LONG LENGTH • Reduce Speeds and Feeds 50% for 4 fl. EXTRA LONG LENGTH • For slot milling, reduce Feeds 20% to 50%.

Hardness		Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC					
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys			
Depth of Cut													
Dia. (in)	(mm)	200 SFM		215 SFM		165 SFM		150 SFM		120 SFM		590 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	0.5	40,000	29.88	40,000	14.75	31,550	13.63	29,125	5.63	24,250	4.38	62,500	49.25
1/32	0.8	26,437	29.88	29,050	14.75	19,875	13.63	18,250	5.63	15,250	4.38	62,500	49.25
1/32	1	19,500	29.88	21,750	14.75	15,750	13.63	14,250	5.63	11,250	4.38	55,500	49.25
3/64	1.5	17,675	29.88	19,600	14.75	14,237	13.63	12,981	5.63	10,181	4.38	50,343	49.25
1/16	1.5	13,893	29.88	15,131	14.75	11,118	13.63	10,056	5.63	7,987	4.38	39,637	49.25
5/64	2	10,112	29.88	10,668	14.75	7,993	13.63	7,225	5.63	5,781	4.38	28,918	49.25
3/32	2	8,712	29.88	9,150	15.75	6,868	13.63	6,206	5.50	4,950	4.25	24,775	50.75
7/64	3	7,400	29.88	7,750	16.88	5,825	13.63	5,256	5.38	4,175	4.25	20,906	52.25
1/8	3	6,362	30.75	6,662	18.00	5,006	13.63	4,512	5.38	3,587	4.13	17,962	53.63
9/64	3	5,881	32.88	5,981	19.25	4,475	13.63	4,031	5.38	3,231	4.13	16,168	54.75
5/32	4	5,000	35.00	5,300	20.50	3,937	13.63	3,562	5.38	2,868	4.13	14,381	56.00
11/64	4	4,587	35.13	4,856	21.13	3,618	14.00	3,275	5.38	2,625	4.13	13,206	56.50
3/16	5	4,200	35.13	4,443	21.50	3,318	14.50	3,006	5.38	2,387	4.13	12,075	57.00
13/64	5	3,862	35.13	4,075	22.00	3,056	14.75	2,756	5.38	2,187	4.13	11,100	57.50
7/32	5	3,587	35.13	3,775	22.38	2,856	14.75	2,556	5.38	2,037	4.13	10,350	57.88
1/4	6	3,150	35.13	3,300	22.75	2,500	14.75	2,218	5.38	1,787	4.13	9,100	58.50
9/32	6	2,825	35.13	2,975	22.88	2,231	14.75	1,975	5.38	1,618	4.13	8,150	58.75
5/16	8	2,493	35.13	2,643	23.00	1,962	14.75	1,737	5.38	1,437	4.13	7,200	59.00
11/32	8	2,275	35.38	2,425	24.25	1,806	14.75	1,612	5.38	1,318	4.13	6,600	59.00
3/8	10	2,068	35.75	2,218	25.50	1,656	14.75	1,500	5.38	1,206	4.13	6,037	59.00
13/32	10	1,893	36.13	2,037	26.25	1,525	14.75	1,387	5.38	1,106	4.13	5,537	60.00
7/16	10	1,775	36.38	1,887	26.38	1,425	14.75	1,293	5.38	1,031	4.13	5,150	62.25
1/2	12	1,562	38.63	1,637	28.13	1,243	15.25	1,125	5.38	900	4.13	4,481	65.00
9/16	12	1,400	42.88	1,468	31.13	1,100	16.38	993	5.38	793	4.13	3,962	65.00
5/8	16	1,256	44.38	1,318	32.13	987	17.25	900	5.38	712	4.13	3,550	65.00
11/16	16	1,143	48.00	1,200	32.38	900	17.38	812	5.38	643	4.13	3,243	65.00
3/4	20	1,025	49.25	1,075	32.88	800	17.38	725	5.13	581	4.13	2,925	65.00
7/8	22	887	44.38	937	29.50	700	15.75	637	4.63	506	3.75	2,518	61.38
1	25	787	39.00	825	25.88	612	13.63	550	4.13	450	3.25	2,218	54.38

Speeds & Feeds - TiAlN Coated Carbide Roughing End Mills - Side Milling

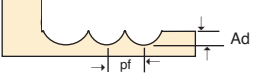
Hardness		Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels		Hardened Steels, Stainless Steels	
Depth of Cut											
Dia. (in)	(mm)	420 SFM		350 SFM		300 SFM		225 SFM		175 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	6	6,350	29.9	5,300	25.2	4,500	14.2	3,450	11.0	2,650	8.3
5/16	8	4,750	29.9	4,000	25.2	3,400	16.1	2,600	12.2	2,000	9.4
3/8	10	3,800	29.9	3,200	25.2	2,700	16.9	2,050	13.0	1,600	10.2
1/2	12	3,200	30.3	2,650	25.2	2,250	17.7	1,700	13.4	1,350	10.6
5/8	16	2,400	30.3	2,000	25.2	1,700	18.9	1,300	14.2	1,000	11.0
3/4	20	1,900	29.9	1,600	24.0	1,350	18.5	1,050	13.8	800	10.2
1	25	1,500	29.9	1,150	24.0	1,000	18.5	800	13.8	600	10.2

Speeds & Feeds - TiAlN Coated Carbide Roughing End Mills - Slotting

Hardness		Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels		Hardened Steels, Stainless Steels	
Depth of Cut											
Dia. (in)	(mm)	350 SFM		300 SFM		250 SFM		190 SFM		160 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	6	5,300	25.2	4,500	21.3	3,700	11.8	2,900	9.1	2,400	7.5
5/16	8	4,000	25.2	3,400	21.3	2,800	13.4	2,200	10.2	1,800	8.7
3/8	10	3,200	25.2	2,700	21.3	2,250	14.2	1,750	11.0	1,450	9.1
1/2	12	2,650	25.2	2,250	21.3	1,850	14.6	1,450	11.4	1,200	9.4
5/8	16	2,000	25.2	1,700	21.3	1,400	15.4	1,100	12.2	900	9.8
3/4	20	1,600	25.2	1,350	20.1	1,100	15.4	900	11.8	700	9.1
1	25	1,150	25.2	950	20.1	800	15.4	700	11.8	500	9.1

Speeds & Feeds - 2 & 4 Fl. Ball Nose TiAlN Coated Carbide End Mills

Profiling - 2 fl. Reg Length Ball Nose End Mills

Hardness		Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		Aluminum Alloys			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys			
Depth of Cut				$D < 1/8$ $1/8 \leq D$		Ad 0.1D 0.3D		pf 0.2D 0.7D					
Dia. (in)	(mm)	200 SFM		205 SFM		150 SFM		125 SFM		100 SFM		600 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	0.5	38,750	6.00	38,750	5.63	29,125	3.13	24,250	1.50	14,375	1.13	62,500	8.50
	0.8	24,500	6.00	24,500	5.63	18,350	3.13	15,250	1.50	12,225	1.13	62,500	8.50
	1	19,500	6.25	19,500	5.88	14,250	3.50	11,925	1.75	9,525	1.13	48,000	8.88
3/64		17,675	6.50	17,675	6.00	12,881	3.75	10,775	1.88	8,606	1.25	44,418	10.00
1/16	1.5	13,893	7.25	13,893	6.38	10,056	4.25	8,400	2.13	6,700	1.50	36,981	12.25
5/64	2	10,112	7.88	10,112	6.75	7,225	4.63	6,012	2.25	4,800	1.75	29,537	14.63
3/32		8,712	8.13	8,712	7.13	6,206	4.88	5,175	2.38	4,112	1.75	25,525	14.75
7/64		7,400	8.38	7,400	7.50	5,256	5.13	4,400	2.38	3,493	1.75	21,656	14.75
1/8	3	6,362	9.00	6,362	7.63	4,512	5.38	3,787	2.38	3,000	1.75	18,681	14.75
9/64		5,681	9.88	5,681	7.75	4,031	5.38	3,362	2.38	2,675	1.75	16,837	14.75
5/32	4	5,000	10.75	5,000	7.88	3,562	5.38	2,950	2.38	2,343	1.75	14,987	14.75
11/64		4,587	11.50	4,587	8.25	3,275	5.38	2,700	2.38	2,156	1.75	13,775	15.88
3/16		4,200	12.00	4,200	8.63	3,006	5.50	2,462	2.38	1,975	1.75	12,612	17.00
13/64	5	3,862	12.63	3,862	8.88	2,756	5.50	2,262	2.38	1,818	1.75	11,593	17.75
7/32		3,587	13.00	3,587	8.88	2,556	5.38	2,112	2.38	1,700	1.75	10,787	17.75
1/4	6	3,150	14.13	3,150	8.63	2,218	5.25	1,862	2.38	1,506	1.75	9,462	18.25
9/32		2,825	15.63	2,825	8.00	1,975	5.13	1,687	2.38	1,350	1.75	8,481	19.38
5/16	8	2,493	17.00	2,493	7.38	1,737	5.00	1,500	2.38	1,200	1.75	7,500	20.50
11/32		2,275	17.13	2,275	7.25	1,612	5.00	1,375	2.38	1,100	1.75	6,868	20.63
3/8		2,068	17.13	2,068	7.13	1,500	5.00	1,256	2.38	1,000	1.75	6,275	20.63
13/32	10	1,893	17.13	1,893	7.00	1,387	4.88	1,150	2.38	918	1.75	5,762	21.13
7/16		1,775	17.13	1,775	6.75	1,293	4.63	1,068	2.38	862	1.75	5,375	22.25
1/2	12	1,562	17.13	1,562	6.50	1,125	4.38	937	2.38	750	1.75	4,687	23.63
9/16		1,400	17.38	1,400	6.50	993	4.38	825	2.38	662	1.75	4,112	23.13
5/8	16	1,256	17.38	1,256	6.50	900	4.38	737	2.38	587	1.75	3,700	20.88
11/16		1,143	17.38	1,143	6.50	812	4.38	675	2.38	537	1.75	3,393	20.63
3/4	20	1,025	16.13	1,025	6.50	725	4.38	606	2.38	475	1.75	3,018	20.63
7/8	22	887	14.00	887	6.50	637	4.38	531	2.25	418	1.75	2,625	20.63
1	25	787	12.25	787	6.38	550	4.38	462	2.00	375	1.75	2,287	20.38


- 2 fl. Notes:
- Reduce Speeds and Feeds 25% for 2 fl. Ball Nose Long Length
 - Reduce Speeds and Feeds 50% for 2 fl. Ball Nose Extra Long Length

- 4 fl. Notes:
- Increase Speeds and Feeds 40% for 4fl. Ball Nose Reg. Length
 - Reduce Speeds 25% and Increase Feeds 10% for 4 fl. Ball Nose Long Length
 - Reduce Speeds 50% and Increase Feeds 10% for 4 fl. Ball Nose Extra Long Length



Speeds & Feeds - 2 Fl. Square End & 2 Fl. Corner Radius Typhoon Mod. AlTiN Carbide End Mills

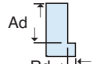
Slot Milling - 2 Flute Square End & 2 Flute Corner Radius

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys		Hardened Steels			
Depth of Cut				D < 1/16 1/16 ≤ D < 1/8 1/16 ≤ D		Ad 0.1D 0.3D 0.5D		D < 1/16 1/16 ≤ D		Ad 0.02D 0.05D		D < 1/16 1/16 ≤ D < 1/8 1/8 ≤ D		Ad 0.01D 0.02D 0.05D	
Dia. (in)	(mm)	360 SFM		330 SFM		260 SFM		220 SFM		280 SFM		120 SFM		80 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/16	1.5	19,145	6.9	17,405	6.2	13,095	5.9	11,115	4.2	9,915	3.2	6,245	1.7	4,430	1.2
3/32		12,710	8.3	11,550	7.6	9,135	6.3	7,620	4.3	6,750	3.4	4,185	2.0	2,950	1.2
1/8	3	9,450	10.7	8,570	9.8	7,310	7.4	6,135	4.9	5,135	3.7	3,180	2.2	2,300	1.4
5/32	4	7,910	12.2	7,190	11.1	5,930	8.6	5,145	5.8	4,230	4.2	2,655	2.4	1,870	1.4
3/16		7,190	15.4	6,540	14.0	5,325	10.5	4,455	6.0	3,785	4.5	2,360	2.6	1,590	1.4
7/32		6,365	16.3	5,790	14.7	4,690	11.1	3,855	6.1	3,285	4.7	2,045	2.6	1,365	1.3
1/4	6	5,600	16.0	5,090	14.5	4,125	11.1	3,375	6.0	2,870	4.7	1,775	2.6	1,205	1.2
9/32		5,000	15.6	4,545	14.2	3,700	11.1	3,020	6.0	2,585	4.7	1,580	2.5	1,080	1.2
5/16	8	4,395	15.3	4,000	13.9	3,270	11.1	2,660	5.9	2,295	4.7	1,390	2.4	960	1.2
11/32		4,035	15.0	3,670	13.7	2,990	11.1	2,440	5.9	2,100	4.6	1,290	2.4	880	1.2
3/8		3,695	14.7	3,360	13.3	2,735	11.0	2,225	5.9	1,910	4.5	1,200	2.4	800	1.2
13/32	10	3,400	14.5	3,090	13.2	2,505	10.9	2,040	5.9	1,750	4.4	1,110	2.4	735	1.1
7/16		3,160	14.5	2,870	13.2	2,345	10.9	1,895	5.9	1,630	4.4	1,035	2.3	690	1.0
1/2	12	2,760	14.5	2,510	13.2	2,030	10.6	1,655	5.6	1,415	4.4	900	2.1	600	0.9
9/16		2,460	14.2	2,230	13.0	1,770	10.1	1,480	5.1	1,240	4.3	795	1.9	530	0.8
5/8		2,195	12.6	1,995	12.3	1,625	9.5	1,330	4.7	1,150	4.0	720	1.7	470	0.7
11/16		1,980	12.1	1,800	11.2	1,485	8.7	1,215	4.3	1,040	3.7	650	1.5	430	0.7
3/4	20	1,760	11.1	1,605	10.0	1,305	7.6	1,095	3.8	935	3.2	580	1.4	380	0.6
7/8	22	1,565	9.8	1,420	8.9	1,140	6.8	960	3.3	815	2.8	510	1.2	340	0.5
1	25	1,360	8.5	1,240	7.7	1,020	6.0	840	3.0	720	2.6	440	0.9	300	0.5

Note: For side milling, increase Feeds 20% to 50%.

Speeds & Feeds - 4 Fl. Square End & 4 Fl. Corner Radius Typhoon Mod. AlTiN Carbide End Mills

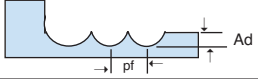
Side Milling - 4 Flute Square End & 4 Flute Corner Radius

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys		Hardened Steels			
Depth of Cut				D < 1/8 1/8 ≤ D		Ad 1.5D 1.5D		Rd 0.05D 0.1D		Ad 1D		Rd 0.02D			
Dia. (in)	(mm)	390 SFM		330 SFM		270 SFM		220 SFM		190 SFM		120 SFM		80 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/16	1.5	20,825	15.4	18,070	12.5	15,670	11.2	10,870	4.7	9,915	4.2	6,740	2.6	5,400	1.6
3/32		16,305	21.5	13,720	18.1	11,550	14.5	8,075	5.4	6,885	4.9	4,185	2.9	2,950	2.0
1/8	3	12,060	28.4	10,205	24.0	8,700	16.9	7,125	5.9	5,475	5.2	3,180	2.9	2,290	2.2
5/32	4	9,630	29.9	8,060	25.0	7,890	17.5	5,170	6.3	4,475	5.3	2,655	3.3	1,815	2.2
3/16		8,075	33.7	6,740	28.3	5,930	19.4	4,455	6.5	3,935	5.7	2,360	3.5	1,565	2.0
7/32		7,580	34.8	5,790	29.1	4,835	20.0	3,855	6.7	3,440	6.0	2,045	3.4	1,360	1.9
1/4	6	7,060	34.4	5,090	28.9	4,235	20.0	3,375	6.9	3,030	6.1	1,775	3.3	1,205	1.9
9/32		5,945	34.0	4,545	28.3	3,785	19.9	3,020	6.9	2,690	6.1	1,580	3.3	1,080	1.8
5/16	8	4,820	33.6	4,000	27.8	3,330	19.8	2,660	6.9	2,360	6.1	1,390	3.2	960	1.7
11/32		4,385	33.6	3,670	27.8	3,050	19.8	2,440	6.9	2,160	6.1	1,290	3.5	880	1.7
3/8		4,005	33.6	3,360	27.8	2,795	19.8	2,225	6.9	1,970	6.1	1,200	3.8	800	1.7
13/32	10	3,680	33.6	3,090	27.8	2,565	19.8	2,040	6.9	1,810	6.1	1,110	3.9	735	1.7
7/16		3,440	33.6	2,870	27.8	2,405	19.8	1,895	6.9	1,690	6.1	1,035	3.4	690	1.5
1/2	12	3,010	32.7	2,510	27.5	2,090	19.7	1,655	6.9	1,475	6.0	900	2.7	600	1.3
9/16		2,645	31.2	2,230	26.9	1,820	19.6	1,470	6.7	1,295	5.8	795	2.4	530	1.1
5/8		2,355	31.4	1,995	26.1	1,630	19.6	1,325	6.1	1,200	5.4	720	2.3	470	0.9
11/16		2,160	31.0	1,800	25.7	1,485	19.2	1,215	5.6	1,090	5.0	650	2.0	430	0.9
3/4	20	1,920	29.7	1,605	24.9	1,350	15.7	1,095	5.0	975	4.5	580	1.7	380	0.9
7/8	22	1,660	26.2	1,420	22.4	1,185	15.9	960	4.3	850	3.9	510	1.4	335	0.8
1	25	1,485	23.3	1,240	19.5	1,050	14.0	840	3.9	750	3.5	440	1.4	300	0.7

Cutting Tools

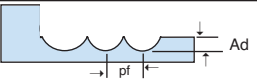
Speeds & Feeds - 2 & 4 Fl. Ball Nose Typhoon Mod. AlTiN Carbide End Mills

Profiling- 2 & 4 Flute Ball Nose

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC			
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys		Hardened Steels			
Depth of Cut												$\frac{Ad}{0.1D}$ $\frac{pf}{0.2D}$			
Dia. (in)	(mm)	575 SFM		460 SFM		375 SFM		310 SFM		260 SFM		230 SFM		165 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/16	1.5	32,405	41.0	29,230	36.1	26,520	29.3	21,185	18.9	18,640	13.6	16,095	9.9	11,970	6.6
3/32		24,540	44.4	19,820	36.1	16,305	29.4	13,145	18.9	11,550	13.7	9,950	9.9	7,480	6.6
1/8	3	17,760	44.4	14,370	36.1	12,060	29.8	9,695	19.5	8,490	14.4	7,280	10.4	5,445	6.9
5/32	4	13,950	44.4	11,505	36.1	9,630	29.8	7,695	20.9	6,725	17.3	5,760	12.7	4,300	8.2
3/16		11,100	48.3	9,660	39.4	8,075	29.9	6,425	21.0	5,650	17.5	4,830	13.3	3,615	8.3
7/32		10,360	49.6	8,280	40.4	6,915	30.9	5,490	21.5	4,835	18.0	4,120	13.7	3,080	8.5
1/4	6	9,120	51.6	7,280	42.0	6,070	32.6	4,815	22.7	4,235	18.9	3,610	14.2	2,690	8.9
9/32		8,165	56.3	6,520	45.6	5,430	34.9	4,310	24.4	3,785	20.2	3,225	14.7	2,405	9.4
5/16	8	7,210	61.0	5,760	49.3	4,785	37.1	3,815	26.1	3,330	21.4	2,850	15.3	2,115	9.9
11/32		6,610	59.7	5,280	48.0	4,385	36.5	3,490	25.7	3,050	21.0	2,620	15.5	1,940	9.9
3/8		6,040	57.8	4,830	46.3	4,005	35.7	3,180	25.1	2,795	20.6	2,405	15.7	1,775	9.9
13/32	10	5,540	55.9	4,430	44.6	3,680	34.8	2,920	24.5	2,565	20.3	2,205	15.6	1,630	9.8
7/16		5,165	54.0	4,120	42.7	3,440	34.0	2,730	23.9	2,405	20.3	2,045	15.2	1,510	9.5
1/2	12	4,505	51.1	3,585	40.7	3,010	32.6	2,390	22.9	2,090	19.7	1,775	14.5	1,310	9.1
9/16		4,000	49.6	3,170	40.7	2,645	31.7	2,110	22.4	1,820	18.3	1,580	13.9	1,175	8.9
5/8	16	3,570	49.6	2,840	39.7	2,355	30.5	1,875	22.4	1,630	18.0	1,390	12.8	1,080	8.7
11/16		3,275	47.9	2,595	38.1	2,160	29.2	1,725	22.4	1,485	18.0	1,290	12.4	980	8.4
3/4	20	2,915	45.2	2,340	36.5	1,920	27.4	1,545	21.5	1,350	17.6	1,175	11.9	880	8.1
7/8	22	2,540	42.1	2,130	33.8	1,775	24.4	1,365	19.2	1,185	15.9	1,025	10.8	765	7.7
1	25	2,240	36.8	1,775	31.5	1,475	21.8	1,180	16.8	1,050	13.7	900	9.8	670	6.7

Increase Feeds 40% to 50% for 4 Flute Ball Nose

High-Speed Light Milling - 2 & 4 Flute Ball Nose

Hardness		Tensile Strength: Up to 750N/mm ²		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys		Hardened Steels		Hardened Steels	
Depth of Cut												$\frac{Ad}{0.02D}$ $\frac{pf}{0.05D}$	
Dia. (in)	(mm)	985 SFM		855 SFM		740 SFM		590 SFM		590 SFM		400 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/16	1.5	39,125	126.4	35,305	110.2	35,010	98.4	33,400	88.6	23,180	59.4	17,650	39.4
3/32		27,490	137.8	21,750	110.2	21,250	98.4	20,450	88.6	14,705	61.0	10,950	39.4
1/8	3	20,475	139.2	16,325	114.4	15,825	100.1	15,150	90.0	11,000	63.4	8,355	40.0
5/32	4	18,085	145.4	15,525	133.1	15,025	108.0	13,555	96.2	11,000	74.4	7,960	43.1
3/16		16,085	154.6	15,110	153.3	14,230	112.8	11,585	91.9	10,230	80.8	7,675	46.3
7/32		15,215	175.0	14,160	164.9	12,600	110.9	10,160	89.4	9,715	85.9	7,035	46.1
1/4	6	14,380	181.0	12,880	161.7	11,050	103.8	9,080	84.8	9,080	84.8	6,305	43.5
9/32		12,990	163.1	11,490	144.5	10,035	93.6	8,150	76.2	8,150	76.2	5,650	39.4
5/16	8	11,600	145.1	10,100	127.3	9,025	83.5	7,215	67.6	7,215	67.6	5,000	35.4
11/32		10,760	134.3	9,355	117.3	8,285	76.9	6,610	61.9	6,610	61.9	4,575	32.4
3/8		9,975	124.2	8,660	108.0	7,575	70.7	6,035	56.4	6,035	56.4	4,180	29.6
13/32	10	9,250	115.0	8,025	99.5	6,950	65.0	5,540	51.6	5,540	51.6	3,840	27.2
7/16		8,630	107.1	7,465	92.5	6,475	60.4	5,165	47.6	5,165	47.6	3,580	25.3
1/2	12	7,540	93.6	6,510	80.5	5,650	52.4	4,500	41.5	4,500	41.5	3,125	22.0
9/16		6,675	83.2	5,785	71.4	5,000	46.4	3,975	37.5	3,975	37.5	2,740	19.3
5/8	16	6,000	75.4	5,190	63.6	4,485	41.7	3,575	33.7	3,575	33.7	2,465	17.4
11/16		5,465	67.6	4,705	58.7	4,075	38.3	3,250	30.7	3,250	30.7	2,260	16.0
3/4	20	4,890	60.6	4,215	52.8	3,650	34.4	2,925	27.6	2,925	27.6	2,010	14.3
7/8	22	4,255	53.2	3,710	46.3	3,190	30.2	2,550	24.0	2,550	24.1	1,755	12.3
1	25	3,740	46.6	3,250	40.8	2,805	26.4	2,215	21.0	2,215	21.0	1,525	10.7

Increase Feeds 40% to 50% for 4 Flute Ball Nose



Speeds & Feeds - Typhoon Mod. AlTiN Mold Mills

Mold Mills for Profile Milling

Hardness		Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC					
Work Material		Cast Iron		Mild Steels, Carbon Steels		Alloy Steels, Tool Steels, Ti Alloys (Annealed)		Hardened Steels, Prehardened Steels, Ti Alloys (Solution Treated and Aged)		Hardened Steels, Prehardened Steels, Stainless Steels, Inconel, Ni Based Alloys		Hardened Steels					
Depth of Cut																	
		<table border="1"> <tr> <td>$D < 5/8$</td> <td>Ad</td> </tr> <tr> <td>$5/8 \leq D$</td> <td>0.05D 0.03"</td> </tr> </table>												$D < 5/8$	Ad	$5/8 \leq D$	0.05D 0.03"
$D < 5/8$	Ad																
$5/8 \leq D$	0.05D 0.03"																
Dia. (in)	(mm)	550 SFM		550 SFM		450 SFM		360 SFM		270 SFM		230 SFM		200 SFM			
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min		
1/8	3	14,400	40.8	14,400	34.8	12,720	28.8	10,200	19.2	7,680	14.4	6,528	10.5	5,683	9.4		
3/16	5	11,520	43.2	11,520	34.8	9,600	28.8	7,680	21.6	5,760	16.8	4,896	12.3	4,262	10.9		
1/4	6	9,120	43.2	9,120	34.8	7,680	28.8	6,120	22.8	4,560	16.8	3,876	12.3	3,374	10.9		
5/16	8	7,680	43.2	7,680	36.0	6,360	28.8	5,040	24.0	3,840	18.0	3,264	13.1	2,842	11.7		
3/8	10	5,760	32.4	5,760	27.6	4,800	22.8	3,840	18.0	2,880	13.2	2,448	9.6	2,131	8.6		
7/16	11	4,560	25.2	4,560	21.6	3,840	18.0	3,000	14.4	2,280	10.8	1,938	7.9	1,687	7.0		
1/2	12	4,200	24.0	4,200	19.2	3,480	16.8	2,760	13.2	2,040	9.6	1,734	7.0	1,510	6.2		
9/16	14	3,840	21.6	3,840	18.0	3,120	15.6	2,520	12.0	1,920	9.6	1,632	7.0	1,421	6.2		
5/8	16	2,880	16.8	2,880	13.2	2,400	10.8	1,920	9.6	1,440	7.2	1,224	5.3	1,066	4.7		
3/4	20	2,280	13.2	2,280	10.8	1,920	9.6	1,560	7.2	1,140	6.0	969	4.4	844	3.9		
1	25	1,800	10.8	1,800	8.4	1,560	7.2	1,200	6.0	912	4.8	775	3.5	675	3.1		

Speeds & Feeds - 6 Flute 60° High Spiral Typhoon Mod. AlTiN Carbide End Mills

Side Milling

Work Material		Mild Steel Carbon Steel Cast Iron		Alloyed Steels Tool Steels		Hardened Steels Tool Steels		Hardened Steels Tool Steels		Titanium Alloy		Nickel Base High-Temp Alloy	
Hardness		Up to HRC25		HRC25-45		HRC45-55		HRC55-60		HRC30-40		HRC25-45	
Depth of Cut													
Mill Diameter (inch)	mm	312-540 SFM		156-312 SFM		96-156 SFM		60-96 SFM		156-276 SFM		48-80 SFM	
		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	3	11,400	70.8	6,360	19.2	3,240	7.2	2,280	4.8	5,040	33.6	1,680	2.4
5/32	4	8,640	70.8	4,800	19.2	2,640	9.6	1,800	4.8	3,840	36.0	1,260	2.4
3/16	5	6,840	61.2	3,840	19.2	2,160	10.8	1,560	4.8	3,000	36.0	984	3.6
1/4	6	6,360	122.4	3,480	39.6	1,920	14.4	1,320	7.2	2,520	42.0	840	4.8
5/16	8	4,800	112.8	2,640	39.6	1,440	14.4	996	7.2	1,920	42.0	624	4.8
3/8	10	3,840	99.6	2,160	39.6	1,152	13.2	804	7.2	1,560	37.2	480	4.8
1/2	12	3,480	99.6	1,920	36.0	960	13.2	672	6.0	1,260	36.0	408	3.6
5/8	16	2,640	75.6	1,440	27.6	720	10.8	528	4.8	960	33.6	312	3.6
3/4	20	2,160	61.2	1,140	21.6	576	7.2	420	3.6	780	28.8	240	3.6
1	25	1,500	56.4	900	22.8	450	8.4	300	3.6	720	24.0	216	2.4

TAPS



We have taken the guess work out of your tap selection!

HSSE-V3 ANSI SHANK Blue Ring

- For general ductile materials including:
- :: LOW AND MEDIUM CARBON STEEL
 - :: BRASS
 - :: COPPER AND CAST IRON
 - :: ALUMINUM



HSSE-V3 ANSI SHANK Yellow Ring

- For tough materials including:
- :: HIGH CARBON STEEL
 - :: HIGH ALLOY
 - :: TITANIUM
 - :: ALUMINUM



HSSE-V3 ANSI SHANK Orange Ring

- For STAINLESS STEEL
as well as:
- :: LOW CARBON STEELS
 - :: MEDIUM CARBON STEELS
 - :: ALLOYED HIGH CARBON



P-HSS ANSI SHANK Red Ring

- For high tensile materials including:
- :: TOOL STEELS
 - :: TITANIUM
 - :: NICKEL ALLOYS



HSSE-V3 ANSI SHANK Green Series

- For ALUMINUM:
- :: PURE/LOW
 - :: DIE CAST





Recommended Cutting Conditions

Blue Ring HSSE-V3 Soft Steels up to 25HRC				
Materials Main Group	Materials Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)
Low Carbon	1018, 1010, 1035	Normalized	<25	20-50
Medium Carbon	1045, 1050, 1065	Normalized	<25	20-40
Aluminum	Unalloyed, Cast	-	-	30-80
Brass/Bronze	-	-	-	30-80
Copper	-	-	-	25-60
Cast Iron	-	As Cast	<15	20-40

Yellow Ring HSSE-V3 Steels and other materials up to 35HRC				
Materials Main Group	Materials Sub-Group	Condition	Hardness(HRC)	Cutting Speed (FPM)
Tool Steels	01, A-2, D-2, H-13, P-20	Annealed	<35	15-25
Medium Carbon	1030, 1035, 1038, 1040, 1045, 1050	Normalized	<28	20-40
Alloyed High Carbon	1065, 1070, 1080, 1090,1095, 1561,1572	Normalized	<32	20-30
High Strength	4140, 4340	Normalized	<32	20-30
Titanium	Commercially Pure	Annealed	<32	15-30
Stainless Steel		Annealed	<29	20-30
Aluminum	Cast, Wrought	-	-	30-90

Orange Ring HSSE-V3 for Stainless Steel and other materials				
Materials Main Group	Materials Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)
Stainless Steel	200 Series,	Annealed	<28	20-35
	300 Series, 17-4 PH, 15-5, A286	Annealed	<28	20-35
	400 Series	Annealed	<29	20-35
	400 Series	Hardened	35-42	15-20
	17-4PH, 15-5, A286	Hardened	35-42	15-20
Low Carbon Steels	1010, 1018	Normalized	<20	25-50
Alloyed High Carbon	1050, 1065, 1070,1080,1090,1095, 1561, 1572	Normalized	<25	20-30
Beryllium Copper			<25	20-30

Red Ring P-HSS for materials up to 48HRC				
Materials Main Group	Materials Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)
Tool Steels	01, A-2, D-2, H-13, P-20,	Hardened	<48	10-20
High Strength	4140, 4340, 50100	Hardened	<48	15-20
Nickel Alloys	Inconel, Hastaloy, Waspaloy,	Annealed	<42	5-20
	Astraloy, Rene, Monel	and Hardened		
Titanium	6 AL 4	Annealed/hardened	<42	8-15

Green Series HSSE-V3 for Aluminum and other materials				
Materials Main Group	Materials Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)
Steels	Sheet, Low/Medium	Hardened	<20	20-50
	Carbon, Stainless Steel			
Aluminum	Pure/Low	-	-	30-60
Aluminum	Die Cast	-	-	30-60

Blue Ring HSSE-V3 Spiral Point Taps

Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production or conventional tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life.



- Used in general machine tapping applications for mild carbon steels such as 1018, 1010, 1035, 1045, 1050 and 1065
- Up to 25 HRC

Inch

• 4.5 Pitch lead (Intermediate)

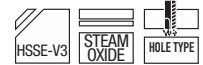
Tap	Threads Per Inch	No. of Flutes	Thread Limits	Overall Length (in.)	Thread Length	Code No.	Price \$
4	40	2	H2	1-7/8	.433	119-700	12.30
6	32	3	H3	2	.512	119-701	10.00
6	40	3	H2	2	.512	119-722	10.00
8	32	3	H3	2-1/8	.512	119-702	10.40
10	24	2	H3	2-3/8	.512	119-703	10.40
10	24	3	H3	2-3/8	.512	119-704	10.40
10	32	2	H3	2-3/8	.512	119-723	10.40
10	32	3	H3	2-3/8	.512	119-724	10.40
12	24	3	H3	2-3/8	.512	119-705	11.60
1/4	20	2	H3	2-1/2	.630	119-706	11.60
1/4	20	3	H3	2-1/2	.630	119-707	11.60
1/4	28	2	H3	2-1/2	.630	119-725	11.60
1/4	28	3	H3	2-1/2	.630	119-726	11.60
5/16	18	2	H3	2-23/32	.748	119-708	13.90
5/16	18	3	H3	2-23/32	.748	119-709	13.90
5/16	24	2	H3	2-23/32	.748	119-727	13.90
5/16	24	3	H3	2-23/32	.748	119-728	13.90
3/8	16	2	H3	2-15/16	.748	119-710	16.00
3/8	16	3	H3	2-15/16	.748	119-711	16.00
3/8	24	2	H3	2-15/16	.748	119-729	16.00
3/8	24	3	H3	2-15/16	.748	119-730	16.00
7/16	14	3	H3	3-5/32	.866	119-712	21.00
7/16	20	3	H3	3-5/32	.866	119-731	21.00
1/2	13	3	H3	3-3/8	.945	119-713	23.20
1/2	20	3	H3	3-3/8	.945	119-732	23.20
5/8	11	3	H3	3-13/16	1.102	119-714	36.30
5/8	18	3	H3	3-13/16	1.102	119-733	36.30
3/4	10	3	H3	4-1/4	1.220	119-715	60.50
3/4	16	3	H3	4-1/4	1.220	119-734	60.50
7/8	9	3	H4	4-11/16	1.339	119-716	80.50
7/8	14	3	H4	4-11/16	1.339	119-735	80.50
1	8	3	H4	5-1/8	1.496	119-717	108.00
1	12	3	H4	5-1/8	1.496	119-736	108.00
1-1/8	7	4	H4	5-7/16	1.732	119-718	152.90
1-1/8	12	4	H4	5-7/16	1.732	119-737	152.90
1-1/4	7	4	H4	5-3/4	1.732	119-719	178.10
1-1/4	12	4	H4	5-3/4	1.732	119-738	178.10
1-3/8	6	4	H4	6-1/16	2.000	119-720	234.10
1-3/8	12	4	H4	6-1/16	2.000	119-739	234.10
1-1/2	6	4	H4	6-3/8	2.000	119-721	300.20
1-1/2	12	4	H4	6-3/8	2.000	119-740	300.20

Cutting Conditions

Materials	Condition	Hardness (HRC)	Cutting Speed (FPM)
Main Group	Sub-Group	Condition	Hardness (HRC)
Low Carbon	1018, 1010, 1035	Normalized	<25
Medium Carbon	1045, 1050, 1065	Normalized	<25
Aluminum	Unalloyed, Cast	-	-
Brass/Bronze	-	-	-
Copper	-	-	-
Cast Iron	-	As Cast	<15

Blue Ring HSSE-V3 Spiral Point Taps

Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production or conventional tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life.



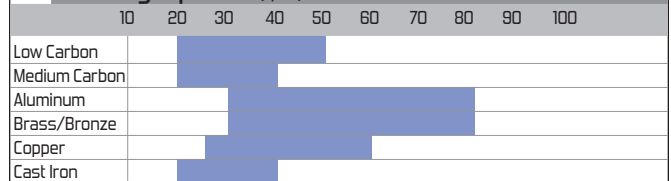
- Used in general machine tapping applications for mild carbon steels such as 1018, 1010, 1035, 1045, 1050 and 1065
- Up to 25 HRC

Metric

• 4.5 Pitch lead (Intermediate)

Tap	No. of Flutes	Thread Limits	Overall Length (in.)	Thread Length	Code No.	Price \$
M2 x .4	2	D3	1-3/4	.433	119-750	14.70
M2.5 x .45	2	D3	1-13/16	.512	119-751	14.70
M3 x .5	3	D3	1-15/16	.433	119-752	10.00
M3.5 x .6	3	D4	2	.512	119-753	10.00
M4 x .7	3	D4	2-1/8	.512	119-754	10.40
M4.5 x .75	3	D4	2-3/8	.512	119-755	10.40
M5 x .8	3	D4	2-3/8	.512	119-756	11.40
M6 x 1	3	D5	2-1/2	.630	119-757	11.60
M7 x 1	3	D5	2-23/32	.630	119-758	14.60
M8 x 1	3	D5	2-23/32	.748	119-759	14.60
M8 x 1.25	3	D5	2-23/32	.748	119-760	14.60
M10 x 1.25	3	D5	2-15/16	.748	119-761	21.20
M10 x 1.5	3	D6	2-15/16	.748	119-762	21.20
M12 x 1.25	3	D5	3-3/8	.945	119-763	26.40
M12 x 1.75	3	D6	3-3/8	.945	119-764	26.40
M14 x 1.5	3	D6	3-19/32	.984	119-765	39.50
M14 x 2	3	D7	3-19/32	.984	119-766	39.50
M16 x 1.5	3	D6	3-13/16	1.102	119-767	46.40
M16 x 2	3	D7	3-13/16	1.102	119-768	46.40
M18 x 1.5	3	D6	4-1/32	1.102	119-769	60.50
M18 x 2.5	3	D7	4-1/32	1.102	119-770	60.50
M20 x 1.5	3	D5	4-15/32	1.220	119-771	74.10
M20 x 2.5	3	D6	4-15/32	1.220	119-772	74.10
M22 x 1.5	3	D6	4-11/16	1.339	119-773	88.20
M22 x 2.5	3	D6	4-11/16	1.339	119-774	88.20
M24 x 1.5	3	D5	4-29/32	1.339	119-775	108.00
M24 x 3	3	D7	4-29/32	1.339	119-776	108.00
M27 x 1.5	4	D7	5-1/8	1.181	119-777	152.90
M27 x 3	4	D7	5-1/8	1.181	119-778	152.90
M30 x 1.5	4	D7	5-7/16	1.378	119-779	178.10
M30 x 3.5	4	D7	5-7/16	1.378	119-780	178.10

Cutting Speed (fpm)



Hardness (hrc)





Blue Ring HSSE-V3 Spiral Flute Taps

Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production or conventional tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life.



- Used in general machine tapping applications for mild carbon steels such as 1018, 1010, 1035, 1045, 1050 and 1065
- Up to 25 HRC



Inch • 2.5 Pitch lead (Bottoming)

Tap	Threads Per Inch	No. of Flutes	Thread Limits	Overall Length (in.)	Thread Length	Code No.	Price \$
4	40	2	H2	1-7/8	.433	119-800	14.50
6	32	3	H3	2	.512	119-801	14.50
8	32	3	H3	2-1/8	.512	119-802	14.40
10	24	3	H3	2-3/8	.512	119-803	14.40
10	32	3	H3	2-3/8	.512	119-817	14.40
1/4	20	3	H3	2-3/8	.630	119-804	15.40
1/4	28	3	H3	2-1/2	.630	119-818	15.40
5/16	18	3	H3	2-1/2	.748	119-805	20.20
5/16	24	3	H3	2-23/32	.748	119-819	20.20
3/8	16	3	H3	2-23/32	.748	119-806	22.20
3/8	24	3	H3	2-15/16	.748	119-820	22.20
7/16	14	3	H3	2-15/16	.866	119-807	33.20
7/16	20	3	H3	2-15/16	.866	119-830	33.20
1/2	13	3	H3	3-3/8	.945	119-808	38.00
1/2	20	3	H3	3-3/8	.945	119-821	38.00
5/8	11	4	H3	3-13/16	1.102	119-809	57.50
5/8	18	4	H3	3-13/16	1.102	119-822	57.50
3/4	10	4	H3	4-1/4	1.220	119-810	81.30
3/4	16	4	H3	4-1/4	1.220	119-823	81.30
7/8	9	4	H4	4-11/16	1.339	119-811	117.60
7/8	14	4	H4	4-11/16	1.339	119-824	117.60
1	8	4	H4	5-1/8	1.496	119-812	156.50
1	12	4	H4	5-1/8	1.496	119-825	156.50
1-1/8	7	4	H4	5-7/16	1.732	119-813	216.30
1-1/8	12	4	H4	5-7/16	1.732	119-826	216.30
1-1/4	7	4	H4	5-3/4	1.732	119-814	232.10
1-1/4	12	4	H4	5-3/4	1.732	119-827	232.10
1-3/8	6	4	H4	6-1/16	2.000	119-815	311.30
1-3/8	12	4	H4	6-1/16	2.000	119-828	311.30
1-1/2	6	4	H4	6-3/8	2.000	119-816	390.90
1-1/2	12	4	H4	6-3/8	2.000	119-829	390.90

Blue Ring HSSE-V3 Spiral Flute Taps

Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production or conventional tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life.



- Used in general machine tapping applications for mild carbon steels such as 1018, 1010, 1035, 1045, 1050 and 1065
- Up to 25 HRC



Metric • 2.5 Pitch lead (Bottoming)

Tap	No. of Flutes	Thread Limits	Overall Length (in.)	Thread Length	Code No.	Price \$
M3 x .5	3	D3	1-15/16	.433	119-840	20.70
M3.5 x .6	3	D4	2	.512	119-841	20.70
M4 x .7	3	D4	2-1/8	.512	119-842	20.70
M5 x .8	3	D4	2-3/8	.512	119-843	20.70
M6 x 1	3	D5	2-1/2	.630	119-844	20.70
M7 x 1	3	D5	2-23/32	.630	119-845	25.60
M8 x 1	3	D5	2-23/32	.748	119-846	25.60
M8 x 1.25	3	D5	2-23/32	.748	119-847	25.60
M10 x 1.25	3	D5	2-15/16	.748	119-848	38.10
M10 x 1.5	3	D6	2-15/16	.748	119-849	38.10
M12 x 1.25	3	D5	3-3/8	.945	119-850	41.70
M12 x 1.75	3	D6	3-3/8	.945	119-851	41.70
M14 x 1.5	3	D6	3-19/32	.984	119-852	55.90
M14 x 2	3	D7	3-19/32	.984	119-853	55.90
M16 x 1.5	3	D6	3-13/16	1.102	119-854	66.70
M16 x 2	3	D7	3-13/16	1.102	119-855	66.70
M18 x 1.5	4	D6	4-1/32	1.102	119-856	96.40
M18 x 2.5	4	D7	4-1/32	1.102	119-857	96.40
M20 x 1.5	4	D5	4-15/32	1.220	119-858	133.90
M20 x 2.5	4	D6	4-15/32	1.220	119-859	133.90
M22 x 1.5	4	D6	4-11/16	1.339	119-860	144.60
M22 x 2.5	4	D6	4-11/16	1.339	119-861	144.60
M24 x 1.5	4	D5	4-29/32	1.339	119-862	155.50
M24 x 3	4	D7	4-29/32	1.339	119-863	155.50
M27 x 1.5	4	D7	5-1/8	1.181	119-864	252.40
M27 x 3	4	D7	5-1/8	1.181	119-865	252.40
M30 x 1.5	4	D7	5-7/16	1.378	119-866	270.80
M30 x 3.5	4	D7	5-7/16	1.378	119-867	270.80

Cutting Conditions				
Materials			Hardness (HRC)	Cutting Speed (FPM)
Main Group	Sub-Group	Condition		
Low Carbon	1018, 1010, 1035	Normalized	<25	20-50
Medium Carbon	1045, 1050, 1065	Normalized	<25	20-40
Aluminum	Unalloyed, Cast	-	-	30-80
Brass/Bronze	-	-	-	30-80
Copper	-	-	-	25-60
Cast Iron	-	As Cast	<15	20-40

Cutting Speed (fpm)										
	10	20	30	40	50	60	70	80	90	100
Low Carbon										
Medium Carbon										
Aluminum										
Brass/Bronze										
Copper										
Cast Iron										

Hardness (hrc)										
	0	5	10	15	20	25	30	35	35	40
Low Carbon						up to 25				
Medium Carbon						up to 25				
Aluminum										
Brass/Bronze										
Copper										
Cast Iron							up to 15			

Yellow Ring HSSE-V3 Spiral Point Taps

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRc

Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life.



Inch

• 4.5 Pitch lead (Intermediate)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Steam Oxide Code No.	Price \$
2-56	2	H2	1-3/4	.433	122-550	11.60
3-48	2	H2	1-13/16	.512	122-552	11.60
4-40	2	H2	1-7/8	.433	123-296	11.60
4-40	2	H3	1-7/8	.433	122-554	11.60
6-32	3	H3	2	.512	123-300	10.40
6-40	3	H3	2	.512	123-334	10.40
8-32	3	H3	2-1/8	.512	123-302	11.00
10-24	3	H3	2-3/8	.512	123-304	11.30
10-32	3	H3	2-3/8	.512	123-338	11.30
12-24	3	H3	2-3/8	.512	123-306	12.20
1/4-20	3	H3	2-1/2	.630	123-308	12.80
1/4-28	3	H3	2-1/2	.630	123-342	12.80
5/16-18	3	H3	2-23/32	.748	123-310	15.60
5/16-24	3	H3	2-23/32	.748	123-344	15.60
3/8-16	3	H3	2-15/16	.748	123-312	18.80
3/8-24	3	H3	2-15/16	.748	123-346	18.90
7/16-14	3	H3	3-5/32	.866	123-314	24.60
7/16-20	3	H3	3-5/32	.866	123-348	24.60
1/2-13	3	H3	3-3/8	.945	123-316	27.30
1/2-20	3	H3	3-3/8	.945	123-350	27.30
5/8-11	3	H3	3-13/16	1.102	123-318	43.00
5/8-18	3	H3	3-13/16	1.102	123-352	43.00
3/4-10	3	H3	4-1/4	1.220	123-320	72.10
3/4-16	3	H3	4-1/4	1.220	123-353	72.10
7/8-9	3	H4	4-11/16	1.339	123-321	100.50
7/8-14	3	H4	4-11/16	1.339	123-359	100.50
1-8	4	H4	5-1/8	1.496	123-323	135.00
1-12	4	H4	5-1/8	1.496	123-361	135.00
1-14	4	H4	5-1/8	1.496	123-360	135.00
1-1/8-7	4	H4	5-7/16	1.732	123-364	191.20
1-1/8-12	4	H4	5-7/16	1.732	123-365	191.20
1-1/4-7	4	H4	5-3/4	1.732	123-367	222.60
1-1/4-12	4	H4	5-3/4	1.732	123-369	222.60
1-3/8-6	4	H4	6-1/16	2.000	123-371	292.60
1-3/8-12	4	H4	6-1/16	2.000	123-373	292.50
1-1/2-6	4	H4	6-3/8	2.000	123-363	375.20
1-1/2-12	4	H4	6-3/8	2.000	123-375	375.20

Metric Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Steam Oxide Code No.	Price \$
M2 x .4	2	D3	1-3/4	.433	123-502	16.70
M2.5 x .45	2	D3	1-13/16	.512	123-504	14.70
M3 x .5	3	D3	1-15/16	.433	123-505	12.50
M3.5 x .6	3	D4	2	.512	123-506	10.40
M4 x .7	3	D4	2-1/8	.512	123-507	11.00
M4.5 x .75	3	D4	2-3/8	.512	123-508	11.30
M5 x .8	3	D4	2-3/8	.512	123-509	11.30
M6 x 1	3	D5	2-1/2	.630	123-510	12.80
M7 x 1	3	D5	2-23/32	.630	123-511	15.60
M8 x 1	3	D5	2-23/32	.748	123-512	15.60
M8 x 1.25	3	D5	2-23/32	.748	123-513	15.60
M10 x 1.25	3	D5	2-15/16	.748	123-516	21.20
M10 x 1.5	3	D6	2-15/16	.748	123-515	21.20
M12 x 1.25	3	D5	3-3/8	.945	123-518	27.30
M12 x 1.75	3	D6	3-3/8	.945	123-517	27.30
M14 x 1.5	3	D7	3-19/32	.984	123-519	36.40
M14 x 2	3	D6	3-19/32	.984	123-520	36.40
M16 x 1.5	3	D6	3-13/16	1.102	123-522	43.00
M16 x 2	3	D7	3-13/16	1.102	123-521	43.00
M18 x 1.5	4	D6	4-1/32	1.102	123-523	72.10
M18 x 2.5	4	D7	4-1/32	1.102	123-524	72.10
M20 x 1.5	4	D5	4-15/32	1.220	123-525	86.30
M20 x 2.5	4	D6	4-15/32	1.220	123-526	86.30
M22 x 1.5	4	D6	4-11/16	1.339	123-527	100.50
M22 x 2.5	4	D6	4-11/16	1.339	123-528	100.50

Metric Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Steam Oxide Code No.	Price \$
M24 x 1.5	4	D5	4-29/32	1.339	123-529	135.00
M24 x 3	4	D7	4-29/32	1.339	123-530	135.00
M27 x 1.5	4	D7	5-1/8	1.181	123-531	191.20
M27 x 3	4	D7	5-1/8	1.181	123-532	191.20
M30 x 1.5	4	D7	5-7/16	1.378	123-533	222.60
M30 x 3.5	4	D7	5-7/16	1.378	123-534	222.60

Cutting Conditions

Materials			Hardness (HRC)	Cutting Speed (FPM)
Main Group	Sub-Group	Condition		
Tool Steels	01, A-2, D-2	Annealed	<35	15-25
	H-13, P-20			
Medium Carbon	1030, 1035	Normalized	<28	20-40
	1038, 1040			
	1045, 1050			
Alloyed High Carbon	1065, 1070,	Normalized	<32	20-30
	1080, 1090			
	1095, 1561,			
	1572			
High Strength Titanium	4140, 4340	Normalized	<32	20-30
	Commercially Pure	Annealed	<32	15-30
Aluminum	Cast,	-	-	30-90
	Wrought			



Yellow Ring HSSE-V3 Spiral Flute Taps

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRC

Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life.



Inch

• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Steam Oxide Code No.	Price \$
2-56	2	H2	1-3/4	.433	122-500	17.30
3-48	2	H2	1-13/16	.512	122-502	17.30
4-40	2	H2	1-7/8	.250	123-362	14.50
4-40	2	H3	1-7/8	.250	122-506	14.50
6-32	3	H2	2	.313	123-366	14.50
8-32	3	H3	2-1/8	.313	123-368	14.50
10-24	3	H3	2-3/8	.417	123-370	14.50
10-32	3	H3	2-3/8	.417	123-382	14.50
1/4-20	3	H3	2-1/2	.500	123-372	15.40
1/4-28	3	H3	2-1/2	.500	123-384	15.40
5/16-18	3	H3	2-23/32	.556	123-374	18.50
5/16-24	3	H3	2-23/32	.556	123-386	18.50
3/8-16	3	H3	2-15/16	.625	123-376	22.20
3/8-24	3	H3	2-15/16	.625	123-388	22.20
7/16-14	3	H3	3-5/32	.714	123-378	33.20
7/16-20	3	H3	3-5/32	.714	123-389	36.50
1/2-13	3	H3	3-3/8	.769	123-380	38.00
1/2-20	3	H3	3-3/8	.769	123-392	38.00
5/8-11	4	H3	3-13/16	.909	123-452	57.50
5/8-18	4	H3	3-13/16	.909	123-462	57.50
3/4-10	4	H3	4-1/4	1.000	123-454	78.70
3/4-16	4	H3	4-1/4	1.000	123-464	78.70
7/8-9	4	H4	4-11/16	1.111	123-466	112.00
7/8-14	4	H4	4-11/16	1.111	123-468	112.00
1-8	4	H4	5-1/8	1.250	123-469	151.30
1-12	4	H4	5-1/8	1.250	123-470	151.30
1-14	4	H4	5-1/8	1.250	123-465	156.50
1-1/8-7	4	H4	5-7/16	1.429	123-471	216.30
1-1/8-12	4	H4	5-7/16	1.429	123-472	216.30
1-1/4-7	4	H4	5-3/4	1.429	123-473	232.10
1-1/4-12	4	H4	5-3/4	1.429	123-474	232.10
1-3/8-6	4	H4	6-1/16	1.667	123-475	311.30
1-3/8-12	4	H4	6-1/16	1.667	123-476	311.30
1-1/2-6	4	H4	6-3/8	1.667	123-477	375.20
1-1/2-12	4	H4	6-3/8	1.667	123-478	375.20

Metric Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Steam Oxide Code No.	Price \$
M3 x .5	3	D3	2-3/8	.197	123-650	18.90
M3.5 x .6	3	D4	2-3/8	.236	123-651	18.90
M4 x .7	3	D4	2-3/8	.276	123-652	18.90
M5 x .8	3	D4	2-3/8	.315	123-654	18.90
M6 x 1	3	D5	2-1/2	.394	123-656	18.90
M7 x 1	3	D5	2-23/32	.394	123-657	23.20
M8 x 1	3	D5	2-23/32	.492	123-659	23.20
M8 x 1.25	3	D5	2-23/32	.492	123-658	23.20
M10 x 1.25	3	D5	2-15/16	.591	123-661	34.70
M10 x 1.5	3	D6	2-15/16	.591	123-660	34.70
M12 x 1.25	3	D5	3-3/8	.689	123-663	41.80
M12 x 1.75	3	D6	3-3/8	.689	123-662	41.80
M14 x 1.5	3	D6	3-19/32	.787	123-665	55.90
M14 x 2	3	D7	3-19/32	.787	123-667	55.90
M16 x 1.5	3	D6	3-13/16	.787	123-668	60.60
M16 x 2	3	D7	3-13/16	.787	123-669	60.60
M18 x 1.5	4	D6	4-1/32	.984	123-670	96.50
M18 x 2.5	4	D7	4-1/32	.984	123-671	96.50
M20 x 1.5	4	D5	4-15/32	.984	123-672	121.70
M20 x 2.5	4	D6	4-15/32	.984	123-673	121.70
M22 x 1.5	4	D6	4-11/16	.984	123-674	144.60
M22 x 2.5	4	D6	4-11/16	.984	123-675	144.60
M24 x 1.5	4	D5	4-29/32	1.181	123-676	155.50

Metric Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Steam Oxide Code No.	Price \$
M24 x 3	4	D7	4-29/32	1.181	123-677	155.50
M27 x 1.5	4	D7	5-1/8	1.181	123-678	252.40
M27 x 3	4	D7	5-1/8	1.181	123-679	252.40
M30 x 1.5	4	D7	5-7/16	1.378	123-680	270.80
M30 x 3.5	4	D7	5-7/16	1.378	123-681	270.80

Cutting Conditions					
Materials					
Main Group	Sub-Group	Condition	Hardness (HRC)	Speed (FPM)	Cutting
Tool Steels	01, A-2, D-2	Annealed	<35	15-25	
	H-13, P-20				
Medium Carbon	1030, 1035	Normalized	<28	20-40	
	1038, 1040				
	1045, 1050				
Alloyed High Carbon	1065, 1070,	Normalized	<32	20-30	
	1080, 1090				
	1095, 1561,				
	1572				
High Strength Titanium	4140, 4340	Normalized	<32	20-30	
	Commercially Pure	Annealed	<32	15-30	
Aluminum	Cast, Wrought	-	-	30-90	

Cutting Tools

Yellow Ring UN8 DIN Length ANSI Shank

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRC



• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
1-8	4	H7	6.299	1.417	123-055	203.00
1-1/8-8	4	H9	7.087	1.575	123-056	228.50
1-1/4-8	4	H9	7.087	1.575	123-079	380.60
1-3/8-8	5	H9	7.874	1.654	123-080	516.00
1-1/2-8	5	H9	7.874	1.654	123-057	592.10
1-3/4-8	6	H9	7.874	1.772	123-058	1,572.60
2-8	6	H10	8.858	1.969	123-059	2,237.90

DIN Length ANSI Shank Spiral Flute Taps

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRC



These taps combine ANSI shank specifications with advantage of DIN lengths for added reach.

• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
10-24	3	H3	2.756	.417	124-800	16.20
1/4-20	3	H3	3.150	.500	124-802	16.60
5/16-18	3	H3	3.543	.556	124-804	21.60
3/8-16	3	H3	3.937	.625	124-806	26.10
7/16-14	3	H3	3.937	.714	124-808	37.90
1/2-13	3	H3	4.331	.769	124-810	43.60
5/8-11	4	H3	4.331	.909	124-812	64.20
3/4-10	4	H3	4.921	1.000	124-814	92.90

DIN Length ANSI Shank Spiral Point Taps

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRC

These taps combine ANSI shank specifications with advantage of DIN lengths for added reach.



• 4.5 Pitch lead (Intermediate)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
10-24	3	H3	2.756	.591	124-820	12.80
1/4-20	3	H3	3.150	.669	124-822	15.10
5/16-18	3	H3	3.543	.669	124-824	18.60
3/8-16	3	H3	3.937	.787	124-826	23.40
7/16-14	3	H3	3.937	.866	124-828	29.50
1/2-13	3	H3	4.331	.984	124-830	33.70
5/8-11	3	H3	4.331	1.063	124-832	51.10
3/4-10	3	H3	4.921	1.181	124-834	85.50

4" & 6" O.A.L. Spiral Point HSSE-V3 Taps

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRC



Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life.



Designed for long reach applications.

• 4.5 Pitch lead (Intermediate)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
4-40	2	H2	4"	.433	122-700	14.50
6-32	3	H3	4"	.512	122-702	13.10
8-32	3	H3	4"	.512	122-704	14.30
10-24	3	H3	6"	.512	122-706	14.40
10-32	3	H3	6"	.512	122-708	14.40
1/4-20	3	H3	6"	.630	122-710	20.20
1/4-28	3	H3	6"	.630	122-712	20.20
5/16-18	3	H3	6"	.748	122-714	23.60
5/16-24	3	H3	6"	.748	122-716	23.60
3/8-16	3	H3	6"	.748	122-718	29.90
3/8-24	3	H3	6"	.748	122-720	29.90
7/16-14	3	H3	6"	.866	122-722	37.30
7/16-20	3	H3	6"	.866	122-724	37.30
1/2-13	3	H3	6"	.945	122-726	41.20
1/2-20	3	H3	6"	.945	122-728	41.20
5/8-11	3	H3	6"	1.102	122-730	61.80
3/4-10	3	H3	6"	1.220	122-731	98.10
7/8-9	3	H4	6"	1.339	122-732	131.60
1-8	4	H4	6"	1.496	122-733	169.80

Cutting Conditions

Materials

Main Group	Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)
Stainless Steel	200 Series,	Annealed	<28	20-35
	300 Series,	Annealed	<28	20-35
	17-4, 15-5	Annealed	<25	15-25
	AM286	Annealed	<25	15-25
Tool Steels	400 Series	Annealed	<29	20-35
	01, A-2, D-2 H-13, P-20	Annealed	<35	15-25
Medium Carbon	1030, 1035 1038, 1040 1045, 1050	Normalized	<28	20-40
Alloyed High Carbon	1065, 1070, 1080, 1090 1095, 1561, 1572	Normalized	<32	20-30
High Strength Titanium	4140, 4340 Commercially Pure	Normalized Annealed	<32 <32	20-30 15-30
Aluminum	Cast, Wrought	-	-	30-90

Cutting Speed (fpm)

	10	20	30	40	50	60	70	80	90	100
Tool Steels										
Medium Carbon										
Alloyed High Carbon										
High Strength										
Titanium										
Aluminum										

Hardness (hrc)

	0	5	10	15	20	25	30	35	35	40
Tool Steels										
Medium Carbon										
Alloyed High Carbon										
High Strength										
Titanium										
Aluminum										



4" & 6" O.A.L. Spiral Flute HSSE-V3 Taps

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRC



Designed for high-speed tapping applications. Developed to withstand the high stress and high heat associated with high-speed CNC production tapping. Features a unique free-cutting design with a special tempering and geometry which contributes to extra tool life. Designed for long reach applications.



• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
4-40	2	H2	4"	.433	123-060	16.70
6-32	3	H3	4"	.512	123-061	15.90
8-32	3	H3	4"	.512	123-062	16.40
10-24	3	H3	4"	.512	123-063	16.50
10-32	3	H3	6"	.512	123-073	16.50
1/4-20	3	H3	6"	.630	123-064	20.90
1/4-28	3	H3	6"	.630	123-074	20.90
5/16-18	3	H3	6"	.748	123-065	26.90
5/16-24	3	H3	6"	.748	123-075	26.90
3/8-16	3	H3	6"	.748	123-066	32.70
3/8-24	3	H3	6"	.748	123-076	32.70
7/16-14	3	H3	6"	.866	123-067	41.80
7/16-20	3	H3	6"	.866	123-077	41.80
1/2-13	3	H3	6"	.945	123-068	51.70
1/2-20	3	H3	6"	.945	123-078	51.70
5/8-11	4	H3	6"	1.102	123-069	65.40
3/4-10	4	H3	6"	1.220	123-070	105.70
7/8-9	4	H4	6"	1.339	123-071	144.70
1-8	4	H4	6"	1.496	123-072	188.50

Orange Ring HSSE-V3 Spiral Point Taps

HSSE-V3% Vanadium

- Superior performance in stainless steels
- Up to 35 HRC



• 4.5 Pitch lead (Intermediate)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
2-56	2	H2	1-3/4	.433	124-926	11.60
3-48	2	H2	1-13/16	.512	124-927	11.60
4-40	2	H2	1-7/8	.433	124-930	11.60
6-32	3	H3	2	.512	124-931	10.40
8-32	3	H3	2-1/8	.512	124-932	11.00
10-24	3	H3	2-3/8	.512	124-933	11.30
10-32	3	H3	2-3/8	.512	124-945	11.30
1/4-20	3	H3	2-1/2	.630	124-934	12.80
1/4-28	3	H3	2-1/2	.630	124-946	12.80
5/16-18	3	H3	2-23/32	.748	124-935	15.60
5/16-24	3	H3	2-23/32	.748	124-947	15.60
3/8-16	3	H3	2-15/16	.748	124-936	18.90
3/8-24	3	H3	2-15/16	.748	124-948	18.90
7/16-14	3	H3	3-5/32	.866	124-937	24.60
7/16-20	3	H3	3-5/32	.866	124-949	24.60
1/2-13	3	H3	3-3/8	.945	124-938	27.30
1/2-20	3	H3	3-3/8	.945	124-950	31.10
5/8-11	3	H3	3-13/16	1.102	124-939	43.00
5/8-18	3	H3	3-13/16	1.102	124-951	43.00
3/4-10	3	H3	4-1/4	1.220	124-940	72.10
3/4-16	3	H3	4-1/4	1.220	124-952	72.10
7/8-9	3	H4	4-11/16	1.339	124-941	100.50
7/8-14	3	H4	4-11/16	1.339	124-953	100.50
1-8	3	H4	5-1/8	1.496	124-942	135.00
1-12	3	H4	5-1/8	1.496	124-954	135.00

HSSE-V3 NPT Spiral Flute Pipe Taps

HSSE-V3% Vanadium

- Superior performance in hardened tool steels such as 4140, 4340, H13, D2.
- Up to 35 HRC



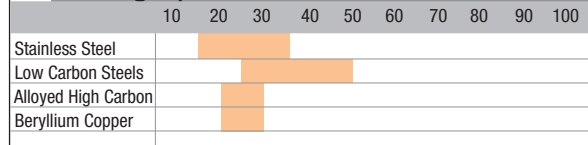
• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Overall Length	Thread Length	Code No.	Price \$
1/16-27	4	2-1/8	.688	123-400	25.00
1/8-27	4	2-1/8	.750	123-402	27.60
1/4-18	4	2-7/16	1.063	123-404	39.20
3/8-18	4	2-9/16	1.063	123-406	61.80
1/2-14	4	3-1/8	1.375	123-410	104.20
3/4-14	5	3-1/4	1.375	123-412	156.20
1-11-1/2	5	3-3/4	1.750	123-414	260.20
1-1/4-11-1/2	5	4	1.750	123-416	455.30
1-1/2-11-1/2	5	4-1/4	1.750	123-418	585.40
2-11-1/2	5	4-1/2	1.750	123-420	975.60

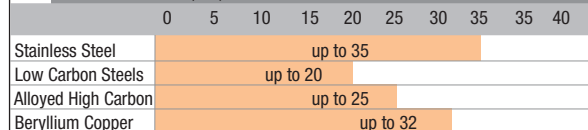
Cutting Conditions

Materials	Main Group	Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)
Stainless Steel	200 Series, 300 Series, 17-4, 15-5 AM286 400 Series 400 Series 17-4PH, 15-5 A286	Annealed	Normalized	<28	20-35
					20-35
					15-25
					15-25
					20-35
					15-20
					15-20
					15-20
					15-20
					15-20
Low Carbon Steels	1010, 1018	Normalized	Normalized	<20	25-50
					20-30
					20-30
Alloyed High Carbon	1050, 1065, 1070, 1080, 1090, 1095, 1561, 1572	Normalized	Normalized	<25	20-30
					20-30
					20-30
					20-30
Beryllium Copper	4140, 4340			<32	20-30

Cutting Speed (fpm)



Hardness (hrc)



Low / Medium Carbon Steels Alloy / High Carbon Steels Stainless Steel High Tensile

Orange Ring HSSE-V3 Spiral Point Taps

- HSSE-V3% Vanadium**
- Superior performance in stainless steels
 - Up to 35 HRC



Metric • 4.5 Pitch lead (Intermediate)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
M3 x .5	3	D3	1-15/16	.433	124-955	10.30
M4 x .7	3	D4	2-1/8	.512	124-956	11.00
M5 x .8	3	D4	2-3/8	.512	124-957	12.90
M6 x 1	3	D5	2-1/2	.630	124-958	12.90
M8 x 1.25	3	D5	2-23/32	.748	124-959	16.20
M10 x 1.25	3	D5	2-15/16	.748	124-960	23.30
M10 x 1.5	3	D6	2-15/16	.748	124-961	23.30
M12 x 1.75	3	D6	3-3/8	.945	124-962	29.10
M14 x 2	3	D6	3-19/32	.984	124-897	43.50
M16 x 2	3	D7	3-13/16	1.102	124-899	51.10
M18 x 2.5	3	D7	4-1/32	1.102	124-901	72.10
M20 x 2.5	3	D6	4-1/4	1.220	124-903	86.30
M22 x 2.5	3	D6	4-11/16	1.339	124-905	100.50
M24 x 3	3	D7	4-29/32	1.339	124-907	135.00

Orange Ring HSSE-V3 Spiral Flute Taps

- HSSE-V3% Vanadium**
- Superior performance in stainless steels
 - Up to 35 HRC



Metric • 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
M3 x .5	3	D3	1-15/16	.197	124-988	23.00
M4 x .7	3	D4	2-1/8	.276	124-989	23.00
M5 x .8	3	D4	2-3/8	.315	124-990	23.00
M6 x 1	3	D5	2-1/2	.394	124-991	23.00
M8 x 1.25	3	D5	2-23/32	.492	124-992	28.20
M10 x 1.25	3	D5	2-15/16	.591	124-993	42.00
M10 x 1.5	3	D6	2-15/16	.591	124-994	42.00
M12 x 1.75	3	D6	3-3/8	.689	124-995	46.00
M14 x 2	3	D7	3-19/32	.787	124-996	61.50
M16 x 2	3	D7	3-13/16	.787	124-997	73.40
M18 x 2.5	4	D7	4-1/32	.984	124-998	151.30
M20 x 2.5	4	D6	4-15/32	.984	124-999	147.30
M22 x 2.5	4	D6	4-11/16	.984	124-943	159.10
M24 x 3	4	D7	4-29/32	1.181	124-944	188.30

Orange Ring HSSE-V3 Spiral Flute Taps

- HSSE-V3% Vanadium**
- Superior performance in stainless steels
 - Up to 35 HRC



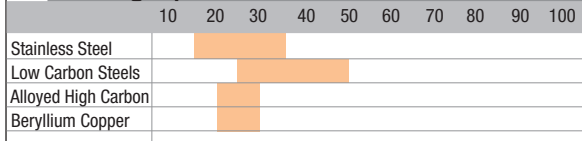
Inch • 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
2-56	2	H2	1-3/4	.433	124-928	16.20
3-48	2	H2	1-13/16	.512	124-929	16.20
4-40	2	H2	1-7/8	.250	124-965	16.50
6-32	3	H2	2	.313	124-966	15.80
8-32	3	H2	2-1/8	.313	124-967	15.80
10-24	3	H3	2-3/8	.417	124-968	16.10
10-32	3	H3	2-3/8	.417	124-979	16.10
1/4-20	3	H3	2-1/2	.500	124-969	16.50
1/4-28	3	H3	2-1/2	.500	124-980	16.50
5/16-18	3	H3	2-23/32	.556	124-970	20.30
5/16-24	3	H3	2-23/32	.556	124-981	22.40
3/8-16	3	H3	2-15/16	.625	124-971	27.00
3/8-24	3	H3	2-15/16	.625	124-982	27.00
7/16-14	3	H3	3-5/32	.714	124-972	36.50
7/16-20	3	H3	3-5/32	.714	124-964	36.50
1/2-13	3	H3	3-3/8	.769	124-973	46.10
1/2-20	3	H3	3-3/8	.769	124-983	46.10
9/16-12	4	H3	3-19/32	.880	124-974	63.30
5/8-11	4	H3	3-13/16	.909	124-975	63.30
5/8-18	4	H3	3-13/16	.909	124-984	63.30
3/4-10	4	H3	4-1/4	1.000	124-976	89.50
3/4-16	4	H3	4-1/4	1.000	124-985	89.50
7/8-9	4	H4	4-11/16	1.111	124-977	129.40
7/8-14	4	H4	4-11/16	1.111	124-986	129.40
1-8	4	H4	5-1/8	1.250	124-978	171.50
1-12	4	H4	5-1/8	1.250	124-987	171.50

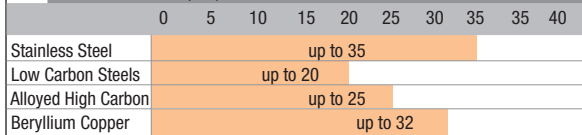
Cutting Conditions

Materials	Main Group	Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)		
Stainless Steel	200 Series, 300 Series, 17-4, 15-5	AM286, 400 Series, 17-4PH, 15-5 A286	Annealed	<28	20-35		
			Annealed	<28	20-35		
			Annealed	<25	15-25		
			Annealed	<25	15-25		
			Annealed	<29	20-35		
			Hardened	<35	15-20		
Low Carbon Steels	1010, 1018	Normalized	Normalized	<20	25-50		
			Alloyed High Carbon	1050, 1065, 1070, 1080, 1090, 1095, 1561, 1572	Normalized	<25	20-30
						Beryllium Copper	4140, 4340

Cutting Speed (fpm)



Hardness (hrc)





Red Ring P-HSS Spiral Point Taps

P-HSS - Powdered Metal

Powdered Metal taps offer superior toughness and lubricity and are made of premium-grade, super hard powder high speed steel. These taps have a special geometry for tougher applications.

- Used for heat resistant materials, titanium alloys as well as other high tensile steels and alloys including tool steel and nickel alloys
- Up to 48 HRC



Inch

• 4.5 Pitch lead (Intermediate)

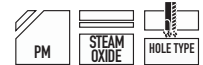
Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
4-40	2	H2	1-7/8	.433	124-100	24.30
5-40	3	H2	1-15/16	.433	124-105	21.30
6-32	3	H3	2	.512	124-110	20.00
8-32	3	H3	2-1/8	.512	124-115	20.00
10-24	3	H3	2-3/8	.512	124-120	21.30
10-32	3	H3	2-3/8	.512	124-125	21.30
1/4-20	3	H3	2-1/2	.630	124-130	23.10
1/4-28	3	H3	2-1/2	.630	124-135	23.10
5/16-18	3	H3	2-23/32	.748	124-140	27.30
5/16-24	3	H3	2-23/32	.748	124-145	27.30
3/8-16	3	H3	2-15/16	.748	124-150	36.40
3/8-24	3	H3	2-15/16	.748	124-155	36.40
7/16-14	3	H3	3-5/32	.866	124-160	43.00
7/16-20	3	H3	3-5/32	.866	124-165	43.00
1/2-13	3	H3	3-3/8	.945	124-170	50.40
1/2-20	3	H3	3-3/8	.945	124-175	50.40
5/8-11	3	H3	3-13/16	1.102	124-180	102.90
5/8-18	3	H3	3-13/16	1.102	124-185	102.90
3/4-10	4	H3	4-1/4	1.220	124-190	163.40
3/4-16	4	H3	4-1/4	1.220	124-195	163.40

Red Ring P-HSS Spiral Point Taps

P-HSS - Powdered Metal

Powdered Metal taps offer superior toughness and lubricity and are made of premium-grade, super hard powder high speed steel. These taps have a special geometry for tougher applications.

- Used for heat resistant materials, titanium alloys as well as other high tensile steels and alloys including tool steel and nickel alloys
- Up to 48 HRC



Metric

• 4.5 Pitch lead (Intermediate)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
M3 x .5	3	D3	1-15/16	.433	124-500	20.00
M4 x .7	3	D4	2-1/8	.512	124-505	20.00
M5 x .8	3	D4	2-3/8	.512	124-510	21.30
M6 x 1.0	3	D5	2-1/2	.630	124-515	23.10
M8 x 1.25	3	D5	2-23/32	.748	124-520	27.30
M10 x 1.25	3	D5	2-15/16	.748	124-525	36.40
M10 x 1.5	3	D6	2-15/16	.748	124-530	36.40
M12 x 1.75	3	D6	3-3/8	.945	124-535	50.40

Red Ring P-HSS Spiral Flute Taps

P-HSS - Powdered Metal

Powdered Metal taps offer superior toughness and lubricity and are made of premium-grade, super hard powder high speed steel. These taps have a special geometry for tougher applications.

- Used for heat resistant materials, titanium alloys as well as other high tensile steels and alloys including tool steel and nickel alloys
- Up to 48 HRC



Inch

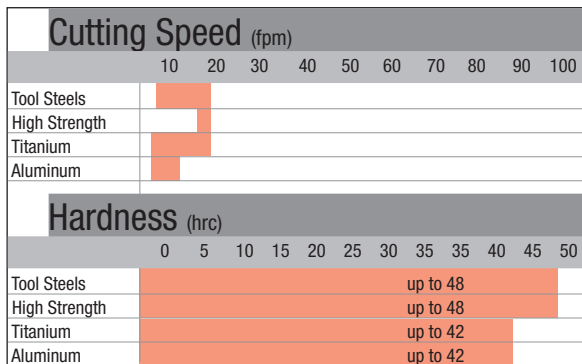
• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
4-40	2	H2	1-7/8	.250	124-250	24.70
6-32	3	H3	2	.313	124-255	22.50
8-32	3	H3	2-1/8	.313	124-260	22.20
10-24	3	H3	2-3/8	.417	124-265	22.20
10-32	3	H3	2-3/8	.417	124-270	22.20
1/4-20	3	H3	2-1/2	.500	124-275	24.70
1/4-28	3	H3	2-1/2	.500	124-280	24.70
5/16-18	3	H3	2-23/32	.556	124-285	27.30
5/16-24	3	H3	2-23/32	.556	124-290	27.30
3/8-16	3	H3	2-15/16	.625	124-295	36.40
3/8-24	3	H3	2-15/16	.625	124-300	36.40
7/16-14	3	H3	3-5/32	.714	124-305	43.80
7/16-20	3	H3	3-5/32	.714	124-310	43.80
1/2-13	3	H3	3-3/8	.769	124-315	50.40
1/2-20	3	H3	3-3/8	.769	124-320	50.40
5/8-11	4	H3	3-13/16	.909	124-325	108.90
5/8-18	4	H3	3-13/16	.909	124-330	108.90
3/4-10	4	H3	4-1/4	1.000	124-335	163.40
3/4-16	4	H3	4-1/4	1.000	124-340	163.40

Metric

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
M3 x .5	3	D3	1-15/16	.197	124-550	21.20
M4 x .7	3	D4	2-1/8	.276	124-555	21.50
M5 x .8	3	D4	2-3/8	.315	124-560	22.00
M6 x 1.0	3	D5	2-1/2	.394	124-565	23.10
M8 x 1.25	3	D5	2-23/32	.492	124-570	34.90
M10 x 1.25	3	D5	2-15/16	.591	124-575	48.00
M10 x 1.5	3	D6	2-15/16	.591	124-580	48.00
M12 x 1.75	3	D6	3-3/8	.689	124-585	60.20

Cutting Conditions				
Materials				Cutting Speed (FPM)
Main Group	Sub-Group	Condition	Hardness (HRC)	
Tool Steels	01, A-2, D-2 H-13, P-20	Hardened	<48	10-20
High Strength	4140, 4340 50100	Hardened	<48	15-20
Nickel Alloys	Inconel, Hastalloy, Waspaloy, Rene, Monel	Annealed/ Hardened	<42	5-20
Titanium	6 AL 4	Annealed/ Hardened	<42	8-15



Low / Medium Carbon Steels | Alloy / High Carbon Steels | Stainless Steel | High Tensile

HSSE-V3 Spiral Flute Taps For Aluminum

Aluminum

High performance taps with special geometries & bright finish for Aluminum.

- Bright finish
- 45° Spiral flute



Inch

• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
4-40	2	H2	1-7/8	.250	124-400	17.40
6-32	2	H3	2	.313	124-405	14.00
8-32	2	H3	2-1/8	.313	124-415	14.00
10-24	2	H3	2-3/8	.417	124-420	14.20
10-32	2	H3	2-3/8	.417	124-425	14.20
1/4-20	2	H3	2-1/2	.500	124-430	15.70
1/4-28	2	H3	2-1/2	.500	124-440	15.70
5/16-18	2	H3	2-23/32	.556	124-445	18.90
5/16-24	2	H3	2-23/32	.556	124-455	18.90
3/8-16	2	H3	2-15/16	.625	124-465	22.10
3/8-24	2	H3	2-15/16	.625	124-475	22.10

Metric

Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
M3 x .5	2	D3	1-15/16	.197	124-600	19.80
M4 x .7	2	D4	2-1/8	.276	124-605	19.80
M5 x .8	2	D5	2-3/8	.315	124-610	19.80
M6 x 1.0	2	D5	2-1/2	.394	124-615	19.80
M8 x 1.25	2	D5	2-23/32	.492	124-620	30.40
M10 x 1.25	2	D5	2-15/16	.591	124-625	45.50
M10 x 1.5	2	D6	2-15/16	.591	124-630	45.50

HSSE-V3 S.T.I. 45° Spiral Flute Taps

STI taps combine special geometry & surface finish for tapping in Aluminum and other non-ferrous materials for screw thread insert applications.



Inch

• 2.5 Pitch lead (Bottoming)

Tap	No. Flutes	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
4-40	2	1-7/8	.250	124-050	14.10
8-32	2	2-1/8	.313	124-054	16.00
10-24	2	2-3/8	.417	124-056	16.00
10-32	2	2-3/8	.417	124-058	16.00
1/4-28	2	2-1/2	.500	124-062	19.80
5/16-18	2	2-23/32	.556	124-064	22.50
3/8-16	2	2-15/16	.625	124-068	29.70
3/8-24	2	2-15/16	.625	124-070	29.70

• Available only while quantities last

HSS Roll Form Taps

Extended life results from tap geometry that allows optimum cutting performance and close control over tapped hole size. Superior wear resistance, heat treated for toughness.

- Used for thread forming in copper, brass, aluminum, die castings, leaded steels, low carbon steels and stainless steels
- Bright finish
- Premium High Speed Steel



Inch

Tap	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
4-40	H5	1-7/8	.560	124-650	26.10
6-32	H5	2	.480	124-655	18.00
8-32	H5	2-1/8	.500	124-660	15.60
10-24	H6	2-3/8	.640	124-665	15.60
10-32	H6	2-3/8	.640	124-670	15.60
1/4-20	H6	2-1/2	.830	124-675	18.30
1/4-28	H6	2-1/2	.830	124-680	16.30
5/16-18	H7	2-23/32	.930	124-685	18.50
5/16-24	H7	2-23/32	.930	124-690	18.50
3/8-16	H7	2-15/16	.980	124-695	25.10
3/8-24	H7	2-15/16	.980	124-700	25.10
1/2-13	H8	2-23/32	.930	124-705	46.70
1/2-20	H8	2-15/16	.980	124-710	46.70

Metric

Tap	Thread Limits	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
M3 x .5	D5	1-15/16	.620	124-750	21.70
M4 x .7	D6	2-1/8	.500	124-755	18.30
M5 x .8	D7	2-3/8	.640	124-760	18.30
M6 x 1.0	D8	2-1/2	.830	124-765	19.40
M8 x 1.25	D9	2-23/32	.930	124-770	20.90
M10 x 1.5	D10	2-15/16	.980	124-775	29.10

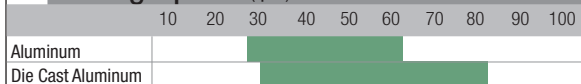
Cutting Conditions

Materials	Sub-Group	Condition	Hardness (HRC)	Cutting Speed (FPM)
Steels	Sheet, Low/Medium Carbon and Stainless Steels	Hardened	<20	20-50
Aluminum	Pure/Low Alloyed			30-60
Copper	Die Cast, Cast			30-80
Aluminum Cast	Zinc Die Cast			
Copper Alloys	Brass, Bronze			

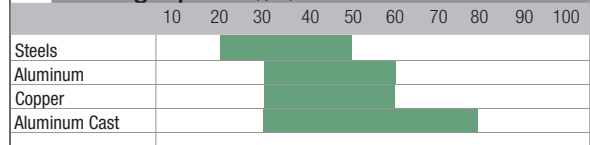
Cutting Conditions

Materials	Cutting Speed (FPM)
Main Group	
Aluminum	25-60
Die Cast Aluminum	30-80

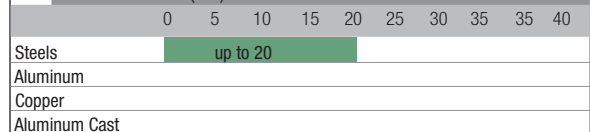
Cutting Speed (fpm)



Cutting Speed (fpm)



Hardness (hrc)





Hand Taps - Inch

High Speed Steel for hand tapping of through or blind holes in ferrous and non-ferrous alloys.



Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Taper Code No.	Price \$	Plug Code No.	Price \$	Bottom Code No.	Price \$
6-32	3	H3	2	.688	123-032	5.20	123-034	5.20	123-036	5.20
8-32	4	H3	2-1/8	.750	123-038	5.20	123-040	5.20	123-042	5.20
10-24	4	H3	2-3/8	.875	123-044	5.20	123-046	5.20	123-048	5.20
10-32	4	H3	2-3/8	.875	123-104	5.20	123-106	5.20	123-108	5.20
12-24	4	H3	2-3/8	.938	123-050	5.20	123-052	5.20	123-054	5.20
1/4-20	4	H3	2-1/2	1.000	123-116	5.10	123-118	5.10	123-120	5.10
1/4-28	4	H3	2-1/2	1.000	123-200	5.10	123-202	5.10	123-204	5.10
5/16-18	4	H3	2-23/32	1.125	123-122	6.30	123-124	6.30	123-126	6.30
5/16-24	4	H3	2-23/32	1.125	123-206	6.30	123-208	6.30	123-210	6.30
3/8-16	4	H3	2-15/16	1.250	123-128	8.20	123-130	8.20	123-132	8.20
3/8-24	4	H3	2-15/16	1.250	123-212	8.20	123-214	8.20	123-216	8.20
7/16-14	4	H3	3-5/32	1.438	123-134	12.00	123-136	12.00	123-138	12.00
7/16-20	4	H3	3-5/32	1.438	123-218	12.00	123-220	12.00	123-222	12.00
1/2-13	4	H3	3-3/8	1.656	123-140	13.50	123-142	13.50	123-144	13.50
1/2-20	4	H3	3-3/8	1.656	123-224	13.50	123-226	13.50	123-228	13.50
9/16-12	4	H3	3-19/32	1.656	123-146	20.20	123-148	20.20	123-150	20.20
9/16-18	4	H3	3-19/32	1.656	123-230	20.20	123-232	20.20	123-234	20.20
5/8-11	4	H3	3-13/16	1.813	123-152	24.40	123-154	24.40	123-156	24.40
5/8-18	4	H3	3-13/16	1.813	123-236	24.40	123-238	24.40	123-240	24.40
3/4-10	4	H3	4-1/4	2.000	123-158	33.70	123-160	33.70	123-162	33.70
3/4-16	4	H3	4-1/4	2.000	123-242	33.70	123-244	33.70	123-246	33.70
7/8-9	4	H4	4-11/16	2.219	123-164	46.70	123-166	46.70	123-168	46.70
7/8-14	4	H4	4-11/16	2.219	123-248	46.70	123-250	46.70	123-252	46.70
1-8	4	H4	5-1/8	2.500	123-170	63.00	123-172	63.00	123-174	63.00
1-12	4	H4	5-1/8	2.500	123-254	63.00	123-256	63.00	123-258	63.00
1-14	4	H4	5-1/8	2.500	123-260	63.00	123-262	63.00	123-264	63.00
1-1/8-7	4	H4	5-7/16	2.562	123-176	87.20	123-178	87.20	123-180	87.20
1-1/8-12	4	H4	5-7/16	2.562	123-266	93.80	123-268	93.80	123-270	93.80
1-1/4-7	4	H4	5-3/4	2.562	123-272	78.20	123-274	78.20	123-276	78.20
1-1/4-12	6	H4	5-3/4	2.562	123-536	78.20	123-538	78.20	123-540	78.20
1-3/8-6	4	H4	6-1/16	3.000	123-278	97.70	123-280	97.70	123-282	97.70
1-3/8-12	6	H4	6-1/16	3.000	123-542	97.70	123-544	97.70	123-546	97.70
1-1/2-6	4	H4	6-3/8	3.000	123-284	117.20	123-286	117.20	123-288	117.20
1-1/2-12	6	H4	6-3/8	3.000	123-548	117.20	123-550	117.20	123-552	117.20

Hand Taps - Metric

High Speed Steel for hand tapping of through or blind holes in ferrous and non-ferrous alloys.



Tap	No. Flutes	Thread Limits	Overall Length (in.)	Thread Length (in.)	Taper Code No.	Price \$	Plug Code No.	Price \$	Bottom Code No.	Price \$
M3 x .5	3	D3	1-15/16	5/8	123-479	8.10	123-480	8.10	123-481	9.80
M4 x 7	3	D4	2-1/8	3/4	123-496	8.10	123-482	8.10	123-483	8.10
M5 x .8	3	D4	2-3/8	7/8	123-497	8.10	123-484	8.10	123-485	8.10
M6 x 1.0	4	D5	2-1/2	1	123-498	8.50	123-486	8.50	123-487	8.50
M8 x 1.25	4	D5	2-23/32	1-1/8	123-499	9.40	123-488	9.40	123-489	9.40
M10 x 1.25	4	D5	2-15/16	1-1/4	123-500	17.50	123-490	17.50	123-491	17.50
M10 x 1.5	4	D6	2-15/16	1-1/4	123-501	17.50	123-492	17.50	123-493	17.50
M12 x 1.75	4	D6	3-3/8	1-21/32	123-503	20.60	123-494	20.60	123-495	20.60
M14 x 2.0	4	D7	3-19/32	1-21/32	123-081	16.40	123-082	16.40	123-083	16.40
M16 x 2.0	4	D7	3-13/16	1-13/16	123-084	19.60	123-085	19.60	123-086	19.60
M18 x 2.5	4	D7	4-1/32	1-13/16	123-087	26.10	123-088	26.10	123-089	26.10
M20 x 2.5	4	D6	4-15/32	2	123-090	32.70	123-091	32.70	123-092	32.70
M22 x 2.5	4	D6	4-11/16	2-7/32	123-093	35.90	123-094	35.90	123-095	35.90
M24 x 3.0	4	D7	4-29/32	2-7/32	123-096	45.60	123-098	45.60	123-097	45.60

Cutting Tools

HSS NPT Taps

Ground thread High Speed
Steel pipe taps.



Tap	No. Flutes	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
1/16-27	4	2-1/8	.688	123-430	18.60
1/8-27	4	2-1/8	.750	123-432	20.60
1/4-18	4	2-7/16	1.063	123-434	31.00
3/8-18	4	2-9/16	1.063	123-436	49.00
1/2-14	4	3-1/8	1.375	123-438	82.30
3/4-14	5	3-1/4	1.375	123-440	123.50
1-11-1/2	5	3-3/4	1.750	123-442	205.70
1-1/4-11-1/2	5	4	1.750	123-444	360.00
1-1/2-11-1/2	7	4-1/4	1.750	123-446	462.80
2-11-1/2	7	4-1/2	1.750	123-448	771.20

HSS 6" OAL NPT Taps

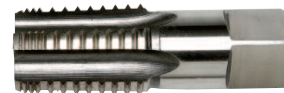
Long series high speed steel pipe taps
for longer reach applications.



Tap	No. Flutes	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
1/16-27	4	6	.688	122-430	41.80
1/4-18	4	6	1.063	122-434	81.70
3/8-18	4	6	1.063	122-436	133.20
1/2-14	4	6	1.375	122-438	193.60

HSS NPT Interrupted Thread Taps

These taps are designed to produce
less cutting pressure in a variety of
applications.



Tap	No. Flutes	Overall Length (in.)	Thread Length (in.)	Code No.	Price \$
1/8-27	4	2-1/8	.750	123-700	26.90
1/4-18	4	2-7/16	1.063	123-702	40.20
3/8-18	4	2-9/16	1.063	123-704	63.60
1/2-14	4	3-1/8	1.375	123-706	107.10
3/4-14	5	3-1/4	1.375	123-708	160.50
1-11-1/2	5	3-3/4	1.750	123-710	267.40



TAPPING SPEED GUIDE

TAPPING SPEED GUIDE

Proper tapping speeds are very important in obtaining efficient tapping results. There are many factors which affect proper tapping speeds, some of which are listed below.

MATERIAL FACTORS:

- Thermo-conductivity of the material and wall thickness as it affects heat dispersion
- Variations in carbon content of steel
- Hard spots in material
- Depth of hole to be tapped
- Percentage of full thread to be tapped

TAP FACTORS:

- Major diameters, pitch and lead
- Style of tap
- Width of lands
- Amount of hook or rake
- Length of chamfer
- Bottoming taps normally require slower speeds than plug chamfered taps

Materials			Speed Feet/ Minute
HSSE-V3 BLUE RING			
Low Carbon	1018, 1010, 1035	Normalized	20-50
Medium Carbon	1045, 1050, 1065	Normalized	20-40
Aluminum	Unalloyed, Cast	–	30-80
Brass/Bronze	–	–	30-80
Copper	–	–	25-60
Cast Iron	–	As Cast	20-40
HSSE-V3			
Stainless Steel	200 Series,	Annealed	20-35
	300 Series, 17-4, 15-5	Annealed	20-35
	AM286	Annealed	15-25
	400 Series	Annealed	20-35
Tool Steels	01, A-2, D-2, H-13, P-20	Annealed	15-25
Medium Carbon	1030, 1035, 1038, 1040, 1045, 1050	Normalized	20-40
Alloyed High Carbon	1065, 1070, 1080, 1090, 1095, 1561, 1572	Normalized	20-30
High Strength	4140, 4340	Normalized	20-30
Titanium	Commercially Pure	Annealed	15-30
Aluminum	Cast, Wrought	–	30-90
P-HSS			
Stainless Steel	17-4PH, 15-5, 17-7PH, AM350	Hardened	12-20
Tool Steels	01, A-2, D-2, H-13, P-20,	Hardened	10-20
High Strength	4140, 4340, 50100	Hardened	15-20
Nickel Alloys	Inconel, Hastaloy, Waspaloy, Astraloy, Rene, Monel	Annealed and Hardened	5-20
Titanium	6 AL 4	Annealed/ Hardened	8-15
ALUMINUM			
Aluminum			25-60
Die Cast Aluminum			30-80
ROLL FORM			
Steels	Sheet, Low/Medium Carbon/Stainless Steels	Hardened	20-50
Aluminum/Copper	Pure/Low Alloyed		30-60
Aluminum Cast, Copper Alloys	Die Cast, Zinc Die Cast, Brass, Bronze		30-80

CONVERSION TABLE, SURFACE FEET PER MINUTE TO REVOLUTIONS PER MINUTE

Proper tapping speeds are determined best by experiment. In the table below, speeds shown should be used as a guide only, and the suggested surface feet per minute adjusted upward or downward until the best results are obtained.

Surface Feet Per Minute	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150
Tap Size rpm															
0	1273	1592	1910	2546	3183	3820	4456	5093	5730	6366	7003	7639	8276	8913	9549
1	1047	1308	1570	2093	2617	3140	3663	4186	4710	5233	5756	6279	6808	7326	7849
2	888	1110	1333	1777	2221	2665	3109	3554	3999	4442	4886	5330	5774	6218	6662
3	772	964	1157	1543	1929	2315	2701	3086	3472	3858	4244	4629	5015	5401	5787
4	682	853	1023	1364	1705	2046	2387	2728	3069	3411	3751	4092	4434	4775	5116
5	611	764	917	1222	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	4584
6	553	691	829	1106	1382	1658	1934	2211	2487	2764	3040	3316	3592	3869	4145
8	466	583	699	932	1165	1387	1631	1864	2097	2330	2563	2796	3029	3262	3495
10	402	502	603	804	1005	1208	1406	1607	1808	2009	2210	2411	2612	2813	3014
12	354	442	531	707	884	1061	1238	1415	1592	1769	1945	2122	2300	2476	2653
1/4	306	382	458	611	764	917	1070	1222	1375	1528	1681	1833	1986	2139	2292
5/16	245	306	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833
3/8	204	255	306	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528
7/16	175	219	262	349	437	524	611	698	786	872	960	1048	1135	1222	1310
1/2	153	191	229	306	382	458	535	611	688	764	840	917	993	1070	1146
9/16	137	172	206	275	344	412	481	550	619	687	756	825	893	963	1031
5/8	122	153	183	244	306	367	428	489	550	611	672	733	794	856	917
3/4	102	128	153	203	255	306	357	407	458	509	560	611	662	713	764
7/8	87	109	131	175	218	262	306	350	392	437	480	524	568	611	655
1	76	96	115	153	191	230	268	306	344	382	420	458	497	535	573

MECHANICAL FACTORS:

- Type of tapping machine and holder; speeds for small diameter taps are often governed by the limitations of the machine
- Condition of tapping machine and spindle
- Type of fixture; vertical or horizontal tapping (faster speeds for vertical tapping)
- Method of feeding the tap
- Cutting fluid used and method of application
- The optimum speed for tapping is the highest speed that conditions permit, consistent with economic tool life



Mach. Screw Size No.	Nominal Fractional Diameter (in.)	Nominal Metric Diameter (mm)	Tap Dimensions – inches				
			Overall Length	Thread Length	Square Length	Shank Diameter	Size of Square
0	1/16	M1.6	1-5/8	5/16	3/16	.141	.110
1		M1.8	1-11/16	3/8	3/16	.141	.110
2		M2, M2.2	1-3/4	7/16	3/16	.141	.110
3	3/32	M2.5	1-13/16	1/2	3/16	.141	.110
4			1-7/8	9/16	3/16	.141	.110
5	1/8	M3, M3.15	1-15/16	5/8	3/16	.141	.110
6		M3.5	2	11/16	3/16	.141	.110
8	5/32	M4	2-1/8	3/4	1/4	.168	.131
10	3/16	M4.5, M5	2-3/8	7/8	1/4	.194	.152
12	7/32		2-3/8	15/16	9/32	.220	.165
14	1/4	M6, M6.3	2-1/2	1	5/16	.255	.191
	5/16	M7, M8	2-23/32	1-1/8	3/8	.318	.238
	3/8	M10	2-15/16	1-1/4	7/16	.381	.286
	7/16		3-5/32	1-7/16	13/32	.323	.242
	1/2	M12, 12.5	3-3/8	1-21/32	7/16	.367	.275
	9/16	M14	3-19/32	1-21/32	1/2	.429	.322
	5/8	M16	3-13/16	1-13/16	9/16	.480	.360
	11/16	M18	4-1/32	1-13/16	5/8	.542	.406
	3/4		4-1/4	2	11/16	.590	.442
	13/16	M20	4-15/32	2	11/16	.652	.489
	7/8	M22	4-11/16	2-7/32	3/4	.697	.523
	15/16	M24	4-29/32	2-7/32	3/4	.760	.570
	1	M25	5-1/8	2-1/2	13/16	.800	.600
	1-1/16	M27	5-1/8	2-1/2	7/8	.895	.672
	1-1/8		5-7/16	2-9/16	7/8	.896	.672
	1-3/16	M30	5-7/16	2-9/16	1	1.021	.766
	1-1/4		5-3/4	2-9/16	1	1.021	.766
	1-5/16	M33	5-3/4	2-9/16	1-1/16	1.108	.831
	1-3/8		6-1/16	3	1-1/16	1.108	.831
	1-7/16	M36	6-1/16	3	1-1/8	1.233	.925
	1-1/2		6-3/8	3	1-1/8	1.233	.925
	1-5/8	M39	6-11/16	3-3/16	1-1/8	1.305	.979
	1-3/4	M42	7	3-3/16	1-1/4	1.430	1.072
	1-7/8		7-5/16	3-9/16	1-1/4	1.519	1.139
	2	M48	7-5/8	3-9/16	1-3/8	1.644	1.233

Nominal Size Inches	NPT Dimensions – inches				
	Overall Length	Thread Length	Square Length	Shank Diameter	Size of Square
1/16	2-1/8	11/16	3/8	.3125	.234
1/8	2-1/8	3/4	3/8	.3125	.234
1/8	2-1/8	3/4	3/8	.4375	.328
1/4	2-7/16	1-1/16	7/16	.5625	.421
3/8	2-9/16	1-1/16	1/2	.7000	.531
1/2	3-1/8	1-3/8	5/8	.6875	.515
3/4	3-1/4	1-3/8	11/16	.9063	.679
1	3-3/4	1-3/4	13/16	1.1250	.843
1-1/4	4	1-3/4	15/16	1.3125	.984
1-1/2	4-1/4	1-3/4	1	1.5000	1.125
2	4-1/2	1-3/4	1-1/8	1.8750	1.406

TAP/DRILL CHART - INCH

To minimize tapping problems and lengthen tool life, use the largest drill possible to produce a minor diameter that will result in the lowest percentage of full thread consistent with adequate strength. A minor diameter that provides a 55% to 65% thread is sufficient for most requirements, but in some cases a higher percentage of thread may be necessary to conform with the minor diameter limits of the thread class specified.

TAP DRILL SIZES

Drills generally cut holes larger than their diameters. In the table to the right, the probable percentages of full thread were determined by the average amount oversize the various drills are expected to cut.

SUGGESTED PIPE TAP DRILL SIZES

Tap Size	Pipe Taper	Tap Drill Size Straight [†]
1/16	D	-
1/8	R	S
1/4	7/16	29/64
3/8	37/64	19/32
1/2	23/32	47/64
3/4	59/64	15/16
1	1-5/32	1-3/16
1-1/4	1-1/2	1-33/64
1-1/2	1-47/64	1-3/4
2-1/2	2-5/8	-
3	3-1/4	-

* Sizes given permit direct tapping without reaming the hole, but only give a full thread for the first two or three threads

† For Dryseal Straight Pipe Threads suggested drill sizes are as shown, except; 1/4" pipe, use .444 drill size

TAP/DRILL SELECTION

Tap	Tap Drill	Decimal Equiv. of Tap Drill	Theo. Oversize Mean (%)	Probable Oversize Mean	Probable Hole Size	% of Threads
0-80	56	.0465	83	.0015	.0480	74
	3/64	.0469	81	.0015	.0484	71
1-64	54	.0550	89	.0015	.0565	81
	53	.0595	67	.0015	.0610	59
1-72	53	.0595	75	.0015	.0610	67
	1/16	.0625	58	.0015	.0640	50
5-56	51	.0670	82	.0017	.0687	74
	50	.0700	69	.0017	.0717	62
	49	.0730	56	.0017	.0747	49
2-64	50	.0700	79	.0017	.0717	70
	49	.0730	64	.0017	.0747	56
3-48	48	.0760	85	.0019	.0779	78
	5/64	.0781	77	.0019	.0800	70
	47	.0785	76	.0019	.0801	69
	46	.0810	67	.0019	.0829	60
3-56	45	.0820	61	.0019	.0839	56
	46	.0810	78	.0019	.0829	69
	45	.0820	73	.0019	.0839	65
	44	.0860	56	.0020	.0880	47
4-40	44	.0860	80	.0020	.0880	74
	43	.0890	71	.0020	.0910	65
	42	.0935	57	.0020	.0955	51
	3/32	.0938	56	.0020	.0958	50
4-48	42	.0935	68	.0020	.0955	61
	3/32	.0938	68	.0020	.0958	60
	41	.0960	59	.0020	.0980	52
5-40	40	.0980	83	.0023	.1003	76
	39	.0995	79	.0023	.1018	71
	38	.1015	72	.0023	.1038	65
	37	.1040	65	.0023	.1063	58
5-44	38	.1015	79	.0023	.1038	72
	37	.1040	71	.0023	.1063	63
	36	.1065	63	.0023	.1088	55
6-32	37	.1040	84	.0023	.1063	78
	36	.1065	78	.0023	.1088	72
	7/64	.1094	70	.0026	.1120	64
	35	.1100	69	.0026	.1126	63
6-40	34	.1110	67	.0026	.1136	60
	33	.1130	62	.0026	.1156	55
	32	.1160	68	.0026	.1186	60
8-32	29	.1360	69	.0029	.1389	62
	28	.1405	58	.0029	.1434	51
8-36	29	.1360	78	.0029	.1389	70
	28	.1405	68	.0029	.1434	57
	9/64	.1406	68	.0029	.1435	57
10-24	27	.1440	85	.0032	.1472	79
	26	.1470	79	.0032	.1502	74
	25	.1495	75	.0032	.1527	69
	24	.1520	70	.0032	.1552	64
	23	.1540	67	.0032	.1572	61
	5/32	.1563	62	.0032	.1595	56
	22	.1570	61	.0032	.1602	55
10-32	5/32	.1563	83	.0032	.1595	75
	22	.1570	81	.0032	.1602	73
	21	.1590	76	.0032	.1672	64
	20	.1610	71	.0032	.1642	64
12-24	19	.1660	59	.0032	.1692	51
	11/64	.1719	82	.0035	.1754	75
	17	.1730	79	.0035	.1765	73
	16	.1770	72	.0035	.1805	66
	15	.1800	67	.0035	.1835	60
12-28	14	.1820	63	.0035	.1855	56
	16	.1770	84	.0035	.1805	77
	15	.1800	78	.0035	.1835	70
	14	.1820	73	.0038	.1835	66
	13	.1850	67	.0035	.1885	59
	3/16	.1875	61	.0035	.1970	54



TAP/DRILL CHART - INCH cont'd

Formula: Percentage of Full Thread

Threads Per Inch x Major Dia. of Tap - Drill Dia.
 .01299

= Percentage of Full Thread

Example: Determine percentage of full thread for 2" - 12N Tap, using 1.9219" Drill.

$2.0000 - 1.9219 = .0781 \div .01299 = 6.012$

Threads Per Inch = $\times 12$

Theoretical Percentage of Full Threads = 72.144

Formula: Tap Drill Size

Major Dia. of Tap - $\frac{.1299 \times \text{Percent of Full Thread}}{\text{Number of threads Per inch}}$

= Drill Size

Example: Determine drill size for 2" - 12N Tap, 70% Full Thread.

Basic Major Diameter of Tap = 2.0000"

$.01299 \times 70 = .9093 \div 12 = .0758"$

Theoretical Drill Size = 1.9242"

Nearest Standard Drill Size 1.9219" = 1.9219"

TAP/DRILL SELECTION

Tap	Tap Drill	Decimal Equiv. of Tap Drill	Theo. Oversize Mean (%)	Probable Oversize Mean	Probable Hole Size	% of Threads
1/4-20	9	.1960	83	.0038	.1998	77
	8	.1990	79	.0039	.2028	73
	7	.2010	75	.0038	.2048	70
	13/64	.2031	72	.0038	.2068	66
	6	.2040	71	.0038	.2078	65
1/4-28	5	.2055	69	.0038	.2093	63
	4	.2090	63	.0038	.2128	57
	3	.2130	80	.0038	.2168	72
	7/32	.2188	67	.0038	.2226	59
5/16-18	2	.2210	63	.0038	.2248	55
	F	.2570	77	.0038	.2608	72
	G	.2610	71	.0041	.2651	66
5/16-24	17/64	.2656	65	.0041	.2697	59
	H	.2660	64	.0041	.2701	59
	I	.2720	75	.0041	.2761	67
3/8-16	J	.2770	66	.0041	.2811	58
	5/16	.3125	77	.0044	.3169	72
	O	.3160	73	.0044	.3204	68
3/8-24	P	.3230	64	.0044	.3274	59
	21/64	.3281	87	.0044	.3325	79
	Q	.3320	79	.0044	.3364	71
7/16-14	R	.3390	67	.0044	.3434	58
	T	.3580	86	.0046	.3626	81
	23/64	.3594	84	.0046	.3640	79
	U	.3680	75	.0046	.3726	70
7/16-20	3/8	.3750	67	.0046	.3796	62
	V	.3770	65	.0046	.3816	61
	W	.3860	79	.0046	.3906	72
1/2-13	25/64	.3906	72	.0046	.3952	65
	X	.3970	62	.0046	.4016	55
	27/64	.4219	78	.0047	.4266	73
1/2-20	7/16	.4375	63	.0047	.4422	58
	29/64	.4531	72	.0047	.4578	65
9/16-12	15/32	.4688	87	.0048	.4736	82
	31/64	.4844	72	.0048	.4892	68
9/16-18	1/2	.5000	87	.0048	.5048	80
	33/64	.5156	65	.0048	.5204	58
5/8-11	17/32	.5313	79	.0049	.5362	75
	35/64	.5469	66	.0049	.5618	62
5/8-18	9/16	.5628	87	.0049	.5674	80
	37/64	.5781	65	.0049	.5831	58
3/4-10	41/64	.6406	84	.0050	.6456	80
	21/32	.6563	72	.0050	.6613	68
3/4-16	11/16	.6875	77	.0050	.6925	71
	49/64	.7656	76	.0052	.7708	72
7/8-9	25/32	.7812	65	.0052	.7864	61
	51/64	.7969	84	.0052	.8021	79
1-8	13/16	.8125	67	.0052	.8177	62
	55/64	.8594	87	.0059	.8653	83
	7/8	.8750	77	.0059	.8809	73
1-12	57/64	.8906	67	.0059	.8965	64
	29/32	.9063	58	.0059	.9122	54
	29/32	.9063	87	.0059	.9122	81
1-14	59/64	.9219	72	.0060	.9279	67
	15/16	.9375	58	.0060	.9435	52
	59/64	.9219	84	.0060	.9279	78
1-1/8-7	15/16	.9375	67	.0060	.9435	61
	31/21	.9688	84	.0062	.9750	81
	63/64	.9844	76	.0067	.9911	72
1-1/8-12	1	1.0000	67	.0070	1.0070	64
	1-1/64	1.0156	59	.0070	1.0226	55
	1-1/32	1.0313	87	.0071	1.0384	80
1-1/4-7	1-3/64	1.0469	72	.0072	1.0541	66
	1-3/32	1.0938				
	1-7/64	1.1094				
1-1/4-12	1-1/8	1.1250				
	1-5/32	1.1563				
	1-11/64	1.1719				
1-3/8-6	1-3/16	1.1875				
	1-13/64	1.2031				
	1-7/32	1.2188				
1-3/8-12	1-15/64	1.2344				
	1-9/32	1.2813				
	1-19/64	1.2969				
1-1/2-6	1-5/16	1.3125				
	1-21/64	1.3281				
	1-11/32	1.3438				
	1-23/64	1.3594				
1-1/2-12	1-13/32	1.4063				
	1-27/64	1.4219				

Reaming Recommended

	*Deep Hole Tapping	Average Commercial	Thin Sheet Stock or Stamping
FREE CUTTING MATERIAL			
Aluminum			
Brass			
Bronze			
Cast Iron	60%-70%	65%-70%	75%-85%
Copper			
Mild Steel			
Tool Steel			
FREE CUTTING MATERIAL			
Cast Steel			
Drop Forging			
Monel Metal	55%-65%	65%-70%	
Nickel Steel			
Stainless Steel			

* Sizes given permit direct tapping without reaming the hole, but only give a full thread for the first two or three threads

Cutting Tools

METRIC TAP DRILL SIZES

METRIC TAP DRILL SIZES (drill sizes based on approximate 72%-77% Full Thread)							
Tap Size	Pitch Form	Tap Drill Size	Alt. Tap Drill	Tap Size	Pitch Form	Tap Drill Size	Alt. Tap Drill
I.S.O. METRIC COARSE				I.S.O. METRIC FINE			
1.6	0.35mm	1.25mm	3/64	3	0.35mm	2.65mm	37
1.7	0.35mm	1.35mm	55	4	0.35mm	3.65mm	27
1.8	0.35mm	1.45mm	54	4	0.50mm	3.50mm	29
2	0.40mm	1.60mm	1/16	4.5	0.45mm	4.06mm	21
2.2	0.45mm	1.75mm	50	5	0.50mm	4.50mm	16
2.3	0.40mm	1.90mm	49	5	0.70mm	4.30mm	18
2.5	0.45mm	2.05mm	46	5	0.75mm	4.25mm	18
2.6	0.45mm	2.15mm	44	5.5	0.50mm	5.00mm	9
3	0.5mm	2.50mm	40	6	0.50mm	5.50mm	7/32
3.5	0.60mm	2.90mm	33	6	0.75mm	5.25mm	5
4	0.70mm	3.30mm	30	7	0.75mm	6.25mm	D
4.5	0.75mm	3.70mm	27	8	0.50mm	7.50mm	M
5	0.80mm	4.20mm	19	8	1.00mm	7.00mm	J
5.5	0.90mm	4.60mm	15	9	0.50mm	8.50mm	Q
6	1.00mm	5.00mm	9	9	1.00mm	8.00mm	0
7	1.00mm	6.00mm	15/64	10	0.50mm	9.50mm	3/8
8	1.25mm	6.80mm	H	10	0.75mm	9.25mm	U
9	1.25mm	7.80mm	5/16	10	1.00mm	9.00mm	T
10	1.50mm	8.50mm	Q	10	1.25mm	8.75mm	11/32
11	1.50mm	9.50mm	3/8	11	1.00mm	10.00mm	X
12	1.75mm	10.20mm	Y	12	1.00mm	11.00mm	7/16
14	2.00mm	12.00mm	15/32	12	1.25mm	10.75mm	27/64
16	2.00mm	14.00mm	35/64	12	1.50mm	10.50mm	Z
18	2.50mm	15.50mm	39/64	13	1.50mm	11.50mm	29/64
20	2.50mm	17.50mm	11/16	13	1.75mm	11.25mm	7/16
22	2.50mm	19.50mm	49/64	14	1.25mm	12.75mm	1/2
24	3.00mm	21.00mm	53/64	14	1.50mm	12.50mm	31/64
27	3.00mm	24.00mm	61/64	15	1.50mm	13.50mm	17/32
30	3.50mm	26.50mm	1-3/64	16	1.00mm	15.00mm	19/32
33	3.50mm	29.50mm	1-5/32	16	1.25mm	14.75mm	37/64
36	4.00mm	32.00mm	1-1/4	16	1.50mm	14.50mm	9/16
39	4.00mm	35.00mm	1-3/8	18	1.00mm	17.00mm	43/64
				18	1.25mm	16.75mm	21/32
				18	1.50mm	16.50mm	41/64
				18	2.00mm	16.00mm	5/8
				20	1.00mm	19.00mm	3/4
				20	1.50mm	18.50mm	47/64
				20	2.00mm	18.00mm	45/64
				22	1.0mm	21.00mm	53/64
				22	1.50mm	20.50mm	13/16
				22	2.00mm	20.00mm	25/32
				24	1.00mm	23.00mm	29/32
				24	1.50mm	22.50mm	7/8
				24	2.00mm	22.00mm	55/64
				24	2.50mm	21.50mm	27/32



DRILLS



High Performance TiAlN Coated Parabolic Jobber Drills

Designed for deep hole drilling with extremely efficient chip evacuation, without the need for frequent drill withdrawal. A heavy web and parabolic flute shape provide increased stability enabling drilling of accurate straight holes up to 5 x D.



* = Tap Drill sizes



Size (in.)	Size (mm)	Decimal Equivalent	Flute Length (mm)	Overall Length (mm)	Code No.	Price \$
60	1.02	0.0400	12	34	133-940	2.40
59	1.04	0.0410	12	34	133-941	2.60
58	1.07	0.0420	14	36	133-942	2.80
57	1.09	0.0430	14	36	133-943	2.80
56	1.18	0.0465	14	36	133-944	2.60
3/64*	1.19	0.0469	16	38	134-211	2.60
55	1.32	0.0520	16	38	133-945	3.20
54	1.40	0.0540	18	40	133-946	3.10
53*	1.51	0.0595	20	43	133-947	3.50
1/16	1.59	0.0625	20	43	134-458	3.40
52	1.61	0.0635	20	43	133-948	3.20
51	1.70	0.0670	20	43	133-949	3.20
50*	1.78	0.0700	22	46	133-950	3.30
49	1.85	0.0730	22	46	133-951	3.30
48	1.93	0.0760	24	49	133-952	3.50
5/64	1.98	0.0781	24	49	134-462	3.50
47*	1.99	0.0785	24	49	133-953	3.50
46	2.06	0.0810	24	49	133-954	3.60
45*	2.08	0.0820	24	49	133-955	3.60
44	2.18	0.0860	27	53	133-956	3.80
43*	2.26	0.0890	27	53	133-957	3.80
42*	2.37	0.0935	30	57	133-958	4.00
3/32	2.38	0.0938	30	57	134-467	4.00
41	2.44	0.0960	30	57	133-959	4.00
40	2.50*	0.0980	30	57	133-960	4.00
39	2.53	0.0995	30	57	133-961	4.20
38*	2.58	0.1015	30	57	133-962	4.20
37*	2.64	0.1040	30	57	133-963	4.30
36*	2.71	0.1065	33	61	133-964	4.20
7/64	2.78	0.1094	33	61	134-472	3.60
35	2.79	0.1100	33	61	133-965	3.60
34	2.82	0.1110	33	61	133-966	4.20

Size (in.)	Size (mm)	Decimal Equivalent	Flute Length (mm)	Overall Length (mm)	Code No.	Price \$
33*	2.87	0.1130	33	61	133-967	4.20
32	2.95	0.1160	33	61	133-968	3.50
	3.00	0.1181	33	61	134-475	4.00
31	3.05	0.1200	36	65	133-969	6.10
	3.10	0.1220	36	65	134-476	5.90
1/8	3.17	0.1250	36	65	134-477	5.90
	3.20	0.1260	36	65	134-478	5.90
30	3.26	0.1285	36	65	133-970	5.10
	3.30*	0.1299	36	65	134-479	4.50
	3.40	0.1339	39	70	134-480	6.30
29*	3.57	0.1360	39	70	133-971	6.50
	3.50	0.1378	39	70	134-481	4.70
28	3.57	0.1405	39	70	133-972	4.30
9/64	3.57	0.1406	39	70	134-482	4.30
	3.60	0.1417	39	70	134-483	6.80
27	3.66	0.1440	39	70	133-973	6.80
	3.70	0.1457	39	70	134-484	7.50
26	3.73	0.1470	39	70	133-974	6.80
25*	3.80	0.1495	43	75	133-975	6.80
	3.80	0.1496	43	75	134-485	6.80
24	3.86	0.1520	43	75	133-976	6.80
	3.90	0.1535	43	75	134-486	6.80
23	3.91	0.1540	43	75	133-977	6.90
5/32	3.97	0.1562	43	75	134-487	6.80
22	3.99	0.1570	43	75	133-978	6.90
	4.00*	0.1575	43	75	134-488	6.90
21*	4.04	0.1590	43	75	133-979	6.90
20	4.09	0.1610	43	75	133-980	6.90
	4.10*	0.1614	43	75	134-489	6.90
	4.20*	0.1654	43	75	134-490	6.90
19	4.22	0.1660	43	75	133-981	7.20

High Performance TiAlN Coated Parabolic Jobber Drills - cont'd

Size (in.)	Size (mm)	Decimal Equivalent	Flute Length (mm)	Overall Length (mm)	Code No.	Price \$
	4.30	0.1693	47	80	134-491	7.10
18	4.31	0.1695	47	80	133-982	8.00
11/64	4.37	0.1719	47	80	134-492	7.20
17	4.39	0.1730	47	80	133-983	7.20
	4.40	0.1732	47	80	134-493	7.10
16*	4.50	0.1770	47	80	133-984	7.20
	4.50	0.1772	47	80	134-494	7.70
15	4.57	0.1800	47	80	133-985	7.70
	4.60*	0.1811	47	80	134-495	7.60
14*	4.62	0.1820	47	80	133-986	7.70
	4.70	0.1850	47	80	134-496	7.60
13	4.70	0.1850	47	80	133-987	7.70
3/16	4.76	0.1875	52	86	134-497	7.60
	4.80	0.1890	52	86	134-498	7.60
12	4.80	0.1890	52	86	133-988	7.70
11	4.85	0.1910	52	86	133-989	7.70
	4.90	0.1929	52	86	134-499	7.60
10	4.91	0.1935	52	86	133-990	7.70
9	4.97	0.1960	52	86	133-991	7.70
	5.00*	0.1969	52	86	134-500	7.70
8	5.05	0.1991	52	86	133-992	8.40
	5.10	0.2008	52	86	134-501	8.00
7*	5.10	0.2010	52	86	133-993	8.00
13/64	5.16	0.2031	52	86	134-502	8.10
6	5.18	0.2040	52	86	133-994	8.80
	5.20	0.2047	52	86	134-503	8.70
5	5.21	0.2055	52	86	133-995	8.80
	5.30	0.2087	52	86	134-504	8.80
4	5.30	0.2090	57	93	133-996	9.70
	5.40	0.2126	57	93	134-505	9.50
3*	5.41	0.2130	57	93	133-997	9.70
	5.50	0.2165	57	93	134-506	9.70
7/32	5.56	0.2188	57	93	134-507	10.20
	5.60	0.2205	57	93	134-508	10.20
2	5.61	0.2210	57	93	133-998	9.70
	5.70	0.2244	57	93	134-509	10.20
1	5.79	0.2280	57	93	133-999	10.30
	5.80	0.2283	57	93	134-510	10.20
	5.90	0.2323	57	93	134-511	10.20
A	5.94	0.2340	57	93	134-198	10.30
15/64	5.95	0.2344	57	93	134-512	10.20
	6.00*	0.2362	57	93	134-513	10.20
B	6.05	0.2380	63	101	134-199	10.80
	6.10	0.2402	63	101	134-514	10.70
C	6.15	0.2420	63	101	134-204	10.80
	6.20	0.2441	63	101	134-515	10.70
D	6.25*	0.2460	63	101	134-843	10.70
	6.30	0.2480	63	101	134-516	10.70
1/4	6.35	0.2500	63	101	134-517	10.70
E	6.35	0.2500	63	101	134-844	10.70
	6.40	0.2520	63	101	134-518	12.50
	6.50	0.2559	63	101	134-519	10.50
F*	6.53	0.2570	63	101	134-845	10.40
	6.60	0.2598	63	101	134-520	13.10
G	6.63	0.2610	63	101	134-846	10.40
	6.70	0.2638	63	101	134-521	10.90
17/64	6.75	0.2656	69	109	134-522	11.50
H	6.76	0.2660	69	109	134-847	11.50
	6.80*	0.2677	69	109	134-523	13.70
	6.90	0.2717	69	109	134-524	13.70
I*	6.91	0.2720	69	109	134-848	13.70
	7.00*	0.2756	69	109	134-525	11.50
J	7.04	0.2770	69	109	134-849	14.30
	7.10	0.2795	69	109	134-526	14.20
K	7.14	0.2810	69	109	134-974	12.80
9/32	7.14	0.2812	69	109	134-527	12.80
	7.20	0.2835	69	109	134-528	14.10
	7.30	0.2874	69	109	134-529	13.10
L	7.37	0.2900	69	109	134-975	14.20
	7.40	0.2913	69	109	134-530	13.10
M	7.49	0.2950	69	109	134-976	15.00
	7.50	0.2953	69	109	134-531	12.60

* = Tap Drill sizes

Size (in.)	Size (mm)	Decimal Equivalent	Flute Length (mm)	Overall Length (mm)	Code No.	Price \$
19/64	7.54	0.2969	75	117	134-532	16.20
	7.60	0.2992	75	117	134-533	14.60
N	7.67	0.3020	75	117	134-977	14.50
	7.70	0.3031	75	117	134-534	14.60
	7.80*	0.3071	75	117	134-535	14.60
	7.90	0.3110	75	117	134-536	14.60
5/16*	7.94	0.3125	75	117	134-537	15.50
	8.00*	0.3150	75	117	134-538	13.10
O	8.03	0.3160	75	117	134-978	15.80
	8.10	0.3189	75	117	134-539	16.60
	8.20	0.3228	75	117	134-540	15.90
P	8.20	0.3230	75	117	134-979	16.70
	8.30	0.3268	75	117	134-541	15.90
21/64	8.33	0.3281	75	117	134-542	15.90
	8.40	0.3307	75	117	134-543	15.90
Q*	8.43	0.3320	75	117	134-980	16.00
	8.50*	0.3346	75	117	134-544	14.10
	8.60	0.3386	81	125	134-545	18.10
R	8.61	0.3390	81	125	134-981	17.20
	8.70	0.3425	81	125	134-546	18.10
11/32	8.73	0.3438	81	125	134-547	17.10
	8.80*	0.3465	81	125	134-548	17.30
S	8.84	0.3480	81	125	134-982	17.40
	8.90	0.3504	81	125	134-549	17.30
	9.00*	0.3543	81	125	134-550	14.70
T	9.09	0.3580	81	125	134-983	18.30
	9.10	0.3583	81	125	134-551	18.60
23/64	9.13	0.3594	81	125	134-552	18.60
	9.20	0.3622	81	125	134-553	18.60
	9.30	0.3661	81	125	134-554	18.70
U*	9.35	0.3680	81	125	134-984	18.70
	9.40	0.3701	81	125	134-555	18.70
	9.50*	0.3740	81	125	134-556	15.80
3/8	9.52	0.3750	87	133	134-557	17.10
V	9.56	0.3770	87	133	134-985	20.00
	9.60	0.3780	87	133	134-558	20.00
	9.70	0.3819	87	133	134-559	19.80
	9.80	0.3858	87	133	134-560	19.80
W	9.80	0.3860	87	133	134-986	19.70
	9.90	0.3898	87	133	134-561	19.80
25/64*	9.92	0.3906	87	133	134-562	19.90
	10.00	0.3937	87	133	134-563	19.90
X	10.08	0.3970	87	133	134-987	22.00
	10.20	0.4016	87	133	134-565	22.60
Y	10.26	0.4040	87	133	134-988	22.80
13/32	10.32	0.4063	87	133	134-567	19.90
Z	10.49	0.4130	87	133	134-989	22.60
	10.50*	0.4134	87	133	134-569	19.30
27/64*	10.72	0.4220	87	133	134-572	21.60
	10.80*	0.4252	87	133	134-573	22.60
	11.00	0.4331	94	142	134-575	20.50
7/16	11.11	0.4374	94	142	134-577	24.40
	11.50	0.4528	94	142	134-581	22.00
29/64*	11.51	0.4531	94	142	134-582	28.20
	11.80	0.4646	94	142	134-585	27.30
15/32	11.91	0.4689	101	151	134-587	26.10
	12.00	0.4724	101	151	134-588	23.60
	12.20	0.4803	101	151	134-590*	42.10
31/64*	12.30	0.4882	101	151	134-592	32.40
	12.50*	0.4961	101	151	134-594	32.40
1/2	12.70	0.5000	101	151	134-597	24.60
33/64*	13.09	0.5156	101	151	134-991	30.10
17/32*	13.49	0.5312	108	160	134-598	32.20
35/64	13.89	0.5469	108	160	134-992	42.00
9/16	14.28	0.5625	114	169	134-607	47.00
37/64*	14.68	0.5781	114	169	134-993	51.20
19/32	15.08	0.5938	120	178	134-610	54.70
39/64	15.47	0.6094	120	178	134-994	55.70
5/8	15.87	0.6250	120	178	134-612	56.40

* Available only while quantities last



High Performance Parabolic Stub Drills

A very rigid drill for high performance metal removal at speeds of up to 30% above normal high-speed steel. Suitable for use in rigid machine set-ups at high feed rates, where depth of hole does not exceed 3 x D.



* = Tap Drill sizes

Size (in.)	Size (mm)	Decimal Equivalent	Flute Length (mm)	Overall Length (mm)	Code No.	Price \$
60	1.02	0.0400	6	26	134-750	2.50
59	1.04	0.0410	6	26	134-751	2.50
58	1.07	0.0420	7	28	134-759	2.70
57	1.09	0.0430	7	28	134-760	2.90
56	1.18	0.0465	8	30	134-761	3.10
3/64*	1.19	0.0469	8	30	134-309	3.10
55	1.32	0.0520	8	30	134-762	3.50
54	1.40	0.0540	9	32	134-763	2.70
53*	1.51	0.0595	10	34	134-764	2.90
1/16	1.59	0.0625	10	34	134-591	2.80
52	1.61	0.0635	10	34	134-765	2.90
51	1.70	0.0670	10	34	134-766	3.40
50*	1.78	0.0700	11	36	134-767	2.90
49	1.85	0.0730	11	36	134-768	2.90
48	1.93	0.0760	12	38	134-769	2.70
5/64	1.98	0.0781	12	38	134-596	2.90
47*	1.99	0.0785	12	38	134-770	2.90
46	2.06	0.0810	12	38	134-771	2.70
45*	2.08	0.0820	12	38	134-772	2.90
44	2.18	0.0860	13	40	134-773	2.90
43*	2.26	0.0890	13	40	134-774	2.90
42*	2.37	0.0935	14	43	134-775	2.90
3/32	2.38	0.0938	14	43	134-623	2.50
41	2.44	0.0960	14	43	134-776	3.20
40	2.50*	0.0980	14	43	134-777	3.20
39	2.53	0.0995	14	43	134-778	3.50
38*	2.58	0.1015	14	43	134-779	3.50
37*	2.64	0.1040	14	43	134-780	3.50
36*	2.71	0.1065	16	46	134-781	3.30
7/64	2.78	0.1094	16	46	134-628	2.80
35	2.79	0.1100	16	46	134-782	3.20
34	2.82	0.1110	16	46	134-783	3.20
33*	2.87	0.1130	16	46	134-784	3.20
32	2.95	0.1160	16	46	134-785	3.60
	3.00	0.1181	16	46	134-631	6.30
31	3.05	0.1200	18	49	134-786	5.20
	3.10	0.1220	18	49	134-632	6.30
1/8	3.17	0.1250	18	49	134-633	6.30
	3.20	0.1260	18	49	134-634	6.30
30	3.26	0.1285	18	49	134-787	5.50
	3.30*	0.1299	18	49	134-635	6.30
	3.40	0.1339	20	52	134-636	6.70
29*	3.45	0.1360	18	49	134-788	6.20
	3.50	0.1378	20	52	134-637	6.70
28	3.57	0.1405	20	52	134-789	6.20
9/64	3.57	0.1406	20	52	134-638	8.50
	3.60	0.1417	20	52	134-639	8.50
27	3.66	0.1440	20	52	134-790	6.30
	3.70	0.1457	20	52	134-640	8.50
26	3.73	0.1470	20	52	134-791	6.60
25*	3.80	0.1495	22	55	134-792	4.80
	3.80	0.1496	22	55	134-641	8.50
24	3.86	0.1520	22	55	134-793	6.50
	3.90	0.1535	22	55	134-642	7.90
23	3.91	0.1540	22	55	134-794	6.50
5/32	3.97	0.1562	22	55	134-643	8.60
22	3.99	0.1570	22	55	134-795	6.50
	4.00*	0.1575	22	55	134-644	8.60
21*	4.04	0.1590	22	55	134-796	5.00
20	4.09	0.1610	22	55	134-797	6.70
	4.10*	0.1614	22	55	134-645	9.60
	4.20*	0.1654	22	55	134-646	9.60
19	4.22	0.1660	22	55	134-798	6.80

Size (in.)	Size (mm)	Decimal Equivalent	Flute Length (mm)	Overall Length (mm)	Code No.	Price \$
	4.30	0.1693	24	58	134-647	9.60
18	4.31	0.1695	24	58	134-799	6.80
11/64	4.37	0.1719	24	58	134-648	9.70
17	4.39	0.1730	24	58	134-800	6.80
	4.40	0.1732	24	58	134-649	9.70
16*	4.50	0.1770	24	58	134-801	6.80
	4.50	0.1772	24	58	134-650	9.70
15	4.57	0.1800	24	58	134-802	7.00
	4.60*	0.1811	24	58	134-651	9.90
14*	4.62	0.1820	24	58	134-803	7.10
13	4.70	0.1850	24	58	134-804	7.10
	4.70	0.1850	24	58	134-652	9.90
3/16	4.76	0.1875	26	62	134-653	10.00
12	4.80	0.1890	26	62	134-805	7.10
	4.80	0.1890	26	62	134-654	10.00
11	4.85	0.1910	26	62	134-806	7.10
	4.90	0.1929	26	62	134-655	10.00
10	4.91	0.1935	26	62	134-807	7.10
9	4.97	0.1960	26	62	134-808	7.10
	5.00*	0.1969	26	62	134-656	10.00
8	5.05	0.1991	26	62	134-809	8.20
7*	5.10	0.2010	26	62	134-810	5.70
	5.10	0.2008	26	62	134-657	9.40
13/64	5.16	0.2031	26	62	134-658	10.30
6	5.18	0.2040	26	62	134-811	8.10
	5.20	0.2047	26	62	134-659	10.30
5	5.21	0.2055	26	62	134-812	5.70
4	5.30	0.2090	28	66	134-813	8.10
	5.30	0.2087	26	62	134-660	10.30
	5.40	0.2126	28	66	134-661	10.00
3*	5.41	0.2130	28	66	134-814	8.20
	5.50	0.2165	28	66	134-662	10.30
7/32	5.56	0.2188	28	66	134-663	10.00
2	5.61	0.2210	28	66	134-815	8.40
	5.70	0.2244	28	66	134-665	10.50
1	5.79	0.2280	28	66	134-816	8.40
	5.80	0.2283	28	66	134-666	10.50
	5.90	0.2323	28	66	134-667	10.50
A	5.94	0.2340	28	66	134-817	9.40
15/64	5.95	0.2344	28	66	134-668	10.20
	6.00*	0.2362	28	66	134-669	10.20
B	6.05	0.2380	31	70	134-818	9.80
	6.10	0.2402	32	70	134-670	14.00
C	6.15	0.2420	31	70	134-819	9.70
	6.20	0.2441	32	70	134-671	14.10
D	6.25*	0.2460	31	70	134-820	9.70
	6.30	0.2480	32	70	134-672	14.10
E	6.35	0.2500	31	70	134-821	7.70
1/4	6.35	0.2500	32	70	134-673	13.90
	6.40	0.2520	32	70	134-674	13.90
	6.50	0.2559	32	70	134-675	14.20
F*	6.53	0.2570	31	70	134-822	10.00
	6.60	0.2598	32	70	134-676	14.60
G	6.63	0.2610	31	70	134-823	10.00
	6.70	0.2638	32	70	134-677	14.60
17/64	6.75	0.2656	34	74	134-678	15.20
H	6.76	0.2660	34	74	134-824	10.30
	6.80*	0.2677	34	74	134-679	15.20
	6.90	0.2717	34	74	134-680	15.20
I*	6.91	0.2720	34	74	134-825	10.60
	7.00*	0.2756	34	74	134-681	15.20
J	7.04	0.2770	34	74	134-826	11.10
9/32	7.14	0.2812	34	74	134-683	15.50
K	7.14	0.2810	34	74	134-827	11.50
	7.20	0.2835	34	74	134-684	15.50
	7.30	0.2874	34	74	134-685	15.50
L	7.37	0.2900	34	74	134-828	15.50
	7.40	0.2913	34	74	134-686	15.50
M	7.49	0.2950	34	74	134-829	11.80
	7.50	0.2953	34	74	134-687	15.50
19/64	7.54	0.2969	37	79	134-688	15.50
	7.60	0.2992	37	79	134-689	16.00

* Available only while quantities last

High Performance Parabolic Stub Drills - cont'd

* = Tap Drill sizes

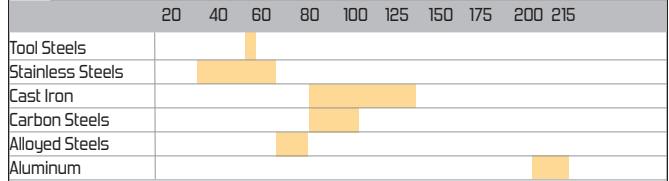
Size (in.)	Size (mm)	Decimal Equivalent	Flute Length (mm)	Overall Length (mm)	Code No.	Price \$
N	7.67	0.3020	37	79	134-830	12.10
	7.70	0.3031	37	79	134-690	16.00
	7.80*	0.3071	37	79	134-691	16.00
	7.90	0.3110	37	79	134-692	16.00
5/16*	7.94	0.3125	37	79	134-693	15.60
	8.00*	0.3150	37	79	134-694	15.60
O	8.03	0.3160	37	79	134-831	13.10
	8.10	0.3189	37	79	134-695	19.10
P	8.20	0.3230	37	79	134-832	13.10
	8.20	0.3228	37	79	134-696	19.10
	8.30	0.3268	37	79	134-697	19.10
21/64	8.33	0.3281	37	79	134-698	19.10
	8.40	0.3307	37	79	134-699	19.40
Q*	8.43	0.3320	37	79	134-833	13.10
	8.50*	0.3346	37	79	134-700	19.40
	8.60	0.3386	40	84	134-701	19.80
R	8.61	0.3390	40	84	134-834	13.90
	8.70	0.3425	40	84	134-702	19.80
11/32	8.73	0.3438	40	84	134-703	19.80
	8.80*	0.3465	40	84	134-704	20.00
S	8.84	0.3480	40	84	134-835	13.90
	8.90	0.3504	40	84	134-705	20.10
	9.00*	0.3543	40	84	134-706	20.10
T	9.09	0.3580	40	84	134-836	14.40
	9.10	0.3583	40	84	134-707	20.10
23/64	9.13	0.3594	40	84	134-708	20.10
	9.20	0.3622	40	84	134-709	20.50
	9.30	0.3661	40	84	134-710	20.50
U*	9.35	0.3680	40	84	134-837	14.90
	9.40	0.3701	40	84	134-711	20.50
3/8	9.52	0.3750	43	89	134-713	20.50
V	9.56	0.3770	43	89	134-838	15.90
	9.60	0.3780	43	89	134-714	22.50
	9.70	0.3819	43	89	134-715	22.50
W	9.80	0.3860	43	89	134-839	15.80
	9.80	0.3858	43	89	134-716	22.50
	9.90	0.3898	43	89	134-717	22.50
25/64	9.92	0.3906	43	89	134-718	22.50
	10.00	0.3937	43	89	134-719	22.10
X	10.08	0.3970	43	89	134-840	17.30
	10.10	0.3976	43	89	134-720	22.60
	10.20	0.4016	43	89	134-721	23.10
Y	10.26	0.4040	43	89	134-841	18.50
13/32	10.32	0.4063	43	89	134-723	23.10
Z	10.49	0.4130	43	89	134-842	18.30
	10.50*	0.4134	43	89	134-725	23.40
27/64*	10.72	0.4220	43	89	134-728	23.40
	10.80*	0.4252	47	95	134-729	24.40
	11.00	0.4331	47	95	134-731	24.40
7/16	11.11	0.4374	47	95	134-733	31.20
29/64*	11.51	0.4531	47	95	134-738	32.20
	11.80	0.4646	47	95	134-741	32.50
15/32	11.91	0.4689	51	102	134-743	34.20
	12.00	0.4724	51	102	134-744	34.20
	12.20	0.4803	51	102	134-746*	34.50
31/64*	12.30	0.4882	51	102	134-747	34.50
	12.50*	0.4961	51	102	134-749*	35.20
1/2	12.70	0.5000	51	102	134-752	35.20
33/64*	13.09	0.5156	51	102	134-756	36.40
17/32*	13.49	0.5312	54	107	134-757	36.40
35/64	13.89	0.5469	54	107	134-758	37.30

* Available only while quantities last

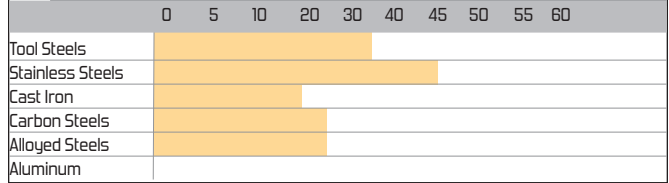
Cutting Conditions

Materials			Hardness (HRC)	Cutting Speed (SFM)
Main Group	Sub-Group	Condition		
Tool Steels	A2, A6, L7, O1, O2, O6, M1, M2 O2, P20	Annealed	<35	50-55
Stainless Steel	200 Series,	Annealed	<28	50-60
	300 Series,	Annealed	<28	30-60
	400 Series	Annealed	<29	55-65
	400 Series	Hardened	<45	50-60
Cast Iron	Soft, Hard, Malleable		<18	80-135
Carbon Steels	1020 thru 1060, 1090	Normalized	<22	80-100
Alloyed Steels	1435, 4140, 4615, 5140	Normalized	<22	65-80
Aluminum	Alloys, Cast	-	-	200-215

Cutting Speed (sfm)



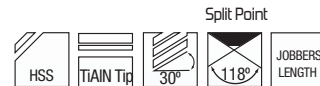
Hardness (hrc)





HSS TiAlN Tip Jobber Length Drills

A stronger self repairing coating leading to longer tool life compared to TiN coating. TiAlN Tip also allows increased speeds and feeds.



Tap	No. Flutes	Overall Length	Thread Length	Code No.	Price \$
60	.0400	1/2	1-3/8	127-189	1.00
59	.0410	1/2	1-3/8	127-188	1.00
58	.0420	9/16	1-7/16	127-187	1.00
57	.0430	9/16	1-7/16	127-186	1.00
56	.0465	11/16	1-1/2	127-185	1.00
55	.0520	3/4	1-5/8	127-184	1.00
54	.0540	3/4	1-5/8	127-183	1.00
53	.0595	13/16	1-3/4	127-182	1.10
1/16	.0625	13/16	1-3/4	127-001	1.00
52	.0635	13/16	1-3/4	127-181	1.10
51	.0670	7/8	1-13/16	127-180	1.10
50	.0700	7/8	1-13/16	127-179	1.10
49	.0730	7/8	1-13/16	127-178	1.10
48	.0760	1"	1-15/16	127-177	1.10
5/64	.0781	1"	1-15/16	127-002	1.00
47	.0785	1"	1-15/16	127-176	1.10
46	.0810	1"	1-15/16	127-175	1.10
45	.0820	1"	1-15/16	127-174	1.10
44	.0860	1-1/8	2-1/8	127-173	1.10
43	.0890	1-1/8	2-1/8	127-172	1.10
42	.0935	1-3/16	2-1/4	127-171	1.60
3/32	.0938	1-3/16	2-1/4	127-003	1.10
41	.0960	1-3/16	2-1/4	127-170	1.60
40	.0980	1-3/16	2-1/4	127-169	1.60
39	.0995	1-3/16	2-1/4	127-168	1.60
38	.1015	1-3/16	2-1/4	127-167	1.60
37	.1040	1-3/16	2-1/4	127-166	1.60
36	.1065	1-5/16	2-7/16	127-165	1.60
7/64	.1094	1-5/16	2-7/16	127-004	1.50
35	.1100	1-5/16	2-7/16	127-164	1.70
34	.1110	1-5/16	2-7/16	127-163	1.70
33	.1130	1-5/16	2-7/16	127-162	1.70
32	.1160	1-5/16	2-7/16	127-161	1.70
31	.1200	1-7/16	2-9/16	127-160	1.70
1/8	.1250	1-7/16	2-9/16	127-005	1.60
30	.1285	1-7/16	2-9/16	127-159	1.70
29	.1360	1-9/16	2-13/16	127-158	1.70
28	.1405	1-9/16	2-13/16	127-157	1.70
9/64	.1406	1-9/16	2-13/16	127-006	1.70
27	.1440	1-9/16	2-13/16	127-156	1.70
26	.1470	1-9/16	2-13/16	127-155	1.70
25	.1495	1-3/4	3"	127-154	1.80
24	.1520	1-3/4	3"	127-153	1.80
23	.1540	1-3/4	3"	127-152	1.80
5/32	.1562	1-3/4	3"	127-007	1.80
22	.1570	1-3/4	3"	127-151	1.80
21	.1590	1-3/4	3"	127-150	1.80
20	.1610	1-3/4	3"	127-149	1.90
19	.1660	1-3/4	3"	127-148	1.90
18	.1695	1-7/8	3-3/16	127-147	1.90
11/64	.1719	1-7/8	3-3/16	127-008	1.90
17	.1730	1-7/8	3-3/16	127-146	2.00
16	.1770	1-7/8	3-3/16	127-145	2.00
15	.1800	1-7/8	3-3/16	127-144	2.00
14	.1820	1-7/8	3-3/16	127-143	2.00
13	.1850	1-7/8	3-3/16	127-142	2.10
3/16	.1875	2-1/16	3-7/16	127-009	2.00
12	.1890	2-1/16	3-7/16	127-141	2.10
11	.1910	2-1/16	3-7/16	127-140	2.10
10	.1935	2-1/16	3-7/16	127-139	2.20
9	.1960	2-1/16	3-7/16	127-138	2.20
8	.1991	2-1/16	3-7/16	127-137	2.30
7	.2010	2-1/16	3-7/16	127-136	2.40
13/64	.2031	2-1/16	3-7/16	127-010	2.40
6	.2040	2-1/16	3-7/16	127-135	2.50
5	.2055	2-1/16	3-7/16	127-134	2.50
4	.2090	2-1/4	3-11/16	127-133	2.60
3	.2130	2-1/4	3-11/16	127-132	2.60

Tap	No. Flutes	Overall Length	Thread Length	Code No.	Price \$
7/32	.2188	2-1/4	3-11/16	127-011	2.50
2	.2210	2-1/4	3-11/16	127-131	2.70
1	.2280	2-1/4	3-11/16	127-130	2.80
A	.2340	2-1/4	3-11/16	127-250	2.90
15/64	.2344	2-1/4	3-11/16	127-012	2.80
B	.2380	2-1/2	4"	127-251	2.90
C	.2420	2-1/2	4"	127-252	2.90
D	.2460	2-1/2	4"	127-253	3.10
1/4	.2500	2-1/2	4"	127-013	2.90
E	.2500	2-1/2	4"	127-254	3.20
F	.2570	2-1/2	4"	127-255	3.40
G	.2610	2-1/2	4"	127-256	3.50
17/64	.2656	2-3/4	4-5/16	127-014	3.40
H	.2660	2-3/4	4-5/16	127-257	3.60
I	.2720	2-3/4	4-5/16	127-258	3.70
J	.2770	2-3/4	4-5/16	127-259	3.90
K	.2810	2-3/4	4-5/16	127-260	3.90
9/32	.2812	2-3/4	4-5/16	127-015	3.70
L	.2900	2-3/4	4-5/16	127-261	4.00
M	.2950	2-3/4	4-5/16	127-262	4.50
19/64	.2969	3"	4-5/8	127-016	4.20
N	.3020	3"	4-5/8	127-263	4.70
5/16	.3125	3"	4-5/8	127-017	4.40
O	.3160	3"	4-5/8	127-264	4.70
P	.3230	3"	4-5/8	127-265	5.20
21/64	.3281	3"	4-5/8	127-018	5.00
Q	.3320	3"	4-5/8	127-266	5.30
R	.3390	3-1/4	4-15/16	127-267	5.80
11/32	.3438	3-1/4	4-15/16	127-019	5.50
S	.3480	3-1/4	4-15/16	127-268	6.10
T	.3580	3-1/4	4-15/16	127-269	6.50
23/64	.3594	3-1/4	4-15/16	127-020	6.10
U	.3680	3-1/4	4-15/16	127-270	6.60
3/8	.3750	3-7/16	5-1/4	127-021	6.20
V	.3770	3-7/16	5-1/4	127-271	6.80
W	.3860	3-7/16	5-1/4	127-272	7.20
25/64	.3906	3-7/16	5-1/4	127-022	7.00
X	.3970	3-7/16	5-1/4	127-273	7.60
Y	.4040	3-7/16	5-1/4	127-274	7.70
13/32	.4062	3-7/16	5-1/4	127-023	7.30
Z	.4130	3-7/16	5-1/4	127-275	8.30
27/64	.4219	3-3/4	5-5/8	127-024	7.90
7/16	.4375	3-3/4	5-5/8	127-025	8.60
29/64	.4531	3-3/4	5-5/8	127-026	9.30
15/32	.4688	4"	6"	127-027	9.80
31/64	.4844	4"	6"	127-028	10.50
1/2	.5000	4"	6"	127-029	10.90

HSS TiAlN Tip Jobber Length Drills Sets

A stronger self repairing coating leading to longer tool life compared to TiN coating. TiAlN Tip also allows increased speeds and feeds.



Description	Pieces Per Set	Code No.	Price \$
1/16" - 1/2" x 64ths Fractional Set	29	127-050	156.10
#1 - #60 Wire Gage Set	60	127-190	116.00
3-in-1 Combination Drill Set	115	127-280	426.40
#1-60, A-Z, 1/16-1/2 x 64ths			

Super HSCO (T15) Spade Drill Blades

For drilling in High Alloy materials & exotic materials, T15 may also be used in general purpose applications where increased speeds and enhanced wear resistance is required.



Series Min to Max	Diameter		TiN		TiAlN		
	Inch Metric	Decimal	Code No.	Price \$	Code No.	Price \$	
Y	9.50mm	.3740	161-999	36.80	162-179	38.00	
	3/8"	.3750	162-000	39.40	162-180	43.70	
	9.80mm	.3860	162-001	31.70	162-181	38.00	
	.374"	25/64"	.3906	162-002	36.50	162-182	38.00
	to	10mm	.3937	162-003	31.70	162-183	38.00
	.436"	10.20mm	.4016	162-005	31.70	162-185	38.00
	(3/32")	13/32"	.4063	162-004	36.50	162-184	38.00
	Thick	10.50mm	.4134	162-007	31.70	162-187	38.00
		27/64"	.4219	162-006	39.40	162-186	43.70
		10.80mm	.4252	162-009	31.70	162-189	38.00
Z	11mm	.4331	162-650	34.30	162-720	40.90	
	7/16"	.4375	162-008	39.40	162-188	47.20	
	11.50mm	.4528	162-011	31.70	162-191	38.00	
	.437"	29/64"	.4531	162-010	39.40	162-190	38.00
	to	15/32"	.4688	162-012	39.40	162-192	47.20
	.510"	12mm	.4724	162-652	34.30	162-722	40.90
	(3/32")	31/64"	.4844	162-014	39.40	162-194	47.20
	Thick	12.50mm	.4921	162-654	34.30	162-724	40.90
		1/2"	.5000	162-016	39.40	162-196	47.20
		13mm	.5118	162-656	34.30	162-726	50.90
O	33/64"	.5156	162-018	42.60	162-198	50.90	
	17/32"	.5313	162-020	42.60	162-200	50.90	
	13.50mm	.5315	162-019	42.60	162-203	49.50	
	35/64"	.5469	162-021	42.60	162-201	50.90	
	14mm	.5512	162-658	42.60	162-728	50.90	
	9/16"	.5625	162-022	42.60	162-204	50.90	
	14.50mm	.5709	162-660	34.30	162-730	40.90	
	37/64"	.5781	162-024	42.60	162-206	50.90	
	.511"	15mm	.5906	162-662	34.30	162-732	50.90
	to	19/32"	.5938	162-026	42.60	162-208	50.90
I	.695"	.6094	162-027	42.60	162-209	50.90	
	(1/8")	15.50mm	.6102	162-664	34.30	162-734	50.90
	Thick	5/8"	.6250	162-028	42.60	162-210	50.90
		16mm	.6299	162-666	42.60	162-736	50.90
		41/64"	.6406	162-029	42.60	162-211	50.90
		16.50mm	.6496	162-668	34.30	162-738	40.90
		21/32"	.6563	162-030	42.60	162-212	50.90
		17mm	.6693	162-670	34.30	162-740	50.90
		43/64"	.6719	162-031	42.60	162-213	50.90
		11/16"	.6875	162-032	42.60	162-214	50.90
1	17.50mm	.6890	162-033	39.40	162-215	50.90	
	45/64"	.7031	162-036	47.80	162-218	56.70	
	18mm	.7087	162-672	47.80	162-742	56.80	
	23/32"	.7188	162-038	47.80	162-220	56.70	
	18.50mm	.7283	162-674	38.60	162-744	40.90	
	47/64"	.7344	162-040	47.80	162-222	56.70	
	19mm	.7480	162-676	38.60	162-746	56.70	
	3/4"	.7500	162-042	47.80	162-224	56.70	
	49/64"	.7656	162-044	47.80	162-226	56.70	
	19.50mm	.7677	162-045	38.60	162-227	45.60	
5	.690"	.7813	162-046	47.80	162-228	56.70	
	to	20mm	.7874	162-678	38.60	162-748	56.70
	.960"	51/64"	.7969	162-047	47.80	162-229	56.70
	(5/32")	20.50mm	.8071	162-680	38.60	162-750	45.60
	Thick	13/16"	.8125	162-048	47.80	162-230	56.70
		21mm	.8268	162-682	44.20	162-752	56.70
		27/32"	.8438	162-050	47.80	162-232	56.70
		55/64"	.8594	162-051	38.60	162-233	56.70
		22mm	.8661	162-684	47.80	162-754	56.70
		7/8"	.8750	162-052	47.80	162-234	56.70
2	57/64"	.8906	162-053	47.80	162-235	56.70	
	23mm	.9055	162-055	38.60	162-237	52.40	
	29/32"	.9063	162-054	47.80	162-236	56.70	
	59/64"	.9219	162-056	47.80	162-238	56.70	
	15/16"	.9375	162-058	47.80	162-240	56.70	
	24mm	.9449	162-686	38.60	162-756	56.70	

Series Min to Max	Diameter		TiN Code No.	Price \$	TiAlN Code No.	Price \$	
	Inch Metric	Decimal					
	31/32"	.9688	162-062	56.10	162-244	66.70	
	63/64"	.9843	162-064	56.10	162-246	66.70	
	1"	1.0000	162-066	56.10	162-248	66.70	
	1-1/64"	1.0156	162-068	56.10	162-250	66.70	
	26mm	1.0236	162-688	56.10	162-758	66.70	
	1-1/32"	1.0313	162-070	56.10	162-252	66.70	
	1-3/64"	1.0469	162-071	56.10	162-253	66.70	
	1-1/16"	1.0625	162-072	56.10	162-254	66.70	
	27mm	1.0630	162-073	52.00	162-255	61.70	
	2	1-3/32"	1.0938	162-074	56.10	162-256	61.70
	.961"	28mm	1.1024	162-690	45.20	162-760	53.80
	to	1-7/64"	1.1094	162-075	56.10	162-257	66.70
	1.380"	1-1/8"	1.1250	162-076	56.10	162-258	66.70
	(3/16")	29mm	1.1417	162-692	56.10	162-762	61.70
	Thick	1-5/32"	1.1563	162-078	56.10	162-260	66.70
		30mm	1.1811	162-694	56.10	162-764	66.70
		1-3/16"	1.1875	162-080	56.10	162-262	66.70
		1-7/32"	1.2188	162-082	56.10	162-264	66.70
		31mm	1.2205	162-083	56.10	162-265	66.70
		1-1/4"	1.2500	162-084	56.10	162-266	66.70
	32mm	1.2598	162-696	52.00	162-766	66.70	
	1-9/32"	1.2813	162-086	56.10	162-268	66.70	
	33mm	1.2992	162-698	45.20	162-768	66.70	
	1-5/16"	1.3125	162-088	56.10	162-270	66.70	
	34mm	1.3386	162-700	45.20	162-770	53.80	
	1-11/32"	1.3438	162-090	56.10	162-272	66.70	
	1-3/8"	1.3750	162-092	56.10	162-274	66.70	
	35mm	1.3780	162-702	45.20	162-772	53.80	
	1-13/32"	1.4063	162-094	71.40	162-276	85.40	
	36mm	1.4173	162-704	45.20	162-774	53.80	
	1-7/16"	1.4375	162-096	71.40	162-278	85.40	
	37mm	1.4567	162-097	57.50	162-279	68.80	
	1-15/32"	1.4688	162-098	71.40	162-280	85.40	
	38mm	1.4961	162-099	57.50	162-281	68.80	
	1-1/2"	1.5000	162-100	71.40	162-282	85.40	
	1-17/32"	1.5313	162-102	71.40	162-284	85.40	
	39mm	1.5354	162-103	51.70	162-285	68.80	
	3	1-9/16"	1.5625	162-104	71.40	162-286	85.40
	1.380"	40mm	1.5748	162-706	57.50	162-776	85.40
	to	1-19/32"	1.5938	162-106	66.10	162-288	85.40
1.882"	41mm	1.6142	162-107	45.60	162-289	68.80	
(1/4")	1-5/8"	1.6250	162-108	71.40	162-290	85.40	
Thick	42mm	1.6535	162-109	45.60	162-291	79.10	
	1-21/32"	1.6563	162-110	71.40	162-292	85.40	
	1-11/16"	1.6875	162-112	71.40	162-294	85.40	
	43mm	1.6929	162-113	45.60	162-295	68.80	
	1-23/32"	1.7188	162-114	71.40	162-296	79.10	
	44mm	1.7323	162-708	57.50	162-778	68.80	
	1-3/4"	1.7500	162-116	71.40	162-298	85.40	
	45mm	1.7717	162-710	57.50	162-780	68.90	
	1-25/32"	1.7813	162-118	66.10	162-300	85.40	
	46mm	1.8110	162-119	57.50	162-301	68.80	
	1-13/16"	1.8125	162-120	71.40	162-302	85.40	
1-27/32"	1.8438	162-122	71.40	162-304	85.40		
	47mm	1.8504	162-123	45.60	162-305	68.80	
	1-7/8"	1.8750	162-124	71.40	162-306	85.40	
	1-29/32"	1.9063	162-126	90.10	162-308	99.90	
	1-15/16"	1.9375	162-128	90.10	162-310	108.00	
	1-31/32"	1.9688	162-130	90.10	162-312	108.00	
	2"	2.0000	162-132	90.10	162-314	108.00	
	2-1/32"	2.0313	162-134	72.60	162-316	99.90	
	2-3/64"	2.0472	162-135	72.60	162-317	87.00	
	2-1/16"	2.0625	162-136	90.10	162-318	108.00	
	2-3/32"	2.0938	162-138	72.60	162-320	108.00	
	4	2-1/8"	2.1250	162-140	90.10	162-322	108.00
	1.850"	2-5/32"	2.1563	162-142	72.60	162-324	87.00
	to	2-3/16"	2.1875	162-144	90.10	162-326	108.00
	2.570"	2-7/32"	2.1888	162-146	90.10	162-328	108.00
	(5/16")	2-1/4"	2.2500	162-148	90.10	162-330	108.00
	Thick	2-9/32"	2.2813	162-150	72.60	162-332	87.00
		2-5/16"	2.3125	162-152	83.50	162-334	108.00
		2-11/32"	2.3438	162-154	72.60	162-336	87.00
		2-3/8"	2.3750	162-156	90.10	162-338	108.00
		2-13/32"	2.4063	162-158	72.60	162-340	87.00
	2-7/16"	2.4375	162-160	90.10	162-342	108.00	
	2-15/32"	2.4688	162-162	72.60	162-344	99.90	
	2-1/2"	2.5000	162-164	90.10	162-346	108.00	
	2-17/32"	2.5313	162-166	90.10	162-348	87.00	
	2-9/16"	2.5625	162-168	90.10	162-350	108.00	



Short Length Straight Shank Holders - Straight Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Dia.	Shank Length	Pipe Tap	Code No.	Price \$
Y	3/8" - 27/64"	1-1/4"	2-1/32"	2-1/8"	4-13/32"	3/4"	2-3/8"	1/8"	162-801	140.90
Z	7/16" - 1/2"	1-1/4"	2-1/32"	2-1/8"	4-13/32"	3/4"	2-3/8"	1/8"	162-803	140.90
0	33/64" - 11/16"	1-3/8"	2-3/16"	2-19/64"	4-9/16"	3/4"	2-3/8"	1/8"	162-805	140.90
1	45/64" - 15/16"	2-5/8"	3-7/8"	4-1/64"	6-7/8"	3/4"	3"	1/8"	162-822	146.00
2	31/32" - 1-3/8"	3-3/8"	4-1/2"	4-41/64"	8"	1"	3-1/2"	1/8"	162-824	158.10
2	31/32" - 1-3/8"	3-3/8"	4-1/2"	4-41/64"	8"	1-1/4"	3-1/2"	1/8"	162-812	158.10
2.5	1-3/16" - 1-3/8"	3-3/8"	4-1/2"	4-41/64"	8"	1-1/4"	3-1/2"	1/8"	162-815	177.80
3	1-13/32" - 1-7/8"	4-3/4"	6"	6-3/16"	10"	1-1/4"	4"	1/4"	162-826	184.10
4	1-29/32" - 2-9/16"	5-1/8"	6-1/2"	6-3/16"	10-1/2"	1-1/2"	4"	1/4"	162-828	217.10
7-8	3-17/32" - 4-1/2"	6-3/4"	8-7/8"	9-1/8"	13-7/8"	3"	5"	1/2"	163-052*	253.80

* Available only while quantities last

Intermediate Length Straight Shank Holders - Straight Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Dia.	Shank Length	Pipe Tap	Code No.	Price \$
1	45/64" - 15/16"	4-5/8"	5-7/8"	6-1/64"	8-7/8"	1"	3"	1/8"	162-833	209.40
2	31/32" - 1-3/8"	5-3/8"	6-1/2"	6-41/64"	10"	1-1/4"	3-1/2"	1/8"	162-835	227.20

Standard Length Straight Shank Holders - Straight Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Dia.	Shank Length	Pipe Tap	Code No.	Price \$
Y	3/8" - 27/64"	2-3/8"	3-5/32"	3-1/4"	5-17/32"	3/4"	2-3/8"	1/8"	162-800	144.10
Z	7/16" - 1/2"	2-3/8"	3-5/32"	3-1/4"	5-17/32"	3/4"	2-3/8"	1/8"	162-802	144.10
0	33/64" - 11/16"	2-1/2"	3-5/16"	3-27/64"	5-11/16"	3/4"	2-3/8"	1/8"	162-804	144.10
1	45/64" - 15/16"	6-5/8"	7-7/8"	8-1/64"	10-7/8"	3/4"	3"	1/8"	162-806	158.90
1	45/64" - 15/16"	6-5/8"	7-7/8"	8-1/64"	10-7/8"	1"	3"	1/8"	162-821	157.40
1.5	55/64" - 15/16"	6-5/8"	7-7/8"	8-1/64"	10-7/8"	1"	3"	1/8"	162-825	170.10
2	31/32" - 1-3/8"	7-3/8"	8-1/2"	8-41/64"	12"	1-1/4"	3-1/2"	1/8"	162-827	170.10
2.5	1-3/16" - 1-3/8"	7-3/8"	8-1/2"	8-41/64"	12"	1-1/4"	3-1/2"	1/8"	162-830	187.90
3	1-13/32" - 1-7/8"	8-1/4"	9-1/2"	9-11/16"	13-1/2"	1-1/4"	4"	1/4"	162-814	194.80
3	1-13/32" - 1-7/8"	8-1/4"	9-1/2"	9-11/16"	13-1/2"	1-1/2"	4"	1/4"	162-831	207.60
4	1-29/32" - 2-9/16"	9-1/8"	10-1/2"	10-11/16"	14-1/2"	1-1/2"	4"	1/4"	162-818	251.30
5-6	2-1/2" - 3-1/2"	10-3/4"	12-1/2"	12-3/4"	16-1/2"	2"	4"	1/2"	163-054	432.70
7-8	3-17/32" - 4-1/2"	10-3/4"	12-7/8"	13-1/8"	17-7/8"	3"	5"	1/2"	163-056*	1,105.00

* Available only while quantities last

Short Length Taper Shank Holders - Straight Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Taper	Pipe Tap	Code No.	Price \$
Y	3/8" - 27/64"	1-1/4"	2-1/32"	3-15/32"	6-5/16"	#2	1/16"	162-917	140.90
0	33/64" - 11/16"	1-3/8"	2-3/16"	3-41/64"	6-15/32"	#2	1/16"	162-902	140.90
1	45/64" - 15/16"	2-3/4"	3-7/8"	5-39/64"	9-5/32"	#3	1/8"	162-904	157.40
1	45/64" - 15/16"	2-3/4"	3-7/8"	5-43/64"	10-5/32"	#4	1/8"	162-905	157.40
2	31/32" - 1-3/8"	3-3/8"	4-1/2"	6-15/64"	9-25/32"	#3	1/8"	162-908	171.30
2	31/32" - 1-3/8"	3-3/8"	4-1/2"	6-19/64"	10-25/32"	#4	1/8"	162-909	187.30
3	1-13/32" - 1-7/8"	4-3/4"	6"	8-1/8"	13-9/16"	#4	1/4"	162-918	194.80
4	1-29/32" - 2-9/16"	5-1/8"	6-1/2"	8-5/8"	14-5/16"	#5	1/4"	162-914	236.80
5-6	2-1/2" - 3-1/2"	6-3/4"	8-1/2"	11-5/16"	16-15/16"	#5	1/2"	162-915	531.00

Intermediate Length Taper Shank Holders - Straight Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Taper	Pipe Tap	Code No.	Price \$
1	45/64" - 15/16"	4-3/4"	5-7/8"	7-39/64"	11-5/32"	#3	1/8"	162-841	217.10
2	31/32" - 1-3/8"	5-3/8"	6-1/2"	8-19/64"	12-25/32"	#4	1/8"	162-845	251.30
3	1-13/32" - 1-7/8"	6-1/2"	7-3/4"	9-7/8"	14-5/16"	#4	1/4"	162-847	268.40

Standard Length Taper Shank Holders - Straight Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Taper	Pipe Tap	Code No.	Price \$
Y	3/8" - 27/64"	2-3/8"	3-5/32"	4-19/32"	7-7/16"	#2	1/16"	162-864	144.10
Z	7/16" - 1/2"	2-3/8"	3-5/32"	4-19/32"	7-7/16"	#2	1/16"	162-866	144.10
1	45/64" - 15/16"	6-3/4"	7-7/8"	9-39/64"	13-5/32"	#3	1/8"	162-870	165.00
1	45/64" - 15/16"	6-3/4"	7-7/8"	9-43/64"	14-5/32"	#4	1/8"	162-871	170.10
1.5	55/64" - 15/16"	6-3/4"	7-7/8"	9-39/64"	13-5/32"	#3	1/8"	162-872	176.40
2	31/32" - 1-3/8"	7-3/8"	8-1/2"	10-19/64"	14-25/32"	#4	1/8"	162-875	187.30
2.5	1-3/16" - 1-3/8"	7-3/8"	8-1/2"	10-15/64"	13-25/32"	#3	1/8"	162-876	198.00
2.5	1-3/16" - 1-3/8"	7-3/8"	8-1/2"	10-37/64"	15-1/16"	#4	1/4"	162-877	206.90
3	1-13/32" - 1-7/8"	8-1/4"	9-1/2"	11-1/8"	16-1/16"	#4	1/4"	162-878	213.30
3	1-13/32" - 1-7/8"	8-1/4"	9-1/2"	11-5/8"	17-5/16"	#5	1/4"	162-881	229.10
4	1-29/32" - 2-9/16"	9-1/8"	10-1/2"	12-5/8"	17-1/16"	#4	1/4"	162-879	251.30
5-6	2-1/2" - 3-1/2"	10-3/4"	12-1/2"	15-5/16"	20-15/16"	#5	1/2"	163-058	432.10



Extended Length Taper Shank Holders - Straight Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Taper	Pipe Tap	Code No.	Price \$
0	33/64" - 11/16"	4-1/2"	5-5/16"	6-49/64"	9-13/32"	#2	1/16"	162-836	161.80
1	45/64" - 15/16"	10-3/4"	11-7/8"	13-39/64"	17-5/32"	#3	1/8"	162-838	185.90
3	1-13/32" - 1-7/8"	13-3/4"	15"	17-1/8"	21-9/16"	#4	1/4"	162-842	288.10
4	1-29/32" - 2-9/16"	16-5/8"	18"	20-1/8"	25-13/16"	#5	1/4"	162-844	366.80

Standard Length Taper Shank Holders - Helical Flute



Series	Drill Insert Range	Max. Drill Depth	Flute Length	Top of Drill to Shank	Overall Length	Shank Taper	Pipe Tap	Code No.	Price \$
Y	3/8" - 27/64"	2-3/8"	3-5/32"	4-19/32"	7-7/16"	#2	1/16"	162-850	151.70
Z	7/16" - 1/2"	2-3/8"	3-5/32"	4-19/32"	7-7/16"	#2	1/16"	162-852	151.70
0	33/64" - 11/16"	2-1/2"	3-5/16"	4-49/64"	7-19/32"	#2	1/16"	162-854	151.70
1	45/64" - 15/16"	6-3/4"	7-7/8"	9-39/64"	13-5/32"	#3	1/8"	162-856	180.90
2	31/32" - 1-3/8"	7-3/8"	8-1/2"	10-15/64"	13-25/32"	#3	1/8"	162-860	209.40

COMBINED DRILL & COUNTERSINKS & SPOT DRILLS

EUROPEAN MADE



60° HSS COMBINED DRILL & COUNTERSINKS

- 60° countersink
- 118° drill point
- High Speed Steel



Size	Body Dia.	Drill Dia.	Drill Length	O.A.L.	Code No.	Price \$
#000	1/8"	.020"	0.5-0.8mm	31mm	121-907	7.70
#00	1/8"	.025"	0.7-1.0mm	31mm	121-908	7.30
#0	1/8"	1/32"	0.9-1.2mm	31mm	121-910	6.70
1	1/8"	3/64"	1.4-1.7mm	31mm	121-911	6.40
2	3/16"	5/64"	2.4-2.7mm	47mm	121-912	6.70
3	1/4"	7/64"	3.3-3.9mm	50mm	121-913	7.10
4	5/16"	1/8"	3.8-4.4mm	54mm	121-914	8.10
4-1/2	3/8"	9/64"	4.3-4.9mm	63mm	121-919	10.60
5	7/16"	3/16"	5.9-6.5mm	70mm	121-915	12.20
6	1/2"	7/32"	6.9-7.5mm	76mm	121-916	16.10
7	5/8"	1/4"	8.0-8.6mm	82mm	121-917	28.80
8	3/4"	5/16"	10.0-10.6mm	89mm	121-918	47.20
Set	Contents					
5pcs	#1 - 5				121-920	42.80

60° HSS COMBINED DRILL & COUNTERSINKS TiN COATED

- 60° countersink
- 118° drill point
- TiN coated



Size	Body Dia.	Drill Dia.	Drill Length	O.A.L.	Code No.	Price \$
1	1/8"	3/64"	1.4-1.7mm	31mm	121-921	10.80
2	3/16"	5/64"	2.4-2.7mm	47mm	121-922	12.20
3	1/4"	7/64"	3.3-3.9mm	50mm	121-923	13.60
4	5/16"	1/8"	3.8-4.4mm	54mm	121-924	15.90
4-1/2	3/8"	9/64"	4.3-4.9mm	63mm	121-929	20.40
5	7/16"	3/16"	5.9-6.5mm	70mm	121-925	23.10
6	1/2"	7/32"	6.9-7.5mm	76mm	121-926	28.10
7	5/8"	1/4"	8.0-8.6mm	82mm	121-927	42.00
8	3/4"	5/16"	10.0-10.6mm	89mm	121-928	64.70

60° COMBINED DRILL & COUNTERSINKS - LONG SERIES



- 60° countersink
- 118° drill point
- High Speed Steel

Size	Body Dia.	Drill Dia.	Drill Length	O.A.L.	Code No.	Price \$
1	1/8"	3/64"	1.4-1.7mm	4"	121-931	16.50
2	3/16"	5/64"	2.4-2.7mm	4"	121-932	16.50
3	1/4"	7/64"	3.3-3.9mm	4"	121-933	18.30
4	5/16"	1/8"	3.8-4.4mm	4"	121-934	19.60
5	7/16"	3/16"	5.9-6.5mm	4"	121-935	25.30

90° HSS STUB NC SPOT DRILLS

- M2 High Speed Steel



Dia. (in.)	Overall Length (in.)	Flute Length (in.)	Code No.	Price \$
1/8"	1-1/4"	0.380"	121-939	8.60
3/16"	1-3/8"	0.500"	121-940	9.50
1/4"	1-1/2"	0.640"	121-941	9.90
5/16"	1-1/2"	0.640"	121-942	12.20
3/8"	2"	1"	121-943	13.20
7/16"	2"	1"	121-944	17.60
1/2"	2"	1"	121-945	20.90
5/8"	2-1/4"	1-1/8"	121-946	36.30
3/4"	2-1/4"	1-1/8"	121-947	48.30
7/8"	2-1/2"	1-1/4"	121-948	61.50
1"	2-1/2"	1-1/4"	121-949	74.70



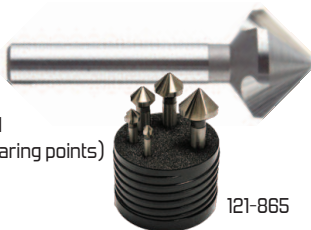
HSS & COBALT 3 FLUTE COUNTERSINKS

EUROPEAN MADE



90° COBALT 3 FLUTE COUNTERSINKS

- M35 Cobalt
- Wide flutes provide good chip evacuation
- Positive cut
- Constant profile aids regrinding of the tool
- Self-centering of the cutting mill (three bearing points) virtually eliminates vibration

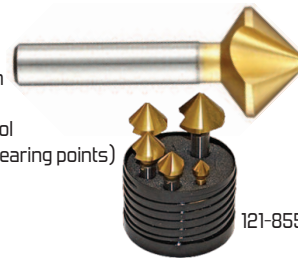


121-865

Diameter	O.A.L.	Shank Diameter	Code No.	Price \$
INCH				
1/4"	45mm	1/4"	121-899	20.90
5/16"	45mm	1/4"	121-900	24.20
3/8"	50mm	1/4"	121-901	27.50
1/2"	50mm	1/4"	121-902	34.10
5/8"	60mm	3/8"	121-903	39.60
3/4"	60mm	3/8"	121-904	46.10
1"	70mm	3/8"	121-905	56.00
7pc Set			121-866	248.00
METRIC				
6.3mm	45mm	5mm	121-894	24.20
10.4mm	50mm	6mm	121-895	32.50
16.5mm	60mm	10mm	121-896	45.70
20.5mm	63mm	10mm	121-897	53.80
25.0mm	67mm	10mm	121-898	65.50
5pc Set			121-865	271.20

90° COBALT 3 FLUTE COUNTERSINKS - TIN COATED

- M35 Cobalt - TiN coated
- Wide flutes provide good chip evacuation
- Positive cut
- Constant profile aids regrinding of the tool
- Self-centering of the cutting mill (three bearing points) virtually eliminates vibration



121-855

Diameter	O.A.L.	Shank Diameter	Code No.	Price \$
INCH				
1/4"	45mm	1/4"	121-857	27.50
5/16"	45mm	1/4"	121-858	31.80
3/8"	50mm	1/4"	121-859	35.10
1/2"	50mm	1/4"	121-862	42.80
5/8"	60mm	3/8"	121-863	50.60
3/4"	60mm	3/8"	121-864	58.20
1"	70mm	3/8"	121-867	69.20
7pc Set			121-856	314.90
METRIC				
10.4mm	50mm	6mm	121-850	39.60
16.5mm	60mm	10mm	121-851	57.10
20.5mm	63mm	10mm	121-852	65.90
25.0mm	67mm	10mm	121-853	78.60
31.0mm	71mm	12mm	121-854	111.90
5pc Set			121-855	340.20

82° COBALT 3 FLUTE COUNTERSINKS

- M35 Cobalt
- Wide flutes provide good chip evacuation
- Positive cut
- Constant profile aids regrinding of the tool
- Self-centering of the cutting mill (three bearing points) virtually eliminates vibration

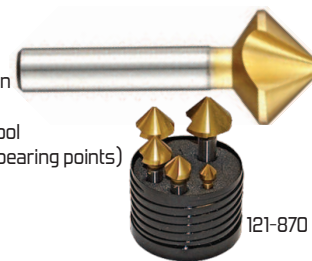


121-860

Diameter	O.A.L.	Shank Diameter	Code No.	Price \$
INCH				
1/4"	45mm	1/4"	121-875	20.90
5/16"	45mm	1/4"	121-876	24.20
3/8"	50mm	1/4"	121-877	27.50
1/2"	50mm	1/4"	121-878	34.10
5/8"	60mm	3/8"	121-879	39.60
3/4"	60mm	3/8"	121-880	46.10
1"	70mm	3/8"	121-881	56.00
7pc Set			121-861	248.00
METRIC				
6.3mm	45mm	5mm	121-868	24.20
10.4mm	50mm	6mm	121-869	32.50
16.5mm	61mm	10mm	121-872	45.70
20.5mm	64mm	10mm	121-873	53.80
25.0mm	68mm	10mm	121-874	65.50
5pc Set			121-860	219.50

82° COBALT 3 FLUTE COUNTERSINKS - TIN COATED

- M35 Cobalt
- Wide flutes provide good chip evacuation
- Positive cut
- Constant profile aids regrinding of the tool
- Self-centering of the cutting mill (three bearing points) virtually eliminates vibration



121-870

Diameter	O.A.L.	Shank Diameter	Code No.	Price \$
10.4mm	50mm	6mm	121-882	39.60
16.5mm	61mm	10mm	121-883	57.10
20.5mm	64mm	10mm	121-884	65.90
25.0mm	68mm	10mm	121-885	78.60
31.0mm	73mm	12mm	121-886	111.90
5pc Set			121-870	485.80

CARBIDE BURRS



Solid Carbide Burrs

• Solid carbide burr



MICROGRAIN carbide

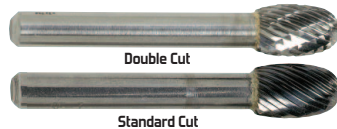


Cylindrical - Square End - End Not Cut

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Price \$	Standard Cut Code No.	Price \$
SA-41	1/16	1/4	1/8	1-1/2	170-002	5.60	170-001	5.30
SA-42	3/32	7/16	1/8	1-1/2	170-004	5.60	170-003	5.30
SA-43	1/8	9/16	1/8	1-1/2	170-006	5.60	170-005	5.30
SA-12	1/8	1/2	1/4	2	170-008	10.60	170-007	10.20
SA-14	3/16	5/8	1/4	2	170-010	10.60	170-009	11.40
SA-1	1/4	5/8	1/4	2	170-014	10.60	170-013	9.90
SA-51	1/4	1/2	1/8	2-1/4	170-016	9.60	170-015	9.20
SA-2	5/16	3/4	1/4	2-1/2	170-020	13.10	170-019	14.10
SA-3	3/8	3/4	1/4	2-1/2	170-022	14.20	170-021	13.60
SA-4	7/16	1	1/4	2-3/4	170-024	21.30	170-023	20.20
SA-5	1/2	1	1/4	2-3/4	170-026	22.40	170-025	21.30
SA-6	5/8	1	1/4	2-3/4	170-028	28.30	170-027	26.60
SA-16	3/4	3/4	1/4	2-1/2	170-030	33.60	170-029	36.10
SA-7	3/4	1	1/4	2-3/4	170-032	42.20	170-031	45.30
SA-9	1	1	1/4	2-3/4	170-034	55.10	170-033	65.40

Tree - Pointed End

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Price \$	Standard Cut Code No.	Price \$
SG-41	1/8	1/4	1/8	1-1/2	170-130	6.30	170-129	6.00
SG-53	3/16	1/2	1/8	1-1/2	170-132	7.90	170-131	9.80
SG-44	1/8	1/2	1/8	1-1/2	170-134	6.30	170-133	5.30
SG-1	1/4	5/8	1/4	2	170-138	12.90	170-137	13.80
SG-51	1/4	1/2	1/8	2	170-140	9.60	170-139	9.20
SG-2	5/16	3/4	1/4	2-1/2	170-142	9.30	170-141	18.70
SG-3	3/8	3/4	1/4	2-1/2	170-144	16.20	170-143	15.50
SG-13	1/2	3/4	1/4	2-1/2	170-146	22.80	170-145	24.50
SG-5	1/2	1	1/4	2-3/4	170-148	23.00	170-147	21.90
SG-6	5/8	1	1/4	2-3/4	170-150	33.00	170-149	35.40
SG-7	3/4	1	1/4	2-3/4	170-152	49.00	170-151	46.70
SG-15DC	3/4	1-1/2	1/4	3-1/4	170-154	62.10	170-153	67.80



Oval Shape

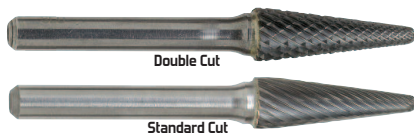
E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Price \$	Standard Cut Code No.	Price \$
SE-41	1/8	7/32	1/8	1-1/2	170-160	5.60	170-159	5.30
SE-1	1/4	3/8	1/4	2	170-164	14.20	170-163	15.30
SE-51	1/4	3/8	1/8	1-3/4	170-166	9.60	170-165	9.20
SE-3	3/8	5/8	1/4	2-3/8	170-168	17.50	170-167	16.70
SE-5	1/2	7/8	1/4	2-5/8	170-170	24.80	170-169	23.60
SE-6	5/8	1	1/4	2-3/4	170-172	35.00	170-171	37.80
SE-7	3/4	1	1/4	2-3/4	170-174	50.90	170-173	43.00

Cylindrical - Radius End

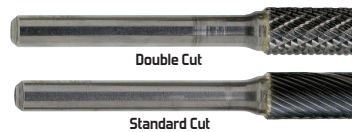
E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Price \$	Standard Cut Code No.	Price \$
SC-41	3/32	7/16	1/8	1-1/2	170-050	5.60	170-049	6.00
SC-42	1/8	9/16	1/8	1-1/2	170-052	5.60	170-051	5.30
SC-12	1/8	1/2	1/4	2	170-054	11.50	170-053	11.60
SC-14	3/16	5/8	1/4	2	170-056	11.50	170-055	11.50
SC-1	1/4	5/8	1/4	2	170-060	11.90	170-059	11.50
SC-51	1/4	1/2	1/8	2-15/16	170-062	9.60	170-061	9.20
SC-2	5/16	3/4	1/4	2-1/2	170-064	16.30	170-063	14.90
SC-3	3/8	3/4	1/4	2-1/2	170-066	15.80	170-065	15.10
SC-4	7/16	1	1/4	2-3/4	170-068	23.00	170-067	21.90
SC-5	1/2	1	1/4	2-3/4	170-070	24.80	170-069	23.60
SC-6	5/8	1	1/4	2-3/4	170-072	31.60	170-071	30.10
SC-7	3/4	1	1/4	2-3/4	170-074	45.20	170-073	48.40



Solid Carbide Burrs



MICROGRAIN
carbide



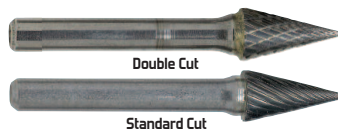
Taper 14° Included Taper with Radius End

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Double Cut Price \$	Standard Cut Code No.	Standard Cut Price \$
SL-41	1/8	3/8	1/8	1-1/2	170-230	6.30	170-229	6.00
SL-42	1/8	1/2	1/8	1-1/2	170-232	5.60	170-231	5.30
SL-1	1/4	5/8	1/4	2	170-236	13.10	170-235	12.40
SL-2	5/16	7/8	1/4	2-5/8	170-238	16.40	170-237	15.70
SL-3	3/8	1-1/16	1/4	2-13/16	170-240	19.60	170-239	18.70
SL-4	1/2	1-1/8	1/4	2-7/8	170-242	25.00	170-241	23.90
SL-6	5/8	1-5/16	1/4	3-1/16	170-244	42.90	170-243	47.20
SL-7	3/4	1-1/2	1/4	3-1/4	170-246	63.10	170-245	67.80



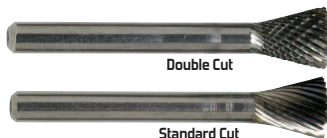
Flame

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Double Cut Price \$	Standard Cut Code No.	Standard Cut Price \$
SH-41	1/8	1/4	1/8	1-1/2	170-250	5.60	170-247	5.30
SH-1	1/4	5/8	1/4	2	170-251	16.00	-	-
SH-2	5/16	3/4	1/4	2-3/4	170-254	15.90	170-255	15.10
SH-5	1/2	1-1/4	1/4	3-1/4	170-256	32.50	170-257	31.00
SH-6	5/8	1-7/16	1/4	3-7/16	170-258	46.70	170-259	44.50
SH-7	3/4	1-5/8	1/4	3-5/8	170-260	67.70	170-261	72.60



Cone

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Included Angle	Double Cut Code No.	Double Cut Price \$	Standard Cut Code No.	Standard Cut Price \$
SM-41	1/8	11/32	1/8	1-1/2	12°	170-270	5.60	170-269	5.30
SM-42	1/8	7/16	1/8	1-1/2	14°	170-272	5.60	170-271	5.30
SM-43	1/8	5/8	1/8	1-1/2	7°	170-274	5.60	170-273	5.30
SM-1	1/4	1/2	1/4	2	22°	170-278	12.60	170-277	12.10
SM-2	1/4	3/4	1/4	2	14°	170-280	13.60	170-279	12.90
SM-3	1/4	1	1/4	2	10°	170-282	14.40	170-281	13.80
SM-51	1/4	1/2	1/8	2-1/8	22°	170-284	9.60	170-283	9.20
SM-4	3/8	5/8	1/4	2-3/8	28°	170-286	12.80	170-285	10.80
SM-5	1/2	7/8	1/4	2-5/8	28°	170-288	24.80	170-287	23.60
SM-6	5/8	1	1/4	2-3/4	31°	170-290	43.50	170-289	36.80



Inverted Cone - End Not Cut

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Included Angle	Double Cut Code No.	Double Cut Price \$	Standard Cut Code No.	Standard Cut Price \$
SN-41	3/32	1/8	1/8	1-1/2	10°	170-300	6.30	170-299	6.00
SN-42	1/8	3/16	1/8	1-1/2	10°	170-302	5.60	170-301	5.30
SN-1	1/4	5/16	1/4	2	10°	170-306	11.60	170-305	12.50
SN-51	1/4	1/4	1/8	1-3/4	10°	170-308	9.60	170-307	10.30
SN-4	1/2	1/2	1/4	2-1/4	16°	170-310	23.00	170-309	21.90
SN-6	5/8	3/4	1/4	2-1/2	18°	170-312	33.00	170-311	35.40
SN-7	3/4	5/8	1/4	4	30°	170-314	38.80	170-313	36.80

Cylindrical - End Cut

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Double Cut Price \$	Standard Cut Code No.	Standard Cut Price \$
SB-41	1/16	1/4	1/8	1-1/2	170-038	5.60	170-078	6.00
SB-42	3/32	7/16	1/8	1-1/2	170-040	6.30	170-080	6.00
SB-43	1/8	9/16	1/8	1-1/2	170-042	5.60	170-082	6.00
SB-12	1/8	5/8	1/4	2	170-035	12.30	170-075	11.70
SB-14	3/16	5/8	1/4	2	170-036	12.20	170-076	13.10
SB-1	1/4	5/8	1/4	2	170-037	11.30	170-077	10.80
SB-2	5/16	3/4	1/4	2-1/2	170-043	14.50	170-083	13.80
SB-3	3/8	3/4	1/4	2-1/2	170-039	15.60	170-079	14.70
SB-4	7/16	1	1/4	2-3/4	170-044	23.00	170-084	24.70
SB-5	1/2	1	1/4	2-3/4	170-041	28.00	170-081	23.60
SB-6	5/8	1	1/4	2-3/4	170-045	31.00	170-085	30.00
SB-16	3/4	3/4	1/4	2-1/2	170-047	41.80	170-087	35.30
SB-7	3/4	1	1/4	2-3/4	170-046	46.00	170-086	43.80
SB-9	1	1	1/4	2-3/4	170-048	76.30	170-088	64.50



Tree - Radius End

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Double Cut Price \$	Standard Cut Code No.	Standard Cut Price \$
SF-42	1/8	1/2	1/8	1-1/2	170-100	5.60	170-099	5.30
SF-41	1/8	1/4	1/8	1-1/2	170-102	6.30	-	-
SF-12	1/8	1/2	1/4	2	170-104	14.60	170-103	13.80
SF-1	1/4	5/8	1/4	2	170-108	12.90	170-107	12.30
SF-51	1/4	1/2	1/8	2	170-110	9.60	170-109	9.20
SF-3	3/8	3/4	1/4	2-1/2	170-112	16.20	170-111	15.50
SF-4	7/16	1	1/4	2-3/4	170-114	23.90	170-113	22.80
SF-5	1/2	1	1/4	2-3/4	170-116	23.00	170-115	21.90
SF-6	5/8	1	1/4	2-3/4	170-118	33.00	170-117	35.40
SF-7	3/4	1	1/4	2-3/4	170-120	43.50	170-119	46.70
SF-14	3/4	1-1/4	1/4	3	170-122	45.40	170-121	43.20
SF-15	3/4	1-1/2	1/4	3-1/4	170-124	71.20	170-123	67.80



Ball Shape

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Double Cut Price \$	Standard Cut Code No.	Standard Cut Price \$
SD-41	3/32	-	1/8	1-1/2	170-200	5.60	170-199	6.00
SD-42	1/8	-	1/8	1-1/2	170-202	5.60	170-201	5.30
SD-12	1/8	-	1/4	2	170-204	13.50	170-203	12.90
SD-14	3/16	-	1/4	2	170-206	13.50	170-205	11.50
SD-53	3/16	-	1/8	2	170-208	10.30	170-207	10.30
SD-1	1/4	-	1/4	2	170-210	11.50	170-209	11.00
SD-51	1/4	-	1/8	2	170-212	9.60	170-211	9.20
SD-2	5/16	-	1/4	2-1/16	170-214	12.50	170-213	11.80
SD-3	3/8	-	1/4	2-1/8	170-216	14.10	170-215	13.10
SD-5	1/2	-	1/4	2-1/4	170-218	18.10	170-217	17.20
SD-6	5/8	-	1/4	2-3/8	170-220	22.60	170-219	21.50
SD-7	3/4	-	1/4	2-1/2	170-222	30.80	170-221	33.00
SD-9	1	-	1/4	2-3/4	170-224	50.50	170-223	48.20

Solid Carbide Burrs



MICROGRAIN
carbide



Alumacut Burrs - Cylindrical

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Alumacut Burrs Code No.	Price \$
SA-1FM	1/4	5/8	1/4	2	170-320	13.50
SA-3FM	3/8	3/4	1/4	2-1/2	170-321	18.30
SA-5FM	1/2	1	1/4	2-3/4	170-322	32.30
SA-6FM	5/8	1	1/4	2-3/4	170-323	40.60
SA-7FM	3/4	1	1/4	2-3/4	170-324	61.10



Alumacut Burrs - Tree Radius

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Alumacut Burrs Code No.	Price \$
SF-1FM	1/4	5/8	1/4	2	170-340	16.40
SF-3FM	3/8	3/4	1/4	2-1/2	170-341	20.90
SF-5FM	1/2	1	1/4	2-3/4	170-342	33.40
SF-6FM	5/8	1	1/4	2-3/4	170-343	47.70
SF-7FM	3/4	1-1/4	1/4	3	170-344	65.70



Alumacut Burrs - Radius End

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Alumacut Burrs Code No.	Price \$
SC-1FM	1/4	5/8	1/4	2	170-325	17.60
SC-3FM	3/8	3/4	1/4	2-1/2	170-326	20.30
SC-5FM	1/2	1	1/4	2-3/4	170-327	31.90
SC-6FM	5/8	1	1/4	2-3/4	170-328	40.60
SC-7FM	3/4	1	1/4	2-3/4	170-329	65.40



Alumacut Burrs - Ball

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Alumacut Burrs Code No.	Price \$
SD-1FM	1/4	7/32	1/4	2	170-330	15.30
SD-3FM	3/8	5/16	1/4	2-1/8	170-331	20.00
SD-5FM	1/2	7/16	1/4	2-1/4	170-332	23.20
SD-6FM	5/8	9/16	1/4	2-3/8	170-333	29.00
SD-7FM	3/4	11/16	1/4	2-1/2	170-334	44.40



Alumacut Burrs - Egg

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Alumacut Burrs Code No.	Price \$
SE-1FM	1/4	3/8	1/4	2	170-335	20.60
SE-3FM	3/8	5/8	1/4	2-3/8	170-336	22.50
SE-5FM	1/2	7/8	1/4	2-5/8	170-337	36.00
SE-6FM	5/8	1	1/4	2-3/4	170-338	51.00
SE-7FM	3/4	1	1/4	2-3/4	170-339	65.40



Alumacut Burrs - 14° Included Angle

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Alumacut Burrs Code No.	Price \$
SL-3FM	3/8	1-1/16	1/4	2-13/16	170-345	28.50
SL-4FM	1/2	1-1/8	1/4	2-7/8	170-346	36.30
SL-6FM	5/8	1-5/16	1/4	3-1/16	170-347	63.80
SL-7FM	3/4	1-1/2	1/4	3-1/4	170-348	91.50



60° Taper

Double Cut

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Price \$
SJ-42	1/8	3/32	1/8	1-1/2	170-176	5.60
SJ-1	1/4	3/16	1/4	2	170-177	11.80
SJ-2	5/16	5/16	1/4	2-1/16	170-178	14.60
SJ-3	3/8	5/16	1/4	2-1/16	170-179	14.40
SJ-5	1/2	7/16	1/4	2-3/16	170-180	20.10
SJ-6	5/8	9/16	1/4	2-5/16	170-181	26.40
SJ-7	3/4	11/16	1/4	2-7/16	170-182	35.50
SJ-9	1	15/16	1/4	2-9/16	170-184	49.60



90° Taper

Double Cut

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut Code No.	Price \$
SK-42	1/8	1/16	1/8	1-1/2	170-185	5.60
SK-1	1/4	1/8	1/4	2	170-186	11.80
SK-2	5/16	3/16	1/4	1-15/16	170-187	14.60
SK-3	3/8	3/16	1/4	1-15/16	170-188	14.40
SK-5	1/2	1/4	1/4	2	170-189	17.90
SK-6	5/8	5/16	1/4	2-1/16	170-190	23.50
SK-7	3/4	3/8	1/4	2-1/8	170-191	35.50
SK-9	1	1/2	1/4	2-1/4	170-193	56.00



6" OAL Solid Carbide Burrs



6" O.A.L. Carbide Burrs

E.D.P.	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Cut		Standard Cut	
					Code No.	Price \$	Code No.	Price \$
SA-3L6	3/8	3/4	1/4	6"	170-370	24.50	170-372	25.00
SA-5L6	1/2	1	1/4	6"	170-371	40.20	170-373	33.70
SC-3L6	3/8	3/4	1/4	6"	170-374	28.70	170-376	26.70
SC-5L6	1/2	1	1/4	6"	170-375	42.80	170-377	36.30
SF-3L6	3/8	3/4	1/4	6"	170-378	26.70	170-380	27.10
SF-5L6	1/2	1	1/4	6"	170-379	41.50	170-381	34.40
SL-3L6	3/8	1-1/16	1/4	6"	170-382	35.90	170-384	30.80
SL-5L6	1/2	1-1/8	1/4	6"	170-383	41.80	-	-
SD-3L6	3/8	-	1/4	6"	170-386	22.40	170-388	24.50
SD-5L6	1/2	-	1/4	6"	170-387	30.20	170-389	29.10



8pc Solid Carbide Double Cut Burr Sets

- Solid carbide
- Double cut
- Comes in fitted case



Contents	Shank Diameter	Code No.	Price \$
SA-51, SB-51, SC-51, SD-1, SD-52, SF-53, SG-51, SL-51	1/8"	172-984	102.20
SA-3, SA-5, SC-1, SC-3, SD-3, SD-5 SF-3, SF-5	1/4"	172-986	188.10

INDEXABLE CUTTING

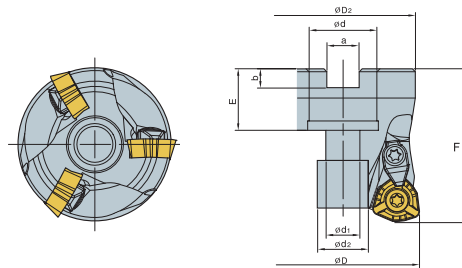


HFPC Face Mill Kits

 Coolant through



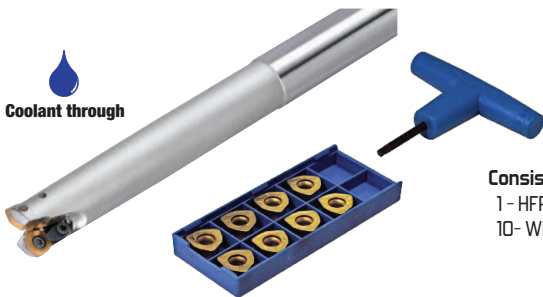
Consists of:
1 - HFPC Face Mill
10 - WDKT 130520 Inserts (Coated)



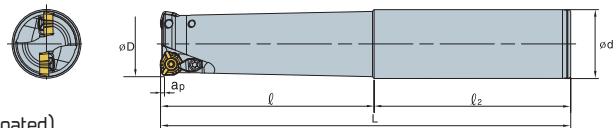
Model No.	Cutting Dia. (ϕD)	Bore Dia. (ϕd)	ϕD_2	ϕd_2	a	b	E	F	Insert	No. of Inserts	Kit Code No.	Price \$
HFPC 13200R-3 (148-636)	2.000	.750	1.772	.630	.321	.221	.778	1.969	WDKT 130520 ZDSR-MH PM10C (148-653)	10	149-992	598.40
HFPC 13250R-4 (148-639)	2.500	.750	1.772	.630	.321	.221	.778	1.969	WDKT 130520 ZDSR-MH PM10C (148-653)	10	149-993	733.10
HFPC 13300R-5 (148-641)	3.000	1.000	2.205	.827	.384	.248	.985	2.756	WDKT 130520 ZDSR-MH PM10C (148-653)	10	149-994	1,054.10

HFPA End Mill Kits

 Coolant through



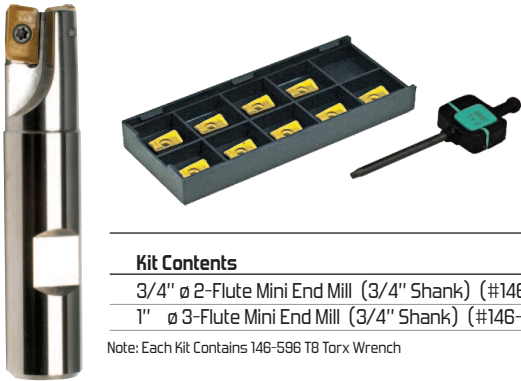
Consists of:
1 - HFPA End Mill
10 - WDKT 130520 Inserts (Coated)



Model No.	Cutting Dia. (ϕD)	Shank Dia. (ϕd)	l_1	l_2	L	Insert	No. of Inserts	Kit Code No.	Price \$
HFPA 1-1/4 (148-646)	1-1/4	1.000	2.756	3.150	5.906	WDKT 130520 ZDSR-MH PM10C (148-653)	10	149-990	487.00
HFPA 1-1/4 (148-647)	1-1/4	1.000	4.725	3.150	7.874	WDKT 130520 ZDSR-MH PM10C (148-653)	10	149-991	497.80



AP11 End Mill Kits



Consists of:
 1 - AP11-90 End Mill
 10 - APXT 11T3 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
3/4" ϕ 2-Flute Mini End Mill (3/4" Shank) (#146-373)	10 - APXT 11T3 Coated Inserts (#146-356)	149-864	205.70
1" ϕ 3-Flute Mini End Mill (3/4" Shank) (#146-374)	10 - APXT 11T3 Coated Inserts (#146-356)	149-865	217.20

Note: Each Kit Contains 146-596 T8 Torx Wrench

AP11 Master End Mill Kit

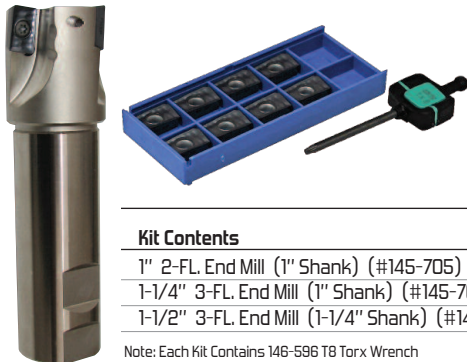


Consists of:
 1 - Each 1/2", 5/8", 3/4", 1" AP11-90 End Mills
 20 - APXT 11T3 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
1/2" ϕ , 5/8" ϕ , 3/4" ϕ , and 1" ϕ Mini-Mill (#146-371, #146-372, #146-373, #146-374)	20 - APXT 11T3 PM25C Inserts (#146-356)	149-866	574.30

Note: Kit Contains 146-596 T8 Torx Wrench

AP16 End Mill Kits



Consists of:
 1 - AP16-90 Endmills
 10 - APKT 1604 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
1" 2-FL. End Mill (1" Shank) (#145-705)	10 - APKT 1604PDSR M PM30P Coated Inserts (#147-333)	149-900	262.20
1-1/4" 3-FL. End Mill (1" Shank) (#145-706)	10 - APKT 1604PDSR M PM30P Coated Inserts (#147-333)	149-901	276.70
1-1/2" 3-FL. End Mill (1-1/4" Shank) (#145-707)	10 - APKT 1604PDSR M PM30P Coated Inserts (#147-333)	149-902	291.30

Note: Each Kit Contains 146-596 T8 Torx Wrench

APFM Face Mill Kits



Consists of:
 1 - APFM 16-90 Face Mill
 10 - APKT 1604 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
2" Face Mill (147-009) c/w 10 inserts (147-333)	APKT 1604 PDSR M PM30P	149-907	342.30
2-1/2" Face Mill (147-011) c/w 10 inserts (147-333)	APKT 1604 PDSR M PM30P	149-908	425.80
3" Face Mill (147-013) c/w 10 inserts (147-333)	APKT 1604 PDSR M PM30P	149-909	425.80
4" Face Mill (147-000) c/w 10 inserts (147-333)	APKT 1604 PDSR M PM30P	149-910	479.80
5" Face Mill (147-015) c/w 10 inserts (147-333)	APKT 1604 PDSR M PM30P	149-911	738.20

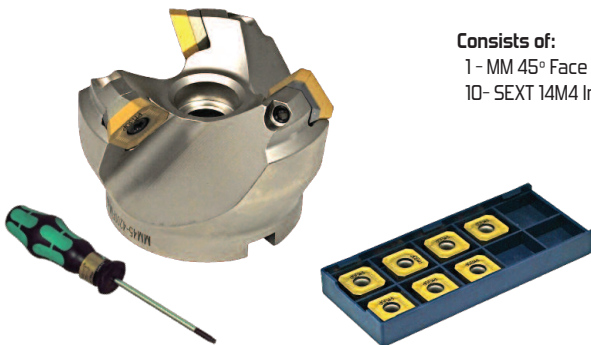
R8 Milling Cutter & Inserts Kit



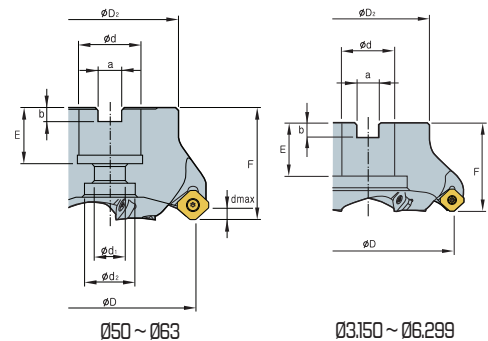
Consists of:
 1 - R8 Shank End Mill 2" Dia.
 10 - TPU 322 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
2" R8 (Bridgeport shank) End Mill (141-016) c/w 10 inserts (146-709)	TPU 322 PM25C Inserts (Coated)	500-732	547.50

45° Max Mill Kits



Consists of:
 1 - MM 45° Face Mill
 10 - SEXT 14M4 Inserts (Coated)



Designation	Cutter No.	ØD	Ød	ØD ₂	Ød ₁	Ød ₂	a	b	E	F	No. of Inserts	d max
MM 45° Coarse Pitch	4200FM 147-811	2.000	0.750	1.654	0.433	0.709	0.321	0.181	0.787	1.575	3	0.256
	4250FM 147-812	2.500	0.750	1.654	0.433	0.709	0.321	0.181	0.787	1.575	4	
	4300FM 147-813	3.000	1.000	1.969	0.551	0.787	0.384	0.248	0.866	1.969	5	
	4400FM 147-814	4.000	1.250	2.362	-	1.772	0.510	0.319	0.866	1.969	5	

Kit Contents	Insert	Kit Code No.	Price \$
2" Cutter (147-811) c/w 10 inserts (147-730)	SEXT 14M4 AGSN PM25C	149-932	385.40
2" Cutter (147-811) c/w 10 inserts (148-182)	SEXT 14M4 AGSN PM30P	149-933	385.40
2 1/2" Cutter (147-812) c/w 10 inserts (147-730)	SEXT 14M4 AGSN PM25C	149-934	441.60
2 1/2" Cutter (147-812) c/w 10 inserts (148-182)	SEXT 14M4 AGSN PM30P	149-935	441.60
3" Cutter (147-813) c/w 10 inserts (147-730)	SEXT 14M4 AGSN PM25C	149-936	593.40
3" Cutter (147-813) c/w 10 inserts (148-182)	SEXT 14M4 AGSN PM30P	149-937	593.40
4" Cutter (147-814) c/w 10 inserts (147-730)	SEXT 14M4 AGSN PM25C	149-938	699.20
4" Cutter (147-814) c/w 10 inserts (148-182)	SEXT 14M4 AGSN PM30P	149-939	699.20



OKT-MAX Face Mill Kits



Consists of:
 1 - OKT-MAX Face Mill
 10- OFKT 05T3 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
2" OKT-MAX Face Mill (147-019) c/w 10 inserts (146-843)	OFKT 05T3 PM25C Inserts (Coated)	149-863	548.00

Note: Each Kit Contains 146-940 T15 Torx Wrench

Alumimill Kits



Consists of:
 1 - AMFM Face Mill Complete With
 VCKT 43.575 Inserts (Polished)

Kit Contents	Insert	Kit Code No.	Price \$
2" Face Mill (147-424) c/w 3 inserts (147-425)	VCKT 43.575 NA KT10U	149-927	432.10
2-1/2" Face Mill (147-834) c/w 4 inserts (147-425)	VCKT 43.575 NA KT10U	149-928	539.30
3" Face Mill (147-470) c/w 4 inserts (147-425)	VCKT 43.575 NA KT10U	149-929	561.60
4" Face Mill (147-471) c/w 5 inserts (147-425)	VCKT 43.575 NA KT10U	149-930	690.70

Chamfer Tool Kits



Consists of:
 1 - CT 45° Chamfer Tool
 10- TCMT/TCGT Inserts

Kit Contents	Insert	Kit Code No.	Price \$
1/8-5/8" Chamfer Tool 1 Flute (147-113) c/w 10 inserts (148-811)	TCMT 21.51 Inserts (Coated)	149-853	293.50
1/8-5/8" Chamfer Tool 1 Flute (147-113) c/w 10 inserts (146-506)	TCGT 21.52 Inserts For Aluminum	149-854	327.50
15/32-1-1/8" Chamfer Tool 2 Flute (147-112) c/w 10 inserts (148-707)	TCMT 32.52 Inserts (Coated)	149-855	216.70
15/32-1-1/8" Chamfer Tool 2 Flute (147-112) c/w 10 inserts (146-508)	TCGT 32.52 Inserts For Aluminum	149-856	264.70

Mold Mill Kits

Consists of:
 1 - Mold Mill
 2 - RC Inserts (Coated)



KIT CONTENTS	Insert	Kit Code No.	Price \$
5/8" Standard Length Moldmill (148-094) c/w 2 pcs RC-5/8 Inserts (147-858)		149-912	536.80
5/8" Medium Length Moldmill (147-853) c/w 2 pcs RC-5/8 Inserts (147-858)		149-913	365.20
5/8" Long Length Moldmill (148-095) c/w 2 pcs RC-5/8 Inserts (147-858)		149-914	578.20
3/4" Standard Length Moldmill (148-096) c/w 2 pcs RC-3/4 Inserts (147-859)		149-915	491.20
3/4" Medium Length Moldmill (147-854) c/w 2 pcs RC-3/4 Inserts (147-859)		149-916	514.10
3/4" Long Length Moldmill (148-097) c/w 2 pcs RC-3/4 Inserts (147-859)		149-917	537.30
1" Standard Length Moldmill (148-098) c/w 2 pcs RC-1 Inserts (147-860)		149-918	543.30
1" Medium Length Moldmill (147-855) c/w 2 pcs RC-1 Inserts (147-860)		149-919	574.70
1" Long Length Moldmill (148-099) c/w 2 pcs RC-1 Inserts (147-860)		149-920	736.70
1-1/8" Standard Length Moldmill (148-100) c/w 2 pcs RC-1-1/8 Inserts (147-861)		149-923	486.80
1-1/8" Medium Length Moldmill (147-856) c/w 2 pcs RC-1-1/8 Inserts (147-861)		149-924	517.70
1-1/8" Long Length Moldmill (148-102) c/w 2 pcs RC-1-1/8 Inserts (147-861)		149-925	1,051.90
1-1/4" Standard Length Moldmill (148-103) c/w 2 pcs RC-1-1/4 Inserts (147-862)		149-921	745.80
1-1/4" Medium Length Moldmill (147-857) c/w 2 pcs RC-1-1/4 Inserts (147-862)		149-922	651.70
1-1/4" Long Length Moldmill (148-104) c/w 2 pcs RC-1-1/4 Inserts (147-862)		149-926	699.80

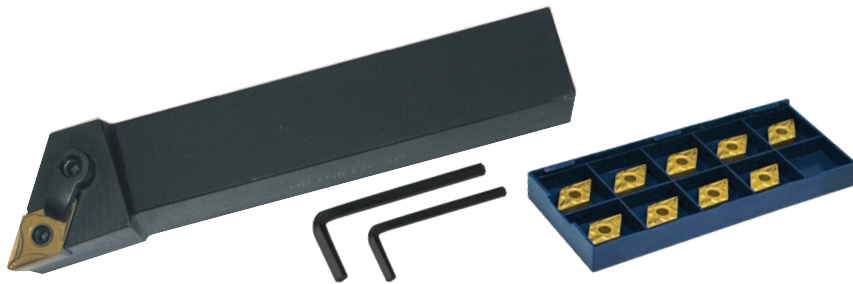
MCLNR/L Turning Kits



Consists of:
 1 - MCLNR/L Toolholder
 10 - CNMG 432 Inserts (Coated)

Application	Material	Kit Contents	Right Hand		Left Hand	
			Kit Code No.	Price \$	Kit Code No.	Price \$
Finishing	Steel	1 pc MCLNR 16-4D (145-828) 10 pcs CNMG 432 F2 PT10C (146-471)	149-800	181.80	-	-
Medium/Finishing	Steel	1 pc MCLNR 16-4D (145-828) 10 pcs CNMG 432 M PT22C (146-677)	149-806	181.80	-	-
Medium	Steel	1 pc MCLNR 16-4D (145-828)/MCLNL 16-4D (145-829) 10 pcs CNMG 432 MM PT22C (146-557)	149-801	181.80	149-805	181.80
Roughing	Steel	1 pc MCLNR 16-4D (145-828) 10 pcs CNMG 432 R1 PT22C (146-569)	149-802	181.80	-	-
Medium	Stainless Steel	1 pc MCLNR 16-4D (145-828) 10 pcs CNMG 432 MM MT20C (146-765)	149-803	181.80	-	-
Medium	Cast Iron	1 pc MCLNR 16-4D (145-828) 10 pcs CNMA 432 KT10C (147-473)	149-804	116.20	-	-

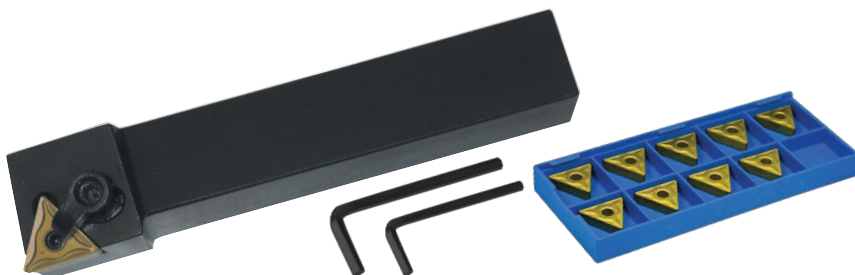
MDJNR/L Turning Kits



Consists of:
 1 - MDJNR/L Toolholder
 10 - DNMG 432 Inserts (Coated)

Application	Material	Kit Contents	Right Hand		Left Hand	
			Kit Code No.	Price \$	Kit Code No.	Price \$
Finishing	Steel	1 pc MDJNR 16-4D (145-845) 10 pcs DNMG 432 F2 PT10C (146-757)	149-807	197.80	-	-
Medium/Finishing	Steel	1 pc MDJNR 16-4D (145-845) 10 pcs DNMG 432 M PT22C (146-555)	149-813	202.80	-	-
Medium	Steel	1 pc MDJNR 16-4D (145-845)/MDJNL 16-4D (145-846) 10 pcs DNMG 432 MM PT22C (148-669)	149-808	230.80	149-812	230.80
Roughing	Steel	1 pc MDJNR 16-4D (145-845) 10 pcs DNMG 432 R1 PT10C (146-263)	149-809	202.80	-	-
Medium	Stainless Steel	1 pc MDJNR 16-4D (145-845) 10 pcs DNMG 432 MM MT20C (146-768)	149-810	202.80	-	-
Medium	Cast Iron	1 pc MDJNR 16-4D (145-845) 10 pcs DNMA 432 KT10C (147-551)	149-811	129.30	-	-

MTGNR Turning Kits

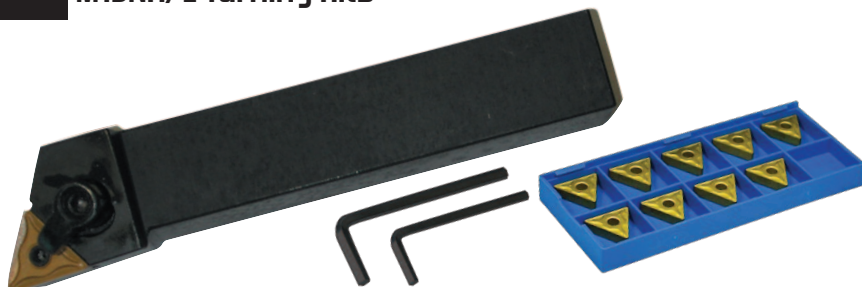


Consists of:
 1 - MTGNR Toolholder
 10 - TNMG 432 Inserts (Coated)

Application	Material	Kit Contents	Right Hand	
			Kit Code	Price \$
Finishing	Steel	1 pc MTGNR 16-4D (145-814) 10 pcs TNMG 432 F2 PT10C (146-632)	149-814	128.70
Medium/Finishing	Steel	1 pc MTGNR 16-4D (145-814) 10 pcs TNMG 432 M PT22C (148-771)	149-824	208.00
Roughing	Steel	1 pc MTGNR 16-4D (145-814) 10 pcs TNMG 432 MM PT22C (149-088)	149-815	214.00
Medium	Cast Iron	1 pc MTGNR 16-4D (145-814) 10 pcs TNMA 432 R1 KT10C (147-609)	149-816	128.70



MTJNR/L Turning Kits



Consists of:
1 - MTJNR/L Toolholder
10 - TNMG 432 Inserts (Coated)

Application	Material	Kit Contents	Right Hand		Left Hand	
			Kit Code No.	Price \$	Kit Code No.	Price \$
Medium Finishing	Steel	1 pc MTJNR 16-4D (145-757) 10 pcs TNMG 432 M PT22C (148-771)	149-823	235.20	-	-
Medium	Steel	1 pc MTJNR 16-4D 1" Shank (145-757)/MTJNL 16-4D (145-756) 10 pcs TNMG 432 MM PT22C (149-040)	149-817	247.20	149-820	247.20
Medium	Steel	1 pc MTJNR 12-3D 3/4" Shank (145-887)/MTJNL 12-3B (145-888) 10 pcs TNMG 322 G PT30C (146-093)	149-818	190.90	149-821	190.90
Medium	Steel	1 pc MTJNR 10-3B 5/8" Shank (145-891)/MTJNL 10-3B (145-892) 10 pcs TNMG 322 G PT30C (146-093)	149-819	219.00	149-822	219.10

MVJNR/L Turning Kits



Consists of:
1 - MVJNR/L Toolholder
10 - VNMG 332 Inserts (Coated)

Application	Material	Kit Contents	Right Hand		Left Hand	
			Kit Code No.	Price \$	Kit Code No.	Price \$
Medium	Steel	1 pc MVJNR 16-3D (145-893)/MVJNL 16-3D (145-738) 10 pcs VNMG 332 M PT22C (147-587)	149-833	234.40	149-834	234.40

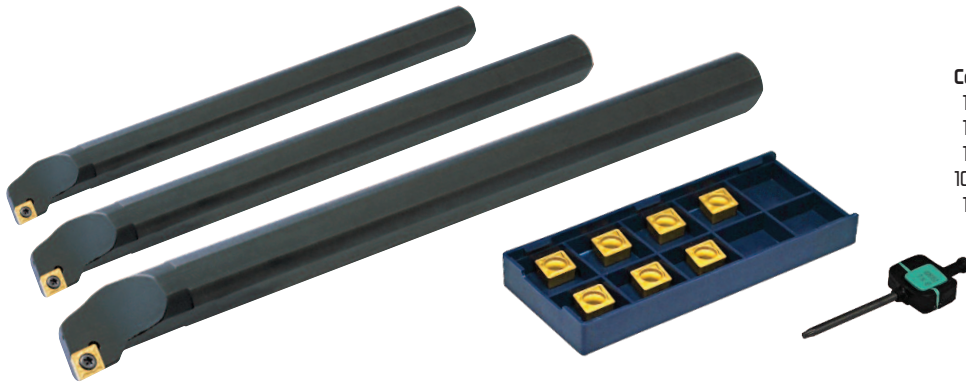
MWLN/L Turning Kits



Consists of:
1 - MWLN/L Toolholder
10 - WNMG 432 Inserts (Coated)

Application	Material	Kit Contents	Right Hand		Left Hand	
			Kit Code No.	Price \$	Kit Code No.	Price \$
Medium Finish	Steel	1 pc MWLN 16-4D (145-808) 10 pcs WNMG 432 M PT22C (148-773)	149-832	210.80	-	-
Medium	Steel	1 pc MWLN 16-4D 1" Shank (145-808)/MWLN 16-4D (145-809) 10 pcs WNMG 432 MM PT22C (145-868)	149-825	181.80	149-830	181.80
Medium	Steel	1 pc MWLN 12-4D 3/4" Shank (145-875)/MWLN 12-4D (145-876) 10 pcs WNMG 432 MM PT22C (145-868)	149-826	183.40	149-831	175.20
Medium	Stainless Steel	1 pc MWLN 16-4D (145-808) 10 pcs WNMG 432 MM MT20C (146-769)	149-827	181.80	-	-
Medium	Cast Iron	1 pc MWLN 16-4D (145-808) 10 pcs WNMA 432 KT05C (147-429)	149-828	181.80	-	-
Roughing	Cast Iron	1 pc MWLN 16-4D (145-808) 10 pcs WNMA 432 KT10C (147-672)	149-829	119.40	-	-

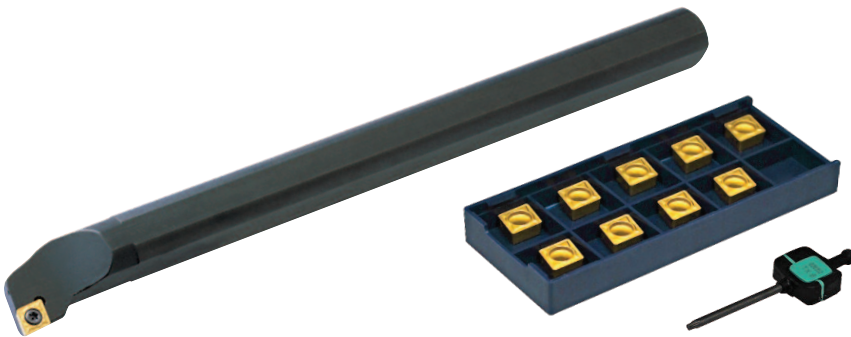
SI-SCLCR/L Master Boring Bar Kits



Consists of:
 1 - 5/8" Ø B/Bar, SI-SCLCR 10-3 (#145-925)
 1 - 3/4" Ø B/Bar, SI-SCLCR 12-3 (#145-926)
 1 - 1" Ø B/Bar, SI-SCLCR 16-3 (#145-927)
 10 - CCMT 32.51 inserts
 1 - wrench (#146-940)

Application	Material	Kit Contents	Right Hand Kit Code No.	Price \$	Left Hand Kit Code No.	Price \$
Medium	Steel	1 pc SI SCLCR 5/8", 3/4", 1" Boring Bars	149-844	315.70	-	-
Medium	Steel	1 pc SI SCLCR 5/8", 3/4", 1" Boring Bars	-	-	149-845	324.00
Medium	Cast Iron	1 pc SI SCLCR 5/8", 3/4", 1" Boring Bars	149-846	315.70	-	-
Medium	Aluminum	1 pc SI SCLCR 5/8", 3/4", 1" Boring Bars	149-847	371.00	-	-

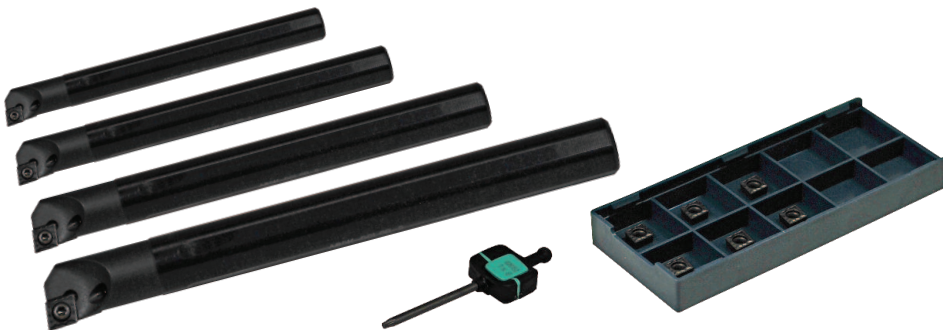
SI-SCLCR Boring Bar Kits



Consists of:
 1 - SI-SCLCR Boring Bar
 10 - CCMT 32.51 Inserts (Coated)

Application	Material	Kit Contents	Right Hand Kit Code No.	Price \$
Medium	Steel	1 pc SI SCLCR 10-3(5/8") (145-925)	149-873	151.90
Medium	Steel	1 pc SI SCLCR 12-3(3/4") (145-926)	149-874	158.90
Medium	Steel	1 pc SI SCLCR 16-3(1") (145-927)	149-875	174.90

A-SCLCR Coolant Thru Boring Bar Kits

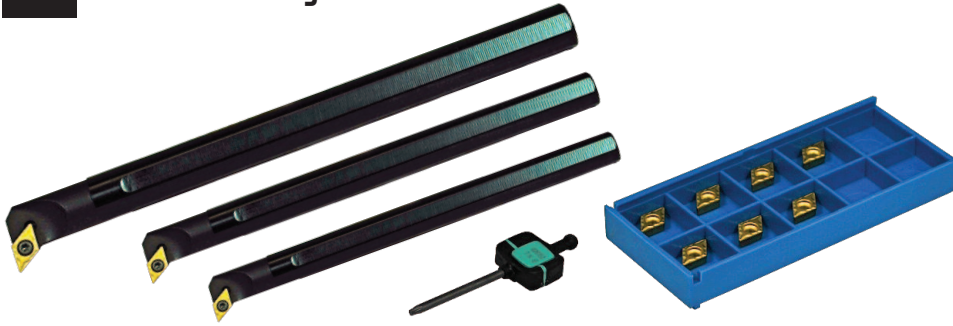


Consists of:
 1 - 5/16" Ø B/Bar, A-SCLCR 5-2 (#146-589)
 1 - 3/8" Ø B/Bar, A-SCLCR 6-2 (#146-590)
 1 - 1/2" Ø B/Bar, A-SCLCR 8-2 (#146-591)
 1 - 5/8" Ø B/Bar, A-SCLCR 10-2 (#147-348)
 1 - wrench (#146-939)
 10 - CC_T21.51 Inserts

Application	Material	Kit Contents	Right Hand Kit Code No.	Price \$
Finishing	Steel	1 pc A-SCLCR 5/16", 3/8", 1/2", 5/8	149-848	393.80
Medium	Steel	1 pc A-SCLCR 5/16", 3/8", 1/2", 5/8	149-849	397.80
Medium	Aluminum	1 pc A-SCLCR 5/16", 3/8", 1/2", 5/8	149-850	353.00



SI-SDUCR Boring Bar Kits



Consists of:

- 1 - 3/8" Ø B/Bar, SI-SDUCR 6-2 (#145-939)
- 1 - 1/2" Ø B/Bar, SI-SDUCR 8-2 (#145-940)
- 1 - 5/8" Ø B/Bar, SI-SDUCR 10-2 (#145-941)
- 10 DC_T21.51 Inserts

Application	Material	Kit Contents	Right Hand Kit Code No.	Price \$
Medium	Steel	1 pc SI-SDUCR 3/8", 1/2", 5/8" Boring Bars 10 pcs DCMT 21.51 F2P PT22C (146-578)	149-851	272.10
Medium	Aluminum	1 pc SI-SDUCR 3/8", 1/2", 5/8" Boring Bars 10 pcs DCGT 21.51 AP KT10U (146-989)	149-852	290.10

External Threading Kits



Consists of:

- 1 - ETH3 Toolholder
- 2 - ECTR 300 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
3/4" Toolholder (146-708) c/w 2pcs 3/8" Partial Profile inserts Coated (146-597)	ECTR 300 8-28 PM30P	149-839	176.80
1" Toolholder (146-290) c/w 2pcs 3/8" Partial Profile inserts Coated (146-597)	ECTR 300 8-28 PM30P	149-840	184.10

Internal Threading Kits

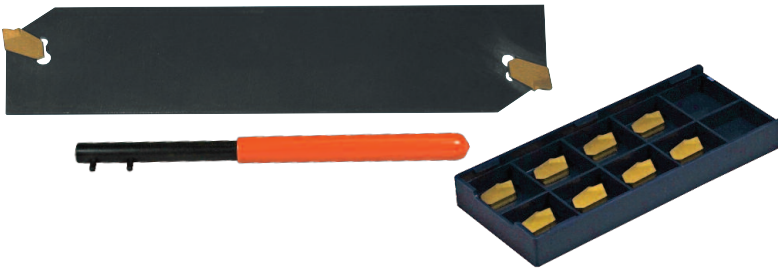


Consists of:

- 1 - ITH3 Toolholder
- 2 - ICTR 300 Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
3/4" Toolholder (146-255) c/w 2pcs - 3/8" Partial Profile inserts Coated (146-610)	ICTR 300 8-28 PM30P	149-842	206.00
1" Toolholder (146-254) c/w 2pcs - 3/8" Partial Profile inserts Coated (146-610)	ICTR 300 8-28 PM30P	149-843	216.90
1-1/4" Toolholder (146-256) c/w 2pcs - 3/8" Partial Profile inserts Coated (146-610)	ICTR 300 8-28 PM30P	149-879	246.10

PRO Part Off Kits



Consists of:
 1 - PP-B Part Off Blade
 10 - SP 300 Inserts (Coated)
 1 - SW155 Wrench

Kit Contents	Insert	Kit Code No.	Price \$
PP-B 3265 1" Blade (146-232)	c/w 10-1/8" inserts (146-452)	149-835	276.50
PP-B 3325 1-1/4" Blade (146-898)	c/w 10-1/8" inserts (146-452)	149-836	276.50
PP-B 4325 1-1/4" Blade (146-899)	c/w 10-0.161" inserts (146-454)	147-441	280.50

PRO Part Off Kits



Consists of:
 1 - PP-B Part Off Blade
 1 - P.O.B. Part Off Block
 10 - SP 300 Inserts (Coated)
 1 - SW155 Wrench

Kit Contents	Insert	Kit Code No.	Price \$
PP-B 3265 1" Blade (146-232) c/w 10-1/8" inserts (146-452) & P.O.B. 19-5 Part Off Block (146-510)	SP300 PT30C	149-837	433.80
PP-B 3265 1-1/4" Blade (146-898) c/w 10-1/8" inserts (146-452) & P.O.B. 25; 4-6 Part Off Block (145-895)	SP300 PT30C	149-838	379.30

MTG - Multi Turn Groove Kits



Consists of:
 1 - MGEHR Toolholder
 5 - MGMN Inserts (Coated)

Kit Contents	Insert	Kit Code No.	Price \$
MGEHR 16-3 1" Shank (148-066) c/w 5-3mm inserts (146-834)	MGMN 300M PT20C	149-898	245.60
MGEHR 16-4 1" Shank (148-074) c/w 5-4mm inserts (149-049)	MGMN 400M PT22C	149-899	235.10



DEBURRING



Promo N Noga Set - NG8000

For Steel, Aluminum & Plastic
Contains: Noga Grip 2 handle & 10pcs N1 (B10) blades



Model	Code No.	Price \$
NG8000	165-474	20.40

N Golden Noga Set - NG8002 TiN Coated

For Steel, Aluminum and Plastic
Contains: Noga Grip Handle & 10 N1 TiN Coated blades



Model	Code No.	Price \$
NG8002	165-465	30.50

Promo S Noga Set - NG8150

For Steel, Aluminum & Plastic
Contains: Noga Grip 1 handle & 10pcs S10 (E100) blades



Model	Code No.	Price \$
NG8150	165-464	22.30

S Golden Noga Set - NG8152 TiN Coated

For Abrasive Materials
Contains: Noga Grip 1 handle & 10pcs S10 Tin Coated blades



Model	Code No.	Price \$
NG8152	165-460	35.20

Cutting Tools

N Economy Set - NG8050

For Steel, Aluminum & Plastic
Contains: Noga Grip handle &
 20pcs N1 (B10) blades



Model	Code No.	Price \$
NG8050	165-478	31.10

N Cobalt Set - NG8100

For Plastic & Hard Materials
Contains: 1 Noga Grip 2 handle &
 20 pcs N10 (B10) Cobalt blades



Model	Code No.	Price \$
NG8100	165-466	43.60

The Set - SP7700

The most popular deburring tools you need to carry for any deburring application. Packed in one handy box.

Contains:
 Countersink NG3100, Mini Scraper NG3700,
 Noga V Cut NG3200, Adjustable Scraper SC8000,
 Keyway-Burr NG3300, Internal Scraper NG3710,
 Super Burr NG3003



Model	Code No.	Price \$
SP7700	165-482	203.30

Noga Box - NX1000

• Collected to meet the total requirements of the tool and die makers.

Contains:
 Keyway burr; half round riffler file; round riffler file; flat riffler file; double-burr; D-key; uni-handle plus SN holder; C holder plus C20; C12; D holder plus D50; D holder plus D66; T120 scraper; L holder plus L1; N1 blade; S10 blade; S101 B blade; S20 blade



Model	Code No.	Price \$
NX1000	165-160	256.00

Deburring Kit - SP1007

Contains:
 RB Handle (12mm Hex. Aluminum Handle),
 OR (1/8" Ring Grooves Blade),
 RD 16.5 (RotoDrive Countersink),
 RDE18 (External Rotodrive Countersink),
 TC (Thread Cleaner Blade),
 S100 Blade (for Steel),
 S150 Blade (for Plastic).



Model	Code No.	Price \$
SP1007	165-190	82.20

Micro Deburring Set - FT3000

• Ideal for Tool and Die makers
 • For extra fine jobs
Contains:
 • Micro Deburring Tool (FT1000)
 • Micro Scraper (FT1100)
 • Micro RotoDrive Countersink (FT1200)



Model	Code No.	Price \$
FT3000	165-135	47.50

MultiBurr - RG1000

Four of Noga's most popular multi-purpose blades in one innovative tool set.

Contains:
 • S10 blade (steel, aluminum, plastic)
 • D50 scraper (ideal for tool & die makers)
 • N2 blade (brass, cast iron)
 • Rotodrive 90° countersink (1-10.4mm)



Model	Code No.	Price \$
RG1000	165-371	108.40

Magic Set - RB4000

The handle can hold both types of blades (rotating & fixed)

Contains:
 Rapid Burr (RB1000) and modified D50 Mini Scraper Blade.



Model	Code No.	Price \$
RB4000	165-480	24.70



Unikit Special - UK2000

• The Standard UNIKIT with the addition of the internal scraper and the 12mm countersink C12

Contains:

D holder plus D66; T120 scraper; uni-handle; SN holder; C holder plus C20; C12; N2 blade; N1 blade; S101 blade; S30 blade; S20 blade; S10 blade



Model	Code No.	Price \$
UK2000	165-150	141.50

Unikit Extra - UK3000

Contains:

- D holder plus D50,D66; T120 scraper; uni-handle; SN holder;
- C holder plus C20; C12; N1 blade; N2 blade; S101 blade; S30 blade; S20 blade; S10 blade
- L holder; L1;L2



Model	Code No.	Price \$
UK3000	165-168	186.20

Noga Unikit - UK1000

• Recommended for machinists and tool makers

Contains:

1 Liza-burr; 1 C20 countersink, 1 countersink holder; 1 scraper blade; 1 S10 blade; 1 S20 blade; 1 S30 blade; 1 S101 blade



Model	Code No.	Price \$
UK1000	165-020	102.50

Rotodrive Combi Set - RD2001

Combination of RotoDrive and Universal deburring set

Contains:

NB handle, 3,2 mm RotoDrive Countersink, 10.4 mm RotoDrive countersink, S10, S20,S30 blade, demo plate



Model	Code No.	Price \$
RD2001	165-165	72.20

Universal Handy Chuck Holder - PV1000

A 3 jaw chuck helps with the quick and secure clamping of a wide variety of tools, blades and blade holders such as scrapers, countersinks, files etc.

Hardness 58HRC
Range: 0.5-8.0mm



Model	Code No.	Price \$
PV1000	165-484	83.30

Plastic Edge-Off Set - E02100

Includes:

E0 handle + S10 blade, green sleeve (for aluminum)
E0 handle + S20 blade, red sleeve for (brass & cast iron)
E0 handle + S100 blade, blue sleeve (for steel)
E0 handle + S150 blade, yellow sleeve (for plastic)



Model	Code No.	Price \$
E02100	165-440	19.40

YT Handle - YT1000

The perfect grip on Noga Adjustable Scrapers, Needle Files, Pins & Drills

- Quick Change
- Fits every hand
- Flexible collet

Range: 2.2 - 4.5mm



Model	Code No.	Price \$
YT1000	165-486	9.50

Edge-Off Disposable Deburring Tool - E01000

- Handy tool fits in shirt pocket
- Equipped with a non-removable 165-024 blade
- Pocket clip included



Model	Code No.	Price \$
E01000	165-008	7.50

Deburring Tool - SG1000

Includes:

- Ergonomic soft grip SG handle
- S100 and N10 blades



Model	Code No.	Price \$
SG1000	165-380	19.40

Noga Burr 3 - NB3000

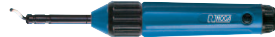
- Multi-functional tool deburrs round parts, small holes and straight edges
- Blades are easily changed and stored in handle
- Contains handle and 3 "S" blades (165-024, 165-026, 165-030)



Model	Code No.	Price \$
NB3000	165-370	17.60

Liza Burr - LB1000

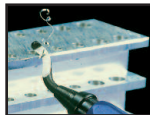
- Double sided blade holder
- Accepts all "N" and "S" blades
- Standard tool includes uni-handle
- To lock holder in position turn black ring clockwise



Model	Code No.	Price \$
LB1000	165-010	19.90

Rapid Burr - RB1000

- Economical version of the Noga Burr
- Utilizes replaceable blades only without spare blade storage



Model	Code No.	Price \$
RB1000	165-006	12.90
RB1005 (RB1000 + S20 Blade)	165-130	16.10

Edge Off - E02000

Includes:

Plastic handle and S10 blade, holds all types of "S" blades. (blades can be replaced)



Model	Code No.	Price \$
E02000	165-375	4.70

Noga Burr 1 - NB1100

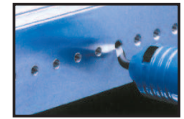
- Blue plastic handle and S10 blade



Model	Code No.	Price \$
NB1100	165-390	11.20

Noga Burr 5 - NB5000

- Multi-functional tool deburrs round parts, small holes and straight edges
- Blades are easily changed and stored in handle
- Set includes blades 1pc ea.: 165-024, 165-026, 165-030, 165-032, 165-034



Model	Code No.	Price \$
NB5000	165-004	21.10

Super Burr - SB10000

Similar to the Liza-Burr but with heavy duty blades for heavy duty jobs.

Contains:

- Uni-handle, SN-holder, S100, S20, S30 blades



Model	Code No.	Price \$
SB1000	165-001	25.70

Teddy Burr - TB1000

Slim-grip design allows deburring in hard to reach locations.

- Holds all "N" (2.6 mm) blades
- Easy to replace blades with handy pocket clip
- Contains: N1 blade, 8 mm hexagonal painted handle



Model	Code No.	Price \$
TB1000	165-031	11.00

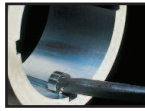


H.D. Keyway Burr - KW1300

Most useful for wide, deep or shallow keyways
Range: 3 - 15 mm

Contains:

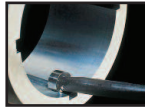
- Uni-handle, K-holder, N90K blade



Model	Code No.	Price \$
KW1300	165-003	22.30

H.D. Keyway Burr - KW1000

- Effectively solves the problem of deburring
- Keyways, internal and external
- Blade can be reversed to extend life



Model	Code No.	Price \$
KW1000	165-018	21.40

Double Burr (Sheet Metal) - DB1000

- Dual purpose tool for machinists and sheet metal workers
- Deburr both sides of sheet metal simultaneously
- Blades adjustable up to 3/8" thickness
- Can be used with one blade in centre for deburring edges of blocks
- Blades can be rotated to extend life
- Standard tool includes: handle, two 165-042 blades



Model	Code No.	Price \$
DB1000	165-016	31.90

Noga "V" Cut - NC1000

Simple and safe for use with hand guard, which is available on request.

- Most economical tool for sheet metal range 1 - 8 mm
- Contains: Uni-handle, LD-holder, L3 blade



Model	Code No.	Price \$
NC1000	165-011	24.80

Countersink - CS1000

- 20mm Dia. countersink
- Uses 140mm hex. blade holder which can be locked into any position
- Useful for chamfering deep holes
- Standard tool includes Unihandle, hex blade holder



Model	Code No.	Price \$
CS1000	165-012	44.90

Reversible Countersinks - RC2000 & RC2200

- RC2000 Range: 5 - 9 mm
- RC2200 Range: 10-22 mm

Contains:

- Handle and R2 (RC2000) or R3 blade (RC2200)
- Similar to RC1000 only larger
- Patented



Model	Code No.	Price \$
RC2000	165-029	40.70
RC2200	165-182	58.50

Reversible Mini Countersink - RC1000

- Unique 2 pair of cutting edges
- For chamfering, hold tool between fingers and thumb and rotate back and forth
- Fine tool for deburring both back side and front side of holes
- Blade has two working positions
- Range: 3 - 3.5 mm
- To insert/withdraw blade into/from hole, push knob and release slowly
- Contains: Handle and small R1 blade



Model	Code No.	Price \$
RC1000	165-027	40.70

H.D. Rotodrive - RD7000

- Has cranked blade holder with M7 thread
- Accepts C12, C20 and C30
- 56 mm displacement allows for heavy-duty burrs to be removed

Contains:

- Uni-handle, H.D. rotodrive holder, C20 countersink
- Continuous rotation of countersink enables very fast chamfering



Model	Code No.	Price \$
RD7000	165-002	48.00

Fixed Rotodrive - RD1040

- The quickest way to chamfer by hand

Contains:

- NB-handle, 10.4 rotodrive countersink
- Single flute countersink provides a smoother cut.
- Patented



Model	Code No.	Price \$
RD1040	165-022	37.90

Scraper - SC1000

- Includes: Uni-handle, 3/4" scraper blade
- Heavy duty scraper
- Triangular double ended blade
- Blade can be locked into the handle at desired length



Model	Code No.	Price \$
SC1000	165-014	30.60

Mini-Scraper - MS1000

- Ideal for tool and die makers
- Hollow ground
- Contains:**
- Uni-handle, D-holder, triangular mini-scraper D50
- D50 scraper is held in the D-holder by means of wedge action



Model	Code No.	Price \$
MS1000	165-005	26.30

Internal Scraper - IS1000

- For the deburring of cross-holes
- D66 scraper is held in the D-holder by means of wedge action
- Contains:**
- Uni-handle, D-holder, internal scraper D66



Model	Code No.	Price \$
IS1000	165-007	24.50

Adjustable Scraper - SC8000

- Protected by plastic cap
- 5 mm medium size scraper
- Contains:**
- 12 mm anodized handle, T80 double ended triangular scraper
- Knurled locking collar to control blade extension



Model	Code No.	Price \$
SC8000	165-033	27.50

Adjustable Mini Scraper - SC7500

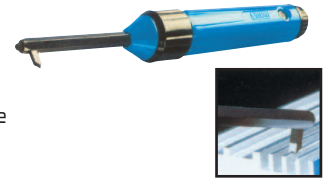
- Protected by plastic cap
- 3.2 x 75 mm triangular scraper
- Contains:**
- 12 mm anodized handle, D75 triangular scraper
- Ideal for tool and mold making



Model	Code No.	Price \$
SC7500	165-035	25.70

Noga Mini Cut - NG3220

- Used for deburring small ridges in difficult to reach places
- Range of 0 - 2.5 mm makes this tool very unique
- Contains: Uni-handle, LD-holder, L4 blade



Model	Code No.	Price \$
NG3220	165-479	18.20

Leader - LD1000

- Safe and easy to use
- Ensures 45° chamfers
- Contains: Uni-handle, L-holder, L1 blade
- Chamfers straight or curved edges



Model	Code No.	Price \$
LD1000	165-013	25.20

Noga "O" Ring Burr - KW2000

- Range: 0 - 3 mm (groove width)
- Contains:** NB-handle, OR blade
- Removes burrs from internal "O" ring grooves
- Patented



Model	Code No.	Price \$
KW2000	165-019	22.50

Thread Cleaner - TC1000

- For repair and cleaning damaged internal threads
- 9 mm minimum dia.
- Contains:** NB-handle, TC blade
- Works well on all threads and pitches
- Patented



Model	Code No.	Price \$
TC1000	165-017	19.80

Deburring Accessories

Item	Description	Range	Code No.	Price \$
D50	Mini-scraper; most suitable for miniature components	HSS 3mm	165-100	10.70
D66	Internal scraper; most useful on cross holes	HSS 3.2mm	165-105	8.80
N70K	Special square blade for small keyways (For shallow Keyways, one corner is truncated)	1.2 - 8mm 3/64" - 5/16"	165-120	9.30
N90K	Heavy duty blade for wide Keyways (similar to N70K)	3 - 15mm 3/64" - 5/16"	165-125	14.60



Ceramic Double Burr - DB5000

- Includes: V-shaped blade mounted in a DB handle, (blades can be replaced).
- Removes burr from both sides of workpiece simultaneously.
- Ergonomically designed handle with guard to protect you while you work.



Model	Code No.	Price \$
DB5000	165-410	92.00

Ceramic Tool - CR2000

- Includes: Cera-Cut handle and straight Cera-Cut blade, (blades can be replaced).
- Ideal for all plastic materials and soft metals.
- Ideal for cleaning surface and parting line flash.



Model	Code No.	Price \$
CR2000	165-415	47.50

Soft Cut Ceramic Tool - NC5100

Ideal for deburring soft abrasive plastics. Blade can be replaced

Includes: Noga NC5100 holder & CR6100 blade



Model	Code No.	Price \$
NC5100 holder	165-492	43.50
CR6000 65° blade	165-494	24.20
CR6100 75° blade	165-496	24.20

Cera-Cut - CR1100

- Includes: Ceramic blade mounted in a modified Soft Grip handle, (this blade cannot be replaced).
- Ideal for deburring plastics and other soft materials.
- Extremely long life.



Model	Code No.	Price \$
CR1100	165-385	48.40

Blade Selection - L-Blades And Handles & Holders

L3



165-090
Used with Leader for steel and aluminum

L4



165-091
Used for sheet metal 1 - 8 mm wide

L5



165-092
Used for ridges 0 - 2.5 mm wide

L6



165-093
Used for cleaning corners

L7



165-094
Double ended slot cleaner

Uni Handle



165-095
Holds round, hexagonal and triangular holders

D Holder



165-096
Holds D50 and D66 blades

K Holder



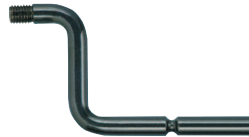
165-097
Holds N80K and N90 K on one side and N70K on the other

LD Holder



165-099
Holds L3, L4, L5, L6, L7 blades

H.D. Cranked Holder



165-101
Heavy duty cranked holder for C12, C20, C30

L Holder



165-098
Holds L1 blade

Type	Code No.	Per Blade Price \$
L3	165-090	4.90
L4	165-091	3.80
L5	165-092	5.80
L6	165-093	4.20
L7	165-094	8.70
UNI Handle	165-095	10.20
D Holder	165-096	8.40
K Holder	165-097	8.00
L Holder	165-098	16.50
LD Holder	165-099	10.30
H.D. Cranked Holder	165-101	13.00

Blade Selection - General

- Ready-to-use blades included

- All blades are made of HSS



S10
165-024
For steel and aluminum



S20
165-026
For brass and cast iron; for both right and left hand



S30
165-028
For external and internal burrs simultaneously in sheet metal and tubing



S35
165-030
Works best on straight edges for most materials



S101
165-032
Works best on fine edges for all materials



S202
165-034
For brass and cast iron fine edges



B10
165-320
For steel, plastic and aluminum



N1
165-036
For steel, plastic and aluminum



N2
165-038
For brass and cast iron



N3
165-040
Simultaneously removes external and internal burrs

165-042
For use in double burr. (M42 available for stainless)



165-044
For use in keyway burr. (M42 available for stainless)



165-046
12 mm dia., countersink
M7 internal thread



165-048
20mm Dia., countersink
M7 internal thread



165-050
30mm Dia., countersink
M7 internal thread



T120
165-052
Double headed scraper ground on 3 sides from solid



SN
165-054
Double headed blade holder. Accepts all "S" and "N" series blades



C
165-056
Holds C12, C20, C30 countersink blades.

Type	Length (in.)	Fits Tool No.	Standard Pack	Code No.	Per Blade Price \$
S10	1-7/8	165-004/165-010	10	165-024	2.10
S20	1-7/8	165-004/165-010	10	165-026	2.30
S30	1-7/8	165-004/165-010	10	165-028	2.30
S35	1-7/8	165-004/165-010	10	165-030	2.30
S101	1-5/8	165-004/165-010	10	165-032	2.40
S202	1-5/8	165-004/165-010	10	165-034	2.40
B10	7/8	165-010/165-310	10	165-320	1.60
N1	7/8	165-010	10	165-036	1.60
N2	7/8	165-010	10	165-038	1.60
N3	7/8	165-010	10	165-040	3.30
N80	7/16	165-016	10	165-042	6.80
N80K	7/16	165-018	10	165-044	6.80
C12	1-1/8	165-012	1	165-046	24.10
C20	1-3/16	165-012	1	165-048	32.50
C30	1-7/16	165-012	1	165-050	45.20
T120	4-3/4	165-014	1	165-052	20.90
SN	5-3/4	165-010	1	165-054	10.50
C-Holder	5-1/2	165-012	1	165-056	7.60



Blade Selection - Swivel Blades

- Ready-to-use blades included

N1 LH



165-037
For left handed user

N1 TiN



165-039
TiN coated N1 for long life

N1 C



165-041
Solid carbide N1 for hardened steel and special plastics

N2 C



165-043
Solid carbide N2 for ceramic and glass

N6



165-045
For cross holes in difficult to reach places

S10 LH



165-047
For left handed users

S10 TiN



165-049
TiN coated S10 for long life

S10 C



165-051
Solid carbide tipped S10 for hardened steel and special plastics

S100



165-053
Cobalt combination blade best for plastics and hard materials

S101 LH



165-055
S101 for left handed users

S101 TiN



165-057
TiN coated S101 for long life

S150



165-059
Heavy duty shank, for holes as small as 1.5 mm dia.

S20 C



165-061
Solid carbide tipped S20 for hardened materials

S60



165-062
Heavy duty for cross holes in difficult to reach places

TC



165-063
Patented for internal thread cleaning and deburring from 9 mm

Type	Standard Pack	Code No.	Per Blade Price \$
N1 Left Hand	10	165-037	2.30
N1 TiN	10	165-039	3.30
N1 C	1	165-041	8.30
N2 C	1	165-043	9.50
N6	1	165-045	4.80
S10 Left Hand	10	165-047	2.90
S10 TiN	10	165-049	3.50
S10 C	10	165-051	9.30
S100 Cobalt	10	165-053	2.70
S101 Left Hand	10	165-055	2.90
S101 TiN	10	165-057	3.50
S150	10	165-059	2.40
S20 C	10	165-061	9.30
S60	1	165-062	4.80
TC	1	165-063	9.30

Blade Selection - Diamond Coated Blades, Countersinks, And Reversible Blades

- Ready-to-use blades included

N1D



165-074
Diamond coated N1 for ceramic and glass

S10D



165-075
Diamond coated S10 for ceramic and glass

RD 10.4D



165-076
Diamond coated RotoDrive countersink (D126) 10.4 mm

RD 10.4DC



165-077
Same as RD 10.4D but coated with D252

RDE 25D



165-080
External diamond coated RotoDrive for reinforced plastic, fiberglass and epoxy

MINI FILE



165-081
Diamond coated file (D126) 3.2 mm, ideal for horizontal filing jobs

D55



165-082
Solid carbide D50, fits adjustable scraper handle

D75



165-083
Similar to D50 but 75 mm long, fits adjustable scraper handle

D77



165-084
Similar to D66 but 75 mm long, fits adjustable scraper handle

T80



165-085
Double medium scraper blade for adjustable scraper

165-086

Same as N80 but heat-treated to 68 Rc., use for stainless steel

N80M42



165-087

Same as N80K but heat-treated to 68 Rc.

N80KM42



REVERSIBLE BLADES

165-088

For cross holes 3 - 5.5 mm

R1



165-089

For cross holes 5 - 9 mm

R2



Type	Standard Pack	Code No.	Per Blade Price \$
N1D	1	165-074	17.00
S10D	10	165-075	17.50
RD 10.4D	1	165-076*	19.00
RD 10.4DC	1	165-077*	19.90
RDE 25D	1	165-080	73.70
MINI FILE	1	165-081	18.20
D55	1	165-082	21.90
D75	1	165-083	11.50
D77	1	165-084	10.70
T80	1	165-085	11.70
N80 M42	10	165-086	9.20
N80K M42	10	165-087	9.10
R1	1	165-088	18.40
R2	1	165-089	19.40

* Available only while quantities last



Blade Selection - Swivel Blades

• Ready-to-use blades included

• All blades are made of HSS



165-064
Patented HSS for
"O" ring grooves up to 3 mm



165-065
Patented, 3.2mm cranked countersink



165-066
Patented, 6.3mm cranked countersink



165-067
Patented, 8.3 mm cranked
countersink



165-068
Patented, 10.4 mm cranked
countersink



165-069
Patented, 16.5 mm cranked
countersink



165-073
Patented, 4 - 18 mm
cranked external countersink

Type	Standard Pack	Code No.	Per Blade Price \$
OR	1	165-064	12.20
RD 3.2	1	165-065	10.30
RD 6.3	1	165-066	23.30
RD 8.3	1	165-067	23.80
RD 10.4	1	165-068	26.80
RD 16.5	1	165-069	29.10
RDE 18	1	165-073	22.60

COMBO OFFER

Code No.: 500-006

STM Fine Adjustment Magnetic Base

- Fine adjustment
- Powerful On/Off magnetic base
- 80kg/f
- Dial gauge holder is three dimensional



Coolant Proof Dial Indicator

- Travel: 0-0.4"
- Dial: 0-50
- Graduation: 0.0005"
- Water resistant
- Reverse counter
- Stainless Steel components
- Rotating bezel with clamp
- Lugback (1/4" hole)
- Interchangeable point
- Conforms to AGD2 standards

CALL TODAY FOR A QUOTE

CAT40 / 50 COLLET CHUCK PACKAGES

- 100% Forged Construction • Balanced up to 30,000 rpm
- All Ground Body • DIN Coolant option - standard



* Case may not be as shown



CAT40

	Description	Promo Code No.
ER11 Set	<ul style="list-style-type: none"> • CT40 ER11 x 2.50" Gage Length Chuck (531-400) • 7pc ER11 Collet Set 1/16-1/4 x 32nds (337-401) • ER11 Chuck Nut Wrench (337-388) 	500-232
ER16 Set	<ul style="list-style-type: none"> • CT40 ER16 x 2.50" Gage Length Chuck (531-406) • 11pc ER16 Collet Set 1/16-3/8 x 32nds (337-403) • ER16 Chuck Nut Wrench (337-395) 	500-231
ER20 Set	<ul style="list-style-type: none"> • CT40 ER20 x 4.00" Gage Length Chuck (531-414) • 15pc ER20 Collet Set 1/16-1/2 x 32nds (337-404) • ER20 Chuck Nut Wrench (337-397) 	500-230
ER25 Set	<ul style="list-style-type: none"> • CT40 ER25 x 2.50" Gage Length Chuck (531-418) • 17pc ER25 Collet Set 1/8-5/8 x 32nds (337-405) • ER25 Chuck Nut Wrench (337-396) 	500-229
ER32 Set	<ul style="list-style-type: none"> • CT40 ER32 x 2.50" Gage Length Chuck (531-421) • 21pc ER32 Collet Set 1/8-3/4 x 32nds (337-407) • ER32 Chuck Nut Wrench (337-398) 	500-241



CAT50

	Description	Promo Code No.
ER25 Set	<ul style="list-style-type: none"> • CT50 ER25 x 4.00" Gage Length Chuck (531-448) • 17pc ER25 Collet Set 1/8-5/8 x 32nds (337-405) • ER25 Chuck Nut Wrench (337-396) 	500-233
ER32 Set	<ul style="list-style-type: none"> • CT50 ER32 x 4.00" Gage Length Chuck (531-454) • 21pc ER32 Collet Set 1/8-3/4 x 32nds (337-407) • ER32 Chuck Nut Wrench (337-398) 	500-234

CALL TODAY FOR A QUOTE



MISCELLANEOUS SHOP SUPPLIES

Drill Sharpeners	312
Punch Formers	313
Magnetic Lifters	313
Work Stoppers	314
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DM213 Fast Drill Sharpener 13mm Capacity

Model DM213

Patented Features

- Double-bearing grinding unit (reduces wear).
- Drill tightening design with bearing device.
- Adjustable trimming angle.

Standard Accessories

- ER20 Collets, ranged from 2.5mm-13mm (12pcs).
- CBN Diamond wheel #200x1pc (for High Speed drill).
- 4mm and 5mm Hexagon (Hex.) wrench x 1 pc each.

Drill Diameter: Ø2mm - Ø13mm

Point Angle: 85° ~ 140°

Power Supply: AC110 / AC220 50/60HZ

Motor: 90W

R.P.M.: 6000RPM

Weight: 10 kg

	Code No.	Price \$
DM213	326-130	1,484.70



Replacement Wheels for Model DM213

Description	Code No.	Price \$
CBN Wheel for HSS	326-141	125.10
Diamond Wheel for Carbide	326-143	125.10
CBN Wheel for Drills under 4mm	326-145	125.10

ER20 Collets for Model DM213

Size (mm)	ER20 Code No.	Price \$	Size (mm)	ER20 Code No.	Price \$
1.5-2.5*	326-151	37.60	8-9	337-480	23.00
2-3*	326-153	37.60	9-10	337-481	23.00
3-4*	326-155	36.70	10-11	337-482	23.00
4-5*	326-157	37.60	11-11.5	337-469	23.00
5-6	337-477	23.00	11-12	337-483	23.00
6-7	337-478	23.00	12-13	337-484	23.00
7-8	337-479	23.00			

* 2.5-5mm sizes are specially designed pull-back collets, standard ER20 collets cannot be substituted. 6-13mm sizes are standard ER20

DM1226 Fast Drill Sharpener 30mm Capacity

Model DM1226

Patented Features

- Double-bearing grinding unit (reduces wear).
- Drill tightening design with bearing device.
- Adjustable trimming angle.

Standard Accessories

- ER 40 Collets, ranged from 12mm-26mm (15pcs).
Optional Collets 8~11mm, 27~30mm
- CBN Diamond wheel #200x1pc (for High Speed drill).
- 4mm and 6mm Hexagon (Hex.) wrench x 1 pc each.

Drill Diameter: Ø8mm - Ø30mm

Point Angle: 85° ~ 140°

Power Supply: AC110 / AC220 50/60HZ

Motor: 450W

R.P.M.: 4000RPM

Weight: 25 kg

	Code No.	Price \$
DM1226	326-134	3,399.00



Replacement Wheels for Model DM1226

Description	Code No.	Price \$
CBN Wheel for HSS	326-154	312.60
Diamond Wheel for Carbide	326-156	312.60

ER40 Collets for Model DM1226

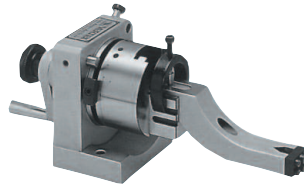
Size (mm)	ER40 Code No.	Price \$	Size (mm)	ER40 Code No.	Price \$
7-8*	326-165	42.40	18.5-19.5	337-496	27.00
8-9*	326-166	42.40	19-20	337-522	27.00
9-10*	326-167	42.40	20-21	337-523	27.00
10-11*	326-168	42.40	21-22	337-524	27.00
11-12	337-511	27.00	22-23	337-525	27.00
12-13	337-513	27.00	23-24	337-526	27.00
13-14	337-514	27.00	24-25	337-527	27.00
14-15	337-515	27.00	25-26	337-528	27.00
15-16	337-517	27.00	26-27*	326-158	42.40
16-17	337-518	27.00	27-28*	326-159	42.40
17-18	337-519	27.00	28-29*	326-160	42.40
18-19	337-521	27.00	29-30*	326-161	42.40

* Optional 8-11mm & 27-30mm sizes are specially designed for the DM1226, standard ER40 collets cannot be substituted. 12-26mm sizes are standard ER40



Punch Former - YCT-PB

Punch former is the great dressing instrument. Precision forming of grinding wheels can be done by assembling an arm with the main body. Any combination of tangents or radii form of the grinding wheel may be dressed accurately by easy operation. Maximum grinding wheel diameter of 200 mm can be dressed accurately and safely. The height from the base to roller's centre is 80mm. Movement of each side can reach 12.5 mm while aiming at the centre of V-block. The main body is one-piece steel construction.



Features:

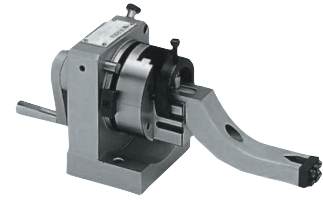
- Punch former is the fixture to grind the point of standard punches and E.D.M. electrodes for precise and fast operation
- Besides the round, radius and multi-angle punches, any special forms can be ground precisely
- By using this attachment, it can be ground either concave or convex radius shape
- Capacity from 4 mm to 30 mm

Style	Code No.	Price \$
Off set	230-730	2,187.90

Punch Former - YCT-PS

Features:

- YCT-PS can pass through from itself to the centre of grip, in case of facing a longer punch ejector pin, it can go deep into the grip position
- To assemble an arm with the main body, any combination of radii of the grinding wheel may be dressed accurately by easy operation
- The longer punch can also be ground



Style	Code No.	Price \$
Through hole	230-735	1,875.40

Pot Magnets

Unique combination of a strong magnet with nickel chrome plated insulating ring gives these magnets the superior holding power of larger ones

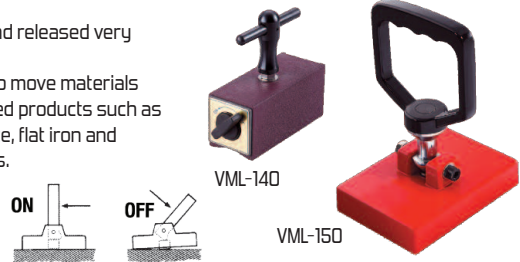
- 1/4"-20 threaded



Model	Diameter (in.)	Height (in.)	Magnetic		Code No.	Price \$
			Pull (kg)			
PMG/11-16	11/16"	5/8"	2.7		231-420	6.90
PMG/13-16	13/16"	3/4"	4.5		231-422	8.70
PMG/1-1-16	1-1/16"	1"	6.0		231-424	13.70
PMG/1-3-8	1-3/8"	1-3/16"	13		231-426	19.80

Magnetic Lifters

- Work is held and released very smoothly
- Most suitable to move materials or semi-finished products such as black steel plate, flat iron and other materials.

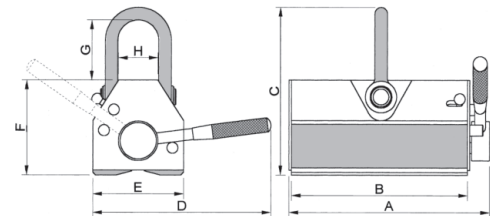


Model	Capacity (kgf)	Length (mm)	Width (mm)	Height (mm)	Code No.	Price \$
VML-140	140	120	50	55	230-602	86.80
VML-150	150	140	100	140	230-604	222.10

Permanent Magnetic Lifters

Features:

- Faster and Safer than using straps and slings.
- Beveled surface for lifting round objects.
- Magnets are maintenance free and never wear out.
- Magnets have built-in safety factor of 3.5 times the rated load. Do Not lift more than the maximum rated load.

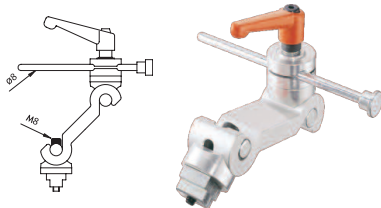


Model No.	Capacity (lbs)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)	Weight (lbs)	Code No.	Price \$
VML-100	220	4.2	3.3	4.7	4.9	2.4	2.8	1.6	1.2	5.5	230-600	500.90
VML-300	660	7.1	6.1	6.1	7.3	3.6	3.7	2.0	1.6	18.9	230-605	1,266.90
VML-600	1320	10	8.8	8.3	10.2	4.5	4.7	3.0	2.0	46	230-610	2,073.10
VML-1000	2200	11	9.6	11.3	14.6	6.5	6.7	3.8	3.4	101	230-615	3,167.20
VML-2000	4400	16.6	15	13.7	20.2	8.5	8.5	4.1	4.8	259	230-620	5,701.00



U/N Work Stopper - Non-Toothed

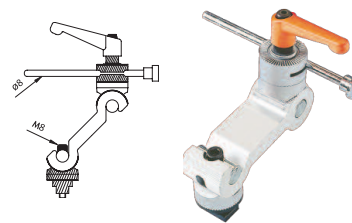
- Locking lever can be rotated a full 360°
- Arm made of anodized aluminum
- Steel hinge pins



Model	T-Slot Size	Stop Pin Length	Height	Arm Length	Code No.	Price \$
VW5-123	16mm	160mm	200mm	132mm	326-440	276.60

U/N Work Stopper - Toothed

- Locking lever can be rotated a full 360°
- Arm made of anodized aluminum
- Steel hinge pins
- Slip adjustment of the stop pin before it is locked into place



Model	T-Slot Size	Stop Pin Length	Height	Arm Length	Code No.	Price \$
VW5-125	16mm	160mm	200mm	132mm	326-445	273.50

Deluxe Shock Absorbers

Suitable for machine tools, CNC lathe, molding, printing, grinding, drilling, and milling machines.

- Prevents shock and reduces noise



Model	Height (H) (mm)	Bolt Size (Ød) (mm)	Load (kg)	Adjustment Height	Code No.	Price \$
SB-4	60	12x50L	500	25mm	231-450	109.60
SB-6	95	16x110L	1000	40mm	231-452	164.50
SB-8	100	20x120L	2500	40mm	231-454	193.40
SB-10	125	24x180L	4000	40mm	231-456	372.90

Metric Serrated Soft Top Jaws - Pointed

Quality Import Jaws

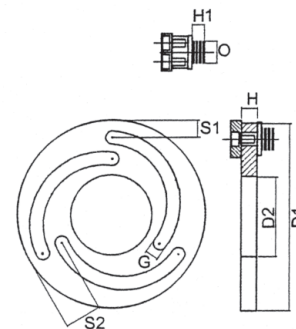
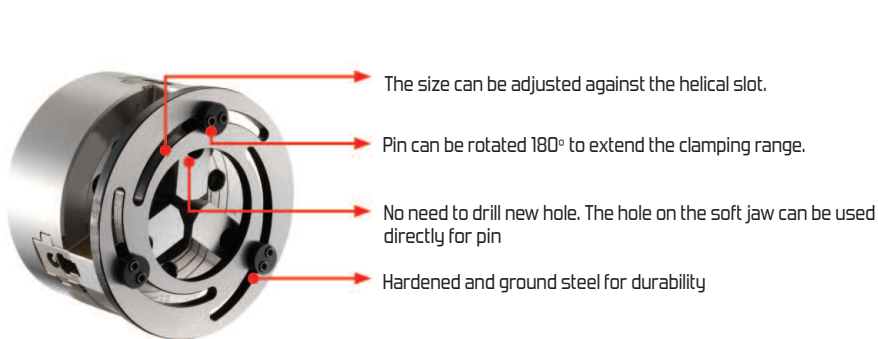
- For Kitagawa power chucks: Models B, BT, B200, BT200, HOH, HOB, N, NL
- Set of 3



Chuck Dia.	Serration	A	B	C	D	F	Code No.	Price \$
150(6")	1.5x60°	70	38	25	12	20	656-050	53.20
210(8")	1.5x60°	90	50	38	14	25	656-055	72.30
254(10")	1.5x60°	110	42	40	16	30	656-060	83.70
304(12")	1.5x60°	120	50	38	18	30	656-065	131.40
381(15")	1.5x60°	165	62	62	22	43	656-070	342.30

Soft Jaw Forming Rings

The forming ring is used for cutting soft jaws by clamping and extending the thru hole to increase the accuracy of clamping the workpiece



Model No.	For Chuck Dia.	H (mm)	D1 (mm)	D2 (mm)	S1 (mm)	S2 (mm)	G (mm)	H1 (mm)	O (mm)	Weight kg.	Code No.	Price \$
VFR-05	5"	12	140	60	12	28	10	9	13.5	1	326-250	249.50
VFR-06	6"	12	168	80	12	32	10	9	16.5	1.5	326-255	316.80
VFR-08	8"	12	218	115	17	36	10	9	18.5	2.4	326-260	364.60
VFR-10	10"	12	258	150	15	40	10	9	18.5	3.2	326-265	383.80
VFR-12	12"	15	316	118	21	50	10	9	21.5	5	326-270	575.90



Height Presetters - Optical Type

- Height 50 mm
- With magnetic base
- The red lamp will light up when touched
- Accuracy 0.005 mm
- Combined vertical and horizontal in a unit
- Weight: 0.3 kg



Model No.	Code No.	Price \$
HP-50ZM (Magnetic Base)	337-970	341.00
HP-50Z (Standard Base)	337-971	296.90

Electronic Tool Length Setters

- High Accuracy
- Easy Operation
- Be sure to remove all chips and oil from the sensor plate and the base of the HP-50E as well as from the workpiece and tool
- To move the tool approaching the sensor plate slowly
- When touching, the "LED" turns on immediately and "H" is just 50.00 mm (or 2")
- LED will not function if batteries are not set in correctly.
- Designed to be used on ferrous and non-ferrous materials



Model No.	H	Base Dia.	Sensor Plate Dia.	Code No.	Price \$
With Magnetic Base					
HP-50EM	50 mm	40mm	12.7mm	337-976	443.10
HP-100 EM	100 mm	40mm	12.7mm	337-978	689.30

Height Presetter

Fast Accurate Measurement of Vertical Height Magnetic Base for Horizontal Operation.

Reference point of work can be measured very quickly and accurately without damage to tool teeth. The red LED is activated when the plunger comes within the measuring range of the reference height.



Size	Description	Code No.	Price \$
4"	Height Presetter	337-950	608.10

Machinists' Mate

Self-Contained Visual Aid - 1/2" Shank

- For Machine Set-Up
- Checks machine, tool and workpiece set-up
 - Acts as edge finder on vertical milling machines
 - Trams table quickly
 - Parallels vise
 - Checks "spindle run out" – simply, quickly, accurately
 - Emits light to indicate precise contact of part at ± 0.001 "

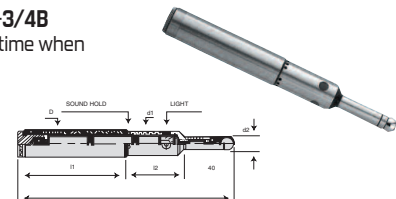
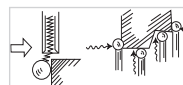


Shank Dia.	Code No.	Price \$
1/2"	145-600	35.20

Touch Point Sensors (With Beeper)

Model No. VPS-20B / VPS-3/4B

- Unit will sound at the same time when the red lamp lights up
- Accuracy: within 0.005 mm

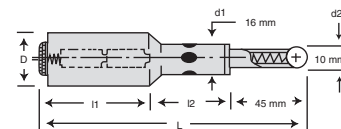


D	d1	d2	L	l1	l2	Type	Code No.	Price \$
20	16	10	157	77	35	UM-5#	337-960	140.90
3/4	.629"	.394"	6.18"	3.03"	1.378	UM-5#	337-962	148.30

Touch Point Sensor

Model No. VPS-20

- Red pilot can be seen clearly
- High sensitivity location sensor
- Location of end surface, outside circle dia., inside circle dia. of the workpiece for processing can be detected with full effect
- Whole travel of red pilot is illuminating, detecting also can be done during turning while spindle stops



D	d1	d2	L	l1	l2	Type	Code No.	Price \$
20	18	10	160	79	41	UM-5#(SP)	337-955	105.60

Standard Draw Bar - SDB-2J

- 7/16-20 thread
- 4140 heat treated Alloy Steel



Machine Type	Bar Length (in.)	Hex Length (in.)	Code No.	Price \$
2J Head Bridgeport Variable Speed	18	5.5	151-700	87.70



Chip Collector with Flexible Arm

Flexible Magnetic Pick-Up Tool

- 21" in length
- 12 lb capacity



Model No.	Code No.	Price \$
VCC-20	230-640	32.90

Chip Collector with LED Light & Flexible Arm

Flexible Magnetic Pick-Up Tool

- LED light
- 21" in length
- 0.7 lb capacity
- 2pcs. 1.5V batteries



Model No.	Code No.	Price \$
VCC-21	230-645	34.00

Chip Hooks - SP2500 & SP2550

For removing chips and clean the chip trays on your machines. Black finished steel hooks. The Chip Hooks include a plastic protective guard. NogaGrip Handle designed for maximum comfort in your hand.



Model	Length	Code No.	Price \$
SP2500	400mm	165-488	35.90
SP2550	600mm	165-490	40.50

Magnetic Base With Working Beam

- 110V



Model	Base Size	Holding	Arm	Weight (kg)	Code No.	Price \$
	LxWxH (mm)	Power (kg)	OD x L (mm)			
VML-A-110	62x50x55.5	75	20x200	1.5	326-884	72.60

Magnetic Base With Magnifying Glass

- 2X magnification
- M8x1.25 threaded mount



Model	Base Size	Holding	Arm	Weight (kg)	Code No.	Price \$
	LxWxH (mm)	Power (kg)	OD x L (mm)			
VML-M	60x50x55	80	15x325	1.7	326-880	87.70

Dust-Proof Halogen Lamps c/w Magnetic Base

Features:

- Dust Proof with Magnetic Base
 - 110 voltage
- 600FT Series - Segment Adjustable Arm
700FT Series - Flexible Arm



VHL-600FT



VHL-700FT

Model No.	Arm Length (mm)	Base Width (mm)	Weight (kgs.)	Code No.	Price \$
VHL-600FT	380	88	1.7	326-365	110.80
VHL-700FT	400	88	1.7	326-370	110.80

Water-Proof Halogen Lamps

Features:

- Water proof lighting head with reinforced glass resists large temperature fluctuations of cutting oil.
- 110 voltage



VHL-400L



VHL-500S



VHL-500L

Model No.	Arm Length (mm)	Base Width (mm)	Weight (kgs.)	Code No.	Price \$
VHL-400L	400 x 400	79	3.8	326-335	181.30
VHL-400M	220 x 220	79	3.5	326-340	181.30
VHL-400S	-	60	2.8	326-345	141.50
VHL-500L	400 x 400	79	4	326-350	181.30
VHL-500M	220 x 220	79	3.8	326-355	181.30
VHL-500S	-	79	2.7	326-360	141.50

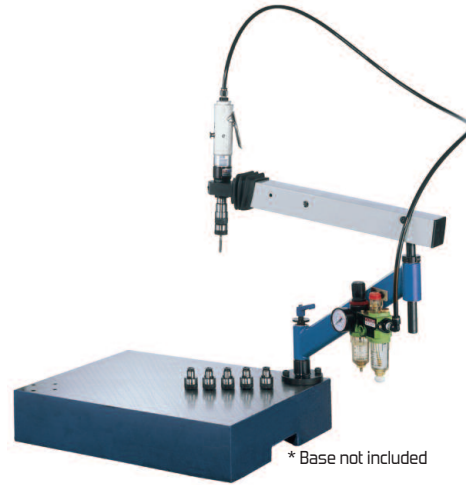


Mini Arm Type Air Tapping Unit - VAT-712

Features:

- Air tapping spindle
- Parallel arm
- Table mounting column
- Air combination
- 6 ANSI Tap Collets #10-1/2"
- Radial jib
- Air pressure: 6~8 kgs/cm³
- Air Cylinders included
- Requires: 5HP compressor
- Without stand plate

Tap Range	Speed RPM	Work Range	Weight (kg)	Code No.	Price \$
#10 - 1/2"	400	Rmax 700mm	12	326-700	3,134.20



Small Arm Type Air Tapping Unit - VAT-1412

Features:

- Air tapping spindle
- Parallel arm
- Table mounting column
- Air combination
- 6 ANSI Tap Collets #10-1/2"
- Radial jib, increases arm reach by 500mm
- Air pressure: 6~8 kgs/cm³
- Air Cylinders included
- Requires: 5HP compressor
- Without stand plate

Tap Range	Speed RPM	Work Range	Weight (kg)	Code No.	Price \$
#10 - 1/2"	400	Rmax 1400mm Rmin 200mm	18	326-705	3,485.40



Air Belt Sanders

- For sanding both curved and flat surfaces
- For removing spot welding, semi-automatic welds, adhesive, paint, and other coatings



Model	Belt Size (mm)	Speed (RPM)	Length (mm)	Weight (kg)	Code No.	Price \$
VAG-310	10x330	16,000	290	0.80	174-160	321.70
VAG-320	20x520	16,000	360	1.10	174-162	459.70

Sanding Belts

- For use with Air Belt Sanders
- Aluminum Oxide
- For use on metal



Size	Grit	For Model	Code No.	Price \$
3/8" x 13"	120	VAG-310	174-167*	2.00
3/4" x 20-1/2"	80	VAG-320	174-168*	2.70
3/4" x 20-1/2"	100	VAG-320	174-169*	2.70

* Available only while quantities last



STANDARD DUTY PRECISION AIR TOOLS

1/4" Mini Die Grinder - TP-1006

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Front
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	4-3/4	0.68	174-012	40.90

STANDARD DUTY PRECISION AIR TOOLS

3" Extended Die Grinder - TP-1011

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	9-1/4	1.45	174-020	114.60

1/4" Mini Die Grinder - TP-1008

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	6-5/16	0.79	174-010	40.90

5" Extended Die Grinder - TP-1012

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	11-1/4	1.45	174-022	130.30

1/4" Medium Die Grinder - TP-1001

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 14 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	22,000	1/4"(6mm)	90	6-7/8	1.36	174-008	41.30

1/4" Mini Angle Die Grinder - TP-1007

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Front
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	20,000	1/4"(6mm)	90	4-7/8	0.99	174-016	82.40

1" Extended Die Grinder - TP-1010

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	7-1/2	1.25	174-018	99.00

1/4" Right Angle Die Grinder - TP-1014

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	20,000	1/4"(6mm)	90	6-5/16	1.10	174-014	82.40



HEAVY DUTY PRECISION AIR TOOLS

1/4" H.D. Die Grinders - TP-1101 / TP-1101F

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: TP1101 - Rear
- Exhaust System: TP1101F - Front
- Aluminum Alloy Housing
- Horse Power: 0.3



Model	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
TP-1101	25,000	1/4"(6mm)	90	6-5/16	0.81	174-024	70.20
TP-1101F	25,000	1/4"(6mm)	90	6-5/16	0.81	174-026	70.20

1" Extended H.D. Die Grinder - TP-1102

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	7-1/2	1.07	174-028	123.50

3" Extended H.D. Die Grinder - TP-1103

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	9-1/4	1.21	174-030	139.20

5" Extended H.D. Die Grinder - TP-1104

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	25,000	1/4"(6mm)	90	11-1/4	1.45	174-032	154.80

1/4" Right Angle H.D. Die Grinder-TP-1106/TP-1106F

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: TP1106 - Rear
- Exhaust System: TP1106F - Front
- Aluminum Alloy Housing
- Horse Power: 0.3



Model	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
TP-1106	20,000	1/4"(6mm)	90	6-5/16	1.07	174-034	115.80

PROFESSIONAL DUTY PRECISION AIR TOOLS

1/4" Die Grinder - TP-1101H

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	28,000	1/4"(6mm)	90	6-5/16	0.81	174-038	83.00

1" Extended Die Grinder - TP-1102H

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	28,000	1/4"(6mm)	90	7-1/2	1.07	174-040	137.60

3" Extended Die Grinder - TP-1103H

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	28,000	1/4"(6mm)	90	9-1/4	1.21	174-042	153.20

5" Extended Die Grinder - TP-1104H

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	28,000	1/4"(6mm)	90	11-1/4	1.45	174-044	172.00

1/4" Right Angle Die Grinder - TP-1106H

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	15,000	1/4"(6mm)	90	6-5/16	1.07	174-046	131.40



1/4" Die Grinder - TP-1109H

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Front
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.3	20,000	1/4"(6mm)	90	7-1/2	1.32	174-048	113.30

105° Die Grinder - TP-9059

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.9	9,000	1/4"(6mm)	90	9-1/4	2.28	174-056	187.60

1/4" Die Grinder - TP-6001

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 15 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.6	20,000	1/4"(6mm)	90	6-11/16	1.43	174-050	111.10

1/4" Die Grinder Kit (with Throttle Lever)

Contains:

- 1 pc. TP-1008 Grinder
- 1 pc. 1/8" (3 mm) collet
- 1 pc. 1/4" (6 mm) collet
- 2 pcs. spanners
- 5 pcs. 1/4" (6 mm) shank grinding
- 5 pcs. 1/8" (3 mm) shank grinding



Description	Code No.	Price \$
1/4" straight die grinder kit	174-004	60.30

1/4" Die Grinder - TP-9001

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 13 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.9	18,000	1/4"(6mm)	90	7-5/16	1.56	174-052	132.90

1/4" 90° Die Grinder Kit (with Throttle Lever)

Contains:

- 1 pc. TP-1014 Grinder
- 1 pc. 1/8" (3 mm) collet
- 1 pc. 1/4" (6 mm) collet
- 2 pcs. spanners
- 5 pcs. 1/4" (6 mm) shank grinding
- 5 pcs. 1/8" (3 mm) shank grinding



Description	Code No.	Price \$
1/4" 90° die grinder kit	174-006	101.40

Angle Die Grinder - TP-6059

Specifications

- Air Inlet (N.P.T.): 1/4"
- Air Consumption (Loading): 15 cfm
- Exhaust System: Rear
- Aluminum Alloy Housing



Horse Power	RPM	Collet Size	Air Pressure (psi)	O.A.L. (in.)	Net Weight (lb)	Code No.	Price \$
0.6	10,000	1/4"(6mm)	90	7-1/2	2.20	174-054	172.00

Air Micro Die Grinder Kit

Contains:

- 1 pc. TP-501-1 Grinder
- 1 pc. 3 mm collet
- 10 pcs. 1/8" (3 mm) grinding stones
- 2 pcs. spanners
- 1 pc. blow case



Description	Code No.	Price \$
1/8" die grinder kit	174-002	143.90



10 Piece Needle File Set



Description	Code No.	Price \$
10 Piece Needle File Set	200-761	7.30

10 Piece Diamond File Set



Description	Code No.	Price \$
10 Piece Diamond File Set	200-763	24.40

Safety Air Blow Gun

- 4-1/2" stainless steel nozzle
- Conforms to OSHA STD 1-13.1 for safety
- Operating pressure: 50-235 PSI
- Vent in tip prevents pressure from exceeding 30psi if tip becomes blocked
- Impact & weather resistant nylon body
- Operating temperature: -10° to 70° C



Model	Noise Level (100psi)	Blowing Force (100psi)	Air Consumption (100psi)	Code No.	Price \$
ABG/3/1-4F/N	80db	0.76lb	15.18cfm	231-474	41.00

12" Hacksaw

- A rugged heavy-duty industrial quality hacksaw designed for the professional.
- Strong aluminum die cast handle
 - Guarded grip design
 - Comes complete with a 12" chrome steel hacksaw blade



Model	O.A.L.	Bow Depth	Code No.	Price \$
HF/12/BC	17-5/16"	4"	231-370	19.50

Eye Shield

- The clamping height is adjustable.
- Brass plate under the clamp arm to protect the working material from damage



Model	Shield Size (mm)	Weight (kg)	Code No.	Price \$
VH-56	300x180x2	1.0	230-660	59.80

13pc Bi-Metal Journeyman Hole Saw Set

- 3/4", 7/8", 1-1/8", 1-3/8", 1-1/2", 1-3/4", 2", 2-1/4", 2-1/2"
- HSS
- Comes with 2 arbors, 1 pilot drill and 1 adapter



Description	Code No.	Price \$
Journeyman Hole Saw Set	505-020	92.90

• Available only while quantities last

Arbor Presses

Arbor Presses

Capacity Ton	Shipping Weight (lb)	Throat Depth (in.)	Height of Press	Base Dimensions	Largest Arbor	Size	Length	Stroke	Code No.	Price \$
1/2	22	2-7/8	10	4 x 9-1/2	1-1/8	3/4 x 3/4	7-1/2	4-1/2	326-090	100.80
1	37	3-1/4	12	5 x 11	1-3/8	1 x 1	9-1/2	5-1/4	326-092	145.40
2	86	5	17	6-3/4 x 17	1-3/4	1-1/4 x 1-1/4	14	8-1/2	326-094	334.00
3	152	5-3/4	21-1/2	8 x 18	2-1/2	1-1/2 x 1-1/2	18	12-1/2	326-096	584.00
5	308	8-3/4	35-3/4	10 x 26-3/4	3-1/4	2 x 2	26-3/4	18-1/8	326-098	1,667.70

Ratchet Type Arbor Press

Capacity Ton	Shipping Weight (lb)	Throat Depth (in.)	Height of Press	Base Dimensions	Max. Height	Largest Arbor	Size	Length	Stroke	Code No.	Price \$
3	152	5-3/4	21-1/2	8 x 18	12-1/2	2-1/2	1-1/2 x 1-1/2	18	12-1/2	326-099	680.80





Lever Type Oil Cans

This series of oil cans have a modern and contemporary design with a dome shaped body. Most popularly used oil can style all over the world. Manufactured with a steel pump, powder coated red body, and a flexible wire braided extension.



Model	Capacity	Spout Length	Code No.	Price \$
MP21F	200 ml	6"	231-392	9.90
MP22F	300 ml	6"	231-394	10.40
MP23F	500 ml	7"	231-396	11.30

Pistol Grease Gun

One hand operated grease gun designed for use in confined spaces.

- Capacity: 14oz cartridge
- Heavy duty aluminum die cast head
- 5,000 psi
- 12" flexible hose



Model	Code No.	Price \$
G5F/N	231-384	41.80

Hand Rotary Barrel Pump

- Dual Directional Operation allows the pump to both empty, as well as refill containers
- Extremely heavy duty and rugged
- Pump body is sturdy cast iron with precisely machined cast iron vanes for better draw and smoother delivery
- Fits 15-55 gallon barrels
- Complete with suction tube, 2" cast iron bung nut, and discharge spout



Model	Code No.	Price \$
GNB-25/3R/SPL	231-390	112.70

Heavy Duty Lever Grease Gun

Top of the line grease gun designed for heavy industrial applications.

- Capacity: 14oz cartridge
- 10,000 psi
- Variable stroke feature
- High tolerance aluminum die cast head
- Complete with 6" steel extension



Model	Code No.	Price \$
G1R/HD/N	231-380	41.80

Lever Action Barrel Pump

Premium powder coated steel pump body with ribbed section aluminum die cast pump head for maximum strength.

- Built-in 1-1/2" & 2" bung for use on drums
- Plated steel lever handle with rubber grip
- Complete with curved metal spout and telescopic suction tube for use on 15-55 gallon barrels



Model	Code No.	Price \$
LBP/D4	231-388	56.40

80pc SAE Grease Fitting Assortment

Contents:

- 1/8"-27 PTF - 25pcs straight, 10pcs 45°, 10pcs 90°
- 1/4"-28 SAE-LT - 15pcs straight, 10pcs 45°, 10pcs 90°



Model	Code No.	Price \$
GFT/KIT/SAE-80	231-386	60.20

Mini Pistol Grease Gun

One hand pistol grip grease gun with convenient pull type operating mechanism

- Capacity: 3oz cartridge
- 3,500 psi
- Zinc plated finish
- Complete with 4" steel extension



Model	Code No.	Price \$
G-16/ZN/N	231-382	27.10

Aluminum Drum Wrench

An easy & convenient tool to open all types of drums. Ends of the wrench are designed to fit perfectly onto most 2" and 3/4" drum plugs.

- Hardened and tempered cast aluminum for increased strength
- Compact design for easy storage

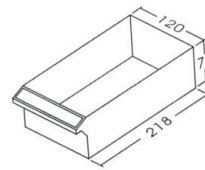
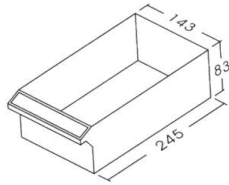


Model	Code No.	Price \$
DRW/AL-01	231-398	24.60

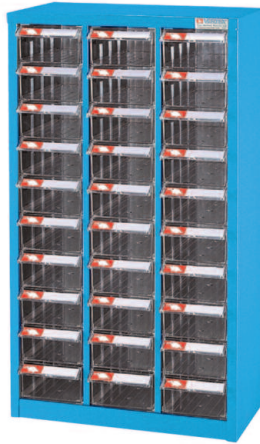


Parts Cabinets

- Steel plate cover with Zinc.
- Drawer material: GPS



VA6-212H



VA6-330H



VA7-324P



VA7-448P

Model No.	Width (mm)	Depth (mm)	Height (mm)	No. of Drawers	Weight (kgs.)	Code No.	Price \$
VA6-212H	362	265	571	12	10.8	326-534	270.90
VA6-330H	533	264	937	30	25.3	326-536	493.40
VA7-324P	440	222	642	24	15.5	326-538	309.50
VA7-448P	586	222	937	48	27.5	326-540	474.00
VA1-525	586	222	350	25	10.0	326-542	358.20
VA1-575	586	222	937	75	32.3	326-544	662.50

Tool Boxes

- ABS plastic
- VTB-102 has two levered trays
- VTB-901 has one removable tray



VTB-102



VTB-901

Model	Dimensions (mm)	Code No.	Price \$
VTB-102	420W x 235D x 180H	326-546	66.90
VTB-901	378W x 182D x 144H	326-547	26.20



215pc TiAlN TIP DRILL SET WITH DISPLAY CASE



Code No.: 500-747

215pc Set includes:

- 10 pcs - 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 11/64", 3/16", 13/64", 7/32", 15/64", 1/4", 17/64"
- 5 pcs - 9/32", 19/64", 5/16", 21/64", 11/32", 23/64", 3/8", 25/64", 13/32", 27/64", 7/16", 29/64", 15/32", 31/64", 1/2"



TiAlN Tip Drills
50% more holes drilled compared to TiN tip,
200% more holes compared to bright finish

Empty drill display also available



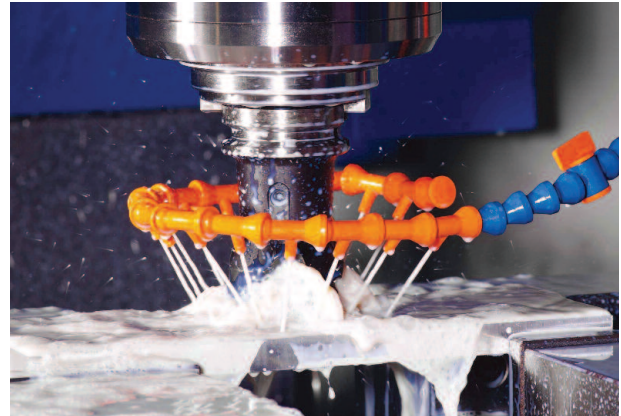
Code No.: 113-843

- Labeled for inch drills
- 1/16" - 1/2" by 64ths
- Metal construction
- Lockable

(see pg 279 for the full range of the TiAlN Tip Drills)



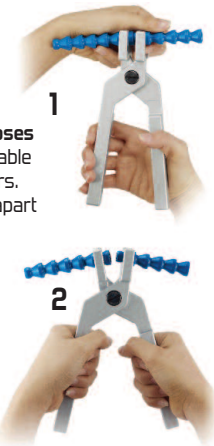
Adjustable Coolant Hose System



Length and angle can be freely adjusted, suitable for most fluids (liquids and gases), hose orifice can be changed as needed.
Can be used for air or for water/oil supply to metal processing machinery

- Made of Dupont 100P material; this highly rigid yet resilient acetal (POM) is strongly resistant to oils and chemicals.
- Adjustable Coolant Hose is highly pliable; it holds its shape well and will not spring back.
- Bending hose will not reduce inner diameter; hose will not pinch or fatigue.
- Adjustable Coolant Hose will not damage cutting blades if there is accidental contact.
- Adjustable Coolant Hose does not conduct electricity and is suitable for use on electrical discharge (EDM) machines.
- Four kinds of inner diameter are available: 1/4", 3/8", 1/2", 3/4"
- Adjustable Coolant Hose is designed for the transport of low-pressure fluids

Installation of Adjustable Coolant Hoses
It's simple and easy to install Adjustable Coolant Hoses using the special pliers. The pliers can also be used to take apart the hose.



Total Control Units

The **Total Flow Control Unit** can be installed on all types of mechanical equipment to control water flow. It is easy to install and makes the machine more aesthetically attractive. Ensure convenient flow control.

Standard Control Unit

Description	Code No.	Price \$
#1 Control Unit	665-002	162.10
• Total Flow Control Unit - 1 set		
• 1/4" Adjustable Coolant Hoses & Valves Unit - 1 set		
• 3/8" Adjustable Coolant Hoses & Valves Unit - 3 sets		



High Pressure Control Unit

Description	Code No.	Price \$
#2 Control Unit	665-004	266.50
• Total Flow Control Unit - 1 set		
• 1/4" Adjustable Coolant Hoses & Valves Unit - 1 set		
• High Pressure Adjustable Nozzles - 3 sets		





Adjustable Coolant Hose System


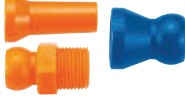




1/4" Coolant Hose System







	Description	Code No.	Price \$		Description	Code No.	Price \$
	1/4" Hose Kit Includes: 10pcs of 1/4" segments - 2 sets 1/16", 1/8", 1/4" Nozzles 1/4" & 1/8" Male NPT Connectors	665-008	17.70		1/4" Socket to 1/8" NPTF, Pack of 4 1/4" Socket to 1/8" NPTF, Pack of 20	665-094 665-096	9.40 34.60
	1/4" Extended Element Kit Includes: 4 each of: 1/4" Extended Elements, 1/4" Element Clamps	665-010	23.80		1/4" Female NPTF Connector, Pack of 4 1/4" Female NPTF Connector, Pack of 50	665-102 665-104	11.60 144.10
	1/4" Segment Pack 2 x 5-1/2" pcs 1/4" x 50 ft coil 1/4" x 82 ft coil	665-012 665-014 665-016	9.60 500.10 836.60		5/8" Female UNF Connector, Pack of 4 5/8" Female UNF Connector, Pack of 50	665-106 665-108	11.60 57.70
	1/4 Circle Flow Nozzles Nozzle Kit Assembled with 15 Side Flow Nozzles 1/4", 1pc End Cap-1/4"	665-018	39.50		7/16" Female UNF Connector, Pack of 4 7/16" Female UNF Connector, Pack of 50	665-110 665-112	11.60 57.70
	1/4" Extended Element, Pack of 4 1/4" Extended Element, Pack of 20	665-020 665-022	13.70 68.50		1/4" Elbow Fitting, Pack of 2 1/4" Elbow Fitting, Pack of 20	665-114 665-116	8.70 86.50
	1/4" Element Clamp, Pack of 4 1/4" Element Clamp, Pack of 20	665-024 665-026	10.10 50.50		1/4" T Fitting, Pack 2 1/4" T Fitting, Pack 20	665-118 665-120	10.10 46.90
	1/4" - 90° Nozzle Kit 1 ea. 1/16", 1/8", 1/4" & Spray Bar Nozzle	665-028	11.00		1/4" Side Flow Nozzle, Pack of 4 1/4" Side Flow Nozzle, Pack of 20	665-122 665-124	10.10 50.50
	1/16" Round Nozzle, Pack of 4 1/16" Round Nozzle, Pack of 50	665-030 665-032	5.80 72.10		1/4" End Cap, Pack of 4 1/4" End Cap, Pack of 20	665-126 665-128	6.20 30.70
	1/8" Round Nozzle, Pack of 4 1/8" Round Nozzle, Pack of 50	665-034 665-036	5.80 72.10		1/4" Swivel Nozzle 40, Pack of 2 1/4" Swivel Nozzle 40, Pack of 20	665-130 665-132	13.40 133.30
	1/4" Round Nozzle, Pack of 4 1/4" Round Nozzle, Pack of 50	665-038 665-040	5.80 72.10		1/4" Swivel Nozzle 60, Pack of 2 1/4" Swivel Nozzle 60, Pack of 20	665-134 665-136	13.40 133.30
	1/16" - 90° Round Nozzle, Pack of 4 1/16" - 90° Round Nozzle, Pack of 20	665-042 665-044	8.50 42.50		1/4" NPT Male Hose Nipple Valve, Pk. of 2 1/4" NPT Male Hose Nipple Valve, Pk. of 10	665-138 665-140	14.50 72.10
	1/8" - 90° Round Nozzle, Pack of 4 1/8" - 90° Round Nozzle, Pack of 20	665-046 665-048	8.50 42.50		1/4" Connection Valve, Pack of 2 1/4" Connection Valve, Pack of 10	665-142 665-144	14.50 72.10
	1/4" - 90° Round Nozzle, Pack of 4 1/4" - 90° Round Nozzle, Pack of 20	665-050 665-052	8.50 42.50		1/4" Male NPT Valve, Pack of 2 1/4" Male NPT Valve, Pack of 10	665-150 665-152	14.50 72.10
	1/4" - 90° Spray Bar Nozzle, Pack of 2 1/4" - 90° Spray Bar Nozzle, Pack of 20	665-054 665-056	9.20 91.90		1/4" Female NPT Valve, Pack of 2 1/4" Female NPT Valve, Pack of 10	665-158 665-160	14.50 72.10
	3/8" Flat Nozzle, Pack of 2 3/8" Flat Nozzle, Pack of 20	665-058 665-060	7.40 73.90		1/4" Connection Check Valve, Pack of 2 1/4" Connection Check Valve, Pack of 10	665-162 665-164	14.50 72.10
	1" Flare Nozzle, Pack of 2 1" Flare Nozzle, Pack of 20	665-062 665-064	4.40 43.30		1/4" Modular Manifold System Includes: 1/4" Elbow Fitting-1pc. 1/4" Manifold Bracket-1pc. 1/4" T Fitting-3pcs. 1/4" Mounting Screws-3pcs.	665-166	23.10
	1/8" NPT Connector, Pack of 4 1/8" NPT Connector, Pack of 50	665-070 665-072	5.80 72.10		1/4" Main Flow Control Manifold System Includes: 1/4" Modular Manifold-1set 1/4" Connection Valve-5pcs.	665-168	61.40
	1/4" NPT Connector, Pack of 4 1/4" NPT Connector, Pack of 50	665-078 665-080	5.80 72.10		1/4" Manifold Bracket, Pack of 2	665-170	6.90
	1/4" Y Fitting Pack, of 2 1/4" Y Fitting Pack, of 20	665-086 665-088	9.20 91.90		1/4" Hose Assembly Pliers	665-172	45.70
	1/4" Double Socket, Pack of 4 1/4" Double Socket, Pack of 20	665-090 665-092	6.70 33.20				

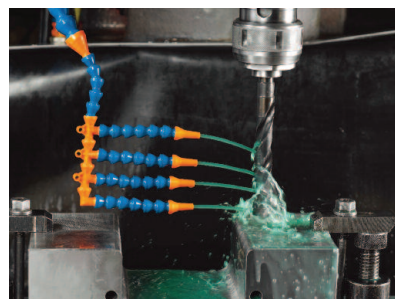
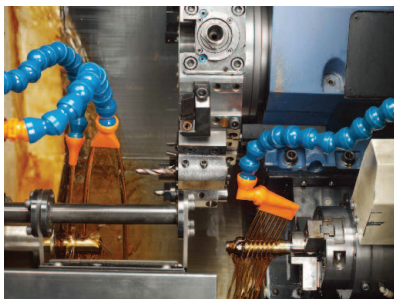
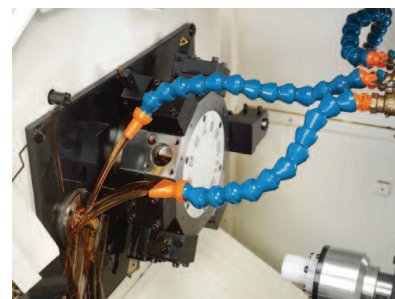
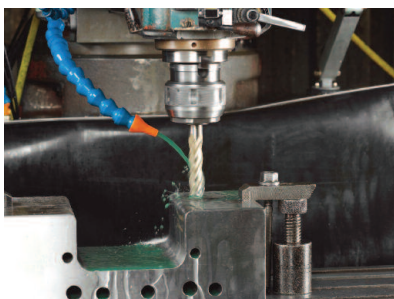
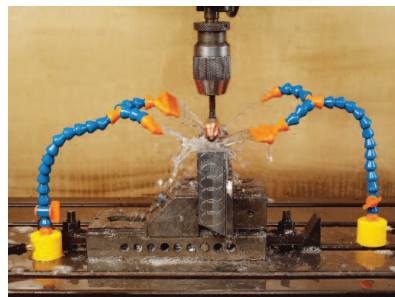
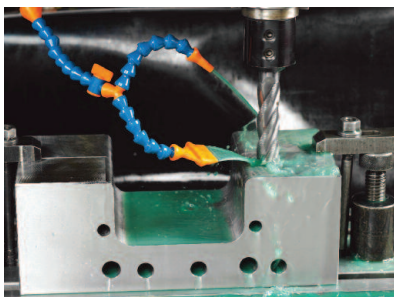


Adjustable Coolant Hose System

3/8" Coolant Hose System

	Description	Code No.	Price \$
	3/8" Hose Kit Includes: 8pcs of 3/8" segments - 2 sets 3/8" Nozzle 3/8" Male NPT Connector	665-176	14.30
	3/8" Hose Kit Includes: 8pcs of 3/8" segments - 2 sets 1/4", 3/8", 1/2" Nozzles 3/8" & 1/2" Male NPT Connectors	665-180	20.20
	3/8" Segment Pack 2 x 5-1/2" pcs	665-182	9.80
	3/8" x 25 ft coil	665-184	290.90
	3/8" x 50 ft coil	665-186	541.20
	1/4" Round Nozzle, Pack of 4	665-188	7.30
	1/4" Round Nozzle, Pack of 50	665-190	90.10
	3/8" Round Nozzle, Pack of 4	665-192	7.30
	3/8" Round Nozzle, Pack of 50	665-194	90.10
	1/2" Round Nozzle, Pack of 4	665-196	7.30
	1/2" Round Nozzle, Pack of 50	665-198	90.10

	Description	Code No.	Price \$
	3/8" NPT Connector, Pack of 4	665-208	7.30
	3/8" NPT Connector, Pack of 50	665-210	90.10
	1/2" NPT Connector, Pack of 4	665-216	7.30
	1/2" NPT Connector, Pack of 50	665-218	90.10
	1-1/4" Flare Nozzle, Pack of 2	665-220	5.30
	1-1/4" Flare Nozzle, Pack of 20	665-222	52.30
	3/8" Male NPT Valve, Pack of 2	665-228	18.10
	3/8" Male NPT Valve, Pack of 10	665-230	90.10
	3/8" Female NPT Valve, Pack of 2	665-236	18.10
	3/8" Female NPT Valve, Pack of 10	665-238	90.10
	3/8" Hose Assembly Pliers	665-240	45.70





Adjustable Coolant Hose System

















1/2" Coolant Hose System

	Description	Code No.	Price \$		Description	Code No.	Price \$
	1/2" Hose Kit Includes: 6pcs of 1/2" segments - 2 sets 1/4", 3/8", 1/2" Nozzles 3/8" & 1/2" Male NPT Connectors	665-244	22.90		1/2" to 1/4" Y Reducer, Pack of 2	665-326	10.30
					1/2" to 1/4" Y Reducer, Pack of 20	665-328	102.70
	1/2" Extended Element Kit Includes: 4 each of: 1/2" Extended Elements, 1/2" Element Clamps	665-246	29.90		1/2" to 1/4" Adapter, Pack of 2	665-330	7.60
					1/2" to 1/4" Adapter, Pack of 20	665-332	75.70
	1/2" Segment Pack 2 x 5-1/2" pcs	665-248	11.50		1/2" Double Socket, Pack of 4	665-334	7.60
	1/2" x 50 ft coil	665-250	666.40		1/2" Double Socket,, Pack of 20	665-336	37.90
	1/2" x 82 ft coil	665-252	728.10		1/2" Elbow Fitting, Pack of 2	665-338	9.80
	1/2 Circle Flow Nozzles Nozzle Kit Assembled with 15 Side Flow Nozzles 1/2", 1pc End Cap-1/2"	665-254	50.50		1/2" Elbow Fitting, Pack of 20	665-340	97.30
	1/2" Extended Element, Pack of 4	665-256	17.00		1/2" T Fitting, Pack 2	665-342	11.40
	1/2" Extended Element, Pack of 20	665-258	84.70		1/2" T Fitting, Pack 20	665-344	113.50
	1/2" Element Clamp, Pack of 4	665-260	13.00		1/2" Side Flow Nozzle, Pack of 4	665-346	13.00
	1/2" Element Clamp, Pack of 20	665-262	64.90		1/2" Side Flow Nozzle, Pack of 20	665-348	64.90
	1/4" - 90° Nozzle Kit 1 ea. 1/4", 3/8", 1/2" & Spray Bar Nozzle	665-264	12.90		1/2" End Cap, Pack of 4	665-350	6.90
	1/4" Round Nozzle, Pack of 4	665-266	8.70		1/2" End Cap, Pack of 20	665-352	34.30
	1/4" Round Nozzle, Pack of 50	665-268	108.10		1/2" Connection Valve, Pack of 2	665-354	23.50
	3/8" Round Nozzle, Pack of 4	665-270	8.70		1/2" Connection Valve, Pack of 10	665-356	117.10
	3/8" Round Nozzle, Pack of 50	665-272	108.10		1/2" Male NPT Valve, Pack of 2	665-362	23.50
	1/2" Round Nozzle, Pack of 4	665-274	8.70		1/2" Male NPT Valve, Pack of 10	665-364	117.10
	1/2" Round Nozzle, Pack of 50	665-276	108.10		1/2" Female NPT Valve, Pack of 2	665-370	23.50
	1/4" - 90° Round Nozzle, Pack of 4	665-278	9.40		1/2" Female NPT Valve, Pack of 10	665-372	117.10
	1/4" - 90° Round Nozzle, Pack of 20	665-280	46.90		1/2" Connection Check Valve, Pack of 2	665-374	19.30
	3/8" - 90° Round Nozzle, Pack of 4	665-282	9.40		1/2" Connection Check Valve, Pack of 10	665-376	96.40
	3/8" - 90° Round Nozzle, Pack of 20	665-284	46.90		3/8" SAE Flare Nut Adapter, Pack of 4	665-378	9.80
	1/2" - 90° Round Nozzle, Pack of 4	665-286	9.40		3/8" SAE Flare Nut Adapter, Pack of 20	665-380	48.70
	1/2" - 90° Round Nozzle, Pack of 20	665-288	46.90		1/2" Modular Manifold System Includes: 1/2" Elbow Fitting-1pc. 1/2" Manifold Bracket-1pc. 1/2" T Fitting-3pcs. 1/2" Mounting Screws-3pcs.	665-382	25.80
	1/2" - 90° Spray Bar Nozzle, Pack of 2	665-290	10.30		1/2" Main Flow Control Manifold System Includes: 1/2" Modular Manifold-1set 1/2" Connection Valve-5pcs.	665-384	84.30
	1/2" - 90° Spray Bar Nozzle, Pack of 20	665-292	102.70		1/2" Manifold Bracket, Pack of 2	665-386	7.80
	1-1/4" Flare Nozzle, Pack of 2	665-294	6.20		1/2" Hose Assembly Pliers	665-388	45.70
	1-1/4" Flare Nozzle, Pack of 20	665-296	61.30				
	1-3/4" Flare Nozzle, Pack of 2	665-298	6.50				
	1-3/4" Flare Nozzle, Pack of 20	665-300	64.90				
	2-1/2" Flare Nozzle, Pack of 2	665-302	7.30				
	2-1/2" Flare Nozzle, Pack of 20	665-304	72.10				
	3/8" NPT Connector, Pack of 4	665-310	8.70				
	3/8" NPT Connector, Pack of 50	665-312	108.10				
	1/2" NPT Connector, Pack of 4	665-318	8.70				
	1/2" NPT Connector, Pack of 50	665-320	108.10				
	1/2" Y Fitting Pack, of 2	665-322	10.30				
	1/2" Y Fitting Pack, of 20	665-324	102.70				



Adjustable Coolant Hose System

3/4" Coolant Hose System

Description	Code No.	Price \$	Description	Code No.	Price \$
 3/4" Hose Kit Includes: 6pcs of 3/4" segments - 2 sets 5/8" & 3/4" Nozzles 3/4" Male NPT Connectors	665-392	30.30	 3" Flare Nozzle, Pack of 2  3" Flare Nozzle, Pack of 20	665-416	8.70
 3/4" Segment Pack 2 x 5-1/2" pcs 3/4" x 50 ft coil 3/4" x 82 ft coil	665-394 665-396 665-398	20.60 1,120.80 1,776.20	 3/4" Y Fitting, Pack of 2  3/4" Y Fitting, Pack of 20	665-420 665-422	22.70 226.90
 5/8" Round Nozzle, Pack of 4 5/8" Round Nozzle, Pack of 50	665-400 665-402	12.30 153.10	 3/4" to 1/2" Adapter, Pack of 2  3/4" to 1/2" Adapter, Pack of 20	665-424 665-426	8.70 86.50
 3/4" Round Nozzle, Pack of 4 3/4" Round Nozzle, Pack of 50	665-404 665-406	12.30 153.10	 3/4" to 1/2" Y Reducer, Pack of 2  3/4" to 1/2" Y Reducer, Pack of 20	665-428 665-430	30.80 307.90
 3/4" NPT Connector, Pack of 4 3/4" NPT Connector, Pack of 50	665-412 665-414	12.30 153.10	 3/4" Double Socket, Pack of 4  3/4" Double Socket, Pack of 20	665-432 665-434	9.40 46.90
			 3/4" Hose Assembly Pliers	665-436	45.70

Magnetic Base & Shield Systems

3 Valve Magnetic Set (With On-Off)

Description	Code No.	Price \$
<ul style="list-style-type: none"> Magnetic Base (W 2" x L 2-1/2" x H 2") 20 pcs of 1/4" Segment - 3 pcs 1" Flare Nozzle - 3 pcs 1/4" NPT Connector - 3 pcs 1/4" Copper Valve - 3 pcs 	665-438	222.50



2 Valve Magnetic Set (With On-Off)

Description	Code No.	Price \$
<ul style="list-style-type: none"> Magnetic Base (W 2" x L 2-1/2" x H 2") 20 pcs of 1/4" Segment - 2 pcs 1" Flare Nozzle - 2 pcs 1/4" NPT Connector - 2 pcs 1/4" Copper Valve - 2 pcs 	665-440	209.20



Single Hose Magnetic Set

Description	Code No.	Price \$
<ul style="list-style-type: none"> Magnetic Base - 1 pc 10 pcs of 1/4" Segment - 1 pc 1" Flare Nozzle - 1 pc 1/4" NPT Connector - 1 pc 	665-442	28.60



Single Hose Magnetic Set (Shut Off Valve)

Description	Code No.	Price \$
<ul style="list-style-type: none"> Magnetic Base - 1 pc 10 pcs of 1/4" Segment - 1 pc 1" Flare Nozzle - 1 pc 1/4" Male NPT Valve - 1 pc 	665-446	38.10



Long Single Hose Magnetic Set

Description	Code No.	Price \$
<ul style="list-style-type: none"> Magnetic Base - 1 pc 20 pcs of 1/4" Segment - 1 pc 1" Flare Nozzle - 1 pc 1/4" NPT Connector - 1 pc 	665-444	32.40



Long Single Hose Magnetic Set (Shut Off Valve)

Description	Code No.	Price \$
<ul style="list-style-type: none"> Magnetic Base - 1 pc 20 pcs of 1/4" Segment - 1 pc 1" Flare Nozzle - 1 pc 1/4" Male NPT Valve - 1 pc 	665-448	42.80



Magnetic Shield Kits

Description	Dimensions	Code No.	Price \$
<ul style="list-style-type: none"> Magnetic Base - 1 pc 	6" x 8"	665-450	60.90
<ul style="list-style-type: none"> 12 pcs of 3/4" Segment - 1 pc 	7-1/2" x 10"	665-452	63.70
<ul style="list-style-type: none"> 3/4" Shield Mounting Elbow - 1 pc 	8-1/2" x 12"	665-454	68.50
<ul style="list-style-type: none"> Nut - 2 pcs Acrylic Board - 1 pc 			





Adjustable Coolant Hose System

Adjustable Coolant Hoses & Valves



1/4" Male 13" Length Hose Kit

Description	Code No.	Price \$
• 1/4" Male NPT Valve - 1 pc	665-456	18.70
• 20 pcs of 1/4" Segment - 1 pc		
• 1/4" Round Nozzle - 1 pc		



1/4" Female 13" Length Hose Kit

Description	Code No.	Price \$
• 1/4" Female NPT Valve - 1 pc	665-458	18.70
• 20 pcs of 1/4" Segment - 1 pc		
• 1/4" Round Nozzle - 1 pc		



3/8" Male 14" Length Hose Kit

Description	Code No.	Price \$
• 3/8" Male NPT Valve - 1 pc	665-460	22.70
• 16 pcs of 3/8" Segment - 1 pc		
• 3/8" Round Nozzle - 1 pc		



3/8" Female 14" Length Hose Kit

Description	Code No.	Price \$
• 3/8" Female NPT Valve - 1 pc	665-462	22.70
• 16 pcs of 3/8" Segment - 1 pc		
• 3/8" Round Nozzle - 1 pc		



1/2" Male 13" Length Hose Kit

Description	Code No.	Price \$
• 1/2" Male NPT Valve - 1 pc	665-464	28.00
• 12 pcs of 1/2" Segment - 1 pc		
• 1/2" Round Nozzle - 1 pc		



1/2" Female 13" Length Hose Kit

Description	Code No.	Price \$
• 1/2" Female NPT Valve - 1 pc	665-466	28.00
• 12 pcs of 1/2" Segment - 1 pc		
• 1/2" Round Nozzle - 1 pc		

ABRASIVES



Abrasives

Symbols	Characteristics
A	Regular aluminum oxide, hard and tough. Suitable for mild steel, case-iron etc in rough grinding
10A	The prime regular aluminum oxide, hard and tough. It is suited for cylindrical grinding of unhardened steels.
WA, 38A	White aluminum oxide, hard and brittle. Suitable for all kinds of steel grinding.
32A	Strong sharp monocrystalline aluminum oxide. Suitable for all kinds of tool precision grinding.
FA, 57A	Semi-friable, with a grinding action intermediate A and WA. Suitable for cylindrical grinding of steel parts.
PA	Pink aluminum oxide is suitable for tool grinding and surface grinding.
C	Black silicone carbide. Used for grinding gray iron, non-ferrous metals, and non-metallic materials such as glass, rubber, stones etc.
CSKG	Blue Ceramic Fast stock removal excellent cutting 5X more life than aluminum oxide wheels.
GC	Green silicone carbide is well suited for special alloy grinding such as tungsten carbide, cold rolled steels, sapphire, glass and granite.

Standard Wheel Markings

For clarity as well as to avoid mistakes in wheel selection, a standard designation of wheel specifications was developed and was inscribed by ISO in 1995.

WA	46	K	8	V	7N
Abrasive	Grit	Grade	Structure	Bond Type	KINIK Symbol

Bond Type

Symbols	Characteristics
V (Vitrified)	Most common bond for precision grinding porosity and strength. Wheels made with this bond give high stock removal and their rigidity helps attain high precision. Not affected by water, acid oils or ordinary temperature
B (Resinoid)	Used for wheels in fabrication shops, foundries, billet shops, sharpening and gumming saws, and in many precision applications. These wheels excel in rapid stock removal as well as in applications requiring better finishes. This bond is also restricted to reinforced resinoid products, cut-off wheels or specialty formulated products.
R (Rubber)	Used for most centerless feed wheels, precision ball race grinding wheels and for snagging with portable grinders. Used where finish is important and for cut-off wheels where burr and burn must be kept to a minimum.

GRADES: Grades indicate the relative strength of the bond which holds the abrasive grains in place

Very Soft	Soft	Medium	Hard	Very Hard
D, E, F, G	H, I, J, K	L, M, N, O	P, Q, R, S	T, U, V, W, X, Y, Z

GRIT (CNS and JIS STANDARD)

Coarse			Medium			Fine				Very Fine				Ultra Fine			
10	12	14	30	36	46	70	80	90	100	240	280	320	400	1000	1200	1500	2000
16	20	24	54	60		120	150	180	220	500	600	700	800	2500	3000	4000	

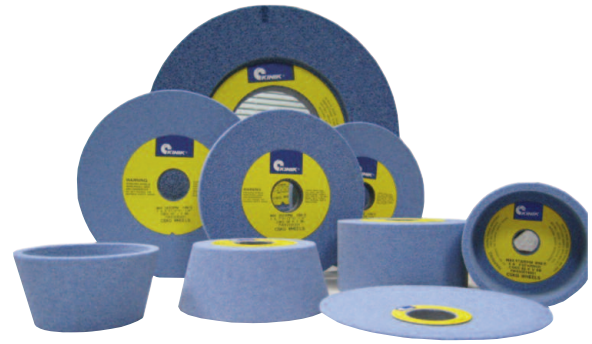
STRUCTURES:

Symbol No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Abrasive Ratio %	62	60	58	56	54	52	50	48	46	44	42	40	38	36	34



CERAMIC GRINDING WHEELS

- HIGH PERFORMANCE CERAMIC ALUMINUM OXIDE
- UP TO 5X LONGER LIFE THAN WHITE ALUMINUM OXIDE WHEELS
- SUPERIOR STOCK REMOVAL RATES, LONG WHEEL LIFE REDUCING GRINDING COSTS
- MAXIMUM RESULTS FOR:
 - TOOL SHARPENING
HSS & TOOL STEEL <68 HRC
 - SURFACE GRINDING
HSS & TOOL STEEL <68 HRC, 300 & 400 SERIES STAINLESS STEEL, CAST IRON: DUCTILE & GRAY, NONFERROUS ALLOYS



Ceramic Surface Grinding Wheels

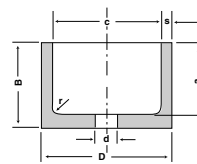
Peripheral Surface Grinding

Surface grinding with straight or recessed wheels on machines with a rotating or reciprocating table results in a larger contact area than in cylindrical grinding. Therefore it is necessary to use softer grade wheels, particularly when large diameter and/or wide wheels are used. When grinding a large number of components, the grinding is not continuous. In this case the components tend to dress the wheel, so a harder grade wheel should be used.



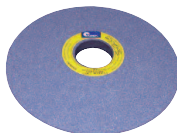
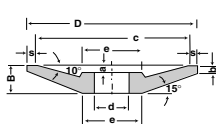
Dimensions	Structure CSKG 46H		Structure CSKG 46K		Structure CSKG 60K		Structure CSKG 80K		Structure CSKG 100K	
		Price \$		Price \$		Price \$		Price \$		Price \$
6x1/4x1-1/4			635-040	15.90	635-041	15.90	635-042	15.90		
6x1/2x1-1/4			635-044	18.20	635-046	18.20	635-052	18.20		
6x5/8x1-1/4			635-112	33.20						
7x1/4x1-1/4			635-047	22.50	635-048	21.80	635-049	21.80		
7x1/2x1-1/4			635-055	23.60	635-050	23.60	635-053	23.60	635-056	23.60
8x1/4x1-1/4			635-057	25.70	635-061	25.70	635-062	25.70		
8x1/2x1-1/4			635-064	31.20	635-065	31.20	635-066	31.20		
8x3/4x1-1/4			635-067	39.00	635-068	39.00	635-091	39.00		
8x3/4x2			635-093	39.00	635-094	39.00	635-096	39.00		
8x1x1-1/4			635-069	44.60	635-071	44.60	635-092	44.60		
8x1x2			635-097	44.60	635-098	44.60				
10x3/4x3			635-101	57.40	635-102	57.40	635-103	59.80		
10x1x3			635-072	64.50	635-073	64.50	635-104	64.50		
12x3/4x3					635-074	87.60				
12x1x3			635-076	93.70	635-077	93.70	635-078	93.00		
12x1x5			635-079	92.90	635-081	93.00				
12x1-1/2x5			635-082	117.10	635-105	117.10				
14x1x5			635-083	117.10	635-084	121.30	635-109	117.10		
14x1-1/2x5			635-086	149.50	635-087	149.50				
14x2x5			635-110	193.30	635-111	193.30				
RECESSED 2A BOTH SIDES										
12x2x3 2A 6x3/8			635-106	160.10	635-107	160.10				
12x2x5 2A 7-1/4x1/2			635-108	149.50						
14x2x5 2A 8x3/8			635-088	202.40	635-089	202.40				
14x2x5 2A 8x3/8 H	635-070	209.90								

Ceramic Shape D Straight Cup Wheels



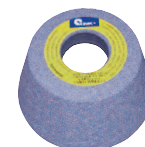
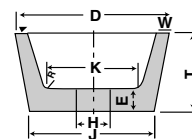
D	B	d	a	c	r	s	CSKG60J Code No.	Price \$	CSKG60K Code No.	Price \$
4	2	20mm	1-9/16	3-1/2	3/16	1/4	635-075	32.50	635-080	40.80
5	2-1/2	1-1/4	2	4-5/16	1/4	5/16				

Ceramic Shape B Saucer Type Wheel



D	B	d	a	b	c	e	s	CSKG60K Code No.	Price \$
6	5/8	1-1/4	1/4	1/8	5-3/8	2	5/16	635-095	43.80

Ceramic Shape E Flaring Cup Wheels



D	T	H	W	E	J	K	CSKG60K Code No.	Price \$
4	2	1-1/4	6 mm	1/2	3	2-1/2	635-085	32.50
5	2	1-1/4	8 mm	1/2	4	3	635-090	43.80

Aluminum Oxide Surface Grinding Wheels

Peripheral Surface Grinding

Surface grinding with straight or recessed wheels on machines with a rotating or reciprocating table results in a larger contact area than in cylindrical grinding. Therefore it is necessary to use softer grade wheels, particularly when large diameter and/or wide wheels are used. When grinding a large number of components, the grinding is not continuous. In this case the components tend to dress the wheel, so a harder grade wheel should be used.



WA
White Aluminum Oxide



PA
Pink Aluminum Oxide

Dimensions	Structure WA46J	Price \$	WA60J	Price \$	WA80J	Price \$	PA46J	Price \$	PA60J	Price \$
6x1/4x1-1/4	635-280	15.10	635-282	15.10	635-284	15.10				
6x1/2x1-1/4	635-288	17.40	635-290	17.40	635-292	17.40				
7x1/4x1-1/4	635-296	21.20	635-298	21.20	635-300	21.20				
7x1/2x1-1/4	635-306	22.70	635-308	22.70	635-310	22.70	635-812	24.20		
8x1/4x1-1/4	635-314	25.70	635-316	25.70	635-318	25.70				
8x1/2x1-1/4	635-324	25.70	635-326	25.70	635-328	28.00	635-820	31.00	635-822	31.00
8x3/4x1-1/4	635-334	33.30	635-336	33.30	635-338	33.30	635-824	38.60		
8x1x1-1/4	635-344	40.10	635-346	40.10	635-348	40.10				
8x3/4x2	635-352	35.50	635-354	35.50	635-356	35.50				
8x1x2	635-360	40.10	635-362	40.10			635-836	43.10	635-838	43.10
10x1/2x3	635-364	49.90	635-366	49.90						
10x3/4x3	635-368	54.40	635-370	54.40	635-372	54.40				
10x1x3	635-376	57.40	635-378	57.40	635-379	57.40	635-848	62.70		
12x3/4x3	635-380	78.60	635-382	78.60	635-384	78.60			635-854	85.80
12x1x3	635-386	82.30	635-388	82.30						
12x1x5	635-390	82.30	635-392	82.30						
12x1-1/2x5	635-394	103.50	635-396	106.50						
14x1x5	635-402	106.50	635-404	106.50	635-406	106.50				
14x1-1/2x5	635-408	135.90	635-410	135.90						
14x2x5	635-411	181.20	635-414	181.20						
Recessed 2A Both Sides										
12x2x3	635-398	135.90	635-399	135.90			635-872	148.80		
2A 6x3/8										
12x2x5	635-400	135.90	635-401	135.90						
2A 7-1/4x1/2										
14x2x5	635-412	184.30	635-418	184.30			635-880	206.90		
2A 8x3/8										



32A Open Bond White Aluminum Oxide Grinding Wheels



Dimensions	Specifications		Price \$	
	32A46J		32A60J	
7x1/2x1-1/4	635-420	27.20	635-422	27.20
8x1/2x1-1/4	635-424	33.30		
8x3/4x1-1/4	635-428	41.60	635-430	41.60
8x1x1-1/4	635-432	49.90	635-434	49.90
10x1x3	635-436	74.00	635-438	74.00
12x1x3	635-440	106.50	635-442	106.50
14x1x5	635-443	142.70	635-444	142.70
14x1-1/2x5	635-445	185.80	635-446	185.80
Recessed 2A Both Sides				
12x2x3	635-447	151.00	635-448	151.00
2A 6x3/8				
12x2x5	635-449	151.00	635-439	151.00
2A 7-1/4x1/2				
14x2x5	635-441	241.60	635-437	241.60
2A 8x3/8				

General Purpose Grinding Wheels

Used on bench, pedestal, wagon and swing frame Grinders

- Dia: 125 ~ 760 mm
- Dia: 5" ~ 30"



Dimensions	A: Dark Regular Aluminum Oxide						GC: Green Silicone Carbide							
	A30P	Price \$	A54N	Price \$	A80N	Price \$	GC60KV	Price \$	GC80JV	Price \$	GC100J	Price \$	GC120JV	Price \$
6x1/2x1	635-200*	11.40												
6x3/4x1	635-202*	13.00	635-204	13.00	635-206	13.00	635-450	20.40	635-452	20.40	635-454	20.40		
6x1x1	635-208	14.50	635-210	14.50	635-212	14.50	635-458	22.70	635-460	22.70	635-462	22.70		
7x3/4x1			635-218	19.10			635-474	29.00	635-476	29.00				
7x1x1	635-220	21.50	635-222	21.50			635-480	34.20	635-482	34.20				
7x1/2x1-1/4							635-466	23.90	635-468	23.90			635-472	23.90
8x3/4x1	635-226	21.20	635-228	21.20					635-490	33.30			635-492	33.30
8x1x1	635-232	24.20	635-234	24.20			635-494	40.20	635-496	40.20	635-498	40.20	635-500	39.00
10x1x1	635-238	37.80	635-240	37.80			635-502	66.80						
10x1-1/2x1-1/4	635-250	54.40	635-252	54.40					635-510	96.70				
10x2x1-1/4	635-256	63.50	635-258	63.50					635-516	125.80				
12x1-1/2x1-1/4	635-262*	72.50	635-264	72.50			635-518	148.00						
12x2x1-1/4	635-268	96.70	635-270	96.70										
14x2x1-1/4	635-274*	125.40												

* A36P

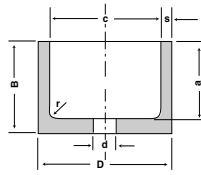
Nested Wheel Bushings

- Used to reduce the size of grinding wheel bores
- Can reduce 1-1/4" down to 1/2"
- 4 bushings with 10 possible combinations



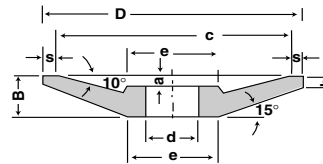
O.D.	I.D.	Code No.	Price \$
Nested Wheel Bushings		635-999	2.00
Contains:			
1-1/4"	1"		
1"	3/4"		
3/4"	5/8"		
5/8"	1/2"		

Aluminum Oxide Shape D Straight Cup Grinding Wheels



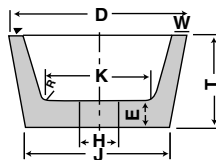
WA WHITE ALUMINUM OXIDE								WA46J	Price \$	WA60J	Price \$	WA80J	Price \$	WA100J	Price \$
D	B	d	a	c	r	s									
4	2	1-1/4	1-9/16	3-1/2	3/16	1/4	635-530	25.70	635-532	25.70	635-534	25.70			
4	2	20mm	1-9/16	3-1/2	3/16	1/4	635-538	25.70	635-540	25.70	635-542	25.70	635-544	25.70	
5	2-1/2	1-1/4	2	4-5/16	1/4	5/16	635-546	36.30	635-548	36.30	635-550	36.30			
6	3-1/8	1-1/4	2-1/2	5-1/8	1/4	3/8	635-554	64.40	635-556	64.40	635-558	64.40			
PA PINK ALUMINUM OXIDE								PA46J	Price \$	PA60J	Price \$	PA80J	Price \$	PA100J	Price \$
4	2	1-1/4	1-9/16	3-1/2	3/16	1/4	635-900	27.50	635-902	27.50	635-904	27.50	635-906	27.50	
4	2	20mm	1-9/16	3-1/2	3/16	1/4	635-908	27.50	635-910	27.50	635-912	27.50			
5	2-1/2	1-1/4	2	4-5/16	1/4	5/16	635-916	39.30							
6	3-1/8	1-1/4	2-1/2	5-1/8	1/4	3/8			635-926	69.50					

Aluminum Oxide Shape B Saucer Type Grinding Wheels



WA WHITE ALUMINUM OXIDE								WA46J	Price \$	WA60J	Price \$
D	B	d	a	b	c	e	s				
6	5/8	1-1/4	1/4	1/8	5-3/8	2	5/16	635-970	37.80	635-972	37.80
7	11/16	1-1/4	5/16	1/8	6-1/4	2-3/8	5/16	635-978	43.80	635-980	43.80

Aluminum Oxide Shape E Flaring Cup Grinding Wheels

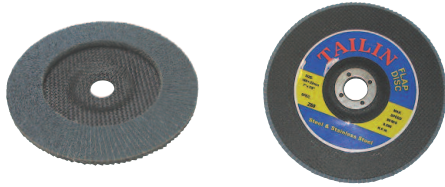


WA WHITE ALUMINUM OXIDE								WA46J	Price \$	WA60J	Price \$	WA80J	Price \$	WA100J	Price \$
D	T	H	W	E	J	K									
4	2	1-1/4	6 mm	1/2	3	2-1/2	635-562	30.20	635-564	30.20	635-566	30.20	635-568	30.20	
5	2	1-1/4	8 mm	1/2	4	3	635-570	39.30	635-572	39.30	635-574	39.30			
6	2	1-1/4	10 mm	1/2	4-1/2	4	635-578	43.80	635-580	43.80					
PA PINK ALUMINUM OXIDE								PA46J	Price \$	PA60J	Price \$				
4	2	1-1/4	6 mm	1/2	3	2-1/2	635-940	31.20							
5	2	1-1/4	8 mm	1/2	4	3	635-948	41.90	635-950	41.90					

ABRASIVES **TAILIN**

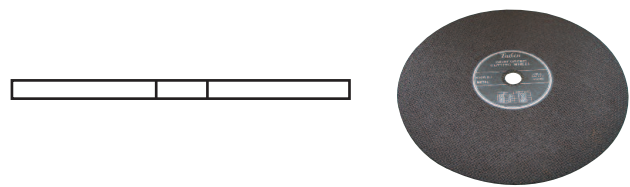


Flap Discs - Type 27



Dimensions (in.)	Grit	Code No.	Price \$
4-1/2 x 7/8	60	635-656	7.00
4-1/2 x 7/8	80	635-657	7.00
5 x 7/8	60	635-658	8.40
5 x 7/8	80	635-659	8.40
7 x 7/8	60	635-661	14.40
7 x 7/8	80	635-663	14.40

Cut-Off Wheels For Steel



Dimensions	Specification	RPM	Code No.	Price \$
12 x 1/8 x 1	A30RBF2G	5000	635-694	6.90
12 x 1/8 x 1	A30RBF1G	4500	635-696	5.70
12 x 1/8 x 1	A30RBF2G	6300	635-697	6.90
12 x 1/8 x 20mm	A30RBF2.5G	6300	635-700	6.90
14 x 1/8 x 1	A30RBF2G	4300	635-702	8.70
14 x 1/8 x 1	A30RBF1G	3900	635-704	6.90
14 x 7/64 x 1	A30RBF2G	5400	635-705	9.20
16 x 1/8 x 1	A24SBF2G	3800	635-708	12.00

Reinforced Depressed Center Discs For Steel

A. (Type 27)

- Approved by CNS standard No. 2551
- German DSA standard No. 2335



Dimensions	Specification	RPM	Code No.	Price \$
4 x 1/8 x 5/8	A24R2G	15300	635-600	1.20
4 x 1/8 x 5/8	A24S2G	15300	635-602	1.20
4 x 1/4 x 5/8	A24R2G	15300	635-604	1.40
4 x 1/4 x 5/8	A24S2G	15300	635-606	1.40
4-1/2 x 1/8 x 7/8	A24R2G	13300	635-608	1.70
4-1/2 x 1/8 x 7/8	A24S2G	13300	635-610	1.70
4-1/2 x 1/4 x 7/8	A24R2G	13300	635-616	1.90
4-1/2 x 1/4 x 7/8	A24S2G	13300	635-612	1.90
5 x 1/8 x 7/8	A24R2G	12200	635-618	2.00
5 x 1/4 x 7/8	A24R2G	12200	635-620	2.40
5 x 1/4 x 7/8	A24S2G	12200	635-621	2.40
7 x 1/8 x 7/8	A24R2G	8500	635-622	2.90
7 x 1/8 x 7/8	A24S2G	8500	635-624	2.90
7 x 1/4 x 7/8	A24R2.5G	8500	635-628	3.40
7 x 1/4 x 7/8	A24S2.5G	8500	635-629	3.40
9 x 1/8 x 7/8	A24R2G	6500	635-634	4.00
9 x 1/4 x 7/8	A24R2.5G	6500	635-640	5.70
9 x 1/4 x 7/8	A24S2.5G	6500	635-642	5.70

P R O M O

2 ER16 OR 2 ER32 COLLET CHUCKS AND YOU PICK 6 ER COLLETS

FREE!

FEATURES:

- 100% Forged Construction
- DIN Coolant option - standard
- 100% Forged Construction
 - TIR, 0.0003" at 4xDia
 - All Ground Body
- Wrench not included



CAT40 PREMIUM BALANCED
UP TO **30,000** RPM



Each holder comes complete with certificate

Each holder comes complete with certificate

Pick 6 Collets

ER 16 INCH		
Size	Code No.	QTY.
1/16	337-531	
3/32	337-532	
1/8	337-533	
5/32	337-534	
3/16	337-535	
7/32	337-536	
1/4	337-537	
9/32	337-538	
5/16	337-540	
11/32	337-541	
3/8	337-542	

2x CAT40 ER16 - 2.5" Collet Chucks (531-406)
6x ER16 Collets of your choice

2x CAT40 ER32 - 2.5" Collet Chucks (531-421)
6x ER32 Collets of your choice

Use Promo Code:
GSER16

Use Promo Code:
GSER32

Pick 6 Collets

ER 32 INCH		
Size	Code No.	QTY.
1/8	337-703	
5/32	337-704	
3/16	337-706	
7/32	337-707	
1/4	337-708	
9/32	337-709	
5/16	337-711	
11/32	337-712	
3/8	337-713	
7/16	337-716	
1/2	337-718	
9/16	337-721	
5/8	337-723	
11/16	337-725	
3/4	337-727	



CALL TODAY FOR A QUOTE

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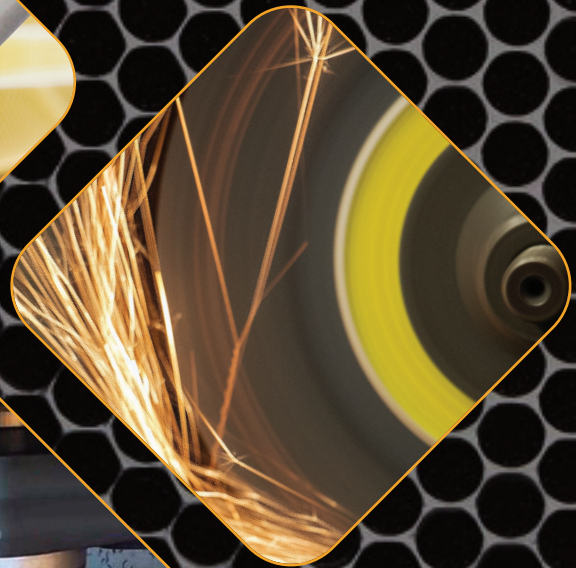
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