

HARDINGE WORKHOLDING

Precision Tooling Systems for Milling



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Hardinge. Solid since 1890.

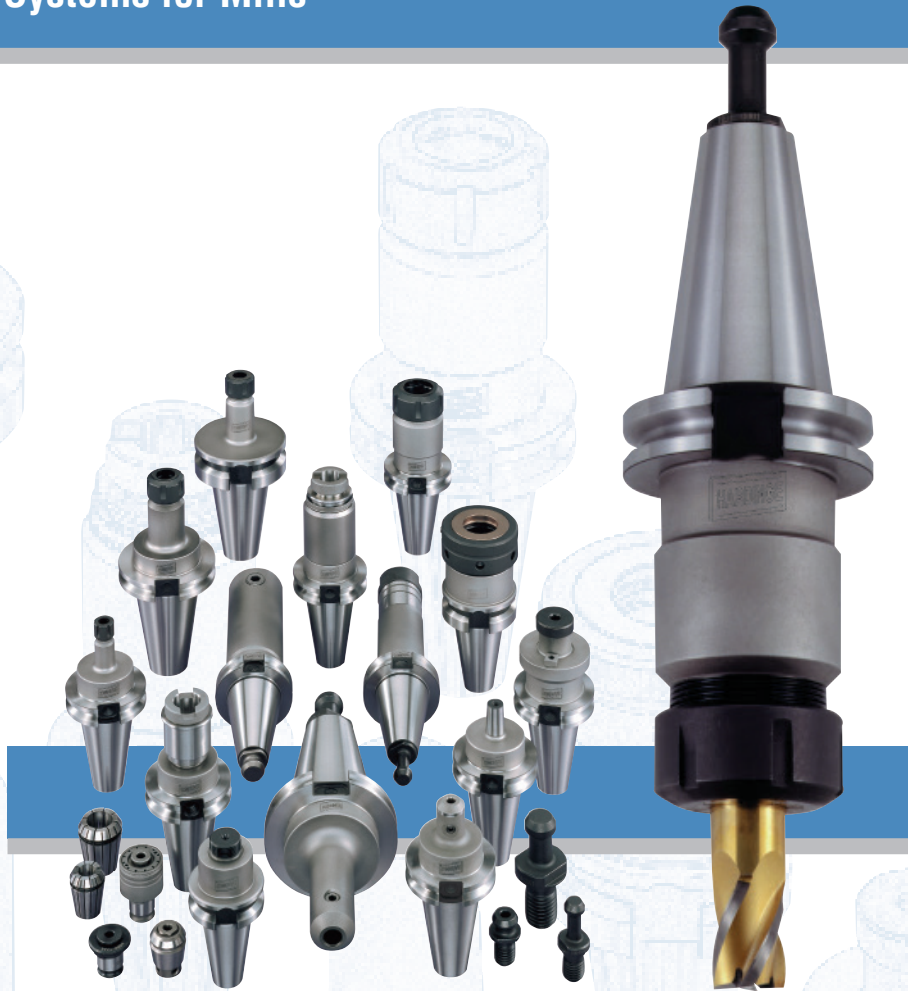
At Hardinge, our mission is to provide the **Best Value** in workholding products to meet demanding production levels and produce the quality of parts required in a competitive industry. **When it comes to the toolholder, value is all about precision and reliability.**

The quality of the toolholder is directly reflected in the quality of the part. Our standard of performance is high to help you achieve the level of accuracy required for automotive, medical, aerospace and the electronics industries, not to mention the zillions of parts that involve the safety of our day-to-day activities.

Our BT and CAT-V flange CNC tool holding systems are **precision ground** to assure a stable holder with the best possible TIR, resulting in better surface finishes, longer tool life and a more accurate workpiece.

Take pride in precision machining. Step up to Hardinge for precision tool holders, toolholder collets and accessories to meet your milling machine requirements.

We've built in the Value for longer lasting tool holders – you'll save in the long run.

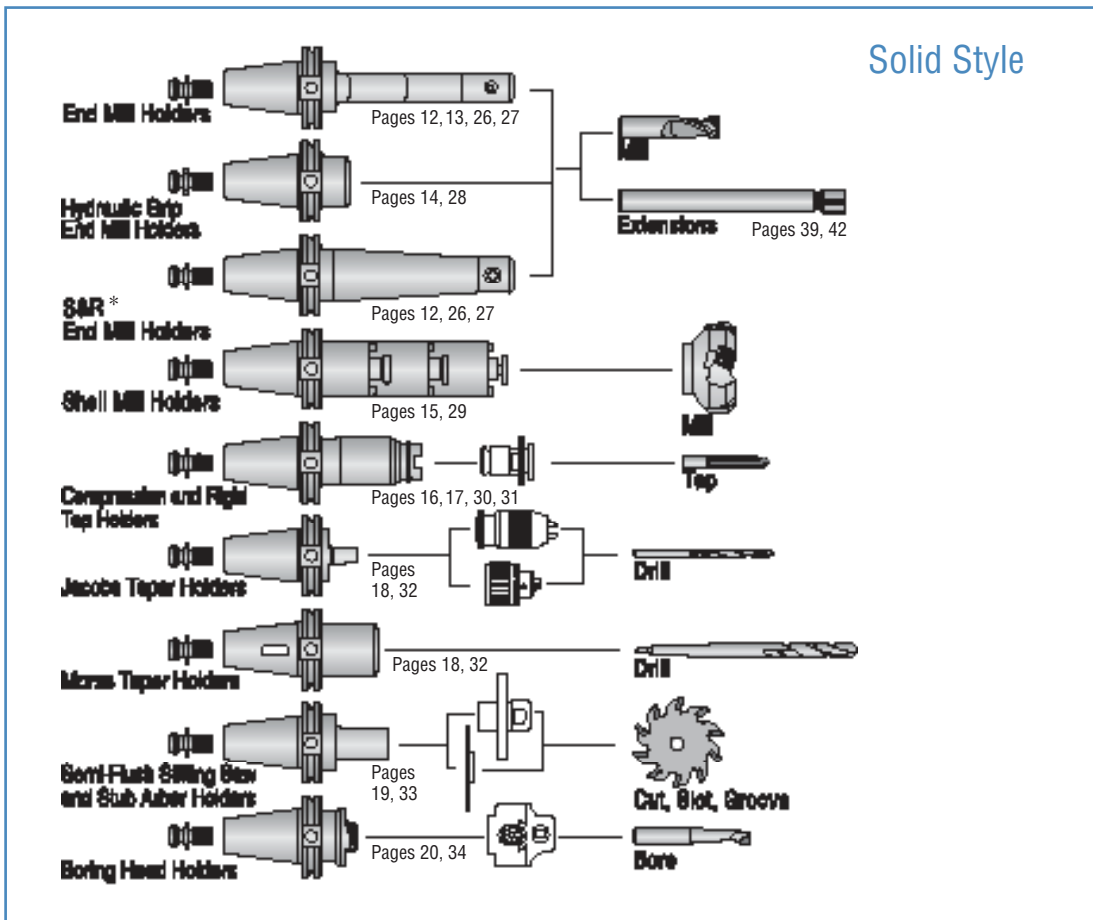
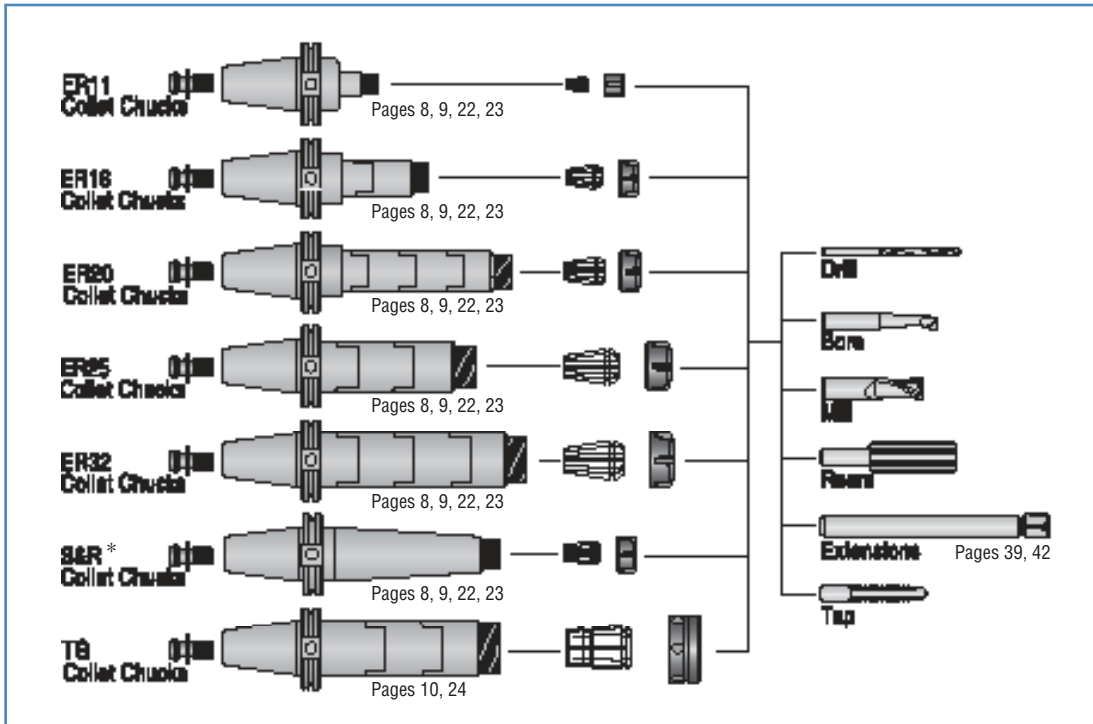


Hardinge offers many tooling and workholding solutions for the mill. Collet Blocks, Rotary Tables and Indexers are available to hold or position your parts. Collets, Sure-Grip® expanding collets, step chucks, chucks, and fixtures can be held in the collet block or a rotary table or indexer for a variety of OD and ID gripping solutions.



Rotary Tables & Indexers; page 50, full-line brochure 2372. Collet Blocks; page 51, full-line brochure 2365.

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Retention Knobs – Pages 21, 35, 36, 37

* S & R (Strong & Rugged)

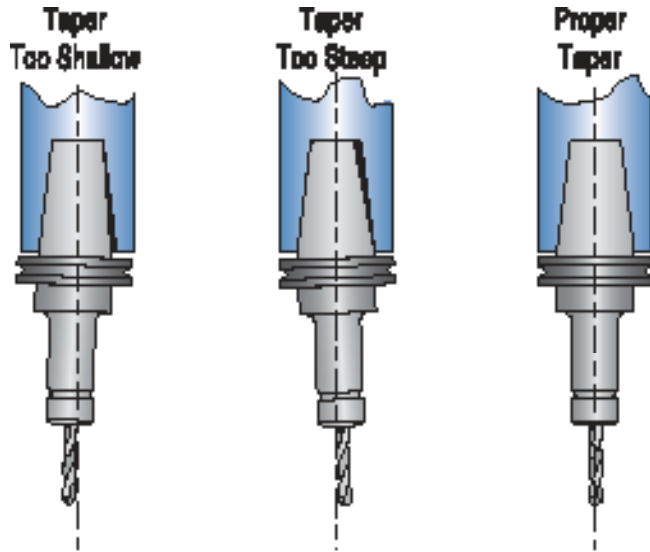
Hardinge offers a full line of tool holders for the BT and CAT-V flange machine spindles. There are many different style holders including collet-style, shell mill, semi-flush slitting saw, stub arbor, tapping (floating and rigid), boring tool, Jacobs chuck, Morse taper, and blanks.

Quality & Accuracy

Hardinge's AT-3 (and better) accuracy for the shank taper on all tool holders exceeds ANSI Standards by a minimum of 35%. With a precision machine spindle, such as those found on Hardinge and Bridgeport machine tools, the holder shanks and the spindle taper are precisely mated. This assures the best TIR possible and a stable holder, resulting in better surface finishes, longer tool life and more accurate workpieces.

It is necessary for the grind on the shank of the holder to be uniform and have an excellent surface finish. The latest high-precision CNC grinding equipment is used to ensure this consistency. If the shanks have raised areas (or asperities), the working forces common to machining will weld the asperities to the spindle's ID taper. These will continually break off and reform on both the spindle seat and the tool shank surfaces which will cause pitting. These metal particles turn into powder and oxides – a process called fretting. The extremely high precision grind on our holder shanks resists fretting, which results in longer life of the holders and your machine's spindle.

Tooling will be positioned on the centerline of the spindle due to the precise concentricity of the holders. This results in accurate dimensions on your workpiece and maximum productivity.



**ER Collets
and ER Tap
Collets**



**TG100 and
TG150 Collets**

ER Collets collapse .040" from their nominal size. With this feature, fewer collets are required to handle the full range of each holder. Collets are available in metric or fractional sizes. Tap collets are also available. Our easy-to-read charts will help you make your selections.

The **ER and TG collet-style holders** will hold drills, end mills, reamers, taps and boring bars, reducing the need for separate tool holders for each operation. Collet-style holders are available in Stub, Standard, Extended, Extra-Extended and the massive S&R (strong and rugged) configuration.

FAQ

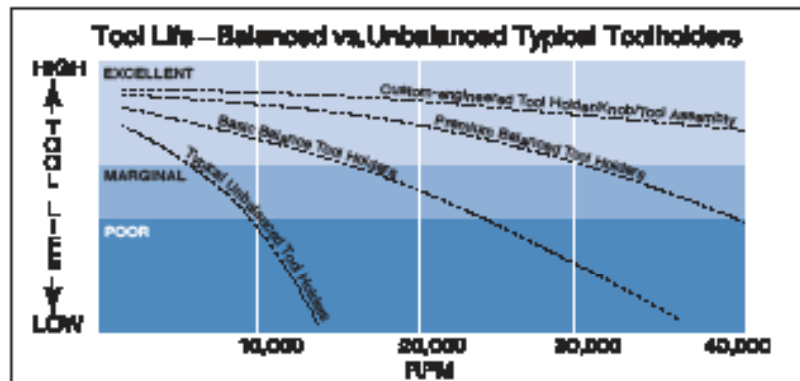
Do I need to balance the shell mills, taps, slitters, stub arbors, Jacobs chucks, Morse taper and boring head tool holders?

No, unless they are used at high rpm. Generally, these holders are run at low rpm and balance is not a factor.

FAQ

Can I use the standard unbalanced ER Collet Holders and End Mill Holders on my 10,000 rpm spindle?

No, unless you are always running less than 6,000 rpm. The Basic Balance holder should be used on 10,000 rpm spindles and should also be used when machining above 6,000 rpm on 7,000 and 8,000 rpm spindles.



Tool life increases in relationship to the balance option selected.

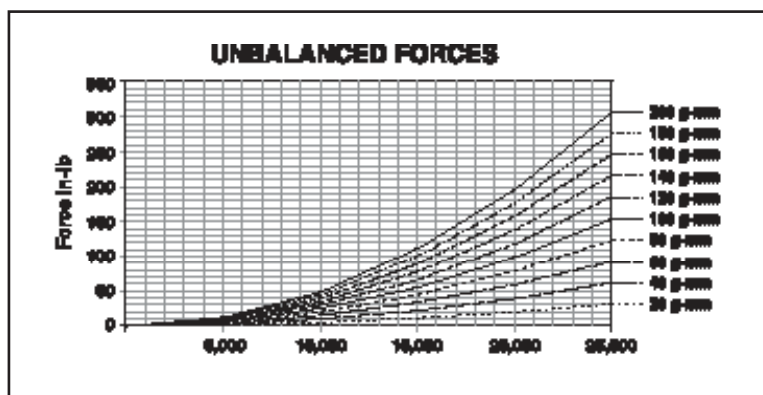
Balanced Tooling

With the advent of higher spindle speeds, it is necessary to thoroughly understand the need for balanced tooling. When running at low spindle speeds, a slight imbalance of the tooling will not affect your machine tool's spindle. However, as the rpm increases, this "slight" imbalance becomes considerable. As the imbalance increases, the amount of force (centrifugal) generated increases. When this force becomes high enough, the machine tool's spindle can be damaged. This imbalance can also cause deflection of the tool and inaccuracies in the machining process. Take a look at the "Unbalanced Forces" chart shown below. The out-of-balance is

measured in g-mm (gram-millimeters) and the resulting force as the rpm increases is measured in in-lb (inch-pounds).

There are many factors which contribute to an imbalance in the tooling. The first is the balance of the holder itself and its assembled components (holder, retention knob, nosepiece). We manufacture holders that will meet your balance requirements (see Balance Options) but there are other factors. Other factors include: the condition of the spindle taper - proper angle, damage (nicks, fretting, etc.); the condition of the holder's taper (nicks, fretting, etc.) after the holder has been used; and the condition of the

tooling - adjustable boring holders, drill chucks, drills, end mills, boring bars. The assembly tolerance of the components of the tool holder (nosepiece, retention knob) are a factor of imbalance when the holder assembly was not balanced by the manufacturer. All of these factors must be at their optimum when doing high-speed machining. Like a chain, a balanced system is only as good as its weakest link. As the chart shows, balance is critical at the higher rpms.

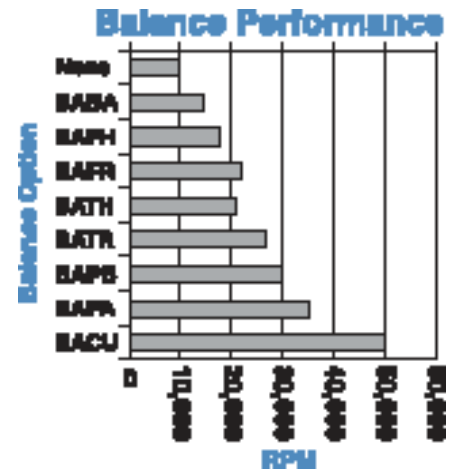


Balance Options

Fortunately, our tool holders can be balanced to the speed you need. The latest balancing equipment is used to provide accurate balancing and quick turnaround. Leading machine tool builders highly recommend the use of accurately balanced holders for demanding high-speed applications. Our balancing team has years of experience and are committed to providing you with properly balanced tool holders.

Balance Options for Collet, End Mill, Hydraulic and Shell Mill Tool Holders

Hardinge offers many balance options for the toolholder that requires balancing. When placing the order, give the Hardinge representative the tool holder part number, the balance option and the nose cap option if desired. If this option is not specified, you will receive the standard tool holder with the standard nose cap.

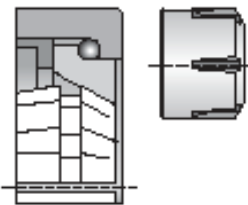


Option:	Rating:	Description:
None	Standard Holder	<ul style="list-style-type: none"> • Holders are not counterbalanced
BABA	Basic Balance	<ul style="list-style-type: none"> • Unequal drive slot depths, set screws, taper holders and other design asymmetries are counterbalanced
BAFH	G2.5 @ 15,000 rpm	<ul style="list-style-type: none"> • Counterbalances toolholder body design asymmetry – Includes balanced standard nose cap on collet chucks
BAFR	G2.5 @ 15,000 rpm	<ul style="list-style-type: none"> • Counterbalances toolholder body and retention knob asymmetry – Includes balanced standard nose cap on collet chucks
BATH	G2.5 @ 20,000 rpm	<ul style="list-style-type: none"> • Counterbalances toolholder body design asymmetry – Includes balanced standard nose cap on collet chucks
BATR	G2.5 @ 20,000 rpm	<ul style="list-style-type: none"> • Counterbalances toolholder body and retention knob asymmetry – Includes balanced standard nose cap on collet chucks
BAPB	Premium Balance	<ul style="list-style-type: none"> • Available for ER collet chucks and hydraulic end mill holders only • Certificate of Balance supplied • Counterbalances toolholder body, retention knob and collet with gage pin completely assembled • "Fine Balance" nose cap and choice of collet and gage pin • Parts are balanced individually and assembly is Certified to less than 3g-mm
BAPA	Premium Adjustable	<ul style="list-style-type: none"> • Available for ER Collet chucks and hydraulic end mill holders only – Balance Same as "Premium Balance" except includes U-Balance nose cap
BACU	Custom Engineered	<ul style="list-style-type: none"> • Designed to meet your individual requirement – consult Hardinge

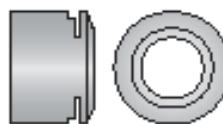
Optional Nosecaps improve balance and/or holding power (replace standard nose cap)



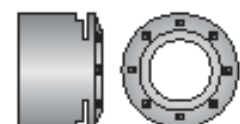
NPBA Basic Balance Nosepiece
Standard nosepiece (precision balanced)



NPBB Ball Bearing Nosepiece
Almost doubles the holding power of the standard nosepiece



NPFB Fine Balance Nosepiece
Eliminates the imbalance of the standard-style nosepiece

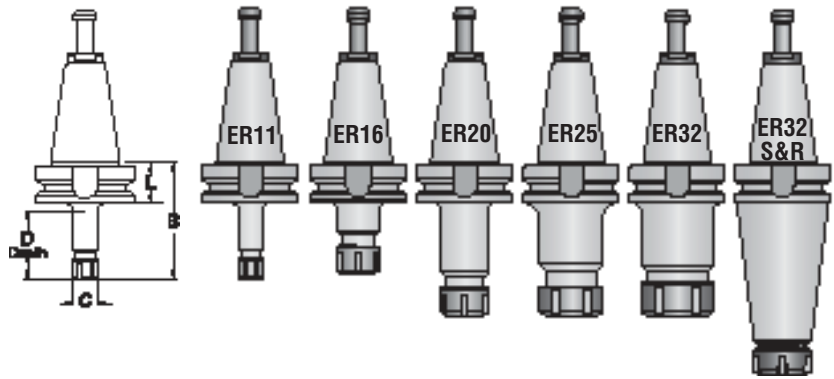


NPUB U-Balance Nosepiece
Includes eight small set screws which can be added or removed to help balance the tool holder – this nose-piece requires a balancing machine



Some of my drills and taps are spinning in the ER tool holders. Is there a way to get a better grip? Yes, use the ball bearing nosepiece. It allows almost twice the torque of the standard nosepiece. The ER Collet with a square will help with tap slippage (when combined with ball bearing nosepiece) for an even tighter grip.

Precision ER Collet Chucks — BT-Style Flange



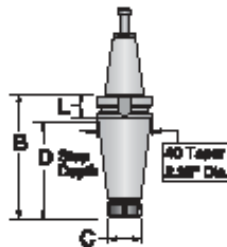
ER Collet Holders are available from ER11 to ER32 styles (.019" to .787" diameters). They are made to precision specification. Each style is concentric to the centerline within .0002". The flush precision nosepiece grips the tool close to the cutting edge for better accuracy. The shank taper accuracy for the holders is AT-3 or better. This style holder gives you the flexibility to mill, drill, ream, bore and tap.

Note: Retention knobs must be ordered separately for each holder; see page 21. Refer to page 47 for "Cool Stop" high-pressure coolant seals. For balance options; see pages 6 and 7.

Precision ER Holders – BT-Style Flange

Style	Taper	STUB					STANDARD					EXTENDED				
		Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L
ER11	30						7961-30-02	3.00"	.63"	1.90"	0.87"					
ER16	30	7962-30-01	2.00"	1.08"	2.05"	0.87"	7962-30-02	2.88"	1.08"	3.00"	0.87"					
ER20	30	7963-30-01	2.00"	1.26"	2.00"	0.87"	7963-30-02	3.00"	1.26"	2.90"	0.87"					
ER32	30	7965-30-01	2.15"	1.88"	2.10"	0.87"	7965-30-02	3.00"	1.88"	2.60"	0.87"					
ER11	35						7961-35-02	3.00"	.63"	1.90"	0.87"					
ER16	35						7962-35-02	2.88"	1.08"	3.00"	0.87"	7962-35-03	4.88"	1.08"	3.00"	0.87"
ER20	35						7963-35-02	3.00"	1.26"	3.30"	0.87"	7963-35-03	5.00"	1.26"	3.50"	0.87"
ER32	35						7965-35-02	3.00"	1.88"	2.80"	0.87"	7965-35-03	5.00"	1.88"	4.00"	0.87"
ER11	40						7961-40-02	3.00"	.63"	1.80"	1.06"					
ER16	40						7962-40-02	2.88"	1.08"	3.00"	1.06"	7962-40-03	4.88"	1.08"	3.00"	1.06"
ER20	40	7963-40-01	2.50"	1.26"	2.80"	1.06"	7963-40-02	4.00"	1.26"	3.50"	1.06"	7963-40-03	6.00"	1.26"	3.50"	1.06"
ER25	40	7964-40-01	2.20"	1.65"	2.50"	1.06"	7964-40-02	4.00"	1.65"	3.50"	1.06"	7964-40-03	6.00"	1.65"	3.50"	1.06"
ER32	40	7965-40-01	2.40"	1.88"	2.80"	1.06"	7965-40-02	4.00"	1.88"	4.00"	1.06"	7965-40-03	6.00"	1.88"	4.00"	1.06"
ER16	45						7962-45-02	3.88"	1.08"	3.00"	1.31"					
ER20	45						7963-45-02	4.00"	1.26"	3.50"	1.31"					
ER32	45						7965-45-02	4.00"	1.88"	4.00"	1.31"					
ER16	50						7962-50-02	4.88"	1.08"	3.00"	1.50"					
ER20	50						7963-50-02	4.00"	1.26"	3.50"	1.50"					
ER32	50						7965-50-02	4.00"	1.88"	4.00"	1.50"					

Style	Taper	S & R SHANK				
		Part No.	B	C	D	L
ER20R	40	7963-40-50	6.00"	1.25"	3.50"	1.06"
ER32R	40	7965-40-50	6.00"	1.88"	4.00"	1.06"



S&R (Strong and Rugged)

These extra-strong and rugged long tool holders steady the tool for smoother and faster cutting. Tools last longer due to the added mass of the holder - decreases vibration. Accepts double-ended end mills.



Why shouldn't I use end mills with Weldon flats in collet-style holders? Non-symmetrical tools should not be used in a collet-style holder. The Weldon flat makes the end mill unbalanced (non-symmetrical) resulting in poor finishes and possible spindle damage.



Nosepiece Caps and Wrenches for ER Collet Chuck Holders

Style	Taper	C Dia.	Standard Part No.	Ball Bearing Part No.	Wrench for Std. & Ball Bearing Part No.	Fine Tune Part No.	U-Balance Part No.	Wrench for Fine & U-Bal. Part No.
ER11	All	0.63"	7991-01-11-000001	—	7992-01-11-000003	—	—	—
ER16	All	1.08"	7991-01-16-000001	—	7992-01-16-000003	7991-01-16-000009	7991-01-16-000010	7992-01-16-000009
ER20	All	1.26"	7991-01-20-000001	7991-01-20-000008	7992-01-20-000003	7991-01-20-000009	7991-01-20-000010	7992-01-20-000009
ER25	All	1.65"	7991-01-25-000001	7991-01-25-000008	7992-01-25-000003	7991-01-25-000009	7991-01-25-000010	7992-01-25-000009
ER32	All	1.88"	7991-01-32-000001	7991-01-32-000008	7992-01-32-000003	7991-01-32-000009	7991-01-32-000010	7992-01-32-000009



Stop Screws and Clips for ER Holders

Style	ER Standard Stop Screw Part No.	ER Standard Coolant 400psi Stop Screw Part No.	Thread	Extractor Clips Package of 10
ER11	—	—	—	—
ER16	7990-01-16-000004	7990-01-16-000006	7/16" - 20	7993-01-16-000007
ER20	7990-01-20-000004	7990-01-20-000006	M14 - 1.5	7993-01-20-000007
ER25	7990-01-25-000004	7990-01-25-000006	M18 - 1.5	7993-01-25-000007
ER32	7990-01-32-000004	7990-01-32-000006	M22 - 1.5	7993-01-32-000007



Collets for ER Holders — see pages 43-44 for additional collet information

Style	Metric Collets			Fractional Collets		Tap Collets – Split	
	Base Part No.	Range	Range Inches	Base Part No.	Range	Base Part No.	Range
ER11	1911-00-17-	1 mm to 07 mm	.019" to .275"	1911-00-19-	1/16" to 1/4"	—	—
ER16	1913-00-17-	1 mm to 10 mm	.019" to .393"	1913-00-19-	1/16" to 13/32"	1913-00-18-	#0 to 1/4"
ER20	1915-00-17-	2 mm to 13 mm	.039" to .511"	1915-00-19-	1/16" to 1/2"	1915-00-18-	#8 to 1/2"
ER25	2095-00-17-	2 mm to 16 mm	.039" to .629"	2095-00-19-	1/16" to 5/8"	2095-00-18-	#8 to 5/8"
ER32	1917-00-17-	3 mm to 20 mm	.078" to .787"	1917-00-19-	3/32" to 3/4"	1917-00-18-	#8 to 13/16"

Quick-Change Floating Solid Tap Collets

Style	Base Part No.	Range
ERQC16	2143-00-18-	#0 - #10
ERQC20	2145-00-18-	#0 - 1/4"
ERQC25	2147-00-18-	#0 - 1/2"
ERQC32	2149-00-18-	#0 - 9/16"

Additional ER-Style Collets are shown on page 46.

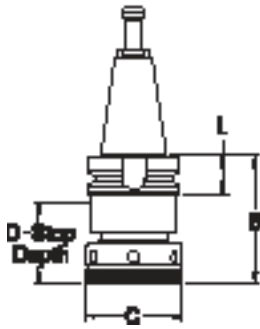


Floating Solid Tap Collets

Style	Base Part No.	Range
ERTC16	1921-00-18-	#0 - #10
ERTC20	1923-00-18-	#0 - 1/4"
ERTC25	2097-00-18-	#0 - 1/2"
ERQC32	2099-00-18-	#8 - 5/8"

Additional ER-Style Collets are shown on page 45.

Precision TG Collet Chucks — BT-Style Flange

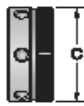


TG Collet Holders are available for TG100 and TG150 (.093" to 1.5" diameter) collets. The TG Holders have a flush nosepiece design incorporating a rotating ball assembly which produces a radial float. This, in turn, forces the collet to self-center for maximum grip, precision and extended tool life.

Retention knobs must be ordered separately for each holder; see page 21. Refer to page 47 for "Cool Stop" high-pressure coolant seals. For balance options; see pages 6 and 7. Maximum recommended torque is 60 ft-lb – DO NOT OVER-TORQUE.

Precision TG Holders – BT-Style Flange

Style	Taper	STANDARD					EXTENDED					STANDARD Stop Screw	EXTENDED Stop Screw
		Part No.	B	C	D	L	Part No.	B	C	D	L		
TG100	30	7959-30-02	4.00"	2.50"	2.7"	.87"	—	—	—	—	—	7990-02-10-000004	—
TG100	35	7959-35-02	3.50"	2.50"	2.9"	.87"	7959-35-03	5.47"	2.50"	4.6"	.87"	7990-02-10-000004	7990-02-10-000004
TG100	40	7959-40-02	3.50"	2.50"	3.1"	1.06"	7959-40-03	5.50"	2.50"	5.0"	1.06"	7990-02-10-000004	7990-02-10-000004
TG150	40	7960-40-02	4.78"	3.50"	3.8"	1.06"	—	—	—	—	—	7990-02-15-000004	—
TG100	45	7959-45-02	3.50"	2.50"	4.1"	1.31"	7959-45-03	6.00"	2.50"	5.0"	1.31"	7990-02-10-000004	7990-02-10-000004
TG150	45	7960-45-02	4.00"	3.50"	4.4"	1.31"	7960-45-03	6.00"	3.50"	5.0"	1.31"	7990-02-15-000004	7990-02-15-000014
TG100	50	7959-50-02	3.50"	2.50"	4.4"	1.50"	7959-50-03	6.00"	2.50"	5.0"	1.50"	7990-02-10-000004	7990-02-10-000004
TG150	50	7960-50-02	3.50"	3.50"	4.5"	1.50"	7960-50-03	6.00"	3.50"	5.0"	1.50"	7990-02-15-000014	7990-02-15-000014



Nosepiece and Wrench for TG Holders

Style	Taper	C Diameter	TG Nosepiece Part No.	Wrench Part No.
TG100	All	2.50"	7991-02-10-000014	7992-02-10-000003
TG150	All	3.50"	7991-02-15-000015	7992-02-15-000003

Stop Screws for TG Holders

Style	Thread	TG Stop Screw Standard Part No.	TG Stop Screw Coolant 400 psi Part No.
TG100	1 1/8" x 16	7990-02-10-000004	7990-02-10-000006
TG150	1 3/8" x 12	7990-02-15-000004	7990-02-15-000006
TG150	1 5/8" x 12	7990-02-15-000014	7990-02-15-000016



TG collets have a shallow single-angle to ensure precise concentricity between the collet, the holder and the tool. The nosepiece associated with the TG holder incorporates a rotating ball assembly with a radial float. The accuracy of this system is unsurpassed by any other. Coolant seals are shown on page 47.

Standard TG Collets

Style	Inch Part No.	Range 1/64" Increments	Metric Part No.	Range
TG100	1905-00-19-	3/32" to 1"	1905-00-17-	6.0mm to 25.5mm
TG150	1909-00-19-	1/2" to 1 1/2"	1909-00-17-	12.0mm to 38.0mm

See the next page for the full range of TG Collets and part numbers.

TG Collet Racks

	TG100	TG150
Part No.	0946-10-00-000035	0946-15-00-000025
Capacity	35 TG100 Collets	25 TG150 Collets

TG Collets — Inch

Inch	TG100 Part Number	Inch	TG150 Part Number
3/32"	1905-00-19-000937	1/2"	1909-00-19-005000
7/64"	1905-00-19-001093	39/64"	1909-00-19-005156
1/8"	1905-00-19-001250	17/32"	1909-00-19-005312
9/64"	1905-00-19-001406	39/64"	1909-00-19-005468
5/32"	1905-00-19-001562	9/16"	1909-00-19-005625
11/64"	1905-00-19-001718	37/64"	1909-00-19-005781
3/16"	1905-00-19-001875	19/32"	1909-00-19-005937
13/64"	1905-00-19-002031	39/64"	1909-00-19-006093
7/32"	1905-00-19-002187	9/8"	1909-00-19-006250
15/64"	1905-00-19-002343	41/64"	1909-00-19-006406
1/4"	1905-00-19-002500	21/32"	1909-00-19-006562
17/64"	1905-00-19-002656	49/64"	1909-00-19-006718
9/32"	1905-00-19-002812	11/16"	1909-00-19-006875
19/64"	1905-00-19-002968	49/64"	1909-00-19-007031
5/16"	1905-00-19-003125	23/32"	1909-00-19-007187
21/64"	1905-00-19-003281	47/64"	1909-00-19-007343
11/32"	1905-00-19-003437	3/4"	1909-00-19-007500
23/64"	1905-00-19-003593	49/64"	1909-00-19-007656
3/8"	1905-00-19-003750	29/32"	1909-00-19-007812
25/64"	1905-00-19-003906	51/64"	1909-00-19-007968
13/32"	1905-00-19-004062	19/16"	1909-00-19-008125
27/64"	1905-00-19-004218	59/64"	1909-00-19-008281
7/16"	1905-00-19-004375	27/32"	1909-00-19-008437
29/64"	1905-00-19-004531	59/64"	1909-00-19-008593
15/32"	1905-00-19-004687	7/8"	1909-00-19-008750
31/64"	1905-00-19-004843	57/64"	1909-00-19-008906
1/2"	1905-00-19-005000	29/32"	1909-00-19-009062
33/64"	1905-00-19-005156	59/64"	1909-00-19-009218
17/32"	1905-00-19-005312	19/16"	1909-00-19-009375
35/64"	1905-00-19-005468	61/64"	1909-00-19-009531
9/16"	1905-00-19-005625	31/32"	1909-00-19-009687
37/64"	1905-00-19-005781	69/64"	1909-00-19-009843
19/32"	1905-00-19-005937	1"	1909-00-19-010000
39/64"	1905-00-19-006093	1 1/64"	1909-00-19-010156
5/8"	1905-00-19-006250	1 1/32"	1909-00-19-010312
41/64"	1905-00-19-006406	1 3/64"	1909-00-19-010468
21/32"	1905-00-19-006562	1 1/16"	1909-00-19-010625
43/64"	1905-00-19-006718	1 5/64"	1909-00-19-010781
11/16"	1905-00-19-006875	1 9/32"	1909-00-19-010937
45/64"	1905-00-19-007031	1 7/64"	1909-00-19-011093
23/32"	1905-00-19-007187	1 1/8"	1909-00-19-011250
47/64"	1905-00-19-007343	1 9/64"	1909-00-19-011406
3/4"	1905-00-19-007500	1 3/16"	1909-00-19-011562
49/64"	1905-00-19-007656	1 11/64"	1909-00-19-011718
25/32"	1905-00-19-007812	1 3/16"	1909-00-19-011875
51/64"	1905-00-19-007968	1 13/64"	1909-00-19-012031
13/16"	1905-00-19-008125	1 7/32"	1909-00-19-012187
53/64"	1905-00-19-008281	1 15/64"	1909-00-19-012343
27/32"	1905-00-19-008437	1 1/4"	1909-00-19-012500
55/64"	1905-00-19-008593	1 17/64"	1909-00-19-012656
7/8"	1905-00-19-008750	1 9/32"	1909-00-19-012812
57/64"	1905-00-19-008906	1 19/64"	1909-00-19-012968
29/32"	1905-00-19-009062	1 5/16"	1909-00-19-013125
59/64"	1905-00-19-009218	1 21/64"	1909-00-19-013281
15/16"	1905-00-19-009375	1 11/32"	1909-00-19-013437
61/64"	1905-00-19-009531	1 23/64"	1909-00-19-013593
31/32"	1905-00-19-009687	1 3/8"	1909-00-19-013750
63/64"	1905-00-19-009843	1 25/64"	1909-00-19-013906
1"	1905-00-19-010000	1 13/32"	1909-00-19-014062
		1 27/64"	1909-00-19-014218
		1 7/16"	1909-00-19-014375
		1 29/64"	1909-00-19-014531
		1 15/32"	1909-00-19-014687
		1 31/64"	1909-00-19-014843
		1 1/2"	1909-00-19-015000

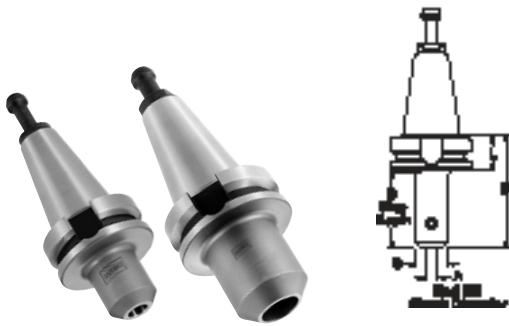
TG Collets — Metric

mm	TG100 Part Number	TG150 Part Number	
6.0	1905-00-17-060000	12.0	1909-00-17-120000
6.5	1905-00-17-065000	12.5	1909-00-17-125000
7.0	1905-00-17-070000	13.0	1909-00-17-130000
7.5	1905-00-17-075000	13.5	1909-00-17-135000
8.0	1905-00-17-080000	14.0	1909-00-17-140000
8.5	1905-00-17-085000	14.5	1909-00-17-145000
9.0	1905-00-17-090000	15.0	1909-00-17-150000
9.5	1905-00-17-095000	15.5	1909-00-17-155000
10.0	1905-00-17-100000	16.0	1909-00-17-160000
10.5	1905-00-17-105000	16.5	1909-00-17-165000
11.0	1905-00-17-110000	17.0	1909-00-17-170000
11.5	1905-00-17-115000	17.5	1909-00-17-175000
12.0	1905-00-17-120000	18.0	1909-00-17-180000
12.5	1905-00-17-125000	18.5	1909-00-17-185000
13.0	1905-00-17-130000	19.0	1909-00-17-190000
13.5	1905-00-17-135000	19.5	1909-00-17-195000
14.0	1905-00-17-140000	20.0	1909-00-17-200000
14.5	1905-00-17-145000	20.5	1909-00-17-205000
15.0	1905-00-17-150000	21.0	1909-00-17-210000
15.5	1905-00-17-155000	21.5	1909-00-17-215000
16.0	1905-00-17-160000	22.0	1909-00-17-220000
16.5	1905-00-17-165000	22.5	1909-00-17-225000
17.0	1905-00-17-170000	23.0	1909-00-17-230000
17.5	1905-00-17-175000	23.5	1909-00-17-235000
18.0	1905-00-17-180000	24.0	1909-00-17-240000
18.5	1905-00-17-185000	24.5	1909-00-17-245000
19.0	1905-00-17-190000	25.0	1909-00-17-250000
19.5	1905-00-17-195000	25.5	1909-00-17-255000
20.0	1905-00-17-200000	26.0	1909-00-17-260000
20.5	1905-00-17-205000	26.5	1909-00-17-265000
21.0	1905-00-17-210000	27.0	1909-00-17-270000
21.5	1905-00-17-215000	27.5	1909-00-17-275000
22.0	1905-00-17-220000	28.0	1909-00-17-280000
22.5	1905-00-17-225000	28.5	1909-00-17-285000
23.0	1905-00-17-230000	29.0	1909-00-17-290000
23.5	1905-00-17-235000	29.5	1909-00-17-295000
24.0	1905-00-17-240000	30.0	1909-00-17-300000
24.5	1905-00-17-245000	30.5	1909-00-17-305000
25.0	1905-00-17-250000	31.0	1909-00-17-310000
25.5	1905-00-17-255000	31.5	1909-00-17-315000
		32.0	1909-00-17-320000
		32.5	1909-00-17-325000
		33.0	1909-00-17-330000
		33.5	1909-00-17-335000
		34.0	1909-00-17-340000
		34.5	1909-00-17-345000
		35.0	1909-00-17-350000
		35.5	1909-00-17-355000
		36.0	1909-00-17-360000
		36.5	1909-00-17-365000
		37.0	1909-00-17-370000
		37.5	1909-00-17-375000
		38.0	1909-00-17-380000

TG Collet Sets

	Part Numbers	Qty.	Range & Increment
TG100	0932-00-19-000059	59	3/32" to 1" (1/64" Incr.)
TG100	0932-00-19-000041	41	3/8" to 1" (1/64" Incr.)
TG100	0932-00-19-000030	30	3/32" to 1" (1/32" Incr.)
TG100	0932-00-19-000021	21	3/8" to 1" (1/32" Incr.)
TG150	0934-00-19-000065	65	1/2" to 1 1/2" (1/64" Incr.)
TG150	0934-00-19-000033	33	1/2" to 1 1/2" (1/32" Incr.)
TG150	0934-00-19-000017	17	1/2" to 1 1/2" (1/16" Incr.)

End Mill Holders — BT-Style Flange



End Mill Holders are offered in stub, standard, extended and S & R (strong & rugged) models. The fine pitch set screws (included) match Weldon flats to firmly lock the end mill. All holders, except the stub holders from 1/8" up to 1" diameter, can accept single- or double-end tools. The stub holder will only accept single-end tools. Holders for end mills 1" and larger have two locking screws (except the stub). The locking screws are aligned with the drive slot for your convenience. End mills without Weldon flats should not be used in these holders.

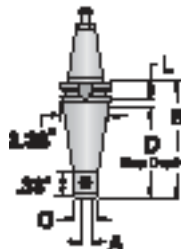
Retention knobs must be ordered separately for each holder; refer to page 21. For balance options; see pages 6 and 7. Holders for metric tools are available on application.

End Mill Holders 30- and 40-Taper – BT-Style Flange

		30-TAPER STANDARD					35-TAPER STANDARD						
A	Taper	Part No.	B	C	D	L	A	Taper	Part No.	B	C	D	L
0.125"	30	7951-30-02-001250	2.50"	0.69"	3.3"	0.87"	0.187"	35	7951-35-02-001875	2.50"	0.69"	3.6"	0.87"
0.187"	30	7951-30-02-001875	2.50"	0.69"	3.3"	0.87"	0.250"	35	7951-35-02-002500	2.50"	0.78"	3.6"	0.87"
0.250"	30	7951-30-02-002500	2.50"	0.78"	3.3"	0.87"	0.375"	35	7951-35-02-003750	2.50"	1.00"	2.2"	0.87"
0.312"	30	7951-30-02-003125	2.50"	0.88"	3.3"	0.87"	0.500"	35	7951-35-02-005000	2.50"	1.25"	3.0"	0.87"
0.375"	30	7951-30-02-003750	2.50"	1.00"	3.3"	0.87"	0.625"	35	7951-35-02-006250	2.50"	1.50"	3.6"	0.87"
0.437"	30	7951-30-02-004375	2.50"	1.13"	2.0"	0.87"	0.750"	35	7951-35-02-007500	2.50"	1.75"	3.9"	0.87"
0.500"	30	7951-30-02-005000	2.50"	1.25"	3.1"	0.87"	0.875"	35	7951-35-02-008750	3.50"	1.88"	4.2"	0.87"
0.562"	30	7951-30-02-005625	2.50"	1.38"	3.0"	0.87"	1.000"	35	7951-35-02-010000	3.50"	2.00"	4.4"	0.87"
0.625"	30	7951-30-02-006250	2.75"	1.57"	3.6"	0.87"	1.250"	35	7951-35-02-012500	4.00"	2.50"	3.8"	0.87"
0.750"	30	7951-30-02-007500	3.00"	1.75"	3.7"	0.87"							

		40-TAPER STUB				40-TAPER STANDARD				40-TAPER EXTENDED						
A	Taper	Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L
0.125"	40						7951-40-02-001250	2.50"	0.69"	3.8"	1.06"					
0.187"	40						7951-40-02-001875	2.50"	0.69"	2.4"	1.06"					
0.250"	40						7951-40-02-002500	2.50"	0.78"	2.4"	1.06"					
0.312"	40						7951-40-02-003125	2.50"	0.88"	3.8"	1.06"					
0.375"	40						7951-40-02-003750	2.50"	1.00"	2.4"	1.06"	7951-40-03-003750	4.00"	1.00"	3.9"	1.06"
0.437"	40						7951-40-02-004375	2.50"	1.13"	3.8"	1.06"					
0.500"	40	7951-40-01-005000	1.25"	1.25"	1.8"	1.06"	7951-40-02-005000	2.50"	1.25"	2.4"	1.06"	7951-40-03-005000	4.00"	1.25"	3.9"	1.06"
0.562"	40						7951-40-02-005625	2.50"	1.38"	3.0"	1.06"					
0.625"	40	7951-40-01-006250	1.38"	1.50"	2.4"	1.06"	7951-40-02-006250	2.50"	1.57"	3.6"	1.06"	7951-40-03-006250	4.00"	1.50"	3.6"	1.06"
0.750"	40	7951-40-01-007500	1.44"	1.75"	2.5"	1.06"	7951-40-02-007500	2.50"	1.75"	3.9"	1.06"	7951-40-03-007500	4.00"	1.75"	3.9"	1.06"
0.875"	40						7951-40-02-008750	3.50"	1.88"	4.2"	1.06"	7951-40-03-008750	5.00"	1.88"	4.2"	1.06"
1.000"	40	7951-40-01-010000	2.50"	2.00"	2.5"	1.06"	7951-40-02-010000	3.75"	2.00"	4.4"	1.06"	7951-40-03-010000	5.00"	2.00"	4.4"	1.06"
1.250"	40	7951-40-01-012500	2.50"	2.49"	2.5"	1.06"	7951-40-02-012500	3.75"	2.50"	4.0"	1.06"	7951-40-03-012500	5.00"	2.50"	4.0"	1.06"
1.500"	40						7951-40-02-015000	4.25"	2.50"	4.0"	1.06"					

		40-TAPER S & R SHANK				
Style	Taper	Part No.	B	C	D	L
0.375"	40	7951-40-50-003750	6.00"	1.00"	7.3"	1.06"
0.500"	40	7951-40-50-005000	6.00"	1.25"	7.3"	1.06"
0.625"	40	7951-40-50-006250	6.00"	1.50"	3.6"	1.06"
0.750"	40	7951-40-50-007500	6.00"	1.75"	3.9"	1.06"



S&R (Strong and Rugged)

These extra strong and rugged long tool holders steady the tool for smoother and faster cutting. Tools last longer due to the added mass of the holder - decreases vibration. Accepts double-ended end mills.

End Mill Holders & Accessories — BT-Style Flange



End Mill Holders are offered in stub, standard, extended and S & R (strong & rugged) models. The fine pitch set screws (included) match Weldon flats to firmly lock the end mill. All holders, except the stub holders from 1/8" up to 1" diameter, can accept single- or double-end tools. The stub holder will only accept single-end tools. Holders for end mills 1" and larger have two locking screws (except the stub). The locking screws are aligned with the drive slot for your convenience. End mills without Weldon flats should not be used in these holders.

Retention knobs must be ordered separately for each holder; refer to page 21. For balance options; see pages 6 and 7. Holders for metric tools are available on application.

End Mill Holders 45- and 50-Taper – BT-Style Flange

A	Taper	45-TAPER STANDARD				45-TAPER EXTENDED					
		Part No.	B	C	D	L	Part No.	B	C	D	L
0.375"	45	7951-45-02-003750	3.00"	1.00"	3.2"	1.31"	7951-45-03-003750	5.00"	1.00"	5.2"	1.31"
0.500"	45	7951-45-02-005000	3.00"	1.25"	3.2"	1.31"	7951-45-03-005000	5.00"	1.25"	5.2"	1.31"
0.625"	45	7951-45-02-006250	3.00"	1.50"	3.2"	1.31"	7951-45-03-006250	5.00"	1.50"	5.2"	1.31"
0.750"	45	7951-45-02-007500	3.00"	1.75"	3.9"	1.31"	7951-45-03-007500	5.00"	1.75"	5.2"	1.31"
0.875"	45	7951-45-02-008750	4.00"	1.88"	4.2"	1.31"	7951-45-03-008750	6.00"	1.88"	4.2"	1.31"
1.000"	45	7951-45-02-010000	4.00"	2.00"	4.4"	1.31"	7951-45-03-010000	6.00"	2.00"	4.4"	1.31"
1.250"	45	7951-45-02-012500	4.00"	2.50"	4.0"	1.31"	7951-45-03-012500	6.00"	2.50"	4.0"	1.31"
1.500"	45	7951-45-02-015000	4.00"	2.50"	4.0"	1.31"	7951-45-03-015000	6.00"	2.50"	4.0"	1.31"

A	Taper	50-TAPER STANDARD				50-TAPER EXTENDED					
		Part No.	B	C	D	L	Part No.	B	C	D	L
0.375"	50	7951-50-02-003750	3.00"	1.00"	3.7"	1.50"	7951-50-03-003750	6.00"	1.00"	6.7"	1.50"
0.500"	50	7951-50-02-005000	3.00"	1.25"	3.7"	1.50"	7951-50-03-005000	6.00"	1.25"	6.7"	1.50"
0.625"	50	7951-50-02-006250	3.00"	1.50"	3.7"	1.50"	7951-50-03-006250	6.00"	1.50"	6.7"	1.50"
0.750"	50	7951-50-02-007500	3.00"	1.75"	3.7"	1.50"	7951-50-03-007500	6.00"	1.75"	6.7"	1.50"
0.875"	50	7951-50-02-008750	4.00"	1.88"	4.2"	1.50"	7951-50-03-008750	6.00"	1.88"	4.2"	1.50"
1.000"	50	7951-50-02-010000	4.25"	2.00"	4.4"	1.50"	7951-50-03-010000	6.00"	2.00"	4.4"	1.50"
1.250"	50	7951-50-02-012500	4.25"	2.50"	4.0"	1.50"	7951-50-03-012500	6.00"	2.50"	4.0"	1.50"
1.500"	50	7951-50-02-015000	4.25"	2.50"	4.0"	1.50"	7951-50-03-015000	6.00"	2.50"	4.0"	1.50"
2.000"	50	7951-50-02-020000	5.00"	3.75"	5.0"	1.50"	7951-50-03-020000	6.00"	3.75"	5.0"	1.50"

Replacement Locking Screws

A	Part No.	Thread Size	Length	Torque (in-lb)
0.125"	7990-12-45-000008	8 - 32	.25"	18
0.187"	7990-12-45-000010	10 - 32	.25"	30
0.250"	7990-12-45-002500	1/4" - 28	.25"	60
0.312"	7990-12-45-003125	5/16" - 24	.25"	120
0.375"	7990-12-45-003750	3/8" - 24	.25"	200
0.500"	7990-12-45-004375	7/16" - 20	.36"	220
0.625"	7990-12-45-005000	1/2" - 20	.42"	500
0.750"	7990-12-45-006250	5/8" - 18	.49"	560
0.875"	7990-12-45-006250	5/8" - 18	.49"	560
1.000"	7990-12-45-007500	3/4" - 16	.45"	1150
1.250"	7990-12-45-007500	3/4" - 16	.45"	1150
1.500"	7990-12-45-007500	3/4" - 16	.45"	1150
2.000"	7990-12-45-010000	1" - 14	.88"	1500

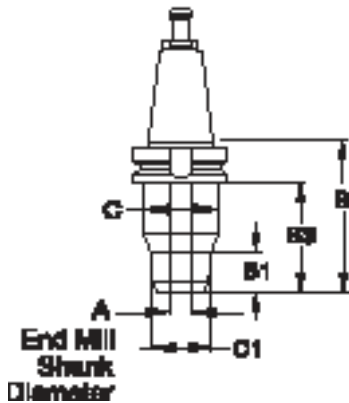




Hydraulic clamping ensures high-torque gripping of the end mill. The complete circumference of the end mill is gripped, which eliminates the need for special seals. Precision balance is assured when using end mills without flats. The hydraulic chamber is completely enclosed, eliminating any possibility of contamination from coolant and dirt. The unique design of this holder provides excellent gripping over the long haul. **Hydraulic End Mill Holders** are for precision work (not for roughing) and for end mills with one cutting end. Retention knobs must be ordered separately for each holder; see page 21. For balance options; see pages 6 and 7. Stop screws are sold separately. Metric sizes available on application.

Benefits:

- Powerful hydraulic grip
- Radial repeatability of $\pm 0.00008"$ (.0020 mm)
- Vibration damping for chatter-free machining
- Full radial grip on tool's diameter with greater gripping power than competitive holders
- Repetitive balance for high spindle speeds
- High gripping force provides a smooth and secure torque transmission to the cutting tool
- Ability to grip the end mill's shank with or without flats - high-speed operations require end mills with no flats
- Standard through-the-spindle coolant
- Holders for metric tools are available on application



End Mill Holders, Hydraulic Grip — BT-Style Flange

A	Taper	Part No.	B	B1	B3	C	C1
0.500"	40	7953-40-02-005000	4.000"	1.094"	2.936"	1.750"	1.404"
0.625"	40	7953-40-02-006250	4.000"	1.088"	2.936"	1.875"	1.500"
0.750"	40	7953-40-02-007500	4.000"	1.094"	2.936"	2.000"	1.638"
1.000"	40	7953-40-02-010000	4.000"	1.164"	2.936"	2.250"	1.967"

Stop Screws

Style	Part No.	Thread
All	7990-13-45-160000	M16-20



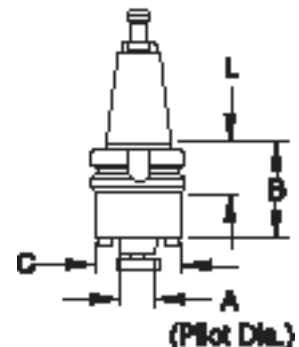


Shell Mill Holders are manufactured to precision tolerances. The pilot diameter is ground to fit the bore of the shell mill and is concentric to the centerline of the holder's shank. The locating face is perpendicular to the centerline within .0002". A cap screw and two removable drive keys come standard with each holder. 2" Shell Mill Holders have four 5/8"-11 threaded holes on a 4" bolt circle.

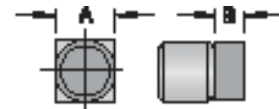
Retention knobs must be ordered separately for each holder; see page 21. For balance options; see pages 6 and 7. Holders for metric tools are available on application.

Shell Mill Holders – BT-Style Flange

A	Taper	STANDARD			EXTENDED				
		Part No.	B	C	L	Part No.	B	C	L
0.750"	30	7954-30-02-007500	1.75"	1.69"	.87"	—	—	—	—
1.000"	30	7954-30-02-010000	2.00"	2.19"	.87"	—	—	—	—
0.750"	35	7954-35-02-007500	1.18"	1.69"	.87"	7954-35-03-075000	4.72"	1.69"	.87"
1.000"	35	7954-35-02-010000	1.26"	2.19"	.87"	7954-35-03-010000	4.72"	2.19"	.87"
1.250"	35	7954-35-02-012500	2.36"	2.75"	.87"	—	—	—	—
0.750"	40	7954-40-02-007500	1.77"	1.69"	1.06"	7954-40-03-007500	4.13"	1.69"	1.06"
1.000"	40	7954-40-02-010000	1.77"	2.19"	1.06"	7954-40-03-010000	4.13"	2.19"	1.06"
1.250"	40	7954-40-02-012500	1.81"	2.75"	1.06"	7954-40-03-012500	4.13"	2.75"	1.06"
1.500"	40	7954-40-02-015000	2.36"	3.81"	1.06"	7954-40-03-015000	4.72"	3.81"	1.06"
0.750"	45	7954-45-02-007500	1.77"	1.69"	1.31"	7954-45-03-007500	4.13"	1.69"	1.31"
1.000"	45	7954-45-02-010000	1.77"	2.19"	1.31"	7954-45-03-010000	4.13"	2.19"	1.31"
1.250"	45	7954-45-02-012500	1.77"	2.75"	1.31"	7954-45-03-012500	4.13"	2.75"	1.31"
1.500"	45	7954-45-02-015000	2.36"	3.81"	1.31"	7954-45-03-015000	4.13"	3.81"	1.31"
2.000"	45	7954-45-02-020000	2.75"	4.88"	1.31"	7954-45-03-020000	4.72"	4.88"	1.31"
1.000"	50	7954-50-02-010000	1.75"	2.19"	1.50"	7954-50-03-010000	4.00"	2.19"	1.50"
1.250"	50	7954-50-02-012500	1.75"	2.75"	1.50"	7954-50-03-012500	4.00"	2.75"	1.50"
1.500"	50	7954-50-02-015000	1.75"	3.81"	1.50"	7954-50-03-015000	4.00"	3.81"	1.50"
2.000"	50	7954-50-02-020000	3.00"	4.88"	1.50"	7954-50-03-020000	4.00"	4.88"	1.50"



Drive Keys



Cap Screws



Drive Keys and Cap Screws

Pilot Diameter	Drive Key Part No.	A	B	Cap Screw Part No.	A	B
.750"	7993-10-09-003125	5/16"	.156"	7990-10-45-008750	7/8"	3/8" - 24
1.000"	7993-10-09-003750	3/8"	.187"	7990-10-45-011875	1 3/16"	1/2" - 20
1.250"	7993-10-09-005000	1/2"	.250"	7990-10-45-015000	1 1/2"	5/8" - 18
1.500"	7993-10-09-006250	5/8"	.312"	7990-10-45-018750	1 7/8"	3/4" - 16
2.000"	7993-10-09-007500	3/4"	.375"	7990-10-45-025000	2 1/2"	1" - 14

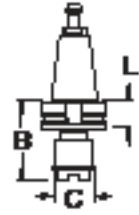
Heavy-Duty Tap Holders and Tap Collets — BT-Style Flange



This **Tension/Compression floating Tap Holder** accommodates feeding errors. Maximum pull out of .750" and compression of .370".



This Heavy-duty **Rigid Tap Holder** is for use on newer machine tools that have synchronous capabilities.



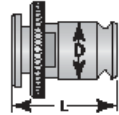
Tension/Compression and Rigid Tap Holders

Taper	Collet Size	STANDARD TAP HOLDER TENSION COMPRESSION			STANDARD TAP HOLDER RIGID SYNCHRONOUS			EXTENDED TAP HOLDER RIGID SYNCHRONOUS					
		Part No.	B*	C	L	Part No.	B*	C	L	Part No.	B*	C	L
30	#1	7955-30-02-000001	4.95"	1.75"	.87"	7956-30-02-000001	3.07"	1.50"	.87"	—	—	—	—
35	#1	7955-35-02-000001	4.68"	1.75"	.87"	7956-35-02-000001	3.12"	1.50"	.87"	—	—	—	—
35	#2	7955-35-02-000002	6.72"	2.25"	.87"	7956-35-02-000002	3.82"	1.88"	.87"	—	—	—	—
40	#1	7955-40-02-000001	4.53"	1.75"	1.06"	7956-40-02-000001	3.31"	1.50"	1.06"	7956-40-03-000001	5.87"	1.50"	1.06"
40	#2	7955-40-02-000002	6.72"	2.25"	1.06"	7956-40-02-000002	4.01"	1.88"	1.06"	7956-40-03-000002	6.57"	1.88"	1.06"
45	#1	7955-45-02-000001	4.53"	1.75"	1.31"	7956-45-02-000001	3.56"	1.50"	1.31"	7956-45-03-000001	6.87"	1.50"	1.31"
45	#2	7955-45-02-000002	6.72"	2.25"	1.31"	7956-45-02-000002	4.26"	1.88"	1.31"	7956-45-03-000002	7.57"	1.88"	1.31"
45	#3	7955-45-02-000003	8.33"	3.25"	1.31"	—	—	—	—	7956-45-03-000003	8.33"	3.25"	1.31"
50	#1	7955-50-02-000001	4.64"	1.75"	1.50"	7956-50-02-000001	3.75"	1.50"	1.50"	7956-50-03-000001	7.87"	1.50"	1.50"
50	#2	7955-50-02-000002	6.72"	2.25"	1.50"	7956-50-02-000002	4.45"	1.88"	1.50"	7956-50-03-000002	8.57"	1.88"	1.50"
50	#3	7955-50-02-000003	8.33"	3.25"	1.50"	—	—	—	—	7956-50-03-000003	8.33"	3.25"	1.50"

"B" dimension includes tap collet - no tap*. Both tap holders use Bilz-style quick-change collet systems. To use standard ER collets instead of quick-change collets; see adapter on page 46. Retention knobs must be ordered separately for each holder; see page 21.



Size	Diameter	Length
#1	.75" (19mm)	1.12" (28.44mm)
#2	1.22" (31mm)	1.81" (45.97mm)
#3	1.89" (48mm)	2.74" (70.00mm)



Quick-Change Tap Collets — Inch

Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-51-11-001410	0.141"	0.110"	#0-#6	7989-51-12-003180	0.318"	0.238"	5/16"	7989-51-13-006520	0.652"	0.489"	13/16"
7989-51-11-001680	0.168"	0.131"	#8	7989-51-12-003810	0.381"	0.286"	3/8"	7989-51-13-006970	0.697"	0.523"	7/8"
7989-51-11-001940	0.194"	0.152"	#10	7989-51-12-003230	0.323"	0.242"	7/16"	7989-51-13-007600	0.760"	0.570"	15/16"
7989-51-11-002200	0.220"	0.165"	#12	7989-51-12-003670	0.367"	0.275"	1/2"	7989-51-13-008000	0.800"	0.600"	1"
7989-51-11-002550	0.255"	0.191"	1/4"	7989-51-12-004290	0.429"	0.322"	9/16"	7989-51-13-008960	0.896"	0.672"	1 1/8"
7989-51-11-003180	0.318"	0.238"	5/16"	7989-51-12-004800	0.480"	0.360"	5/8"	7989-51-13-010210	1.021"	0.766"	1 1/4"
7989-51-11-003810	0.381"	0.286"	3/8"	7989-51-12-005420	0.542"	0.406"	11/16"	7989-51-13-011080	1.108"	0.831"	1 3/8"
7989-51-11-003230	0.323"	0.242"	7/16"	7989-51-12-005900	0.590"	0.442"	3/4"	7989-51-13-007000	0.700"	0.531"	3/8" Pipe
7989-51-11-003670	0.367"	0.275"	1/2"	7989-51-12-006520	0.652"	0.489"	13/16"	7989-51-13-006870	0.687"	0.515"	1/2" Pipe
7989-51-11-004290	0.429"	0.322"	9/16"	7989-51-12-006970	0.697"	0.523"	7/8"	7989-51-13-009060	0.906"	0.679"	3/4" Pipe
7989-51-11-003130	0.313"	0.234"	1/16" Pipe	7989-51-12-005620	0.562"	0.421"	1/4" Pipe	7989-51-13-011250	1.125"	0.843"	1" Pipe
7989-51-11-004370	0.437"	0.328"	1/8" Pipe	7989-51-12-007000	0.700"	0.531"	3/8" Pipe				
				7989-51-12-006870	0.687"	0.515"	1/2" Pipe				
7989-51-11-000002	Kit of 12 Collets			7989-51-12-000002	Kit of 13 Collets			7989-51-13-000002	Kit of 11 Collets		

Metric collets are made to the DIN standard – ANSI standard metric taps (the standard common in the United States) cannot be used in these collets – Refer to chart below for ANSI Metric tap shank sizes for use in Inch collets. See Brochure 2351 for additional Tap Holder Collet information.

ANSI Metric Taps and their Shank Sizes:

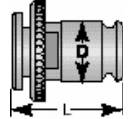
M1 to M3.5 – .141"; M4 – .168"; M4.5 & M5 – .194"; M6 & M6.3 – .255"; M7 & M8 – .318"; M10 – .381"; M12 – .367"; M14 – .429"

Quick-Change Tap and Torque Control Collets



Dimensions

Size	Diameter	Length
#1	.75" (19mm)	1.12" (28.44mm)
#2	1.22" (31mm)	1.81" (45.97mm)
#3	1.89" (48mm)	2.74" (70.00mm)



Quick-Change Tap Collets — Metric

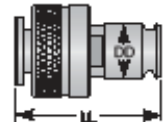
Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-51-21-035000	3.5mm	2.7mm	M7	7989-51-22-060000	6.0mm	4.9 mm	M6,M8	7989-51-23-110000	11.0mm	9.0mm	M14
7989-51-21-045000	4.5mm	3.4mm	M4	7989-51-22-080000	8.0mm	6.2 mm	M8	7989-51-23-120000	12.0mm	9.0mm	M16
7989-51-21-060000	6.0mm	4.9mm	M5,6,8	7989-51-22-100000	10.0mm	8.0 mm	M10	7989-51-23-140000	14.0mm	11.0mm	M18
7989-51-21-080000	8.0mm	6.2mm	M8	7989-51-22-070000	7.0mm	5.5 mm	M10	7989-51-23-160000	16.0mm	12.0mm	M20
7989-51-21-100000	10.0mm	8.0mm	M10	7989-51-22-090000	9.0mm	7.0 mm	M12	7989-51-23-180000	18.0mm	14.5mm	M22,M24
7989-51-21-070000	7.0mm	5.5mm	M10	7989-51-22-110000	11.0mm	9.0 mm	M14	7989-51-23-200000	20.0mm	16.0mm	M27
7989-51-21-090000	9.0mm	7.0mm	M12	7989-51-22-120000	12.0mm	9.0 mm	M16	7989-51-23-220000	22.0mm	18.0mm	M30
7989-51-21-110000	11.0mm	9.0mm	M14	7989-51-22-140000	14.0mm	11.0 mm	M18	7989-51-23-250000	25.0mm	20.0mm	M33
—	—	—	—	7989-51-22-160000	16.0mm	12.0 mm	M20	—	—	—	—

Metric collets are made to the DIN standard. ANSI standard metric taps (the standard common in the United States) cannot be used in these collets. Refer to chart below for ANSI Metric tap shank sizes for use in Inch collets.



Dimensions

Size	Diameter	Length
#1	.75" (19mm)	1.83" (48.48mm)
#2	1.22" (31mm)	2.72" (69.00mm)
#3	1.89" (48mm)	3.96" (100.58mm)



Torque Control Tap Collets — Inch

Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-52-11-001410	0.141"	0.110"	#0-#6	7989-52-12-003180	0.318"	0.238"	5/16"	7989-52-13-006520	0.652"	0.489"	13/16"
7989-52-11-001680	0.168"	0.131"	#8	7989-52-12-003810	0.381"	0.286"	3/8"	7989-52-13-006970	0.697"	0.523"	7/8"
7989-52-11-001940	0.194"	0.152"	#10	7989-52-12-003230	0.323"	0.242"	7/16"	7989-52-13-007600	0.760"	0.570"	15/16"
7989-52-11-002200	0.220"	0.165"	#12	7989-52-12-003670	0.367"	0.275"	1/2"	7989-52-13-008000	0.800"	0.600"	1"
7989-52-11-002550	0.255"	0.191"	1/4"	7989-52-12-004290	0.429"	0.322"	9/16"	7989-52-13-008960	0.896"	0.672"	1 1/8"
7989-52-11-003180	0.318"	0.238"	5/16"	7989-52-12-004800	0.480"	0.360"	5/8"	7989-52-13-010210	1.021"	0.766"	1 1/4"
7989-52-11-003810	0.381"	0.286"	3/8"	7989-52-12-005420	0.542"	0.406"	11/16"	7989-52-13-011080	1.108"	0.831"	1 3/8"
7989-52-11-003230	0.323"	0.242"	7/16"	7989-52-12-005900	0.590"	0.442"	3/4"	7989-52-13-007000	0.700"	0.531"	3/8" Pipe
7989-52-11-003670	0.367"	0.275"	1/2"	7989-52-12-006520	0.652"	0.489"	13/16"	7989-52-13-006870	0.687"	0.515"	1/2" Pipe
7989-52-11-004290	0.429"	0.322"	9/16"	7989-52-12-006970	0.697"	0.523"	7/8"	7989-52-13-009060	0.906"	0.679"	3/4" Pipe
7989-52-11-003130	0.313"	0.234"	1/16" Pipe	7989-52-12-005620	0.562"	0.421"	1/4" Pipe	7989-52-13-011250	1.125"	0.843"	1" Pipe
7989-52-11-004370	0.437"	0.328"	1/8" Pipe	7989-52-12-007000	0.700"	0.531"	3/8" Pipe	—	—	—	—
—	—	—	—	7989-52-12-006870	0.687"	0.515"	1/2" Pipe	—	—	—	—

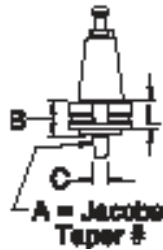
ANSI Metric Taps and their Shank Sizes:

M1 to M3.5 — .141"; M4 — .168"; M4.5 & M5 — .194"; M6 & M6.3 — .255"; M7 & M8 — .318"; M10 — .381"; M12 — .367"; M14 — .429"

Torque Control Tap Collets — Metric (Non-stock) made to DIN Standard. ANSI metric taps cannot be used in these collets

Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-52-21-035000	3.5mm	2.7mm	M3	7989-52-22-060000	6.0mm	4.9mm	M6,M8	7989-51-23-110000	11.0mm	9.0mm	M14
7989-52-21-045000	4.5mm	3.4mm	M4	7989-52-22-080000	8.0mm	6.2mm	M8	7989-51-23-120000	12.0mm	9.0mm	M16
7989-52-21-060000	6.0mm	4.9mm	M5,6,8	7989-52-22-100000	10.0mm	8.0mm	M10	7989-51-23-140000	14.0mm	11.0mm	M18
7989-52-21-080000	8.0mm	6.2mm	M8	7989-52-22-070000	7.0mm	5.5mm	M10	7989-51-23-160000	16.0mm	12.0mm	M20
7989-52-21-100000	10.0mm	8.0mm	M10	7989-52-22-090000	9.0mm	7.0mm	M12	7989-51-23-180000	18.0mm	14.5mm	M22,M24
7989-52-21-070000	7.0mm	5.5mm	M10	7989-52-22-110000	11.0mm	9.0mm	M14	7989-51-23-200000	20.0mm	16.0mm	M27
7989-52-21-090000	9.0mm	7.0mm	M12	7989-52-22-120000	12.0mm	9.0mm	M16	7989-51-23-220000	22.0mm	18.0mm	M30
7989-52-21-110000	11.0mm	9.0mm	M14	7989-52-22-140000	14.0mm	11.0mm	M18	7989-51-23-250000	25.0mm	20.0mm	M33
—	—	—	—	7989-52-22-160000	16.0mm	12.0mm	M20	—	—	—	—

NOTE: Torque Control collets can only be used in Tension/Compression Tap Holders. These collets slip when the torque is exceeded. There is no tension/compression built into the collet. See Brochure 2351 for additional information on Collets.

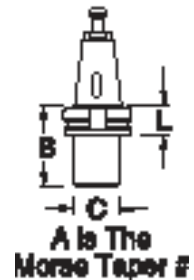


The **Jacobs Taper Holder** is designed for use with standard and keyless chucks that require a male Jacobs taper. The male taper is precision ground to ensure a locking fit. These holders are not recommended for high spindle speeds. The holder and the chuck must be thoroughly cleaned and degreased for a precision fit.

ER or TG collet chucks are recommended for the tightest grip and high spindle speed application. Retention knobs must be ordered separately for each holder; see page 21. Metric sizes available on application.

Jacobs Taper Holders

A	Taper	Part Number	B	C	L
#1	30	7966-30-02-000001	1.18"	.384"	0.87"
#33	30	7966-30-02-000033	1.77"	.624"	0.87"
#1	35	7966-35-02-000001	1.18"	.384"	0.87"
#2	35	7966-35-02-000002	1.77"	.559"	0.87"
#3	35	7966-35-02-000003	1.77"	.811"	0.87"
#33	35	7966-35-02-000033	1.77"	.624"	0.87"
#1	40	7966-40-02-000001	1.34"	.384"	1.06"
#2	40	7966-40-02-000002	1.77"	.559"	1.06"
#3	40	7966-40-02-000003	1.77"	.811"	1.06"
#4	40	7966-40-02-000004	1.77"	1.124"	1.06"
#33	40	7966-40-02-000033	1.77"	.624"	1.06"
#1	45	7966-45-02-000001	1.77"	.384"	1.31"
#2	45	7966-45-02-000002	1.77"	.559"	1.31"
#3	45	7966-45-02-000003	1.77"	.811"	1.31"
#4	45	7966-45-02-000004	1.77"	1.124"	1.31"
#6	45	7966-45-02-000006	1.77"	.676"	1.31"
#33	45	7966-45-02-000033	1.77"	.624"	1.31"
#1	50	7966-50-02-000001	1.80"	.384"	1.50"
#2	50	7966-50-02-000002	1.77"	.559"	1.50"
#3	50	7966-50-02-000003	1.77"	.811"	1.50"
#4	50	7966-50-02-000004	1.77"	1.124"	1.50"
#6	50	7966-50-02-000006	1.77"	.675"	1.50"
#33	50	7966-50-02-000033	1.77"	.624"	1.50"



The **Morse Taper Holder** is used when the only drill available is one with a Morse taper. The female taper is precision ground to ensure a locking fit. These holders are not recommended for high spindle speeds. They must be thoroughly cleaned and degreased for a precision fit.

ER or TG collet chucks are recommended for the tightest grip and high spindle speed application. Retention knobs must be ordered separately for each holder; see page 21. Metric sizes available on application.

Morse Taper Holders

A	Taper	Part Number	B	C	L
#2	30	7967-30-02-000002	2.50"	1.26"	0.87"
#2	35	7967-35-02-000002	2.36"	1.26"	0.87"
#3	35	7967-35-02-000003	2.95"	1.58"	0.87"
#4	35	7967-35-02-000004	3.85"	1.97"	0.87"
#2	40	7967-40-02-000002	2.36"	1.26"	1.06"
#3	40	7967-40-02-000003	2.95"	1.58"	1.06"
#4	40	7967-40-02-000004	3.74"	1.97"	1.06"
#2	45	7967-45-02-000002	1.77"	1.26"	1.31"
#3	45	7967-45-02-000003	2.36"	1.58"	1.31"
#4	45	7967-45-02-000004	3.35"	1.97"	1.31"
#5	45	7967-45-02-000005	4.72"	2.56"	1.31"
#2	50	7967-50-02-000002	2.36"	1.26"	1.50"
#3	50	7967-50-02-000003	2.95"	1.58"	1.50"
#4	50	7967-50-02-000004	3.74"	1.97"	1.50"
#5	50	7967-50-02-000005	4.13"	2.56"	1.50"

Ball Bearing Key-Type Drill Chuck



Taper	Part Number	Model	Capacity	Key Part No.
#2	7994-14-02-003750	11N	0 - 3/8"	7994-15-02-003750
#3	7994-14-03-005000	14N	0 - 1/2"	7994-15-03-005000
#3	7994-14-03-006250	16N	1/8" - 5/8"	7994-15-03-006250
#4	7994-14-04-007500	18N	1/8" - 3/4"	7994-15-04-006250

Keyless Drill Chuck



Taper	Part Number	Model	Capacity
#1	7994-16-01-002500	85J1	0 - 1/4"
#2	7994-16-02-003125	80J2	0 - 5/16"
#2	7994-16-02-005000	130J2	1/32" - 1/2"
#33	7994-16-33-003750	100J33	0 - 3/8"



Semi-Flush Slitting & Stub Arbor Holders — BT-Style Flange



The **Semi-Flush Slitting Saw Holder** is designed for slitting saws up to $\frac{5}{16}$ " thick. The semi-flush cap allows the cutter to get into tight areas not accessible with stub arbor holders. Spacers are not required when changing saw widths. The pilot diameter is precision ground concentric to the shank with the locating shoulder perpendicular to the centerline within .0002".

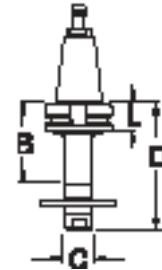
Retention knobs must be ordered separately for each holder; see page 21. See pages 6 and 7 for balance options.

Semi-Flush Slitting Saw Holders

Taper	Part Number	Saw ID	B	C	L
40	7957-40-00-010000	1.00"	4.00"	1.50"	1.06"
40	7957-40-00-012500	1.25"	4.00"	2.00"	1.06"

Cap and Drive Keys

Item	Part Number
Cap for 1"	7991-08-00-010000
Drive Key For 1"	7993-08-09-010000
Cap for 1 $\frac{1}{4}$ "	7991-08-00-012500
Drive Key for 1 $\frac{1}{4}$ "	7993-08-09-012500



The pilot diameter and thread on the **Stub Arbor Holder** is precision ground concentric to the shank. The diameter mates precisely to the cutter ID and is keyed to provide a positive drive. The locating shoulder is guaranteed to be perpendicular to the centerline within .0002". Included with each arbor is a heavy-duty locking nut, $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{3}{4}$ " spacers.

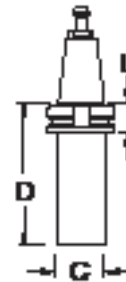
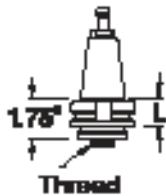
Retention knobs must be ordered separately for each holder; see page 21. See pages 6 and 7 for balance options. Holders for metric tools are available on application.

Stub Arbor Holders

Taper	Part No.	Saw ID	B	C	D	L
40	7958-40-02-010000	1.00"	4.00"	1.56"	6.25"	1.06"
40	7958-40-02-012500	1.25"	4.00"	1.87"	6.50"	1.06"
45	7958-45-02-010000	1.00"	4.00"	1.56"	6.25"	1.31"
45	7958-45-02-012500	1.25"	4.00"	1.87"	6.50"	1.31"
50	7958-50-02-010000	1.00"	4.00"	1.56"	6.25"	1.50"
50	7958-50-03-010000	1.00"	6.00"	1.56"	8.25"	1.50"
50	7958-50-02-012500	1.25"	4.00"	1.87"	6.50"	1.50"
50	7958-50-03-012500	1.25"	6.00"	1.87"	8.50"	1.50"

Accessories

Item	Part Number
Nut for 1"	7990-09-40-010000
Key For 1"	7993-09-09-010000
$\frac{1}{4}$ " Spacer For 1"	7993-09-42-010000
$\frac{3}{8}$ " Spacer For 1"	7993-09-43-010000
$\frac{3}{4}$ " Spacer For 1"	7993-09-47-010000
Nut For 1 $\frac{1}{4}$ "	7990-09-40-012500
Key For 1 $\frac{1}{4}$ "	7993-09-09-012500
$\frac{1}{4}$ " Spacer For 1 $\frac{1}{4}$ "	7993-09-42-012500
$\frac{3}{8}$ " Spacer For 1 $\frac{1}{4}$ "	7993-09-43-012500
$\frac{3}{4}$ " Spacer For 1 $\frac{1}{4}$ "	7993-09-47-012500



Hardinge **Boring Head Holders** will take the most popular adjustable boring heads – Erickson #37 and #50 heads, SPI, Yuasa and Criterion heads. When ordering, make certain that you order the holder for your specific boring head.

Retention knobs must be ordered separately for each holder; see page 21.

When special applications arise and you need to make your own holder; we suggest you start with our **Blank Holders**. They are made from 8620 alloy steel with the shank and flange case hardened and precision ground. We have left the head softer for easier machining. We offer a standard and short version to better meet your needs.

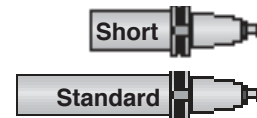
Retention knobs must be ordered separately for each holder; see page 21.

Boring Head Holders

Taper	Part Number	Thread	L	Boring Heads
30	7968-30-00-006250	5/8"-18	.87"	Erickson #37 & #50
30	7969-30-00-008750	7/8"-20	.87"	SPI, Yuasa & Criterion
35	7968-35-00-006250	5/8"-18	.87"	Erickson #37 & #50
35	7969-35-00-008750	7/8"-20	.87"	SPI, Yuasa & Criterion
40	7968-40-00-006250	5/8"-18	1.06"	Erickson #37 & #50
40	7969-40-00-008750	7/8"-20	1.06"	SPI, Yuasa & Criterion
40	7969-40-00-015000	1 1/2"-18	1.06"	SPI, Yuasa & Criterion
45	7968-45-00-006250	5/8"-18	1.06"	Erickson #37 & #50
45	7969-45-00-008750	7/8"-20	1.06"	SPI, Yuasa & Criterion
45	7969-45-00-015000	1 1/2"-18	1.06"	SPI, Yuasa & Criterion
50	7968-50-00-006250	5/8"-18	1.06"	Erickson #37 & #50
50	7969-50-00-008750	7/8"-20	1.06"	SPI, Yuasa & Criterion
50	7969-50-00-015000	1 1/2"-18	1.06"	SPI, Yuasa & Criterion

Blank Holders

Taper	Part Number	C	D	L
30	7970-30-01-000000	1 3/4"	6" short	.87"
35	7970-35-01-000000	2 3/8"	6" short	.87"
35	7970-35-02-000000	2 3/8"	11" standard	.87"
40	7970-40-01-000000	2 1/2"	6" short	1.06"
40	7970-40-02-000000	2 1/2"	11" standard	1.06"
45	7970-45-01-000000	3 1/4"	6" short	1.31"
45	7970-45-02-000000	3 1/4"	11" standard	1.31"
50	7970-50-01-000000	3 3/8"	6" short	1.50"
50	7970-50-02-000000	3 3/8"	11" standard	1.50"

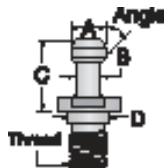


Retention Knobs — BT-Style Flange



Our retention knobs are manufactured to the industrial standards indicated in the charts. The knobs are made from tool steel that was heat treated to ensure durability and excellent performance. In addition to U.S. ANSI and MAS Styles, retention knobs are also available for other domestic and imported machining centers.

Due to the many different retention knobs used by machining center manufacturers, you may not find your knob in our catalog. We stock hundreds of knobs not listed. Please fill out the retention knob request form. If it is not a stock item, we will manufacture it to your machine tool builder's specifications.



If the specifications for your retention knob do not appear in our listing, please fill out this Retention Knob Request Form and give us a call.

A inch/mm _____
 B inch/mm _____
 C inch/mm _____
 D inch/mm _____
 Angle degrees _____
 Thread _____
 Toolholder Shank Style _____

Machine Make _____
 Machine Model _____
 Coolant Hole—Yes/No _____
 Hole Diameter _____
 O-Ring—Yes/No _____

(send print for position)

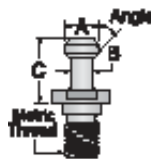
Caution: Our retention knobs are built to the machine tool builder's specifications. Using retention knobs which do not conform to these specifications can cause damage to your tooling and/or machine tool.

U.S. ANSI BT-Flange Retention Knobs with Coolant Hole



Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
BT40C	7985-40-11-000001	0.74"	0.49"	0.64"	45	M16-2.0	85
BT40C	7985-40-11-000002	0.74"	0.49"	0.75"	45	M16-2.0	85
BT45C	7985-45-11-000001	0.94"	0.61"	0.82"	45	M20-2.5	100
BT50C	7985-50-11-000001	1.14"	0.83"	1.00"	45	M24-3.0	110

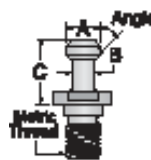
MAS Style BT-Flange Retention Knobs



Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
BT30	7985-30-20-000001	0.43"	0.27"	0.90"	45	M12-1.75	40
BT30	7985-30-20-000002	0.43"	0.27"	0.90"	60	M12-1.75	40
BT35	7985-35-20-000001	0.51"	0.33"	1.10"	45	M12-1.75	40
BT35	7985-35-20-000002	0.51"	0.33"	1.10"	60	M12-1.75	40
BT40	7985-40-20-000001	0.59"	0.39"	1.38"	45	M16-2.0	85
BT40C	7985-40-21-000001	0.59"	0.39"	1.38"	45	M16-2.0	85
BT40	7985-40-20-000002	0.59"	0.39"	1.38"	60	M16-2.0	85
BT40C	7985-40-21-000002	0.59"	0.39"	1.38"	60	M16-2.0	85
BT40	7985-40-20-000003	0.59"	0.39"	1.38"	90	M16-2.0	85
BT45	7985-45-20-000001	0.75"	0.55"	1.57"	45	M20-2.5	100
BT45	7985-45-20-000002	0.75"	0.55"	1.57"	60	M20-2.5	100
BT45	7985-45-20-000003	0.75"	0.55"	1.57"	90	M20-2.5	100
BT50	7985-50-20-000001	0.91"	0.67"	1.77"	45	M24-3.0	110
BT50C	7985-50-21-000001	0.91"	0.67"	1.77"	45	M24-3.0	110
BT50	7985-50-20-000002	0.91"	0.67"	1.77"	60	M24-3.0	110
BT50	7985-50-20-000003	0.91"	0.67"	1.77"	90	M24-3.0	110
BT50C	7985-50-21-000002	0.91"	0.67"	1.77"	90	M24-3.0	110

See page 37 for Bridgeport machine knob compatibility.

Other Style BT-Flange Retention Knobs

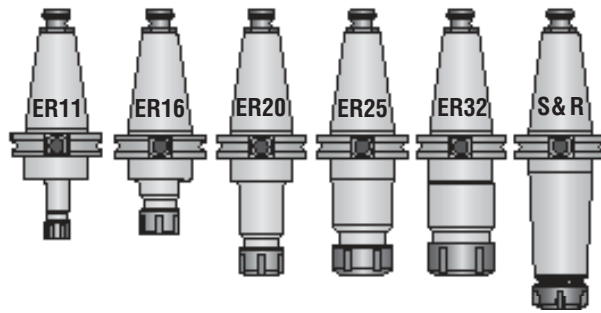
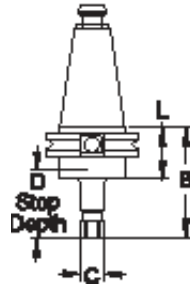


Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
BT30	7985-30-30-000001	0.47"	0.31"	0.94"	.16 R*	M12-1.75	40
BT30C	7985-30-31-000001	0.47"	0.31"	0.92"	75	M12-1.75	40
BT35	7985-35-30-000001	0.54"	0.35"	1.10"	60	M12-1.75	40
BT35	7985-35-30-000002	0.55"	0.31"	0.91"	90	M12-1.75	40
BT40	7985-40-30-000001	0.75"	0.55"	1.13"	75	M16-2.0	85
BT40C	7985-40-31-000001	0.75"	0.55"	1.14"	75	M16-2.0	85
BT40	7985-40-30-000002	0.59"	0.39"	1.09"	90	M16-2.0	85
BT40	7985-40-30-000003	0.59"	0.39"	0.98"	90	M16-2.0	85
BT40H	7985-40-32-000001	0.75"	0.55"	1.14"	75	M16-2.0	85
BT45	7985-45-30-000001	0.91"	0.67"	1.18"	75	M20-2.5	100

* Wrench flats are on the knob end

"C" at the end of the Taper and Flange number designates a Coolant hole

Precision ER Collet Chucks — CAT-V Flange



ER Collet Holders are available from ER11 to ER32 Styles (.019" to .787" diameters). The flush, precision nosepiece grips the tool close to the cutting edge for better accuracy. The shank taper accuracy for the holders is AT-3 or better. They are made to precision specifications. Each style is concentric to the centerline within .0002". ER holders give you the flexibility to mill, drill, ream, bore and tap. Retention knobs must be ordered separately for each holder; see pages 35 and 36. High-pressure coolant seals; see page 47. Balance options; see pages 6 and 7.

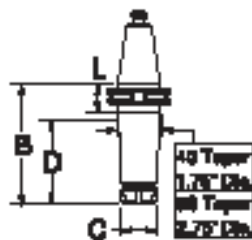
Precision ER Holders – CAT-V Flange

Style	Taper	STUB					STANDARD					EXTENDED					
		Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L	
ER11	30																
ER16	30						7932-30-02	3.00"	1.08"	2.7"	1.38"						
ER20	30						7933-30-02	3.00"	1.26"	3.0"	1.38"						
ER32	30						7935-30-02	3.00"	1.88"	2.5"	1.38"						
ER11	40						7931-40-02	3.00"	.63"	1.6"	1.38"						
ER16	40						7932-40-02	2.88"	1.08"	3.0"	1.38"	7932-40-03	4.88"	1.08"	3.0"	1.38"	
ER20	40	7933-40-01	2.55"	1.26"	2.9"	1.38"	7933-40-02	4.00"	1.26"	3.5"	1.38"	7933-40-03	6.00"	1.26"	3.5"	1.38"	
ER20X	40											7933-40-04	8.00"	1.26"	3.5"	1.38"	
ER25	40	7934-40-01	2.50"	1.65"	3.0"	1.38"	7934-40-02	4.00"	1.65"	3.5"	1.38"	7934-40-03	6.00"	1.65"	3.5"	1.38"	
ER32	40	7935-40-01	2.70"	1.88"	3.3"	1.38"	7935-40-02	4.00"	1.88"	4.0"	1.38"	7935-40-03	6.00"	1.88"	4.0"	1.38"	

Note: Suffix X indicates Extra-Extended Holder

Style	Taper	STANDARD					EXTENDED					EXTRA EXTENDED					
		Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L	
ER16	45	7932-45-02	3.88"	1.08"	3.0"	1.38"											
ER20	45	7933-45-02	4.00"	1.26"	3.5"	1.38"											
ER32	45	7935-45-02	4.00"	1.88"	4.0"	1.38"											
ER16	50	7932-50-02	4.88"	1.08"	3.0"	1.38"	7932-50-03	6.88"	1.08"	3.0"	1.38"						
ER20	50	7933-50-02	4.00"	1.26"	3.5"	1.38"	7933-50-03	6.00"	1.26"	3.5"	1.38"	7933-50-04	8.00"	1.26"	3.5"	1.38"	
ER25	50	7934-50-02	4.00"	1.65"	3.5"	1.38"	7934-50-03	6.00"	1.65"	3.5"	1.38"						
ER32	50	7935-50-02	4.00"	1.88"	4.0"	1.38"	7935-50-03	6.00"	1.88"	4.0"	1.38"	7935-50-04	8.00"	1.88"	4.0"	1.38"	

Style	Taper	S & R SHANK				
		Part No.	B	C	D	L
ER20	40	7933-40-50	6.00"	1.26"	3.5"	1.38"
ER20	50	7933-50-50	6.00"	1.26"	3.5"	1.38"
ER20	50	7933-50-51	8.00"	1.26"	3.5"	1.38"
ER32	50	7935-50-50	6.00"	1.88"	4.0"	1.38"
ER32	50	7935-50-51	8.00"	1.88"	4.0"	1.38"



S&R (Strong and Rugged)

These extra strong and rugged long tool holders steady the tool for smoother, and faster cutting. Tools last longer due to the added mass of the holder that decreases vibration. Accepts double-ended end mills.



Nosepiece Caps and Wrenches for ER Collet Chuck Holders

Style	Taper	C Dia.	Standard Part No.	Ball Bearing Part No.	Wrench for Std. & Ball Bearing Part No.	Fine Tune Part No.	U-Balance Part No.	Wrench for Fine & U-Bal. Part No.
ER11	All	.63"	7991-01-11-000001	—	7992-01-11-000003	—	—	—
ER16	All	1.08"	7991-01-16-000001	—	7992-01-16-000003	7991-01-16-000009	7991-01-16-000010	7992-01-16-000009
ER20	All	1.26"	7991-01-20-000001	7991-01-20-000008	7992-01-20-000003	7991-01-20-000009	7991-01-20-000010	7992-01-20-000009
ER25	All	1.65"	7991-01-25-000001	7991-01-25-000008	7992-01-25-000003	7991-01-25-000009	7991-01-25-000010	7992-01-25-000009
ER32	All	1.88"	7991-01-32-000001	7991-01-32-000008	7992-01-32-000003	7991-01-32-000009	7991-01-32-000010	7992-01-32-000009



Stop Screws and Clips for ER Holders

Style	ER Standard Part No.	ER Standard Coolant 400psi Part No.	Thread	Extractor Clips Package of 10
ER11	—	—	—	—
ER16	7990-01-16-000004	7990-01-16-000006	7/16" - 20	7993-01-16-000007
ER20	7990-01-20-000004	7990-01-20-000006	M14 - 1.5	7993-01-20-000007
ER25	7990-01-25-000004	7990-01-25-000006	M18 - 1.5	7993-01-25-000007
ER32	7990-01-32-000004	7990-01-32-000006	M22 - 1.5	7993-01-32-000007



Collets for ER Holders — see pages 43-44 for additional collet information

Style	Metric Collets			Fractional Collets		Tap Collets – Split	
	Base Part No.	Range	Range Inches	Base Part No.	Range	Base Part No.	Range
ER11	1911-00-17-	1 mm to 07 mm	.019" to .275"	1911-00-19-	1/16" to 1/4"	—	—
ER16	1913-00-17-	1 mm to 10 mm	.019" to .393"	1913-00-19-	1/16" to 13/32"	1913-00-18-	#0 to 1/4"
ER20	1915-00-17-	2 mm to 13 mm	.039" to .511"	1915-00-19-	1/16" to 1/2"	1915-00-18-	#8 to 1/2"
ER25	2095-00-17-	2 mm to 16 mm	.039" to .629"	2095-00-19-	1/16" to 5/8"	2095-00-18-	#8 to 5/8"
ER32	1917-00-17-	3 mm to 20 mm	.078" to .787"	1917-00-19-	3/32" to 3/4"	1917-00-18-	#8 to 13/16"

Quick-Change Floating Solid Tap Collets

Style	Base Part No.	Range
ERQC16	2143-00-18-	#0 - #10
ERQC20	2145-00-18-	#0 - 1/4"
ERQC25	2147-00-18-	#0 - 1/2"
ERQC32	2149-00-18-	#0 - 5/16"



ERQC Collets are shown on page 46.

Floating Solid Tap Collets

Style	Base Part No.	Range
ERTC16	1921-00-18-	#0 - #10
ERTC20	1923-00-18-	#0 - 1/4"
ERTC25	2097-00-18-	#0 - 1/2"
ERQC32	2099-00-18-	#8 - 5/8"

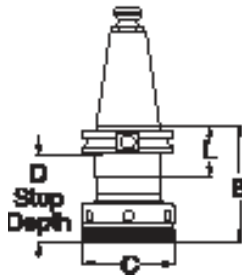
ERTC Collets are shown on page 45.



Why shouldn't I use end mills with Weldon flats in collet-style holders?

Non-symmetrical tools should not be used in a collet-style holder. The Weldon flat makes the end mill unbalanced (non-symmetrical) resulting in poor finishes and possible spindle damage.




Precision TG Collet Chucks — CAT-V Flange



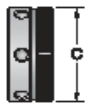
TG Collet Holders are available for the TG100 and TG150 (.093" to 1.5" diameter) collets. The TG Holders have a flush nosepiece design incorporating a rotating ball assembly which produces a radial float. This, in turn, forces the collet to self-center for maximum grip, precision and extended tool life.

Retention knobs are ordered separately; see pages 35 and 36. "Cool Stop" high-pressure coolant seals available on page 47. For balance options; see pages 6 and 7. Maximum recommended torque is 60 ft-lb – DO NOT OVER-TORQUE

Precision TG Holders – CAT-V Flange

Style	Taper	STANDARD/STUB 					EXTENDED 					EXTRA EXTENDED 				
		Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L
TG100	30	7929-30-02	4.34"	2.50"	2.0"	1.38"										
TG100	40	7929-40-02	3.25"	2.50"	2.9"	1.38"	7929-40-03	4.50"	2.50"	3.9"	1.38"	7929-40-04	6.25"	2.50"	5.0"	1.38"
TG150	40	7930-40-02	4.88"	3.50"	3.8"	1.38"										
TG100	45	7929-45-02	3.75"	2.50"	4.3"	1.38"	7929-45-03	6.00"	2.50"	5.0"	1.38"	7929-45-04	7.75"	2.50"	5.0"	1.38"
TG150	45	7930-45-02	4.00"	3.50"	4.4"	1.38"	7930-45-03*	6.00"	3.50"	5.0"	1.38"	7930-45-04*	8.00"	3.50"	5.0"	1.38"
TG100S	50	7929-50-01	2.75"	2.50"	3.7"	1.37"										
TG100	50	7929-50-02	3.25"	2.50"	4.2"	1.38"	7929-50-03	5.50"	2.50"	5.0"	1.38"	7929-50-04	7.25"	2.50"	5.0"	1.38"
TG150	50	7930-50-02	3.50"	3.50"	4.5"	1.38"	7930-50-03*	5.50"	3.50"	5.0"	1.38"	7930-50-04*	7.50"	3.50"	5.0"	1.38"

Note: D - Depth of Stop Screw, S - Stub Holder, * Requires Stop Screw



Nosepiece and Wrench for TG Holders

Style	Taper	C Diameter	TG Nosepiece Part No.	Wrench Part No.
TG100	All	2.50"	7991-02-10-000014	7992-02-10-000003
TG150	All	3.50"	7991-02-15-000015	7992-02-15-000003

Stop Screws for TG Holders

Style	Thread	TG Stop Screw Standard Part No.	TG Stop Screw Coolant 400 psi Part No.
TG100	1 1/8" x 16	7990-02-10-000004	7990-02-10-000006
TG150	1 1/8" x 12	7990-02-15-000004	7990-02-15-000006
TG150	1 5/8" x 12	7990-02-15-000014	7990-02-15-000016



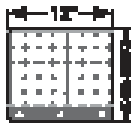
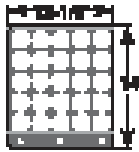
TG collets have a shallow single-angle to ensure precise concentricity between the collet, the holder and the tool. The nosepiece associated with the TG holder incorporates a rotating ball assembly with a radial float. The accuracy of this system is unsurpassed by any other. Coolant seals are shown on page 47.

Standard TG Collets

Style	Inch Part No.	Range 1/64" Increments	Metric Part No.	Range
TG100	1905-00-19-	3/32" to 1"	1905-00-17-	6.0mm to 25.5mm
TG150	1909-00-19-	1/2" to 1 1/2"	1909-00-17-	12. mm to 38.0mm

See the next page for the full range of TG Collets and part numbers.

TG Collet Racks

	TG100	TG150
		
Part No.	0946-10-00-000035	0946-15-00-000025
Capacity	35 TG100 Collets	25 TG150 Collets

TG Collets — Inch

Inch	TG100 Part Number	Inch	TG150 Part Number
3/32"	1905-00-19-000937	1/2"	1909-00-19-005000
7/64"	1905-00-19-001093	33/64"	1909-00-19-005156
1/8"	1905-00-19-001250	17/32"	1909-00-19-005312
9/64"	1905-00-19-001406	35/64"	1909-00-19-005468
5/32"	1905-00-19-001562	9/16"	1909-00-19-005625
11/64"	1905-00-19-001718	37/64"	1909-00-19-005781
3/16"	1905-00-19-001875	19/32"	1909-00-19-005937
13/64"	1905-00-19-002031	39/64"	1909-00-19-006093
7/32"	1905-00-19-002187	5/8"	1909-00-19-006250
15/64"	1905-00-19-002343	41/64"	1909-00-19-006406
1/4"	1905-00-19-002500	21/32"	1909-00-19-006562
17/64"	1905-00-19-002656	43/64"	1909-00-19-006718
9/32"	1905-00-19-002812	11/16"	1909-00-19-006875
19/64"	1905-00-19-002968	45/64"	1909-00-19-007031
5/16"	1905-00-19-003125	23/32"	1909-00-19-007187
21/64"	1905-00-19-003281	47/64"	1909-00-19-007343
11/32"	1905-00-19-003437	3/4"	1909-00-19-007500
23/64"	1905-00-19-003593	49/64"	1909-00-19-007656
3/8"	1905-00-19-003750	25/32"	1909-00-19-007812
25/64"	1905-00-19-003906	51/64"	1909-00-19-007968
13/32"	1905-00-19-004062	13/16"	1909-00-19-008125
27/64"	1905-00-19-004218	53/64"	1909-00-19-008281
7/16"	1905-00-19-004375	27/32"	1909-00-19-008437
29/64"	1905-00-19-004531	55/64"	1909-00-19-008593
15/32"	1905-00-19-004687	7/8"	1909-00-19-008750
31/64"	1905-00-19-004843	57/64"	1909-00-19-008906
1/2"	1905-00-19-005000	29/32"	1909-00-19-009062
33/64"	1905-00-19-005156	59/64"	1909-00-19-009218
17/32"	1905-00-19-005312	15/16"	1909-00-19-009375
35/64"	1905-00-19-005468	61/64"	1909-00-19-009531
9/16"	1905-00-19-005625	31/32"	1909-00-19-009687
37/64"	1905-00-19-005781	63/64"	1909-00-19-009843
19/32"	1905-00-19-005937	1"	1909-00-19-010000
39/64"	1905-00-19-006093	1 1/64"	1909-00-19-010156
5/8"	1905-00-19-006250	1 1/32"	1909-00-19-010312
41/64"	1905-00-19-006406	1 1/16"	1909-00-19-010468
21/32"	1905-00-19-006562	1 1/8"	1909-00-19-010625
43/64"	1905-00-19-006718	1 1/4"	1909-00-19-010781
11/16"	1905-00-19-006875	1 3/8"	1909-00-19-010937
45/64"	1905-00-19-007031	1 1/2"	1909-00-19-011093
23/32"	1905-00-19-007187	1 5/8"	1909-00-19-011250
47/64"	1905-00-19-007343	1 3/4"	1909-00-19-011406
3/4"	1905-00-19-007500	1 7/8"	1909-00-19-011562
49/64"	1905-00-19-007656	1 11/16"	1909-00-19-011718
25/32"	1905-00-19-007812	1 13/16"	1909-00-19-011875
51/64"	1905-00-19-007968	1 15/16"	1909-00-19-012031
13/16"	1905-00-19-008125	1 7/8"	1909-00-19-012187
53/64"	1905-00-19-008281	1 15/8"	1909-00-19-012343
27/32"	1905-00-19-008437	1 3/4"	1909-00-19-012500
55/64"	1905-00-19-008593	1 17/16"	1909-00-19-012656
7/8"	1905-00-19-008750	1 9/8"	1909-00-19-012812
57/64"	1905-00-19-008906	1 19/16"	1909-00-19-012968
29/32"	1905-00-19-009062	1 5/8"	1909-00-19-013125
59/64"	1905-00-19-009218	1 21/16"	1909-00-19-013281
15/16"	1905-00-19-009375	1 11/32"	1909-00-19-013437
61/64"	1905-00-19-009531	1 23/64"	1909-00-19-013593
31/32"	1905-00-19-009687	1 3/8"	1909-00-19-013750
63/64"	1905-00-19-009843	1 25/64"	1909-00-19-013906
1"	1905-00-19-010000	1 13/32"	1909-00-19-014062
		1 27/64"	1909-00-19-014218
		1 7/16"	1909-00-19-014375
		1 29/64"	1909-00-19-014531
		1 15/32"	1909-00-19-014687
		1 31/64"	1909-00-19-014843
		1 1/2"	1909-00-19-015000

TG Collets — Metric

mm	TG100 Part Number	TG150 Part Number	
6.0	1905-00-17-060000	12.0	1909-00-17-120000
6.5	1905-00-17-065000	12.5	1909-00-17-125000
7.0	1905-00-17-070000	13.0	1909-00-17-130000
7.5	1905-00-17-075000	13.5	1909-00-17-135000
8.0	1905-00-17-080000	14.0	1909-00-17-140000
8.5	1905-00-17-085000	14.5	1909-00-17-145000
9.0	1905-00-17-090000	15.0	1909-00-17-150000
9.5	1905-00-17-095000	15.5	1909-00-17-155000
10.0	1905-00-17-100000	16.0	1909-00-17-160000
10.5	1905-00-17-105000	16.5	1909-00-17-165000
11.0	1905-00-17-110000	17.0	1909-00-17-170000
11.5	1905-00-17-115000	17.5	1909-00-17-175000
12.0	1905-00-17-120000	18.0	1909-00-17-180000
12.5	1905-00-17-125000	18.5	1909-00-17-185000
13.0	1905-00-17-130000	19.0	1909-00-17-190000
13.5	1905-00-17-135000	19.5	1909-00-17-195000
14.0	1905-00-17-140000	20.0	1909-00-17-200000
14.5	1905-00-17-145000	20.5	1909-00-17-205000
15.0	1905-00-17-150000	21.0	1909-00-17-210000
15.5	1905-00-17-155000	21.5	1909-00-17-215000
16.0	1905-00-17-160000	22.0	1909-00-17-220000
16.5	1905-00-17-165000	22.5	1909-00-17-225000
17.0	1905-00-17-170000	23.0	1909-00-17-230000
17.5	1905-00-17-175000	23.5	1909-00-17-235000
18.0	1905-00-17-180000	24.0	1909-00-17-240000
18.5	1905-00-17-185000	24.5	1909-00-17-245000
19.0	1905-00-17-190000	25.0	1909-00-17-250000
19.5	1905-00-17-195000	25.5	1909-00-17-255000
20.0	1905-00-17-200000	26.0	1909-00-17-260000
20.5	1905-00-17-205000	26.5	1909-00-17-265000
21.0	1905-00-17-210000	27.0	1909-00-17-270000
21.5	1905-00-17-215000	27.5	1909-00-17-275000
22.0	1905-00-17-220000	28.0	1909-00-17-280000
22.5	1905-00-17-225000	28.5	1909-00-17-285000
23.0	1905-00-17-230000	29.0	1909-00-17-290000
23.5	1905-00-17-235000	29.5	1909-00-17-295000
24.0	1905-00-17-240000	30.0	1909-00-17-300000
24.5	1905-00-17-245000	30.5	1909-00-17-305000
25.0	1905-00-17-250000	31.0	1909-00-17-310000
25.5	1905-00-17-255000	31.5	1909-00-17-315000
		32.0	1909-00-17-320000
		32.5	1909-00-17-325000
		33.0	1909-00-17-330000
		33.5	1909-00-17-335000
		34.0	1909-00-17-340000
		34.5	1909-00-17-345000
		35.0	1909-00-17-350000
		35.5	1909-00-17-355000
		36.0	1909-00-17-360000
		36.5	1909-00-17-365000
		37.0	1909-00-17-370000
		37.5	1909-00-17-375000
		38.0	1909-00-17-380000

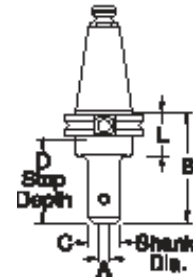
TG Collet Sets

	Part Numbers	Qty.	Range & Increment
TG100	0932-00-19-000059	59	3/32" to 1" (1/64" Incr.)
TG100	0932-00-19-000041	41	3/8" to 1" (1/64" Incr.)
TG100	0932-00-19-000030	30	3/32" to 1" (1/32" Incr.)
TG100	0932-00-19-000021	21	3/8" to 1" (1/32" Incr.)
TG150	0934-00-19-000065	65	1/2" to 1 1/2" (1/64" Incr.)
TG150	0934-00-19-000033	33	1/2" to 1 1/2" (1/32" Incr.)
TG150	0934-00-19-000017	17	1/2" to 1 1/2" (1/16" Incr.)

End Mill Holders — CAT-V Flange







End Mill Holders are offered in stub, standard, extended and S & R (strong & rugged) models. The fine pitch set screws match Weldon flats to firmly lock the end mill. All holders, except the stub holders from 1/8" up to 1" diameter, can accept single- or double-end tools. The stub holder will only accept single-end tools. Holders (except the stub) for end mills 1" and larger have two locking screws. The locking screws are aligned with the drive slot for your convenience. End mills without Weldon flats should not be used in these holders. Locking set screws are included.





Retention knobs must be ordered separately for each holder; see pages 35 and 36.

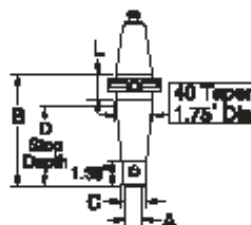
End Mill Holders 40-Taper and 50-Taper Metric – CAT-V Flange

		40-TAPER STUB 					40-TAPER STANDARD 					40-TAPER EXTENDED 				
A	Taper	Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L
0.125"	40						7921-40-02-001250	2.50"	0.69"	4.1"	1.38"					
0.187"	40						7921-40-02-001875	2.50"	0.69"	2.5"	1.38"					
0.250"	40						7921-40-02-002500	2.50"	0.78"	2.5"	1.38"					
0.312"	40						7921-40-02-003125	2.50"	0.88"	4.1"	1.38"					
0.375"	40						7921-40-02-003750	2.50"	1.00"	2.5"	1.38"	7921-40-03-003750	4.50"	1.00"	4.5"	1.38"
0.437"	40						7921-40-02-004375	2.50"	1.13"	4.1"	1.38"					
0.500"	40	7921-40-01-005000	1.75"	1.25"	3.3"	1.38"	7921-40-02-005000	2.63"	1.25"	2.7"	1.38"	7921-40-03-005000	4.63"	1.25"	4.7"	1.38"
0.562"	40						7921-40-02-005625	2.63"	1.38"	3.0"	1.38"					
0.625"	40	7921-40-01-006250	1.75"	1.50"	2.4"	1.38"	7921-40-02-006250	3.75"	1.50"	3.6"	1.38"	7921-40-03-006250	5.75"	1.50"	3.6"	1.38"
0.750"	40	7921-40-01-007500	1.75"	1.75"	2.5"	1.38"	7921-40-02-007500	3.75"	1.75"	3.9"	1.38"	7921-40-03-007500	5.75"	1.75"	3.9"	1.38"
0.875"	40						7921-40-02-008750	4.00"	1.88"	4.2"	1.38"	7921-40-03-008750	6.00"	1.88"	4.2"	1.38"
1.000"	40	7921-40-01-010000	1.75"	1.75"	2.5"	1.38"	7921-40-02-010000	4.00"	2.00"	4.4"	1.38"	7921-40-03-010000	6.00"	2.00"	4.4"	1.38"
1.250"	40	7921-40-01-012500	2.00"	2.25"	2.4"	1.38"	7921-40-02-012500	4.25"	2.50"	4.0"	1.38"	7921-40-03-012500	6.25"	2.50"	4.0"	1.38"
1.500"	40						7921-40-02-015000	4.63"	2.50"	3.0"	1.38"	7921-40-03-015000	6.63"	2.50"	4.0"	1.38"

		40-TAPER METRIC STANDARD 				
A	Taper	Part No.	B	C	D	L
6 mm	40	7922-40-02-060000	2.50"	0.97"	2.6"	1.38"
8 mm	40	7922-40-02-080000	2.50"	1.09"	2.5"	1.38"
10 mm	40	7922-40-02-100000	2.63"	1.37"	2.7"	1.38"
12 mm	40	7922-40-02-120000	2.63"	1.64"	2.7"	1.38"
14 mm	40	7922-40-02-140000	3.75"	1.81"	3.8"	1.38"
16 mm	40	7922-40-02-160000	3.75"	1.88"	2.2"	1.38"
18 mm	40	7922-40-02-180000	3.75"	1.96"	2.4"	1.38"
20 mm	40	7922-40-02-200000	3.75"	2.04"	2.4"	1.38"

		50-TAPER METRIC STANDARD 				
A	Taper	Part No.	B	C	D	L
6 mm	50	7922-50-02-060000	2.50"	0.97"	3.4"	1.38"
8 mm	50	7922-50-02-080000	2.50"	1.09"	3.4"	1.38"
10 mm	50	7922-50-02-100000	2.63"	1.37"	3.5"	1.38"
12 mm	50	7922-50-02-120000	2.63"	1.64"	3.5"	1.38"
14 mm	50	7922-50-02-140000	3.75"	1.81"	4.6"	1.38"
16 mm	50	7922-50-02-160000	3.75"	1.88"	4.6"	1.38"
18 mm	50	7922-50-02-180000	3.75"	1.96"	4.6"	1.38"
20 mm	50	7922-50-02-200000	3.75"	2.04"	4.6"	1.38"




		40-TAPER S & R SHANK 				
Style	Taper	Part No.	B	C	D	L
0.375"	40	7921-40-50-003750	6.00"	1.00"	7.6"	1.38"
0.500"	40	7921-40-50-005000	6.00"	1.25"	7.3"	1.38"


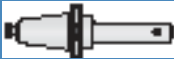




S&R (Strong and Rugged)

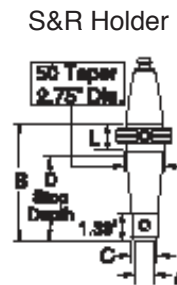
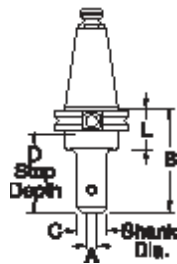
These extra strong and rugged long tool holders steady the tool for smoother; and faster cutting. Tools last longer due to the added mass of the holder that decreases vibration. Accepts double-ended end mills.

End Mill Holder 45- and 50-Taper – CAT-V Flange

A	Taper	45-TAPER STANDARD 				45-TAPER EXTENDED 				45-TAPER EXTRA EXTENDED 						
		Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L
0.375"	45	7921-45-02-003750	2.50"	1.00"	2.7"	1.38"	7921-45-03-003750	4.50"	1.00"	4.7"	1.38"	7921-45-04-003750	6.50"	1.00"	4.7"	1.38"
0.500"	45	7921-45-02-005000	2.63"	1.25"	2.9"	1.38"	7921-45-03-005000	4.63"	1.25"	4.9"	1.38"	7921-45-04-005000	6.63"	1.25"	4.9"	1.38"
0.625"	45	7921-45-02-006250	3.75"	1.50"	4.0"	1.38"	7921-45-03-006250	5.75"	1.50"	6.0"	1.38"	7921-45-04-006250	7.75"	1.50"	6.0"	1.38"
0.750"	45	7921-45-02-007500	3.75"	1.75"	3.9"	1.38"	7921-45-03-007500	5.75"	1.75"	6.0"	1.38"	7921-45-04-007500	7.75"	1.75"	3.9"	1.38"
0.875"	45	7921-45-02-008750	3.75"	1.88"	4.2"	1.38"	7921-45-03-008750	5.75"	1.88"	4.2"	1.38"	7921-45-04-008750	7.75"	1.88"	4.2"	1.38"
1.000"	45	7921-45-02-010000	4.00"	2.00"	4.4"	1.38"	7921-45-03-010000	6.00"	2.00"	4.4"	1.38"	7921-45-04-010000	8.00"	2.00"	4.4"	1.38"
1.250"	45	7921-45-02-012500	4.00"	2.50"	4.0"	1.38"	7921-45-03-012500	6.00"	2.50"	4.0"	1.38"	7921-45-04-012500	8.00"	2.50"	4.0"	1.38"
1.500"	45	7921-45-02-015000	4.00"	2.50"	4.0"	1.38"	7921-45-03-015000	6.00"	2.50"	4.0"	1.38"	7921-45-04-015000	8.00"	2.50"	4.0"	1.38"
2.000"	45	7921-45-02-020000	5.25"	3.75"	3.5"	1.38"	7921-45-03-020000	7.25"	3.75"	5.0"	1.38"	7921-45-04-020000	9.25"	3.75"	5.0"	1.38"

A	Taper	50-TAPER STANDARD 				50-TAPER EXTENDED 				50-TAPER EXTRA EXTENDED 						
		Part No.	B	C	D	L	Part No.	B	C	D	L	Part No.	B	C	D	L
0.125"	50	7921-50-02-001250	2.50"	0.69"	4.9"	1.38"										
0.187"	50	7921-50-02-001875	2.50"	0.69"	3.4"	1.38"										
0.250"	50	7921-50-02-002500	2.50"	0.78"	3.4"	1.38"										
0.312"	50	7921-50-02-003125	2.50"	0.88"	4.9"	1.38"										
0.375"	50	7921-50-02-003750	2.50"	1.00"	3.4"	1.38"	7921-50-03-003750	4.50"	1.00"	5.4"	1.38"	7921-50-04-003750	6.50"	1.00"	5.4"	1.38"
0.437"	50	7921-50-02-004375	2.63"	1.13"	5.0"	1.38"										
0.500"	50	7921-50-02-005000	2.63"	1.25"	3.5"	1.38"	7921-50-03-005000	4.63"	1.25"	5.5"	1.38"	7921-50-04-005000	6.63"	1.25"	5.5"	1.38"
0.562"	50	7921-50-02-005625	2.63"	1.38"	5.0"	1.38"										
0.625"	50	7921-50-02-006250	3.75"	1.50"	4.6"	1.38"	7921-50-03-006250	5.75"	1.50"	6.6"	1.38"	7921-50-04-006250	7.75"	1.50"	6.6"	1.38"
0.750"	50	7921-50-02-007500	3.75"	1.75"	4.6"	1.38"	7921-50-03-007500	5.75"	1.75"	6.6"	1.38"	7921-50-04-007500	7.75"	1.75"	8.6"	1.38"
0.875"	50	7921-50-02-008750	3.75"	1.88"	4.2"	1.38"	7921-50-03-008750	5.75"	1.88"	6.6"	1.38"	7921-50-04-008750	7.75"	1.88"	4.2"	1.38"
1.000"	50	7921-50-02-010000	4.00"	2.00"	4.4"	1.38"	7921-50-03-010000	6.00"	2.00"	4.4"	1.38"	7921-50-04-010000	8.00"	2.00"	4.4"	1.38"
1.250"	50	7921-50-02-012500	4.00"	2.50"	4.0"	1.38"	7921-50-03-012500	6.00"	2.50"	4.0"	1.38"	7921-50-04-012500	8.00"	2.50"	4.0"	1.38"
1.500"	50	7921-50-02-015000	4.00"	2.50"	4.0"	1.38"	7921-50-03-015000	6.00"	2.50"	4.0"	1.38"	7921-50-04-015000	8.00"	2.50"	4.0"	1.38"
2.000"	50	7921-50-02-020000	5.63"	3.75"	5.0"	1.38"	7921-50-03-020000	7.63"	3.75"	5.0"	1.38"	7921-50-04-020000	9.63"	3.75"	5.0"	1.38"

A	Taper	50-TAPER S&R HOLDER 				
		Part No.	B	C	D	L
0.375"	50	7921-50-50-003750	6.00"	1.00"	8.4"	1.38"
0.375"	50	7921-50-51-003750	8.00"	1.00"	10.4"	1.38"
0.375"	50	7921-50-52-003750	10.00"	1.00"	12.4"	1.38"
0.375"	50	7921-50-53-003750	12.00"	1.00"	14.4"	1.38"
0.500"	50	7921-50-50-005000	6.00"	1.25"	8.4"	1.38"
0.500"	50	7921-50-51-005000	8.00"	1.25"	10.4"	1.38"
0.500"	50	7921-50-52-005000	10.00"	1.25"	12.4"	1.38"
0.500"	50	7921-50-53-005000	12.00"	1.25"	14.4"	1.38"
0.625"	50	7921-50-50-006250	6.00"	1.50"	8.4"	1.38"
0.625"	50	7921-50-51-006250	8.00"	1.50"	10.4"	1.38"
0.625"	50	7921-50-52-006250	10.00"	1.50"	12.4"	1.38"
0.625"	50	7921-50-53-006250	12.00"	1.50"	3.6"	1.38"
0.750"	50	7921-50-50-007500	6.00"	1.75"	8.4"	1.38"
0.750"	50	7921-50-51-007500	8.00"	1.75"	10.4"	1.38"
0.750"	50	7921-50-52-007500	10.00"	1.75"	12.4"	1.38"
0.750"	50	7921-50-53-007500	12.00"	1.75"	3.9"	1.38"
1.000"	50	7921-50-50-010000	6.00"	2.00"	4.4"	1.38"
1.000"	50	7921-50-51-010000	8.00"	2.00"	4.4"	1.38"
1.000"	50	7921-50-52-010000	10.00"	2.00"	4.4"	1.38"
1.000"	50	7921-50-53-010000	12.00"	2.00"	4.4"	1.38"



Replacement Locking Screws

End Mill Dia. Size	Locking Screw Part No.	Thread Size	Length	Torque (In-lb)
0.125"	7990-12-45-000008	8-32	.25"	18
0.188"	7990-12-45-000010	10-32	.25"	30
0.250"	7990-12-45-002500	1/4"-28	.25"	60
0.313"	7990-12-45-003125	5/16"-24	.25"	120
0.375"	7990-12-45-003750	3/8"-24	.25"	200
0.500"	7990-12-45-004375	7/16"-20	.36"	220
0.625"	7990-12-45-005000	1/2"-20	.42"	500
0.750"	7990-12-45-006250	5/8"-18	.49"	560
0.875"	7990-12-45-006250	5/8"-18	.49"	560
1.000"	7990-12-45-007500	3/4"-16	.45"	1150
1.250"	7990-12-45-007500	3/4"-16	.45"	1150
1.500"	7990-12-45-007500	3/4"-16	.45"	1150
2.000"	7990-12-45-010000	1"-14	.88"	1500
6 mm	7990-13-45-060000	M6 - 1.0	10	60
8 mm	7990-13-45-080000	M8 - 1.25	10	120
10 mm	7990-13-45-100000	M10 - 1.5	12	180
12 mm	7990-13-45-120000	M12 - 1.75	16	250
14 mm	7990-13-45-120000	M12 - 1.75	16	250
16 mm	7990-13-45-140000	M14 - 2.0	16	450
18 mm	7990-13-45-140000	M14 - 2.0	16	450
20 mm	7990-13-45-160000	M16 - 2.0	16	840



Hydraulic clamping ensures high-torque gripping of the end mill. The complete circumference of the end mill is gripped to eliminate the need for special seals. Precision balance is assured when using end mills without flats. The hydraulic chamber is completely enclosed, eliminating any possibility of contamination from coolant and dirt. The unique design of this holder provides excellent gripping over the long haul. **Hydraulic Holders** are for precision work (not for roughing) and end mills with one cutting end.

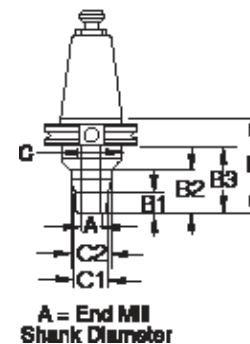
Retention knobs must be ordered separately for each holder; see pages 35 and 36. For balance options; see pages 6 and 7. Stop screws are sold separately. Holders for metric tools are available on application.

Benefits:

- Powerful hydraulic grip
- Radial repeatability of $\pm .00008"$ (.0020 mm)
- Vibration damping for chatter-free machining
- Full radial grip on tool's diameter with greater gripping power than competitive holders
- Repetitive balance for high spindle speeds
- High gripping force provides a smooth and secure torque transmission to the cutting tool
- Ability to grip the end mill's shank with or without flats - high-speed operations require end mills with no flats
- Standard through-the-spindle coolant

Hydraulic Grip End Mill Holder — CAT-V Flange

A	Taper	Part No.	B	B1	B2	B3	C	C1	C2
.500"	40	7923-40-02-005000	4.000"	1.094"	—	3.250"	1.750"	1.404"	—
.625"	40	7923-40-02-006250	4.000"	1.088"	—	3.250"	1.875"	1.500"	—
.750"	40	7923-40-02-007500	4.000"	1.094"	—	3.250"	2.000"	1.638"	—
1.000"	40	7923-40-02-010000	4.000"	1.164"	—	3.250"	2.250"	1.967"	—
.500"	50	7923-50-02-005000	4.000"	1.094"	2.045"	3.250"	2.750"	1.404"	1.750"
.625"	50	7923-50-02-006250	4.000"	1.088"	2.125"	3.250"	2.750"	1.500"	1.875"
.750"	50	7923-50-02-007500	4.000"	1.094"	2.187"	3.250"	2.750"	1.638"	2.000"
1.000"	50	7923-50-02-010000	4.000"	1.094"	2.312"	3.250"	2.750"	1.967"	2.250"
1.250"	50	7923-50-02-012500	4.000"	—	2.361"	3.250"	2.750"	2.348"	—



Stop Screws

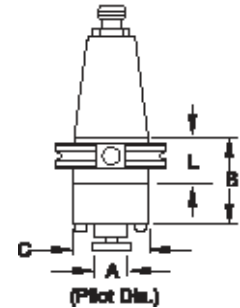


Style	Part No.	Flange	Thread
All	—	40	5/8" - 11
.500"	7990-12-45-007500	50	3/4" - 16
.625"	7990-12-45-007500	50	3/4" - 16
.750"	Non-Stock	50	1" - 8
1.000"	Non-Stock	50	1" - 8
1.250"	Non-Stock	50	1" - 8



Shell Mill Holders are manufactured to precision tolerances. The pilot diameter is ground to fit the bore of the shell mill and is concentric to the centerline of the holder's shank. The locating face is perpendicular to the centerline within .0002". A cap screw and two removable drive keys come standard with each holder. 2" Shell Mill Holders have four 5/8"-11 threaded holes on a 4" bolt circle.

Retention knobs must be ordered separately for each holder; see pages 35 and 36. For balance options; see pages 6 and 7. Holders for Metric tools are available on application.



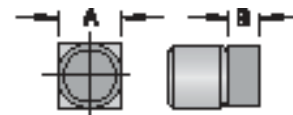
Shell Mill Holders – CAT-V Flange

A	Taper	STANDARD			EXTENDED			EXTRA EXTENDED					
		Part No.	B	C	L	Part No.	B	C	L	Part No.	B	C	L
0.500"	40	7924-40-02-005000	1.50"	1.44"	1.38"	7924-40-03-005000	3.50"	1.44"	1.38"				
0.750"	40	7924-40-02-007500	1.50"	1.69"	1.38"	7924-40-03-007500	3.50"	1.69"	1.38"				
1.000"	40	7924-40-02-010000	2.06"	2.19"	1.38"	7924-40-03-010000	4.00"	2.19"	1.38"				
1.250"	40	7924-40-02-012500	2.63"	2.75"	1.38"	7924-40-03-012500	4.00"	2.75"	1.38"				
1.500"	40	7924-40-02-015000	3.00"	3.81"	1.38"	7924-40-03-015000	4.00"	3.81"	1.38"				
0.500"	45	7924-45-02-005000	1.50"	1.44"	1.38"	7924-45-03-005000	3.50"	1.44"	1.38"	7924-45-04-005000	5.50"	1.44"	1.38"
0.750"	45	7924-45-02-007500	1.50"	1.69"	1.38"	7924-45-03-007500	3.50"	1.69"	1.38"	7924-45-04-007500	5.50"	1.69"	1.38"
1.000"	45	7924-45-02-010000	2.00"	2.19"	1.38"	7924-45-03-010000	4.00"	2.19"	1.38"	7924-45-04-010000	6.00"	2.19"	1.38"
1.250"	45	7924-45-02-012500	2.38"	2.75"	1.38"	7924-45-03-012500	4.00"	2.75"	1.38"	7924-45-04-012500	6.00"	2.75"	1.38"
1.500"	45	7924-45-02-015000	2.75"	3.81"	1.38"	7924-45-03-015000	4.00"	3.81"	1.38"	7924-45-04-015000	6.00"	3.81"	1.38"
2.000"	45	7924-45-02-020000	3.31"	4.88"	1.38"	7924-45-03-020000	4.00"	4.88"	1.38"	7924-45-04-020000	6.00"	4.88"	1.38"
0.500"	50	7924-50-02-005000	1.50"	1.44"	1.38"	7924-50-03-005000	3.50"	1.44"	1.38"	7924-50-04-005000	5.50"	1.44"	1.38"
0.750"	50	7924-50-02-007500	1.50"	1.69"	1.38"	7924-50-03-007500	3.50"	1.69"	1.38"	7924-50-04-007500	5.50"	1.69"	1.38"
1.000"	50	7924-50-02-010000	2.00"	2.19"	1.38"	7924-50-03-010000	4.00"	2.19"	1.38"	7924-50-04-010000	6.00"	2.19"	1.38"
1.250"	50	7924-50-02-012500	1.50"	2.75"	1.38"	7924-50-03-012500	3.50"	2.75"	1.38"	7924-50-04-012500	5.50"	2.75"	1.38"
1.500"	50	7924-50-02-015000	2.50"	3.81"	1.38"	7924-50-03-015000	4.00"	3.81"	1.38"	7924-50-04-015000	6.00"	3.81"	1.38"
2.000"	50	7924-50-02-020000	3.00"	4.88"	1.38"	7924-50-03-020000	4.00"	4.88"	1.38"	7924-50-04-020000	6.00"	4.88"	1.38"
2.500"	50	7924-50-02-025000	2.40"	4.88"	1.38"								

Drive Keys and Cap Screws

Pilot Dia.	Drive Key Part No.	A	B	Cap Screw Part No.	A	B
.500"	7993-10-09-002500	1/4"	.125"	7990-10-45-006250	5/8"	1/4" - 28
.750"	7993-10-09-003125	5/16"	.156"	7990-10-45-008750	7/8"	3/8" - 24
1.000"	7993-10-09-003750	3/8"	.187"	7990-10-45-013125	1 3/16"	1/2" - 20
1.250"	7993-10-09-005000	1/2"	.250"	7990-10-45-015000	1 1/2"	5/8" - 18
1.500"	7993-10-09-006250	5/8"	.312"	7990-10-45-018750	1 7/8"	3/4" - 16
2.000"	7993-10-09-007500	3/4"	.375"	7990-10-45-025000	2 1/2"	1" - 14
2.500"	7993-10-09-010000	1"	.500"	7990-10-45-031250	3 1/8"	1" - 14

Drive Keys



Cap Screws



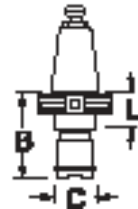
Heavy-duty Tap Holders & Tap Collets — CAT-V Flange



This **Tension/Compression Floating Tap Holder** accommodates feeding errors. Maximum pull out is .750" and compression is .370".



This heavy-duty **Rigid Tap Holder** is for use on newer machine tools which have synchronous capabilities.



Both tap holders use Bilz-style quick-change collet systems. To use standard ER collets instead of quick-change collets; see adapter on page 46. Retention knobs must be ordered separately for each holder; see pages 35 and 36.

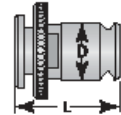
Tension Compression and Heavy-duty Tap Holders – CAT-V Flange

Taper	Collet Size	STANDARD TAP HOLDER TENSION COMPRESSION			STANDARD TAP HOLDER RIGID SYNCHRONOUS			EXTENDED TAP HOLDER RIGID SYNCHRONOUS					
		Part No.	B	C	L	Part No.	B	C	L	Part No.	B	C	L
40	#1	7925-40-02-000001	4.56"	1.75"	1.38"	7926-40-02-000001	3.58"	1.50"	1.06"	7926-40-03-000001	5.58"	1.50"	1.38"
40	#2	7925-40-02-000002	6.47"	2.25"	1.38"	7926-40-02-000002	4.22"	1.88"	1.06"	7926-40-03-000002	6.22"	1.88"	1.38"
45	#1	7925-45-02-000001	4.56"	1.75"	1.38"	7926-45-02-000001	3.58"	1.50"	1.31"	7926-45-03-000001	5.58"	1.50"	1.38"
45	#2	7925-45-02-000002	5.82"	2.25"	1.38"	7926-45-02-000002	4.22"	1.88"	1.31"	7926-45-03-000002	6.22"	1.88"	1.38"
45	#3	7925-45-02-000003	8.33"	3.25"	1.38"					7926-45-03-000003	8.33"	3.25"	1.38"
50	#1	7925-50-02-000001	4.56"	1.75"	1.38"	7926-50-02-000001	3.58"	1.50"	1.50"	7926-50-03-000001	5.58"	1.50"	1.38"
50	#2	7925-50-02-000002	5.82"	2.25"	1.38"	7926-50-02-000002	4.22"	1.88"	1.50"	7926-50-03-000002	6.22"	1.88"	1.38"
50	#3	7925-50-02-000003	8.33"	3.25"	1.38"					7926-50-03-000003	8.33"	3.25"	1.38"



Dimensions

Size	Diameter	Length
#1	.75" (19mm)	1.12" (28.44mm)
#2	1.22" (31mm)	1.81" (45.97mm)
#3	1.89" (48mm)	2.74" (70.00mm)



Quick-Change Tap Collets — Inch

Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-51-11-001410	0.141"	0.110"	#0-#6	7989-51-12-003180	0.318"	0.238"	5/16"	7989-51-13-006520	0.652"	0.489"	13/16"
7989-51-11-001680	0.168"	0.131"	#8	7989-51-12-003810	0.381"	0.286"	3/8"	7989-51-13-006970	0.697"	0.523"	7/8"
7989-51-11-001940	0.194"	0.152"	#10	7989-51-12-003230	0.323"	0.242"	7/16"	7989-51-13-007600	0.760"	0.570"	15/16"
7989-51-11-002200	0.220"	0.165"	#12	7989-51-12-003670	0.367"	0.275"	1/2"	7989-51-13-008000	0.800"	0.600"	1"
7989-51-11-002550	0.255"	0.191"	1/4"	7989-51-12-004290	0.429"	0.322"	9/16"	7989-51-13-008960	0.896"	0.672"	1 1/8"
7989-51-11-003180	0.318"	0.238"	5/16"	7989-51-12-004800	0.480"	0.360"	5/8"	7989-51-13-010210	1.021"	0.766"	1 1/4"
7989-51-11-003810	0.381"	0.286"	3/8"	7989-51-12-005420	0.542"	0.406"	11/16"	7989-51-13-011080	1.108"	0.831"	1 3/8"
7989-51-11-003230	0.323"	0.242"	7/16"	7989-51-12-005900	0.590"	0.442"	3/4"	7989-51-13-007000	0.700"	0.531"	3/8" Pipe
7989-51-11-003670	0.367"	0.275"	1/2"	7989-51-12-006520	0.652"	0.489"	13/16"	7989-51-13-006870	0.687"	0.515"	1/2" Pipe
7989-51-11-004290	0.429"	0.322"	9/16"	7989-51-12-006970	0.697"	0.523"	7/8"	7989-51-13-009060	0.906"	0.679"	3/4" Pipe
7989-51-11-003130	0.313"	0.234"	1/16" Pipe	7989-51-12-005620	0.562"	0.421"	1/4" Pipe	7989-51-13-011250	1.125"	0.843"	1" Pipe
7989-51-11-004370	0.437"	0.328"	1/8" Pipe	7989-51-12-007000	0.700"	0.531"	3/8" Pipe				
				7989-51-12-006870	0.687"	0.515"	1/2" Pipe				
7989-51-11-000002	Kit of 12 Collets			7989-51-12-000002	Kit of 13 Collets			7989-51-13-000002	Kit of 11 Collets		

"B" dimension includes tap collet - no tap. Metric collets are made to the DIN standard. ANSI standard metric taps (the standard common in the United States) cannot be used in these collets. Refer to chart below for ANSI Metric tap shank sizes for use in Inch collets. See Brochure 2351 for additional Tap Holder Collet information.

ANSI Metric Taps and their Shank Sizes:

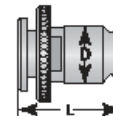
M1 to M3.5 – .141"; M4 – .168"; M4.5 & M5 – .194"; M6 & M6.3 – .255"; M7 & M8 – .318"; M10 – .381"; M12 – .367"; M14 – .429"

Quick-Change Tap & Torque Control Collets



Dimensions

Size	Diameter	Length
#1	.75" (19mm)	1.12" (28.44mm)
#2	1.22" (31mm)	1.81" (45.97mm)
#3	1.89" (48mm)	2.74" (70.00mm)



Quick-Change Tap Collets — Metric

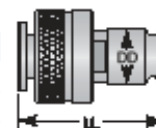
Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-51-21-035000	3.5mm	2.7mm	M7	7989-51-22-060000	6.0mm	4.9 mm	M6,M8	7989-51-23-110000	11.0mm	9.0mm	M14
7989-51-21-045000	4.5mm	3.4mm	M4	7989-51-22-080000	8.0mm	6.2 mm	M8	7989-51-23-120000	12.0mm	9.0mm	M16
7989-51-21-060000	6.0mm	4.9mm	M5,6,8	7989-51-22-100000	10.0mm	8.0 mm	M10	7989-51-23-140000	14.0mm	11.0mm	M18
7989-51-21-080000	8.0mm	6.2mm	M8	7989-51-22-070000	7.0mm	5.5 mm	M10	7989-51-23-160000	16.0mm	12.0mm	M20
7989-51-21-100000	10.0mm	8.0mm	M10	7989-51-22-090000	9.0mm	7.0 mm	M12	7989-51-23-180000	18.0mm	14.5mm	M22,M24
7989-51-21-070000	7.0mm	5.5mm	M10	7989-51-22-110000	11.0mm	9.0 mm	M14	7989-51-23-200000	20.0mm	16.0mm	M27
7989-51-21-090000	9.0mm	7.0mm	M12	7989-51-22-120000	12.0mm	9.0 mm	M16	7989-51-23-220000	22.0mm	18.0mm	M30
7989-51-21-110000	11.0mm	9.0mm	M14	7989-51-22-140000	14.0mm	11.0 mm	M18	7989-51-23-250000	25.0mm	20.0mm	M33
—	—	—	—	7989-51-22-160000	16.0mm	12.0 mm	M20	—	—	—	—

Metric collets are made to the DIN standard. ANSI standard metric taps (the standard common in the United States) cannot be used in these collets. Refer to chart below for ANSI Metric tap shank sizes for use in Inch collets.



Dimensions

Size	Diameter	Length
#1	.75" (19mm)	1.83" (48.48mm)
#2	1.22" (31mm)	2.72" (69.00mm)
#3	1.89" (48mm)	3.96" (100.58mm)



Torque Control Tap Collets — Inch

Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-52-11-001410	0.141"	0.110"	#0-#6	7989-52-12-003180	0.318"	0.238"	5/16"	7989-52-13-006520	0.652"	0.489"	13/16"
7989-52-11-001680	0.168"	0.131"	#8	7989-52-12-003810	0.381"	0.286"	3/8"	7989-52-13-006970	0.697"	0.523"	7/8"
7989-52-11-001940	0.194"	0.152"	#10	7989-52-12-003230	0.323"	0.242"	7/16"	7989-52-13-007600	0.760"	0.570"	15/16"
7989-52-11-002200	0.220"	0.165"	#12	7989-52-12-003670	0.367"	0.275"	1/2"	7989-52-13-008000	0.800"	0.600"	1"
7989-52-11-002550	0.255"	0.191"	1/4"	7989-52-12-004290	0.429"	0.322"	9/16"	7989-52-13-008960	0.896"	0.672"	1 1/8"
7989-52-11-003180	0.318"	0.238"	5/16"	7989-52-12-004800	0.480"	0.360"	5/8"	7989-52-13-010210	1.021"	0.766"	1 1/4"
7989-52-11-003810	0.381"	0.286"	3/8"	7989-52-12-005420	0.542"	0.406"	11/16"	7989-52-13-011080	1.108"	0.831"	1 3/8"
7989-52-11-003230	0.323"	0.242"	7/16"	7989-52-12-005900	0.590"	0.442"	3/4"	7989-52-13-007000	0.700"	0.531"	3/8" Pipe
7989-52-11-003670	0.367"	0.275"	1/2"	7989-52-12-006520	0.652"	0.489"	13/16"	7989-52-13-006870	0.687"	0.515"	1/2" Pipe
7989-52-11-004290	0.429"	0.322"	9/16"	7989-52-12-006970	0.697"	0.523"	7/8"	7989-52-13-009060	0.906"	0.679"	3/4" Pipe
7989-52-11-003130	0.313"	0.234"	1/16" Pipe	7989-52-12-005620	0.562"	0.421"	1/4" Pipe	7989-52-13-011250	1.125"	0.843"	1" Pipe
7989-52-11-004370	0.437"	0.328"	1/8" Pipe	7989-52-12-007000	0.700"	0.531"	3/8" Pipe	—	—	—	—
—	—	—	—	7989-52-12-006870	0.687"	0.515"	1/2" Pipe	—	—	—	—

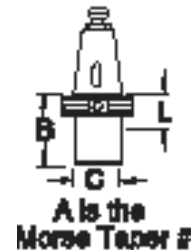
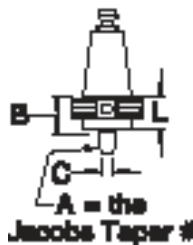
ANSI Metric Taps and their Shank Sizes:

M1 to M3.5 – .141"; M4 – .168"; M4.5 & M5 – .194"; M6 & M6.3 – .255"; M7 & M8 – .318"; M10 – .381"; M12 – .367"; M14 – .429"

Torque Control Tap Collets — Metric (Non-stock) made to DIN Standard. ANSI metric taps cannot be used in these collets

Collet Size #1				Collet Size #2				Collet Size #3			
Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size	Part Number	Shank Dia.	Square	Tap Size
7989-52-21-035000	3.5mm	2.7mm	M3	7989-52-22-060000	6.0mm	4.9mm	M6,M8	7989-51-23-110000	11.0mm	9.0mm	M14
7989-52-21-045000	4.5mm	3.4mm	M4	7989-52-22-080000	8.0mm	6.2mm	M8	7989-51-23-120000	12.0mm	9.0mm	M16
7989-52-21-060000	6.0mm	4.9mm	M5,6,8	7989-52-22-100000	10.0mm	8.0mm	M10	7989-51-23-140000	14.0mm	11.0mm	M18
7989-52-21-080000	8.0mm	6.2mm	M8	7989-52-22-070000	7.0mm	5.5mm	M10	7989-51-23-160000	16.0mm	12.0mm	M20
7989-52-21-100000	10.0mm	8.0mm	M10	7989-52-22-090000	9.0mm	7.0mm	M12	7989-51-23-180000	18.0mm	14.5mm	M22,M24
7989-52-21-070000	7.0mm	5.5mm	M10	7989-52-22-110000	11.0mm	9.0mm	M14	7989-51-23-200000	20.0mm	16.0mm	M27
7989-52-21-090000	9.0mm	7.0mm	M12	7989-52-22-120000	12.0mm	9.0mm	M16	7989-51-23-220000	22.0mm	18.0mm	M30
7989-52-21-110000	11.0mm	9.0mm	M14	7989-52-22-140000	14.0mm	11.0mm	M18	7989-51-23-250000	25.0mm	20.0mm	M33
—	—	—	—	7989-52-22-160000	16.0mm	12.0mm	M20	—	—	—	—

Torque Control collets can only be used in Tension/Compression Tap Holders. These collets slip when the torque is exceeded. There is no tension/compression built into the collet. See Brochure 2351 for additional information on Collets.



The **Jacobs Taper Holder** is designed for use with standard and keyless chucks that require a male Jacobs taper. The male taper is precision ground to ensure a locking fit. These holders are not recommended for high spindle speeds. The holder and the chuck must be thoroughly cleaned and degreased for a precision fit.

ER or TG collet chucks are recommended for the tightest grip and high spindle speed application. Retention knobs must be ordered separately for each holder; see pages 35 and 36.

The **Morse Taper Holder** is used when the only drill available is one with a Morse taper. The female taper is precision ground to ensure a locking fit. These holders are not recommended for high spindle speeds. They must be thoroughly cleaned and degreased for a precision fit.

ER or TG collet chucks are recommended for the tightest grip and high spindle speed application. Retention knobs must be ordered separately for each holder; see pages 35 and 36.

Jacobs Taper Holders

A	Taper	Part Number	B	C	L
#1	40	7936-40-02-000001	1.50"	.384"	1.38"
#2	40	7936-40-02-000002	1.50"	.559"	1.38"
#3	40	7936-40-02-000003	1.50"	.811"	1.38"
#4	40	7936-40-02-000004	1.50"	1.124"	1.38"
#6	40	7936-40-02-000006	1.50"	.675"	1.38"
#33	40	7936-40-02-000033	1.50"	.624"	1.38"
#1	45	7936-45-02-000001	1.50"	.384"	1.38"
#2	45	7936-45-02-000002	1.50"	.559"	1.38"
#3	45	7936-45-02-000003	1.50"	.811"	1.38"
#4	45	7936-45-02-000004	1.50"	1.124"	1.38"
#6	45	7936-45-02-000006	1.50"	.675"	1.38"
#33	45	7936-45-02-000033	1.50"	.624"	1.38"
#1	50	7936-50-02-000001	1.50"	.384"	1.38"
#2	50	7936-50-02-000002	1.50"	.559"	1.38"
#3	50	7936-50-02-000003	1.50"	.811"	1.38"
#4	50	7936-50-02-000004	1.50"	1.124"	1.38"
#6	50	7936-50-02-000006	1.50"	.675"	1.38"
#33	50	7936-50-02-000033	1.50"	.624"	1.38"

Morse Taper Holders

A	Taper	Part Number	B	C	L
#2	40	7937-40-02-000002	2.00"	1.75"	1.38"
#3	40	7937-40-02-000003	2.75"	1.75"	1.38"
#4	40	7937-40-02-000004	3.63"	1.75"	1.38"
#2	45	7937-45-02-000002	1.81"	2.25"	1.38"
#3	45	7937-45-02-000003	2.44"	2.25"	1.38"
#4	45	7937-45-02-000004	3.31"	2.25"	1.38"
#5	45	7937-45-02-000005	4.63"	2.63"	1.38"
#2	50	7937-50-02-000002	1.38"	2.75"	1.38"
#3	50	7937-50-02-000003	1.88"	2.75"	1.38"
#4	50	7937-50-02-000004	2.75"	2.75"	1.38"
#5	50	7937-50-02-000005	4.06"	2.75"	1.38"

Ball Bearing Key-Type Drill Chuck



Taper	Part Number	Model	Capacity	Key Part No.
#2	7994-14-02-003750	11N	0 - 3/8"	7994-15-02-003750
#3	7994-14-03-005000	14N	0 - 1/2"	7994-15-03-005000
#3	7994-14-03-006250	16N	1/8" - 5/8"	7994-15-03-006250
#4	7994-14-04-007500	18N	1/8" - 3/4"	7994-15-04-006250

Keyless Drill Chuck



Taper	Part Number	Model	Capacity
#1	7994-16-01-002500	85J1	0 - 1/4"
#2	7994-16-02-003125	80J2	0 - 5/16"
#2	7994-16-02-005000	130J2	1/32" - 1/2"
#33	7994-16-33-003750	100J33	0 - 3/8"



The **Semi-Flush Slitting Saw Holder** is designed for slitting saws up to $\frac{5}{16}$ " thick. The semi-flush cap allows the cutter to get into tight areas not accessible with stub arbor holders. Spacers are not required when changing saw widths. The pilot diameter is precision ground concentric to the shank with the locating shoulder perpendicular to the centerline within .0002".

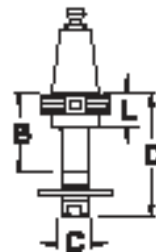
Retention knobs must be ordered separately for each holder; see pages 35 and 36. Refer to pages 6 and 7 for balance options. Holders for metric tools are available on application.

Semi-Flush Slitting Saw Holders

Taper	Part Number	Saw ID	B	C	L
40	7927-40-02-010000	1.00"	4.00"	1.50"	1.38"
40	7927-40-02-012500	1.25"	4.00"	2.00"	1.38"
45	7927-45-02-010000	1.00"	4.00"	1.50"	1.38"
45	7927-45-02-012500	1.25"	4.00"	2.00"	1.38"
50	7927-50-02-010000	1.00"	4.00"	1.50"	1.38"
50	7927-50-03-010000	1.00"	6.00"	1.50"	1.38"
50	7927-50-02-012500	1.25"	4.00"	2.00"	1.38"
50	7927-50-03-012500	1.25"	6.00"	2.00"	1.38"

Cap and Drive Keys

Item	Part Number
Cap for 1"	7991-08-00-010000
Drive Key For 1"	7993-08-09-010000
Cap for 1 $\frac{1}{4}$ "	7991-08-00-012500
Drive Key for 1 $\frac{1}{4}$ "	7993-08-09-012500



The pilot diameter and thread on the **Stub Arbor Holder** is precision ground concentric to the shank. The diameter mates precisely to the cutter ID and is keyed to provide a positive drive. The locating shoulder is guaranteed to be perpendicular to the centerline within .0002". Included with each arbor is a heavy-duty locking nut, $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{3}{4}$ " spacers.

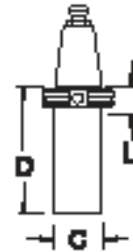
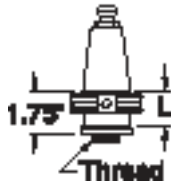
Retention knobs must be ordered separately for each holder; see pages 35 and 36. Refer to pages 6 and 7 for balance options. Holders for metric tools are available on application.

Stub Arbor Holders

Taper	Part No.	Saw ID	B	C	D	L
40	7928-40-02-010000	1.00"	4.00"	1.56"	6.25"	1.38"
40	7928-40-02-012500	1.25"	4.00"	1.87"	6.50"	1.38"
45	7928-45-02-010000	1.00"	4.00"	1.56"	6.25"	1.38"
45	7928-45-02-012500	1.25"	4.00"	1.87"	6.50"	1.38"
50	7928-50-02-010000	1.00"	4.00"	1.56"	6.25"	1.38"
50	7928-50-03-010000	1.00"	6.00"	1.56"	8.25"	1.38"
50	7928-50-02-012500	1.25"	4.00"	1.87"	6.50"	1.38"
50	7928-50-03-012500	1.25"	6.00"	1.87"	8.50"	1.38"

Accessories

Item	Part Number
Nut for 1"	7990-09-40-010000
Key For 1"	7993-09-09-010000
$\frac{1}{4}$ " Spacer For 1"	7993-09-42-010000
$\frac{3}{8}$ " Spacer For 1"	7993-09-43-010000
$\frac{3}{4}$ " Spacer For 1"	7993-09-47-010000
Nut For 1 $\frac{1}{4}$ "	7990-09-40-012500
Key For 1 $\frac{1}{4}$ "	7993-09-09-012500
$\frac{1}{4}$ " Spacer For 1 $\frac{1}{4}$ "	7993-09-42-012500
$\frac{3}{8}$ " Spacer For 1 $\frac{1}{4}$ "	7993-09-43-012500
$\frac{3}{4}$ " Spacer For 1 $\frac{1}{4}$ "	7993-09-47-012500



Hardinge **Boring Head Holders** will take the most popular adjustable boring heads – Erickson #37 and #50 heads, SPI, Yuasa and Criterion heads. When ordering, make certain that you order the holder for your specific boring head.

Retention knobs must be ordered separately for each holder; see pages 35 and 36.

When special applications arise and you need to make your own holder, we suggest you start with our **Blank Holders**. They are made from 8620 alloy steel with the shank and flange case hardened and precision ground. We have left the head softer for easier machining. We offer a standard and short version to better meet your needs.

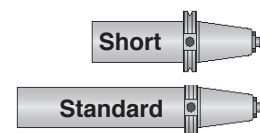
Retention knobs must be ordered separately for each holder; see pages 35 and 36.

Boring Head Holders

Taper	Part Number	Thread	L	Boring Heads
40	7938-40-02-006250	5/8"-18	1.38"	Erickson #37 & #50
40	7939-40-02-008750	7/8"-20	1.38"	SPI, Yuasa & Criterion
40	7939-40-02-015000	1 1/2"-18	1.38"	SPI, Yuasa & Criterion
45	7938-45-02-006250	5/8"-18	1.38"	Erickson #37 & #50
45	7939-45-02-008750	7/8"-20	1.38"	SPI, Yuasa & Criterion
45	7939-45-02-015000	1 1/2"-18	1.38"	SPI, Yuasa & Criterion
50	7938-50-02-006250	5/8"-18	1.38"	Erickson #37 & #50
50	7939-50-02-008750	7/8"-20	1.38"	SPI, Yuasa & Criterion
50	7939-50-02-015000	1 1/2"-18	1.38"	SPI, Yuasa & Criterion

Blank Holders

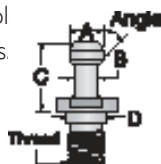
Taper	Part Number	C	D	L
40	7940-40-01-000000	2 1/2"	6"	1.38"
40	7940-40-02-000000	2 1/2"	11"	1.38"
45	7940-45-01-000000	3 1/4"	6"	1.38"
45	7940-45-02-000000	3 1/4"	11"	1.38"
50	7940-50-01-000000	3 7/8"	6"	1.38"
50	7940-50-02-000000	3 7/8"	11"	1.38"





Our retention knobs are manufactured to the industrial standards indicated in the charts. The knobs are made from tool steel that was heat treated to ensure durability and excellent performance. In addition to U.S. ANSI and MAS Styles, retention knobs are also available for other domestic and imported machining centers.

Due to the many different retention knobs used by machining center manufacturers, you may not find your knob in the listing below. We stock hundreds of knobs not listed. Please fill out the retention knob request form. If it is not a stock item, we will manufacture it to your machine tool builder's specifications.



If the specifications for your retention knob do not appear in our listing, please fill out this Retention Knob Request Form and give us a call.

A inch/mm _____

B inch/mm _____

C inch/mm _____

D inch/mm _____

Angle degrees _____

Thread _____

Toolholder Shank Style _____

Machine Make _____

Machine Model _____

Coolant Hole—Yes/No _____

Hole Diameter _____

O-Ring—Yes/No _____

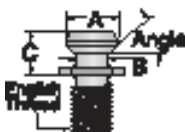
(send print for position)

Caution: Our retention knobs are built to the machine tool builder's specifications. Using retention knobs which do not conform to these specifications can cause damage to your tooling and/or machine tool.



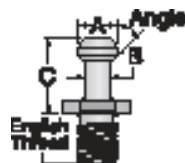
U.S. ANSI CAT-V Retention Knobs with Coolant Hole

Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
CV30	7986-30-11-000001	0.52"	0.39"	0.46"	45	1/2" - 13	40
CV40	7986-40-11-000001	0.74"	0.49"	0.64"	45	5/8" - 11	85
CV45	7986-45-11-000001	0.94"	0.61"	0.82"	45	3/4" - 10	100
CV50	7986-50-11-000001	1.14"	0.83"	1.00"	45	1" - 8	110



U.S. ANSI CAT-V Retention Knobs

Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
CV40	7986-40-10-000001	0.74"	0.49"	0.64"	45	5/8" - 11	85
CV45	7986-45-10-000001	0.94"	0.61"	0.82"	45	3/4" - 10	100
CV50	7986-50-10-000001	1.14"	0.83"	1.00"	45	1" - 8	110



MAS Style CAT-V Retention Knobs

Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
CV40	7986-40-20-000001*	0.59"	0.39"	1.27"	45	5/8" - 11	85
CV40C	7986-40-21-000001*	0.59"	0.39"	1.27"	45	5/8" - 11	85
CV40	7986-40-20-000002°	0.59"	0.39"	1.27"	45	5/8" - 11	85
CV40C	7986-40-21-000002°	0.59"	0.39"	1.27"	45	5/8" - 11	85
CV40	7986-40-20-000003	0.59"	0.39"	1.27"	60	5/8" - 11	85
CV40C	7986-40-21-000003	0.59"	0.39"	1.27"	60	5/8" - 11	85
CV40	7986-40-20-000004	0.59"	0.39"	1.27"	90	5/8" - 11	85
CV40C	7986-40-21-000004	0.59"	0.39"	1.27"	90	5/8" - 11	85
CV45	7986-45-20-000001	0.75"	0.55"	1.58"	45	3/4" - 10	100
CV45	7986-45-20-000002	0.75"	0.55"	1.58"	90	3/4" - 10	100
CV50	7986-50-20-000001	0.91"	0.67"	1.78"	45	1" - 8	110
CV50C	7986-50-21-000001	0.91"	0.67"	1.78"	45	1" - 8	110
CV50	7986-50-20-000002	0.91"	0.67"	1.78"	60	1" - 8	110
CV50C	7986-50-21-000002	0.91"	0.67"	1.78"	60	1" - 8	110
CV50	7986-50-20-000003	0.91"	0.67"	1.78"	90	1" - 8	110
CV50C	7986-50-21-000003	0.91"	0.67"	1.78"	90	1" - 8	110

See page 37 for Bridgeport machine knob compatibility.

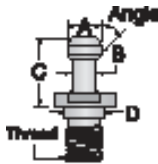
"C" at the end of the Taper and Flange designates a coolant hole.

* Thin Flange; ° Thick Flange



Our retention knobs are manufactured to the industrial standards indicated in the charts. The knobs are made from tool steel that was heat treated to ensure durability and excellent performance. In addition to U.S. ANSI and MAS Styles, retention knobs are also available for other domestic and imported machining centers.

Due to the many different retention knobs used by machining center manufacturers, you may not find your knob in the listing below. We stock hundreds of knobs not listed. Please fill out the retention knob request form. If it is not a stock item, we will manufacture it to your machine tool builder's specifications.



If the specifications for your retention knob do not appear in our listing, please fill out this Retention Knob Request Form and give us a call.

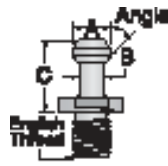
A inch/mm _____
 B inch/mm _____
 C inch/mm _____
 D inch/mm _____
 Angle degrees _____
 Thread _____
 Toolholder Shank Style _____

Machine Make _____
 Machine Model _____
 Coolant Hole—Yes/No _____
 Hole Diameter _____
 O-Ring—Yes/No _____

(send print for position)

Caution: Our retention knobs are built to the machine tool builder's specifications. Using retention knobs which do not conform to these specifications can cause damage to your tooling and/or machine tool.

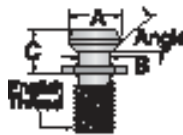
Other CAT-V Retention Knobs



Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
CV30	7986-30-30-000001	0.50"	0.40"	0.76"	45	½" - 13	40
CV30	7986-30-30-000002	0.50"	0.31"	0.75"	75	½" - 13	40
CV40	7986-40-30-000001	0.59"	0.39"	1.05"	90	⅝" - 11	85
CV40	7986-40-30-000002	0.59"	0.39"	0.98"	90	⅝" - 11	85
CV40	7986-40-30-000003	0.59"	0.41"	1.44"	45	⅝" - 11	85
CV40	7986-40-30-000001	0.59"	0.41"	1.44"	45	⅝" - 11	85
CV40	7986-40-30-000004	0.59"	0.39"	1.38"	45	⅝" - 11	85
CV40	7986-40-30-000005	0.52"	0.39"	0.47"	50	⅝" - 11	85
CV40	7986-40-30-000006	0.98"	0.83"	0.99"	75	⅝" - 11	85
CV40	7986-40-30-000007	0.50"	0.31"	0.75"	75	⅝" - 11	85
CV40H	7986-40-32-000001	0.75"	0.55"	1.02"	75	⅝" - 11	85
CV40	7986-40-30-000008	0.50"	0.31"	0.87"	75	⅝" - 11	85
CV40	7986-40-30-000009	0.50"	0.31"	2.38"	90	⅝" - 11	85
CV40	7986-40-30-000010	0.74"	0.48"	0.87"	75	⅝" - 11	85
CV40C	7986-40-31-000002	0.74"	0.55"	1.03"	75	⅝" - 11	85
CV40C	7986-40-31-000003	0.74"	0.49"	0.64"	45	⅝" - 11	85
CV40	7986-40-30-000011	0.75"	0.55"	1.02"	75	⅝" - 11	85
CV40C	7986-40-31-000004	0.75"	0.55"	1.02"	75	⅝" - 11	85
CV40H	7986-40-32-000002	0.75"	0.55"	1.02"	75	⅝" - 11	85
CV40C	7986-40-31-000005	0.75"	0.55"	1.14"	75	⅝" - 11	85
CV40H	7986-40-32-000003	0.59"	0.39"	1.26"	45	⅝" - 11	85
CV45	7986-45-30-000001	0.81"	0.56"	1.20"	90	¾" - 10	100
CV45	7986-45-30-000002	0.94"	0.64"	1.34"	45	¾" - 10	100
CV45C	7986-45-31-000001	0.94"	0.64"	1.34"	45	¾" - 10	100
CV50*	7986-50-30-000001	0.91"	0.67"	1.78"	90	1" - 8	110
CV50	7986-50-30-000002	0.94"	0.71"	1.23"	90	1" - 8	110
CV50C	7986-50-31-000001	0.94"	0.71"	1.23"	90	1" - 8	110
CV50	7986-50-30-000003	0.95"	0.70"	2.48"	.22R	1" - 8	110
CV50	7986-50-30-000004	0.95"	0.70"	3.48"	.22R	1" - 8	110
CV50C	7986-50-31-000002	1.14"	0.82"	1.00"	45	1" - 8	110
CV50H	7986-50-32-000001	0.90"	0.66"	1.78"	45	1" - 8	110
CV50H	7986-50-32-000002	0.90"	0.66"	1.78"	60	1" - 8	110

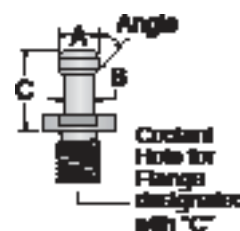
"C" at the end of the Taper and Flange designates a coolant hole;
 "H" indicates an O-Ring is included; * Wrench flats are on the knob end

Din 69872 CAT-V Retention Knobs



Taper and Flange	Part Number	A	B	C	Angle	Thread Size	Max. Torque (ft-lb)
CV30C	7986-30-41-000001	0.51"	0.35"	0.95"	75	½" - 13	40
CV40	7986-40-40-000001	0.75"	0.55"	1.02"	75	⅝" - 11	85
CV40C	7986-40-41-000001	0.75"	0.55"	1.02"	75	⅝" - 11	85
CV50	7986-50-40-000001	1.10"	0.83"	1.34"	75	1" - 8	110
CV50C	7986-50-41-000001	1.10"	0.83"	1.34"	75	1" - 8	110

"C" at the end of the Taper and Flange designates a coolant hole.



BT-Flange Retention Knobs for Hardinge & Bridgeport

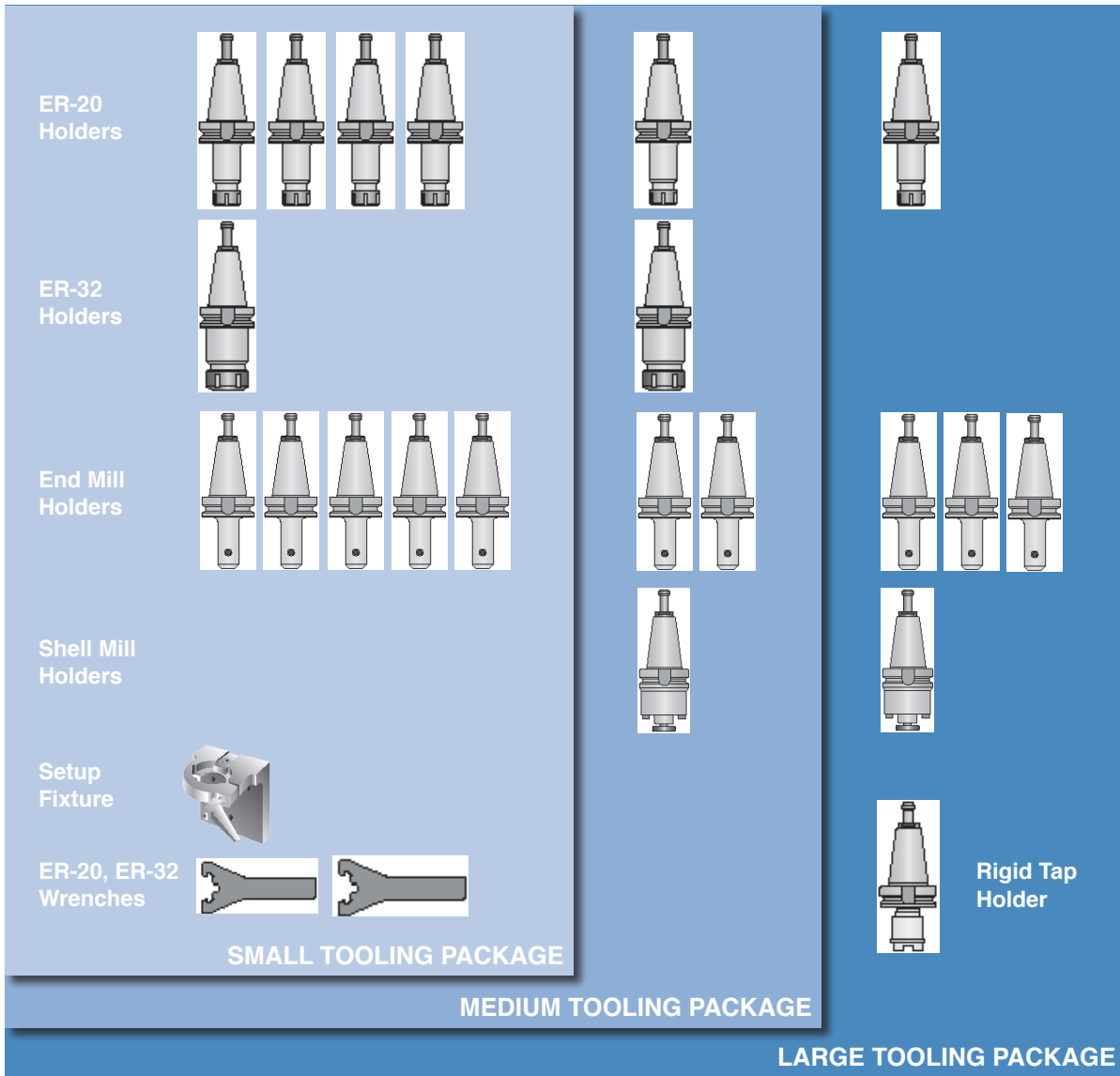
Hardinge and Bridgeport Machines	Taper Flange	Part Number	A	B	C	Angle	Maximum Thread Size	Torque (ft-lb)
GX 480DT, GX 480DT APC, DT480P ³ , DT480P ³ APC	BT30-45	7985-30-20-000001	0.43"	0.27"	0.90"	45	M12-1.75	40
VMC700 Type-II Flange	BT-40	7985-40-20-000002	0.59"	0.39"	1.38"	60	M16-2.0	85
	BT-40C	7985-40-21-000002	0.59"	0.39"	1.38"	60	M16-2.0	85
GX 480 APC, GX 600, GX 710, GX 800, GX 1000, GX 1250, GX 1500, GX 1600, VMC 480P ³ APC, VMC 600P ³ , VMC 800P ³ , VMC 1000P ³ , VMC 1250P ³ , VMC 1500P ³ , VMC 600II, VMC 700, VMC 800II, VMC 1000II, VMC 1250II, VMC 1500II	BT-40	7985-40-20-000001	0.59"	0.39"	1.38"	45	M16-2.0	85
	BT-40C	7985-40-21-000001	0.59"	0.39"	1.38"	45	M16-2.0	85
XR 610, XR 760, XR 1000, XR 1270, XR 1500HP, XR 1500HPD, XR 700HMC, XR 700HMC HP, XR 700HMC HPD, XR 1000 APC, XR 5005AX, XV 710, XV 1000, VMC 610XP ³ , VMC 760XP ³ , VMC 1000XP ³ , VMC 1270XP ³ , VMC 1500HPXP ³ , VMC 1500HPDXP ³ , HMC 700XP ³ , HMC 700HP, HMC 700HPD, APC 1000XP ³ , 5AX500XP ³ , VMC 710XV, VMC 1000XV	BT-40C	7985-40-11-000002	0.74"	0.49"	0.75"	45	M16-2.0	85

CAT-V Flange Retention Knobs for Hardinge & Bridgeport

Hardinge and Bridgeport Machines	Taper Flange	Part Number	A	B	C	Angle	Maximum Thread Size	Torque (ft-lb)
VMC700	CATV-40	7986-40-10-000001	0.74"	0.49"	0.64"	45	5/8" - 11	85
	CATV-40C	7986-40-11-000001	0.74"	0.49"	0.64"	45	5/8" - 11	85
GX 480 APC, GX 600, GX 710, GX 800, GX 1000, GX 1250, GX 1500, GX 1600, VMC 480P ³ APC, VMC 600P ³ , VMC 800P ³ , VMC 1000P ³ , VMC 1250P ³ , VMC 1500P ³ , VMC 600II, VMC 800II, VMC 1000II, VMC 1250II, VMC 1500II	CATV-40	7986-40-20-000001*	0.59"	0.39"	1.27"	45	5/8" - 11	85
	CATV-40C	7986-40-21-000001*	0.59"	0.39"	1.27"	45	5/8" - 11	85
XR 610, XR 760, XR 1000, XR 1270, XR 1500HP, XR 1500HPD, XR 700HMC, XR 700HMC HP, XR 700HMC HPD, XR 1000 APC, XR 5005AX, XV 710, XV 1000, VMC 610XP ³ , VMC 760XP ³ , VMC 1000XP ³ , VMC 1270XP ³ , VMC 1500HPXP ³ , VMC 1500HPDXP ³ , HMC 700XP ³ , HMC 700HP, HMC 700HPD, APC 1000XP ³ , 5AX500XP ³ , VMC 710XV, VMC 1000XV	CATV-40	7986-40-10-000001	0.74"	0.49"	0.64"	45	5/8" - 11	85
	CATV-40C	7986-40-11-000001	0.74"	0.49"	0.64"	45	5/8" - 11	85
VMC600, 1000	CATV-40	7986-40-20-000004	0.59"	0.39"	1.27"	90	5/8" - 11	85
	CATV-40C	7986-40-21-000004	0.59"	0.39"	1.27"	90	5/8" - 11	85
GX 1600	CATV-50	7986-50-20-000001	0.91"	0.67"	1.78"	45	1" - 8	110
	CATV-50C	7986-50-21-000001	0.91"	0.67"	1.78"	45	1" - 8	110

* Thin Flange

"C" following Taper Flange number designates coolant



Small Tooling Package:

BT-40 Tooling Package
Part No. 09554000001001

CATV-40 Tooling Package
Part No. 09554000000001

- (4) ER20 tool holders
- (1) ER32 tool holder
- (5) Standard end mill holders
.375", .500", .625", .750", 1.00"
- (1) Setup fixture
- (1) ER20 wrench
- (1) ER32 wrench
- (1) ER20 Metric Collet Kit {12pc}
- (5) ER32 Collets
1/2", 9/16", 5/8", 11/16", 3/4"

Medium Tooling Package:

BT-40 Tooling Package
Part No. 09554000002002

CATV-40 Tooling Package
Part No. 09554000000002

- (5) ER20 tool holders
- (2) ER32 tool holders
- (7) Standard end mill holders
2 each: .375", .500"
1 each: .625", .750", 1.00"
- (1) Shell mill holder 1.00"
- (1) Setup fixture
- (1) ER20 wrench
- (1) ER32 wrench
- (7) ER20 Collets
1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2"
- (1) ER20 Metric Collet Kit {12pc}
- (10) ER32 Collets 2 each:
1/2", 9/16", 5/8", 11/16", 3/4"

Large Tooling Package:

BT-40 Tooling Package
Part No. 09554000003003

CATV-40 Tooling Package
Part No. 09554000000003

- (6) ER20 tool holders
- (2) ER32 tool holders
- (10) Standard end mill holders
2 each: .375", .500", .625", .750", 1.00"
- (1) Shell mill holder 1.00"
- (1) Standard rigid tap holder
- (1) Setup fixture
- (1) ER20 wrench
- (1) ER32 wrench
- (7) ER20 Collets
1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2"
- (1) ER20 Metric Collet Kit {12pc}
- (10) ER32 Collets 2 each:
1/2", 9/16", 5/8", 11/16", 3/4"
- (1) Quick-change tap collet set {12pc}

Retention knobs are sold separately; refer to pages 21, 35 and 36.

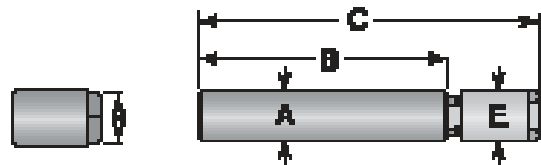
Double-Angle Extension Tool Holders



Shown with optional collet.

Double-Angle (DA) Collet Extension Tool Holders mount directly into a round shank tool holder on both mills and lathes. The DAH model holders will accept DA100, DA180, DA200 or DA300 collets.

Optional qualifying collars and chuck stops are available. The collars position and lock on the holder shank to qualify the tool's position in the DAH holder. Chuck stops are positioned inside the holder body to provide a qualified locating stop for tooling and to help prevent tool "push back".



DA Double-Angle Collet Extension Tool Holders

Collet Style	Tool Holder Part Number	Shank A	B	Length C	Cap E	Cap (included) Part Number	H Hex	Stop Screw Opt. Part Number
DA300	7996-03-30-005000	.500"	5.500"	6.79"	.560"	7991-03-30-000001	1/2"	7990-03-30-000004
DA200	7996-03-20-007500	.750"	5.500"	7.23"	.860"	7991-03-20-000001	3/4"	7990-03-20-000004
DA100	7996-03-10-010000	1.000"	5.500"	7.47"	1.062"	7991-03-10-000001	31/32"	7990-03-10-000004
DA180	7996-03-18-012500	1.250"	5.500"	7.37"	1.440"	7991-03-18-000001	1 1/4"	7990-03-18-000004

DA collets shown on pages 40 and 41.



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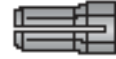
www.shophardinge.com

800.843.8801



Double-Angle Collets — Inch

DA Collets — Inch



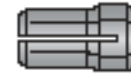
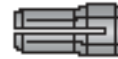
Size Range		DA300 Collet	DA200 Collet	DA100 Collet	DA 180 Collet
Inch	Inch Dec.	Part Number	Part Number	Part Number	Part Number
1/32"	.0312"	1891-00-19-000312	—	—	—
3/64"	.0468"	1891-00-19-000468	1889-00-19-000468	1887-00-19-000468	1885-00-19-000468
1/16"	.0625"	1891-00-19-000625	1889-00-19-000625	1887-00-19-000625	1885-00-19-000625
5/64"	.0781"	1891-00-19-000781	1889-00-19-000781	1887-00-19-000781	1885-00-19-000781
3/32"	.0937"	1891-00-19-000937	1889-00-19-000937	1887-00-19-000937	1885-00-19-000937
7/64"	.1093"	1891-00-19-001093	1889-00-19-001093	1887-00-19-001093	1885-00-19-001093
1/8"	.1250"	1891-00-19-001250	1889-00-19-001250	1887-00-19-001250	1885-00-19-001250
9/64"	.1406"	1891-00-19-001406	1889-00-19-001406	1887-00-19-001406	1885-00-19-001406
5/32"	.1562"	1891-00-19-001562	1889-00-19-001562	1887-00-19-001562	1885-00-19-001562
11/64"	.1718"	1891-00-19-001718	1889-00-19-001718	1887-00-19-001718	1885-00-19-001718
3/16"	.1875"	1891-00-19-001875	1889-00-19-001875	1887-00-19-001875	1885-00-19-001875
13/64"	.2031"	1891-00-19-002031	1889-00-19-002031	1887-00-19-002031	1885-00-19-002031
7/32"	.2187"	1891-00-19-002187	1889-00-19-002187	1887-00-19-002187	1885-00-19-002187
15/64"	.2343"	1891-00-19-002343	1889-00-19-002343	1887-00-19-002343	1885-00-19-002343
1/4"	.2500"	1891-00-19-002500	1889-00-19-002500	1887-00-19-002500	1885-00-19-002500
17/64"	.2656"	—	1889-00-19-002656	1887-00-19-002656	1885-00-19-002656
9/32"	.2812"	—	1889-00-19-002812	1887-00-19-002812	1885-00-19-002812
19/64"	.2968"	—	1889-00-19-002968	1887-00-19-002968	1885-00-19-002968
5/16"	.3125"	—	1889-00-19-003125	1887-00-19-003125	1885-00-19-003125
21/64"	.3281"	—	1889-00-19-003281	1887-00-19-003281	1885-00-19-003281
11/32"	.3437"	—	1889-00-19-003437	1887-00-19-003437	1885-00-19-003437
23/64"	.3593"	—	1889-00-19-003593	1887-00-19-003593	1885-00-19-003593
3/8"	.3750"	—	1889-00-19-003750	1887-00-19-003750	1885-00-19-003750
25/64"	.3906"	—	1889-00-19-003906	1887-00-19-003906	1885-00-19-003906
13/32"	.4062"	—	—	1887-00-19-004062	1885-00-19-004062
27/64"	.4218"	—	—	1887-00-19-004218	1885-00-19-004218
7/16"	.4375"	—	—	1887-00-19-004375	1885-00-19-004375
29/64"	.4531"	—	—	1887-00-19-004531	1885-00-19-004531
15/32"	.4687"	—	—	1887-00-19-004687	1885-00-19-004687
31/64"	.4843"	—	—	1887-00-19-004843	1885-00-19-004843
1/2"	.5000"	—	—	1887-00-19-005000	1885-00-19-005000
33/64"	.5156"	—	—	1887-00-19-005156	1885-00-19-005156
17/32"	.5312"	—	—	1887-00-19-005312	1885-00-19-005312
35/64"	.5468"	—	—	1887-00-19-005468	1885-00-19-005468
9/16"	.5625"	—	—	1887-00-19-005625	1885-00-19-005625
37/64"	.5781"	—	—	—	1885-00-19-005781
19/32"	.5937"	—	—	—	1885-00-19-005937
39/64"	.6093"	—	—	—	1885-00-19-006093
5/8"	.6250"	—	—	—	1885-00-19-006250
41/64"	.6406"	—	—	—	1885-00-19-006406
21/32"	.6562"	—	—	—	1885-00-19-006562
43/64"	.6718"	—	—	—	1885-00-19-006718
11/16"	.6875"	—	—	—	1885-00-19-006875
45/64"	.7031"	—	—	—	1885-00-19-007031
23/32"	.7187"	—	—	—	1885-00-19-007187
47/64"	.7343"	—	—	—	1885-00-19-007343
3/4"	.7500"	—	—	—	1885-00-19-007500
DA Collet Sets		0931-00-19-300009 9 Collets 1/8" to 1/4" (1/64" Incr.)	0931-00-19-200017 17 Collets 1/8" to 3/8" (1/64" Incr.)	0931-00-19-000000 34 Collets 3/64" to 9/16" (1/64" Incr.)	0933-00-19-000000 40 Collets 3/64" to 3/4" (1/64" Incr.)
DA Collet Sets		0931-00-19-300005 5 Collets 1/8" to 1/4" (1/32" Incr.)	0931-00-19-200009 9 Collets 1/8" to 3/8" (1/32" Incr.)		



Double-Angle Collets are held in the proper size DAH holders shown on the previous pages. The double-angle collet is noted for its parallel gripping capability due to the two angles and the opposed split configuration which places the parallel bearing on the tool shank as well as the full diameter of the tool. Collet range is -.5 mm (-.0196").

Dimensions		
Style	B	C
DA300	1.08"	.375"
DA200	1.18"	.539"
DA100	1.44"	.769"
DA180	1.62"	1.035"

DA Collets — Metric



Size Range mm	DA300 Collet Part Number	DA200 Collet Part Number	DA100 Collet Part Number	DA180 Collet Part Number
1.0	1891-00-17-010000	1889-00-17-010000	1887-00-17-010000	1885-00-17-010000
1.5	1891-00-17-015000	1889-00-17-015000	1887-00-17-015000	1885-00-17-015000
2.0	1891-00-17-020000	1889-00-17-020000	1887-00-17-020000	1885-00-17-020000
2.5	1891-00-17-025000	1889-00-17-025000	1887-00-17-025000	1885-00-17-025000
3.0	1891-00-17-030000	1889-00-17-030000	1887-00-17-030000	1885-00-17-030000
3.5	1891-00-17-035000	1889-00-17-035000	1887-00-17-035000	1885-00-17-035000
4.0	1891-00-17-040000	1889-00-17-040000	1887-00-17-040000	1885-00-17-040000
4.5	1891-00-17-045000	1889-00-17-045000	1887-00-17-045000	1885-00-17-045000
5.0	1891-00-17-050000	1889-00-17-050000	1887-00-17-050000	1885-00-17-050000
5.5	1891-00-17-055000	1889-00-17-055000	1887-00-17-055000	1885-00-17-055000
6.0	1891-00-17-060000	1889-00-17-060000	1887-00-17-060000	1885-00-17-060000
6.5	1891-00-17-065000	1889-00-17-065000	1887-00-17-065000	1885-00-17-065000
7.0		1889-00-17-070000	1887-00-17-070000	1885-00-17-070000
7.5		1889-00-17-075000	1887-00-17-075000	1885-00-17-075000
8.0		1889-00-17-080000	1887-00-17-080000	1885-00-17-080000
8.5		1889-00-17-085000	1887-00-17-085000	1885-00-17-085000
9.0		1889-00-17-090000	1887-00-17-090000	1885-00-17-090000
9.5		1889-00-17-095000	1887-00-17-095000	1885-00-17-095000
10.0			1887-00-17-100000	1885-00-17-100000
10.5			1887-00-17-105000	1885-00-17-105000
11.0			1887-00-17-110000	1885-00-17-110000
11.5			1887-00-17-115000	1885-00-17-115000
12.0			1887-00-17-120000	1885-00-17-120000
12.5			1887-00-17-125000	1885-00-17-125000
13.0			1887-00-17-130000	1885-00-17-130000
13.5			1887-00-17-135000	1885-00-17-135000
14.0			1887-00-17-140000	1885-00-17-140000
14.5			1887-00-17-145000	1885-00-17-145000
15.0			1887-00-17-150000	1885-00-17-150000
15.5				1885-00-17-155000
16.0				1885-00-17-160000
16.5				1885-00-17-165000
17.0				1885-00-17-170000
17.5				1885-00-17-175000
18.0				1885-00-17-180000
18.5				1885-00-17-185000
19.0				1885-00-17-190000
19.5				1885-00-17-195000
20.0				1885-00-17-200000
DA Collet Sets			0931-00-17-000000 4 Collets 4.5, 6, 7, 8	0933-00-17-000000 32 Collets 4.5 to 19 (.5mm Incr.)



Double-Angle Collets are held in the proper size DAH holders shown on the previous pages. The double-angle collet is noted for its parallel gripping capability due to the two angles and the opposed split configuration which places the parallel bearing on the tool shank as well as the full diameter of the tool. Collet range is -0.5 mm ($-0.0196''$).

Dimensions

Style	B	C
DA300	1.08"	.375"
DA200	1.18"	.539"
DA100	1.44"	.769"
DA180	1.62"	1.035"

DA Collet Racks

	DA100	DA180 Rack	DA/ER Combination
Part Number	0946-10-00-000036	0946-18-00-000045	0946-00-00-000054
Collet Capacity	36 DA100 Collets	45 DA180 Collets	18 DA300, 27 DA200 and 9 ER16 Collets

Collet racks will help minimize damage to the precision surfaces and critical diameters of your collet. Collets which are loosely put in a drawer are subject to damage. Damaged collets may result in your cutting tools not being on the toolholder or spindle's centerline, resulting in inaccurate machining.

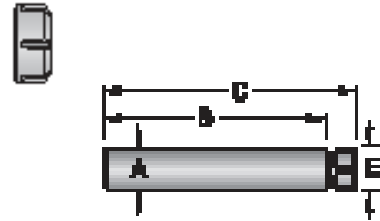


ER Collet Extension Tool Holders range from ER11 through ER32 series collets. One collet has enough flex to be able to hold a large range of tool shanks, eliminating the need for separate collets for each tool. Both metric and the inch sizes are listed for all collets.

Coolant seals are shown on page 47. Tap shank diameters and squares are the same as those on page 31.

ER-Style Collet Tool Holders for Vertical Machining Centers

Collet Style	Part Number	Shank A	B	C	E	Standard Cap Part No. (included)
ER11	7996-01-11-005000	.500"	5.8"	6.6"	.63"	7991-01-11-000001
ER16	7996-01-16-007500	.750"	5.9"	7.0"	1.08"	7991-01-16-000001
ER20	7996-01-20-010000	1.000"	5.8"	7.0"	1.375"	7991-01-20-000001
ER25	7996-01-25-010000	1.000"	5.5"	7.5"	1.65"	7991-01-25-000001
ER32	7996-01-32-012500	1.250"	5.5"	7.5"	1.88"	7991-01-32-000001



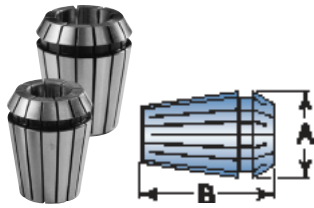
Optional Caps, Wrenches, Screws and Extractors



Style	Dia. C	Wrench for Std. Cap and Ball Bearing Cap Part Number	Ball Bearing Cap Part Number	Fine Tune Cap Part Number	U-Balance Cap Part Number	Wrench for Fine Tune U-Balance Caps Part Number
ER11	.63"	7992-01-11-000003	—	—	—	—
ER16	1.08"	7992-01-16-000003	—	7991-01-16-000009	7991-01-16-000010	7992-01-16-000009
ER20	1.375"	7992-01-20-000003	7991-01-20-000008	7991-01-20-000009	7991-01-20-000010	7992-01-20-000009
ER25	1.65"	7992-01-25-000003	7991-01-25-000008	7991-01-25-000009	7991-01-25-000010	7992-01-25-000009
ER32	1.88"	7992-01-32-000003	7991-01-32-000008	7991-01-32-000009	7991-01-32-000010	7992-01-32-000009



Style	ER Stop Screw Standard Part Number	ER Stop Screw Standard Coolant Part Number	Thread	Extractor Clip
ER11	—	—	—	None
ER16	7990-01-16-000004	7990-01-16-000006	7/16"-20	7993-01-16-000007
ER20	7990-01-20-000004	7990-01-20-000006	M14-1.5	7993-01-20-000007
ER25	7990-01-25-000004	7990-01-25-000006	M18-1.5	7993-01-25-000007
ER32	7990-01-32-000004	7990-01-32-000006	M22-1.5	7993-01-32-000007



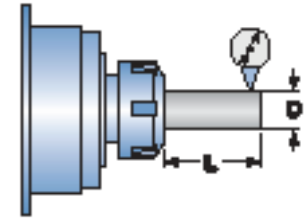
ER Series collets have enough flex to hold a large range of tool shanks, eliminating the need for separate collets for each tool. (ER-series collets are interchangeable with DR- and ESX-type collets)

ER11 Collets—Metric

Size Range	ER11 Collet Part Number
mm Inch	
0.5 - .25	—
1.0 - 0.5	1911-00-17-010000
1.5 - 1.0	1911-00-17-015000
2.0 - 1.5	1911-00-17-020000
2.5 - 2.0	1911-00-17-025000
3.0 - 2.5	1911-00-17-030000
3.5 - 3.0	1911-00-17-035000
4.0 - 3.5	1911-00-17-040000
4.5 - 4.0	1911-00-17-045000
5.0 - 4.5	1911-00-17-050000
5.5 - 5.0	1911-00-17-055000
6.0 - 5.5	1911-00-17-060000
6.5 - 6.0	1911-00-17-065000
7.0 - 6.5	1911-00-17-070000
Standard Collet Sets	0947-11-17-000013 13 Collets

Collet Dimensions

ER Style	A - Diameter		B - Length	
	mm	Inch	mm	Inch
11	11.5	.453"	18.0	.709"
16	17.0	.669"	27.0	1.063"
20	21.0	.827"	31.0	1.220"
25	26.0	1.024"	35.0	1.378"
32	33.0	1.299"	40.0	1.575"



Total Indicator Reading (TIR) from the face of the collet

Hardinge® ER Collet Concentricity Specifications

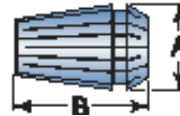
Dimension – D Clamping Range	Dimension – L Distance from Face	Maximum TIR					
		Precision DIN 6499		High Precision DIN 6499			
		mm	Inch	mm	Inch		
1.0 - 1.6	.039" - .063"	6.0	.236"	.015	.0006"	.008	.0003"
1.6 - 3.0	.063" - .118"	10.0	.394"	.015	.0006"	.008	.0003"
3.0 - 6.0	.118" - .236"	16.0	.630"	.015	.0006"	.008	.0003"
6.0 - 10.0	.236" - .394"	25.0	.984"	.015	.0006"	.008	.0003"
10.0 - 18.0	.394" - .709"	40.0	1.575"	.020	.0008"	.010	.0004"
18.0 - 26.0	.709" - 1.024"	50.0	1.969"	.020	.0008"	.010	.0004"
26.0 - 34.0	1.024" - 1.339"	60.0	2.363"	.025	.0010"	—	—

ER16, ER20, ER25, ER32 Collets — Metric Sizes

Size Range	ER16 Collet Part Number	ER20 Collet Part Number	ER25 Collet Part Number	ER32 Collet Part Number
mm Inch				
1.0 - 0.5	1913-00-17-010000	—	—	—
2.0 - 1.0	1913-00-17-020000	1915-00-17-020000	2095-00-17-020000	—
3.0 - 2.0	1913-00-17-030000	1915-00-17-030000	2095-00-17-030000	1917-00-17-030000
4.0 - 3.0	1913-00-17-040000	1915-00-17-040000	2095-00-17-040000	1917-00-17-040000
5.0 - 4.0	1913-00-17-050000	1915-00-17-050000	2095-00-17-050000	1917-00-17-050000
6.0 - 5.0	1913-00-17-060000	1915-00-17-060000	2095-00-17-060000	1917-00-17-060000
7.0 - 6.0	1913-00-17-070000	1915-00-17-070000	2095-00-17-070000	1917-00-17-070000
8.0 - 7.0	1913-00-17-080000	1915-00-17-080000	2095-00-17-080000	1917-00-17-080000
9.0 - 8.0	1913-00-17-090000	1915-00-17-090000	2095-00-17-090000	1917-00-17-090000
10.0 - 9.0	1913-00-17-100000	1915-00-17-100000	2095-00-17-100000	1917-00-17-100000
11.0 - 10.0	.433" - .394"	1915-00-17-110000	2095-00-17-110000	1917-00-17-110000
12.0 - 11.0	.472" - .433"	1915-00-17-120000	2095-00-17-120000	1917-00-17-120000
13.0 - 12.0	.511" - .472"	1915-00-17-130000	2095-00-17-130000	1917-00-17-130000
14.0 - 13.0	.551" - .511"		2095-00-17-140000	1917-00-17-140000
15.0 - 14.0	.590" - .551"		2095-00-17-150000	1917-00-17-150000
16.0 - 15.0	.629" - .590"		2095-00-17-160000	1917-00-17-160000
17.0 - 16.0	.669" - .629"			1917-00-17-170000
18.0 - 17.0	.708" - .669"			1917-00-17-180000
19.0 - 18.0	.748" - .708"			1917-00-17-190000
20.0 - 19.0	.787" - .748"			1917-00-17-200000
Standard Collet Sets	0947-16-17-000010 10 Collets	0947-20-17-000012 12 Collets	0947-25-17-000015 15 Collets	0947-32-17-000018 18 Collets



ER Series collets have enough flex to hold a large range of tool shanks, eliminating the need for separate collets for each tool. Refer to page 43 for concentricity specifications. (ER-series collets are interchangeable with DR- and ESX-type collets)



Collet Dimensions

ER Style	A - Diameter		B - Length	
	mm	Inch	mm	Inch
11	11.5	.453"	18.0	.709"
16	17.0	.669"	27.0	1.063"
20	21.0	.827"	31.0	1.220"
25	26.0	1.024"	35.0	1.378"
32	33.0	1.299"	40.0	1.575"

ER Collets — Inch

Size Range		ER11 Collet	ER16 Collet	ER20 Collet	ER25 Collet	ER32 Collet
Inch	mm	Part Number	Part Number	Part Number	Part Number	Part Number
1/16"	1.58	1911-00-19-000625	1913-00-19-000625	1915-00-19-000625	2095-00-19-000625	—
3/32"	2.38	1911-00-19-000937	1913-00-19-000937	1915-00-19-000937	2095-00-19-000937	1917-00-19-000937
1/8"	3.17	1911-00-19-001250	1913-00-19-001250	1915-00-19-001250	2095-00-19-001250	1917-00-19-001250
5/32"	3.96	1911-00-19-001562	1913-00-19-001562	1915-00-19-001562	2095-00-19-001562	1917-00-19-001562
3/16"	4.76	1911-00-19-001875	1913-00-19-001875	1915-00-19-001875	2095-00-19-001875	1917-00-19-001875
7/32"	5.55	1911-00-19-002187	1913-00-19-002187	1915-00-19-002187	2095-00-19-002187	1917-00-19-002187
1/4"	6.35	1911-00-19-002500	1913-00-19-002500	1915-00-19-002500	2095-00-19-002500	1917-00-19-002500
9/32"	7.14		1913-00-19-002812	1915-00-19-002812	2095-00-19-002812	1917-00-19-002812
5/16"	7.93		1913-00-19-003125	1915-00-19-003125	2095-00-19-003125	1917-00-19-003125
11/32"	8.72		1913-00-19-003437	1915-00-19-003437	2095-00-19-003437	1917-00-19-003437
3/8"	9.52		1913-00-19-003750	1915-00-19-003750	2095-00-19-003750	1917-00-19-003750
13/32"	10.31		1913-00-19-004062	1915-00-19-004062	2095-00-19-004062	1917-00-19-004062
7/16"	11.11			1915-00-19-004375	2095-00-19-004375	1917-00-19-004375
15/32"	11.90			1915-00-19-004687	2095-00-19-004687	1917-00-19-004687
1/2"	12.70			1915-00-19-005000	2095-00-19-005000	1917-00-19-005000
17/32"	13.49				2095-00-19-005312	1917-00-19-005312
9/16"	14.28				2095-00-19-005625	1917-00-19-005625
19/32"	15.08				2095-00-19-005937	1917-00-19-005937
5/8"	15.87				2095-00-19-006250	1917-00-19-006250
21/32"	16.66					1917-00-19-006562
11/16"	17.46					1917-00-19-006875
23/32"	18.25					1917-00-19-007187
3/4"	19.05					1917-00-19-007500
Standard Collet Sets		0947-11-19-000007 7 Collets	0947-16-19-000012 12 Collets	0947-20-19-000015 15 Collets	0947-25-19-000019 19 Collets	0947-32-19-000022 22 Collets

ER Collet Racks

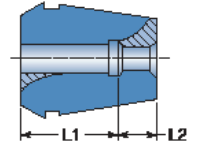
	ER11 Rack	ER16 Rack	ER20 Rack	ER25 Rack	ER32 Rack	Combination Rack
Part Number	0946-11-00-000036	0946-16-00-000036	0946-20-00-000036	0946-25-00-000036	0946-32-00-000036	0946-00-00-000069
Collet Capacity	36 ER11 Collets	36 ER16 Collets	36 ER20 Collets	30 ER25 Collets	30 ER32 Collets	16 ER11 Collets 16 ER16 Collets 16 ER20 Collets 21 ER32 Collets



The ERTCSP-Style Rigid Tap Collet with square drive are multi-split with more shank bearing surface than ER/DR collets. The bore is the exact size of the shank with a square broached hole to eliminate tap slippage. Available for thru-coolant applications.

Collet Dimensions

Tap Size	L1	L2			
		ERTCSP16	ERTCSP20	ERTCSP25	ERTCSP32
0-6 - 1/4"	0.709"	0.374"	0.531"	0.630"	0.866"
5/16" - 1/2"	0.866"	—	0.374"	0.472"	0.709"
9/16" - 7/8"	0.984"	—	—	0.374"	0.591"
1"	1.102"	—	—	—	—



ERTCSP16, 20, 25 and 32 Tap Collets

Size Range	ERTCSP16 Tap	ERTCSP20 Tap	ERTCSP25 Tap	ERTCSP32 Collet
Tap Size	Shank	Part Number	Part Number	Part Number
#0 - 6	.141"	1913-19-18-001410	1915-19-18-001410	—
#8	.168"	1913-19-18-001680	1915-19-18-001680	2095-19-18-001680
#10	.194"	1913-19-18-001940	1915-19-18-001940	2095-19-18-001940
#12	.220"	1913-19-18-002200	1915-19-18-002200	2095-19-18-002200
1/4"	.255"	1913-19-18-002550	1915-19-18-002550	2095-19-18-002550
5/16"	.318"		1915-19-18-003180	2095-19-18-003180
3/8"	.381"		1915-19-18-003810	2095-19-18-003810
7/16"	.323"		1915-19-18-003230	2095-19-18-003230
1/2"	.367"		1915-19-18-003670	2095-19-18-003670
9/16"	.429"			2095-19-18-004290
5/8"	.480"			2095-19-18-004800
11/16"	.542"			
3/4"	.590"			
13/16"	.652"			
Tap Kits		0949-16-18-000005 5 Tap Collets	0949-20-18-000009 9 Tap Collets	0949-25-18-00010 10 Tap Collets
				0949-32-18-000013 13 Tap Collets

ANSI Metric Taps — Shank Sizes

ANSI Metric Taps	M1 to M3.5	M4	M4.5 & M5	M6 & M6.3	M7 & M8	M10	M12	M14
Shank Size	.141"	.168"	.194"	.255"	.318"	.381"	.367"	.429"

Metric (DIN), Japanese (JIS) and Chinese (CIC) standard sizes on request.

ERTC Floating Solid Tap Collets

Size Range	ERTC11/12 Tap Collet	ERTC16 Tap Collet	ERTC20 Tap Collet	ERTC25 Tap Collet	ERTC32 Tap Collet
Tap Size	Shank	Part Number	Part Number	Part Number	Part Number
#0 - 6	.141"	1919-00-18-001410	1921-00-18-001410	1923-00-18-001410	2097-00-18-001410
#8	.168"		1921-00-18-001680	1923-00-18-001680	2097-00-18-001680
#10	.194"		1921-00-18-001940	1923-00-18-001940	2097-00-18-001940
#12	.220"			1923-00-18-002200	2097-00-18-002200
1/4"	.255"			1923-00-18-002550	2097-00-18-002550
5/16"	.318"				2097-00-18-003180
3/8"	.381"				2097-00-18-003810
7/16"	.323"				2097-00-18-003230
1/2"	.367"				2097-00-18-003670
9/16"	.429"				
5/8"	.480"				
1/8" NPT	.437"				



The Floating Solid Tap Collet reduces tap breakage because of its tension compensation feature. This feature is needed when using synchronous (rigid) feed or machines requiring axial tension compensation. The collet is removed to change taps. The tap is secured with set screws which go through the sides of the square drive hole in the collet.

ERQC Quick-Change Floating Solid Tap Collets

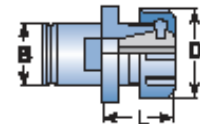
Size Range	ERQC16 Tap	ERQC20 Tap	ERQC25 Tap	ERQC32 Collet	
Tap Size	Shank	Part Number	Part Number	Part Number	
#0 - 6	.141"	2143-00-18-001410	2145-00-18-001410	2147-00-18-001410	
#8	.168"	2143-00-18-001680	2145-00-18-001680	2147-00-18-001680	
#10	.194"	2143-00-18-001940	2145-00-18-001940	2147-00-18-001940	
#12	.220"		2145-00-18-002200	2147-00-18-002200	
1/4"	.255"		2145-00-18-002550	2147-00-18-002550	
5/16"	.318"			2147-00-18-003180	
3/8"	.381"			2147-00-18-003810	
7/16"	.323"			2147-00-18-003230	
1/2"	.367"			2147-00-18-003670	
9/16"	.429"			2149-00-18-004290	
5/8"	.480"				
1 1/16"	.542"				
Tap Kits		0948-16-18-000003 3 Tap Collets	0948-20-18-000005 5 Tap Collets	0948-25-18-000009 9 Tap Collets	0948-32-18-000010 10 Tap Collets



ERQC Quick-Change Tap Collets can be used in any standard ER-, DR- or ESX-style collet holder used on lathes and milling machines. The ERQC collets allow taps to be quickly changed without removing the collet, while maintaining gauge lengths from one tap to the next. The collet has a ball bearing tension-compensating float and a solid square drive that eliminates tap slippage. Tap breakage is reduced when using synchronous (rigid) feed or machines requiring axial tension compensation.

Adapters to use ER Collets in Tap Holders

- Adapter and ER Collet system can be used for tapping, drilling, reaming, etc.
- Quick-change adapters for Bilz and other popular tapping systems
- Collets permit holding ANSI and metric sizes

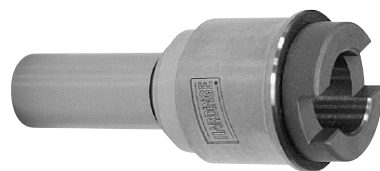


Adapters

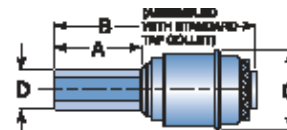


Adapter Part Number	Collet Series	Tap Range	Head	B		L		D	
				Inch	mm	Inch	mm	Inch	mm
2153-00-00-000011	ER11	0-6 - 1/4"	#0	0.51"	13.0	1.10"	28.0	0.75"	19.0
2153-00-00-000016	ER16	0-6 - 1/2"	#1	0.75"	19.0	0.98"	25.0	1.10"	28.0
2153-00-00-000025	ER25	0-6 - 3/4"	#2	1.22"	31.0	1.34"	34.0	1.65"	42.0
2153-00-00-000032	ER32	0-6 - 1 1/4"	#3	1.89"	48.0	1.89"	48.0	1.97"	50.0

Straight Round Shank Bilz-Style Holder

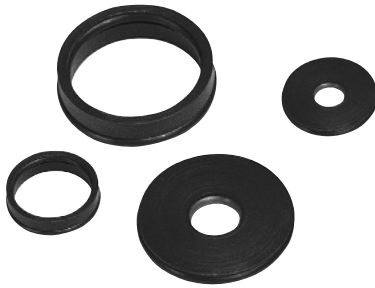


Adapter Part Number	Head Number	A		B		C		D - Shank	
		Inch	mm	Inch	mm	Inch	mm	Inch	mm
2547-00-00-000001	#1	1.72"	43.6	3.92"	99.5	1.50"	38.1	.75"	19.05
2547-00-00-000002	#2	1.72"	43.6	4.70"	119.3	1.88"	47.7	.75"	19.05
2549-00-00-000001	#1	6.00"	152.4	8.50"	215.9	1.50"	38.1	1.00"	25.40
2549-00-00-000002	#2	6.00"	152.4	9.25"	234.9	1.88"	47.7	1.00"	25.40





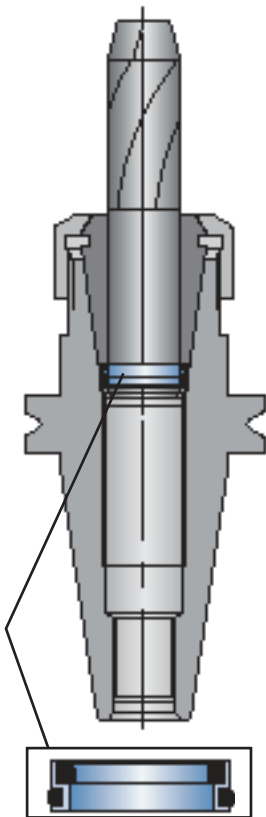
"Cool-Stop" Coolant Seals for ER & TG Collets



Maximize coolant flow through your drills with the "Cool Stop" system. The "Cool Stop" seals around the shank of the drill and the ID of the ER and TG holders. The gauge length of the holder does not change. The collet stays flush with the cap because the "Cool Stop" seal locates at the back of the collet. Each "Cool Stop" has a range from rated size down to .020" (0.5 mm), resulting in a small seal inventory for each collet style. You can keep the coolant running through the drill, rather than out of the collet, at pressures up to 1500 psi.

ER16, ER20, ER25 and ER32 "Cool Stop" Seals — Metric

Size Range	ER16 Seal	ER20 Seal	ER25 Seal	ER32 Seal	
mm	Inch	Part Number	Part Number	Part Number	
5.5 - 5.0	.217" - .197"	7988-01-16-055000	7988-01-20-055000	7988-01-25-055000	7988-01-32-055000
6.0 - 5.5	.236" - .217"	7988-01-16-060000	7988-01-20-060000	7988-01-25-060000	7988-01-32-060000
6.5 - 6.0	.256" - .236"	7988-01-16-065000	7988-01-20-065000	7988-01-25-065000	7988-01-32-065000
7.0 - 6.5	.276" - .256"	7988-01-16-070000	7988-01-20-070000	7988-01-25-070000	7988-01-32-070000
7.5 - 7.0	.295" - .276"	7988-01-16-075000	7988-01-20-075000	7988-01-25-075000	7988-01-32-075000
8.0 - 7.5	.315" - .295"	7988-01-16-080000	7988-01-20-080000	7988-01-25-080000	7988-01-32-080000
8.5 - 8.0	.335" - .315"		7988-01-20-085000	7988-01-25-085000	7988-01-32-085000
9.0 - 8.5	.354" - .335"		7988-01-20-090000	7988-01-25-090000	7988-01-32-090000
9.5 - 9.0	.374" - .354"		7988-01-20-095000	7988-01-25-095000	7988-01-32-095000
10.0 - 9.5	.394" - .374"		7988-01-20-100000	7988-01-25-100000	7988-01-32-100000
10.5 - 10.0	.413" - .394"			7988-01-25-105000	7988-01-32-105000
11.0 - 10.5	.433" - .413"			7988-01-25-110000	7988-01-32-110000
11.5 - 11.0	.453" - .433"			7988-01-25-115000	7988-01-32-115000
12.0 - 11.5	.472" - .453"			7988-01-25-120000	7988-01-32-120000
12.5 - 12.0	.492" - .472"			7988-01-25-125000	7988-01-32-125000
13.0 - 12.5	.512" - .492"			7988-01-25-130000	7988-01-32-130000
13.5 - 13.0	.531" - .512"			7988-01-25-135000	7988-01-32-135000
14.0 - 13.5	.551" - .531"			7988-01-25-140000	7988-01-32-140000
14.5 - 14.0	.571" - .551"			7988-01-25-145000	7988-01-32-145000
15.0 - 14.5	.591" - .571"				7988-01-32-150000
15.5 - 15.0	.610" - .591"				7988-01-32-155000
16.0 - 15.5	.630" - .610"				7988-01-32-160000
16.5 - 16.0	.650" - .630"				7988-01-32-165000
17.0 - 16.5	.669" - .650"				7988-01-32-170000
17.5 - 17.0	.689" - .669"				7988-01-32-175000
18.0 - 17.5	.709" - .689"				7988-01-32-180000
18.5 - 18.0	.728" - .709"				7988-01-32-185000
19.0 - 18.5	.748" - .728"				7988-01-32-190000
19.5 - 19.0	.768" - .748"				7988-01-32-195000
20.0 - 19.5	.787" - .768"				7988-01-32-200000



Seal Cross Section

Quick Assembly:

Put the collet in the cap, the drill through the collet, the "Cool Stop" seal on the drill shank and insert the assembly into the holder. Adjust the drill to the proper length and lock the cap. You are now ready to increase your productivity.

TG100 "Cool Stop" Seals — Inch

Size Range	TG100 Seal
Inch	Part Number
3/4" - .734"	7988-02-10-007500
49/64" - .750"	7988-02-10-007656
25/32" - .765"	7988-02-10-007812
51/64" - .781"	7988-02-10-007968
13/16" - .796"	7988-02-10-008125
53/64" - .812"	7988-02-10-008281
27/32" - .828"	7988-02-10-008437
55/64" - .843"	7988-02-10-008593
7/8" - .859"	7988-02-10-008750
57/64" - .875"	7988-02-10-008906
29/32" - .890"	7988-02-10-009062
59/64" - .906"	7988-02-10-009218
15/16" - .921"	7988-02-10-009375
61/64" - .937"	7988-02-10-009531
31/32" - .953"	7988-02-10-009687
63/64" - .968"	7988-02-10-009843
1.0" - .984"	7988-02-10-010000



R8 Collets, R8 ER-Style Collet Holders, 5C Stub Arbors



One-Piece Design
No bushing that could
work loose.

Precision **R8 Collets** for manual and CNC milling machines are carburized and case hardened for maximum wearability and strength. They are harder than any other R8 collet on the market. A custom process is used to eliminate the use of bushings for the internal draw threads.

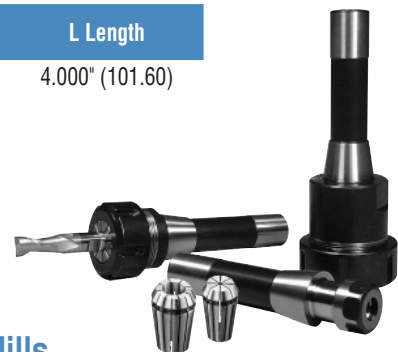
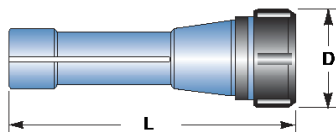
R-8 Mill Collets

R-8	Part No.	Capacity	Maximum Tool Depth
Round	1757-00-19-	1/64" to 3/4"	2.750"
Round	1757-00-19-	.751" to .8125"	.875"
Round	1757-00-19-	.813" to .8750"	.750"
Round	1757-00-19-	.876" to .9375"	.500"
Round	1757-00-19-	.938" to 1.000"	.250"
Hex	1757-00-29-	1/32" to 5/8"	2.750"
Square	1757-00-39-	1/32" to 17/32"	2.750"

R8 Mill Collet Kit (shown above)

Collet Style	Collet Kit Part Number	Quantity	Collet Sizes included in Kit	D Back Bearing	L Length
R8	0942-00-19-000011	11	1/8 through 3/4" in 1/16" increments	.950" (24.13)	4.000" (101.60)

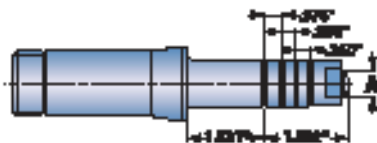
millimeters in parenthesis



R8, ER-Style Tool Holders for Bridgeport and other brand Knee Mills

Collet Style	Collet Holder	Taper	L	D	Range of Collets	Replacement Cap Part Number	Optional Wrench Part Number
ER16	1757-00-00-00ER16	R8	5.414" (137.51)	1.102" (28.00)	1/64 to 3/8"	7991-01-16-000021	7992-01-16-000021
ER32	1757-00-00-00ER32	R8	5.450" (138.43)	1.969" (50.00)	1/16 to 25/32"	7991-01-32-000220	7992-01-32-000220
ER40	1757-00-00-00ER40	R8	6.705" (170.30)	2.480" (63.00)	3/32 - 1"	7991-01-40-000220	7992-01-40-000220

Millimeters in parentheses.

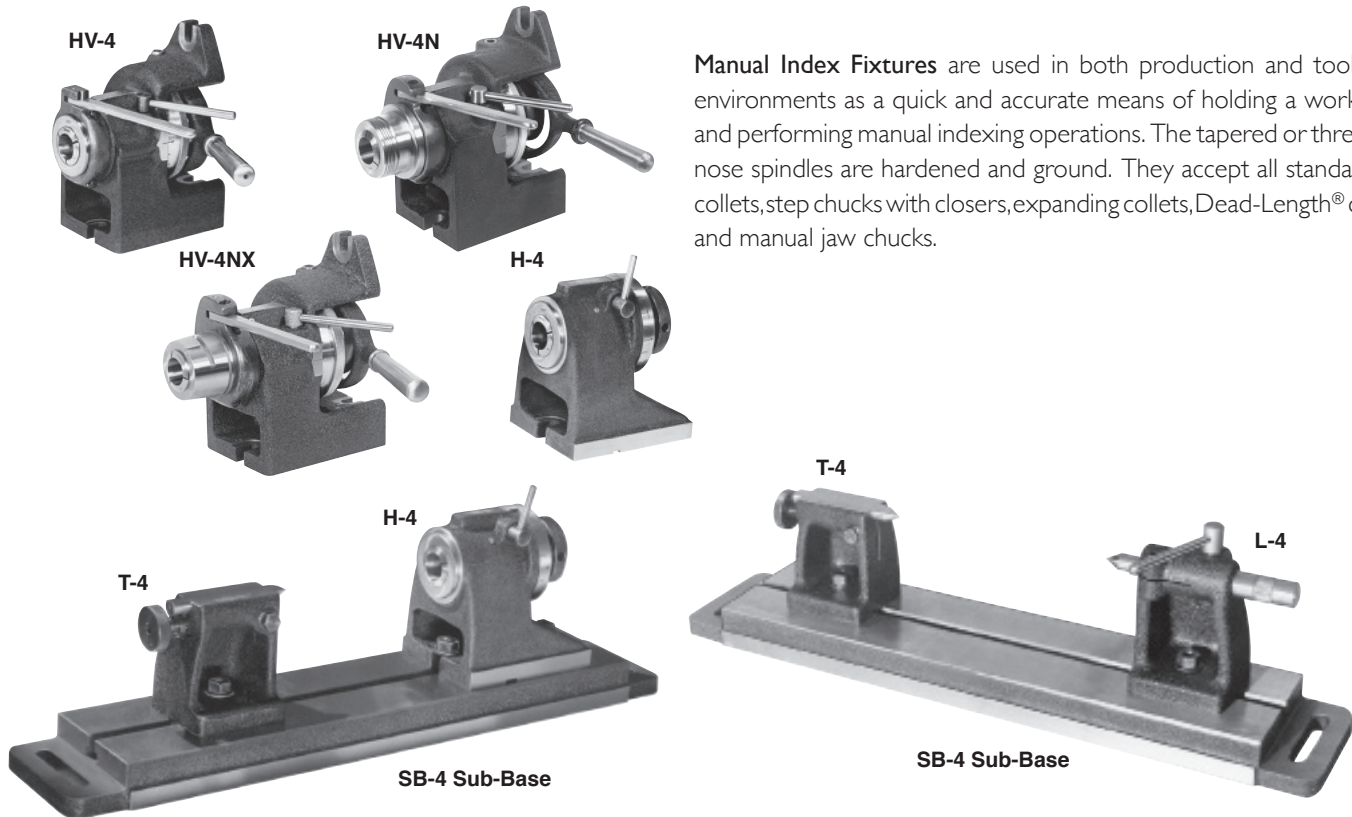


5C Stub Arbors are available in 5/8" and 1/2" shaft diameter. The stub arbors can be used on any mill with a 5C spindle.

5C Stub Arbors

Model	Part Number	Description	A Shaft Diameter
M-4	54-0002602	Stub/Mill Arbor	5/8" (15.88)
M-5	53-0002602	Stub/Mill Arbor	1/2" (12.70)

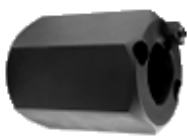
Millimeters in parentheses.



Manual Index Fixtures are used in both production and toolroom environments as a quick and accurate means of holding a workpiece and performing manual indexing operations. The tapered or threaded-nose spindles are hardened and ground. They accept all standard 5C collets, step chucks with closers, expanding collets, Dead-Length® collets and manual jaw chucks.

The **SB-4 Sub-Base** with the tailstocks can be used as a bench center. The **L-4 Tailstock** has a hardened and ground spindle which is lever-operated with a rack and pinion. The spindle is spring loaded to hold the center against the workpiece. A position lock is also provided. The hardened and ground spindle on the **T-4 Tailstock** is screw fed and can be locked in any position with a hexagon clamp bolt. The removable keys permit the tailstocks to be applied directly to any machine table. The SB-4 Sub-Base also accepts various combinations of fixtures such as the **HV** and **H-4** series of indexing fixtures.

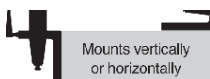
Setup Holding Fixtures for the Workbench



The **Bottom Mount Hex Block** is precision machined to mate with the designated holder. This unit is designed to be used in a vise or similar device. The mount is long enough to accommodate the holder with its retention knob. It is available in all tapers fitting both BT and CAT-V flanges.



This **Setup Fixture** features an open design for easy access to the tool side of the holder and the retention knob. The key is removable for use with both keyed and unkeyed holders. The fixture is made from heat-treated premium grade aircraft aluminum. The high torque split clamp is closed and opened with a user-friendly ratchet handle.



Bottom Mount Block

Taper	Part Number	Hex	O.L.	Key
30	2563-00-00-000030	3.0"	3.41"	.625"
35	2563-00-00-000035	3.0"	3.42"	.530"
40	2563-00-00-000040	3.0"	4.15"	.625"
45	2563-00-00-000045	3.5"	4.90"	.750"
50	2563-00-00-000050	4.0"	5.85"	1.000"

O.L. = Overall Length

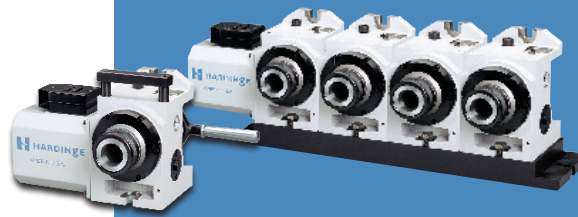
Vertical or Horizontal Setup Fixture

BT	Part Number	Key
30	2565-00-00-000030	.625"
35	2565-00-00-000035	.531"
40	2565-00-00-000040	.625"
CAT-V	Part Number	Key
40	2567-00-00-000040	.625"
50	2567-00-00-000050	1.000"

Hardinge has a large selection of **Rotary Products** for all ranges of production. Choose from precision and Super-Precision® rotary tables and indexers: single-spindle, multi-spindle and dual-axis configurations.

- Accuracy to ± 3 Arc-Sec
- Repeatability to ± 2 Arc-Sec
- Rapid positioning speeds
- Reliability
- Zero backlash systems
- Flexibility of workholding spindle tooling
- Fast changeover
- Heavy axial and radial load capacity

Refer to brochure #2372



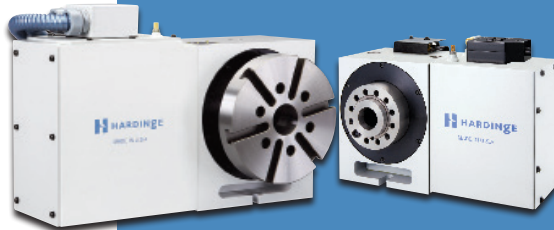
5C² Gear-Driven Rotary Indexers

- GD5C2 single
- GD5C2-02 dual
- GD5C2-03 triple
- GD5C2-04 quad



16C² and 3J² Gear-Driven Rotary Indexers

- GD16C2 and GD3J2 single
- GD16C2-02 and GD3J2-02 dual
- GD16C2-03 and GD3J2-03 triple



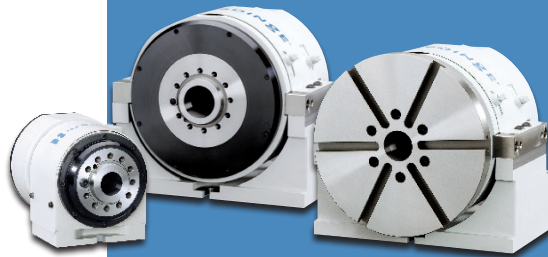
160 and 210mm Low-Profile Rotary Tables

- GD160LP
- GD210LP



Tilting Dual-Axis Rotary Indexers Single and Multi-Spindle

- LPX5C2-02 dual
- LPX5C2-03 triple
- LPX5C2-04 quad
- GDX5C2



Gearless, Direct-Drive, Zero-backlash Rotary Table Indexers

- DD100
- DD200
- DD300

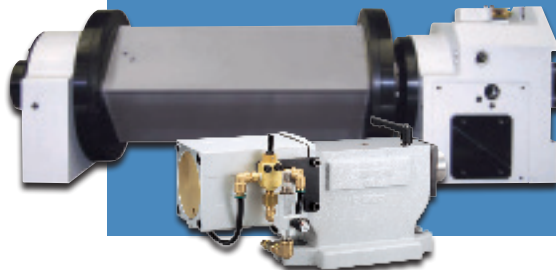


Plate and Cube Trunnions, Servo Controls, Collet Closers, Tailstocks and Workholding Options

Hardinge has several **Collet Block** designs for holding single or multiple parts on your machine table, in trunnions or on towers ...

- Diverse group of products to fit your unique requirement
- Modular components for flexible configurations in horizontal or vertical setups
- Reduce setup and increase productivity using multiple part fixturing
- Low profile models for a large work envelope
- All models use standard collets – 1C, 3C, 5C, 16C, 3J, 22J, 35J, 42mm, 65mm
- Select models can use step chucks and expanding collets
- Range of products to fit your budget and your part size
- Complete turnkey services available with quick turnaround

Refer to brochure #2365




FlexC™ Dead-Length Collet Blocks
High-pressure 42 and 65mm, hydraulic



Tri-Grip Dead-Length Collet Blocks
High-pressure 5C, hydraulic



Fail-Safe Collet Blocks
5C Pneumatic, pull-back



High-pressure Dead-Length Collet Blocks
5C, 16C, 3J, 22J and 35J, hydraulic



Low-pressure Collet Blocks
5C Pneumatic pull-back



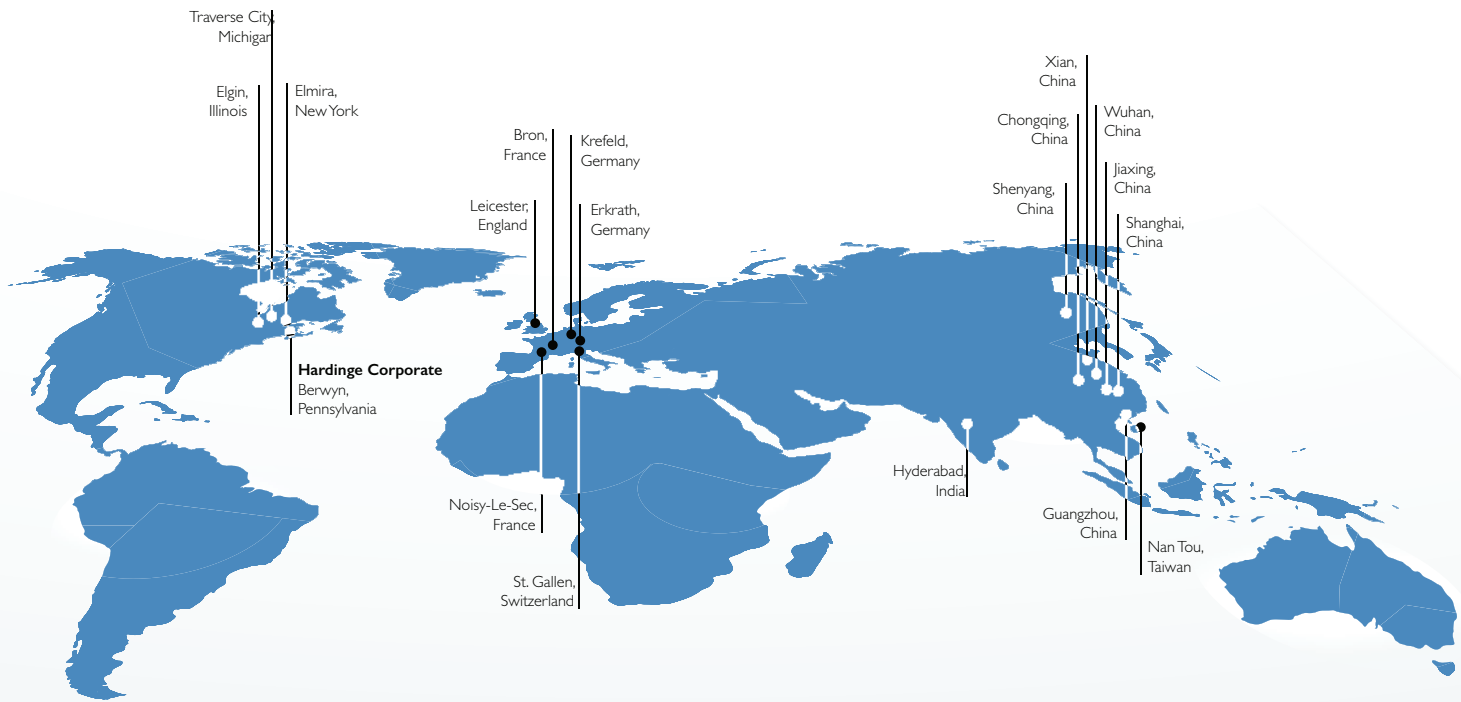
Dead-Length Collet Blocks
1C, 3C, 5C and 16C, pneumatic or hydraulic



Pull-back Collet Blocks
5C and A2-5 16C, pneumatic or hydraulic



Dead-Length® Collet Blocks
A2-5 16C Pneumatic



HARDINGE COMPANIES WORLDWIDE

Hardinge is a leading international provider of advanced metal-cutting solutions. We provide a full spectrum of highly reliable CNC turning, milling, and grinding machines as well as technologically advanced workholding accessories.

The diverse products we offer enable us to support a variety of market applications in industries including aerospace, agricultural, automotive, construction, consumer products, defense, energy, medical, technology, transportation and more.

We've developed a strong global presence with manufacturing operations in North America, Europe, and Asia. Hardinge applies its engineering and applications expertise to provide your company with the right machine tool solution and support every time.

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