



PILDT

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PILLOT

A Reputation for Excellence

The duMONT and Hassay Savage Companies have been designing and manufacturing Precision Broaches for decades, and these Broaches are recognized all over the world for their quality, durability and engineering detail.

duMONT Minute Man® and Hassay Savage are proud to be the largest suppliers of Push-type Broaches in America, offering parts to a wide variety of businesses through a vast national and international distribution network. Our record of design ingenuity, fast delivery and courteous follow-up is unsurpassed.



Materials

All duMONT Minute Man® and Hassay Savage Broaches are manufactured of the finest quality high speed steel. We are equipped to fabricate from a variety of grades to meet your specifications. Contact your industrial distributor or the duMONT Engineering Department for details.

Call Your Industrial Distributor

Your industrial distributor is your best source for duMONT Minute Man® and Hassay Savage Broaches. If your regular distributor does not carry our products, call us and we will be happy to give you the name of the nearest distributor. For special technical assistance, call our Engineering Department at 413-350-5200.

Fast Delivery

An order for stock items placed by your industrial distributor with us by 3:00 PM EST will almost always be shipped on the same working day.

Material Safety Data Sheet

Available upon request or at PilotPrecision.com.

General Ordering Information

When ordering stock Pilot Precision Products Tools from your distributor, please specify EDP No., size and description to ensure proper fulfillment.

Transportation

All shipments are made via UPS where weight limitations allow. Express shipments, both surface and air, are available at your request. Shipments are F.O.B. South Deerfield, MA, unless otherwise stated.

Prices

Please contact us for current pricing or refer to the current price list for prices on all stock items. Prices are subject to change without notice.

TiN or TiAlN Coating

All standard items are available with coatings from stock or short delivery. Please contact Pilot Precision Products for details.

Warning: *Cutting tools may shatter. Eye protection should be worn wherever and whenever cutting tools are being used.*

MADE in the USA



Keyway Broach Sets

1/16 thru 3/8 inch sizes

Applications: **Short Run Production | General Maintenance**

All of our Broach Sets are furnished in traditional boxes, either varnished wood or plastic, depending upon the set selected, and come complete with Precision Broaches, slotted Bushings and necessary Shims.

No. 00 Precision Set / No. 1

3 Broaches and 5 Bushings = 15 Keyway combinations.
Collared bushings only. **Wt. 1 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.	
			duMONT	Hassay Savage
1/16, 3/32, 1/8	A / I	1/4, 5/16, 3/8, 7/16, 1/2	11101 Std 11301 TiN	*15315

Standard Set No. 30

3 Broaches and 9 Bushings = 15 Keyway combinations.
Collared bushings only. **Wt. 8 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.
			duMONT
1/8	B / II	1/2, 5/8, 3/4	11112 Std
3/16, 1/4	C / III	7/8, 1, 1-1/8, 1-1/4, 1-3/8, 1-1/2	

Standard Set No. 10

4 Broaches and 9 Bushings = 18 Keyway combinations.
Collared bushings only. **Wt. 10 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.
			duMONT
1/8, 3/16	B / II	1/2, 5/8, 3/4, 7/8	11104 Std
1/4, 3/8	C / III	1, 1-1/8, 1-1/4, 1-3/8, 1-1/2	11304 TiN

Standard Set No. C-10

4 Broaches and 18 Bushings = 36 Keyway combinations.
Collared bushings only. **Wt. 13 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.
			Hassay Savage
1/8, 3/16	B / II	1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8	*15336
1/4, 3/8	C / III	15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16	

Standard Set No. 10A

4 Broaches and 9 Bushings = 18 Keyway combinations.
Collared bushings only. **Wt. 10 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.
			duMONT
1/8, 3/16	B / II	9/16, 11/16, 13/16	11108 Std
1/4, 3/8	C / III	15/16, 1-1/16, 1-3/16, 1-5/16, 1-7/16, 1-9/16	

Standard Set No. C-10A

3 Broaches and 18 Bushings = 36 Keyway combinations.
Collared bushings only. **Wt. 13 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.
			Hassay Savage
1/8	B / II	1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8	*15330
3/16, 1/4	C / III	15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16	



*Kit comes in a Dura Case

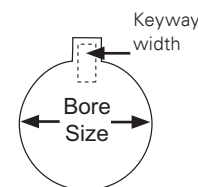
All standard items are available with TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

Keyway Broach Sets

1/8 thru 3/8 inch sizes

Applications: **Short Run Production | General Maintenance**

All of our Broach Sets are furnished in traditional boxes, either varnished wood or plastic, depending upon the set selected, and come complete with Precision Broaches, slotted Bushings and necessary Shims.



No. 10-10A Combination Set

4 Broaches and 18 Bushings = 36 Keyway combinations.
Collared bushings only. **Wt. 16 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No. duMONT
1/8, 3/16	B / II	1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8	11120 Std
1/4, 3/8	C / III	15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16	

No. 20 Combination Set

5 Broaches and 18 Bushings = 47 Keyway combinations.
Collared bushings only. **Wt. 16 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No. duMONT
1/8, 3/16	B / II	1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8	11121 Std 11321 TiN
1/4, 5/16, 3/8	C / III	15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16	

Standard Set C-1

4 Broaches and 9 Bushings = 18 Keyway combinations.
Collared bushings only. **Wt. 8 lbs**

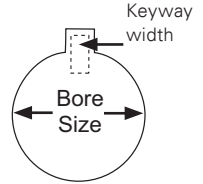
Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No. Hassay Savage
1/8, 3/16	B / II	1/2, 5/8, 3/4, 7/8	*15318
1/4, 3/8	C / III	1, 1-1/8, 1-1/4, 1-3/8, 1-1/2	

Keyway Broach Sets

1/8 thru 3/4 inch sizes

Applications: **Short Run Production | General Maintenance**

All of our Broach Sets are furnished in traditional boxes, either varnished wood or plastic, depending upon the set selected, and come complete with Precision Broaches, slotted Bushings and necessary Shims.



Standard Set No. 40A / 3-D

4 Broaches and 8 Bushings = 32 Keyway combinations.
Plain bushings only. **Wt. 50 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.	
			duMONT	Hassay Savage
5/16, 3/8, 7/16, 1/2	D / IV	1-1/2, 1-5/8, 1-3/4, 1-7/8, 2, 2-1/8, 2-1/4, 2-1/2	11127 Std	15024

Standard Set No. 40 / 3-DA

4 Broaches and 8 Bushings = 32 Keyway combinations.
Plain bushings only. **Wt. 50 lbs**

Keyway Size (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.	
			duMONT	Hassay Savage
5/16, 3/8, 7/16, 1/2	D / IV	1-7/16, 1-9/16, 1-11/16, 1-13/16, 1-15/16, 2-3/16, 2-7/16, 2-15/16	11129 Std	15124

Heavy Duty Set No. 40 1/2 A / 4-E

2 Broaches and 6 Bushings = 12 Keyway combinations.
Plain bushings only. **Wt. 74 lbs**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.	
			duMONT	
5/8, 3/4	E / V	2-3/8, 2-1/2, 2-5/8, 2-3/4, 2-7/8, 3	11131 Std	

Heavy Duty Set No. 50 / No. 5

3 Broaches and 17 Bushings = 29 Keyway combinations.
Plain bushings only. **Wt. 175 lbs 3-4 Boxes**

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.	
			duMONT	
1/2	D / IV	2, 2-1/16, 2-1/8, 2-3/16, 2-1/4, 2-5/16, 2-3/8, 2-7/16	11135 Std	
5/8, 3/4	E / V	2-5/16, 2-3/8, 2-7/16, 2-1/2, 2-9/16, 2-5/8, 2-11/16, 2-3/4, 2-13/16, 2-7/8, 2-15/16, 3		

No. 100 Heavy Duty Combination Set

9 Broaches and 44 Bushings = 102 Keyway combinations.
Collared B / II and C / III bushings, plain D / IV and E / V bushing.
Wt. 250 lbs 5 Boxes

Keyway Sizes (inch)	Broach Style	Bushing Diameters (bore sizes, inch)	EDP No.	
			duMONT	
1/8, 3/16	B / II	1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8	11136 Std	
1/4, 5/16	C / III	15/16, 1, 1-1/16, 1-1/8, 1-3/16, 1-1/4, 1-5/16, 1-3/8, 1-7/16, 1-1/2, 1-9/16		
3/8, 7/16, 1/2	D / IV	1-7/16, 1-1/2, 1-9/16, 1-5/8, 1-11/16, 1-3/4, 1-13/16, 1-7/8, 1-15/16, 2, 2-1/16, 2-1/8, 2- 3/16, 2-1/4		
5/8, 3/4	E / V	2-5/16, 2-3/8, 2-7/16, 2-1/2, 2-9/16, 2-5/8, 2-11/16, 2-3/4, 2-13/16, 2-7/8, 2-15/16, 3		

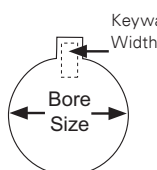
*NOTE: Shipped via freight truck only.

Metric Keyway Broach Sets

2mm thru 18mm

Applications: **Short Run Production | General Maintenance**

All of our Broach Sets are furnished in traditional boxes, either varnished wood or plastic, depending upon the set selected, and come complete with Precision Broaches, slotted Bushings and necessary Shims.



No. 40 Metric Set			
6 Broaches and 18 Bushings = 36 Keyway Combinations Collared Bushings Only. Wt. 10 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. Hassay Savage
2 3	A / I	8, 10	*15440
4 5	B / II	12, 14, 16, 18	
6 8	C / III	18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34	

No. 60 Metric Set			
2 Broaches and 3 Bushings = 6 Keyway combinations. Collared bushings only. Wt. 1 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. duMONT
2 3	A / I	6, 8, 10	44497 Std

No. 70 Metric Set			
4 Broaches and 13 Bushings = 26 Keyway combinations. Collared bushings only. Wt. 15 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. duMONT
4 5	B / II	12, 14 15, 16	44498 Std
6 8	C / III	18, 19, 20, 22 24, 25, 26, 28, 30	

No. 80 Metric Set			
3 Broaches and 12 Bushings = 36 Keyway combinations. Plain bushings only. Wt. 40 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. duMONT
10 12 14	D / IV	32, 34, 35, 36 38, 40, 42, 44 45, 46, 48, 50	44499 Std

No. 90 Metric Set			
2 Broaches and 8 Bushings = 16 Keyway combinations. Plain bushings only. Wt. 61 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. duMONT
16 18	E / V	52, 54, 55, 56 58, 60, 62, 65	44500 Std

Precision Set 10			
2 Broaches and 5 Bushings = 10 Keyway combinations. Collared bushings only. Wt. 1 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. Hassay Savage
2 3	A / I	6, 7, 8, 9, 10	*15410

Metric Set 12			
2 Broaches and 6 Bushings = 12 Keyway combinations. Plain bushings only. Wt. 70 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. Hassay Savage
16 18	E / V	54, 56, 58, 60, 62, 64	15212

Metric Set 18			
4 Broaches and 9 Bushings = 18 Keyway combinations. Collared bushings only. Wt. 7 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. Hassay Savage
4 5 6 8	B / II C / III	12, 14, 16, 18 20, 22, 24, 26, 28	*15418

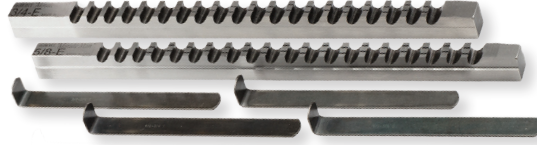
Metric Set 24			
3 Broaches and 8 Bushings = 24 Keyway combinations. Plain bushings only. Wt. 36 lbs			
Keyway Sizes (mm)	Broach Style	Bushing Diameters (bore sizes, mm)	EDP No. Hassay Savage
10 12 14	D / IV	34, 36, 38, 40, 42, 44, 46, 48	15224

*Kit comes in a Dura Case

All standard items are available with TiAIN coating from stock or short delivery. Please contact Pilot Precision Products for details.

A/I - Imperial - Keyway

1/16 thru 1/8 inch sizes

Applications: **Short Run Production** | **General Maintenance**


Stock Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (inch)	Tolerances	Broach Dimensions	Shims Required	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.			
				Min.	Max.		duMONT Std	duMONT TiN	duMONT TiAIN	Hassay Savage
1/16-A	.0625 – .0635	1/8 x 5	0	13/64	1-1/8	390	22201	22301	22801	10104
3/32-A	.0938 – .0948	1/8 x 5	0	13/64	1-1/8	780	22202	22302	22802	10106
1/8-A	.1252 – .1262	1/8 x 5	1	13/64	1-1/8	650	22203	22303	22803	10108

A / I Bushings for A / I Broaches (collared only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
1/4	1-1/8	33301	20116
5/16		33302	20120
3/8		33303	20124
7/16		33304	20128
1/2		33305	20132

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
1/8-A	1	.031	22250

B/II - Imperial - Keyway

3/32 thru 3/16 inch sizes

Stock Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (inch)	Tolerances	Broach Dimensions	Shims Required	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.			
				Min.	Max.		duMONT Std	duMONT TiN	duMONT TiAIN	Hassay Savage
3/32-B	.0938 – .0948	3/16 x 6-3/4	0	19/64	1-11/16	930	22204	22304	22804	10206
1/8-B	.1252 – .1262	3/16 x 6-3/4	1	19/64	1-11/16	720	22205	22305	22805	10208
5/32-B	.1564 – .1574	3/16 x 6-3/4	1	19/64	1-11/16	1,320	22206	22306	22806	10210
3/16-B	.1877 – .1887	3/16 x 6-3/4	1	19/64	1-11/16	1,860	22207	22307	22807	10212

B / II Bushings for B / II Broaches (collared only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
1/2	1-11/16	33313	20232
9/16		33314	20236
5/8		33315	20240
11/16		33316	20244
3/4		33317	20248
13/16		33318	20252
7/8		33319	20256

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
1/8-B	1	.031	22252
5/32-B	1	.042	22253
3/16-B	1	.050	22254

SPECIAL ORDERS: We are fully equipped to manufacture Special Bushings not listed. Please contact Pilot Precision Products for details.

C/III - Imperial - Keyway

3/16 thru 3/8 inch sizes

Stock Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (inch)	Tolerances	Broach Dimensions	Shims Required	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.			
				Min.	Max.		duMONT Std	duMONT TiN	duMONT TiAIN	Hassay Savage
3/16-C	.1877 - .1887	3/8 x 11-3/4	1	25/64	2-1/2	1,540	22208	22308	22808	10312
1/4-C	.2502 - .2512	3/8 x 11-3/4	1	25/64	2-1/2	2,520	22209	22309	22809	10316
5/16-C	.3127 - .3137	3/8 x 11-3/4	2	25/64	2-1/2	3,960	22210	22310	22810	10320
3/8-C	.3755 - .3765	3/8 x 11-3/4	2	25/64	2-1/2	4,340	22211	22311	22811	10324

C / III Bushings for C / III Broaches (collared only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
3/4	2-1/2	33334	20348
13/16		33335	20352
7/8		33336	20356
15/16		33337	20360
1		33338	20364
1-1/16		33339	20368
1-1/8		33340	20372
1-3/16		33341	20376
1-1/4		33342	20380
1-5/16		33343	20384
1-3/8		33344	20388
1-7/16		33345	20392
1-1/2		33346	20396
1-9/16		33347	20400

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
3/16-C	1	.050	22255
1/4-C	1	.0625	22256
5/16-C	2	.055	22257
3/8-C	2	.0625	22258

D/IV - Imperial - Keyway

5/16 thru 9/16 inch sizes

Stock Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (inch)	Tolerances	Broach Dimensions	Shims Required	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.			
				Min.	Max.		duMONT Std	duMONT TiN	duMONT TiAIN	Hassay Savage
5/16-D	.3127 - .3137	9/16 x 13-7/8	2	1	6	8,000	22212	22312	22812	10420
3/8-D	.3755 - .3765	9/16 x 13-7/8	2	1	6	7,000	22213	22313	22813	10424
7/16-D	.4380 - .4390	9/16 x 13-7/8	3	1	6	9,400	22214	22314	22814	10428
1/2-D	.5006 - .5016	9/16 x 13-7/8	3	1	6	9,800	22215	22315	22815	10432
9/16-D	.5631 - .5641	9/16 x 13-7/8	4	1	6	8,900	10142	10342	10842	10436

D / IV Bushings for D / IV Broaches (plain only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
1-7/16	4	33348	21492
1-1/2		33349	21496
1-9/16		33350	21500
1-5/8		33351	21504
1-11/16		33352	21508
1-3/4		33353	21512

D / IV Bushings for D / IV Broaches (plain only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
1-13/16	5	33354	21516
1-7/8		33355	21520
1-15/16		33356	21524
2		33357	21528
2-1/16		33358	21532
2-1/8		33359	21536
2-3/16		33360	21540
2-1/4		33361	21544
2-5/16		33362	21548

D / IV Bushings for D / IV Broaches (plain only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
2-3/8	6	33363	21552
2-7/16		33364	21556
2-1/2		33365	21560
2-9/16		33366	21564
2-5/8		33367	21568
2-11/16		33368	21572
2-3/4		33369	21576
2-13/16		33370	21580
2-7/8		33371	21584
2-15/16		33372	21588
3		33373	21592

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
5/16-D	2	.056	22259
3/8-D	2	.0625	22260
7/16-D	3	.056	22261
1/2-D	3	.0625	22262
9/16-D	4	.056	22269

E/V - Imperial - Keyway

5/8 thru 3/4 inch sizes

Stock Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (inch)	Tolerances	Broach Dimensions	Shims Required	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.			
				Min.	Max.		duMONT Std	duMONT TiN	duMONT TiAIN	Hassay Savage
5/8-E	.6260 – .6270	3/4 x 15-1/2	4	1	6	9,600	22216	22316	22816	10540
3/4-E	.7515 – .7525	3/4 x 15-1/2	5	1	6	11,900	22217	22317	22817	10548

E / V Bushings for E / V Broaches (plain only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
2-5/16	6	33374	21688
2-3/8		33375	21692
2-7/16		33376	21696
2-1/2		33377	21700
2-9/16		33378	21704
2-5/8		33379	21708
2-11/16		33380	21712
2-3/4		33381	21716
2-13/16		33382	21720
2-7/8		33383	21724
2-15/16		33384	21728

E / V Bushings for E / V Broaches (plain only)

Diameter (inch)	Length	EDP No.	
		duMONT	Hassay Savage
3	6	33385	21732
3-1/16		33386	-
3-1/8		33387	-
3-3/16		33388	-
3-1/4		33389	-
3-5/16		33390	-
3-3/8		33391	-
3-7/16		33392	-
3-1/2		33393	-
3-9/16		33394	-
3-5/8		33395	-
3-11/16		33396	-
3-3/4		33397	-
3-13/16		33398	-
3-7/8		33399	-
3-15/16		33400	-
4		33401	-

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
5/8-E	4	.0625	22263
3/4-E	5	.0625	22264

F/VI - Imperial - Keyway

7/8 thru 1 inch sizes

Stock Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (inch)	Tolerances	Broach Dimensions	Shims Required	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.			
				Min.	Max.		duMONT Std	duMONT TiN	duMONT TiAIN	Hassay Savage
7/8-F	.8765 – .8775	1 x 19-3/4	6	1	6	9,800	22218	22318	22818	10656
1-F	1.0015 – 1.0025	1 x 19-3/4	7	1	6	11,100	22219	22319	22819	10664

F / VI Bushings for F / VI Broaches (plain only)

Diameter (inch)	Length	EDP No. duMONT
3-1/16	6	33500
3-1/8		33501
3-3/16		33502
3-1/4		33503
3-5/16		33504
3-3/8		33505
3-7/16		33506
3-1/2		33507
3-9/16		33508
3-5/8		33509

F / VI Bushings for F / VI Broaches (plain only)

Diameter (inch)	Length	EDP No. duMONT
3-11/16	6	33510
3-3/4		33511
3-13/16		33512
3-7/8		33513
3-15/16		33514
4		33515
4-1/16		33516
4-1/8		33517
4-3/16		33518
4-1/4		33519

F / VI Bushings for F / VI Broaches (plain only)

Diameter (inch)	Length	EDP No. duMONT
4-5/16	6	33520
4-3/8		33521
4-7/16		33522
4-1/2		33523
4-9/16		33524
4-5/8		33525
4-11/16		33526
4-3/4		33527
4-13/16		33528
4-7/8		33529
4-15/16		33530
5		33531

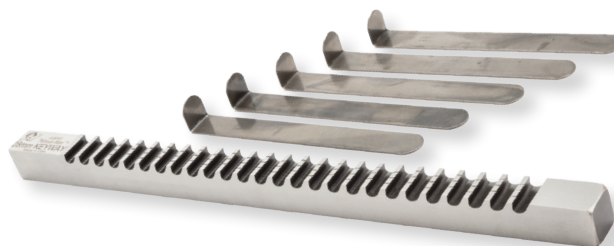
Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
7/8-F	6	.0625	22265
1-F	7	.0625	22266

A/I - Metric - Keyway

2 thru 3 mm sizes

Applications: **Short Run Production** | **General Maintenance**


Stock Keyway Broaches / Optional Metric Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (mm)	Tolerances (Decimal Equiv.)	Broach Dimensions (inches)	Standard Millimeter Keys	Shims Req'd	Length of Cut (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No.			
					Min.	Max.		duMONT Std.	duMONT TiN	duMONT TiAlN	Hassay Savage
2-A / I	0.0782 - 0.0791	1/8 x 5	2 x 2	0	13/64	1-1/8	720	44401	44301	44801	11102
3-A / I	0.1176 - 0.1185		3 x 3	1			650	44402	44302	44802	11103

A / I Bushings for A / I Broaches (collared only)

Diameter (mm)	(Decimal Equiv.)	EDP No.	
		duMONT	Hassay Savage
6	.2362	44501	22106
7	.2756	-	22107
8	.3150	44431	22108
9	.3543	-	22109
10	.3937	44432	22110
12	.4724	44502	
15	.5905	44503	

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
3-A / I	1	0.0310	44480

B1/II - Metric - Keyway

4 thru 5 mm sizes

Stock Keyway Broaches / Optional Metric Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (mm)	Tolerances (Decimal Equiv.)	Broach Dimensions (inches)	Standard Millimeter Keys	Shims Req'd	Length of Cut (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No.			
					Min.	Max.		duMONT Std.	duMONT TiN	duMONT TiAlN	Hassay Savage
4-B1 / II	0.1569 - 0.1579	1/4 x 6-3/4	4 x 4	1	19/64	1-11/16	1,140	44403	44303	44803	11204
5-B1 / II	0.1963 - 0.1972		5 x 5				1,860	44404	44304	44804	11205

B1 / II Bushings for B1 / II Broaches (collared only)

Diameter (mm)	(Decimal Equiv.)	EDP No.	
		duMONT	Hassay Savage
11	.4331	44510	22211HS
12	.4724	44433	22212HS
13	.5118	44511	22213HS
14	.5512	44434	22214HS
15	.5905	44504	22215HS
16	.6299	44435	22216HS
17	.6693	44505	22217HS
18	.7087	44436	22218HS
19	.7480	44506	22219HS

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
4-B1 / II	1	0.0380	44481
5-B1 / II		0.0500	44482

C/III - Metric - Keyway

5 thru 8 mm sizes

Stock Keyway Broaches / Optional Metric Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (mm)	Tolerances (Decimal Equiv.)	Broach Dimensions (inches)	Standard Millimeter Keys	Shims Req'd	Length of Cut (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No.			
					Min.	Max.		duMONT Std.	duMONT TiN	duMONT TiAIN	Hassay Savage
5-C / III	0.1963 – 0.1972	3/8 x 11-3/4	5 x 5	1	25/64	2-1/2	1,470	44405	44305	44805	11305
6-C / III	0.2356 – 0.2366		6 x 6	1			2,100	44406	44306	44806	11306
7-C / III	0.2749 – 0.2763		7 x 6	1			2,900	10232	10332	10832	11307
8-C / III	0.3143 – 0.3155		8 x 7	2			3,680	44407	44307	44807	11308HS

C / III Bushings for C / III Broaches (collared only)

Diameter (mm)	(Decimal Equiv.)	EDP No.	
		duMONT	Hassay Savage
17	.6693	44512	22317HS
18	.7087	44437	22318HS
19	.7480	44438	22319HS
20	.7874	44439	22320HS
22	.8661	44440	22322HS
24	.9449	44441	22324HS
25	.9842	44442	22325HS
26	1.0236	44443	22326HS
27	1.0630	-	22327HS
28	1.1024	44444	22328HS
30	1.1811	44445	22330HS
32	1.2598	44446	22332HS
34	1.3386	44447	22334HS
35	1.3779	44507	22335HS
36	1.4173	44448	22336HS

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
5-C / III	1	0.0470	44483
6-C / III	1	0.0625	44484
7-C / III	1	0.0625	44577
8-C / III	2	0.0500	44485

D/IV - Metric - Keyway

10 thru 14 mm sizes

Stock Keyway Broaches / Optional Metric Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (mm)	Tolerances (Decimal Equiv.)	Broach Dimensions (inches)	Standard Millimeter Keys	Shims Req'd	Length of Cut (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No.			
					Min.	Max.		duMONT Std.	duMONT TiN	duMONT TiAIN	Hassay Savage
10-D / IV	0.3930 – 0.3942	9/16 x 13-7/8	10 x 8	2	1	6	6,500	44408	44308	44808	11410
12-D / IV	0.4716 – 0.4730		12 x 8				8,400	44409	44309	44809	11412
14-D / IV	0.5503 – 0.5517		14 x 9				11,100	44410	44310	44810	11414

D / IV Bushings for D / IV Broaches (plain only)

Diameter (mm)	(Decimal Equiv.)	EDP	
		duMONT	Hassay Savage
32	1.2598	44449	22432
34	1.3386	44450	22434
35	1.3779	44451	22435
36	1.4173	44452	22436
38	1.4961	44453	22438
40	1.5748	44454	22440
42	1.6535	44455	22442
44	1.7323	44456	22444

D / IV Bushings for D / IV Broaches (plain only)

Diameter (mm)	(Decimal Equiv.)	EDP	
		duMONT	Hassay Savage
45	1.7716	44457	22445
46	1.8110	44458	22446
48	1.8898	44459	22448
50	1.9685	44460	22450
52	2.0472	44461	22452
54	2.1260	44462	22454
55	2.1653	-	22455
56	2.2047	44463	22456

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
10-D / IV	2	0.0560	44486
12-D / IV		0.0560	44487
14-D / IV		0.0625	44488

E/V - Metric - Keyway

16 thru 18 mm sizes

Stock Keyway Broaches / Optional Metric Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (mm)	Tolerances (Decimal Equiv.)	Broach Dimensions (inches)	Standard Millimeter Keys	Shims Req'd	Length of Cut (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No.			
					Min.	Max.		duMONT Std.	duMONT TiN	duMONT TiAlN	Hassay Savage
16-E / V	0.6290 – 0.6304	3/4 x 15-1/2	16 x 10	3	1	6	9,400	44411	44311	44811	11516
18-E / V	0.7078 – 0.7092		18 x 11				10,600	44412	44312	44812	11518

E / V Bushings for E / V Broaches (plain only)

Diameter (mm)	(Decimal Equiv.)	EDP No.	
		duMONT	Hassay Savage
52	2.0472	44464	22552
54	2.1260	44465	22554
55	2.1653	44466	22555
56	2.2047	44467	22556
58	2.2835	44468	22558
60	2.3622	44469	22560
62	2.4409	44470	22562
63	2.4803	44471	-
64	2.5197	44472	22564
65	2.5590	44473	22565
66	2.5984	44474	22566
68	2.6772	44475	22568
70	2.7559	44476	22570
72	2.8346	44477	22572

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
16-E / V	3	0.0560	44489
18-E / V		0.0560	44490

F/VI - Metric - Keyway

20 thru 25 mm sizes

Stock Keyway Broaches / Optional Metric Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (mm)	Tolerances (Decimal Equiv.)	Broach Dimensions (inches)	Standard Millimeter Keys	Shims Req'd	Length of Cut (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No.			
					Min.	Max.		duMONT Std.	duMONT TiN	duMONT TiAlN	Hassay Savage
20-F / VI	0.7864 – 0.7880	1 x 19-3/4	20 x 12	3	1	6	8,800	44413	44313	44813	11620
22-F / VI	0.8651 – 0.8667		22 x 14	4			9,400	44414	44314	44814	11622
24-F / VI	0.9439 – 0.9455		24 x 14	4			10,600	44415	44315	44815	11624
25-F / VI	0.9832 – 0.9848		25 x 14	4			12,300	44494	44394	44894	11625

F / VI Bushings for F / VI Broaches (plain only)

Diameter (mm)	(Decimal Equiv.)	EDP No. duMONT
70	2.7559	44539
75	2.9527	44540
80	3.1496	44541
85	3.3464	44542
90	3.5433	44543
95	3.7401	44544
100	3.9370	44545
105	4.1338	44546
110	4.3307	44547
115	4.5275	44548
120	4.7244	44549

Extra Shims

Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
20-F	3	0.0625	44491
22-F	4	0.0560	44492
24-F	5	0.0625	44493
25-F	4	0.0560	44496

Additional Sizes - Imperial - Keyway

1-1/8 thru 2 inch sizes

Stock Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (inch)	Tolerances	Broach Dimensions	Shims Required	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.			
				Min.	Max.		duMONT Std	duMONT TiN	duMONT TiAIN	Hassay Savage
1-1/8	1.1265 – 1.1275	1-1/8 x 20-1/4	8	1	6	14,750	10171	-	-	10666HS
1-1/4	1.2520 – 1.2530	1-1/4 x 20-1/4	9	1-1/2	8	22,100	10172	-	-	10668HS
1-3/8	1.3770 – 1.3780	1-3/8 x 20-1/4	**	1-1/2	8	23,500	10173	-	-	10670HS
1-1/2	1.5020 – 1.5030	1-1/2 x 20-1/4	**	1-1/2	8	26,500	10174	-	-	10672HS
1-3/4	1.7520 – 1.7530	1-3/4 x 20-1/4	**	1-1/2	8	31,400	10175	-	-	-
2	2.003 – 2.004	1-3/4 x 20-1/16	**	1-1/2	8	35,900	10176	-	-	-

*Based on mild steel **Shims are not supplied with these broaches, sold as Progressive Shims only, see below

■ 1-1/8" to 2" broaches need special order bushings. Please provide bore diameter to quote.

Extra Shims

Extra Shims are provided in necessary Shim Sets only. For Broaches larger than 1-1/4" progressive Shims are available as special items. Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
1-1/8	8	.0625	22267
1-1/4	9	.0625	22268

Progressive Shims

Broach Size (inch)	# / Set	Shim Thickness	EDP No.
1-3/8	4	.062, .125, .250, .375	22270
1-1/2	4	.062, .125, .250, .375	22271
1-3/4	4	.062, .125, .250, .375	22272
2	5	.062, .125, .250, .375, .500	22273

All standard items are available with TiAIN coating from stock or short delivery. Please contact Pilot Precision Products for details.

Additional Sizes - Metric - Keyway

28 thru 45mm sizes

Stock Keyway Broaches / Optional Metric Keyway Broaches

Broaches are supplied with necessary Shims unless otherwise noted. For extra or replacement Shims see the table below.

Broach Size (mm)	Tolerances (Decimal Equiv.)	Broach Dimensions (inches)	Standard Millimeter Keys	Shims Req'd	Length of Cut (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No			
					Min.	Max.		duMONT Std.	duMONT TiN	duMONT TiAIN	Hassay Savage
28	1.1025 – 1.1035	1-1/8 x 20-1/4	28 x 16	5	1	6	12,000	10233	-	-	11628
32	1.2600 – 1.2610	1-1/4 x 20-1/4	32 x 18	5	1-1/2	8	20,600	10234	-	-	11632
36	1.4175 – 1.4185	1-7/16 x 20-1/4	36 x 20	**	1-1/2	8	24,200	10235	-	-	11636
40	1.5753 – 1.5760	1-9/16 x 20-1/4	40 x 22	**	1-1/2	8	22,500	10236	-	-	-
45	1.7718 – 1.7728	1-3/4 x 20-1/4	45 x 25	**	1-1/2	8	27,200	10237	-	-	-

*Based on mild steel **Shims are not supplied with these broaches, sold as Progressive Shims only, see below

Extra Shims

Extra Shims are provided in necessary Shim Sets only. Shims are available as special items for Broaches larger than 32mm progressive. Please specify EDP No. when ordering extra or replacement Shims. Shims correspond to Broach size, not to Bushing type.

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
28	5	0.0560	44478
32		0.0625	44479

■ 1-1/8" to 2" & 28 mm to 45 mm broaches need special order bushings. Please provide bore diameter to quote.



Progressive Shims

Broach Size (mm)	# / Set	Shim Thickness	EDP No. duMONT
36	3	.062, .125, .250	44578
40	3	.062, .125, .250	44579
45	4	.062 (2pcs), .125, .250	44580

SPECIAL ORDERS: We are fully equipped to manufacture Special Bushings not listed above. Please contact Pilot Precision Products for details.

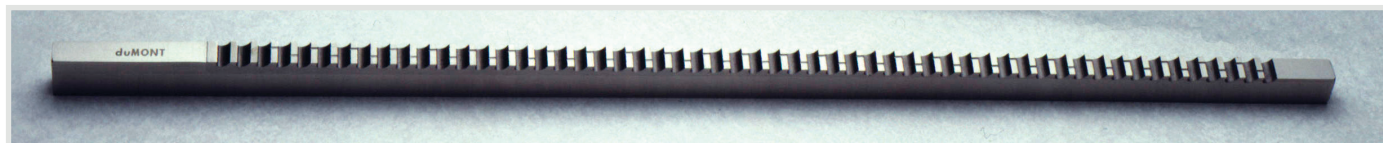
One-Pass Keyway Broaches

1/8 thru 3/8 inch sizes

3mm thru 14mm

Applications: **High Speed Operation** | **Accurate Small Run Production**

One-Pass Keyway Broaches are designed for smaller production runs of identical keyways in varying bores. Used with the appropriate Bushing size (American Standard or Metric) and Style (see pages 10 and 12) to cut to full width and depth in one-pass, no shimming required. Reminder – Broach and Bushing Style must match – “A / I” Broaches with “A / I” Bushings, “B / II” Broaches with “B / II” Bushings, etc. A special chamfering feature that will deburr the keyway while it is being broached is also available.

TiN or TiAlN coatings available.


Stock One-Pass Broaches – Inch

Broach Size (inch)	Broach Dimensions	Tolerances (Decimal Equiv.)	Tooth Pitch	Length of Cut* (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No. duMONT
				Min.	Max.		
1/8-B / II	3/16 x 10-3/4	.1252 – .1262	1/4	19/64	1-11/16	800	55507
5/32-B / II	3/16 x 10-3/4	.1564 – .1574				1,450	55508
3/16-B / II	3/16 x 10-3/4	.1877 – .1887				2,050	55509
1/8-C / III	3/8 x 14-1/8	.1252 – .1262	9/32	19/64	2	900	55501
5/32-C / III	3/8 x 14-1/8	.1564 – .1574				1,360	55502
3/16-C / III	3/8 x 17	.1877 – .1887				1,570	55503
1/4-C / III	3/8 x 17	.2502 – .2512				2,560	55504
5/16-C / III	3/8 x 18-1/2	.3127 – .3137				3,900	55505
3/8-C / III	3/8 x 18-1/2	.3755 – .3765				5,300	55506

Stock One-Pass Metric Keyway Broaches

Broach Size (mm)	Broach Dimensions	Tolerances (Decimal Equiv.)	Tooth Pitch	Length of Cut* (inches)		Pressure Required. for Max. L/C (lbs.)*	EDP No.	
				Min.	Max.		duMONT	Hassay Savage
3-A / I	1/8 x 7-3/4	0.1176 – 0.1185	3/16	13/64	1	675	55510	11103-OP**
4-B1 / II	1/4 x 10-3/4	0.1569 – 0.1579	1/4	3/8	1-5/8	1,550	55511	11204-COP***
5-B1 / II		0.1963 – 0.1972				2,430	55512	11205-COP***
6-C / III	3/8 x 17	0.2356 – 0.2366	9/32	3/8	1-3/4	2,240	55513	11306-COP***
8-C / III	3/8 x 18-1/2	0.3143 – 0.3155	5/16		2	3,485	55514	11308-COP***
10-D / IV	9/16 x 24	0.3930 – 0.3942	3/8	25/64	2	3,410	55515	-
12-D / IV		0.4716 – 0.4730				4,220	55516	-
14-D / IV		0.5503 – 0.5517				5,670	55517	-

*Based on mild steel

OP** designates one-pass, no chamfer

COP*** designates chamfer one pass

Note: 4mm—12mm keyway broaches have deburring feature

All standard items are available with TiN or TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

SPECIAL ORDERS: We are fully equipped to manufacture Special One-Pass Broaches to your specifications. A special chamfering feature that will deburr the keyway while it is being broached is also available. TiN or TiAlN coatings are available. Please contact Pilot Precision Products for details.

Production Push-type Keyway Broaches

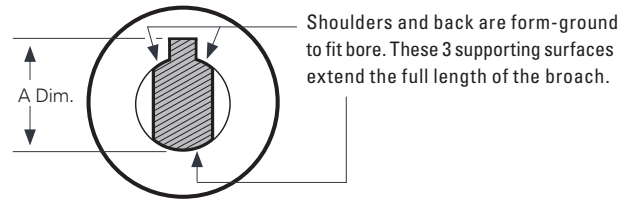
Applications: **High Speed Operation** | **Accurate Long Run Production**



Production Keyway Broaches

Production Keyway Broaches offer maximum speed and accuracy in production runs of identical bores, using either hydraulic or hand-operated presses. These Broaches are self-supporting—no Shims or Bushings are required.

Production Broach Construction



Stock Production Keyway Broaches

Production Keyway Broaches are designed for large production runs of identical keyways with identical bores. No Shims or Bushings required. A special chamfering feature that will deburr the keyway while it is being broached is also available.

TiN or TiAlN coatings available.

Keyway Width	Body Diameter	A Dimension	Broach Length	Tooth Pitch	Length of Cut*		Pressure Required. for Max. L/C (lbs.)	EDP No. duMONT
					Min.	Max.		
1/16"	3/16"	.224"	5-5/8	3/16	13/64	1	390	55520
	1/4"	.287"	6-3/16	3/16	13/64	1	390	55521
1/8"	3/8"	.437"	8-1/2	1/4	17/64	1-1/4	850	55522
	1/2"	.565"	11-3/4	3/8	25/64	2-1/2	1,440	55523
	9/16"	.630"	11-3/4	3/8	25/64	2-1/2	1,440	55524
	5/8"	.693"	11-3/4	3/8	25/64	2-1/2	1,440	55525
3/16"	5/8"	.716"	14-3/4	3/8	25/64	2-1/2	2,170	55526
	3/4"	.844"						55528
	7/8"	.970"						55530
1/4"	1"	1.121"	18	3/8	25/64	2-1/2	2,870	55532
4mm	10mm	11.9mm	12	9/32	19/64	1-7/8	1,550	55533**
		.468"						

*Based on mild steel

** Includes Chamfer

All standard items are available with TiN or TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

SPECIAL ORDERS: We are fully equipped to manufacture Special Production Style Broaches to your specifications. A special chamfering feature that will deburr the keyway while it is being broached is also available. Please contact Pilot Precision Products for details.

Square Push Broaches

1/8 thru 1 inch sizes

4mm thru 25mm sizes


Applications: **Drives, jigs, fixtures and other square broaching operations**

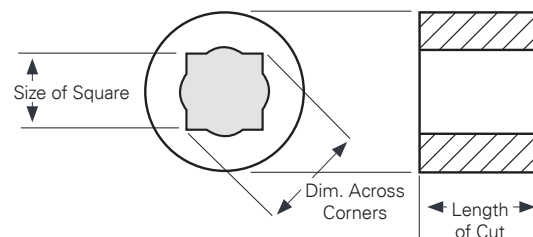

Square Push Broaches

Our Standard Square Broaches are designed to generate in one-pass a Standard Square hole in a previously cast or drilled round hole. Standard Square Broaches begin in an oversized pilot hole and generate the square hole while leaving small radii on the flats. Available from stock in the most

common American Standard / Metric sizes (1/8–1" & 4mm–25mm).

TiN or TiAlN coatings available.

American Standard / Metric Square Broach



Stock Standard Square Broaches

Square Size (inch)	Tolerances	Broach Length	Pilot Diameter	Drill Size	Dimension Across Corners	Tooth Pitch	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.	
							Min.	Max.		duMONT	Hassay Savage
1/8	.1255 – .1265	4-1/8	.1285	No. 30	.1750 – .1770	1/8	3/16	1/2	700	66601	13008
5/32	.1565 – .1575	5-1/8	.1590	No. 21	.2180 – .2200	5/32	1/4	1/2	600	66602	13010
3/16	.1880 – .1890	5-9/16	.1935	No. 10	.2620 – .2640	3/16	1/4	5/8	1,080	66603	13012
7/32	.2190 – .2200	6-3/8	.2280	No. 1	.3060 – .3080	7/32	1/4	3/4	1,410	66604	13014
1/4	.2505 – .2515	6-1/2	.2656	17/64	.3510 – .3530	1/4	3/8	1	1,740	66605	13016
9/32	.2815 – .2825	7-3/4	.2969	19/64	.3930 – .3950	9/32	1/2	1-3/8	2,130	66606	13018
5/16	.3130 – .3140	7-7/8	.3281	21/64	.4370 – .4390	5/16	1/2	1-1/2	2,100	66607	13020
11/32	.3440 – .3450	9-3/8	.3594	23/64	.4830 – .4850	11/32	3/8	1-5/8	3,480	66608	13022
3/8	.3755 – .3765	9-3/8	.3906	25/64	.5240 – .5260	3/8	1/2	2	3,720	66609	13024
13/32	.4065 – .4075	10-5/8	.4219	27/64	.5690 – .5710	13/32	1/2	2	4,080	66610	13026
7/16	.4380 – .4390	10-7/8	.4531	29/64	.6110 – .6130	7/16	1/2	2	4,500	66611	13028
15/32	.4690 – .4700	12	.5000	1/2	.6570 – .6590	15/32	1/2	2	4,000	66612	13030
1/2	.5005 – .5015	12	.5312	17/32	.6990 – .7010	1/2	1/2	2	4,500	66613	13032
9/16	.5630 – .5640	14-3/4	.5938	19/32	.7870 – .7890	9/16	1/2	2	5,700	66614	13036
5/8	.6260 – .6270	16-5/16	.6562	21/32	.8730 – .8750	5/8	1/2	2	5,920	66615	13040
11/16	.6885 – .6895	17-3/4	.7500	3/4	.9630 – .9650	11/16	5/8	2	4,800	66616	13044
3/4	.7510 – .7520	17-3/4	.8125	13/16	1.0450 – 1.0470	3/4	5/8	2	5,940	66617	13048
7/8	.8765 – .8775	22-3/4	.9375	15/16	1.2270 – 1.2290	7/8	5/8	2	9,200	66618	13056
1	1.002 – 1.0030	24-1/8	1.0938	1-3/32	1.4030 – 1.4050	1	5/8	2	9,200	66619	13064

Stock Metric Standard Square Broaches

Square Size (mm)	Tolerances (Dec. Equiv.)	Broach Length	Pilot Diameter	Drill Size	Dimension Across Corners	Tooth Pitch	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.	
							Min.	Max.		duMONT	Hassay Savage
4	.1575 – .1580	5-1/8	.1614	4.1	.2205 – .2220	5/32	1/4	1/2	480	66630	17001
5	.1968 – .1973	6-1/2	.2047	5.2	.2765 – .2780	3/16	1/4	3/4	800	66631	17002
6	.2362 – .2370	6-11/16	.2519	6.4	.3300 – .3320	7/32	1/4	1	1,300	66632	17003
7	.2756 – .2764	7-3/4	.2913	7.4	.3850 – .3870	1/4	3/8	1-1/4	1,800	66633	-
8	.3150 – .3158	7-7/8	.3307	8.4	.4400 – .4420	5/16	1/2	1-3/8	2,300	66634	17004
9	.3543 – .3551	9-3/8	.3701	9.4	.4970 – .4990	3/8	1/2	1-1/2	3,500	66635	-
10	.3937 – .3945	10-1/4	.4094	10.4	.5530 – .5550	7/16	1/2	1-1/2	3,600	66636	17005
12	.4724 – .4732	12	.5039	12.8	.6620 – .6640	1/2	1/2	2	4,200	66637	17006
14	.5512 – .5520	14-3/4	.5826	14.8	.7730 – .7750	5/8	1/2	2	5,600	66638	17007
16	.6302 – .6310	16-5/16	.6614	16.8	.8790 – .8810	3/4	5/8	2	6,000	66639	17008
18	.7090 – .7097	17-7/8	.7716	19.6	.9930 – .9950	7/16	5/8	2	5,200	66640	17009
20	.7874 – .7882	20-7/8	.8504	21.6	1.1030 – 1.1050	1/2	5/8	2	6,600	66641	17010
22	.8663 – .8671	22-3/4	.9291	23.6	1.2130 – 1.2150	3/4	5/8	2	8,900	66642	17011
24	.9453 – .9460	24	1.0079	25.6	1.3230 – 1.3250	7/16	5/8	2	9,200	66643	17012
25	.9845 – .9852	24-1/8	1.0630	27.0	1.3790 – 1.3810	1	5/8	2	9,200	66644	17013

All standard items are available with TiN or TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

SPECIAL ORDERS: We are fully equipped to manufacture Special Full Square Broaches and Special Metric Square Broaches not listed above to your specifications. Please contact Pilot Precision Products for details.

Full Square Push Broaches

3/16 thru 1/2 inch

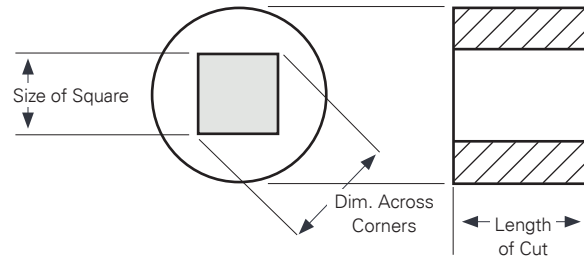
Applications: **Drives, jigs, fixtures, sizing and finishing**

Full Square Broaches

Our Full Square Broaches are designed to generate in one-pass a Full Square hole in a previously cast or drilled round hole. The Broach leaves no radii on the flats of the broached piece and the pilot diameter equals the finished full square size.

TiN or TiAlN coatings available.


Dimensions of Standard Full Square Broach Holes



Stock Full Square Broaches

Full Square Size (inch)	Tolerances (Dec. Equiv.)	Broach Length	Pilot Diameter	Drill Size	Dimension Across Corners	Tooth Pitch	Length of Cut		Pressure Required for Max. L/C (lbs.)	EDP No.	
							Min.	Max.		duMONT	Hassay Savage
3/16	.1880 - .1890	6	3/16	3/16	.2630 - .2650	1/8	3/16	1/2	870	66403	14012
1/4	.2505 - .2515	8-1/2	1/4	1/4	.3510 - .3530	5/32	1/4	5/8	1,310	66405	14016
5/16	.3130 - .3140	10-1/2	5/16	5/16	.4390 - .4410	3/16	5/16	7/8	1,895	66407	14020
3/8	.3755 - .3765	13-1/8	3/8	3/8	.5260 - .5280	7/32	5/16	1	2,410	66409	14024
7/16	.4385 - .4395	14-1/4	7/16	7/16	.6140 - .6160	7/16	5/8	1	3,090	66411	14028
1/2	.5005 - .5015	14-3/4	1/2	1/2	.7010 - .7030	1/4	3/8	1	3,860	66413	14032

All standard items are available with TiN or TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

Round Push Broaches

1/4 thru 1 inch

Applications: **Drives, jigs, fixtures, sizing and finishing**
***Non-Stock Standards - Made to Order**

Round Broaches

duMONT Minute Man® and Hassay Savage Round Broaches are designed to generate in one-pass a precision round hole in a previously cast, drilled or reamed round hole. These Internal Hole Broaches are ideal for precise tolerances, sizing and finish for those applications demanding precision and finish. Broaches are finished with variable pitch teeth and available in American Standard sizes. A burnishing section can be furnished. Metric sizes available upon request.

TiN or TiAlN coatings available.


Stock Round Broaches

Nominal Diameter (inch)	Tolerances	Broach Length	Pilot Diameter	Drill Size	Length of Cut		Pressure Required for Max. L/C (lbs.)	EDP No. duMONT
					Min.	Max.		
1/4	.2505 - .2510	5-7/8	.2344	15/64	5/16	3/4	840	77730
5/16	.3130 - .3135		.2469	19/64			1,050	77731
3/8	.3755 - .3760	6-7/8	.3594	23/64	3/8	1	1,440	77732
7/16	.4380 - .4385		.4219	27/64			1,680	77733
1/2	.5005 - .5010	8	.4844	31/64	1/2	1-1/4	2,240	77734
5/8	.6255 - .6260	8-1/2	.6094	39/64			2,500	77736
3/4	.7505 - .7510	9-1/8	.7344	47/64	5/8	1-1/2	3,720	77738
7/8	.8755 - .8765	9-1/4	.8594	55/64			4,340	77740
1	1.0005 - 1.0015	10-1/4	.9844	63/64	5/8	1-3/4	4,970	77742

Hexagon Push Broaches

1/8 thru 1 inch sizes

4mm thru 25mm sizes

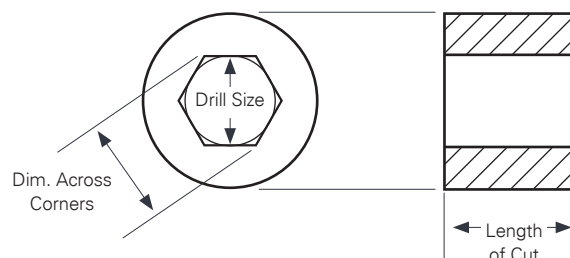
Applications: **Drives, jigs, fixtures and other hexagonal broaching operations**

Hexagon Broaches

Our Hexagon Broaches are designed to generate in one-pass a Hexagon hole in a previously cast or drilled round hole. Available from stock in the most common American Standard / Metric sizes (1/8–1" & 4mm–25mm).

TiN or TiAlN coatings available.


American Standard / Metric Square Broach



Stock Hexagon Broaches

Hex Size (inch)	Tolerances	Broach Length	Pilot Diameter	Drill Size	Dimension Across Corners	Tooth Pitch	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.	
							Min.	Max.		duMONT	Hassay Savage
1/8	.1255 – .1265	4-1/8	1/8	1/8	.1445 – .1455	1/8	3/16	3/8	200	77701	12008
5/32	.1565 – .1575	4-15/16	5/32	5/32	.1800 – .1815	1/8	1/4	1/2	300	77702	12010
3/16	.1880 – .1890	5-1/16	3/16	3/16	.2160 – .2180	5/32	1/4	5/8	560	77703	12012
7/32	.2190 – .2200	5-3/8	7/32	7/32	.2500 – .2520	5/32	1/4	3/4	775	77704	12014
1/4	.2505 – .2515	6	1/4	1/4	.2870 – .2890	3/16	1/4	3/4	1,025	77705	12016
9/32	.2815 – .2825	7-1/4	9/32	9/32	.3230 – .3250	3/16	5/16	1	1,290	77706	12018
5/16	.3130 – .3140	7-3/4	5/16	5/16	.3590 – .3610	7/32	3/8	1	1,510	77707	12020
11/32	.3440 – .3450	7-3/4	11/32	11/32	.3950 – .3970	7/32	3/8	1-1/4	2,280	77708	12022
3/8	.3755 – .3765	8-1/2	3/8	3/8	.4310 – .4330	7/32	3/8	1-1/4	2,400	77709	12024
13/32	.4065 – .4075	9-5/8	13/32	13/32	.4670 – .4690	7/32	3/8	1-1/4	2,790	77710	12026
7/16	.4380 – .4390	10-1/2	7/16	7/16	.5040 – .5060	1/4	1/2	1-3/8	2,700	77711	12028
15/32	.4690 – .4700	11-7/8	15/32	15/32	.5390 – .5410	9/32	1/2	1-3/8	2,700	77712	12030
1/2	.5005 – .5015	11-7/8	1/2	1/2	.5750 – .5770	9/32	1/2	1-3/8	3,025	77713	12032
9/16	.5630 – .5640	13-3/4	9/16	9/16	.6480 – .6500	5/16	1/2	1-5/8	4,800	77714	12036
5/8	.6260 – .6270	16-1/4	5/8	5/8	.7200 – .7220	5/16	1/2	1-5/8	5,400	77715	12040
11/16	.6885 – .6895	16-3/4	11/16	11/16	.7920 – .7940	5/16	1/2	1-5/8	6,000	77716	12044
3/4	.7510 – .7520	17-1/4	3/4	3/4	.8650 – .8670	3/8	5/8	2	6,960	77717	12048
7/8	.8765 – .8775	18-1/2	7/8	7/8	1.0080 – 1.0100	3/8	5/8	2	8,400	77718	12056
1	1.0020 – 1.0030	19-3/4	1	1	1.1520 – 1.1540	3/8	5/8	2	11,100	77719	12064

Stock Metric Hexagon Broaches

Hexagon (mm)	Tolerances (Dec. Equiv.)	Broach Length	Pilot Diameter	Drill Size	Dimension Across Corners	Tooth Pitch	Length of Cut		Pressure Required. for Max. L/C (lbs.)	EDP No.	
							Min.	Max.		duMONT	Hassay Savage
4	.1575 – .1580	4-15/16	.1575	4.0	.1810 – .1825	1/8	1/4	1/2	300	77750	12104
5	.1968 – .1973	5-3/8	.1968	5.0	.2260 – .2275	5/32	1/4	3/4	775	77751	12105
6	.2362 – .2370	6	.2362	6.0	.2710 – .2730	3/16	1/4	3/4	1,025	77752	12106
7	.2756 – .2764	7-1/4	.2756	7.0	.3170 – .3190	7/32	1/4	1	1,290	77753	12107
8	.3150 – .3158	7-3/4	.3150	8.0	.3620 – .3640	7/32	3/8	1	1,510	77754	12108
9	.3545 – .3555	8-1/2	.3543	9.0	.4090 – .4110	1/4	3/8	1-1/4	2,300	77759	-
10	.3937 – .3945	9-5/8	.3937	10.0	.4530 – .4550	9/32	1/2	1-3/8	2,790	77755	12110
12	.4724 – .4732	11-7/8	.4724	12.0	.5430 – .5450	5/16	1/2	1-3/8	2,700	77756	12112
14	.5512 – .5520	13-3/4	.5512	14.0	.6350 – .6370	3/8	1/2	1-5/8	4,800	77757	12114
16	.6302 – .6310	16-1/4	.6299	16.0	.7250 – .7270	3/8	5/8	2	5,400	77758	12116
18	.7092 – .7097	16-3/4	.7087	18.0	.8170 – .8190	3/8	5/8	2	6,400	77760	12118
20	.7876 – .7886	17-5/8	.7874	20.0	.9050 – .9070	3/8	5/8	2	7,200	77761	12120
22	.8664 – .8674	18-1/2	.8661	22.0	.9990 – 1.0010	3/8	5/8	2	8,200	77762	12122
24	.9450 – .9460	19-1/2	.9449	24.0	1.0890 – 1.0910	3/8	5/8	2	9,700	77763	12124
25	.9845 – .9855	19-3/4	.9842	25.0	1.1350 – 1.1370	3/8	5/8	2	11,000	77764	12125

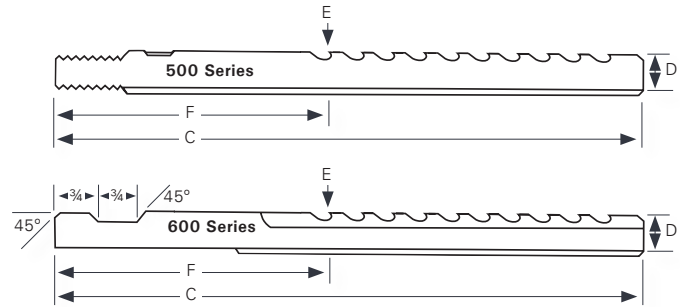
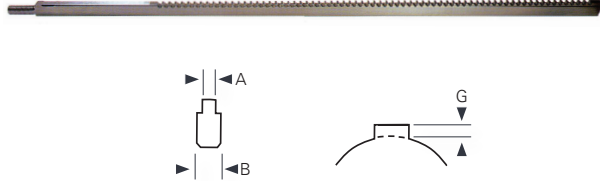
Pull-Type Keyway Broaches

1/16 thru 1 inch sizes

Applications: For high volume production pull-type machines

*Non-Stock Standards - Made to Order

Industry Standard 500 and 600 Series



Industry Standard 500 and 600 Series

duMONT Minute Man® and Hassay Savage brands offer the most common American Standard (1/16–1”) Pull-Type Keyway Broaches for use in high volume production. Available either as Industry Standard 500 Series with threaded pull end or 600 Series with notched pull end.

Nom. Dim.	A Decimal Dim.†	Min. Hole Size	Min Length Cut#	Max Length Cut*	B	C	D	E	F	G	No. of Passes	Thread Size	EDP No.			
													duMONT 500 Series	duMONT 600 Series	Hassay 500 Series	Hassay 600 Series
1/16	.0635	3/8	3/8	1-1/4	.1552	20	.313	.271	7-13/16	.042	1	1/4 – 20	10501S	10601S	-	33601
3/32	.0948	7/16	1/2	1-1/2	.1865	24	.367	.309	8-1/4	.058	1	5/16 – 18	10502S	10602S	-	33602
3/32	.0948	9/16	5/8	2-1/2	.2490	33	.491	.433	10	.058	1	3/8 – 16	10503S	10603S	-	33603
1/8	.1260	1/2	1/2	1-1/2	.2490	30	.438	.364	9	.074	1	3/8 – 16	10504S	10604S	-	33604
1/8	.1260	11/16	5/8	2-1/2	.3115	33	.594	.520	10	.074	1	1/2 – 13	10505S	10605S	-	33605
5/32	.1572	19/32	1/2	1-1/2	.2490	30	.525	.436	9	.089	1	3/8 – 16	10506S	10606S	-	33606
5/32	.1572	23/32	5/8	2-1/2	.3115	33	.625	.536	10	.089	1	1/2 – 13	10507S	10607S	-	33607
3/16	.1885	11/16	5/8	2-1/2	.3740	36	.581	.476	10	.105	1	1/2 – 13	10508S	10608S	-	33608
3/16	.1885	7/8	11/16	3-1/2	.3740	36	.796	.691	10-11/16	.105	1	1/2 – 13	10509S	10609S	-	33609
7/32	.2198	11/16	5/8	2-1/2	.3740	33	.557	.437	10	.120	1	1/2 – 13	10510S	10610S	-	33610
7/32	.2198	15/16	11/16	3-1/2	.3740	42	.813	.693	11-1/16	.120	1	1/2 – 13	10511S	10611S	-	33611
1/4	.2510	3/4	5/8	2-1/2	.3740	36	.612	.476	10	.136	1	1/2 – 13	10512S	10612S	-	33612
1/4	.2510	1	11/16	4	.4990	45	.877	.741	12	.136	1	5/8 – 11	10513S	10613S	-	33613
1/4	.2510	1-3/8	7/8	6	.6240	51	1.250	1.114	13-3/4	.136	1	3/4 – 10	10514S	10614S	-	33614
9/32	.2828	7/8	11/16	4	.4990	42	.716	.564	11-5/8	.152	1	5/8 – 11	10515S	10615S	-	33615
9/32	.2828	1-1/4	7/8	6	.4990	51	1.093	.941	13-1/2	.152	1	5/8 – 11	10516S	10616S	-	33616
5/16	.3140	1-1/16	11/16	4	.4990	45	.908	.741	12	.167	1	5/8 – 11	10517S	10617S	-	33617
5/16	.3140	1-5/16	7/8	6	.4990	51	1.158	.991	13-3/4	.167	1	5/8 – 11	10518S	10618S	-	33618
3/8	.3765	1-9/16	11/16	4	.4990	45	.938	.739	12	.199	1	5/8 – 11	10519S	10619S	-	33619
3/8	.3765	1-5/16	7/8	6	.4990	54	1.189	.990	13-1/2	.199	1	5/8 – 11	10520S	10620S	-	33620
7/16	.4390	1-9/16	11/16	4	.6240	48	1.390	1.160	12	.230	1	3/4 – 10	10521S	10621S	-	33621
7/16	.4390	1-3/4	1	8	.6240	48	1.611	1.496	15-5/8	.230	2	3/4 – 10	10522S	10622S	-	33622
1/2	.5015	1-1/2	11/16	4	.6240	48	1.312	1.051	12	.261	1	3/4 – 10	10523S	10623S	-	33623
1/2	.5015	1-9/16	1	8	.6240	48	1.377	1.246	16-1/2	.261	2	3/4 – 10	10524S	10624S	-	33624
9/16	.5645	1-11/16	11/16	4	.6865	54	1.438	1.146	11-13/16	.292	1	1 – 8	10525S	10625S	-	33625
9/16	.5645	1-5/8	1	8	.6865	51	1.391	1.245	16	.292	2	1 – 8	10526S	10626S	-	33626
9/16	.5645	1-15/16	1-1/8	12	.8740	60	1.641	1.495	20	.292	2	1 – 8	10527S	10627S	-	33627
5/8	.6270	1-7/8	1-1/16	4	.7490	60	1.625	1.301	12	.324	1	1 – 8	10528S	10628S	-	33628
5/8	.6270	1-15/16	1	8	.8740	54	1.657	1.495	16-3/8	.324	2	1 – 8	10529S	10629S	-	33629
5/8	.6270	1-15/16	1-1/8	12	.8740	60	1.657	1.495	20	.324	2	1 – 8	10530S	10630S	-	33630
3/4	.7520	1-15/16	11/16	4	.8740	60	1.625	1.239	12	.386	1	1 – 8	10531S	10631S	-	33631
3/4	.7520	2-1/16	1	8	.9990	60	1.688	1.495	16-1/4	.386	2	1-1/4 – 7	10532S	10632S	33532	33632
3/4	.7520	2-1/16	1-1/8	12	.9990	60	1.688	1.560	20	.386	3	1-1/4 – 7	10533S	10633S	33533	33633
7/8	.8770	2-1/4	11/16	4	1.1240	63	1.875	1.426	12-3/8	.449	1	1-1/4 – 7	10534S	10634S	33534	33634
7/8	.8770	2-1/8	1	8	1.1240	63	1.719	1.494	15-3/4	.449	2	1-1/4 – 7	10535S	10635S	33535	33635
7/8	.8770	2-1/8	1-1/8	12	1.1240	63	1.719	1.569	20	.449	3	1-1/4 – 7	10536S	10636S	33536	33636
1	1.0020	2-1/4	5/8	2-1/2	1.2490	63	1.750	1.239	10-1/2	.511	1	1-1/2 – 6	10537S	10637S	33537	33637
1	1.0020	2-1/4	7/8	8	1.2490	63	1.750	1.494	14-1/4	.511	2	1-1/2 – 6	10538S	10638S	33538	33638
1	1.0020	2-1/4	1-1/8	12	1.2490	63	1.750	1.580	20	.511	3	1-1/2 – 6	10539S	10639S	33539	33639

† Tolerance - Based on +/- .0005 # Minimum length of part recommended to prevent part from dropping in between broach teeth *Based on mild steel

All standard items are available with TiN or TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

Note: All items can be made with deburring feature as specials.

Pull-Type Keyway Broaches

2mm thru 25mm

Applications: For high volume production pull-type machines

Metric 2–25mm Pull-type Keyway Broaches

duMONT Minute Man® and Hassay Savage brands offer the most common Metric (2–25mm) Pull-Type Keyway Broaches for use in high volume production. Available either as Industry Standard 500 Series with threaded pull end or 600 Series with notched pull end. See image on page 16.

Nom. Dim.	A Decimal Dim.†	Min. Hole Size (mm)	Min Length Cut#	Max Length Cut*	B	C	D	E	F	G	No. of Passes	Thread Size	EDP No.	
													duMONT 500M Series	duMONT 600M Series
2	.0792	9 .354	9.5 3/8	31.8 1-1/4	3.942 .1552	508 20	7.95 .313	6.60 .260	197 7-3/4	1.35 .053	1	1/4 – 20	10561S	10661S
3	.1186	11 .433	12.7 1/2	38 1-1/2	4.737 .1865	610 24	9.32 .367	7.49 .295	197 7-3/4	1.83 .072	1	5/16 – 18	10562S	10662S
4	.1581	13 .512	12.7 1/2	38 1-1/2	6.325 .2490	838 33	11.13 .438	8.81 .347	229 9	2.31 .091	1	3/8 – 16	10563S	10663S
	.1581	13 .512	15.9 5/8	63.5 2-1/2	6.325 .2490	915 36	11.07 .436	8.76 .345	254 10	2.31 .091			10564S	10664S
5	.1974	14 .551	14.3 9/16	44.5 1-3/4	7.91 .3115	915 36	11.07 .436	8.18 .322	248 9-3/4	2.89 .114	1	1/2 – 13	10565S	10665S
	.1974	23 .906	15.9 5/8	76.2 3	9.5 .3740	1067 42	2.65 .813	17.75 .699	279 11	2.89 .114			10566S	10666S
6	.2368	18 .709	15.9 5/8	63.5 2-1/2	9.5 .3740	915 36	15.54 .612	11.96 .471	254 10	3.58 .141	1	1/2 – 13	10567S	10667S
	.2368	26 1.024	17.5 11/16	102 4	12.67 .4990	1143 45	22.28 .877	18.69 .736	305 12	3.58 .141		5/8 – 11	10568S	10668S
8	.3157	27 1.063	17.5 11/16	102 4	12.67 .4990	1143 45	23.06 .908	18.77 .739	305 12	4.29 .169	1	5/8 – 11	10569S	10669S
	.3157	33 1.299	22.2 7/8	152 6	12.67 .4990	1295 51	29.41 1.158	25.12 .989	353 13-7/8	4.29 .169			10570S	10670S
10	.3944	27 1.063	17.5 11/16	102 4	12.67 .4990	1143 45	23.27 .916	18.77 .739	305 12	4.49 .177	1	5/8 – 11	10571S	10671S
	.3944	36 1.417	22.2 7/8	152 6	15.85 .6240	1295 51	31.75 1.250	27.25 1.073	353 13-7/8	4.49 .177		3/4 – 10	10572S	10672S
12	.4733	39 1.535	17.5 11/16	102 4	15.85 .6240	1219 48	34.06 1.341	29.46 1.160	302 11-7/8	4.60 .181	1	3/4 – 10	10573S	10673S
	.4733	39 1.535	25.4 1	203 8	15.85 .6240	1524 60	34.06 1.341	29.46 1.160	406 16	4.60 .181			10574S	10674S
14	.552	40 1.575	17.5 11/16	102 4	17.44 .6865	1372 54	34.39 1.354	29.11 1.146	295 11-5/8	5.28 .208	1	1 – 8	10575S	10675S
	.552	44 1.732	25.4 1	203 8	19.02 .7490	1524 60	38.33 1.509	33.04 1.301	400 15-3/4	5.28 .208			10576S	10676S
16	.6308	47 1.850	17.5 11/16	102 4	19.02 .7490	1524 60	41.28 1.625	35.46 1.396	305 12	5.82 .229	1	1 – 8	10577S	10677S
	.6308	48 1.890	28.6 1-1/8	305 12	22.2 .8740	1524 60	41.28 1.625	38.35 1.510	508 20	5.82 .229	2		10578S	10678S
18	.7095	48 1.890	17.5 11/16	102 4	22.2 .8740	1524 60	41.28 1.625	35.26 1.388	305 12	6.02 .237	1	1 – 8	10579S	10679S
	.7095	51 2.008	28.6 1-1/8	305 12	25.37 .9990	1524 60	42.88 1.688	39.85 1.569	513 20-3/16	6.02 .237	2	1-1/4 – 7	10580S	10680S
20	.7884	56 2.205	17.5 11/16	102 4	28.55 1.1240	1600 63	47.63 1.875	4.94 1.612	302 11-7/8	6.68 .263	1	1-1/4 – 7	10581S	10681S
	.7884	53 2.087	28.6 1-1/8	305 12	28.55 1.1240	1600 63	43.66 1.719	4.31 1.587	503 19-13/16	6.68 .263	2		10582S	10682S
22	.8672	57 2.244	17.5 11/16	102 4	28.55 1.1240	1600 63	47.63 1.875	4.39 1.590	302 11-7/8	7.24 .285	1	1-1/4 – 7	10583S	10683S
	.8672	53 2.087	28.6 1-1/8	305 12	28.55 1.1240	1600 63	43.66 1.719	4.03 1.576	503 19-13/16	7.24 .285	2		10584S	10684S
25	.9853	56 2.205	17.5 11/16	102 4	31.72 1.2490	1600 63	44.45 1.750	36.98 1.456	270 10-5/8	7.47 .294	1	1-1/2 – 6	10585S	10685S
	.9853	56 2.205	28.6 1-1/8	305 12	31.72 1.2490	1600 63	44.45 1.750	4.72 1.603	508 20	7.47 .294	2	2-1/2 – 6	10586S	10686S

† Tolerance - Based on +/- .0005 # Minimum length of part recommended to prevent part from dropping in between broach teeth *Based on mild steel

All standard items are available with TiN or TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

Note: All items can be made with deburring feature as specials.

Keyseating Broaches

1/16 thru 1-1/2 inch sizes

2mm thru 25mm

Applications: **Hansford Davis Keyseating Machine Models 4, 5, and 15**

Type AF – Inch

Keyseating Broaches feature superior tooth design and are ground to precision keyway tolerances. Sizes for cutting the most common keyway widths are available.

TiN or TiAlN coatings available.

Broach Size (inch)	Overall Length	Tooth Height	Tooth Pitch	EDP No.	
				duMONT	Hassay Savage
1/16*	16	3/8	3/8	55550	10701
3/32*				55551	10702
1/8*		7/16		55552	10703
5/32*		1/2		55553	10704
3/16		9/16		55554	10705
1/4		3/4		55555	10707
5/16		7/8	17/32	55557	10709
3/8			55559	10711	
7/16		1	-	10713	
3/16	20	3/8	3/8	-	10706
1/4		3/4	55556	10708	
5/16		7/8	17/32	55558	10710
3/8			55560	10712	
7/16		1	11/32	55561	10714
1/2			17/32	55562	10715
9/16				55563	10716
5/8				55564	10717
3/4				55565	10718
7/8				55566	10719
1				55567	10720

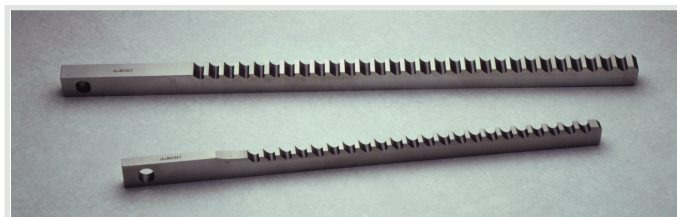
*Reinforced body width 3/16" thick

Type AFS – Inch

Staggered Tooth AFS Type Keyseating Broaches provide a stagger tooth design, promoting an efficient cut.

TiN or TiAlN coatings available.

Broach Size (inch)	Overall Length	Tooth Height	EDP No. duMONT
3/8	20	1	55601
7/16			55603
1/2			55604
9/16			55605
5/8			55606
3/4			55607
7/8			55608
1			55609
1-1/8		1-1/8	55610
1-1/4		1-1/4	55611
1-1/2		1-1/2	55612



Type AF Metric Standard

Broach Size (mm)	Overall Length	Tooth Height	Tooth Pitch	EDP No.	
				duMONT	Hassay Savage
2*	16	3/8	3/8	55570	11701
3*		7/16		55571	11702
4*		1/2		55572	11703
5		9/16		55573	11704
6		3/4		55574	11706
7		7/8	17/32	55576	-
8				55578	11708
9				55580	-
10				-	11710
5	20	1/2	3/8	-	11705
6		3/4		55575	11707
7		7/8	17/32	55577	-
8				55579	11709
9				55581	-
10				55582	11711
11				55583	-
12				55584	11712
13				55585	-
14				55586	11713
15				55587	-
16				55588	11714
17				55589	-
18				55590	11715
19				55591	-
20				55592	11716
22				55593	11717
24				55594	11718
25				55595	11719

*Reinforced body width 3/16" thick

All standard items are available with TiN or TiAlN coating from stock or short delivery. Please contact Pilot Precision Products for details.

SPECIAL ORDERS: We are fully equipped to manufacture Special Keyseating Broaches not listed above. Please contact Pilot Precision Products for details.

Arbor Presses and PressLube Broaching Oil

Hand Operated

Arbor Presses

duMONT Minute Man® Arbor Presses are easy to operate Manual Broaching Machines designed for Push Broaching with Keyways and Internal Hole Broaches. These Hand Operated Presses are available in 3- and 6-ton models and provide the pressure required to Push Broaches through the work piece. Both Arbor Presses provide these essential features:

- Ratchet operation with compound leverage for minimum operator effort.
- Pawl between lever and pinion permits positioning lever for most convenient reach and pull.
- Ram positioned by handwheel reduces travel, tests Broach alignment, supports the Broach and workpiece assembly.
- Round ram with rack teeth cut to center concentrates force along the center line to avoid cramping.



	Duke 1 1/2 Arbor Press	Duke 1 1/2 B Arbor Press	Duke 2 1/2 Arbor Press
EDP No.	55004	55006	55008
Stroke	11-1/2	18-1/4	21-1/2
Tonnage	3	3	6
Horsepower	Manual	Manual	Manual
Shipping Weight	220 lbs.	325 lbs.	450 lbs.

Broaching Oil That Keeps Your Tooling Sharp & Disposal Costs Down



Our PressLube™ Broaching Oil* is a proprietary formulation created to improve the performance of your broaching tools without the use of chlorine (Cl) and phosphorous (P). Our environmentally safe lubricant contains a special electrostatic precipitator (EP) additive that combines with active and inactive sulfurized lubricity agents to produce a high-performance broach cutting oil product.

- Improves Part Quality, Surface Finish & Operational Efficiency
- Provides Excellent Rust Protection
- Extends Tool Life
- Minimizes Built-Up Edge
- Increases Rates of Turning
- Easy to Filter
- Environmentally Friendly
- Recyclable
- Reduces Disposal Costs

EDP #	Description
99960	duMONT Broaching Oil 12 x 1 quart/case
99961	duMONT Broaching Oil 4 x 1 gallon/case
99962	duMONT Broaching Oil 5 gallon pail
99963	duMONT Broaching Oil 55 gallon drum
99964	duMONT Broaching Oil 275 gallon tote

*California Proposition 65 - This product does not contain any substances known to the State of California to cause cancer and/or reproductive harm.



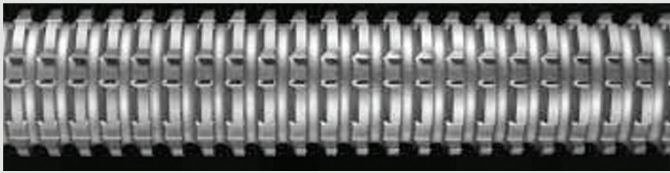
Custom Broaches

Push and Pull Types

Applications: **For high volume production pull-type machines**

Spline Broaches

Spline Broaches specifically designed and manufactured for your application, duMONT Minute Man® and Hassay Savage offer straight sided, Involute Spline, and Serration Broaches in both Push or Pull-type designs. Due to the complex nature of these tools a customer part print is required. Pull-type Broaches are available with a variety of pull ends—Threaded, Notched, Pin and Automatic, to name a few.



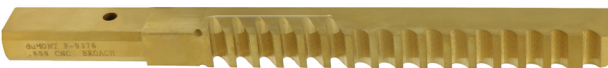
Keyway Broaches

duMONT Minute Man® and Hassay Savage manufacture Special Keyway Broaches in either Push or Pull-type in both American Standard and Metric Sizes. Special Application Multi-pass Push Keyway Broaches and One-Pass Keyway Broaches which require the appropriate guide Bushing can often be manufactured from an existing blank for quick delivery. One-Pass Push Keyway Broaches are also available in a self-guiding Production Style that require no guide Bushing. Both One-Pass Push-type styles as well as their Pull-type counterparts are available with a special chamfer feature that will deburr the keyway bore interface. Double-Keyway and Keyseating Broaches are also available. Pull-type Broaches are available with a variety of pull ends—Threaded, Notched, Pin, and Automatic, to name a few.



Firearms Custom Broaches

Our Breechface Broaches are easily assembled into a standard CNC holder. They are for use with the pistol brands: Glock, Smith & Wesson, H&K, Walther, CZ and Canik. Calibers include: 9mm, .40, .45, .380 and 10mm. Our Breechface broaches are internal to machine cycle and do not require subcontracting / offline operation. We also offer custom linear Push or Pull broaches made for all firearms broaching applications.



Custom Breechface Broaches for the Following Brands:

- Glock
- Smith & Wesson
- H&K
- Walther
- CZ
- Canik

Firearm Broaches we can support:

- Magwells
- Rifling
- Receiver
- Frame Broaches
- Slotters - Revolver
- Revolver Finishing

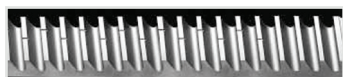
Custom Broaches and Re-Sharpening

Push and Pull Types

Applications: **Virtually any broaching operation** | **Short- and long-run production**

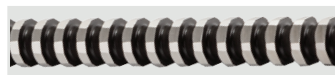
Surface Broaches

Surface Broaches are available as either individual Broaches or as inserts for broaching flat surfaces, irregular shapes, external forms, concave or convex surfaces, serrations, cam shapes, corner squaring and dovetails.



Internal Hole Broaches

Internal Hole Broaches in Push and Pull-type including Square, Hexagon, Round, Rectangular, Keyway, and irregularly shaped Broaches are all readily available. Broaches for Burnishing, Sizing and Combination or Cut and Finish applications are also manufactured as either Push or Pull-type. Pull-type Broaches are available with a variety of pull ends—Threaded, Notched, Pin and Automatic, to name a few.



Let Us Meet Your Custom Broach Requirements

Along with the extensive assortment of Stock Broaches listed in this catalog, we offer short delivery of Special Broaches custom-designed for your application or manufactured from your prints.

Our engineering staff has years of experience designing Special Broaches to replace time-consuming and costly machining operations. Whenever possible, we will meet your Special Broach requirements by using our extensive supply of hardened blank stock, thereby reducing both the cost and delivery time ordinarily associated with ordering Specials. With our extensive stock and expertise in designing and manufacturing specials, we are able to serve our customers as a single complete source for all of their broaching needs.

We are fully equipped to manufacture both Standard and Custom Broaches in either Push or Pull Styles, including all types of Keyway, Internal Hole, and Surface Broaches.

TiN or TiAlN coatings available.

Broach Re-Sharpening

Broaches, regardless of type, should never be used when dull. The use of a dull Broach may result in poor finish or cause drifting, damage to the teeth or breakage. Correct and timely re-sharpening will increase Broach life and quality of parts. The necessity to sharpen a Broach is dependent on numerous factors; material, tolerance, and required finish, etc. A number of conditions indicate the need for sharpening:

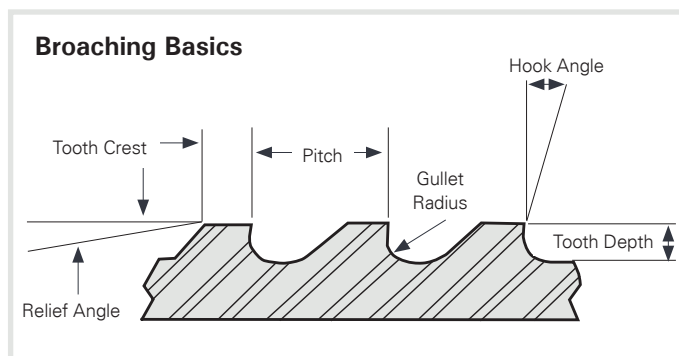
- Poor finish, tears, galling, etc. on the workpiece.
- Cutting edges showing signs of rollover and teeth dull to the touch.
- When using a Hydraulic Press, the pressure gauge showing an increase in pressure required to complete the cut.
- Nicks, gouges, etc. in the teeth from improper handling.
- Broach sticking in the workpiece, pick-up on tops of teeth.
- Holes gauging undersize.

duMONT Minute Man® and Hassay Savage offer expert Broach re-sharpening services, with the goal to restore the cutting edges of the Broach to its original condition. Broaches returned for this service are each individually examined and specific regrind instructions are generated for the reconditioning of the tool.

Applications: **Standard Push Broaching Procedures | Broaching Basics**

Standard Broaching Procedures

duMONT Minute Man® and Hassay Savage Broaches are designed for fast, accurate, and convenient broaching with arbor or hydraulic presses. A study of the Broaching Procedures presented in this section will familiarize the operator with proper broaching procedures and troubleshooting practices. Following proper broaching fundamentals, paying attention to technique and Broach maintenance will help prevent drifting, deflection and even breakage while providing greater efficiencies in the cutting of your parts. If you have a specific question or problem, contact our Engineering Department at 413-350-5200 or by email at info@pilotprecision.com.



Warning Information

Cutting tools may shatter or break, therefore **eye protection should be worn wherever and whenever cutting tools are being used**. Government Regulations require use of safety glasses and other appropriate safety equipment at all times in the vicinity of cutting tool use.

Workpiece Material

duMONT Minute Man® and Hassay Savage stock Broaches can be used on a variety of workpiece materials. It is not practical to Broach material having a Rockwell hardness higher than Rc35. When broaching **Iron** or **Steel**, use the standard Broach as supplied. **Brass** and **Free Machining Bronze** may require stoning of a slight land on the top of the teeth to prevent drifting (pulling into the work). Custom Broaches are designed and engineered to provide the correct tooth form, pitch and rake angles for the material specified.

Length of Cut

Our Broaches are designed to be used in operations where a minimum of two teeth are engaged at all times. Tooth engagement is required to maintain a smooth cutting action promoting a clean finish. The chip generated during the cutting process must be contained within the gullet of the tooth to avoid binding of the tool. This could cause potential damage to the Broach, the workpiece and injury to the operator. Appropriate

chip load allows for smooth cutting, and improved tool life. All individual stock Broaches have recommended Minimum and Maximum Length of Cut guidelines which should be followed. The required force necessary to achieve the Maximum Length of Cut is also provided with the individual Broach specifications. Workpieces may be stacked to establish the Minimum Length of Cut, or to improve the efficiencies of the operation as long as Maximum Length of Cut is not exceeded. Proper nesting and clamping of stacked parts is vital when this approach is taken. The Maximum Length of Cut with Push-type Keyway Broaches should not exceed the length of the Bushing being used.

Reminder: "A/I" Style Broaches are used with "A/I" Style Bushings, "B/II" Style Broaches with "B/II" Style Bushings, etc. Pilot Precision Products Push-type and Pull-type Broaches often can be designed to accommodate your specific length of cut requirements.

Set-Up and Alignment

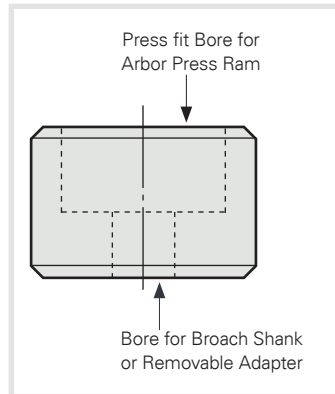
Successful broaching begins with proper set-up, and alignment of the Broach, workpiece and ram. Attention to these details will provide a stable workpiece, and prevent drifting, deflection or even breakage caused by misalignment. The workpiece must be solidly fixed or nested perfectly square with the baseplate and ram face. Make sure all square and parallel surfaces on the face of the ram and baseplate remain true. It is essential to maintain a rigid set-up at all times and caution should be taken when stacking parts to maintain the integrity of the set-up. Never attempt to exceed the Broach's specified Maximum Length of Cut. At the beginning of a cut, be sure the Broach is centered under the ram. Proper alignment is important. After the Broach starts to cut, back off pressure on the ram to allow the Broach to center itself, if not in perfect alignment. If Broach moves out of alignment after starting cut, back off the pressure on the ram and align the broach itself. Repeat this procedure during successive cuts. This will assure a perfectly straight broached hole.

Suggestions for a drifting or "hogging" Push-type Keyway Broach:

1. Reverse workpiece or turn Broach so teeth face toward the back of the press.
2. Let the Bushing protrude above the workpiece to give more support to the back of the Broach, thereby helping to keep it aligned. If a collared Bushing is used, place it upside down under the workpiece.

Ram Adapter Use

Ram Adapters are used for broaching applications that require Round, Custom Shapes such as Rectangular as well as Square, and Hexagon Broaches 1/4" and 6mm or smaller. A Ram Adapter would also be recommended in situations where an extraordinary high degree of accuracy is required.

Applications: **Standard Push Broaching Procedures** | **Broach Re-Sharpening**


These Adapters are also referred to as rear guides and provide support and guidance for the Broach at the shank end, minimizing the possibility of deflection or breakage. When an Adapter is used as a rear guide for the Broach, the hole in the Ram Adapter must be in alignment with the pilot hole in the workpiece. It is important a Ram Adapter provides a tight, true fit to both the press ram and to the Broach shank. An adapter may also be used to allow the shanks of smaller Internal Hole Broaches to be gripped to avoid deflection and breakage.

Cutting Fluids and Lubrication

Broach lubrication is crucial to tool life and the quality of the finish produced. Lubrication enables chips to slide freely and curl in the tooth gullets minimizing frictional heat. This cuts down on Broach wear and prevents build up on the cutting edge of the teeth. Push-type Keyway Broaches, regardless of the material to be broached, require lubrication on the back side of the Broach in order to reduce friction. Proper lubrication will increase Broach life and produce a cleaner finish. Various materials require different lubricants.

Mild Steel – A good quality cutting oil is preferred but water-soluble coolant is ok. Apply on the teeth and back side of the broach.

Tough Steels such as Nickel Alloys – A good grade of a sulfur-based cutting oil.

Brass – Can be broached dry, but Oil is preferred.

Bronze – Works best with oil.

Cast Iron – Is almost always broached dry.

Aluminum – A good quality cutting oil is preferred but water-soluble coolant is OK. Apply on the teeth and back side of the broach.

Coatings Available

duMONT Minute Man® and Hassay Savage Broaches are available with TiN, and TiAlN coatings. The coatings provide enhanced performance for specific applications, delivering greater value and tool life on your more challenging materials.

TiN – provides increased lubricity and wear resistance when broaching abrasive materials such as fiberglass and some aluminum alloys.

TiAlN – offers significant increase in surface hardness (Rc low 90s). Applications would include broaching in most stainless steels, alloy steels and harder materials.

Broaching with Keyway Sets or Individual Broaches



Use of Individual Push-type Keyway Broaches or Keyway Broaches from a Broach Set requires the use of a Bushing and Shim(s). The Bushing size and style are determined by the bore diameter of the workpiece as well as the Style of Broach to be used. "A / I" Style Broaches are used with "A / I" Style Bushings, "B / II" style Broaches with "B / II" Style Bushings, etc. The smallest Broaches cut in one pass and require no Shim.

Multiple pass Keyway Broaches are furnished with all necessary Shim(s) unless otherwise noted. A Shim is required to compensate for the thickness removed following a Keyway Broach's cutting pass. The addition of a Shim to the bottom of the bushing's slot serves to move the Broach forward toward its standard finished cutting depth. Subsequent passes require the stacking of Shims.

1. Select the right Broach for the bore (sizes are plainly marked).
2. Insert Broach (which is also plainly marked for size) and check alignment.
3. Place this assembly in the press.
4. Lubricate.
5. Apply pressure to the Broach—back off pressure on Ram to allow the Broach to center itself if not in perfect alignment—reapply pressure to push Broach through the work.
6. Clean Broach using a stiff brush to remove chips from cutting section.
7. Insert shim and repeat steps 3 through 6 as required to obtain exact keyway depth.

*Find our Oil on Page 25



Engineering Section

How to Use Broaches

Applications: **Broaching with Keyway Sets and Production Keyway Broaches**

Broaching with One-Pass Keyway Broaches



Broaching with One-Pass Keyway Broaches requires the use of a Bushing. The Bushing size and Style are determined by the bore diameter of the workpiece as well as the Style of Broach to be used. "A/I" Style Broaches are used with "A/I" Style Bushings, "B/II" Style Broaches with "B/II" Style Bushings, etc. No Shims are required. The Broach cuts to full width and depth in one pass.

1. Select the right Bushing for the bore (sizes are plainly marked) and insert in the bore of work.
2. Insert Broach (which is also plainly marked for size) for the desired width of keyway into the Bushing slot and check alignment.
3. Place this assembly in the press.
4. Lubricate.
5. Apply pressure to the Broach—back off pressure on Ram to allow the Broach to center itself, if not in perfect alignment—reapply pressure to push Broach through the work.
6. Clean Broach using a stiff brush to remove chips from cutting section.
7. Repeat steps 2 thru 6 for subsequent parts.

Broaching with Production Keyway Broaches

Broaching with Production Style Keyway Broaches requires no Shims or Bushings. The back and shoulders of the Broach are ground to fit the diameter of the bore, supporting and guiding itself while cutting the keyway in one pass.

1. Select desired Broach and insert pilot into bore of part.
2. Lubricate.
3. Apply pressure to the Broach—back off pressure on Ram to allow the Broach to center itself, if not in perfect alignment.
4. Clean Broach using a stiff brush to remove chips from cutting section.
5. Repeat steps 2 through 4 for subsequent passes.

Broaching with Internal Hole Broaches



Broaching with Internal Hole Broaches requires no Shims or Bushings. Round, Square, Hexagon and many Custom Shapes are designed to finish in one pass, in cast or drilled bores requiring a thru hole finish. The starting hole must be drilled square with the face of the work. Square and Hexagon Broaches, 1/4" and 6mm or smaller, should be gripped by the shank in an adapter to prevent deflection and breakage.

1. Pilot Holes: Properly drilled pilot holes are essential for a true and clean cut. Never use a dull or poorly sharpened drill to make pilot holes.
2. Select desired Broach. Confirm the bore of workpiece is equal to pilot diameter of broach. (The use of a ram adapter is advised with all Round Broaches and for Square and Hexagon Broaches 1/4" and 6mm or smaller).
3. Insert pilot into bore of part.
4. Ram Speed: Always use proper ram speed to prevent chatter marks and edge wear. (See Metals Handbook – Vol. 3 "Machining".)
5. Lubricate.
6. Apply pressure to the Broach—back off pressure on Ram to allow the Broach to center itself, if not in perfect alignment—reapply pressure to push Broach through the work.
7. Clean Broach using a stiff brush to remove chips from cutting section.
8. Repeat steps 3 through 7 for subsequent parts.

Troubleshooting

We aim to make your broaching experience efficient, effective and trouble-free. Most broaching failures (poor finish, drifting, deflection, breakage, chatter marks or edge wear) can be attributed to deficiencies in alignment, lubrication, Broach sharpness, tooth configuration or design, material hardness and incorrect broaching speed or pressure as detailed in this section. If you have specific questions or problems not covered on these pages, contact our Engineering Department.

To the Distributor

duMONT Minute Man® and Hassay Savage broaches offer your customers the benefits of advanced design and the latest market technology in manufacturing. Our strict quality controls and skilled group of toolmakers ensure that Pilot Precision Products broaches cut more precisely, last longer and wear better to make money for you and your customers.

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Warning: Cutting tools may shatter or break, therefore eye protection should be worn wherever and whenever cutting tools are being used. Government regulations require use of safety glasses and other appropriate safety equipment at all times in the vicinity of cutting tool use.

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