1-800-GRAINGER (472-4643)

			BRIGHT (UNCOATED)		TIALN					
			60°	82°	90°	100°	60°	82°	90°	100°
		Shank Overal		Item						
Dia.		Length Length	No.	No.	No.	No.	No.	No.	No.	No.
Fast-Cut 1-Flute										
1/8 in	1/8 in	— 1¼ in		3ZXX6	3ZXZ6	3ZYC6	3ZXW6	3ZXY6	3ZYA6	3ZYE5
³ /16 in	3⁄16 in	— 1 ¾ in		3ZXX7	3ZXZ7	3ZYC7	3ZXW7	3ZXY7	3ZYA7	3ZYE7
1⁄4 in	1⁄4 in	— 1 ½ in		3ZXX8	3ZXZ8	3ZYC9	3ZXW8	3ZXY8	3ZYA8	3ZYE9
3∕≋ in	3⁄8 in	7% in 1 ¾ in	3ZXV9	3ZXX9	3ZXZ9	3ZYD2	3ZXW9	3ZXY9	3ZYA9	3ZYF2
1/2 in	1/4 in	1 in 2 in			3ZYA1				3ZYC1	
1/2 in	1/2 in	1 in 2 in	3ZXW1	3ZXY1		3ZYD4	3ZXX1	3ZXZ1		3ZYF4
5∕s in	5% in	1 in 2 1/4 in	3ZXW2	3ZXY2	3ZYA2	3ZYD6	3ZXX2	3ZXZ2	3ZYC2	3ZYF6
3⁄4 in	3⁄4 in	1 ¼ in 2 % in		3ZXY3	3ZYA3	3ZYD8	3ZXX3	3ZXZ3	3ZYC3	3ZYF7
1 in	1/2 in	1 1/4 in 2 3/4 in			3ZYA4					
1 in	1 in	1 1/4 in 2 3/4 in	3ZXW4	3ZXY4		3ZYE1	3ZXX4	3ZXZ4	3ZYC4	3ZYF8
1 ¼ in	3/4 in	1 ¼ in 3 in			3ZYA5				-	-
	1 ¼ in	1 ¼ in 3 in	3ZXW5	3ZXY5		3ZYE3	3ZXX5	3ZXZ5	3ZYC5	3ZYF9
3-Flute										
1/8 in	1/8 in	— <u>1 ¼ in</u>		3ZYJ1	3ZYL1	3ZYT1	3ZYH1	3ZYK1	3ZYP1	3ZYV1
3/16 in	3/16 in	— 1 ¾ in		3ZYJ2	3ZYL3	3ZYT3	3ZYH2	3ZYK2	3ZYP3	3ZYV3
1/4 in	1/4 in	<u> </u>		3ZYJ3	3ZYL5	3ZYT5	3ZYH3	3ZYK3	3ZYP5	2ZTP2
3% in	1/4 in	7% in 1 ¾ in		3ZYJ4	3ZYL7	3ZYT7	3ZYH4	3ZYK4	3ZYP7	2ZTV5
1/2 in	1/4 in	1 in 2 in	3ZYG5	3ZYJ5	3ZYL9	3ZYT9	3ZYH5	3ZYK5	3ZYP9	4CJT2
5% in	3/8 in	1 in 2 1/4 in		3ZYJ6	3ZYN2	3ZYU2	3ZYH6	3ZYK6	3ZYR2	4CJT3
3/4 in	1/2 in	1 1/4 in 2 5/8 in		3ZYJ7	3ZYN4	3ZYU4	3ZYH7	3ZYK7	3ZYR4	4CJT4
1 in	1/2 in	1 1/4 in 2 3/4 in	3ZYG8	3ZYJ8	3ZYN6	3ZYU6	3ZYH8	3ZYK8	3ZYR6	4CJT5
1 1/4 in	1/2 in	1 ¼ in 3 in	3ZYG9		3ZYN8	3ZYU8	3ZYH9	3ZYK9	3ZYR8	4CJT6
1 ¼ in	³ ⁄4 in	1 ¼ in 3 in		3ZYJ9			_	_		_
6-Flut		d 1/ in	4CJT7	4CJV9	4CJY2	401/44	40.000	4CJX1	4CJZ3	40//05
1/8 in 3/16 in	1/8 in	— 1 ¼ in — 1 ¾ in		40JV9 40JW1	40342	4CKA4 4CKA5	4CJU8 4CJU9	4CJX1 4CJX2	40JZ3 40JZ4	4CKC5
^{9/16} In 1/4 in	³ /16 in 1/4 in	— 1 ½ in — 1 ½ in		4CJW1 4CJW2	4CJY3 4CJY4	4CKA5 4CKA6	4CJU9 4CJV1	4CJX2 4CJX3	40JZ4 40JZ5	4CKC6 4CKC7
3/8 in		7/8 in 1 3/4 in		40JW2 40JW3	4CJY4 4CJY5	4CKA0 4CKA7	4CJV1 4CJV2	40JX3 4CJX4	40JZ5 40JZ6	40K07
	1/4 in									
1/2 in 5/8 in	1/4 in 3/8 in	1 in 2 in 1 in 2 ¼ in	4CJU2 4CJU3	4CJW4 4CJW5	4CJY6 4CJY7	4CKA8 4CKA9	4CJV3 4CJV4	4CJX5 4CJX6	4CJZ7 4CJZ8	4CKC9 4CKD1
3/4 in	9/8 IN 1/2 in	1 1/4 in 2 5/4 in		4CJW5 4CJW6	4CJY7 4CJY8	4CKA9 4CKC1	4CJV4 4CJV5	4CJX6 4CJX7	40JZ8 40JZ9	4CKD1 4CKD2
1 in	1/2 in	1 1/4 in 2 3/4 in	40304	4CJW6 4CJW7	4CJY8	4CKC1 4CKC2	4CJV5 4CJV6	4CJX7 4CJX8	40JZ9 4CKA1	4CKD2 4CKD3
1 1/4 in	1/2 in	1 1/4 in 3 in	40305	403W7	4CJ79 4CJZ1	4CKC2 4CKC3	4CJV6 4CJV7	40380	40KA1 40KA2	40KD3
1 1/4 in	3/4 in	1 1/4 in 3 in	40300	4CJW8	40321	40803	40377	4CJX9	40042	4CKD4
$1\frac{1}{12}$ in	³ /4 in	1 1/4 in 3 1/4 in	4CJU7	4CJW8	4CJZ2	4CKC4	4CJV8	40JX9 4CJY1	4CKA3	4CKD4
1 72 111	74 111	1 /4 111 3 /4 111	40307	BRIGHT (U		40864	40340	Ti/		40KD3
			82°	90°	100°	60°	82°	90°	100°	60°
	Sizos	Incl	Item No.	Item No.		Item No.				
Sizes Incl. Item No.										
Fast-Cut Single Flutes										
		/2", 3/4", 1"	4CKD8	4CKE1	4CKE3	_	4CKD9	4CKE2	4CKE4	4CKD7
3-Flut	74,78,1 DC	/2,74,1	40KD0	40KE1	404E3		40409	40AEZ	40464	40KD7
		/2", 3/4", 1"	4CKE7	4CKE9	4CKF2	4CKE5	4CKE8	4CKF1	4CKF3	4CKE6
6-Flut		2,74,1	4011	40113	40112	HUNLU	40110	40111	40113	40110
		/2", 3/4", 1"	4CKF6	4CKF8	4CKG1	4CKF4	4CKF7	4CKF9	4CKG2	4CKF5
	/4,78,3	/2,74,1	46870	40810	46801	46414	46457	46419	46802	40850

MACHINING Countersinks & Counterbores





Fast-Cut 1-Flute Bright (Uncoated) 3ZXY4

5-Pc. Set 6-Flutes 4CKF4

(KEO)

. Set utes KF4

Carbide Countersinks

Carbide countersinks provide excellent wear resistance when machining the toughest materials, such as stainless steel.

Fast-Cut 1-Flute—Leaves clean edges on holes and has a high, positive rake that reduces vibration.

3-Flute—Typically provides better chip clearance and performs better when machining stringy materials than countersinks with more flutes.

6-Flute—Provides fast material removal and leaves a smooth finish. Removes more material with each revolution and typically provides more wear resistance than countersinks with fewer flutes.

HS

Broaches

High-speed steel

Broaches machine keyways and other shapes into a hole. **Davis-style keyway** broaches create precise keyways in the bore holes of pulleys, gears, washers, and other shaft-mounted parts to lock them to keyed shafts. **Hex** and **square** broaches punch hexagonal or square holes in fixtures, jigs, and sockets. Hex broaches turn a round pilot hole into a hexagonal hole in a single pass. Square broaches turn a round pilot hole into a square hole in a single pass.

Keyway Width	Broa Leno		Min. nath of C	M CutLengt	lax. h of Cut	ltem No.	
	le Keyway						5
1/16 in	16	in	5% in	13	∕≋in '	12V210	Davis-Sty
3/16 in	20	in	5% in		√s in •	12V215	Keyway
5⁄16 in	20		1 1/16 in	53		12V219	
3/8 in	16	in	1 1/16 in			12V220	12V210
9⁄16 in	20	in	1 1/16 in	53	16 in -	12V225	
1 in	20	in	1 1/16 in	53	/16 in •	12V229	8
2.00 mm		in	5∕% in	1		12V247	8
5.00 mm			5∕s in			12V250	8
8.00 mm			1 1/16 in			12V255	1
14.00 mr			1 1/16 in			12V259	1
25.00 mr	n 20	in	1 1/16 in	5 5	/16 in -	12V265	1
			Min.	Max.			1
		Broach I	Lenath L		Pressure	Item	12V210
Hex Size	Drill Size				Required	No.	1
Hex							
1/8 in	1/8 in	4 5% in	3∕16 in	3⁄8 in	120 lb	12V266	2
13/32 in	13/32 in	10 in		1 3% in	4.100 lb	12V275	1
9/16 in	9/16 in	14 1/4 in	1/2 in .	1 ½ in	6,700 lb	12V279	Hex
5⁄8 in	5/8 in	16 % in		1 5% in	7.250 lb	12V280	12V285
4.00 mm	4.00 mm	5 ½ in	1/4 in	1/2 in	340 lb	12V285	127285
	8.00 mm		3⁄8 in	1 in	2,175 lb	12V289	
20.00 mm	20.00 mm	17 % in	5% in '	1 5⁄8 in	14.150 lb	12V295	
				4 57 1	00 000 11		
25.00 mm			5% in '	1 5⁄8 in	22,000 lb	12V298	
					22,000 lb	12V298	
25.00 mm		19 ¾ in	Min.	Max.			8
25.00 mm Square	25.00 mm	19 % in Broach	Min. Length	Max. 1 Length	Pressure	Item	
25.00 mm Square Size		19 % in Broach	Min. Length	Max. 1 Length		Item	00000
25.00 mm Square Size Square	25.00 mm Drill Size	19 % in Broach Length	Min. Length of Cut	Max. Length of Cut	Pressure Required	ltem No.	000000
25.00 mm Square Size Square 3/16 in	25.00 mm Drill Size	19 % in Broach Length 6 1/4 in	Min. Length of Cut 3/16 in	Max. Length of Cut	Pressure Required	ltem No. 12V319	0000000
25.00 mm Square Size Square 3/16 in 9/32 in	25.00 mm Drill Size ^{3/16} in ^{1%64} in	19 % in Broach Length 6 ¼ in 7 ¼ in	Min. Length of Cut ^{3/16} in ^{3/8} in	Max. Length of Cut ½ in 1 in	Pressure Required 1,200 lb 2,300 lb	ltem No. 12V319 12V305	00000000
25.00 mm Square Size Square 3/16 in 9/32 in 13/32 in	25.00 mm Drill Size ^{3/16} in ^{19/64} in ^{27/64} in	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir	Min. Length of Cut ^{3/16} in ^{3/8} in 1 ¹ / ₂ in	Max. Length of Cut ½ in 1 in 1 3% in	Pressure Required 1,200 lb 2,300 lb 5,200 lb	Item No. 12V319 12V305 12V309	NAX AND COOLOG
25.00 mm Size Square 3/16 in 9/32 in 13/32 in 12/2 in	25.00 mm Drill Size 3/16 in 1%64 in 27/64 in 1/2 in	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ½ 6 i	Min. Length of Cut 3/16 in 3/8 in 1 1/2 in n 3/8 in	Max. Length of Cut ½ in 1 in 1 % in 1 in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,000 lb	Item No. 12V319 12V305 12V309 12V323	
25.00 mm Square Size Square 3/16 in 9/32 in 13/32 in	25.00 mm Drill Size 3/16 in 1%64 in 27/64 in 1/2 in 3/4 in	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ¼ 6 i 18 ½ ir	Min. Length of Cut ¾i n ¾ in 1 ½ in n ¾ in n ¾ in n ¾ in n 5% in	Max. Length of Cut ½ in 1 in 1 ¾ in 1 in 1 5% in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,000 lb 7,300 lb	Item No. 12V319 12V305 12V309 12V323 12V315	00000000000000000000000000000000000000
25.00 mm Square Size Square 3/16 in 9/32 in 1/3/32 in 1/2 in 11/16 in	25.00 mm Drill Size ^{3/16} in ^{1%64} in ^{1/2} in ^{3/4} in 1 ^{3/2} in	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ¼ 6 ii 18 ½ ir 24 ½ ir 5 % 6 ir	Min. Length of Cut 3/16 in 3/8 in 1 1/2 in 1 3/8 in 1 5/8 in 1 1/2 in 1 5/16 in	Max. Length of Cut ½ in 1 in 1 % in 1 in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,000 lb 7,300 lb 12,500 lb	Item No. 12V319 12V305 12V309 12V323 12V315	••••••••••••••••••••••••••••••••••••••
25.00 mm Square Size Square 3/16 in 13/32 in 11/26 in 11/16 in 1 in 4.00 mm	25.00 mm Drill Size 3/16 in 1%64 in 27/64 in 1/2 in 3/4 in	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ¼ 6 ii 18 ½ ir 24 ½ ir 5 % 6 ir	Min. Length of Cut 3/16 in 3/8 in 1 1/2 in 1 3/8 in 1 5/8 in 1 1/2 in 1 5/16 in	Max. Length of Cut ½ in 1 in 1 ¾ in 1 in 1 ⅔ in 2 in ⅔ in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,000 lb 7,300 lb 12,500 lb	Item No. 12V319 12V305 12V305 12V309 12V323 12V315 12V318 12V324	Square
25.00 mm Square Size Square ³ / ₁₆ in ⁹ / ₃₂ in ¹³ / ₃₂ in ¹³ / ₁₆ in ¹¹ / ₁₆ in ¹¹ / ₁₆ in 1 in 4.00 mm 5.00 mm	25.00 mm Drill Size ³ / ₁₆ in ¹ % ₄ in ² / ₆₄ in ¹ % ₄ in ³ / ₄ in ¹ % ₂ in ⁴ .20 mm 10.30 mm	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ¼ i 18 ½ ir 24 ½ ir 5 % 6 ir 6 ¾ in	Min. Length of Cut 3/16 in 3/8 in 1 1/2 in 1 5/8 in 1 5/16 in 1 5/16 in 1 1/24 in	Max. Length of Cut ½ in 1 in 1 ¾ in 1 in 1 ⅔ in 2 in ⅔ in 1 1¼ 6 in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,200 lb 7,300 lb 12,500 lb 1,000 lb 2,040 lb	Item No. 12V319 12V305 12V309 12V323 12V315 12V318 12V318 12V324 12V233	Square 12V299
25.00 mm Square Size Square ³ / ₁₆ in ¹ / ₃₂₂ in ¹ / ₃₂₂ in ¹ / ₁₆ in 1 in 4.00 mm 5.00 mm	25.00 mm Drill Size ³ / ₁₆ in ¹ % ₄₄ in ² % ₄₄ in ¹ % ₂ in ³ % ₄ in ¹ % ₂₂ in ⁴ .20 mm ^{10.30} mm ⁸ .30 mm	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ¼ 6 il 18 ½ ir 24 ½ ir 5 % 6 ir 6 ¾ in 8 ¾ 6 ir	Min. Length of Cut 3/16 in 3/8 in 1 1/2 in 1 3/8 in 1 5/8 in 1 5/16 in 1 3/6 in 1 7/16 in	Max. Length of Cut ½ in 1 in 1 ¾ in 1 in 1 ⅔ in 2 in ⅔ in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,000 lb 7,300 lb 12,500 lb 1,000 lb 2,040 lb 2,500 lb	Item No. 12V319 12V305 12V309 12V323 12V315 12V318 12V324 12V324 12V233 12V327	Square 12V299
25.00 mm Square Size Square 3/16 in 9/32 in 13/32	25.00 mm Drill Size ³ / ₁₆ in ¹ % ₄ in ² % ₄ in ¹ % ₂ in ³ / ₄ in ¹ % ₂ in ³ / ₄ in ¹ % ₂ in ³ / ₄ in ³ /	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ¼ 6 ii 18 ½ ir 24 ½ ir 5 % 6 ir 6 ¾ in 8 ¾ 6 ir 20 % ir	Min. Length of Cut %6 in %8 in 1 ½ in 1 ½ in 1 ½ in 1 ½ in 1 ½ in 1 %6 in 1 %6 in 1 %6 in 1 %6 in	Max. Length of Cut ½ in 1 % in 1 % in 2 in % in 1 1% in 1 1% in % in 1 1% in 1 % in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,000 lb 7,300 lb 12,500 lb 1,000 lb 2,040 lb 2,500 lb	Item No. 12V319 12V305 12V309 12V323 12V315 12V318 12V318 12V324 12V233 12V327 12V333	Square 12V299
25.00 mm Square Size Square ³ / ₁₆ in ¹ / ₃₂₂ in ¹ / ₃₂₂ in ¹ / ₁₆ in 1 in 4.00 mm 5.00 mm	25.00 mm Drill Size ³ / ₁₆ in ¹ % ₄ in ² % ₄ in ¹ % ₂ in ³ / ₄ in ¹ % ₂ in ³ / ₄ in ¹ % ₂ in ³ / ₄ in ³ /	19 % in Broach Length 6 ¼ in 7 ¼ in 10 % ir 14 ¼ 6 ii 18 ½ ir 24 ½ ir 5 % 6 ir 6 ¾ in 8 ¾ 6 ir 20 % ir	Min. 2 Length 3/16 in 3/8 in 1 1/2 in 1 1/2 in 1 1/2 in 1 1/2 in 1 1/2 in 1 1/4 in 1 1/4 in 1 1/8 in 1	Max. Length of Cut ½ in 1 in 1 3% in 1 in 2 in 5% in 1 11/16 in 7% in	Pressure Required 1,200 lb 2,300 lb 5,200 lb 5,200 lb 5,200 lb 12,500 lb 1,000 lb 2,500 lb 2,500 lb 9,500 lb	Item No. 12V319 12V305 12V309 12V323 12V315 12V318 12V318 12V324 12V233 12V327 12V333	

in, ¼ in, ¾ in, 5% in 10813 20 in GX ¼ in, ¾ in, 5% in 10815 21 in GX ¼ in, ¾ in, 5% in 10815 34 in GS ¼ in, ¾ in, 5% in 10814 20 in 20 ¼ in, ¾ in, % in 10814 20 in 20 ¼ in, ¾ in, % in 10814 20 in 20 ¼ in, ⅔ in, % in 10814

KEO

Cobalt Steel Counterbores with Built-In Pilots

Counterbores make a flat-bottomed cavity at the top of a hole so that a bolt, nut, or other part is hidden beneath or sits flush with the top of the hole when installed into it. Also called solid pilot counterbores, these counterbores have a builtin pilot that keeps them centered in the hole to ensure a level seat. The pilot cannot be removed. Cobalt steel counterbores provide good wear resistance when machining hard materials at high speeds. For additional sizes, see Grainger.com.

For										
Screw	Bore	Pilot	Overall		ltem					
Size	Dia.	Dia.	Length	Shank Dia.	No.					
Oversized										
#6	¹⁵ ⁄64 in	%4 in	3 in	7∕32 in	2RTL8					
#8	‱ in	¹¹ /64 in	3 in	1⁄4 in	2RTN2					
#10	²¹ /64 in	¹³ ⁄64 in	4 1/2 in	9⁄32 in	2RTN5					
1⁄4 in	13/32 in	9∕32 in	4 1/2 in	5⁄16 in	2RTN9					
1/4 in	²⁵ ⁄64 in	1/4 in	4 ½ in	5⁄16 in	2RTN8					
5∕16 in	³¹ /64 in	5∕16 in	4 1/2 in	3⁄8 in	2RTP2					
5⁄8 in	61/64 in	5⁄8 in	6 in	5∕s in	2RTR5					
5⁄16 in	1/2 in	²¹ /64 in	4 1/2 in	3⁄8 in	2RTP3					
3⁄8 in	19⁄32 in	¹³ /32 in	5 in	1⁄2 in	2RTP6					
3⁄8 in	³⁷ ⁄64 in	3⁄8 in	5 in	1⁄2 in	2RTP5					
7/16 in	¹ 1/16 in	²⁹ ⁄64 in	5 in	1/2 in	2RTP9					
7⁄16 in	43⁄64 in	7∕16 in	5 in	1⁄2 in	2RTP8					
1/2 in	25/32 in	³³ ⁄64 in	6 in	1/2 in	2RTR3					
1/2 in	49⁄64 in	1/2 in	6 in	1/2 in	2RTR2					
5⁄8 in	³¹ /32 in	5⁄8 in	6 in	5∕s in	2RTR6					
3⁄4 in	1 3/16 in	⁴⁹ ⁄64 in	7 in	3⁄4 in	2RTR8					
1 in	1 ³⁷ ⁄64 in	1 1/32 in	7 in	1 in	2RTT3					
Stand										
#4	¹³ ⁄64 in	%4 in	3 in	5⁄32 in	2RTL3					
#5	15⁄64 in	5⁄32 in	3 in	3⁄16 in	2RTL6					
7⁄16 in	²¹ /32 in	²⁷ /64 in	5 in	1⁄2 in	2RTP7					
1/2 in	3⁄4 in	1⁄2 in	5 in	1⁄2 in	2RTR1					
5/8 in	¹⁵ /16 in	5⁄8 in	6 in	5⁄8 in	2RTR4					
3⁄4 in	1 11/64 in	⁴⁹ ⁄64 in	7 in	3⁄4 in	2RTR7					
7/8 in	1 25/64 in	⁵⁷ ⁄64 in	7 in	7∕s in	2RTR9					
M3	6.00 mm	3.4 mm	71.00 mm	5.00 mm	12J465					
M8	15.00 mm	6.8 mm	100.00 mm	12.50 mm	12J478					
M12	20.00 mm	10.2 mm	100.00 mm	12.50 mm	12J484					
7-Pc. Sets										
	#10, #6, #	8, 1/2 in, 1/2	4 in, ¾ in, ¾	6 in	1DBT3					
#10,	.#6. #8. ½ i	n +1/32 ir	1 OS. 1⁄4 in. ¾	3 in. 5⁄16 in	1DBT5					
#10,	#6, #8, ½ i	n +1/64 ir	1 OS, 1⁄4 in, 3⁄8	a in, 5⁄16 in	1DBT4					
	M3, N	14, M5, M	6, M8, M10		33UV20					





Sign in to Grainger.com[®] to see YOUR Pricing and MORE