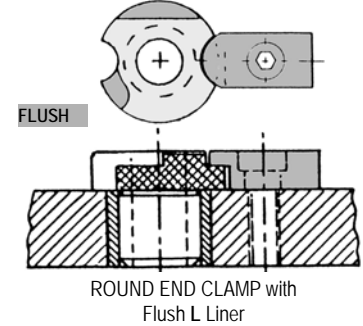
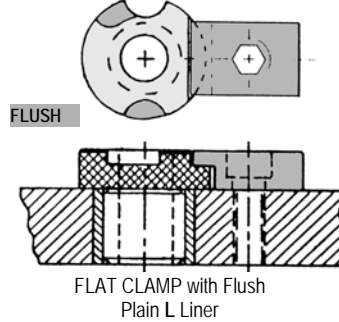
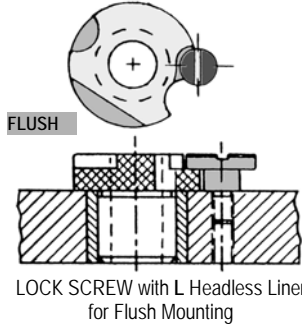
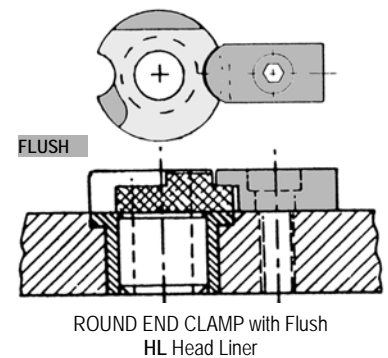
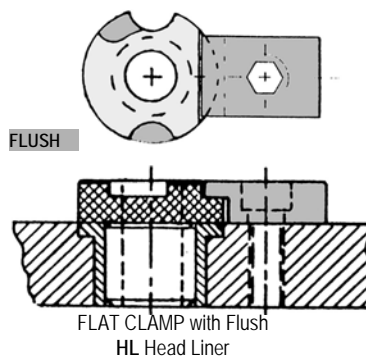
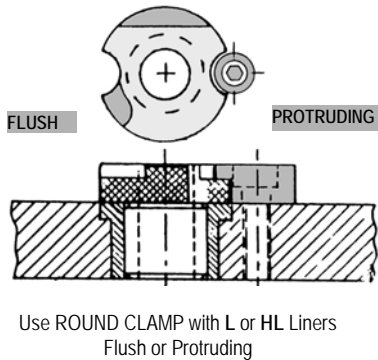


Recommended Bushing Installations

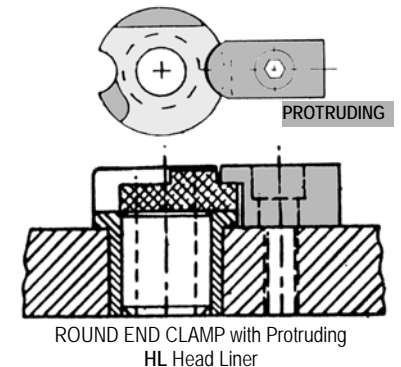
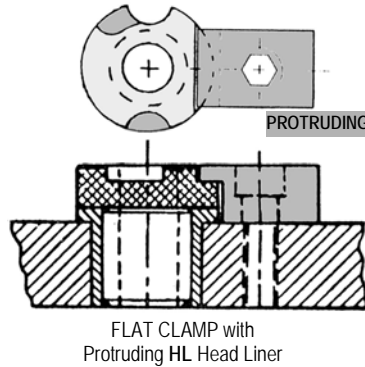
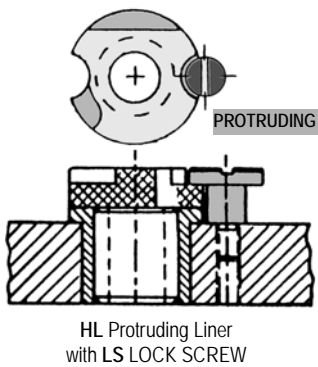
With HEADLESS LINER (Type 'L') FLUSH Mounting



With HEAD LINER (Type 'HL') FLUSH Mounting



With HEAD LINER (Type 'HL') PROJECTED Liner



<p>LOCK SCREWS Provide Close Hole Spacing</p>	<p>ROUND CLAMPS Give Greater Security than Lock Screws with Close Holes</p>
<p>ROUND END CLAMPS Have a Larger Bearing Surface</p>	<p>FLAT CLAMPS Provide Maximum Clamping Security</p>

Guides for Bushings



ANSI I.D. TOLERANCES and ORDERING FORMAT

CONCENTRICITY — T.I.R. (Total Indicator Reading): 1/8" to 1/2" I.D. — .0003" max. All other sizes are T.I.R. .0005" max.
HARDNESS: Rockwell RC61-65 in the hole.
RADIUS COUNTERSINK: <i>UNITED</i> features a radius countersink at the drill exit end.
LEAD: Concentric ground lead .001 to .002 smaller than O.D.

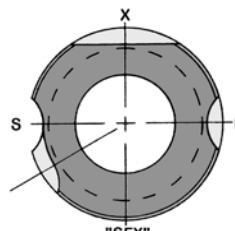


P-PU-PTE
HEADLESS PRESS FIT



H-HU-HTE
HEAD PRESS FIT

TOLERANCE ON INSIDE DIAMETER	
For DRILL BUSHINGS	
I. D. RANGE	TOLERANCE OVER NOM.
Up to .2500	+ .0001 to + .0004
Over .2500 to .7500	+ .0001 to + .0005
Over .7500 to 1.5000	+ .0002 to + .0006
Over 1.5000 and Up	+ .0003 to + .0007
For REAMER BUSHINGS	
Up to .2500	+ .0005 to + .0008
Over .2500 to 1.0000	+ .0006 to + .0010
Over 1.0000	+ .0008 to + .0012



SFX — One size does it all!



SF-SFX-SFTE-SFXN
SLIP FIXED RENEWABLE

REAMER BUSHINGS: Specify "Reamer Bushing." Bushings will be furnished at extra charge with correct clearance according to your specifications. Reamer Bushings are stamped with the letter "R" and are normally supplied in type SF only. Specify Reamer Size if different than chart.



UL
UNI-LOCK LINER



HL-HLU
HEAD LINER



L-LU-LTE
HEADLESS LINER

EASY STEPS FOR ACCURATE ORDERING THE UNITED WAY

5-STEP	①	②	③	④	⑤
ORDER PLAN	QUANTITY	TYPE	I.D.	O.D.	LENGTH
EXAMPLE:	25	P	1/4	1/2	1
ANSI EXAMPLE:	25	P	1/4	32	16

UNITED QUALITY DRILL BUSHINGS

Over 2,500,000 Units Finished Stock, 3,000,000 Units In-Process and 2,000,000 Blanks in stock.

Ease In Radius

Easy Entrance to Bushing I. D.s

NOW!
YOU CAN'T MISS THE HOLE
WITH UNITED'S EXCLUSIVE

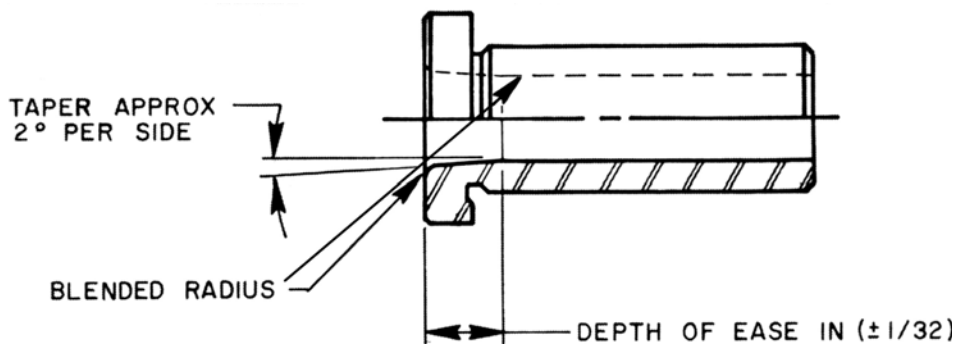


EASE IN

RADIUS

Close tolerances are required to warrant accuracies between Renewable Bushings and Liners. Tedious minutes are saved when inserting Renewables and Pins into Liners of types L and HL.

Provides radial relief, eliminating critical initial alignment.



The **UNITED** "EASE IN" RADII
Provide an easy entrance to the Bushing I.D.

THIS RADIUS ASSURES UNITED CUSTOMERS OF

- ① EASY ENTRY THAT IS IDEAL FOR 'SF' BUSHINGS AND LINERS**
- ② SIMPLICITY OF DRILL ENTRANCE AND LOCATION**
- ③ GREATER DRILL POINT LONGEVITY**
- ④ ELIMINATION OF COUNTERBORED BUSHINGS**
- ⑤ RETAINMENT OF FULL BEARING ADVANTAGES.**

Ease Out Chips With Non-Counterbored Bushings

Call Us, It's Easy!

UNITED's "Ease In" Radius is provided at Minimal Additional Cost while complementing all Non-Counterbore, Full Bearing Standard Liners and Head Liners or Special Bushings.

SLIP AND FIXED-STANDARD

O.D. NOMINAL	EASE IN I.D. RANGE	EASE IN DEPTH		LENGTHS EASED IN
		SLIP	FIXED	
3/32	0135 - 0330	3/16	3/16	3/8 and LONGER
1/8	0135 - 0330	3/16	3/16	3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			3/8 and LONGER
	0600 - 0700			1/2 and LONGER
5/32	0135 - 0330	3/16	3/16	3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			3/8 and LONGER
	0600 - 0700			1/2 and LONGER
	0730 - 0890			5/8 and LONGER
3/16	0135 - 0330	1/4	1/4	3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			3/8 and LONGER
	0600 - 0700			1/2 and LONGER
5/16	0135 - 0330	7/16	5/16	3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			3/8 and LONGER
	0600 - 0700			1/2 and LONGER
	0730 - 0890			5/8 and LONGER
	0935 - 1000			5/8 and LONGER
	1015 - 1150			3/4 and LONGER
	1160 - 1400			3/4 and LONGER
	1405 - 1520			1 and LONGER
	1540 - 1770			1 and LONGER
1/2	1160 - 1400	1/2	5/16	3/4 and LONGER
	1405 - 1520			1 and LONGER
	1540 - 1770			1 and LONGER
	1800 - 1990			1 and LONGER
	2010 - 2280			1-3/8 and LONGER
	2340 - 2570			1-3/8 and LONGER
	2610 - 2811			1-3/4 and LONGER
3/4	2612 - 3480	1/2	5/16	1-3/4 and LONGER

HEAD PRESS FIT-STANDARD

O.D. NOMINAL	EASE IN I.D. RANGE	EASE IN DEPTH		LENGTHS EASED IN
		U.S.A.	STANDARD	
3/32	0135 - 0330	3/16		3/8 and LONGER
1/8	0135 - 0330	3/16		3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			3/8 and LONGER
	0600 - 0700			1/2 and LONGER
5/32	0135 - 0330	5/32		3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			3/8 and LONGER
	0600 - 0700			1/2 and LONGER
13/64	0135 - 0330	5/32		3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			1/2 and LONGER
	0600 - 0700			5/8 and LONGER
	0730 - 0890			5/8 and LONGER
1/4	0935 - 1000	5/32		5/8 and LONGER
	1015 - 1150			3/4 and LONGER
	1160 - 1400			3/4 and LONGER
	1405 - 1520			1 and LONGER
5/16	1160 - 1400	3/16		3/4 and LONGER
	1405 - 1520			1 and LONGER
	1540 - 1770			1 and LONGER
	1800 - 1990			1 and LONGER
13/32	1800 - 1990	7/32		1 and LONGER
	2010 - 2280			1-3/8 and LONGER
	2340 - 2570			1-3/8 and LONGER
1/2	1800 - 1990	9/32		1 and LONGER
	2010 - 2280			1-3/8 and LONGER
	2340 - 2570			1-3/8 and LONGER
	2610 - 2811			1-3/4 and LONGER
	2812 - 3480			1-3/4 and LONGER

SLIP AND FIXED - THINWALL

O.D. NOMINAL	EASE IN I.D. RANGE	EASE IN DEPTH		LENGTHS EASED IN
		SLIP	FIXED	
3/16	0600 - 0700	1/4	5/16	3/8 and LONGER
	0730 - 0890			1/2 and LONGER
	0935 - 1000			1/2 and LONGER
	0935 - 1000			1/2 and LONGER
1/4	1015 - 1150	1/4	5/16	1/2 and LONGER
	1160 - 1400			5/8 and LONGER
	1405 - 1520			3/4 and LONGER
	1405 - 1520			3/4 and LONGER
5/16	1540 - 1770	5/16	5/16	3/4 and LONGER
	1800 - 1990			3/4 and LONGER
	1800 - 1990			3/4 and LONGER
3/8	1800 - 1990	5/16	5/16	1 and LONGER
	2010 - 2280			1 and LONGER
7/16	2340 - 2570	5/16	5/16	1-1/2 and LONGER
	2610 - 2811			1-1/2 and LONGER
	2812 - 3480			1-1/2 and LONGER
9/16	2812 - 3480	7/16	5/16	1-1/2 and LONGER

HEAD PRESS FIT - THINWALL

O.D. NOMINAL	EASE IN I.D. RANGE	EASE IN DEPTH		LENGTHS EASED IN
		THINWALL		
3/16	0135 - 0330	5/32		3/8 and LONGER
	0350 - 0420			3/8 and LONGER
	0460 - 0550			3/8 and LONGER
	0600 - 0700			1/2 and LONGER
	0730 - 0890			5/8 and LONGER
1/4	0935 - 1000	5/32		5/8 and LONGER
	1015 - 1150			3/4 and LONGER
	1160 - 1400			3/4 and LONGER
	1405 - 1520			1 and LONGER
5/16	1405 - 1520	5/32		1 and LONGER
	1540 - 1770			1 and LONGER
	1800 - 1990			1 and LONGER
3/8	1800 - 1990	5/32		1 and LONGER
	2010 - 2280			1-1/4 and LONGER
7/16	2340 - 2570	5/32		1-1/2 and LONGER
	2610 - 2811			1-1/2 and LONGER
	2812 - 3480			1-1/2 and LONGER
9/16	2812 - 3480	5/32		1-1/2 and LONGER

THANK
YOU
FOR
ORDERING
UNITED
DRILL
JIG
BUSHINGS!

**Metric and Inch I.D.
Std. Drills & Bushings**

**Standard Metric & Standard Inch Drill
Sizes & Drill Bushing Sizes**

THOSE NOT LISTED ARE SPECIALS IN METRIC AND INCHES.

METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL
	80	.0135		49	.0730	4.10		.1614		J	.2770	11.50		.4528
0.35		.0138	1.90		.0748	4.20		.1654	7.10		.2795		29/64	.4531
	79	.0145		48	.0760		19	.1660		K	.2810	11.80		.4646
0.38		.0150	1.95		.0768	4.25		.1673		9/32	.2812		15/32	.4687
	1/64	.0156		5/64	.0781	4.30		.1693	7.20		.2835	12.00		.4724
0.40		.0157		47	.0785		18	.1695	7.25		.2854	12.20		.4803
	78	.0160	2.00		.0787		11/64	.1719	7.30		.2874		31/64	.4843
0.42		.0165	2.05		.0807		17	.1730		L	.2900	12.50		.4921
0.45		.0177		46	.0810	4.40		.1732	7.40		.2913		1/2	.5000
	77	.0180		45	.0820		16	.1770		M	.2950	13.00		.5118
0.48		.0189	2.10		.0827	4.50		.1772	7.50		.2953		33/64	.5156
0.50		.0197	2.15		.0846		15	.1800		19/64	.2968		17/32	.5312
	76	.0200		44	.0860	4.60		.1811	7.60		.2992	13.50		.5315
	75	.0210	2.20		.0866		14	.1820		N	.3020		35/64	.5469
0.55		.0217	2.25		.0886	4.70	13	.1850	7.70		.3031	14.00		.5512
	74	.0225		43	.0890	4.75		.1870	7.75		.3051		9/16	.5625
0.60		.0236	2.30		.0906		3/16	.1875	7.80		.3071	14.50		.5709
	73	.0240	2.35		.0925	4.80	12	.1890	7.90		.3110		37/64	.5781
	72	.0250		42	.0935		11	.1910		5/16	.3125	15.00		.5906
0.65		.0256		3/32	.0937	4.90		.1929	8.00		.3150		19/32	.5937
	71	.0260	2.40		.0945		10	.1935		O	.3160		39/64	.6094
0.70		.0276		41	.0960		9	.1960	8.10		.3189	15.50		.6102
	70	.0280	2.45		.0965	5.00		.1969	8.20		.3228		5/8	.6250
	69	.0292		40	.0980		8	.1990		P	.3230	16.00		.6299
0.75		.0295	2.50		.0984	5.10		.2008	8.25		.3248		41/64	.6406
	68	.0310		39	.0995		7	.2010	8.30		.3268	16.50		.6496
	1/32	.0313	2.55		.1004		13/64	.2031		21/64	.3281		21/32	.6562
0.80		.0315		38	.1015		6	.2040	8.40		.3307	17.00		.6693
	67	.0320	2.60		.1024	5.20		.2047		Q	.3320		43/64	.6719
	66	.0330		37	.1040		5	.2055	8.50		.3346		11/16	.6875
0.85		.0335	2.65		.1043	5.25		.2067	8.60		.3386	17.50		.6890
	65	.0350	2.70		.1063	5.30		.2087		R	.3390		45/64	.7031
0.90		.0354		36	.1065		4	.2090	8.70		.3425	18.00		.7087
	64	.0360	2.75		.1083	5.40		.2126		11/32	.3437		23/32	.7187
	63	.0370		7/64	.1093		3	.2130	8.75		.3445	18.50		.7283
0.95		.0374		35	.1100	5.50		.2165	8.80		.3465		47/64	.7344
	62	.0380	2.80		.1102		7/32	.2187		S	.3480	19.00		.7480
	61	.0390		34	.1110	5.60		.2205	8.90		.3504		3/4	.7500
1.00		.0394		33	.1130		2	.2210	9.00		.3543		49/64	.7656
	60	.0400	2.90		.1142	5.70		.2244		T	.3580	19.50		.7677
	59	.0410		32	.1160	5.75		.2264	9.10		.3583		25/32	.7812
1.05		.0413	3.00		.1181		1	.2280		23/64	.3594	20.00		.7874
	58	.0420		31	.1200	5.80		.2283	9.20		.3622		51/64	.7969
	57	.0430	3.10		.1220	5.90		.2323	9.25		.3642	20.50		.8071
1.10		.0433		1/8	.1250		A	.2340	9.30		.3661		13/16	.8125
1.15		.0453	3.20		.1260		15/64	.2344		U	.3680	21.00		.8268
	56	.0465	3.25		.1280	6.00		.2362	9.40		.3701		53/64	.8281
	3/64	.0469		30	.1285		B	.2380	9.50		.3740		27/32	.8437
1.20		.0472	3.30		.1299	6.10		.2402		3/8	.3750	21.50		.8465
1.25		.0492	3.40		.1339		C	.2420		V	.3770		55/64	.8594
1.30		.0512		29	.1360	6.20		.2441	9.60		.3780	22.00		.8661
	55	.0520	3.50		.1378		D	.2460	9.70		.3819		7/8	.8750
1.35		.0531		28	.1405	6.25		.2461	9.75		.3839	22.50		.8858
	54	.0550		9/64	.1406	6.30		.2480	9.80		.3858		57/64	.8906
1.40		.0551	3.60		.1417		E	.2500		W	.3860	23.00		.9055
1.45		.0571		27	.1440			.2500	9.90		.3898		29/32	.9062
1.50		.0591	3.70		.1457	6.40		.2520		25/64	.3906		59/64	.9219
	53	.0595		26	.1470	6.50		.2559	10.00		.3937	23.50		.9252
1.55		.0610	3.75		.1476		F	.2570		X	.3970		15/16	.9375
	1/16	.0625		25	.1495	6.60		.2598	10.20		.4016	24.00		.9449
1.60		.0630	3.80		.1496		G	.2610		Y	.4040		61/64	.9531
	52	.0635		24	.1520	6.70		.2638		13/32	.4062	24.50		.9646
1.65		.0650	3.90		.1535		17/64	.2656		Z	.4130		31/32	.9687
1.70		.0669		23	.1540	6.75		.2657	10.50		.4134	25.00		.9843
	51	.0670		5/32	.1562		H	.2660		27/64	.4219		63/64	.9844
1.75		.0689		22	.1570	6.80		.2677	10.80		.4252		1"	1.0000
	50	.0700	4.00		.1575	6.90		.2717	11.00		.4331		1-1/64	1.0156
1.80		.0709		21	.1590		I	.2720		7/16	.4375	26.00		1.0236
1.85		.0728		20	.1610	7.00		.2756	11.20		.4409			

Series continued next page...

LARGER STANDARDS METRIC: Plus 1.00MM increments up to 50.00MM — Plus 5.00MM increments up to 125.00MM
INCHES: Plus 1/64" increments up to 2"—Plus 1/32" increments up to 3"—Plus 1/16" increments up to 4"—Plus 1/8" increments up to 5"
NON-STANDARD I.D.s ARE PRICED AS SPECIALS.

Extended Metric & Inch Sizes for Drills and Drill Bushings

STANDARD METRIC and STANDARD INCH

Extended Metric – Inch
Decimal Conversions
of Drill Sizes

METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL	METRIC	INCH	DECIMAL	
	1"	1.0000		1-23/64	1.3594		1-23/32	1.7187		2-3/16	2.1875		3-1/8	3.1250	
	1-1/64	1.0156		1-3/8	1.3750	44		1.7323		2-7/32	2.2187	80		3.1496	
26		1.0236	35		1.3780		1-47/64	1.7344		2-1/4	2.2500		3-3/16	3.1875	
	1-1/32	1.0313		1-25/64	1.3906		1-3/4	1.7500		2-9/32	2.2812		3-1/4	3.2500	
	1-3/64	1.0469		1-13/32	1.4062		1-49/64	1.7656		2-5/16	2.3125		3-5/16	3.3125	
	1-1/16	1.0625	36		1.4173	45		1.7717		2-11/32	2.3437	85		3.3465	
27		1.0630		1-27/64	1.4219		1-25/32	1.7812	60		2.3622		3-3/8	3.3750	
	1-5/64	1.0781		1-7/16	1.4375		1-51/64	1.7969		2-3/8	2.3750		3-7/16	3.4375	
	1-3/32	1.0937		1-29/64	1.4531	46		1.8110		2-13/32	2.4062		3-1/2	3.5000	
28		1.1024	37		1.4567		1-13/16	1.8125		2-7/16	2.4375	90		3.5433	
	1-7/64	1.1093		1-15/32	1.4687		1-53/64	1.8281		2-15/32	2.4687		3-9/16	3.5625	
	1-1/8	1.1250		1-31/64	1.4843		1-27/32	1.8437		2-1/2	2.5000		3-5/8	3.6250	
	1-9/64	1.1406	38		1.4961	47		1.8504		2-17/32	2.5312		3-11/16	3.6875	
29		1.1417		1-1/2	1.5000		1-55/64	1.8594	65		2.5591	95		3.7402	
	1-5/32	1.1562		1-33/64	1.5156		1-7/8	1.8750		2-9/16	2.5625		3-3/4	3.7500	
	1-11/64	1.1719		1-17/32	1.5312	48		1.8898		2-19/32	2.5937		3-13/16	3.8125	
30		1.1811	39		1.5354		1-57/64	1.8906		2-5/8	2.6250		3-7/8	3.8750	
	1-3/16	1.1875		1-35/64	1.5469		1-29/32	1.9062		2-21/32	2.6562	100		3.9370	
	1-13/64	1.2031		1-9/16	1.5625		1-59/64	1.9219		2-11/16	2.6875		3-15/16	3.9375	
	1-7/32	1.2187	40		1.5748	49		1.9291		2-23/32	2.7187		4"	4.0000	
31		1.2205		1-37/64	1.5781		1-15/16	1.9375		2-3/4	2.7500		4-1/8	4.1250	
	1-15/64	1.2344		1-19/32	1.5937		1-61/64	1.9531	70		2.7559	105		4.1339	
	1-1/4	1.2500		1-39/64	1.6094	50		1.9685		2-25/32	2.7812		4-1/4	4.2500	
32		1.2598	41		1.6142		1-31/32	1.9687		2-13/16	2.8125		4-3/8	4.3750	
	1-17/64	1.2656		1-5/8	1.6250		1-63/64	1.9844		2-27/32	2.8437	110		4.3307	
	1-9/32	1.2812		1-41/64	1.6406		2"	2.0000		2-7/8	2.8750		4-1/2	4.5000	
	1-19/64	1.2968	42		1.6535		2-1/32	2.0313		2-29/32	2.9062	115		4.5276	
33		1.2992		1-21/32	1.6562		2-1/16	2.0625		2-15/16	2.9375		4-5/8	4.6250	
	1-5/16	1.3125		1-43/64	1.6719		2-3/32	2.0937	75		2.9528	120		4.7244	
	1-21/64	1.3281		1-11/16	1.6875		2-1/8	2.1250		2-31/32	2.9687		4-3/4	4.7500	
34		1.3386	43		1.6929		2-5/32	2.1562		3"	3.0000		4-7/8	4.8750	
	1-11/32	1.3437		1-45/64	1.7031	55		2.1654		3-1/16	3.0625	125		4.9213	
Continued top next 3 columns			Continued top next 3 columns			Continued top next 3 columns			Continued top next 3 columns			5"			5.0000

INCH TAP GUIDE BUSHINGS—Select Type, O.D. & Length

INCH TAP SIZE	ACTUAL I.D.	INCH TAP SIZE	ACTUAL I.D.
0 - 80	.0616 - .0619	1/4 - 20	.2551 - .2555
1 - 64	.0746 - .0749	1/4 - 28	.2536 - .2540
1 - 72	.0746 - .0749	5/16 - 18	.3181 - .3185
2 - 56	.0876 - .0879	5/16 - 24	.3166 - .3170
2 - 64	.0876 - .0879	3/8 - 16	.3811 - .3815
3 - 48	.1011 - .1014	3/8 - 24	.3791 - .3795
3 - 56	.1006 - .1009	7/16 - 14	.4446 - .4450
4 - 40	.1146 - .1149	7/16 - 20	.4426 - .4430
4 - 48	.1141 - .1144	1/2 - 13	.5076 - .5080
5 - 40	.1276 - .1279	1/2 - 20	.5051 - .5055
5 - 44	.1271 - .1274	9/16 - 12	.5701 - .5705
6 - 32	.1411 - .1414	9/16 - 18	.5681 - .5685
6 - 40	.1406 - .1409	5/8 - 11	.6331 - .6335
8 - 32	.1671 - .1674	5/8 - 18	.6306 - .6310
8 - 36	.1666 - .1669	3/4 - 10	.7592 - .7596
10 - 24	.1941 - .1944	3/4 - 16	.7562 - .7566
10 - 32	.1931 - .1934	7/8 - 9	.8852 - .8856
12 - 24	.2201 - .2204	7/8 - 14	.8822 - .8826
12 - 28	.2196 - .2199	1 - 8	1.0112 1.0116
		1 - 14	1.0072 1.0076

METRIC TAP GUIDE BUSHINGS—Select Type, O.D. & Length

MM TAP SIZE	MM DRILL	INCH	MM BUSHING	INCH EQUIV.	BUSHING ACTUAL
1.6 x .35	1.25	.0492	1.65	.0650	.0651-.0654
2 x .40	1.60	.0630	2.05	.0807	.0808-.0811
2.5 x .45	2.05	.0807	2.56	.1007	.1008-.1011
3 x .50	2.50	.0984	3.04	.1197	.1198-.1201
3.5 x .60	2.90	.1142	3.50	.1378	.1379-.1382
4 x .70	3.30	.1299	4.10	.1614	.1615-.1618
4.5 x .75	3.70	.1457	4.60	.1811	.1812-.1815
5 x .80	4.20	.1654	5.11	.2012	.2013-.2016
6 x 1.00	5.00	.1969	6.12	.2049	.2050-.2053
8 x 1.00	7.00	.2244	8.16	.3213	.3214-.3217
8 x 1.25	6.80	.2677	8.20	.3228	.3229-.3233
10 x 1.25	8.80	.3465	10.18	.4007	.4007-.4012
10 x 1.50	8.50	.3346	10.20	.4016	.4017-.4021
12 x 1.25	10.80	.4252	12.20	.4803	.4804-.4808
12 x 1.75	10.20	.4016	12.25	.4823	.4824-.4828
14 x 1.50	12.50	.4912	14.20	.5591	.5592-.5595
14 x 2.00	12.00	.4724	14.25	.5610	.5611-.5615
16 x 1.50	14.50	.5709	16.20	.6378	.6379-.6383
16 x 2.00	14.00	.5512	16.25	.6398	.6399-.6403
18 x 1.50	16.50	.6496	18.20	.7165	.7166-.7170
18 x 2.50	15.50	.6102	18.25	.7185	.7186-.7190
20 x 1.50	18.50	.7283	20.22	.7961	.7963-.7167
20 x 2.50	17.50	.6890	20.26	.7976	.7978-.7982
22 x 1.50	20.50	.8071	22.22	.8748	.8750-.8754
22 x 2.50	19.50	.7677	22.26	.8764	.8766-.8770
22 x 2.00	22.00	.8661	24.25	.9547	.9549-.9553
22 x 3.00	21.00	.8268	24.34	.9583	.9585-.9589

Drill Bushing Uses

A Partial List for Drill Bushing Applications

DRILL BUSHINGS ARE USED IN:

Bearings
Build Ups
Cable Guides
Ceramic Rod Molds
Chain Guides
Chip Breaker Bushings
Circuit Board Drilling
Coolant Bushings
Counterboring
Custom Applications
Die Inserts and Liners
Drill Clearing Grinding Bushings
Drill Flute Grinding Bushings
Drilling
Gun Drilling
Handle Bushings
Hinge Bushings
Hole Reinforcers
I. D. Gauges
Indexing Plate Guides
Locating Buttons
Mold Inserts and Guides
O. D. Gauges
Oil Hole Bushings
Paper Punches and Punch Guides
Pilots
Pharmaceutical Measuring Pins,
Dies and Tubes
Profile Spacers
Pins: Alignment
Anchor
Dowel Guide
Stop
Swing
Pulley Bushings
Reaming
Rivet Templates
Roller Bearing Bushings
Rollers
Sizers
Sleeves
Spacers
Spot Facing
Stripper Plate Guides
Swing Pin Fulcrums
Tapping
Template Bushings
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Valve Stem Guides
Wear Inserts
Wire Guides
Workholding Bushings

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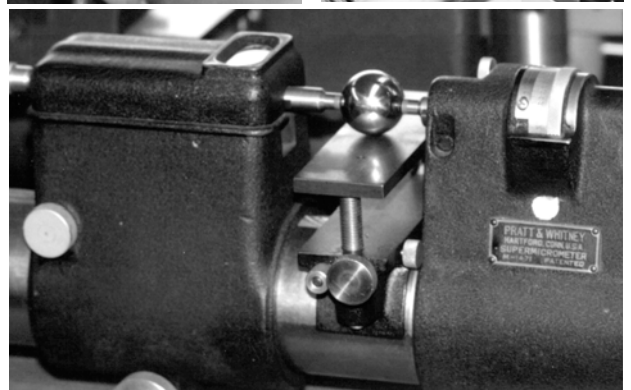
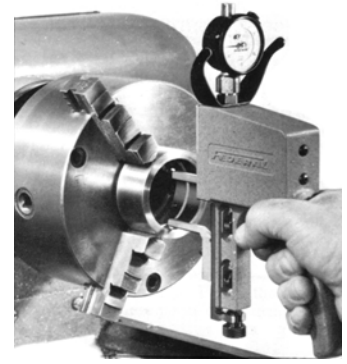


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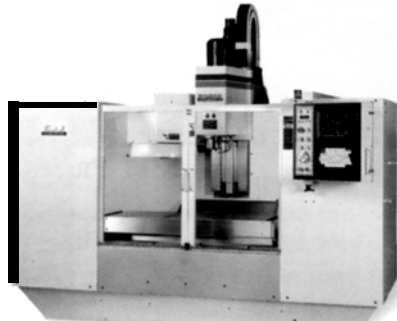


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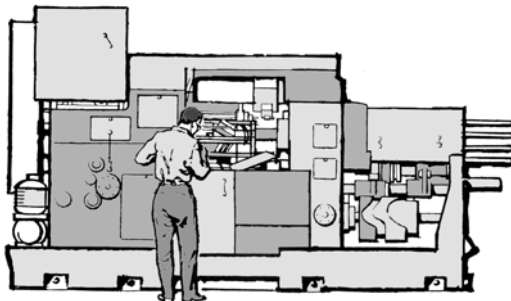
4 - Fadal CNC Machining Centers — 3 and 4 axis
4 - Vertical CNC Super Max Milling Centers

AIRCRAFT & AUTOMOTIVE CUSTOM BUSHING SPECIALS



3 - HAAS CNC Turning Centers to 14.5 x 34" Capacity
4 - Super Max CNC Turning Centers

MOLD PINS and BUSHINGS



40 - Acme Gridley Six Spindle Automatics with Bar Feeds

TRY UNITED FOR SLEEVE BEARINGS!

SUNNEN



28-Sunnen Stroker Automatic Honing Gauging Machines

HONING

ROLLERS

PINS

WEAR PARTS

SPACERS

LATHE DEPARTMENT

- 12 - Turret Lathes — capacities to 6" Bar Feed
- 8 - Engine Lathes — capacities to 12" x 36"
- 10 - Hardinge Six Station Turret Lathes
- 4 - Levin Six Station Micro Hole Driller Lathes

MILLING DEPARTMENT

- 4 - Vertical CNC 2 & 3 Axis Mills 15" x 62"
- 4 - Fadal CNC Machining Centers — 3 and 4 axis
- 12 - Vertical Bridgeport 2HP Mills — 15" x 62" work tables
- 8 - Horizontal Mills — 15" x 72" work tables

GRINDING DEPARTMENT

- 24 - Landis External Grinders with .000010 readout — capacities to 8" x 18"
- 8 - Cincinnati & Centerless Grinders — capacity 1/32" to 6"
- 3 - Crystal Lake Center and Concentricity O.D. Grinders
- 8 - Heald Internal Grinders — capacities to 1/8" to 10"
- 3 - Bryant 1316 Semi Automatic Internal Grinders — 1/4" to 12" I.D.
- 6 - 1209 Bryant Automatic Internal Grinders to 3" I.D. x 4" Stroker
- 3 - 1109 Semi-automatic Internal Grinders to 3" I.D. x 4" Stroker
- 12 - 5A Bryant Internal Custom Precision Grinders 1/8" to 3" x 3"
- 4 - Automatic Surface Grinders — capacity to 15" x 42"
- 14 - Custom True Center and Concentricity O.D. Grinders
- 4 - Cincinnati Tool, Cutter and Carbide Tool Grinders
- 2 - Cincinnati Internal-External Universal Grinders — capacities to 18"
- 2 - Center Grinders

HONING AND LAPPING DEPARTMENT

- 28 - Sunnen Stroker Automatic Honing Machines — capacities to 3-1/2" diameter to 12" length
- 6 - Diamond Lapping Machines for small hole finishing to .005 diameters .0001 Min. Hole Tolerances

MISCELLANEOUS EQUIPMENT

- 6 - El Dorado Gun Drill Spindles .050-1.75
- 10 - Drill Presses
- 8 - Sunnen Reaming Machines
- 8 - Tumbling & Deburr Machines
- 5 - Polishing Machines
- 4 - Power Cold and Band Saws
- 5 - Cadillac Stamping Machines
- 4 - Marking Machines
- 4 - Etching Machines
- 18 - Deburring Machines
- 4 - Second Operation Hardinge Lathes
- 4 - Electromark Chemical Marking Machines
- 2 - Graphotype Machines
- 8 - Washing Machines
- 3 - Spitfire Lapping Machines
- 2 - Continuous Oil Groovers

40 AUTOMATIC SCREW MACHINES

- 40 - Acme Gridley Six Spindle Automatics with threading, pick off, broaching, auxiliary reaming to 3-1/2"
- 3 - Five Spindle Davenport to 1"
- 1 - 6" Automatic Screw Machine
- 2 - Automatic Indexing Drillers

INSPECTION DEPARTMENT

- 3 - HAAS CNC Turning Centers to 14.5 x 34" Capacity
 - 2 - Super Max CNC Turning Centers
 - Walden Radial Rake Cutting Tool Analyzer
 - Stocker & Yale Cutting Tool Analyzer
 - 3 - J & L 10 to 50 Power 18" Universal Comparators
 - 2 - Wilson Hardness Testers
 - 8 - Set Precision Gauge Blocks
 - Federal & Starret Dial Bore Intermikes to 6" diameter Precisionaire Gauges
 - 26 - Federal .000050 Air Gauges
 - 15 - Black Granite Surface Plates
 - 900 Carbide Plug Gauges
 - 66 - Vernier Dial Bore Height Gauges
 - 40 - 1/8" to 8" Sunnen & Federal Dial Bore Gauges
 - Pratt-Whitney Micro Finish Automatic Surface Analyzers
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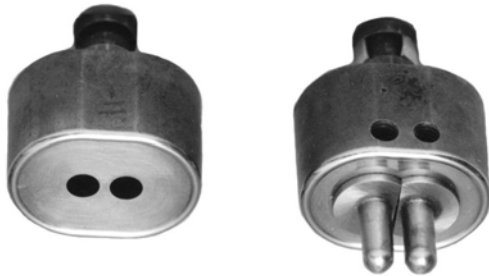
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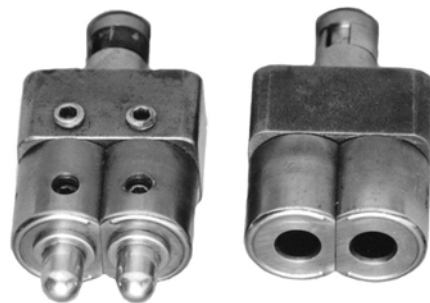
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