

Widest Variety of Bushings For All Tasks

UNITED Does Bushings Best



SF BUSHING SETS
Page A16



GUN DRILL LINER & INSERT
Page A48



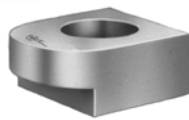
HEADLESS LINER
Page A12



HEAD PRESS FIT
Page A4



SLIP FIXED RENEWABLE
Page A8



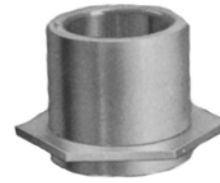
ROUND END CLAMP
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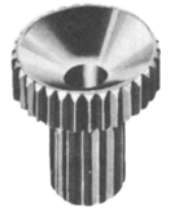
SER-CAST
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HEADLESS PRESS FIT
Page A3



HEX GRIP
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SER-HEAD
Page A23



COOLANT CHIPBREAKER
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OIL GROOVE
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FLANGE GROOVE
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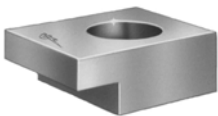
UNI-LOCK LINER
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SER-PRESS
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HEAD LINER
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FLAT CLAMPS
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LOCK SCREWS
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BORING BAR SLEEVES
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COLLET HOLDER
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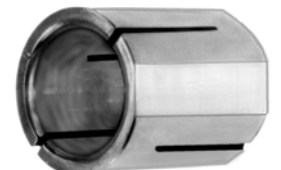
LONG SLOT TOOL HOLDER
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TAP HOLDER BUSHING & COLLAR
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HEAD 4-WAY SPLIT
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4-WAY SPLIT HEADLESS
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SOFT BLANK TOOL HOLDER
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SPLIT MILL FLAT TOOL HOLDER
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CLEARANCE HOLES TOOL HOLDER
Page A75



TOOL HOLDER LINER
Page A77

**P-H-SF-L-HL-UL
Bushings**

UNITED Drill Jig Bushings

ANSI TOLERANCES AND SPECIFICATIONS



P-PU-PTE
HEADLESS PRESS FIT



H-HU-HTE
HEAD PRESS FIT



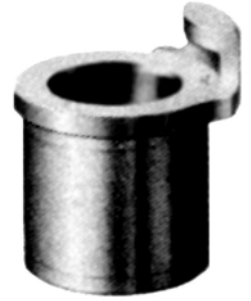
SF-SFX-SFTE-SFXN
SLIP FIXED RENEWABLE



L-LU-LTE
HEADLESS LINER



HL-HLU
HEAD LINER



UL
UNI-LOCK LINER

ALL BUSHINGS SHOWN ARE IN THIS SECTION.

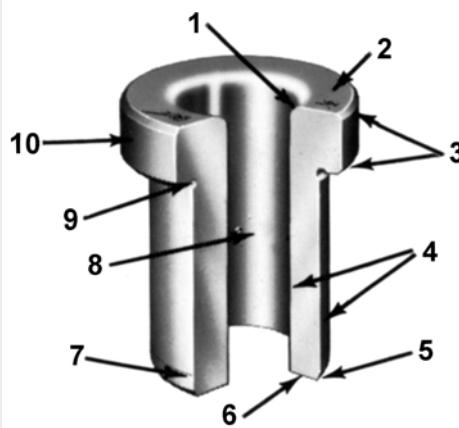
CONCENTRICITY — T.I.R. (Total Indicator Reading):
1/8" to 1/2" I.D. — .0003" max. All other sizes are T.I.R. .0005" max.
T.I.R. met at drill exit end.

HARDNESS: Rockwell RC61-65 in the hole.

RADIUS COUNTERSINK: *UNITED* features a radius countersink at the drill entrance end.

LEAD: Concentric ground lead
.001 to .002 smaller than O.D.
+45° chamfer.

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.



TOLERANCE ON INSIDE DIAMETER

For DRILL BUSHINGS

I. D. RANGE	TOLERANCE OVER NOM.
Up to .2500	+0.0001 to +0.0004
Over .2500 to .7500	+0.0001 to +0.0005
Over .7500 to 1.5000	+0.0002 to +0.0006
Over 1.5000 and Up	+0.0003 to +0.0007

For REAMER BUSHINGS

Up to .2500	+0.0005 to +0.0008
Over .2500 to 1.0000	+0.0006 to +0.0010
Over 1.0000	+0.0008 to +0.0012

1. RADIUS blended and polished for smooth entry of drill.
2. SIZE clearly marked on each Bushing
3. HEAD double-chamfered and polished. Replaceable types are knurled for easier handling.
4. CONCENTRICITY .0003 to .0005 T.I.R. depending upon size.
5. 45° CHAMFERED and polished end eases entry into jig.
6. TOLERANCE on length held ±.015.
7. CONCENTRIC LEAD ground lead provided initial alignment.
8. HARDNESS in hole: Rockwell C61-65.
9. DOUBLE UNDERCUT keeps bushing flat against jig plate.
10. 100% FINAL INSPECTION of every Bushing.

11. 3,400 ADDITIONAL standard types / sizes not catalogued by competitors.
12. COMPLETE EXTENDED RANGE sizes from 3/4" to 7" in length to 5" I.D.
13. A FULL LINE of Circuit Board Bushings at standard catalog prices.
14. *UNITED* manufactures precision parts and tooling to your specifications.
15. THE MAJORITY of our bushings in stock are non-counterbored full bearing and are provided at catalog prices. If you have a preference, add the suffix NCB for non-counterbore and CB for counterbore. We reserve the right to provide counterbore in micro sizes and extra long lengths at catalog prices.

EASY STEPS FOR ACCURATE ORDERING THE UNITED WAY

5-STEP FORMAT ORDER PLAN	1 QTY	2 -TYPE	3 -O.D. (64ths)	4 -LENGTH (16ths)	5 -I.D. (DECIMAL)
UDB EXAMPLE:	25	P	32 (1/2)	1" (16/16)	3/16
ANSI EXAMPLE:	25	P	32 (32/64=1/2)	16	0.1875

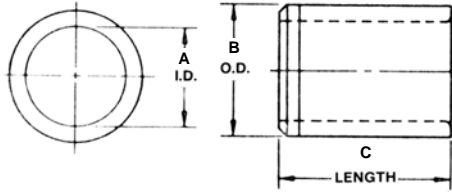
**ASK FOR 'PRIME TIME'
IF YOU NEEDED IT
YESTERDAY!**

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

Headless Press Fit Type P

A.N.S.I. Standards

P-Headless Press
Fit Bushings



Headless Press Fit P and PU



Most Bushings in stock are non-counterbored full bearing. We usually provide counterbore in micro sizes and extra long lengths.

If you have a preference, add the suffix 'CB' for counterbore and 'NCB' for non-counterbore. MILLIMETER DRILL SIZES HAVE BEEN ADDED TO I.D. RANGE.

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED AND ANSI STANDARDS.

SPECIFY 'PU' FOR **UNGROUND**.

For Quantity Discount Pricing, see bottom of page.

RC-61-65

A I. D. DRILL RANGE		B O. D. SIZE		ANSI SYMBOL	C P and PU LENGTH OVERALL / ANSI LENGTH SYMBOL BY 16ths																								
INCH / METRIC NOMINAL	U.S.A. INCH DECIMAL	NOM.	U.S.A. INCH DECIMAL		1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2"	2-1/8	2-1/2	3"										
#80 - #70 .35 - .70MM	.0135 - .0280 .0138 - .0276	5/32	.1578 - .1575 .166 - .161	P-10 PU-10	26.80	27.93	28.77	29.17																					
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492	5/32	.1578 - .1575 .166 - .161	P-10 PU-10	23.88	24.93	25.33	25.98		27.93																			
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630	5/32	.1578 - .1575 .166 - .161	P-10 PU-10	18.90	19.75	20.14	20.45		22.13																			
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492	3/16	.1891 - .1888 .201 - .197	P-12 PU-12	23.88	24.93	25.33	25.98		27.93																			
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630	3/16	.1891 - .1888 .201 - .197	P-12 PU-12	18.90	19.75	20.14	20.45	21.39	22.13																			
#52 - #39 1.65 - 2.50MM	.0635 - .0995 .0650 - .0984	3/16	.1891 - .1888 .201 - .197	P-12 PU-12	8.94	9.86	10.48	11.00	11.53	12.03																			
#80 - #70 .35 - .70MM	.0135 - .0280 .0138 - .0276	13/64	.2046 - .2043 .213 - .208	P-13 PU-13	26.80	27.93	28.77	29.17																					
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492	13/64	.2046 - .2043 .213 - .208	P-13 PU-13	23.88	24.93	25.33	25.98		27.93																			
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630	13/64	.2046 - .2043 .213 - .208	P-13 PU-13	18.90	19.81	20.14	20.45		22.13	25.13																		
#52 - #39 1.65 - 2.25MM	.0635 - .0995 .0650 - .0886	13/64	.2046 - .2043 .213 - .208	P-13 PU-13	8.82	9.86	10.58	11.00		11.96	13.08			16.51															
#40 - 9/64 2.35 - 4.90MM	.0980 - 1.1406 .0925 - .1929	1/4	.2516 - .2513 .265 - .260	P-16 PU-16	8.20	8.62	9.36	9.86	10.58	11.11	12.35			19.51	20.45	21.50													
1/8 - #10 3.10 - 4.90MM	.1250 - .1935 .1220 - .1929	5/16	.3141 - .3138 .327 - .322	P-20 PU-20	6.74	7.16	7.47	7.78	8.20	8.52	8.94			13.08	15.06	17.14													
#10 - #1 4.90 - 5.75MM	.1935 - .2280 .1925 - .2264	3/8	.3766 - .3763 .390 - .385	P-24 PU-24	5.90	6.02	6.64	6.74	7.16	7.47	8.71																		
3/16 - F 4.75 - 6.50MM	.1875 - .2570 .1870 - .2559	13/32	.4078 - .4075 .421 - .416	P-26 PU-26	5.90	6.02	6.64	6.74		7.47	8.71			9.86	11.11	12.35													
A - L 5.90 - 7.30MM	.2340 - .2900 .2323 - .2874	7/16	.4392 - .4389 .453 - .448	P-28 PU-28	5.90	6.02	6.64	6.74	7.16	7.47	8.71																		
3/16 - O 4.75 - 8.00MM	.1875 - .3160 .1870 - .3150	1/2	.5017 - .5014 .520 - .515	P-32 PU-32	5.90	6.02	6.64	6.74		7.47	8.71			9.86	11.11	12.35		24.93											
M - 11/32 7.50 - 8.70MM	.2950 - .3437 .2953 - .3425	9/16	.5642 - .5639 .582 - .577	P-36 PU-36	6.74	5.90	6.24	6.24	6.64	6.74	7.16																		
5/16 - 7/16 8.80 - 11.00MM	.3125 - .4375 .3465 - .4331	5/8	.6267 - .6264 .645 - .640	P-40 PU-40	6.74	5.90	6.24	6.24	6.64	6.74	7.16	9.76	9.76	10.27	11.11		13.41												
5/16 - 17/32 7.10 - 14.00MM	.3125 - .5312 .2795 - .5512	3/4	.7518 - .7515 .770 - .765	P-48 PU-48	7.16	6.02	6.74	6.74	7.16	7.16	7.78	9.86	9.86	10.58	11.53		13.59	24.93											
1/2 - 21/32 12.50 - 16.50MM	.5000 - .6562 .4921 - .6496	7/8	.8768 - .8765 .895 - .890	P-56 PU-56			8.94	9.23	8.20	8.52	8.52	8.94	9.76	9.76	10.58	11.63		13.41	15.47										
1/2 - 49/64 12.50 - 19.50MM	.5000 - .7656 .4646 - .7677	1"	1.0018 - 1.0015 1.020 - 1.015	P-64 PU-64					8.52	8.52	8.52	9.03	9.76	9.76	11.00	12.03		13.41	15.47	26.07									
49/64 - 27/32 19.00 - 21.00MM	.7656 - .8438 .7980 - .8268	1-1/8	1.1270 - 1.1267 1.145 - 1.140	P-72 PU-72					13.08	12.35	11.11	13.08	14.63		15.90	17.14													
55/64 - 15/16 21.50 - 23.50MM	.8594 - .9375 .8465 - .9252	1-1/4	1.2520 - 1.2517 1.270 - 1.265	P-80 PU-80								12.35	11.11	13.08	14.63		15.90	17.14	19.81										
5/8 - 1-1/32 15.50 - 26.00MM	.6250 - 1.0312 .6102 - 1.0236	1-3/8	1.3772 - 1.3768 1.395 - 1.390	P-88 PU-88													12.35	13.41	12.67	11.11	13.41	14.76	14.76	16.22	17.66	20.25	20.45	22.86	31.58
1-1/64 - 1-1/8 25.00 - 28.00MM	1.0156 - 1.1250 .9843 - 1.1024	1-1/2	1.5022 - 1.5018 1.520 - 1.515	P-96 PU-96								16.71	14.76	16.71			17.86	19.02	22.13										
1" - 1-25/64 25.00 - 34.00MM	1.0000 - 1.3906 .9843 - 1.3386	1-3/4	1.7523 - 1.7519 1.770 - 1.765	P-112 PU-112								16.71	14.76			16.71	17.86	19.02											
1-3/8 - 1-49/64 34.00 - 44.00MM	1.3750 - 1.7656 1.3386 - 1.7323	2-1/4	2.2525 - 2.2521 2.270 - 2.265	P-144 PU-144								19.22				21.28	22.33	23.37											
1-49/64 - 2-17/64 44.00 - 55.00MM	1.7656 - 2.2656 1.7323 - 2.1654	2-3/4	2.7526 - 2.7522 2.770 - 2.765	P-176 PU-176								36.52	38.58	42.77	41.16	42.77	44.37	44.37	46.38	47.07	50.17	62.38							
I. D. RANGES		O. D. SIZES		ANSI SYMBOL	1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2"	2-1/8	2-1/2	3"										

BOXED ANSI SIZES INDICATE SIZES OF COUNTERBORED BUSHINGS PROVIDED AS STANDARD.

TOLERANCE ON INSIDE DIAMETER FOR ANSI STANDARD DRILL SIZES	
ANSI For DRILL BUSHINGS	
NOM. I. D. RANGE	TOLERANCE
#80 to 1/4"	+0.001 to +0.004
Over 1/4" to 3/4"	+0.001 to +0.005
Over 3/4" to 1-1/2"	+0.002 to +0.006
Over 1-1/2"	+0.003 to +0.007
ANSI For REAMER BUSHINGS	
Up to 1/4"	+0.005 to +0.008
Over 1/4" to 1"	+0.006 to +0.010
Over 1"	+0.008 to +0.012

* NEW STANDARD I. D. s	
I. D.	O. D.
* 1/4	3/8
* .2510	13/32
* .2510	7/16
* .2510	1/2
* .3750	1/2
* 1/2	5/8
* 5/8	3/4
* 3/4	7/8
* 1"	1-1/4

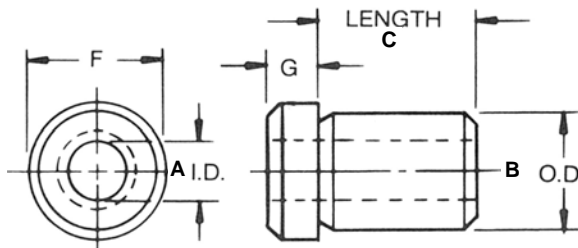
* SEE INSET CHARTS FOR ADDITIONAL I.D. STANDARDS.

QTY DISCOUNT	1-2 LIST	3-5 -6%	6-11 -23%	12-23 -30%	24-49 -35%	50-99 -42%	100-199 -47%	200-499 -51%	500-999 -53%	1000 & UP -56%
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Head Press Fit H Bushings

Head Press Fit Type H

A.N.S.I. Standards



Head Press Fit H and HU

RC-61-65

O.D.	F	G	O.D.	F	G
5/32	1/4	3/32	5/8	51/64	7/32
3/16	5/16	3/32	3/4	59/64	7/32
13/64	19/64	3/32	7/8	1-7/64	1/4
1/4	23/64	3/32	1"	1-15/64	5/16
5/16	27/64	1/8	1-1/8	1-5/16	3/16
3/8	1/2	3/32	1-1/4	1-1/2	1/4
13/32	1/2	5/32	1-3/8	1-39/64	3/8
7/16	9/16	3/32	1-1/2	1-49/64	3/8
1/2	39/64	7/32	1-3/4	1-63/64	3/8
9/16	11/16	3/32	2-1/4	2-31/64	3/8

For Quantity Discount Pricing, see below.

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED AND ANSI STANDARDS.

MILLIMETER DRILL SIZES HAVE BEEN ADDED TO I.D. RANGE. SPECIFY 'HU' FOR **UNGROUND**.

A I.D. DRILL RANGE			B O.D. SIZE		ANSI SYMBOL	C H and HU LENGTH UNDER HEAD / ANSI LENGTH SYMBOL BY 16ths															
INCH / METRIC NOMINAL	U.S.A. INCH DECIMAL	U.S.A. INCH DECIMAL	NOM.	DECIMAL		1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2"	2-1/8	2-1/2	3"	
#80 - #70 .35 - .70MM	.0135 - .0280 .0138 - .0276		5/32	.1578 - .1575 .166 - .161	H-10 HU-10	27.93	28.77	29.49	29.71												
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492		5/32	.1578 - .1575 .166 - .161	H-10 HU-10	24.93	25.33	25.98	26.60		29.17										
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630		5/32	.1578 - .1575 .166 - .161	H-10 HU-10	19.81	19.81	20.45	20.78		23.07										
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630		3/16	.1891 - .1888 .201 - .197	H-12 HU-12	19.81	19.81	20.45	20.78		23.07										
#52 - #39 1.65 - 2.50MM	.0635 - .0995 .0650 - .0984		3/16	.1891 - .1888 .201 - .197	H-12 HU-12	11.53	11.63	12.35	12.67		14.33										
#80 - #70 .35 - .70MM	.0135 - .0280 .0138 - .0276		13/64	.2046 - .2043 .213 - .208	H-13 HU-13	27.93	28.77	29.49	29.71												
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492		13/64	.2046 - .2043 .213 - .208	H-13 HU-13	24.93	25.33	25.98	26.60		29.17										
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630		13/64	.2046 - .2043 .213 - .208	H-13 HU-13	19.81	20.14	20.45	20.78		23.17	26.37									
#52 - #39 1.65 - 2.25MM	.0635 - .0995 .0650 - .0886		13/64	.2046 - .2043 .213 - .208	H-13 HU-13	11.53	11.63	12.35	12.67		14.33	18.70									
#40 - 9/64 2.35 - 4.90MM	.0980 - .1406 .0925 - .1929		1/4	.2516 - .2513 .260 - .255	H-16 HU-16	9.86	10.58	11.11	11.53	12.67	14.14	18.18		25.98	27.63						
1/8 - #10 3.10 - 4.90MM	.1250 - .1935 .1220 - .1929		5/16	.3141 - .3138 .327 - .322	H-20 HU-20	8.20	8.71	9.23	9.36	9.55	9.76	11.63		19.75	22.33						
#10 - #1 4.90 - 5.75MM	.1935 - .2280 .1925 - .2264		3/8	.3766 - .3763 .390 - .385	H-24 HU-24	7.47	8.20	8.52	8.71	9.03	9.23	11.00									
3/16 - F 4.75 - 6.50MM	.1875 - * .2570 .1870 - .2559		13/32	.4078 - .4075 .421 - .416	H-26 HU-26	7.47	7.78	8.52	8.71		9.23	11.00		12.35	13.72	15.06					
A - L 5.90 - 7.30MM	.2340 - * .2900 .2323 - .2874		7/16	.4391 - .4389 .453 - .448	H-28 HU-28	7.47	8.20	8.52	8.71	9.03	9.23	11.00									
3/16 - O 4.75 - 8.00MM	.1875 - * .3160 .1870 - .3150		1/2	.5017 - .5014 .520 - .515	H-32 HU-32	7.47	7.78	8.52	8.71		9.23	11.00		12.35	13.72	15.06					
M - 11/32 7.50 - 8.70MM	.2950 - .3437 .2953 - .3425		9/16	.5642 - .5639 .582 - .577	H-36 HU-36	8.52	7.47	8.20	8.20	8.52	8.52	9.23		12.35							
5/16 - 7/16 8.80 - 11.00MM	.3125 - * .4375 .3465 - .4331		5/8	.6267 - .6264 .645 - .640	H-40 HU-40	8.52	7.47	7.78	7.78	8.52	8.52	9.23		12.35	13.08	14.14		16.41			
5/16 - 17/32 7.10 - 14.00MM	.3125 - * .5312 .2795 - .5512		3/4	.7518 - .7515 .770 - .765	H-48 HU-48	9.23	8.20	8.52	8.52	8.82	9.23	9.86	12.67	12.67	13.41	14.21		16.71			
1/2 - 21/32 12.50 - 16.50MM	.5000 - * .6562 .4921 - .6496		7/8	.8768 - .8765 .895 - .890	H-56 HU-56			10.27	10.27	10.48	11.00	12.03	12.03	13.41	14.76	16.71		16.71			20.14
1/2 - 49/64 12.50 - 19.50MM	.5000 - * .7656 .4646 - .7677		1"	1.0018 - 1.0015 1.020 - 1.015	H-64 HU-64				10.58		10.58	11.53		12.35	14.33	16.22		19.02	21.83	33.66	
55/64 - 15/16 21.50 - 23.50MM	.8594 - .9375 .8465 - .9252		1 - 1/4	1.2520 - 1.2517 1.270 - 1.265	H-80 HU-80					16.30	15.47	17.01	19.02		20.45	21.83	24.73				
5/8 - 1-1/32 15.50 - 26.00MM	.6250 - * 1.0312 .6102 - 1.0236		1-3/8	1.3772 - 1.3768 1.395 - 1.390	H-88 HU-88				17.14		15.78	17.45		19.31	21.50	22.13		22.95	25.73	39.87	
1 - 1-25/64 25.00 - 34.00MM	1.0000 - 1.3906 .9843 - 1.3386		1-3/4	1.7523 - 1.7519 1.770 - 1.765	H-112 HU-112						23.37	21.08		23.37	24.42	25.45		28.87	31.99	44.70	
1-3/8 - 1-49/64 34.00 - 44.00MM	1.3750 - 1.7656 1.3386 - 1.7323		2-1/4	2.2525 - 2.2521 2.270 - 2.265	H-144 HU-144							27.02		30.14	31.99	31.99	36.52	41.16		50.17	
I. D. RANGES		O. D. SIZES	ANSI SYMBOL			1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2"	2-1/8	2-1/2	3"	

BOXED ANSI SIZES INDICATE SIZES OF COUNTERBORED BUSHINGS PROVIDED AS STANDARD.

ANSI For DRILL BUSHINGS		
NOM. I. D. RANGE	TOLERANCE	
#80 to 1/4"	+0.001	to +0.004
Over 1/4" to 3/4"	+0.001	to +0.005
Over 3/4" to 1-1/2"	+0.002	to +0.006
Over 1-1/2"	+0.003	to +0.007
ANSI For REAMER BUSHINGS		
Up to 1/4"	+0.005	to +0.008
Over 1/4" to 1"	+0.006	to +0.010
Over 1"	+0.008	to +0.012

I. D.	O. D.
* .2510	13/32
* .2510	7/16
* .2510	1/2
* .3760	5/8
* .3760	3/4
* .5010	3/4
* .5010	7/8
* .5010	1"
* .7510	1-3/8

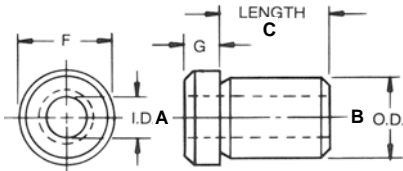
* SEE INSET CHARTS FOR ADDITIONAL I.D. STANDARDS.

QTY DISCOUNT LIST	1-2	3-5	6-11	12-23	24-49	50-99	100-199	200-499	500-999	1000 & UP
		-6%	-23%	-30%	-35%	-42%	-47%	-51%	-53%	-56%

Extra Thinwall Bushings

LARGER I.D.s Within Each A.N.S.I. O.D. Range
A.N.S.I. TOLERANCES APPLY

HTE and PTE Space Saver Thinwalls



RC-61-65

9,800 MORE SPACE SAVER DRILL-SIZED BUSHINGS FOR YOUR FIXTURE! UNITED DESIGNED For Your CLOSE HOLE SPACING Needs — MANUFACTURED

FOR HTE HEAD DIMENSIONS, SEE THIS SECTION.

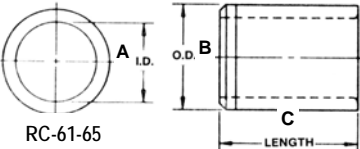
HTE EXTRA THINWALL — WITH HEAD

For Quantity Discount Pricing, see below.				C LENGTH OF BUSHING — BODY ONLY												See this Section for Head Dimensions.			
A I.D. DRILL RANGE		B O.D. SIZE		ANSI	1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-1/2	1-3/4	2"	2-1/4			
INCH - METRIC NOM.	U.S.A. DEC. INCH	NOM.	ACTUAL	SYMBOL	-4	-5	-6	-8	-10	-12	-16	-20	-24	-28	-32	36			
#38 - #31 2.55 - 3.00MM	.1015 - .1200 .1004 - .1181	3/16	.1891 - .1888	HTE-12	24.10	24.61	25.98	26.50	28.77	30.44									
9/64 - 14 3.50 - 4.60MM	.1406 - .1820 .1378 - .1811	1/4	.2516 - .2513	HTE-16	21.08	22.23	23.68	24.10	27.02	30.14									
9 - C 4.90 - 6.10MM	.1960 - .2420 .1929 - .2402	5/16	.3141 - .3138	HTE-20	17.14	18.37	19.43	19.75	20.14	20.45	24.61								
A - 19/64 5.90 - 7.50MM	.2340 - .2968 .2323 - .2953	3/8	.3766 - .3763	HTE-24	15.38	16.09	17.33	17.55	18.37	18.49	21.83								
M - 23/64 7.40 - 9.10MM	.2950 - .3594 .2913 - .3583	7/16	.4392 - .4389	HTE-28	15.38	16.09	17.33	17.55	18.37	18.49	21.83								
S - 29/64 8.80 - 11.50MM	.3480 - .4531 .3465 - .4528	9/16	.5642 - .5639	HTE-36	17.33	15.06	16.09	16.09	16.82	17.33	18.49								
29/64 - 17/32 11.50 - 13.00MM	.4531 - .5312 .4528 - .5118	5/8	.6267 - .6264	HTE-40		15.06	16.09	16.09	16.82	17.33	18.49	24.61							
35/64 - 21/32 13.50 - 16.50MM	.5469 - .6562 .5315 - .6496	3/4	.7518 - .7515	HTE-48		16.41	17.33	17.33	17.86	18.49	19.75	25.45							
43/64 - 49/64 17.00 - 19.00MM	.6719 - .7656 .6693 - .7480	7/8	.8768 - .8765	HTE-56			20.45	20.45	20.99	20.99	22.23	24.10	27.02						
25/32 - 7/8 19.50 - 22.00MM	.7812 - .8750 .7677 - .8661	1"	1.0018 - 1.0015	HTE-64				21.08	21.50	21.50	22.86	25.03	28.77	33.11					
55/64 - 1" 21.50 - 25.00MM	.8594 - 1.0000 .8465 - .9843	1-1/8	1.1270 - 1.1267	HTE-72				33.11	34.08	34.08	34.08	39.23	41.16	43.41					
61/64 - 1-7/64 24.00 - 27.00MM	.9531 - 1.1093 .9449 - 1.0630	1-1/4	1.2520 - 1.2517	HTE-80					34.08	34.08	34.08	39.23	41.16	43.41	50.17				
1-3/64 - 1-7/32 26.00 - 30.00MM	1.0469 - 1.2187 1.0236 - 1.1811	1-3/8	1.3772 - 1.3768	HTE-88					34.08	34.08	34.08	39.23	41.16	43.41	50.17				
1-9/64 - 1-5/16 28.00 - 33.00MM	1.1406 - 1.3125 1.1024 - 1.2992	1-1/2	1.5022 - 1.5018	HTE-96						47.91	47.91	47.91	49.21	50.49	57.38	60.38			
I. D. RANGES		O. D. SIZES		ANSI SYMBOL	1/4 -4	5/16 -5	3/8 -6	1/2 -8	5/8 -10	3/4 -12	1" -16	1-1/4 -20	1-1/2 -24	1-3/4 -28	2" -32	2-1/4 36			

Drill and Reamer Tolerances are in this Section.



HTE



UNITED SPACE SAVER THINWALLS SOLVE SPECIAL FIXTURE SPACE PROBLEMS

Need Fixture Space? We have it! Now YOU can have it!

PTE EXTRA THINWALL — HEADLESS

See Quantity Pricing Below.				C LENGTH OF BUSHING												
A I.D. DRILL RANGE		B O.D. SIZE		ANSI	1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-1/2	1-3/4	2"	2-1/4
INCH - METRIC NOM.	U.S.A. DEC. INCH	NOM.	ACTUAL	SYMBOL	-4	-5	-6	-8	-10	-12	-16	-20	-24	-28	-32	36
#38 - #31 2.55 - 3.00MM	.1015 - .1200 .1004 - .1181	3/16	.1891 - .1888	PTE-12	19.81	22.23	23.26	23.99	25.45	26.50						
9/64 - 14 3.50 - 4.60MM	.1406 - .1820 .1378 - .1811	1/4	.2516 - .2513	PTE-16	18.37	19.43	20.99	21.83	23.26	24.61						
9 - C 4.90 - 6.10MM	.1960 - .2420 .1929 - .2402	5/16	.3141 - .3138	PTE-20	15.06	16.09	16.82	17.33	17.86	18.49	22.86					
A - 19/64 5.90 - 7.50MM	.2340 - .2968 .2323 - .2953	3/8	.3766 - .3763	PTE-24	13.19	13.72	14.86	15.06	15.90	16.41	19.43					
M - 23/64 7.40 - 9.10MM	.2950 - .3594 .2913 - .3583	7/16	.4392 - .4389	PTE-28	13.19	13.72	14.86	15.06	15.90	16.41	19.43					
S - 29/64 8.80 - 11.50MM	.3480 - .4531 .3465 - .4528	9/16	.5642 - .5639	PTE-36	15.06	13.19	14.02	14.02	14.86	15.06	16.09					
29/64 - 17/32 11.50 - 13.00MM	.4531 - .5312 .4528 - .5118	5/8	.6267 - .6264	PTE-40		13.19	14.02	14.02	14.86	15.06	16.09	21.50				
35/64 - 21/32 13.50 - 16.50MM	.5469 - .6562 .5315 - .6496	3/4	.7518 - .7515	PTE-48		13.72	15.06	15.06	15.90	16.09	17.33	21.83				
43/64 - 49/64 17.00 - 19.00MM	.6719 - .7656 .6693 - .7480	7/8	.8768 - .8765	PTE-56			20.45	18.37	18.79	18.79	19.75	21.50	23.68			
25/32 - 7/8 19.50 - 22.00MM	.7812 - .8750 .7677 - .8661	1"	1.0018 - 1.0015	PTE-64				18.79	18.90	18.90	20.14	21.50	24.10	26.50		
55/64 - 1" 21.50 - 25.00MM	.8594 - 1.0000 .8465 - .9843	1-1/8	1.1270 - 1.1267	PTE-72				27.02	27.02	28.77	28.77	33.11	36.01	39.23		
61/64 - 1-7/64 24.00 - 27.00MM	.9531 - 1.1093 .9449 - 1.0630	1-1/4	1.2520 - 1.2517	PTE-80					27.02	28.77	28.77	33.11	36.01	39.23	47.91	
1-3/64 - 1-7/32 26.00 - 30.00MM	1.0469 - 1.2187 1.0236 - 1.1811	1-3/8	1.3772 - 1.3768	PTE-88					27.02	28.77	28.77	33.11	36.01	39.23	47.91	
1-9/64 - 1-5/16 28.00 - 33.00MM	1.1406 - 1.3125 1.1024 - 1.2992	1-1/2	1.5022 - 1.5018	PTE-96						36.34	36.34	36.34	39.23	41.16	49.21	53.69
I. D. RANGES		O. D. SIZES		ANSI SYMBOL	1/4 -4	5/16 -5	3/8 -6	1/2 -8	5/8 -10	3/4 -12	1" -16	1-1/4 -20	1-1/2 -24	1-3/4 -28	2" -32	2-1/4 36



PTE

2-22-06

12200 WOODRUFF AVE. • DOWNEY, CA 90241-5608 • TELEPHONE (562) 803-1521 / (800) 421-3466 IN CA / (800) 486-3466 • FAX (562) 803-6898 / (800) 486-3465

EMAIL united@ucc-udb.com WEBSITE www.ucc-udb.com

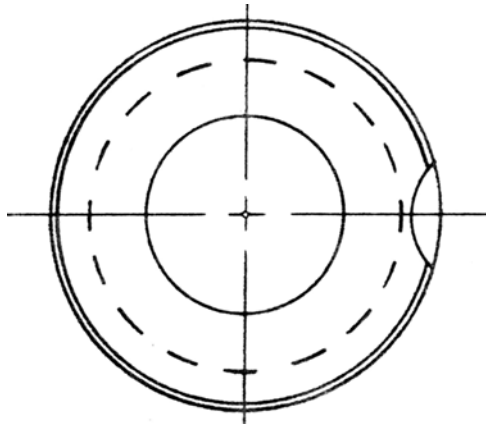
A5

QTY DISCOUNT	1-2 LIST	-6%	3-5 -23%	6-11 -30%	12-23 -35%	24-49 -42%	50-99 -47%	100-199 -51%	200-499 -53%	500-999 -53%	1000 & UP -56%
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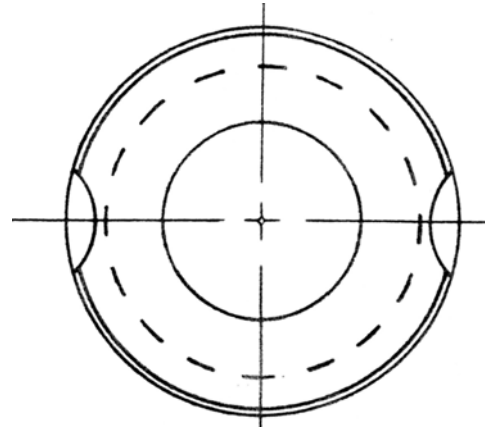
The New Standard

Automotive - Industrial

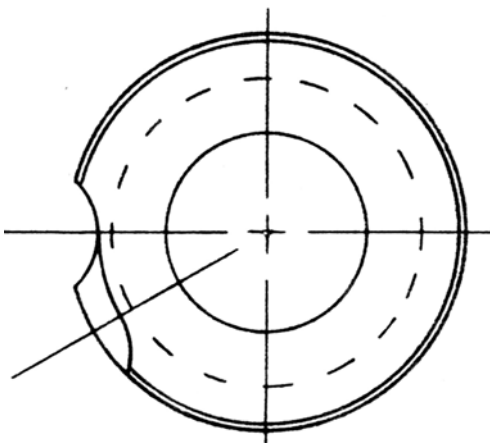
ALL DIMENSIONS ARE TO ANSI



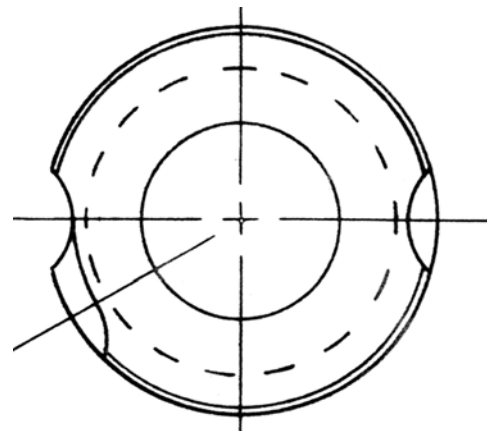
F - FT - FTE
1 2 3



FF - FFT - FFTE
4 5 6



S - ST - STE
13 14 15



SF - SFT - SFTE
FS - FST - FSTE
16 17 18
19 20 21

UNITED
IS THE
ORIGINAL
DESIGNER
AND
HOLDS
THE
ORIGINAL
PATENT
3,606,566
FOR
THE
SFX
BUSHING
STYLE.

91,800 INDIVIDUAL COMBINATIONS of 'S', 'F' and 'X' BUSHINGS EXIST!

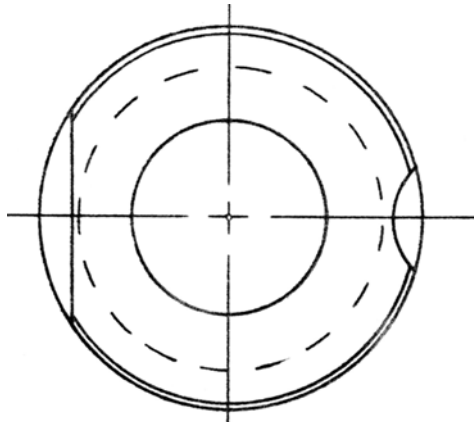
Twenty-seven designations of HEAD STYLES have developed from eight basic configurations throughout the past fifty years! **91,800** Potential Sizes and Designations are possible.

The UNITED 'SFX' combines all 27 STANDARD DESIGNATIONS for LOCKING, HOLDING and CLAMPING OPTIONS into one Logical Head Configuration.

Now **91,800** Sizes are being standardized into **3400 'SFX' Sizes.**

- Aircraft - Head Styles

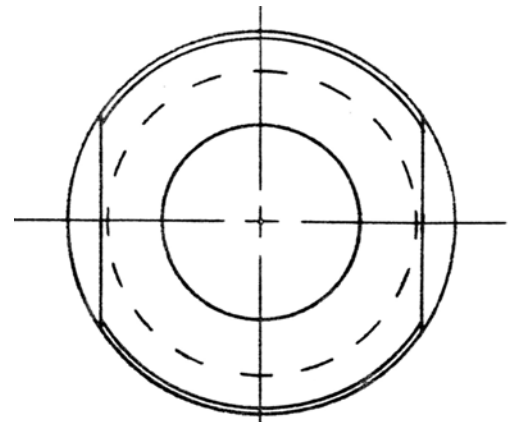
AND INDUSTRY STANDARDS



FX - FTX - FTXE

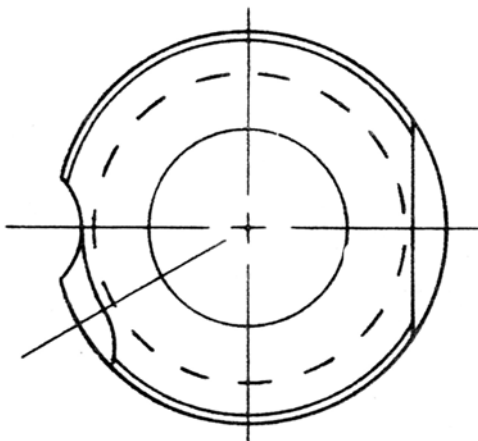
7 8 9

UNITED
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DESIGNER
AND
HOLDS
THE
ORIGINAL
PATENT
3,606,566



FXX - FTXX - FTXXE

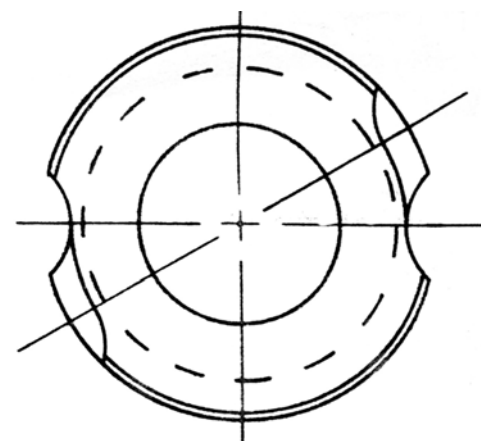
10 11 12



SX - STX - STEX

22 23 24

FOR
THE
SFX
BUSHING
STYLE.

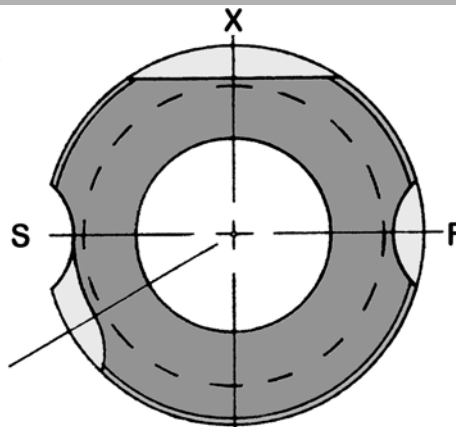


SS - SST - SSTE

25 26 27

The Newest

**ONE STYLE
DOES IT ALL!**



Standard

**UNITED'S SFX
DOES IT ALL!**

ANOTHER SFX UNITED DESIGN

SF Slip Fixed Renewable Bushings

Slip Fixed Renewable

A.N.S.I. Standards

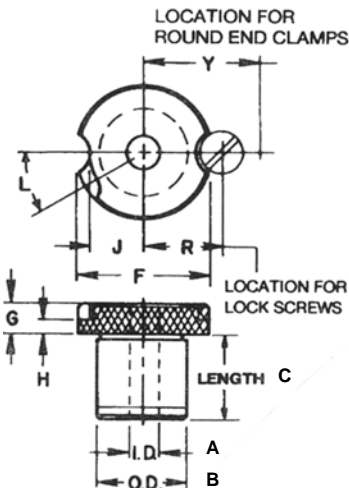


PATENT No. 3,606,566

SLIP FIXED RENEWABLE SF

RC-61-65

For Quantity Discount Pricing, see below.



USE THIS DIAGRAM FOR REFERENCE AND SEE THIS SECTION FOR SF AND SFX HEAD DIMENSIONS, LOCK SCREWS AND CLAMPS.

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED AND ANSI STANDARDS.

Originated by **UNITED**

A I.D. DRILL RANGE		B O.D. SIZE		ANSI SYMBOL	C SF LENGTH - UNDER HEAD / ANSI LENGTH SYMBOL BY 16ths															
INCH - METRIC	U.S.A. INCH	U.S.A. INCH	U.S.A. INCH		1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"		
NOMINAL	DECIMAL	NOM.	DECIMAL		-4	-5	-6	-8	-10	-12	-16	-20	-22	-24	-28	-34	-40	-48		
#80 - .35	#70 .70MM	.0135 - .0138	.0280 .0276	3/16	.1875 - .1873	SF-12	34.08	34.73	35.37	35.69	39.87	47.91								
#69 - .75	3/64 1.25MM	.0292 - .0295	.0469 .0492	3/16	.1875 - .1873	SF-12	29.49	29.71	30.21	31.20	32.47	33.66								
#55 - 1.30	1/16 1.60MM	.0520 - .0512	.0625 .0630	3/16	.1875 - .1873	SF-12	22.13	22.54	22.95	23.37	24.42	25.45								
#52 - 1.65	#40 2.50MM	.0635 - .0650	.0980 .0984	3/16	.1875 - .1873	SF-12	13.41	13.72	14.02	14.33	15.60	16.41								
#39 - 2.50	#28 3.50MM	.0995 - .0984	.1405 .1378	1/4	.2500 - .2498	SF-16	12.35	12.35	12.67	13.41	14.21	15.16								
#80 - .35	#70 .70MM	.0135 - .0138	.0280 .0276	5/16	.3125 - .3123	SF-20	34.08	34.73	35.69	36.01		47.91								
#69 - .75	3/64 1.25MM	.0292 - .0295	.0469 .0492	5/16	.3125 - .3123	SF-20		29.49	30.21	30.95		33.66								
#55 - 1.30	1/16 1.60MM	.0520 - .0512	.0625 .0630	5/16	.3125 - .3123	SF-20		22.54	22.95	23.37		25.45								
#52 - 1.65	#43 2.25MM	.0635 - .0650	.0890 .0886	5/16	.3125 - .3123	SF-20		13.59	13.81	14.33		16.41	20.14							
#42 - 2.30	#10 4.90MM	.0935 - .0906	.1935 .1929	5/16	.3125 - .3123	SF-20		12.03	12.35	13.08	13.72	14.63	17.55	22.54						
#10 - 4.90	#1 5.80MM	.1935 - .1925	.2280 .2282	3/8	.3750 - .3748	SF-24		9.03	9.43	9.86	10.39	10.58	12.03							
A - 5.90	L - 7.30MM	.2340 - .2323	*.2900 .2874	7/16	.4375 - .4373	SF-28		9.03	9.43	9.86	10.39	10.58	12.03							
#28 - 3.50	3/16 4.75MM	.1405 - .1378	*.1875 .1870	1/2	.5000 - .4998	SF-32		10.30	10.58	11.00	0.00	12.03	13.72	15.78	16.95	18.37				
#12 - 4.80	11/32 8.75MM	.1890 - .1890	.3437 .3445	1/2	.5000 - .4998	SF-32		9.03	9.43	9.76	0.00	10.58	12.03	14.33	15.06	16.51	31.20			
M - 7.50	11/32 8.70MM	.2950 - .2953	.3437 .3425	9/16	.5625 - .5623	SF-36		9.03	9.43	9.86	10.27	10.58	12.03							
S - 8.80	7/16 11.00MM	.3480 - .3465	*.4375 .4331	5/8	.6250 - .6248	SF-40			9.55	9.55	9.86	10.27	10.79	14.33						
9/32 - 7.10	9/16 14.00MM	.2812 - .2795	*.5625 .5512	3/4	.7500 - .7498	SF-48			9.43	9.55		10.27	11.00	14.33	15.47	16.71	19.02	32.47	45.02	
35/64 - 13.50	21/32 16.50MM	.5469 - .5315	.6562 .6496	7/8	.8750 - .8748	SF-56				12.03	12.35	12.58	13.41	14.63	16.22					
15/32 - 11.80	25/32 19.50MM	.4688 - .4646	*.7812 .7677	1"	1.0000 - .9998	SF-64				12.03		12.35	13.41	14.63	15.78	17.55	21.08	34.73	45.50	
55/64 - 21.50	15/16 23.50MM	.8594 - .8465	.9375 .9252	1-1/4	1.2500 - 1.2498	SF-80														
23/32 - 18.00	1-1/16 26.00MM	.7187 - .7087	*1.0625 1.0236	1-3/8	1.3750 - 1.3747	SF-88						18.37	20.78	22.43	23.88	25.73	28.87	39.23	50.81	
1-1/64 - 25.00	1-1/8 28.00MM	1.0156 - .9843	1.1250 1.1024	1-1/2	1.5000 - 1.4997	SF-96														
31/32 - 24.50	1-13/32 35.00MM	.9687 - .9646	1.4062 1.3780	1-3/4	1.7500 - 1.7497	SF-112						26.80	24.42	26.70	28.52	30.21	31.99	42.77	50.81	
1-11/32 - 34.00	1-7/8 47.00MM	1.3437 - 1.3386	1.8750 1.8504	2-1/4	2.2500 - 2.2496	SF-144						36.01	33.11	36.01	37.77	39.23	44.70	50.17	58.19	
I. D. RANGES		O. D. SIZES		ANSI SYMBOL	1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"		
					-4	-5	-6	-8	-10	-12	-16	-20	-22	-24	-28	-34	-40	-48		

BOXED ANSI SIZES INDICATE SIZES OF COUNTER-BORED BUSHINGS PROVIDED AS STANDARD.

TOLERANCE ON INSIDE DIAMETER FOR ANSI STANDARD DRILL SIZES	
ANSI For DRILL BUSHINGS	
NOM. I. D. RANGE	TOLERANCE
#80 to 1/4"	+0.001 to +0.004
Over 1/4" to 3/4"	+0.001 to +0.005
Over 3/4" to 1-1/2"	+0.002 to +0.006
Over 1-1/2"	+0.003 to +0.007
ANSI For REAMER BUSHINGS	
Up to 1/4"	+0.005 to +0.008
Over 1/4" to 1"	+0.006 to +0.010
Over 1"	+0.008 to +0.012

* SEE INSET CHARTS FOR ADDITIONAL I.D. STANDARDS. SEE SECTION A FOR LONG HEAD SFX UNALLOY.

QTY	1-2	3-5	6-11	12-23	24-49	50-99	100-199	200-499	500-999	1000 & UP
DISCOUNT LIST	-6%	-23%	-30%	-35%	-42%	-47%	-51%	-53%	-56%	

SFX Slip Fit Renewable Bushings

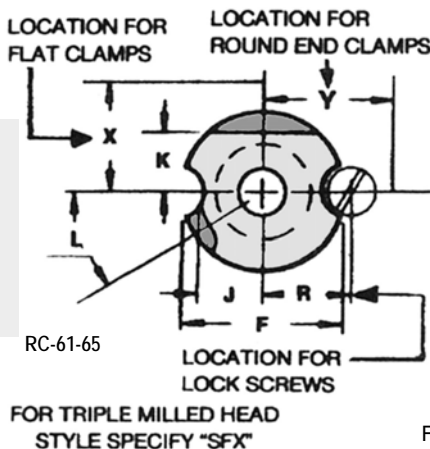
Slip Fixed Renewable With Flat A.N.S.I. Standards



FIXED SLIP AND LOCKSCREW SIDE

SLIP FIXED RENEWABLE with FLAT SFX

USE THIS DIAGRAM FOR REFERENCE AND SEE THIS SECTION FOR SFX HEAD DIMENSIONS, LOCK SCREWS AND CLAMPS.



This Triple Milled Slip Fit Bushing consolidates 6900 sizes down to 2300!

SFX USES ALL BUSHING CLAMPS and LOCKSCREWS .

This is the **BEST HEAD CONFIGURATION** for ALL RENEWABLE BUSHINGS — **IT HOLDS EVERYTHING!**

For Quantity Discount Pricing, see below.

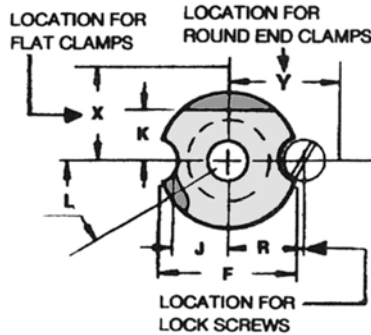
A I. D. DRILL RANGE		B O. D. SIZE			C SFX LENGTH - UNDER HEAD / ANSI LENGTH SYMBOL BY 16ths																																					
INCH - METRIC	U.S.A. INCH	U.S.A. INCH		ANSI	1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"																								
NOMINAL	DECIMAL	NOM.	DECIMAL	SYMBOL	-4	-5	-6	-8	-10	-12	-16	-20	-22	-24	-28	-34	-40	-48																								
#80 - .35 - #70 .70MM	.0135 - .0280 .0138 - .0276	3/16	.1875 - .1873	SFX-12	34.91	35.69	36.34	36.34	40.83	46.95	<div style="border: 1px solid black; padding: 5px;"> <p>BOXED ANSI SIZES INDICATE SIZES OF COUNTER-BORED BUSHINGS PROVIDED AS STANDARD.</p> <table border="1"> <thead> <tr> <th colspan="2">TOLERANCE ON INSIDE DIAMETER FOR ANSI STANDARD DRILL SIZES</th> </tr> <tr> <th colspan="2">ANSI For DRILL BUSHINGS</th> </tr> <tr> <th>NOM. I. D. RANGE</th> <th>TOLERANCE</th> </tr> </thead> <tbody> <tr> <td>#80 to 1/4"</td> <td>+0.001 to +0.004</td> </tr> <tr> <td>Over 1/4" to 3/4"</td> <td>+0.001 to +0.005</td> </tr> <tr> <td>Over 3/4" to 1-1/2"</td> <td>+0.002 to +0.006</td> </tr> <tr> <td>Over 1-1/2"</td> <td>+0.003 to +0.007</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">ANSI For REAMER BUSHINGS</th> </tr> <tr> <th>NOM. I. D. RANGE</th> <th>TOLERANCE</th> </tr> </thead> <tbody> <tr> <td>Up to 1/4"</td> <td>+0.005 to +0.008</td> </tr> <tr> <td>Over 1/4" to 1"</td> <td>+0.006 to +0.010</td> </tr> <tr> <td>Over 1"</td> <td>+0.008 to +0.012</td> </tr> </tbody> </table> </div>								TOLERANCE ON INSIDE DIAMETER FOR ANSI STANDARD DRILL SIZES		ANSI For DRILL BUSHINGS		NOM. I. D. RANGE	TOLERANCE	#80 to 1/4"	+0.001 to +0.004	Over 1/4" to 3/4"	+0.001 to +0.005	Over 3/4" to 1-1/2"	+0.002 to +0.006	Over 1-1/2"	+0.003 to +0.007	ANSI For REAMER BUSHINGS		NOM. I. D. RANGE	TOLERANCE	Up to 1/4"	+0.005 to +0.008	Over 1/4" to 1"	+0.006 to +0.010	Over 1"	+0.008 to +0.012
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#69 - .75 - 3/64 1.25MM	.0292 - .0469 .0295 - .0492	3/16	.1875 - .1873	SFX-12	30.21	30.44	31.20	31.99	33.11	34.73																																
#55 - 1.30 - 1/16 1.60MM	.0520 - .0625 .0512 - .0630	3/16	.1875 - .1873	SFX-12	23.17	23.37	23.99	24.30	25.45	26.50																																
#52 - 1.65 - #40 2.50MM	.0635 - .0980 .0650 - .0984	3/16	.1875 - .1873	SFX-12	14.33	14.86	14.95	15.38	16.51	17.45																																
#39 - 2.50 - #28 3.50MM	.0995 - .1405 .0984 - .1378	1/4	.2500 - .2498	SFX-16	13.29	13.29	13.72	14.21	15.25	16.22																																
#80 - .35 - #70 .70MM	.0135 - .0280 .0138 - .0276	5/16	.3125 - .3123	SFX-20	34.91	35.69	36.52	36.52		47.33																																
#69 - .75 - 3/64 1.25MM	.0292 - .0469 .0295 - .0492	5/16	.3125 - .3123	SFX-20		30.14	31.20	31.99		34.73																																
#55 - 1.30 - 1/16 1.60MM	.0520 - .0625 .0512 - .0630	5/16	.3125 - .3123	SFX-20		23.68	23.99	24.42		26.50																																
#52 - 1.65 - #43 2.25MM	.0635 - .0890 .0650 - .0886	5/16	.3125 - .3123	SFX-20		14.33	14.63	15.06		17.14	20.81																															
#42 - 2.30 - #10 4.90MM	.0935 - .1935 .0906 - .1929	5/16	.3125 - .3123	SFX-20		12.86	13.29	13.72	14.54	15.47	18.37		23.37																													
#10 - 4.90 - #1 5.80MM	.1935 - .2280 .1925 - .2282	3/8	.3750 - .3748	SFX-24	9.36	9.86	10.27	10.71	11.11	11.42	12.86																															
A - 5.90 - L 7.30MM	.2340 - .2900 .2323 - .2874	7/16	.4375 - .4373	SFX-28	9.36	9.86	10.27	10.71	11.11	11.42	12.86																															
#28 - 3.50 - 3/16 4.75MM	.1405 - .1875 .1378 - .1870	1/2	.5000 - .4998	SFX-32		11.11	11.42	11.83		12.86	14.54			16.51	17.76	19.22																										
#12 - 4.80 - 11/32 8.75MM	.1890 - .3437 .1890 - .3445	1/2	.5000 - .4998	SFX-32		9.86	10.27	10.58		11.42	12.86			15.25	15.90	17.33	31.83																									
M - 7.50 - 11/32 8.70MM	.2950 - .3437 .2953 - .3425	9/16	.5625 - .5623	SFX-36		9.86	10.27	10.71	11.11	11.42	12.86																															
S - 8.80 - 7/16 11.00MM	.3480 - .4375 .3465 - .4331	5/8	.6250 - .6248	SFX-40			10.39	10.39	10.71	11.11	11.63	15.25																														
9/32 - 7.10 - 9/16 14.00MM	.2812 - .5625 .2795 - .5512	3/4	.7500 - .7498	SFX-48			10.27	10.39		11.11	11.83	0.00	15.25	16.30	17.55	19.81	33.43	45.98																								
35/64 - 13.50 - 21/32 16.50MM	.5469 - .6562 .5315 - .6496	7/8	.8750 - .8748	SFX-56				12.86	13.19	13.37	14.21	15.47		17.01																												
15/32 - 11.80 - 25/32 19.50MM	.4688 - .7812 .4646 - .7677	1"	1.0000 - .9998	SFX-64				12.86		13.19	14.21		15.47	16.64	18.37	22.02	38.58	46.30																								
55/64 - 21.50 - 15/16 23.50MM	.8594 - .9375 .8465 - .9252	1-1/4	1.2500 - 1.2498	SFX-80																																						
23/32 - 18.00 - 1-1/16 26.00MM	.7187 - 1.0625 .7087 - 1.0236	1-3/8	1.3750 - 1.3747	SFX-88							19.22	21.83		23.26	24.73	26.60	29.71	39.87	51.61																							
1-1/64 - 25.00 - 1-1/8 28.00MM	1.0156 - 1.1250 .9843 - 1.1024	1-1/2	1.5000 - 1.4997	SFX-96																																						
31/32 - 24.50 - 1-13/32 35.00MM	.9687 - 1.4062 .9646 - 1.3780	1-3/4	1.7500 - 1.7497	SFX-112							27.53	25.33		27.53	29.49	31.20	32.80	42.88	51.61																							
1-11/32 - 34.00 - 1-7/8 47.00MM	1.3437 - 1.8750 1.3386 - 1.8504	2-1/4	2.2500 - 2.2496	SFX-144							36.78	33.76		36.78	38.27	40.05	45.50	50.17	59.16																							
I. D. RANGES	O. D. SIZES	ANSI SYMBOL			1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"																								

* SEE INSET CHARTS FOR ADDITIONAL I.D. STANDARDS. ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED AND ANSI STANDARDS.

QTY DISCOUNT	1-2	3-5	6-11	12-23	24-49	50-99	100-199	200-499	500-999	1000 & UP
DISCOUNT LIST	-6%	-23%	-30%	-35%	-42%	-47%	-51%	-53%	-56%	

Unalloy Slip Fixed With Flat Renewable

**SFXN Bushings
The Lifelong Tool**



Unalloy provides Longer Wear than Standard Materials

★ 5 to 10 Times Greater Life!

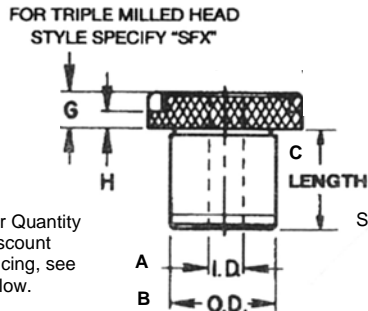
★ Eliminates 4600 head sizes

★ Reduces inventories

★ Replaces all Fixed, Slip and Flat bushings

★ Look for SFXN markings

★ ANSI Standards for All



Dimensions

SEE THIS SECTION FOR HEAD DIMENSIONS, LOCK SCREWS AND CLAMPS.



**SFXN
UNALLOY
WITH FLAT**

For Quantity Discount Pricing, see below.

Originated and Patented by UNITED

UNALLOY—SUPER MATERIAL HARDENED EQUIVALENT TO RC-65-70

A I.D. DRILL RANGE		B O.D. SIZE		C SFXN LENGTH UNDER HEAD / ANSI LENGTH SYMBOL BY 16ths															
INCH - METRIC	U.S.A. INCH	U.S.A. INCH		ANSI	1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"	
NOMINAL	DECIMAL	NOM.	DECIMAL	SYMBOL	-4	-5	-6	-8	-10	-12	-16	-20	-22	-24	-28	-34	-40	-48	
#80 - #70 .35 - .70MM	.0135 - .0280 .0138 - .0276	3/16	.1875 - .1873	SFXN-12	102.47	104.18	106.12	107.40	107.40	136.33									
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492	3/16	.1875 - .1873	SFXN-12		89.18	90.68	91.97		100.32									
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630	3/16	.1875 - .1873	SFXN-12		69.78	70.87	72.36		78.78									
#52 - #40 1.65 - 2.50MM	.0635 - .0980 .0650 - .0984	3/16	.1875 - .1873	SFXN-12		40.83	41.81	43.41		47.59									
#39 - #28 2.50 - 3.50MM	.0995 - .1405 .0984 - .1378	1/4	.2500 - .2498	SFXN-16	37.62	37.62	38.27	39.87	42.72	45.66									
#80 - #70 .35 - .70MM	.0135 - .0280 .0138 - .0276	5/16	.3125 - .3123	SFXN-20	102.47	104.18	106.12	107.40		136.33									
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492	5/16	.3125 - .3123	SFXN-20		89.18	90.68	91.97		100.32									
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630	5/16	.3125 - .3123	SFXN-20		69.78	70.87	72.36		78.78									
#52 - #43 1.65 - 2.25MM	.0635 - .0890 .0650 - .0886	5/16	.3125 - .3123	SFXN-20		40.83	41.81	43.41		47.59	60.38								
#42 - #10 2.30 - 4.90MM	.0935 - .1935 .0906 - .1929	5/16	.3125 - .3123	SFXN-20		37.62	38.27	39.87	41.02	45.98	54.02		68.59						
#10 - #1 4.90 - 5.80MM	.1935 - .2280 .1925 - .2282	3/8	.3750 - .3748	SFXN-24		31.20	31.83	32.80		35.96	41.48								
A - L 5.90 - 7.30MM	.2340 - .2900 .2323 - .2874	7/16	.4375 - .4373	SFXN-28		27.33	28.37	29.17		31.83	35.96								
#28 - 3/16 3.50 - 4.75MM	.1405 - .1875 .1378 - .1870	1/2	.5000 - .4998	SFXN-32		31.20	31.83	32.80		35.96	41.48		47.59	50.68	51.35				
#12 - 11/32 4.80 - 8.75MM	.1890 - .3437 .1890 - .3445	1/2	.5000 - .4998	SFXN-32		27.33	28.37	29.17		31.83	35.96		43.41	45.98	50.81	91.97			
M - 11/32 7.50 - 8.70MM	.2950 - .3437 .2953 - .3425	9/16	.5625 - .5623	SFXN-36			28.37	28.77	31.20	31.20	32.80		43.41	46.95					
S - 7/16 8.80 - 11.00MM	.3480 - .4375 .3465 - .4331	5/8	.6250 - .6248	SFXN-40			28.37	28.77	31.20	31.20	32.80		43.41	46.95					
9/32 - 9/16 7.10 - 14.00MM	.2812 - .5625 .2795 - .5512	3/4	.7500 - .7498	SFXN-48			28.37	28.77	31.20	31.20	32.80		43.41	46.95	50.17	57.38	96.78	135.04	
35/64 - 21/32 13.50 - 16.50MM	.5469 - .6562 .5315 - .6496	7/8	.8750 - .8748	SFXN-56				35.96	37.62	37.62	39.87	44.05	44.05	47.59					
15/32 - 25/32 11.80 - 19.50MM	.4688 - .7812 .4646 - .7677	1"	1.0000 - .9998	SFXN-64				35.96		37.62	39.87		44.05	47.59	52.72	63.35	103.54	136.33	
55/64 - 15/16 21.50 - 23.50MM	.8594 - .9375 .8465 - .9252	1-1/4	1.2500 - 1.2498	SFXN-80						54.98	62.38		67.53	71.71	77.49				
23/32 - 1-1/16 18.00 - 26.00MM	.7187 - 1.0625 .7087 - 1.0236	1-3/8	1.3750 - 1.3747	SFXN-88						54.98	62.38		67.53	71.71	77.49	86.50	116.72	153.06	
1-1/64 - 1-1/8 25.00 - 28.00MM	1.0156 - 1.1250 .9843 - 1.1024	1-1/2	1.5000 - 1.4997	SFXN-96						79.42	73.31		79.42	85.53	91.32	102.58			
31/32 - 1-13/32 24.50 - 35.00MM	.9687 - 1.4062 .9646 - 1.3780	1-3/4	1.7500 - 1.7497	SFXN-112						79.42	73.31		79.42	85.53	91.32	102.58	126.37	155.62	
1-11/32 - 1-7/8 34.00 - 47.00MM	1.3437 - 1.8750 1.3386 - 1.8504	2-1/4	2.2500 - 2.2496	SFXN-144						108.05	99.04		108.05	112.55	117.26	133.77	147.91	174.92	
I. D. RANGES	O. D. SIZES	ANSI SYMBOL			1/4	5/16	3/8	1/2	5/8	3/4	1"	1-1/4	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"	

BOXED ANSI SIZES INDICATE SIZES OF COUNTER-BORED BUSHINGS PROVIDED AS STANDARD.

TOLERANCE ON INSIDE DIAMETER FOR ANSI STANDARD DRILL SIZES	
ANSI For DRILL BUSHINGS	
NOM. I. D. RANGE	TOLERANCE
#80 to 1/4"	+0.001 to +0.004
Over 1/4" to 3/4"	+0.001 to +0.005
Over 3/4" to 1-1/2"	+0.002 to +0.006
Over 1-1/2"	+0.003 to +0.007
ANSI For REAMER BUSHINGS	
Up to 1/4"	+0.005 to +0.008
Over 1/4" to 1"	+0.006 to +0.010
Over 1"	+0.008 to +0.012

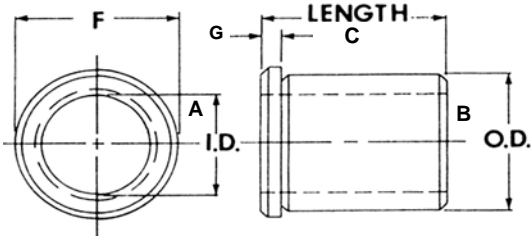
* SEE INSET CHARTS FOR ADDITIONAL I.D. STANDARDS.

QTY DISCOUNT LIST	1-2	3-5	6-11	12-23	24-49	50-99	100-199	200-499	500-999	1000 & UP
		-6%	-23%	-30%	-35%	-42%	-47%	-51%	-53%	-56%

Head and UniLock Liners

HL-HLU-UL-ULU-ULD A.N.S.I. Standards

HL-UL-ULD Liners
Metal and Plastic



RC-61-65

HEAD LINER PRESS FIT HL and HLU

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED AND ANSI STANDARDS.



For Quantity Discounts on all Liners shown, see below.

MILLIMETER DRILL SIZES HAVE BEEN ADDED TO I.D. RANGE.
SPECIFY 'HLU' FOR UNGROUND.

A I.D. DRILL RANGE		B O.D. SIZE		ANSI SYMBOL	C HL and HLU LENGTH OVERALL / ANSI LENGTH SYMBOL BY 16ths											HL-HLU HEAD DIMENSIONS		
IN. - METRIC NOM.	U.S.A. INCH DECIMAL	NOM.	U.S.A. INCH DECIMAL		5/16	3/8	1/2	3/4	1"	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"	F	G	
5/16 * 8.00MM	.3126-.3129 .3150-.3154	1/2	.5017 - .5014 .520 - .515	HL-32 HLU-32	7.78	8.52	8.52	9.23	12.03	14.86					5/8	3/32		
1/2 * 12.00MM	.5002-.5005 .4726-.4735	3/4	.7518 - .7515 .770 - .765	HL-48 HLU-48	8.20	8.52	8.52	9.23	10.58	12.35	13.41	14.33	16.71		7/8	3/32		
3/4 * 18.00MM	.7503-.7506 .7090-.7095	1"	1.0018 - 1.0015 1.395 - 1.390	HL-64 HLU-64			10.27	11.00	11.63	12.35	13.72	15.47	16.22	19.31	29.71	1-1/8	1/8	
1" * 26.00MM	1.0004-1.0007 1.0239-1.0244	1-3/8	1.3772 - 1.3768 1.395 - 1.390	HL-88 HLU-88			13.81	12.35	13.81	15.06		17.55	19.81	22.86	39.87	1-1/2	1/8	
1-3/8 * 35.00MM	1.3756-1.3760 1.3783-1.3785	1-3/4	1.7523 - 1.7519 1.770 - 1.765	HL-112 HLU-112	METRIC SIZES and SIZES WITHOUT PRICES ARE SPECIAL. PRICES ARE FOR FINISHED OR UNGROUND.				17.01	17.86	19.75	20.78	22.13	25.33	28.37	47.91	1-7/8	3/16
1-3/4 * 42.00MM	1.7508-1.7512 1.6534-1.6545	2-1/4	2.2525 - 2.2521 2.270 - 2.265	HL-144 HLU-144				24.42	22.54	24.73	25.73	27.02	29.71	33.66	49.52	2-3/8	3/16	
2-1/4 55.00MM	2.2510-2.2515 2.1658-2.1665	2-3/4	2.7526 - 2.7522 2.770 - 2.765	HL-176 HLU-176				29.49	26.80	30.14		33.66	37.77	40.83	55.30	2-7/8	3/16	
I. D. RANGES		O. D. SIZES		ANSI SYMBOL	5/16	3/8	1/2	3/4	1"	1-3/8	1-1/2	1-3/4	2-1/8	2-1/2	3"	F	G	
					QTY DISCOUNT	1-2 LIST	3-5 -6%	6-11 -23%	12-23 -30%	24-49 -35%	50-99 -42%	100-199 -47%	200-499 -51%	500-999 -53%	1000 & UP -56%			

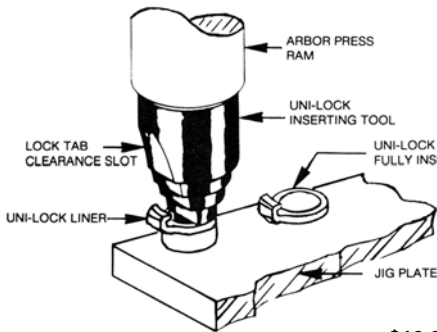
* MILLIMETER SIZE WHICH ACCOMMODATES SFM O.D. PRICED AS SPECIAL

No Lock Screws or Weld On

This tool reduces set-up time dramatically. You are no longer required to locate, drill and tap Holes for Locking Devices.

UniLock LINERS for Slip Renewable Bushings eliminate the need for Lock Screws or Clamps.

UNI-LOCK INSERTING TOOL



PART NO. UDB-ULT-1 \$10.90

UniLock Inserting Tool UDB-ULT-1

The UniLock Inserting Tool makes installation of UniLock Liners a snap! This one tool fits all UniLock Liner I.D.s. Stepped shoulders correspond with Liner Head dimensions and the milled slot accommodates all Locking Tabs.

RC-61-65

CONCENTRICITY (LINERS GROUND TO PRESS FIT SIZE ONLY):

I.D. RANGE OF 3/16 TO 1/2 INCH (INCLUSIVE). Concentricity held to .0003 T.I.R.

I.D. RANGE OVER 1/2 INCH: Concentricity held to .0005 T.I.R.

HARDNESS: Rockwell C61-65 in the hole.

LEAD: UniLock Liners for press fit installation feature a 45° lead at the drill exit end. For ease of entrance into jig or fixture, liners with O.D.s Ground to Press Fit Size have a concentric ground lead, also at the drill exit end. If you purchase unground liners, we recommend you add a ground lead. Lead should be .001 to .002 inch smaller than finish ground O.D. of liner.



UniLock Liners for Plastic

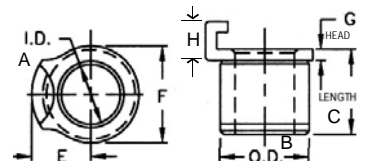
ULD

With its integrated Lock Tab, the UniLock Liner serves as the Liner and Locking Device all in one!



UniLock Liners for Metal

UL - ULU



A I.D. DRILL RANGE		B O.D. SIZE		ANSI SYMBOL	C LENGTH OVERALL — EXCLUDING TAB										
IN. - METRIC NOMINAL	U.S.A. INCH DECIMAL	NOM.	U.S.A. INCH DECIMAL		5/16	3/8	1/2	3/4	1"	1-3/8	E	F	G	H	
3/16 * 5.00MM	.1876-.1879 .1969-.1972	5/16	.3141 - .3138 .327 - .322	UL-20 ULD-20	19.43	20.14	20.45	21.39		1/4	.365	.065	1/4		
5/16 * 8.00MM	.3126-.3129 .3150-.3154	1/2	.5017 - .5014 .520 - .515	UL-32 ULD-32		14.14	14.76	16.41		3/8	9/16	.093	5/16		
1/2 * 12.00MM	.5002-.5005 .4726-.4731	3/4	.7518 - .7515 .770 - .765	UL-48 ULD-48	METRIC SIZES AND SIZES WITHOUT PRICES ARE SPECIAL.				17.33	19.63	22.23	1/2	13/16	.093	21/64
3/4 * 18.00MM	.7503-.7506 .7090-.7095	1"	1.0018 - 1.0015 1.020 - 1.015	UL-64 ULD-64						21/32	1-1/16	.125	3/8		
1" * 26.00MM	1.0004-1.0007 1.0239-1.0244	1-3/8	1.3772 - 1.3768 1.395 - 1.390	UL-88 ULD-88											
I. D. RANGES		O. D. SIZES		ANSI SYMBOL	5/16	3/8	1/2	3/4	1"	1-3/8	E	F	G	H	
					-5	-6	-8	-12	-16	-22					

* Metric O.D.s for SFM Bushings

* Specify ULU for UNGROUND - PRICES ARE SAME.

UNITED Locks in Value With the UniLock Liner's 2-in-1 Feature!

2-24-09