

Metric Bushings Specifications

'M' is for Metric



METRIC SPECIFICATIONS and TECHNICAL INFORMATION

METRIC BUSHING INFORMATION	JIG BORE and JIG GRIND CHART for PRESS FIT BUSHINGS				
Application Information is listed on the specific page for each type of metric bushings.	NOM O.D. MM	ACTUAL O.D. MM	ACTUAL METRIC O.D. in INCHES	METRIC JIG BORE INSTALLATION HOLE SIZE	INSTALLATION HOLE SIZE in INCHES
<i>UNITED</i> Metric Bushings are manufactured to ANSI, Metric and <i>UNITED</i> standards. Most <i>UNITED</i> bushings are non-counterbored , adding critical guidance to insure precise location and eliminating "drill walk."	4	4.027 - 4.019	.1585 - .1582	4.000 - 4.012	.1575 - .1579
Bushings generally assume the shape of the jig plate hole. Care must be taken to jig bore or ream size the hole to achieve hole roundness. Please use our Jig Bore Chart, shown on right, for all Metric Press Fit Bushings.	5	5.027 - 5.019	.1979 - .1976	5.000 - 5.012	.1969 - .1973
Lubricated bushing O.D.s and lubricated mounting holes assure easier installation and removal. They prevent the bushing from picking up metal chips that may score the hole.	6	6.027 - 6.019	.2373 - .2370	6.000 - 6.012	.2362 - .2367
Install PM, LM, HM, HLM and SPM Bushings with a hand arbor press or bushing installation assembly tools into your jig plates. Maintain perpendicularity to centerline. Locate the lead chamfer of the bushing in the hole carefully to direct the installation. Prepare your installation hole size consistently with our Jig Bore Chart for all Metric Press Fit type bushings. All Metric Press Fit bushings have a .02mm ground lead to automatically center your bushings.	7	7.032 - 7.023	.2769 - .2765	7.000 - 7.015	.2756 - .2761
	8	8.032 - 8.023	.3162 - .3159	8.000 - 8.015	.3150 - .3155
	10	10.032 - 10.023	.3950 - .3946	10.000 - 10.015	.3937 - .3943
	12	12.039 - 12.028	.4740 - .4735	12.000 - 12.018	.4725 - .4731
	15	15.039 - 15.028	.5921 - .5917	15.000 - 15.018	.5906 - .5913
	18	18.039 - 18.028	.7102 - .7098	18.000 - 18.018	.7087 - .7094
	22	22.048 - 22.035	.8680 - .8675	22.000 - 22.021	.8661 - .8670
	26	26.048 - 26.035	1.0255 - 1.0250	26.000 - 26.021	1.0236 - 1.0244
	30	30.048 - 30.043	1.1830 - 1.1825	30.000 - 30.021	1.1811 - 1.1819
	35	35.059 - 35.043	1.3803 - 1.3796	35.000 - 35.025	1.3780 - 1.3789
	42	42.059 - 42.043	1.6559 - 1.6552	42.000 - 42.025	1.6535 - 1.6545
	48	48.059 - 48.043	1.8921 - 1.8915	48.000 - 48.025	1.8890 - 1.8907
	55	55.072 - 55.053	2.1682 - 2.1674	55.000 - 55.030	2.1654 - 2.1665
	62	62.072 - 62.053	2.4438 - 2.4430	62.000 - 62.030	2.4409 - 2.4421
	70	70.078 - 70.059	2.7590 - 2.7582	70.000 - 70.030	2.7559 - 2.7571
	78	78.078 - 78.059	3.0739 - 3.0732	78.000 - 78.030	3.0709 - 3.0720
	85	85.093 - 85.071	3.3501 - 3.3493	85.000 - 85.035	3.3465 - 3.3478
	95	95.093 - 95.071	3.7438 - 3.7430	95.000 - 95.035	3.7402 - 3.7415
	105	105.101- 105.079	4.1378 - 4.1370	105.000- 105.035	4.1339 - 4.1352
	115	115.101- 115.079	4.5315 - 4.5307	115.000- 115.035	4.5276 - 4.5289
	125	125.117- 125.092	4.9259 - 4.9249	125.000- 125.040	4.9213 - 4.9228

MINIMUM and MAXIMUM INSIDE DIAMETERS of Bushings in accordance with METRIC TOLERANCE CLASS G6.

- Inside Diameter (I.D.) is concentric to outside (O.D.) within .012 T.I.R. Metric or .0005 Inches.
- Surface Finish on I.D. is 0.4 micrometers or better.
- Hardness is 61-65 RC in the hole.
- Small I.D. Sizes thru 0.80 mm (.032 inch) may be counterbored to provide for lubrication and chip clearance.

METRIC DRILL SIZES	BUSHING AND DRILL I. D. TOLERANCES	EQUIVALENCY U.S.A. INCH	I. D. TOLERANCE FOR METRIC in INCHES	I. D. REAMER SIZES METRIC	U.S.A. INCH
Up to 3mm	Nominal +0.002mm / +0.008mm	Up to .1181	Nominal +.0001 / +.0003	+0.006mm / +0.012mm	+0.0002 / +.0005
3mm to 6mm	Nominal +0.004mm / +0.012mm	.1181 to .2362	Nominal +.0002 / +.0005	+0.010mm / +0.018mm	+0.0004 / +.0007
6mm to 10mm	Nominal +0.005mm / +0.014mm	.2362 to .3937	Nominal +.0002 / +.0006	+0.013mm / +0.027mm	+0.0005 / +.0010
10mm to 18mm	Nominal +0.006mm / +0.017mm	.3937 to .7087	Nominal +.0002 / +.0007	+0.016mm / +0.027mm	+0.0006 / +.0011
18mm to 30mm	Nominal +0.007mm / +0.020mm	.7087 to 1.1811	Nominal +.0003 / +.0008	+0.020mm / +0.033mm	+0.0008 / +.0014
30mm to 50mm	Nominal +0.009mm / +0.025mm	1.1811 to 1.9685	Nominal +.0004 / +.0010		
50mm to 80mm	Nominal +0.010mm / +0.029mm	1.9685 to 3.1496	Nominal +.0004 / +.0011		
80mm to 120mm	Nominal +0.012mm / +0.034mm	3.1496 to 4.7244	Nominal +.0005 / +.0013		

Standard Metric & Standard Inch Drill Sizes & Drill Bushing Sizes

Metric-Inch I.D. Std. Drills & Bushings Drill Sizes

THOSE NOT LISTED ARE SPECIALS IN METRIC & 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		1/4	.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		1-1/32	1.0313

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"
 Refer to page V59 for sizes over 26.00MM and Tap Bushings sizes. NON-STANDARD I.D.s are PRICED as SPECIALS.

5-11-06

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

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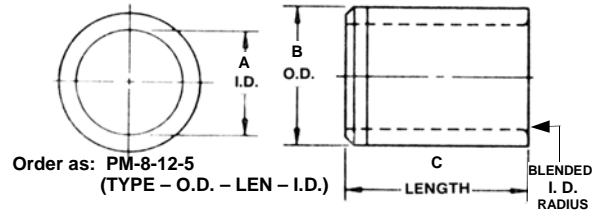
**PM - Headless
Press Fit Metric**

Headless Press Fit Type PM

For the METRIC World
Specify PM Ground or PUM Unground



METRIC Headless Press Fit PM



RC-61-65 T.I.R. .012 (.0005 inch) MAX.
PM Bushings are the most popular and least expensive. PM Bushings are pressed into fixtures or jig plates where replacement due to wear is not anticipated. Ideal for close hole spacing. Usually mounted flush to jig plate. PM Bushings have blended entrance radii, concentric ground leads, and are manufactured from long wear premium steel.

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED, U.S.A. ANSI AND METRIC STANDARDS.

A I.D. DRILL RANGE		METRIC	B O.D. SIZE				ANSI SYMBOL	C PM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM / ±.015")														I.D.
METRIC (G6) MM SIZES INCH SIZES	U.S.A. INCH DECIMAL		NOM. O.D. MM.	METRIC (s6) MAX	MIN	USA INCH MAX		MIN	INCH: .236	.315	.354	.394	.472	.630	.787	.984	1.102	1.181	1.378	1.417	1.772	
0.35 - 1.00 #80 - #61	.0138 - .0394 .0135 - .0390	4	4.027	4.019	.1585	.1582	PM-4	32.80		34.73											0.4	
1.01 - 1.80 #60 - #50	.0398 - .0709 .0400 - .0700	4	4.027	4.019	.1585	.1582	PM-4	28.77		30.88											0.4	
1.81 - 2.60 #49 - #38	.0713 - .1024 .0730 - .1015	5	5.027	5.019	.1979	.1976	PM-5	10.79		12.67											0.4	
2.61 - 3.30 #37 - #30	.1028 - .1299 .1040 - .1285	6	6.027	6.019	.2373	.2370	PM-6		10.48			12.03	13.41								0.4	
3.31 - 4.00 #29 - #22	.1303 - .1575 .1360 - .1570	7	7.032	7.023	.2769	.2765	PM-7		8.62			9.43	10.27								0.4	
4.01 - 5.00 #22 - #9	.1579 - .1969 .1590 - .1960	8	8.032	8.023	.3162	.3159	PM-8		8.62			9.43	10.27								0.8	
5.01 - 6.00 #8 - 15/64	.1972 - .2362 .1990 - .2344	10	10.032	10.023	.3950	.3946	PM-10				7.97	8.20	9.03								0.8	
6.01 - 8.00 B - 5/16	.2366 - .3150 .2380 - .3125	12	12.039	12.028	.4740	.4735	PM-12				7.97	8.20	9.03								0.8	
8.01 - 10.00 O - 25/64	.3154 - .3937 .3160 - .3906	15	15.039	15.028	.5921	.5917	PM-15					7.59	8.20	8.62							1.2	
10.01 - 12.00 X - 15/32	.3941 - .4724 .3970 - .4687	18	18.039	18.028	.7102	.7098	PM-18					8.20	8.62	9.43							1.2	
12.01 - 15.00 31/64 - 37/64	.4728 - .5906 .4923 - .5781	22	22.048	22.035	.8680	.8675	PM-22					10.27			10.79				12.78		1.6	
15.01 - 18.00 19/32 - 45/64	.5909 - .7087 .5937 - .7031	26	26.048	26.035	1.0255	1.0250	PM-26					10.27			10.90				13.29		1.6	
18.01 - 22.00 23/32 - 55/64	.7091 - .8661 .7187 - .8594	30	30.048	30.035	1.1830	1.1825	PM-30						10.27						13.29	14.54	1.6	

FOR QUANTITY DISCOUNTS, SEE BELOW.

A I.D. DRILL RANGE		METRIC	B O.D. SIZE				ANSI SYMBOL	C PM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM / ±.015")														I.D.
METRIC (G6) MM SIZES INCH SIZES	U.S.A. INCH DECIMAL		NOM. O.D. MM.	METRIC (s6) MAX	MIN	USA INCH MAX		MIN	INCH: .787	.984	1.181	1.378	1.417	1.575	1.772	2.205	2.638	3.071	3.504	4.134	4.409	
22.01 - 26.00 7/8 - 1-1/64	.8665 - 1.0236 .8750 - 1.0156	35	35.059	35.043	1.3803	1.3796	PM-35	13.41					19.51		21.28						2.4	
26.01 - 30.00 1-1/32 - 1-11/64	1.0240 - 1.1811 1.0313 - 1.1719	42	42.059	42.043	1.6559	1.6552	PM-42		17.86					22.86	28.37						2.4	
30.01 - 35.00 1-3/16 - 1-3/8	1.1815 - 1.3780 1.1875 - 1.3750	48	48.059	48.043	1.8921	1.8915	PM-48		17.86					22.86	28.37						2.4	
35.01 - 42.00 1-25/64 - 1-41/64	1.3783 - 1.6535 1.3906 - 1.6406	55	55.072	55.053	2.1682	2.1674	PM-55					25.65			35.69	51.13					2.4	
42.01 - 48.00 1-21/32 - 1-7/8	1.6539 - 1.8898 1.6562 - 1.8750	62	62.072	62.053	2.4438	2.4430	PM-62					40.83			52.62	60.77					2.4	
48.01 - 55.00 1-57/64 - 2-5/32	1.8902 - 2.1654 1.8906 - 2.1562	70	70.078	70.059	2.7590	2.7582	PM-70					52.41			63.66	74.27					3.0	
55.01 - 63.00 2-5/32 - 2-15/32	2.1657 - 2.4803 2.1562 - 2.4687	78	78.078	78.059	3.0739	3.0732	PM-78						64.31			84.88	87.79				3.0	
63.01 - 70.00 2-31/64 - 2-3/4	2.4807 - 2.7559 2.4843 - 2.7500	85	85.093	85.071	3.3501	3.3493	PM-85						81.67			95.81	98.39				3.0	
70.01 - 78.00 2-3/4 - 3-1/16	2.7563 - 3.0709 2.7500 - 3.0625	95	95.093	95.071	3.7438	3.7430	PM-95						89.07			110.44		135.04			3.0	
78.01 - 85.00 3-1/16 - 3-11/32	3.0713 - 3.3465 3.0625 - 3.3437	105	105.101	105.079	4.1378	4.1370	PM-105						93.88			116.07		136.33			3.0	
85.01 - 95.00 3-11/32 - 3-47/64	3.3469 - 3.7402 3.3437 - 3.7344	115	115.101	115.079	4.5315	4.5307	PM-115							133.77				141.48		158.19	3.0	
95.01 - 105.00 3-47/64 - 4-1/8	3.7406 - 4.1339 3.7344 - 4.1250	125	125.117	125.092	4.9259	4.9249	PM-125							116.40				149.20		175.21	3.0	

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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UNITED HAS ALL THE METRIC YOU REQUIRE IN BUSHINGS!

7-24-06

Head Press Fit Type HM

For the METRIC World

Specify HM Ground and HUM Unground

HM - Head Press Fit
Metric

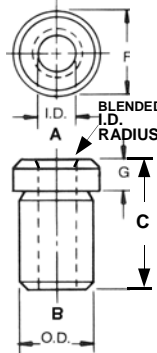
HM LENGTH MEASURED **OVERALL**—The USA inch standard specifies lengths for H Bushings *under* the head. HEADLINERS HLM and HM have IDENTICAL HEAD DIMENSIONS

EXAMPLE Order as: HM-8-12-5 (TYPE - O.D. - LEN - I.D.)

RC-61-65 T.I.R. .012 (.0005 inch) MAX.

HM Bushings are preferred, if space permits, as heavy drilling will not force HM bushings out of the fixture.

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED, U.S.A. ANSI AND METRIC STANDARDS.



METRIC
Head
Press
Fit
HM



A I.D. DRILL RANGE		METRIC NOM. O.D. MM.	B O.D. SIZE		ANSI SYMBOL	C HM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM = ±.015")																
METRIC (G6)	U.S.A. INCH		METRIC (S6)	USA INCH		INCH:	.236	.315	.354	.394	.472	.630	.787	.984	1.102	1.181	1.378	1.417	1.772	F	G	
MM SIZES	DECIMAL		MAX	MIN		MAX	MIN	METRIC:	-6	-8	-9	-10	-12	-16	-20	-25	-28	-30	-35	-36	-45	MM
0.35 - 1.00 #80 - #61	.0138 - .0394 .0135 - .0390	4	4.027 - 4.019	.1585 - .1582		HM-4	34.08		35.69												7	2
1.01 - 1.80 #60 - #50	.0398 - .0709 .0400 - .0700	4	4.027 - 4.019	.1585 - .1582		HM-4	30.14		31.20												7	2
1.81 - 2.60 #49 - #38	.0713 - .1024 .0730 - .1015	5	5.027 - 5.019	.1979 - .1976		HM-5	14.02		14.86												8	2
2.61 - 3.30 #37 - #30	.1028 - .1299 .1040 - .1285	6	6.027 - 6.019	.2373 - .2370		HM-6		12.78			14.02	17.01									9	2.5
3.31 - 4.00 #29 - #22	.1303 - .1575 .1360 - .1570	7	7.032 - 7.023	.2769 - .2765		HM-7		10.48			11.42	11.73									10	2.5
4.01 - 5.00 #22 - #9	.1579 - .1969 .1590 - .1960	8	8.032 - 8.023	.3162 - .3159		HM-8		10.48			11.42	11.73									11	2.5
5.01 - 6.00 #8 - 15/64	.1972 - .2362 .1990 - .2344	10	10.032 - 10.023	.3950 - .3946		HM-10			10.48		11.32	13.29									13	3
6.01 - 8.00 B - 5/16	.2366 - .3150 .2380 - .3125	12	12.039 - 12.028	.4740 - .4735		HM-12			10.48		11.32	13.29									15	3
8.01 - 10.00 O - 25/64	.3154 - .3937 .3160 - .3906	15	15.039 - 15.028	.5921 - .5917		HM-15				9.43		11.32	11.32								18	3
10.01 - 12.00 X - 15/32	.3941 - .4724 .3970 - .4687	18	18.039 - 18.028	.7102 - .7098		HM-18					10.27		11.32	12.03							22	4
12.01 - 15.00 31/64 - 37/64	.4728 - .5906 .4923 - .5781	22	22.048 - 22.035	.8680 - .8675		HM-22						12.67		14.54				16.22			26	4
15.01 - 18.00 19/32 - 45/64	.5909 - .7087 .5937 - .7031	26	26.048 - 26.035	1.0255 - 1.0250		HM-26						12.78		14.02				17.33			30	4
18.01 - 22.00 23/32 - 55/64	.7091 - .8661 .7187 - .8594	30	30.048 - 30.035	1.1830 - 1.1825		HM-30							18.70					24.61	26.18		34	5

FOR QUANTITY DISCOUNTS, SEE BELOW.

A I.D. DRILL RANGE		METRIC NOM. O.D. MM.	B O.D. SIZE		ANSI SYMBOL	C HM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM = ±.015")																
METRIC (G6)	U.S.A. INCH		METRIC (S6)	USA INCH		INCH:	.787	.984	1.181	1.378	1.417	1.575	1.772	2.205	2.638	3.071	3.504	4.134	4.409	F	G	
MM SIZES	DECIMAL		MAX	MIN		MAX	MIN	METRIC:	-20	-25	-30	-35	-36	-40	-45	-56	-67	-78	-89	-105	-112	MM
22.01 - 26.00 7/8 - 1-1/64	.8665 - 1.0236 .8750 - 1.0156	35	35.059 - 35.043	1.3803 - 1.3796		HM-35	19.02					25.03		26.70							39	5
26.01 - 30.00 1-1/32 - 1-11/64	1.0240 - 1.1811 1.0313 - 1.1719	42	42.059 - 42.043	1.6559 - 1.6552		HM-42		25.45						30.88	39.23						46	5
30.01 - 35.00 1-3/16 - 1-3/8	1.1815 - 1.3780 1.1875 - 1.3750	48	48.059 - 48.043	1.8921 - 1.8915		HM-48		25.45						30.88	39.23						52	5
35.01 - 42.00 1-25/64 - 1-41/64	1.3783 - 1.6535 1.3906 - 1.6406	55	55.072 - 55.053	2.1682 - 2.1674		HM-55			36.34					49.21	63.03						59	5
42.01 - 48.00 1-21/32 - 1-7/8	1.6539 - 1.8898 1.6562 - 1.8750	62	62.072 - 62.053	2.4438 - 2.4430		HM-62				42.77				55.30	62.38						66	6
48.01 - 55.00 1-57/64 - 2-5/32	1.8902 - 2.1654 1.8906 - 2.1562	70	70.078 - 70.059	2.7590 - 2.7582		HM-70				61.73				71.06	76.52						74	6
55.01 - 63.00 2-5/32 - 2-15/32	2.1657 - 2.4803 2.1562 - 2.4687	78	78.078 - 78.059	3.0739 - 3.0732		HM-78					68.82				82.17	85.85					82	6
63.01 - 70.00 2-31/64 - 2-3/4	2.4807 - 2.7559 2.4843 - 2.7500	85	85.093 - 85.071	3.3501 - 3.3493		HM-85						92.28		116.40	121.87						90	6
70.01 - 78.00 2-3/4 - 3-1/16	2.7563 - 3.0709 2.7500 - 3.0625	95	95.093 - 95.071	3.7438 - 3.7430		HM-95							98.39			127.66		158.19			100	6
78.01 - 85.00 3-1/16 - 3-11/32	3.0713 - 3.3465 3.0625 - 3.3437	105	105.101 - 105.079	4.1378 - 4.1370		HM-105							108.36			133.77		158.19			110	6
85.01 - 95.00 3-11/32 - 3-47/64	3.3469 - 3.7402 3.3437 - 3.7344	115	115.101 - 115.079	4.5315 - 4.5307		HM-115								119.42				154.35		181.65	120	6
95.01 - 105.00 3-47/64 - 4-1/8	3.7406 - 4.1339 3.7344 - 4.1250	125	125.117 - 125.092	4.9259 - 4.9249		HM-125								135.04				172.64		203.51	130	6

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%

7-24-06 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

SFM Metric Slip Fit Renewable

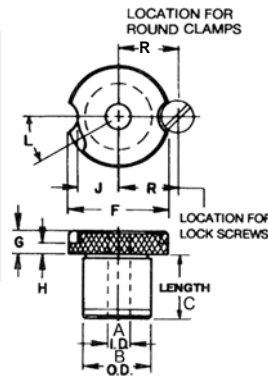
Slip Fit Renewable Type SFM Metric Bushings



METRIC Slip Fit Renewable SFM

Originated by **UNITED** Patent No. 3,606,566

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED, U.S.A. ANSI AND METRIC STANDARDS.



Three metric lengths are provided in most cases: Short, Medium and Long.

For the Metric World

RC-61-65 T.I.R. .012 (.0005 inch) MAX.
Used with LM or HLM LINERS.

EXAMPLE Order as: SFM-8-16-4 (TYPE-O.D.-LEN-I.D.)

Easy and Quick to change sizes of drill, reamer, tap or countersink. SFM Bushings are ideal for long run tool changes.

Used in production lines where multiple operations are performed such as drilling, reaming, countersink and tapping. Knurled for non-slip easy installation.

SFM accommodates Lock Screws and Round Clamps.

SFM LENGTHS measured UNDER the head.

A I.D. DRILL RANGE		METRIC NOM. O.D. MM.	B O.D. SIZE		ANSI SYMBOL	C SFM LENGTH UNDER HEAD / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM / ±.015")													
METRIC (G6) MM SIZES	U.S.A. INCH DECIMAL		METRIC (h5) MAX	USA INCH MIN		INCH:	.394	.472	.630	.787	.984	1.102	1.378	1.417	1.575	1.772	2.205	F	G
						METRIC:	-10	-12	-16	-20	-25	-28	-35	-36	-40	-45	-56	MM	MM
0.35 - 1.00 #80 - #61	.0138 - .0394 .0315 - .0390	8	8.000 - 7.994	.3150 - .3147	SFM-8	43.41		55.30										15	6
1.01 - 1.80 #60 - #50	.0398 - .0709 .0400 - .0700	8	8.000 - 7.994	.3150 - .3147	SFM-8	39.23		49.21										15	6
1.81 - 4.00 #49 - #22	.0713 - .1575 .0730 - .1570	8	8.000 - 7.994	.3150 - .3147	SFM-8	14.33		20.14										15	6
4.01 - 6.00 #21 - 15/64	.1579 - .2362 .1590 - .3125	10	10.000 - 9.994	.3937 - .3935	SFM-10		12.03		12.78	14.54								18	6
6.01 - 8.00 B - 5/16	.2366 - .3150 .2380 - .3125	12	12.000 - 11.992	.4724 - .4721	SFM-12		11.73		12.78	14.54								22	8
8.01 - 10.00 O - 25/64	.3154 - .3937 .3160 - .3906	15	15.000 - 14.992	.5906 - .5902	SFM-15			12.78		14.54		18.27						26	8
10.01 - 12.00 X - 15/32	.3941 - .4724 .3970 - .4687	18	18.000 - 17.992	.7087 - .7083	SFM-18			12.35		13.29		18.70						30	8
12.01 - 15.00 31/64 - 37/64	.4728 - .5906 .4843 - .5781	22	22.000 - 21.991	.8661 - .8658	SFM-22				16.22			19.63		19.63				34	10
15.01 - 18.00 19/32 - 45/64	.5909 - .7087 .5937 - .7031	26	26.000 - 25.991	1.0236 - 1.0233	SFM-26				16.22			19.10		21.28				39	10
18.01 - 22.00 23/32 - 55/64	.7091 - .8661 .7187 - .8594	30	30.000 - 29.991	1.1811 - 1.1807	SFM-30					25.03				31.20	47.07			46	10
22.01 - 26.00 7/8 - 1-1/64	.8665 - 1.0236 .8750 - 1.0156	35	35.000 - 34.989	1.3780 - 1.3775	SFM-35					25.03				31.20	47.07			52	10

FOR QUANTITY DISCOUNTS, SEE BELOW.

A I.D. DRILL RANGE		METRIC NOM. O.D. MM.	B O.D. SIZE		ANSI SYMBOL	C SFM LENGTH UNDER HEAD / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM / ±.015")													
METRIC (G6) MM SIZES	U.S.A. INCH DECIMAL		METRIC (h5) MAX	USA INCH MIN		INCH:	1.181	1.378	1.575	1.772	2.205	2.638	2.756	3.071	3.504	4.134	4.409	F	G
						METRIC:	-30	-35	-40	-45	-56	-67	-70	-78	-89	-105	-112	MM	MM
26.01 - 30.00 1-1/32 - 1-11/64	1.0240 - 1.1811 1.0313 - 1.1719	42	42.000 - 41.989	1.6535 - 1.6531	SFM-42	32.47				50.81	62.38							59	10
30.01 - 35.00 1-3/16 - 1-3/8	1.1815 - 1.3780 1.1875 - 1.3750	48	48.000 - 47.989	1.8898 - 1.8893	SFM-48	47.91				63.66	68.82							66	12
35.01 - 42.00 1-25/64 - 1-41/64	1.3783 - 1.6535 1.3906 - 1.6406	55	55.000 - 54.987	2.1654 - 2.1648	SFM-55	45.02				59.49	70.10							74	12
42.01 - 48.00 1-21/32 - 1-7/8	1.6539 - 1.8898 1.6562 - 1.8750	62	62.000 - 61.987	2.4409 - 2.4404	SFM-62		77.49			97.11		100.00						82	12
48.01 - 55.00 1-57/64 - 2-5/32	1.8902 - 2.1654 1.8906 - 2.1562	70	70.000 - 69.987	2.7559 - 2.7554	SFM-70		97.11			114.14		117.26						90	12
55.01 - 62.00 2-5/32 - 2-7/16	2.1657 - 2.4409 2.1562 - 2.4375	78	78.000 - 77.987	3.0709 - 3.0704	SFM-78			106.43				130.41		158.19				100	12
62.01 - 70.00 2-7/16 - 2-3/4	2.4413 - 2.7559 2.4375 - 2.7500	85	85.000 - 84.985	3.3465 - 3.3459	SFM-85			116.07				146.63		175.21				110	12
70.01 - 78.00 2-3/4 - 3-1/16	2.7563 - 3.0709 2.7500 - 3.0625	95	95.000 - 94.985	3.7402 - 3.7396	SFM-95				125.41				165.92		192.07			120	12
78.01 - 85.00 3-1/16 - 3-11/32	3.0713 - 3.3465 3.0625 - 3.3437	105	105.000 - 104.985	4.1339 - 4.1333	SFM-105				137.62				172.64		203.51			130	12

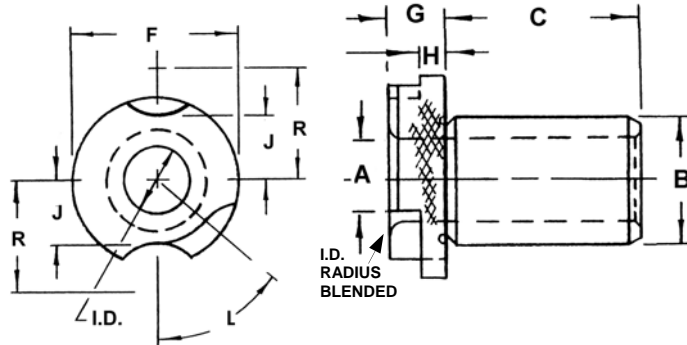
QTY DISCOUNT: | 1-2 LIST | 3-5 -6% | 6-11 -23% | 12-23 -30% | 24-49 -35% | 50-99 -42% | 100-199 -47% | 200-499 -51% | 500-999 -53% | 1000 & UP -56%

Lock Screws and Round Clamps for SFM

For SFM Bushings
Lock Screws & Clamps

For the Metric World

Slip Fixed Locking Dimensions



The Metric Bushing designed to please everyone!

Originated by **UNITED**
Patent No. 3,606,566

UNITED has the world's largest inventory of SF inch standards!



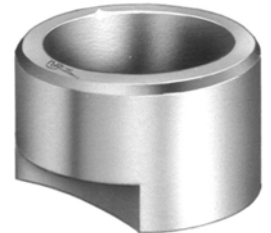
SFM

DIA. O.D. (h5)	ENTRANCE RADII MIN	HEAD DIA. (±0.4)	HEAD THICK (±0.4)	SLOT HT. (±0.13)	SLOT DISTANCE (±0.4)	MOUNTING LOCATION (±0.4)	LOCK SCREWS	ROUND CLAMPS
B MM	D MM	F MM	G MM	H MM	J MM	L	R MM	
8	0.4	15	6	3	4.5	65°	11.5	LSM-1 &-2 RCM-1 &-2
10	0.8	18	6	3	6	65°	13	LSM-1 &-2 RCM-1 &-2
12	0.8	22	8	4	7.5	60°	16	LSM-3 &-4 RCM-3 &-4
15	1.2	26	8	4	9.5	50°	18	LSM-3 &-4 RCM-3 &-4
18	1.2	30	8	4	11.5	50°	20	LSM-3 &-4 RCM-3 &-4
22	1.6	34	10	5.5	13	35°	23.5	LSM-5 &-6 RCM-5 &-6
26	1.6	39	10	5.5	15.5	35°	26	LSM-5 &-6 RCM-5 &-6
30	1.6	46	10	5.5	19	30°	29.5	LSM-5 &-6 RCM-5 &-6
35	2.4	52	10	5.5	22	30°	32.5	LSM-5 &-6 RCM-5 &-6
42	2.4	59	10	5.5	25.5	30°	36	LSM-5 &-6 RCM-5 &-6
48	2.4	66	12	7	28.5	30°	41	LSM-7 &-8 RCM-7 &-8
55	2.4	74	12	7	32.5	25°	45	LSM-7 &-8 RCM-7 &-8
62	2.4	82	12	7	36.5	25°	49	LSM-7 &-8 RCM-7 &-8
70	2.4	90	12	7	40.5	25°	53	LSM-7 &-8 RCM-7 &-8
78	2.4	100	12	7	45.5	25°	58	LSM-7 &-8 RCM-7 &-8
85	2.4	110	12	7	50.5	20°	63	LSM-7 &-8 RCM-7 &-8
95	2.4	120	12	7	55.5	20°	68	LSM-7 &-8 RCM-7 &-8
105	2.4	130	12	7	60.5	20°	73	LSM-7 &-8 RCM-7 &-8

Locate Lock Screws and Round Clamps

RCM METRIC ROUND CLAMPS
RCM-1 thru RCM-8

Dependable
Designed to Hold
Perfect for SFMs!



\$3.13 RCM

Please refer to Page A35 for complete specifications for Round Clamps and Lock Screws.

LSM METRIC LOCK SCREWS
LSM-1 thru LSM-8

For Close Hole Spacing
Black Oxide Finish



LSM
\$1.01

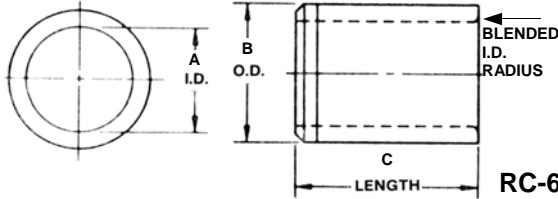
MINIMUM and MAXIMUM INSIDE DIAMETERS of Bushings in accordance with METRIC TOLERANCE CLASS G6.

- Inside Diameter (I.D.) is concentric to outside (O.D.) within .012 T.I.R. Metric or .0005 Inches.
- Surface Finish on I.D. is 0.4 micrometers or better.
- Hardness is 61-65 RC in the hole.
- Small I.D. Sizes thru 0.80 mm (.032 inch) may be counterbored to provide for lubrication and chip clearance.

METRIC DRILL SIZES	BUSHING AND DRILL I. D. TOLERANCES	EQUIVALENCY U.S.A. INCH	I. D. TOLERANCE FOR METRIC IN INCHES	I. D. REAMER SIZES METRIC	U.S.A. INCH
Up to 3mm	Nominal +0.002mm / +0.008mm	Up to .1181	Nominal +.0001 / +.0003	+0.006mm / +0.012mm	+0.002 / +.0005
3mm to 6mm	Nominal +0.004mm / +0.012mm	.1181 to .2362	Nominal +.0002 / +.0005	+0.010mm / +0.018mm	+0.004 / +.0007
6mm to 10mm	Nominal +0.005mm / +0.014mm	.2362 to .3937	Nominal +.0002 / +.0006	+0.013mm / +0.027mm	+0.005 / +.0010
10mm to 18mm	Nominal +0.006mm / +0.017mm	.3937 to .7087	Nominal +.0002 / +.0007	+0.016mm / +0.027mm	+0.006 / +.0011
18mm to 30mm	Nominal +0.007mm / +0.020mm	.7087 to 1.1811	Nominal +.0003 / +.0008	+0.020mm / +0.033mm	+0.008 / +.0014
30mm to 50mm	Nominal +0.009mm / +0.025mm	1.1811 to 1.9685	Nominal +.0004 / +.0010		
50mm to 80mm	Nominal +0.010mm / +0.029mm	1.9685 to 3.1496	Nominal +.0004 / +.0011		
80mm to 120mm	Nominal +0.012mm / +0.034mm	3.1496 to 4.7244	Nominal +.0005 / +.0013		

LM - Press Fit Metric Liners

Metric Liners Type LM Headless Press Fit



For the Metric World
Use With Slip Fixed
Renewable Bushings - SFMs
Specify LM Ground or LUM

RC-61-65 T.I.R. .012 (.0005 inch) MAX.

METRIC Headless Liners LM

LM Bushings are permanently pressed into fixtures or jig plates. Liners maintain precision permanent locations for SFM Slip Fixed Renewable Bushings, Slip Fit Locating Pins and Alignment Pins. Liners reduce wear on jig or fixture and are precision ground.

LM Bushings have blended entrance radii, concentric ground leads, and are manufactured from long wear premium steel for ease of press fit installation.

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED, U.S.A. ANSI AND METRIC STANDARDS.

EXAMPLE Order as: **LM-18-20-12 (TYPE - O.D. - LEN - I.D.)**

STANDARD METRIC LINER I.D.TOLERANCES		U.S.A. INCHES
6 to 10 MM	+0.005 / +0.014 MM	+0.0002 +.0006
10 to 18 MM	+0.006 / +0.017 MM	+0.0002 +.0007
18 to 30 MM	+0.007 / +0.020 MM	+0.0003 +.0008
30 to 50 MM	+0.009 / +0.025 MM	+0.0004 +.0010
50 to 80 MM	+0.010 / +0.029 MM	+0.0004 +.0011
80 to 120 MM	+0.012 / +0.034 MM	+0.0005 +.0013

A I.D. LINER			MET. NOM. O.D.	B O.D. SIZE				ANSI SYMBOL	C LM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC ±0.4 MM = ±.015"														FITS SFM BUSH				
NOM. MM	METRIC G6 ACTUAL	U.S.A. INCH DECIMAL		METRIC S6 MAX	MIN	USA INCH MAX	MIN		INCH: METRIC:	.394	.472	.630	.787	.984	1.102	1.181	1.378	1.417	1.575	1.772	2.205	2.638					
8	8.005 - 8.014	.3152 - .3156	12	12.039 - 12.028	.4740 - .4735	LM-12	7.97																		8		
10	10.005 - 10.014	.3939 - .3943	15	15.039 - 15.028	.5921 - .5917	LM-15		7.59																	10		
12	12.006 - 12.017	.4726 - .4731	18	18.039 - 18.028	.7102 - .7098	LM-18		8.20																	12		
15	15.006 - 15.017	.5908 - .5913	22	22.048 - 22.035	.8680 - .8675	LM-22				10.27				10.71											15		
18	18.006 - 18.017	.7089 - .7094	26	26.048 - 26.035	1.0255 - 1.0250	LM-26				10.27				10.90											18		
22	22.007 - 22.020	.8664 - .8669	30	30.048 - 30.035	1.1830 - 1.1825	LM-30						10.27										13.29			22		
26	26.007 - 26.020	1.0239 - 1.0244	35	35.059 - 35.043	1.3803 - 1.3796	LM-35							13.41									19.51		21.19	26		
30	30.007 - 30.020	1.1814 - 1.1818	42	42.059 - 42.043	1.6559 - 1.6552	LM-42																		22.86	28.37	30	
35	35.009 - 35.025	1.3784 - 1.3790	48	48.059 - 48.043	1.8921 - 1.8915	LM-48																		22.86	28.37	35	
42	42.009 - 42.025	1.6539 - 1.6545	55	55.072 - 55.053	2.1682 - 2.1674	LM-55																			25.65		42
48	48.009 - 48.025	1.8902 - 1.8908	62	62.072 - 62.053	2.4438 - 2.4430	LM-62																			40.83		48

FOR QUANTITY DISCOUNTS, SEE BELOW.

A I.D. LINER			MET. NOM. O.D.	B O.D. SIZE				ANSI SYMBOL	C LM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC ±0.4 MM = ±.015"														FITS SFM BUSH					
NOM. MM	METRIC G6 ACTUAL	U.S.A. INCH DECIMAL		METRIC S6 MAX	MIN	USA INCH MAX	MIN		INCH: METRIC:	.984	1.102	1.181	1.378	1.417	1.575	1.772	2.205	2.638	3.071	3.504	4.134	4.409						
55	55.010 - 55.029	2.1657 - 2.1665	70	70.078 - 70.059	2.7590 - 2.7582	LM-70																				50.81		55
62	62.010 - 62.029	2.4413 - 2.4420	78	78.078 - 78.059	3.0739 - 3.0732	LM-78																				64.31		62
70	70.010 - 70.029	2.7563 - 2.7570	85	85.093 - 85.071	3.3501 - 3.3493	LM-85																				81.67		70
78	78.010 - 78.029	3.0712 - 3.0719	95	95.093 - 95.071	3.7438 - 3.7430	LM-95																				86.50		78
85	85.012 - 85.034	3.3469 - 3.3478	105	105.101 - 105.079	4.1378 - 4.1370	LM-105																				90.68		85
95	95.012 - 95.034	3.7406 - 3.7415	115	115.101 - 115.079	4.5315 - 4.5307	LM-115																				100.65		95
105	105.012 - 105.034	4.1343 - 4.1350	125	125.117 - 125.092	4.9259 - 4.9249	LM-125																				116.40		105

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%

Metric NM and SCM Bushings for Plastic

Nurlock and Ser-Cast Metric

For the Metric World
 NM and SCM Bushings for Potting, Cast Tooling,
 Plastic and Soft Materials Installation

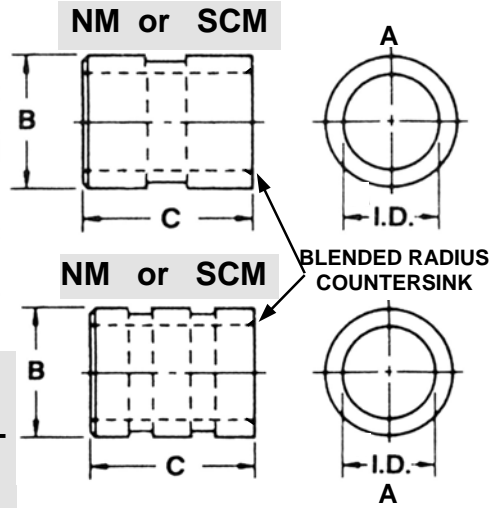


NM METRIC NURLOCK

1 Groove: 6 MM thru 16 MM long
 2 Grooves: 20 MM thru 36 MM long
 SPECIFY 'NM' FOR
 METRIC NURLOCK.

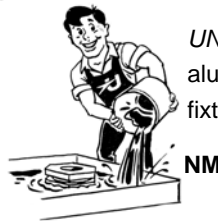


SCM
 METRIC SER-CAST
 SPECIFY 'SCM' FOR
 METRIC SER-CAST



NM and SCM METRIC Bushings For Plastic Tooling

UNITED's special **Nurlock Diamond Knurls** provide superior holding strength for Potted or Cast installation. They resist rotational and axial forces.



UNITED's special **Ser-Cast Serrations** allow pressing into aluminum, magnesium, masonite, soft materials or plastic fixtures while providing excellent holding strength.

For greatest accuracy, align and locate by I.D. for RC-61-65 IN THE HOLE

NM

Order as: NM-8-12-5 (TYPE-O.D.-LEN-I.D.)

ALL UNITED STANDARD BUSHINGS ARE MANUFACTURED TO UNITED.

A I.D. BUSHING		B O.D. SIZE				SELECT ANSI SYMBOL	C NM & SCM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM / ±.015")												
METRIC (G6) ACTUAL	U.S.A. INCH	NOM. O.D.	METRIC (s6)		USA INCH		INCH:	.236	.315	.354	.394	.472	.630	.787	.984	1.102	1.417		
METRIC SIZE	DECIMAL	MM	MAX	MIN	MAX	MIN	METRIC:	-6	-8	-9	-10	-12	-16	-20	-25	-28	-36		
1.00 - 1.80 #61 - #50	.0394 - .0709 .0390 - .0700	5	5.50 -	5.25	.217 -	.207	NM-5 SCM-5	25.65		28.52								NM & SCM SPECIFY TYPE. For PLASTIC Applications	
1.81 - 2.60 #49 - #38	.0713 - .1024 .0730 - .1015	5	5.50 -	5.25	.217 -	.207	NM-5 SCM-5	10.58		11.83									
2.61 - 3.30 #37 - #30	.1028 - .1299 .1040 - .1285	6	6.65 -	6.25	.262 -	.246	NM-6 SCM-6		8.20			8.62	10.79						
3.31 - 4.00 #29 - #22	.1303 - .1575 .1360 - .1570	7	7.68 -	7.25	.302 -	.285	NM-7 SCM-7		7.06			7.28	8.20						
4.01 - 5.00 #21 - #9	.1579 - .1969 .1590 - .1960	8	8.65 -	8.25	.341 -	.325	NM-8 SCM-8		6.24			6.64	7.28						
5.01 - 6.00 #8 - 15/64	.1972 - .2362 .1990 - .2344	10	10.65 -	10.25	.419 -	.404	NM-10 SCM-10				6.64		7.28	8.20					
6.01 - 8.00 B - 5/16	.2366 - .3150 .2380 - .3125	12	12.65 -	12.25	.498 -	.482	NM-12 SCM-12				6.64		7.28	8.20					
8.01 - 10.00 O - 25/64	.3154 - .3937 .3160 - .3906	15	15.65 -	15.25	.616 -	.600	NM-15 SCM-15					5.40		6.64	7.06				
10.01 - 12.00 X - 15/32	.3941 - .4724 .3970 - .4687	18	18.65 -	18.25	.734 -	.719	NM-18 SCM-18					5.82		6.64	7.28				
12.01 - 15.00 31/64 - 37/64	.4728 - .5906 .4843 - .5781	22	22.65 -	22.25	.892 -	.876	NM-22 SCM-22						8.20			8.62	9.43		
15.01 - 18.00 19/32 - 45/64	.5909 - .7087 .5937 - .7031	26	26.65 -	26.25	1.049 -	1.033	NM-26 SCM-26						8.20			9.76	10.90		
METRIC:							-6	-8	-9	-10	-12	-16	-20	-25	-28	-36			
NUMBER of GROOVES:							1	1	1	1	1	1	1	2	2	2	2		

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%

Ser-Press Metric

For the Metric World
SPM Bushings for Potting, Cast Tooling, Plastic
and Soft Materials Installation

Metric Ser-Press
Bushings for Plastic

SER-PRESS prevents spin out EASY PRESS IN — On Soft Materials

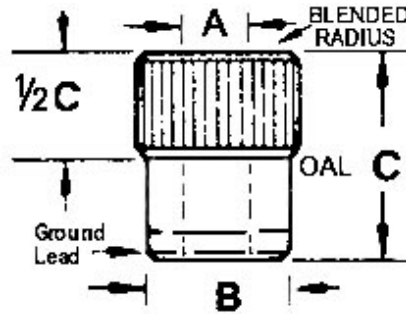
UNITED's SPM Ser-Press Bushing was designed to be pressed into plastic jigs and fixtures. Simultaneously the outside diameter has a ground finish, creating ideal pressing into aluminum, magnesium, masonite and wood.

UNITED's special **Ser-Press Serrations** hold firmly and prevent rotation while resisting axial forces. Serrations are .25MM to .65MM larger than ground O.D. diameter.

One-half of the SPM Bushing consists of serrations, and one-half is Press Fit.

Ser-Press Bushings are often used in holes drilled in imbedments. Allow adequate interference in your hole preparation to hold the SPM firmly. Allow for chip clearance in your standoff.

Refer to our Jig Bore Chart on page A24.



SPM
METRIC SER-PRESS
SPECIFY 'SPM' FOR
METRIC SER-PRESS

EXAMPLE Order as:
SPM-12-16-8 (TYPE-O.D.-LEN-I.D.)

ALL UNITED STANDARD BUSHINGS ARE
MANUFACTURED TO UNITED, U.S.A. ANSI AND
METRIC STANDARDS.

FOR QUANTITY DISCOUNTS, SEE BELOW.

SPM METRIC Bushings For Plastic Tooling

RC-61-65 IN THE HOLE

T.I.R. .012 Max (.0005 inch)

A I.D. BUSHING		B O.D. SIZE				ANSI	C SPM LENGTH OVERALL / ANSI LENGTH SYMBOL FOR METRIC (±0.4 MM / ±.015")										
METRIC (G6) ACTUAL	U.S.A. INCH	NOM. O.D. MM	METRIC (s6)		USA INCH		INCH:	.236	.315	.354	.394	.472	.630	.787	.984	1.102	1.417
METRIC SIZE	DECIMAL		MAX	MIN	MAX MIN	METRIC:	-6	-8	-9	-10	-12	-16	-20	-25	-28	-36	
INCH SIZE																	
1.00 - 1.80 #61 - #50	.0394 - .0709 .0390 - .0700	5	5.000 - 4.995		.1969 - .1967	SPM-5	29.71		34.91								
1.81 - 2.60 #49 - #38	.0713 - .1024 .0730 - .1015	5	5.000 - 4.995		.1969 - .1967	SPM-5	12.26		14.54								
2.61 - 3.30 #37 - #30	.1028 - .1299 .1040 - .1285	6	6.000 - 5.995		.2362 - .2360	SPM-6	10.27				11.73	13.08					
3.31 - 4.00 #29 - #22	.1303 - .1575 .1360 - .1570	7	7.000 - 6.995		.2756 - .2754	SPM-7	8.31				9.14	9.99					
4.01 - 5.00 #21 - #9	.1579 - .1969 .1590 - .1960	8	8.000 - 7.994		.3150 - .3147	SPM-8	8.38				9.14	9.99					
5.01 - 6.00 #8 - 15/64	.1972 - .2362 .1990 - .2344	10	10.000 - 9.994		.3937 - .3935	SPM-10				7.97		8.71	9.99				
6.01 - 8.00 B - 5/16	.2366 - .3150 .2380 - .3125	12	12.000 - 11.992		.4724 - .4721	SPM-12				7.97		8.71	9.99				
8.01 - 10.00 O - 25/64	.3154 - .3937 .3160 - .3906	15	15.000 - 14.992		.5906 - .5902	SPM-15					7.35		8.31	8.71			
10.01 - 12.00 X - 15/32	.3941 - .4724 .3970 - .4687	18	18.000 - 17.992		.7087 - .7083	SPM-18					7.97		9.14	10.27			
12.01 - 15.00 31/64 - 37/64	.4728 - .5906 .4843 - .5781	22	22.000 - 21.991		.8661 - .8658	SPM-22						9.99				10.27	12.47
15.01 - 18.00 19/32 - 45/64	.5909 - .7087 .5937 - .7031	26	26.000 - 25.991		1.0236 - 1.0233	SPM-26						9.99				10.58	11.32

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%

7-31-06

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

A33

**HGM and FGM
Bushings for Plastic**

Plastic Tooling Specialty Metric Bushings

For the Metric World



**HGM
HEXGRIP
HAS ONLY
ONE FLANGE**

**METRIC
HEXGRIP
ELIMINATES
MOST SPIN OUT**

BLENDED RADIUS

ALL UNITED STANDARD BUSHINGS
ARE MANUFACTURED TO UNITED, U.
S.A. ANSI AND METRIC STANDARDS.

RC-61-65 in the hole

EXAMPLE Order As:
HGM-12-16-8
(TYPE-O.D.-LEN-I.D.)



**METRIC
FLANGE
GROOVE
HAS
SUPERIOR
HOLD**

**FGM FLANGE GROOVE
HAS ONE TO FOUR GROOVES**

10MM LENGTH HAS 1 .093" GROOVE
12MM LENGTH HAS 1 .125" GROOVE
19MM LENGTH HAS 2 .125" GROOVES
25MM LENGTH HAS 3 .125" GROOVES
35MM LENGTH HAS 4 .125" GROOVES

SPECIFY 'HGM' FOR HEX GRIP

SPECIFY 'FGM' FOR FLANGE GROOVE

FOR QUANTITY DISCOUNTS, SEE BELOW.

*The Best Hold
Out in Potted
Bushings!*

A I.D. DRILL RANGE				B Body O.D. SIZE		FLANGE O.D. HEX*	ANSI SYMBOL	C OVERALL LENGTH ANSI LENGTH SYMBOL ±.50MM (±.020")				
METRIC (G6)		U.S.A INCH		METRIC (s6) NOM.	U.S.A INCH DECIMAL			±0.50 MM (SEE BELOW)	ANSI LENGTH SYMBOL			
NOMINAL	DECIMAL	NOMINAL	DECIMAL				INCH:	3/8	1/2	3/4	1"	1-3/8
							METRIC:	-10	-12	-20	-25	-35
1.30MM - 1.60MM	.0512 - .0630	#55 - 1/16	.0520 - .0625	7MM	.290 - .270	8MM	HGM-8 OR FGM-8	21.08	18.70	23.68	28.37	32.47
1.65MM - 2.50MM	.0650 - .0984	#52 - #39	.0635 - .0995	7MM	.290 - .270	8MM	HGM-8 OR FGM-8	10.17	10.39	11.63	12.91	
2.55MM - 4.90MM	.1004 - .1929	#38 - 9/64	.1015 - .1406	7MM	.290 - .270	8MM	HGM-8 OR FGM-8	8.62	10.48	11.63	12.47	
3.40MM - 4.90MM	.1339 - .1929	#29 - #10	.1360 - .1935	11MM	.447 - .427	12MM	HGM-12 OR FGM-12	7.28	7.28	8.10	9.86	13.41
4.90MM - 6.50MM	.1929 - .2559	#9 - F	.1960 - .2570	11MM	.447 - .427	12MM	HGM-12 OR FGM-12	6.64	6.74	7.35	8.62	9.86
6.50MM - 8.80MM	.2559 - .3465	F - 5/16	.2570 - .3125	12MM	.510 - .490	16MM	HGM-16 OR FGM-16	6.64	6.74	7.35	8.62	9.86
6.60MM - 8.70MM	.2598 - .3425	G - 11/32	.2610 - .3437	16MM	.635 - .615	20MM	HGM-20 OR FGM-20	6.64	6.74	7.35	8.62	9.86
8.40MM - 16.50MM	.3307 - .6496	Q - 21/32	.3320 - .6562	22MM	.885 - .865	25MM	HGM-25 OR FGM-25	9.14	8.10	7.72	8.62	9.86
16.00MM - 19.50MM	.6299 - .7677	41/64 - 49/64	.6406 - .7656	27MM	1.072 - 1.052	35MM	HGM-35 OR FGM-35		7.91	8.62	8.94	9.86
19.00MM - 26.00MM	.7480 - 1.0236	3/4 - 1-1/32	.7500 - 1.0312	35MM	1.385 - 1.365	45MM	HGM-45 OR FGM-45		13.08	11.11	13.08	14.86
I. D.				O. D.			ANSI	-10	-12	-20	-25	-35

*HEX INCH STOCK IS READILY AVAILABLE IN THE U.S.A.

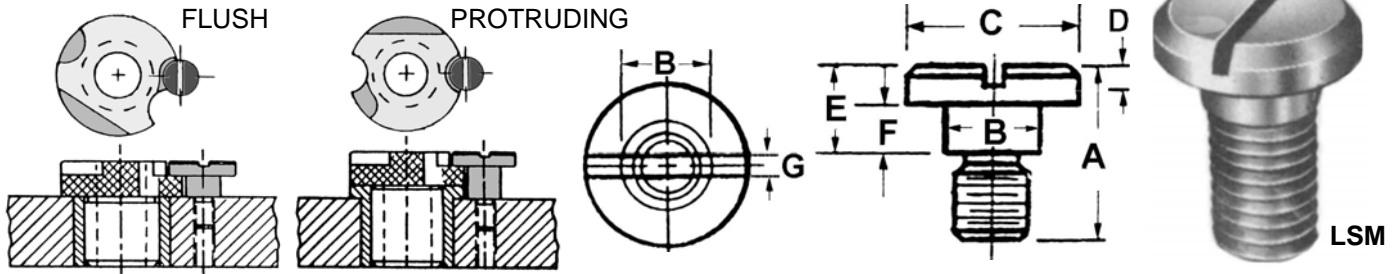
METRIC HEX BAR STOCK IS *NOT* READILY AVAILABLE!

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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Metric Lock Screws and Round Clamps

Metric Lock Screws
Metric Round Clamps

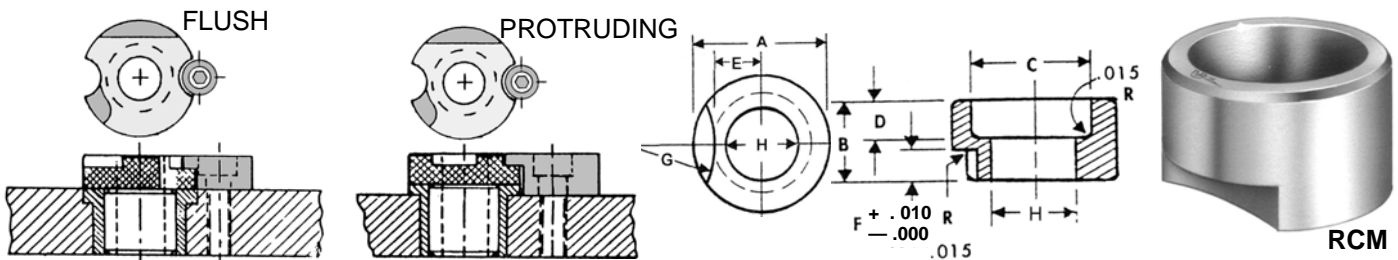
METRIC LOCK SCREWS for Slip-Fixed Renewable



METRIC LOCK SCREWS for STANDARD MOUNTING of Slip-Fixed Renewable Bushings																	\$ 0.80	
LOCK SCREW	SFM BUSHING BODY DIAMETER		A OVERALL LENGTH		B SHOULDER DIAMETER		C HEAD DIAMETER		D SLOT DEPTH		E HEIGHT INCL HEAD		F HEIGHT UNDER HD		G SLOT WIDTH		THREAD	
			MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH		
LSM-1	8 to 10	.3150 to .3937	15	.591	7.5	.295	13	.512	2	.079	6	.236	3	.118	1.6	.063	M5 x 0.8	
LSM-3	12 to 18	.4724 to .7087	18	.709	9.5	.374	16	.630	2.5	.098	8	.315	4	.157	2	.079	M6 x 1	
LSM-5	22 to 42	.8661 to 1.6535	22	.866	12	.472	20	.787	3	.118	10	.394	5.5	.217	2.5	.098	M8 x 1.25	
LSM-7	48 to 55	1.8898 to 2.1654	32	1.260	15	.591	24	.945	3	.118	12	.472	7	.276	2.5	.098	M10 x 1.5	

METRIC LOCK SCREWS for PROJECTED MOUNTING of Slip-Fixed Renewable Bushings																	\$ 0.90	
LOCK SCREW	SFM BUSHING BODY DIAMETER		A OVERALL LENGTH		B SHOULDER DIAMETER		C HEAD DIAMETER		D SLOT DEPTH		E HEIGHT INCL HEAD		F HEIGHT UNDER HD		G SLOT WIDTH		THREAD	
			MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH		
LSM-2	8 to 10	.3150 to .3937	18	.709	7.5	.295	13	.512	2	.079	9	.354	6	.236	1.6	.063	M5 x 0.8	
LSM-4	12 to 18	.4724 to .7087	22	.866	9.5	.374	16	.630	2.5	.098	12	.472	8	.315	2	.079	M6 x 1	
LSM-6	22 to 42	.8661 to 1.6535	27	1.063	12	.472	20	.787	3	.118	15	.591	10.5	.413	2.5	.098	M8 x 1.25	
LSM-8	48 to 55	1.8898 to 2.1654	38	1.496	15	.591	24	.945	3	.118	18	.709	13	.512	2.5	.098	M10 x 1.5	

METRIC ROUND CLAMPS for Slip-Fixed Renewable Bushings



METRIC ROUND CLAMPS for STANDARD MOUNTING of Slip-Fixed Renewable Bushings																	\$ 3.13		
ROUND CLAMP	SFM BUSHING BODY DIAMETER		A OUTSIDE DIAMETER		B OVERALL HEIGHT		C COUNTER-BORE DIA.		D COUNTER-BORE DEPTH		E SLOT DISTANCE		F CLAMPING HEIGHT		G RADIUS		H HOLE DIAMETER		USE WITH SOCKET HEAD CAP SCREW
			MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	
RCM-1	8 to 10	.3150 to .3937	13	.512	8	.315	10	.394	4	.157	3.7	.146	3	.118	9.5	.375	5.4	.213	M5 x 0.8
RCM-3	12 to 18	.4724 to .7087	16	.630	10	.394	12	.472	5	.197	4.7	.185	4	.157	15	.591	6.4	.252	M6 x 1
RCM-5	22 to 42	.8661 to 1.6535	20	.787	12	.472	15	.591	5	.197	6.2	.244	5.5	.217	30	1.181	8.4	.331	M8 x 1.25
RCM-7	48 to 55	1.8898 to 2.1654	24	.945	16	.630	18	.709	7	.276	7.5	.295	7	.276	80	3.150	10.5	.413	M10 x 1.5

METRIC ROUND CLAMPS for PROJECTED MOUNTING of Slip-Fixed Renewable Bushings																	\$ 3.13		
ROUND CLAMP	SFM BUSHING BODY DIAMETER		A OUTSIDE DIAMETER		B OVERALL HEIGHT		C COUNTER-BORE DIA.		D COUNTER-BORE DEPTH		E SLOT DISTANCE		F CLAMPING HEIGHT		G RADIUS		H HOLE DIAMETER		USE WITH SOCKET HEAD CAP SCREW
			MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	
RCM-2	8 to 10	.3150 to .3937	13	.512	11	.433	10	.394	4	.157	3.7	.146	6	.236	9.5	.375	5.4	.213	M5 x 0.8
RCM-4	12 to 18	.4724 to .7087	16	.630	14	.551	12	.472	5	.197	4.7	.185	8	.315	15	.591	6.4	.252	M6 x 1
RCM-6	22 to 42	.8661 to 1.6535	20	.787	17	.669	15	.591	5	.197	6.2	.244	10.5	.413	30	1.181	8.4	.331	M8 x 1.25
RCM-8	48 to 55	1.8898 to 2.1654	24	.945	22	.866	18	.709	7	.276	7.5	.295	13	.512	80	3.150	10.5	.413	M10 x 1.5