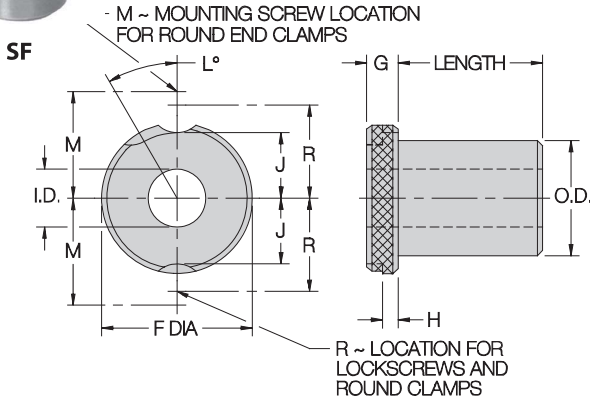
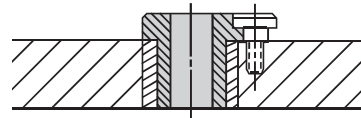


# SLIP/FIXED RENEWABLE BUSHINGS



## APPLICATIONS:

Replaceable bushing generally used with a liner bushing and lock screw. Use when you expect to replace bushings during the tooling's lifetime, or when you want to switch bushings to perform multi-step operations with the same tooling. SF bushings combine the benefits of older S-type slip-renewable and F-type fixed-renewable bushings: One side has a small recess for fixed mounting; the other has a locking recess that allows the bushing to slip down, then lock in place by rotating it. S and F types are now obsolete and combination SF bushings will be furnished at no extra charge.



## ORDERING EXAMPLES:

- SF-20-16-.1250 Standard inch bushing, inch ID
- SF-20-16-.1772 Standard inch bushing, mm ID (.1772 = 4.50mm)
- SF-20-16-.1250 REAMER Reamer tolerance on ID
- SF-20-16-.1250 NCB No counterbore on long bushings marked with \* (no counterbore is standard on all other bushings)
- SFC-20-16-.1250 Carbide bushing
- SFM-8-16-4.50 Standard metric bushing

Standard prices apply only to bushings with a standard-drill-size ID within the stated ID range. See catalog back cover for standard drill sizes and their decimal equivalents. For prices on non-standard ID sizes, including reamer-tolerance and tap-guide bushings, please contact factory.

## INCH

BODY OD	F DIA	G	H	J	L	M	R	LOCK SCREW
3/16	5/16	3/16	3/32	3/32	55°		17/64	LS-0
1/4	7/16	1/4	1/8	9/64	30°		23/64	TW-2
5/16	35/64			11/64	65°	5/8	1/2	LS-1
3/8	5/8			15/64	30°		29/64	TW-2
7/16	5/8			15/64	30°		29/64	TW-2
1/2	51/64			19/64	65°	3/4	5/8	LS-1
9/16	7/8			23/64	65°		37/64	TW-2
5/8	7/8			23/64	30°		37/64	TW-2
3/4	1-3/64			27/64	50°	7/8	3/4	LS-1
7/8	1-1/4			31/64	30°		53/64	TW-7
1	1-27/64			19/32	35°	1-7/64	59/64	LS-2
1-1/4	1-5/8	43/64	30°		1-1/64			
1-3/8	1-51/64	25/32	30°	1-19/64	1-7/64			
1-1/2	1-7/8	51/64	30°		1-9/64	LS-3		
1-3/4	2-19/64	1	30°	1-41/64	1-25/64			
2-1/4	2-51/64	1-1/4	25°	1-57/64	1-41/64			

## METRIC

8mm	15mm	6mm	3mm	4.5mm	65°		11.5mm	LSM-1
10mm	18mm			6mm	65°		13mm	LSM-2
12mm	22mm	8mm	4mm	7.5mm	60°		16mm	LSM-3
15mm	26mm			9.5mm	50°		18mm	LSM-4
18mm	30mm			11.5mm	50°		20mm	
22mm	34mm	10mm	5.5mm	13mm	35°		23.5mm	LSM-5 LSM-6
26mm	39mm			15.5mm	35°		26mm	
30mm	46mm			19mm	30°		29.5mm	
35mm	52mm			22mm	30°		32.5mm	
42mm	59mm			25.5mm	30°		36mm	
48mm	66mm	12mm	7mm	28.5mm	30°		41mm	LSM-7 LSM-8
55mm	74mm			32.5mm	25°		45mm	
62mm	82mm			36.5mm	25°		49mm	
70mm	90mm			40.5mm	25°		53mm	
78mm	100mm			45.5mm	25°		58mm	
85mm	110mm			50.5mm	20°		63mm	
95mm	120mm			55.5mm	20°		68mm	
105mm	130mm			60.5mm	20°		73mm	

## STANDARD ID TOLERANCES:

From #80 to 1/4"	+0.001/+0.0004	From .35 to 3mm	+0.002/+0.008mm
Over 1/4 to 3/4"	+0.001/+0.0005	Over 3 to 6mm	+0.004/+0.012mm
Over 3/4 to 1-1/2"	+0.002/+0.0006	Over 6 to 10mm	+0.005/+0.014mm
Over 1-1/2 to 2-3/4"	+0.003/+0.0007	Over 10 to 18mm	+0.006/+0.017mm
		Over 18 to 30mm	+0.007/+0.020mm
		Over 30 to 50mm	+0.009/+0.025mm
		Over 50 to 80mm	+0.010/+0.029mm
		Over 80 to 120mm	+0.012/+0.034mm
			(G6 tolerance)

## REAMER ID TOLERANCES:

From #60 to 1/4"	+0.005/+0.0008	From 1 to 3mm	+0.006/+0.012mm
Over 1/4 to 1"	+0.006/+0.0010	Over 3 to 6mm	+0.010/+0.018mm
Over 1 to 1-1/2"	+0.008/+0.0012	Over 6 to 10mm	+0.013/+0.022mm
		Over 10 to 18mm	+0.016/+0.027mm
		Over 18 to 30mm	+0.020/+0.033mm
			(F6 tolerance)

# SLIP/FIXED RENEWABLE BUSHINGS

ID RANGE	OD	LENGTH	ANSI PART NO.	LOCK SCREW
<b>.0135-.0291</b> #80-#70 .35-.70mm	<b>3/16</b> .1875-.1873	*1/4	SF-12-4	LS-0
		*5/16	SF-12-5	
		*3/8	SF-12-6	
		*1/2	SF-12-8	
		*5/8	SF-12-10	
		*3/4	SF-12-12	
<b>.0292-.0519</b> #69-3/64 .75-1.25mm		1/4	SF-12-4	
		*5/16	SF-12-5	
		*3/8	SF-12-6	
		*1/2	SF-12-8	
		*5/8	SF-12-10	
		*3/4	SF-12-12	
<b>.0520-.0634</b> #55-1/16 1.30-1.60mm		1/4	SF-12-4	
		*5/16	SF-12-5	
		*3/8	SF-12-6	
		*1/2	SF-12-8	
		*5/8	SF-12-10	
		*3/4	SF-12-12	
<b>.0635-.0980</b> #52-#40 1.65-2.50mm		1/4	SF-12-4	
		*5/16	SF-12-5	
		*3/8	SF-12-6	
		*1/2	SF-12-8	
		*5/8	SF-12-10	
		*3/4	SF-12-12	
<b>.0995-.1405</b> #39-#28 2.55-3.50mm	1/4	SF-16-4	TW-2	
	5/16	SF-16-5		
	*3/8	SF-16-6		
	*1/2	SF-16-8		
	*5/8	SF-16-10		
	*3/4	SF-16-12		

ID RANGE	OD	LENGTH	ANSI PART NO.	LOCK SCREW
<b>.0135-.0291</b> #80-#70 .35-.70mm	<b>5/16</b> .3125-.3123	*1/4	SF-20-4	LS-1 RC-01 RK-10
		*5/16	SF-20-5	
		*3/8	SF-20-6	
		*1/2	SF-20-8	
		*3/4	SF-20-12	
		*5/16	SF-20-5	
<b>.0292-.0519</b> #69-3/64 .75-1.30mm		*3/8	SF-20-6	
		*1/2	SF-20-8	
		*3/4	SF-20-12	
		*5/16	SF-20-5	
		*3/8	SF-20-6	
		*1/2	SF-20-8	
<b>.0520-.0634</b> #55-1/16 1.35-1.60mm		*3/4	SF-20-12	
		5/16	SF-20-5	
		*3/8	SF-20-6	
		*1/2	SF-20-8	
		*3/4	SF-20-12	
		*1	SF-20-16	
<b>.0635-.0934</b> #52-#43 1.65-2.35mm		5/16	SF-20-5	
		3/8	SF-20-6	
		*1/2	SF-20-8	
		*3/4	SF-20-12	
		*1	SF-20-16	
		*1-3/8	SF-20-22	
<b>.0935-.1249</b> #42-#31 2.40-3.15mm	5/16	SF-20-5		
	3/8	SF-20-6		
	*1/2	SF-20-8		
	*3/4	SF-20-12		
	*1	SF-20-16		
	*1-3/8	SF-20-22		
<b>.1250-.1935</b> 1/8-#10 3.20-4.90mm	5/16	SF-20-5		
	3/8	SF-20-6		
	1/2	SF-20-8		
	5/8	SF-20-10		
	*3/4	SF-20-12		
	*1	SF-20-16		
<b>.1935-.2280</b> #10-#1 4.90-5.80mm	*1-3/8	SF-20-22		
	1/4	SF-24-4	TW-2	
	5/16	SF-24-5		
	3/8	SF-24-6		
	1/2	SF-24-8		
	5/8	SF-24-10		
3/4	SF-24-12			
<b>.2340-.2900</b> A-L 5.90-7.40mm	*1	SF-24-16		
	1/4	SF-28-4	TW-2	
	5/16	SF-28-5		
	3/8	SF-28-6		
	1/2	SF-28-8		
	5/8	SF-28-10		
3/4	SF-28-12			
		*1	SF-28-16	

\* **INFO+**: Counterbored, leaving correct drill-bearing length and clearance (see page 537 for bearing length).

CONTINUED ON NEXT PAGE

# SLIP/FIXED RENEWABLE BUSHINGS

ID RANGE	OD	LENGTH	ANSI PART NO.	LOCK SCREW
<b>.1405-.1889</b> #28-3/16 3.60-4.75mm	<b>1/2</b> .5000-.4998	5/16	SF-32-5	LS-1 RC-01 RK-01 RK-10
		3/8	SF-32-6	
		1/2	SF-32-8	
		*3/4	SF-32-12	
		*1	SF-32-16	
		*1-3/8	SF-32-22	
		*1-1/2	SF-32-24	
		*1-3/4	SF-32-28	
<b>.1890-.3438</b> #12-11/32 4.80-8.70mm	<b>1/2</b> .5000-.4998	5/16	SF-32-5	LS-1 RC-01 RK-01 RK-10
		3/8	SF-32-6	
		1/2	SF-32-8	
		3/4	SF-32-12	
		*1	SF-32-16	
		*1-3/8	SF-32-22	
		*1-1/2	SF-32-24	
		*1-3/4	SF-32-28	
<b>.2950-.3438</b> M-11/32 7.50-8.80mm	<b>9/16</b> .5625-.5623	1/4	SF-36-4	TW-2
		5/16	SF-36-5	
		3/8	SF-36-6	
		1/2	SF-36-8	
		5/8	SF-36-10	
		3/4	SF-36-12	
		1	SF-36-16	
<b>.3480-.4375</b> S-7/16 8.90-11.00mm	<b>5/8</b> .6250-.6248	3/8	SF-40-6	TW-2
		1/2	SF-40-8	
		5/8	SF-40-10	
		3/4	SF-40-12	
		1	SF-40-16	
		1-1/4	SF-40-20	
<b>.2812-.5625</b> 9/32-9/16 7.20-14.00mm	<b>3/4</b> .7500-.7498	3/8	SF-48-6	LS-1 RC-01 RK-01 RK-11
		1/2	SF-48-8	
		3/4	SF-48-12	
		1	SF-48-16	
		1-3/8	SF-48-22	
		1-1/2	SF-48-24	
		1-3/4	SF-48-28	
		2-1/8	SF-48-34	
		*2-1/2	SF-48-40	
*3	SF-48-48			
<b>.5469-.6562</b> 35/64-21/32 13.50-16.50mm	<b>7/8</b> .8750-.8748	1/2	SF-56-8	TW-7
		5/8	SF-56-10	
		3/4	SF-56-12	
		1	SF-56-16	
		1-1/4	SF-56-20	
		1-1/2	SF-56-24	
<b>.4688-.7812</b> 15/32-25/32 12.00-19.50mm	<b>1</b> 1.0000-.9998	1/2	SF-64-8	LS-2 RC-02 RK-02 RK-12
		3/4	SF-64-12	
		1	SF-64-16	
		1-3/8	SF-64-22	
		1-1/2	SF-64-24	
		1-3/4	SF-64-28	
		2-1/8	SF-64-34	
		2-1/2	SF-64-40	
3	SF-64-48			

\* **INFO+:** Counterbored, leaving correct drill-bearing length and clearance (see page 537 for bearing length).

ID RANGE	OD	LENGTH	ANSI PART NO.	LOCK SCREW
<b>.7188-1.0625</b> 23/32-1-1/16 18.50-27.00mm	<b>1-3/8</b> 1.3750-1.3747	3/4	SF-88-12	LS-2 RC-02 RK-02 RK-12
		1	SF-88-16	
		1-3/8	SF-88-22	
		1-1/2	SF-88-24	
		1-3/4	SF-88-28	
		2-1/8	SF-88-34	
		2-1/2	SF-88-40	
		3	SF-88-48	
<b>.9688-1.4062</b> 31/32-1-13/32 25.00-35.00mm	<b>1-3/4</b> 1.7500-1.7497	3/4	SF-112-12	LS-3 RC-03 RK-03 RK-14
		1	SF-112-16	
		1-3/8	SF-112-22	
		1-1/2	SF-112-24	
		1-3/4	SF-112-28	
		2-1/8	SF-112-34	
		2-1/2	SF-112-40	
		3	SF-112-48	
<b>1.3438-1.8750</b> 1-11/32-1-7/8 35.00-47.00mm	<b>2-1/4</b> 2.2500-2.2496	3/4	SF-144-12	LS-3 RC-03 RK-03 RK-14
		1	SF-144-16	
		1-3/8	SF-144-22	
		1-1/2	SF-144-24	
		1-3/4	SF-144-28	
		2-1/8	SF-144-34	
		2-1/2	SF-144-40	
		3	SF-144-48	

For extended-range bushings (larger sizes) please see our web catalog.