

SF Coolant Chipbreaker Bushings

Slip Fit Renewed Direct Coolant Bushings with Chipbreakers

MANUFACTURED AS ORDERED FROM SEMI-FINISHED
RC-61-65

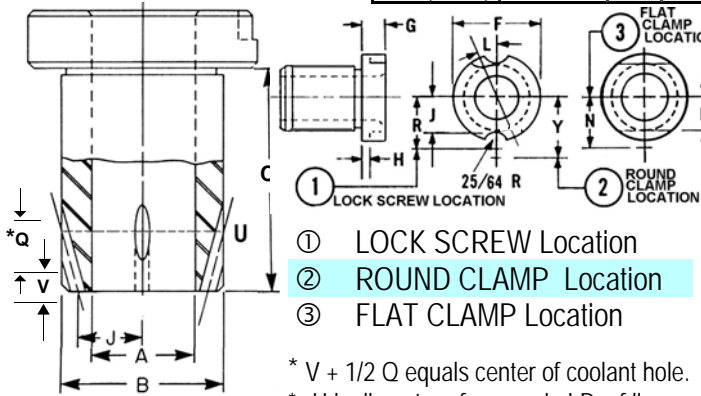
SF-DC DIRECTED COOLANT



SF-DCB DIRECTED COOLANT CHIPBREAKER

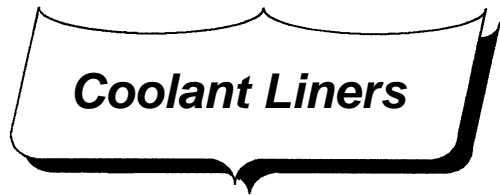


A I.D. RANGE	B O.D. BODY	C LEN UNDER HEAD	SF COOLANT BUSHING	SF CHIPBREAKER BUSHING	*V	*Q	*U	4 HOLES	J	ADD 'U' for UNGROUND HEAD- LESS —LINERS TO USE— WITH HEAD	
1/16 (.0625) TO #43 (.0890)	NOM 5/16 ACTUAL .3125/.3123	3/4	SF-20-12-DC	SF-20-12-DCB	5/32	3/16	25/64	#51	5/64	L-32-8-DC	HL-32-8-DC
		1"	SF-20-16-DC	SF-20-16-DCB	5/32	3/16	25/64	#51	5/64	L-32-12-DC	HL-32-12-DC
		1-3/8	SF-20-22-DC	SF-20-22-DCB	5/32	3/16	25/64	#51	5/64	L-32-16-DC	HL-32-16-DC
#42 (.0935) TO #10 (.1935)	NOM 5/16 ACTUAL .3125/.3123	3/4	SF-20-12-DC	SF-20-12-DCB	5/32	3/16	25/64	#51	5/64	L-32-8-DC	HL-32-8-DC
		1"	SF-20-16-DC	SF-20-16-DCB	5/32	3/16	25/64	#51	5/64	L-32-12-DC	HL-32-12-DC
		1-3/8	SF-20-22-DC	SF-20-22-DCB	5/32	3/16	25/64	#51	5/64	L-32-16-DC	HL-32-16-DC
#28 (.1405) TO 11/32 (.3437)	NOM 1/2 ACTUAL .5000/.4998	3/4	SF-32-12-DC	SF-32-12-DCB	5/32	3/16	39/64	3/32	9/64	L-48-8-DC	HL-48-8-DC
		1"	SF-32-16-DC	SF-32-16-DCB	7/32	5/16	19/32	3/32	9/64	L-48-12-DC	HL-48-12-DC
		1-3/8	SF-32-22-DC	SF-32-22-DCB	7/32	5/16	19/32	3/32	9/64	L-48-16-DC	HL-48-16-DC
		1-3/4	SF-32-28-DC	SF-32-28-DCB	7/32	5/16	19/32	3/32	9/64	L-48-22-DC	HL-48-22-DC
		2-1/8	SF-32-34-DC	SF-32-34-DCB	7/32	5/16	19/32	3/32	9/64	L-48-28-DC	HL-48-28-DC
9/32 (.2812) TO 9/16 (.5625)	NOM 3/4 ACTUAL .7500/.7498	1"	SF-48-16-DC	SF-48-16-DCB	7/32	5/16	55/64	#37	17/64	L-64-12-DC	HL-64-12-DC
		1-3/8	SF-48-22-DC	SF-48-22-DCB	7/32	5/16	55/64	#37	17/64	L-64-16-DC	HL-64-16-DC
		1-3/4	SF-48-28-DC	SF-48-28-DCB	7/32	5/16	55/64	#37	17/64	L-64-22-DC	HL-64-22-DC
		2-1/8	SF-48-34-DC	SF-48-34-DCB	7/32	5/16	55/64	#37	17/64	L-64-28-DC	HL-64-28-DC
		2-1/2	SF-48-40-DC	SF-48-40-DCB	7/32	5/16	55/64	#37	17/64	L-64-34-DC	HL-64-34-DC
15/32 (.4687) TO 25/32 (.7812)	NOM 1" ACTUAL 1.0000 / .9998	1"	SF-64-16-DC	SF-64-16-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-12-DC	HL-88-12-DC
		1-3/8	SF-64-22-DC	SF-64-22-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-16-DC	HL-88-16-DC
		1-3/4	SF-64-28-DC	SF-64-28-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-22-DC	HL-88-22-DC
		2-1/8	SF-64-34-DC	SF-64-34-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-28-DC	HL-88-28-DC
		2-1/2	SF-64-40-DC	SF-64-40-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-34-DC	HL-88-34-DC
23/32 (.7187) TO 1-1/16 (1.0625)	NOM 1-3/8 ACTUAL 1.3750 / 1.3747	1"	SF-88-16-DC	SF-88-16-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-12-DC	HL-112-12-DC
		1-3/8	SF-88-22-DC	SF-88-22-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-16-DC	HL-112-16-DC
		1-3/4	SF-88-28-DC	SF-88-28-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-22-DC	HL-112-22-DC
		2-1/8	SF-88-34-DC	SF-88-34-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-28-DC	HL-112-28-DC
		2-1/2	SF-88-40-DC	SF-88-40-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-34-DC	HL-112-34-DC
31/32 (.9687) TO 1-13/32 (1.4062)	NOM 1-3/4 ACTUAL 1.7500 / 1.7497	1-3/8	SF-112-22-DC	SF-112-22-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-16-DC	HL-144-16-DC
		1-3/4	SF-112-28-DC	SF-112-28-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-22-DC	HL-144-22-DC
		2-1/8	SF-112-34-DC	SF-112-34-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-28-DC	HL-144-28-DC
		2-1/2	SF-112-40-DC	SF-112-40-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-34-DC	HL-144-34-DC
		3"	SF-112-48-DC	SF-112-48-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-40-DC	HL-144-40-DC
1-11/32 (1.3437) TO 1-7/8 (1.8750)	NOM 2-1/4 ACTUAL 2.2500 / 2.2496	1-3/8	SF-144-22-DC	SF-144-22-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-16-DC	HL-176-16-DC
		1-3/4	SF-144-28-DC	SF-144-28-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-22-DC	HL-176-22-DC
		2-1/8	SF-144-34-DC	SF-144-34-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-28-DC	HL-176-28-DC
		2-1/2	SF-144-40-DC	SF-144-40-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-34-DC	HL-176-34-DC
		3"	SF-144-48-DC	SF-144-48-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-40-DC	HL-176-40-DC



BODY O.D.	BUSHING HEAD DIMENSIONS							
	F	G	H	J	R	N	K	Y
3/16	5/16	3/16	3/32	3/32	17/64			
5/16	35/64	1/4	1/8	11/64	1/2	5/8	11/64	11/16
1/2	51/64	1/4	1/8	19/64	5/8	3/4	17/64	25/32
3/4	1-3/64	1/4	1/8	27/64	3/4	13/16	3/8	57/64
1"	1-27/64	3/8	3/16	19/32	59/64	1-7/64	1/2	1-9/64
1-3/8	1-51/64	3/8	3/16	25/32	1-7/64	1-19/64	11/16	1-21/64
1-3/4	2-19/64	3/8	3/16	1"	1-25/64	1-41/64	7/8	1-33/64
2-1/4	2-51/64	3/8	3/16	1-1/4	1-41/64	1-57/64	1-1/8	1-49/64

Increase Cutting Tool Life with UNITED Coolant Liners



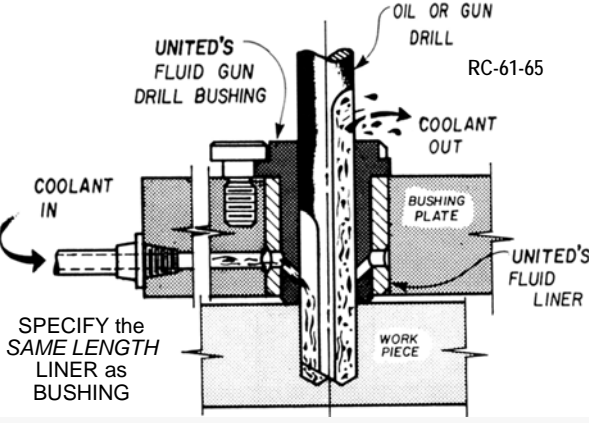
MANUFACTURED AS ORDERED FROM SEMI-FINISHED RC-61-65

A I.D. SIZE	B O. NOM	B O.D. ACTUAL	C OVERALL LENGTH			HEADLESS TYPE COOLANT LINER						L-DC STYLE							
			1/2	3/4	1"	1-3/8	1-3/4	2-1/8	2-1/2	3"	Q	V	U						
5/16	.3129/.3126	1/2 .5017/.5014	L-32-8-DC	L-32-12-DC	L-32-16-DC														
5/16	.3129/.3126	1/2 .5200/.5150	LU-32-8-DC	LU-32-12-DC	LU-32-16-DC														
1/2	.5005/.5002	3/4 .7518/.7515	L-48-8-DC	L-48-12-DC	L-48-16-DC	L-48-22-DC	L-48-28-DC												
1/2	.5005/.5002	3/4 .7700/.7650	LU-48-8-DC	LU-48-12-DC	LU-48-16-DC	LU-48-22-DC	LU-48-28-DC												
3/4	.7506/.7503	1" 1.0018/1.0015	L-64-8-DC	L-64-12-DC	L-64-16-DC	L-64-22-DC	L-64-28-DC	L-64-34-DC											
3/4	.7506/.7503	1" 1.0200/1.0150	LU-64-8-DC	LU-64-12-DC	LU-64-16-DC	LU-64-22-DC	LU-64-28-DC	LU-64-34-DC											
1"	1.0007/1.0003	1-3/8 1.3772/1.3768		L-88-12-DC	L-88-16-DC	L-88-22-DC	L-88-28-DC	L-88-34-DC	L-88-40-DC										
1"	1.0007/1.0003	1-3/8 1.3950/1.3900		LU-88-12-DC	LU-88-16-DC	LU-88-22-DC	LU-88-28-DC	LU-88-34-DC	LU-88-40-DC										
1-3/8	1.3760/1.3756	1-3/4 1.7523/1.7519		L-112-12-DC	L-112-16-DC	L-112-22-DC	L-112-28-DC	L-112-34-DC	L-112-40-DC										
1-3/8	1.3760/1.3756	1-3/4 1.7700/1.7650		LU-112-12-DC	LU-112-16-DC	LU-112-22-DC	LU-112-28-DC	LU-112-34-DC	LU-112-40-DC										
1-3/4	1.7512/1.7508	2-1/4 2.2525/2.2521			L-144-16-DC	L-144-22-DC	L-144-28-DC	L-144-34-DC	L-144-40-DC	L-144-48-DC									
1-3/4	1.7512/1.7508	2-1/4 2.2700/2.2650			LU-144-16-DC	LU-144-22-DC	LU-144-28-DC	LU-144-34-DC	LU-144-40-DC	LU-144-48-DC									
2-1/4	2.2515/2.2510	2-3/4 2.7526/2.7522			L-176-16-DC	L-176-22-DC	L-176-28-DC	L-176-34-DC	L-176-40-DC	L-176-48-DC									
2-1/4	2.2515/2.2510	2-3/4 2.7700/2.7650			LU-176-16-DC	LU-176-22-DC	LU-176-28-DC	LU-176-34-DC	LU-176-40-DC	LU-176-48-DC									

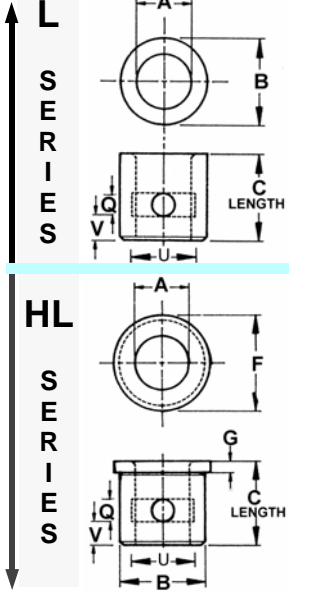


- UNITED's Coolant Bushings direct coolant to the cutting area, washing away chips and reducing heat and friction.
- Coolant allows faster cutting speeds while reducing tool breakage and increasing cutting edge life.
- Coolant Bushings may be substituted for expensive coolant drills on some applications.
- Coolant Bushings should always be used with coolant drills and reamers to reduce wear.
- Low cost manifold bushing plates are accomplished by drilling coolant plate holes to the bushing locations and using standard quick connector fitting. The cost of coolant bushings are more than offset by increased tool life and increased cutting action.
- DO NOT install Coolant Bushings flush or tight to the workpiece because that reduces and sometimes cuts off coolant flow. We recommend that the customary one and one half times drill diameter be used. Vary according to your feeds and speeds.

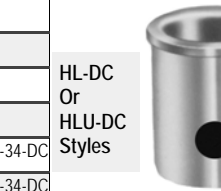
DIRECT the COOLANT to the ACTION!
UNITED COOLANT BUSHINGS and COOLANT LINERS are MATCHED EXACTLY to INSURE HOLE ALIGNMENTS!



The Coolant-In Coolant-Out Process



A I.D. SIZE	B NOM	B O.D. ACTUAL	F HD DIA	G THICK NESS	C OVERALL LENGTH			HEAD TYPE COOLANT LINER						HL-DC STYLE					
					1/2	3/4	1"	1-3/8	1-3/4	2-1/8	2-1/2	3"	Q	V	U				
5/16	.3129/.3126	1/2 .5017/.5014	5/8	3/32	HL-32-8-DC	HL-32-12-DC	HL-32-16-DC												
5/16	.3129/.3126	1/2 .5200/.5150	5/8	3/32	HLU-32-8-DC	HLU-32-12-DC	HLU-32-16-DC												
1/2	.5005/.5002	3/4 .7518/.7515	7/8	3/32	HL-48-8-DC	HL-48-12-DC	HL-48-16-DC	HL-48-22-DC	HL-48-28-DC										
1/2	.5005/.5002	3/4 .7700/.7650	7/8	3/32	HLU-48-8-DC	HLU-48-12-DC	HLU-48-16-DC	HLU-48-22-DC	HLU-48-28-DC										
3/4	.7506/.7503	1" 1.0018/1.0015	1-1/8	1/8	HL-64-8-DC	HL-64-12-DC	HL-64-16-DC	HL-64-22-DC	HL-64-28-DC	HL-64-34-DC									
3/4	.7506/.7503	1" 1.0200/1.0150	1-1/8	1/8	HLU-64-8-DC	HLU-64-12-DC	HLU-64-16-DC	HLU-64-22-DC	HLU-64-28-DC	HLU-64-34-DC									
1"	1.0007/1.0003	1-3/8 1.3772/1.3768	1-1/2	1/8		HL-88-12-DC	HL-88-16-DC	HL-88-22-DC	HL-88-28-DC	HL-88-34-DC	HL-88-40-DC								
1"	1.0007/1.0003	1-3/8 1.3950/1.3900	1-1/2	1/8		HLU-88-12-DC	HLU-88-16-DC	HLU-88-22-DC	HLU-88-28-DC	HLU-88-34-DC	HLU-88-40-DC								
1-3/8	1.3760/1.3756	1-3/4 1.7523/1.7519	1-7/8	3/16		HL-112-12-DC	HL-112-16-DC	HL-112-22-DC	HL-112-28-DC	HL-112-34-DC	HL-112-40-DC								
1-3/8	1.3760/1.3756	1-3/4 1.7700/1.7650	1-7/8	3/16		HLU-112-12-DC	HLU-112-16-DC	HLU-112-22-DC	HLU-112-28-DC	HLU-112-34-DC	HLU-112-40-DC								
1-3/4	1.7512/1.7508	2-1/4 2.2525/2.2521	2-3/8	3/16			HL-144-16-DC	HL-144-22-DC	HL-144-28-DC	HL-144-34-DC	HL-144-40-DC	HL-144-48-DC							
1-3/4	1.7512/1.7508	2-1/4 2.2700/2.2650	2-3/8	3/16			HLU-144-16-DC	HLU-144-22-DC	HLU-144-28-DC	HLU-144-34-DC	HLU-144-40-DC	HLU-144-48-DC							
2-1/4	2.2515/2.2510	2-3/4 2.7526/2.7522	2-7/8	3/16			HL-176-16-DC	HL-176-22-DC	HL-176-28-DC	HL-176-34-DC	HL-176-40-DC	HL-176-48-DC							
2-1/4	2.2515/2.2510	2-3/4 2.7700/2.7650	2-7/8	3/16			HLU-176-16-DC	HLU-176-22-DC	HLU-176-28-DC	HLU-176-34-DC	HLU-176-40-DC	HLU-176-48-DC							



SFC Carbide Coolant Chipbreaker Bushings

Solid Tungsten Carbide SF Direct Coolant & Chipbreaker Bushings with Steel Head

MANUFACTURED AS ORDERED FROM SEMI-FINISHED
RA-89-91 RC-72-79

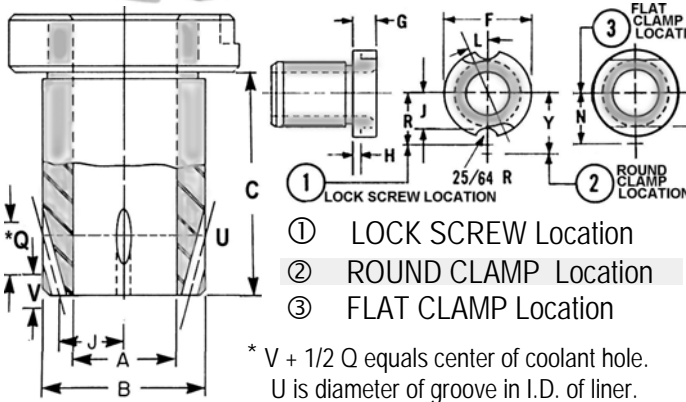
SFC-DC CARBIDE DIRECTED COOLANT



SFC-DCB CARBIDE DIRECTED COOLANT CHIPBREAKER



A I.D. RANGE	B O.D. BODY	C LEN UNDER HEAD	SFC COOLANT BUSHING	SFC CHIPBREAKER BUSHING	*V	*Q	*U	4 HOLES	J	ADD 'U' for UNGROUND HEAD- LESS —LINERS TO USE— WITH HEAD	
1/16 (.0625) TO #43 (.0890)	NOM 5/16 ACTUAL .3125/.3123	3/4	SFC-20-12-DC	SFC-20-12-DCB	5/32	3/16	25/64	#51	5/64	L-32-8-DC	HL-32-8-DC
		1"	SFC-20-16-DC	SFC-20-16-DCB	5/32	3/16	25/64	#51	5/64	L-32-12-DC	HL-32-12-DC
		1-3/8	SFC-20-22-DC	SFC-20-22-DCB	5/32	3/16	25/64	#51	5/64	L-32-16-DC	HL-32-16-DC
#42 (.0935) TO #10 (.1935)	NOM 5/16 ACTUAL .3125/.3123	3/4	SFC-20-12-DC	SFC-20-12-DCB	5/32	3/16	25/64	#51	5/64	L-32-8-DC	HL-32-8-DC
		1"	SFC-20-16-DC	SFC-20-16-DCB	5/32	3/16	25/64	#51	5/64	L-32-12-DC	HL-32-12-DC
		1-3/8	SFC-20-22-DC	SFC-20-22-DCB	5/32	3/16	25/64	#51	5/64	L-32-16-DC	HL-32-16-DC
#28 (.1405) TO 11/32 (.3437)	NOM 1/2 ACTUAL .5000/.4998	3/4	SFC-32-12-DC	SFC-32-12-DCB	5/32	3/16	39/64	3/32	9/64	L-48-8-DC	HL-48-8-DC
		1"	SFC-32-16-DC	SFC-32-16-DCB	7/32	5/16	19/32	3/32	9/64	L-48-12-DC	HL-48-12-DC
		1-3/8	SFC-32-22-DC	SFC-32-22-DCB	7/32	5/16	19/32	3/32	9/64	L-48-16-DC	HL-48-16-DC
		1-3/4	SFC-32-28-DC	SFC-32-28-DCB	7/32	5/16	19/32	3/32	9/64	L-48-22-DC	HL-48-22-DC
9/32 (.2812) TO 9/16 (.5625)	NOM 3/4 ACTUAL .7500/.7498	2-1/8	SFC-32-34-DC	SFC-32-34-DCB	7/32	5/16	19/32	3/32	9/64	L-48-28-DC	HL-48-28-DC
		1"	SFC-48-16-DC	SFC-48-16-DCB	7/32	5/16	55/64	#37	17/64	L-64-12-DC	HL-64-12-DC
		1-3/8	SFC-48-22-DC	SFC-48-22-DCB	7/32	5/16	55/64	#37	17/64	L-64-16-DC	HL-64-16-DC
		1-3/4	SFC-48-28-DC	SFC-48-28-DCB	7/32	5/16	55/64	#37	17/64	L-64-22-DC	HL-64-22-DC
15/32 (.4687) TO 25/32 (.7812)	NOM 1" ACTUAL 1.0000 / .9998	2-1/8	SFC-48-34-DC	SFC-48-34-DCB	7/32	5/16	55/64	#37	17/64	L-64-28-DC	HL-64-28-DC
		2-1/2	SFC-48-40-DC	SFC-48-40-DCB	7/32	5/16	55/64	#37	17/64	L-64-34-DC	HL-64-34-DC
		3"	SFC-64-16-DC	SFC-64-16-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-12-DC	HL-88-12-DC
		1-3/8	SFC-64-22-DC	SFC-64-22-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-16-DC	HL-88-16-DC
		1-3/4	SFC-64-28-DC	SFC-64-28-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-22-DC	HL-88-22-DC
23/32 (.7187) TO 1-1/16 (1.0625)	NOM 1-3/8 ACTUAL 1.3750 / 1.3747	2-1/8	SFC-64-34-DC	SFC-64-34-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-28-DC	HL-88-28-DC
		2-1/2	SFC-64-40-DC	SFC-64-40-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-34-DC	HL-88-34-DC
		3"	SFC-64-48-DC	SFC-64-48-DCB	7/32	5/16	1-5/32	1/8	23/64	L-88-40-DC	HL-88-40-DC
		1"	SFC-88-16-DC	SFC-88-16-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-12-DC	HL-112-12-DC
		1-3/8	SFC-88-22-DC	SFC-88-22-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-16-DC	HL-112-16-DC
31/32 (.9687) TO 1-13/32 (1.4062)	NOM 1-3/4 ACTUAL 1.7500 / 1.7497	1-3/4	SFC-88-28-DC	SFC-88-28-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-22-DC	HL-112-22-DC
		2-1/8	SFC-88-34-DC	SFC-88-34-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-28-DC	HL-112-28-DC
		2-1/2	SFC-88-40-DC	SFC-88-40-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-34-DC	HL-112-34-DC
		3"	SFC-88-48-DC	SFC-88-48-DCB	9/32	7/16	1-17/32	#26	17/32	L-112-40-DC	HL-112-40-DC
		1-3/8	SFC-112-22-DC	SFC-112-22-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-16-DC	HL-144-16-DC
1-11/32 (1.3437) TO 1-7/8 (1.8750)	NOM 2-1/4 ACTUAL 2.2500 / 2.2496	1-3/4	SFC-112-28-DC	SFC-112-28-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-22-DC	HL-144-22-DC
		2-1/8	SFC-112-34-DC	SFC-112-34-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-28-DC	HL-144-28-DC
		2-1/2	SFC-112-40-DC	SFC-112-40-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-34-DC	HL-144-34-DC
		3"	SFC-112-48-DC	SFC-112-48-DCB	9/32	7/16	1-31/32	#17	11/16	L-144-40-DC	HL-144-40-DC
1-11/32 (1.3437) TO 1-7/8 (1.8750)	NOM 2-1/4 ACTUAL 2.2500 / 2.2496	1-3/8	SFC-144-22-DC	SFC-144-22-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-16-DC	HL-176-16-DC
		1-3/4	SFC-144-28-DC	SFC-144-28-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-22-DC	HL-176-22-DC
		2-1/8	SFC-144-34-DC	SFC-144-34-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-28-DC	HL-176-28-DC
		2-1/2	SFC-144-40-DC	SFC-144-40-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-34-DC	HL-176-34-DC
1-11/32 (1.3437) TO 1-7/8 (1.8750)	NOM 2-1/4 ACTUAL 2.2500 / 2.2496	3"	SFC-144-48-DC	SFC-144-48-DCB	9/32	7/16	2-15/32	#17	7/8	L-176-40-DC	HL-176-40-DC

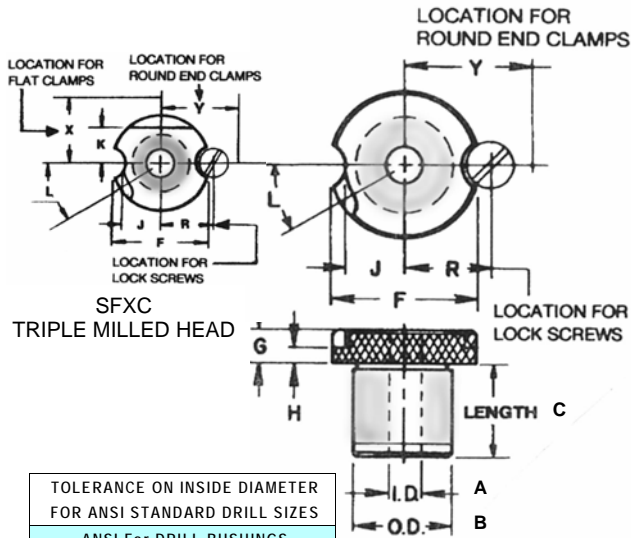


BODY O.D.	BUSHING HEAD DIMENSIONS							
	F	G	H	J	R	N	K	Y
3/16	5/16	3/16	3/32	3/32	17/64			
5/16	35/64	1/4	1/8	11/64	1/2	5/8	11/64	11/16
1/2	51/64	1/4	1/8	19/64	5/8	3/4	17/64	25/32
3/4	1-3/64	1/4	1/8	27/64	3/4	13/16	3/8	57/64
1"	1-27/64	3/8	3/16	19/32	59/64	1-7/64	1/2	1-9/64
1-3/8	1-51/64	3/8	3/16	25/32	1-7/64	1-19/64	11/16	1-21/64
1-3/4	2-19/64	3/8	3/16	1"	1-25/64	1-41/64	7/8	1-33/64
2-1/4	2-51/64	3/8	3/16	1-1/4	1-41/64	1-57/64	1-1/8	1-49/64

Solid Tungsten Carbide SFC Slip Fixed Renewable with Steel Head and SFXC Milled Flat

A.N.S.I. Standards

SFC - SFXC Slip Fixed Renewable Bushings



RA-89-91 RC-72-79



**SLIP
FIXED**

RENEWABLE

**MILLED FLAT
SFXC**

**TUNGSTEN
CARBIDE**

**SLIP FIXED
SFC**

USE THESE DIAGRAMS FOR REFERENCE TO SEE THIS SECTION FOR SFC AND SFXC HEAD DIMENSIONS, LOCK SCREWS AND CLAMPS.

Originated by **UNITED**

PATENT No. 3,606,566

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

TOLERANCE ON INSIDE DIAMETER FOR ANSI STANDARD DRILL SIZES	
ANSI For DRILL BUSHINGS	
NOM. I. D. RANGE	TOLERANCE
#80 to 1/4"	+0.0001 to +0.0004
Over 1/4" to 3/4"	+0.0001 to +0.0005
Over 3/4" to 1-1/2"	+0.0002 to +0.0006
Over 1-1/2"	+0.0003 to +0.0007
ANSI For REAMER BUSHINGS	
Up to 1/4"	+0.0005 to +0.0008
Over 1/4" to 1"	+0.0006 to +0.0010
Over 1"	+0.0008 to +0.0012

A I. D. DRILL RANGE		B O. D. SIZE		SELECT ANSI SYMBOL	C LENGTH SFC/SFXC - UNDER HEAD / ANSI LENGTH SYMBOL BY 16ths															
INCH - METRIC	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 - #70 .35 - .70MM	.0135 - .0280 .0138 - .0276	3/16	.1875 - .1873	SFC-12 SFXC-12	12-4	12-5				12-12										
#69 - 3/64 .75 - 1.25MM	.0292 - .0469 .0295 - .0492	3/16	.1875 - .1873	SFC-12 SFXC-12	12-4	12-5				12-12										
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630	3/16	.1875 - .1873	SFC-12 SFXC-12	12-4	12-5				12-12										
#55 - 1/16 1.30 - 1.60MM	.0520 - .0625 .0512 - .0630	5/16	.3125 - .3123	SFC-20 SFXC-20		20-5	20-6	20-8		20-12										
#52 - #43 1.65 - 2.25MM	.0635 - .0890 .0650 - .0886	5/16	.3125 - .3123	SFC-20 SFXC-20		20-5	20-6	20-8		20-12	20-16									
#42 - #10 2.35 - 4.90MM	.0935 - .1935 .0925 - .1929	5/16	.3125 - .3123	SFC-20 SFXC-20		20-5	20-6	20-8	20-10	20-12	20-16		20-22							
#28 - 3/16 3.50 - 4.75MM	.1405 - *.1875 .1378 - .1870	1/2	.5000 - .4998	SFC-32 SFXC-32		32-5	32-6	32-8		32-12	32-16		32-22	32-24	32-28					
#12 - 11/32 4.80 - 8.70MM	.1890 - .3437 .1890 - .3425	1/2	.5000 - .4998	SFC-32 SFXC-32		32-5	32-6	32-8		32-12	32-16		32-22	32-24	32-28	32-34				
9/32 - 9/16 7.10 - 14.00MM	.2812 - *.5625 .2795 - .5512	3/4	.7500 - .7498	SFC-48 SFXC-48			48-6	48-8		48-12	48-16		48-22	48-24	48-28	48-34	48-40	48-48		
15/32 - 25/32 11.80 - 19.50MM	.4688 - *.7812 .4646 - .7677	1"	1.0000 - .9998	SFC-64 SFXC-64				64-8		64-12	64-16		64-22	64-24	64-28	64-34	64-40	64-48		
23/32 - 1-1/16 18.00 - 26.00MM	.7187 - *.10625 .7087 - 1.0236	1-3/8	1.3750 - 1.3747	SFC-88 SFXC-88						88-12	88-16		88-22	88-24	88-28	88-34	88-40	88-48		
31/32 - 1-13/32 24.50 - 35.00MM	.9687 - 1.4062 .9646 - 1.3780	1-3/4	1.7500 - 1.7497	SFC-112 SFXC-112						112-12	112-16		112-22	112-24	112-28	112-34	112-40	112-48		
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	SFC-144 SFXC-144						144-12	144-16		144-22	144-24	144-28	144-34	144-40	144-48		
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 SMALL CHARTS FOR ADDITIONAL I.D. STANDARDS. ALSO SEE SECTION A FOR LONG HEAD SFX UNALLOY.

PRICES AVAILABLE ON REQUEST.

11-7-06

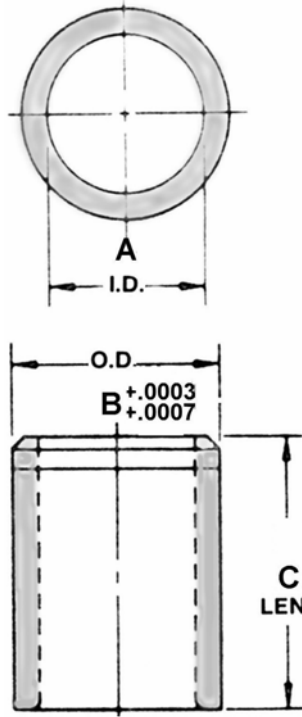
12200 WOODRUFF AVE. • DOWNEY, CA 90241-5608 • TELEPHONE (562) 803-1521 / (800)421-3466 IN CA / 800-486-3466 • FAX (562) 803-6898 / (800)486-3465

PC - Carbide Press Fit

Solid Tungsten Carbide Headless Press Fit

A.N.S.I. Standards

RA-89-91 RC-72-79



**PC
TUNGSTEN
CARBIDE
HEADLESS
PRESS FIT**

A I.D. DRILL RANGE		B O.D. SIZE		C	UNITED
INCH / METRIC NOMINAL	U.S.A. INCH DECIMAL	NOM.	U.S.A. INCH DECIMAL	LENGTH OVERALL	ANSI SYMBOL
#80 - 1/16 .35 - 1.60MM	.0135 - .0280 .0138 - .0630	5/32	.1578 - .1575 .166 - .161	1/4 5/16 3/8 1/2	PC-10-4 PC-10-5 PC-10-6 PC-10-8
1/16 - #39 1.60 - 2.50MM	.0625 - .0995 .0630 - .0984	13/64	.2046 - .2043 .213 - .208	1/4 5/16 3/8	PC-13-4 PC-13-5 PC-13-6
#40 - 9/64 2.35 - 4.90MM	.0980 - .1406 .0925 - .1929	1/4	.2516 - .2513 .265 - .260	1/4 5/16 3/8 1/2 3/4	PC-16-4 PC-16-5 PC-16-6 PC-16-8 PC-16-12
1/8 - #10 3.10 - 4.90MM	.1250 - .1935 .1220 - .1929	5/16	.3141 - .3138 .327 - .322	1/4 5/16 3/8 1/2 3/4	PC-20-4 PC-20-5 PC-20-6 PC-20-8 PC-20-12
3/16 - F 4.75 - 6.50MM	.1875 - .2570 .1870 - .2559	13/32	.4078 - .4075 .421 - .416	1/4 5/16 3/8 1/2 3/4 1"	PC-26-4 PC-26-5 PC-26-6 PC-26-8 PC-26-12 PC-26-16
3/16 - O 4.75 - 8.00MM	.1875 - .3160 .1870 - .3150	1/2	.5017 - .5014 .520 - .515	3/8 1/2 3/4 1" 1-3/8	PC-32-6 PC-32-8 PC-32-12 PC-32-16 PC-32-22
5/16 - 7/16 8.80 - 11.00MM	.3125 - .4375 .3465 - .4331	5/8	.6267 - .6264 .645 - .640	3/8 1/2 3/4 1" 1-3/8 1-3/4	PC-40-6 PC-40-8 PC-40-12 PC-40-16 PC-40-22 PC-40-28
3/8 - 17/32 9.60 - 14.00MM	.3750 - .5312 .3780 - .5512	3/4	.7518 - .7515 .770 - .765	1/2 3/4 1" 1-3/8 1-3/4	PC-48-8 PC-48-12 PC-48-16 PC-48-22 PC-48-28
1/2 - 21/32 12.50 - 16.50MM	.5000 - .6562 .4921 - .6496	7/8	.8768 - .8765 .895 - .890	1/2 3/4 1" 1-3/8 1-3/4	PC-56-8 PC-56-12 PC-56-16 PC-56-22 PC-56-28
1/2 - 49/64 12.50 - 19.50MM	.5000 - .7656 .4921 - .7677	1"	1.0018 - 1.0015 1.020 - 1.015	1/2 3/4 1" 1-3/8 1-3/4 2-1/8	PC-64-8 PC-64-12 PC-64-16 PC-64-22 PC-64-28 PC-64-34
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	3/4 1" 1-3/8 1-3/4 2-1/8	PC-88-12 PC-88-16 PC-88-22 PC-88-28 PC-88-34
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	1" 1-3/8 1-3/4 2-1/8 2-1/2	PC-112-16 PC-112-22 PC-112-28 PC-112-34 PC-112-40
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	1" 1-3/8 1-3/4 2-1/8 2-1/2	PC-144-16 PC-144-22 PC-144-28 PC-144-34 PC-144-40
I. D. RANGES		O. D. SIZES		OVERALL LENGTH	ANSI SYMBOL

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

PRICES
AVAILABLE
ON
REQUEST

All Carbide Bushings are manufactured non-counterbored unless specified otherwise.

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.

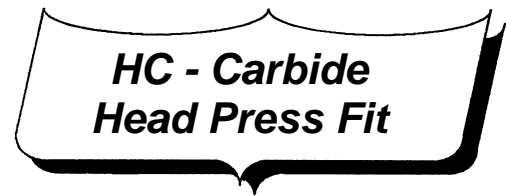
HARDNESS: Rockwell RA-89-91 RC-72-79 in the hole.

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

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

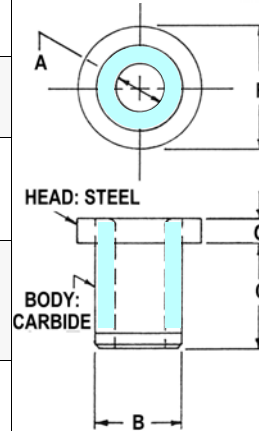
HC - Solid Tungsten Carbide With Steel Head

A.N.S.I. Standards



A I. D. DRILL RANGE		B O. D. SIZE		C LENGTH OVERALL	UNITED A N S I SYMBOL	F HEAD DIAMETER	G HEAD THICKNESS
INCH / METRIC NOMINAL	U.S.A. INCH DECIMAL	NOM.	U.S.A. INCH DECIMAL				
#80 - 1/16 .35 - 1.60MM	.0135 - .0280 .0138 - .0630	5/32	.1578 - .1575 .166 - .161	1/4 5/16 3/8 1/2	HC-10-4 HC-10-5 HC-10-6 HC-10-8	1/4	3/32
1/16 - #39 1.60 - 2.50MM	.0625 - .0995 .0630 - .0984	13/64	.2046 - .2043 .213 - .208	1/4 5/16 3/8	HC-13-4 HC-13-5 HC-13-6	19/64	3/32
#40 - 9/64 2.35 - 4.90MM	.0980 - .1406 .0925 - .1929	1/4	.2516 - .2513 .265 - .260	1/4 5/16 3/8 1/2 3/4	HC-16-4 HC-16-5 HC-16-6 HC-16-8 HC-16-12	23/64	3/32
1/8 - #10 3.10 - 4.90MM	.1250 - .1935 .1220 - .1929	5/16	.3141 - .3138 .327 - .322	1/4 5/16 3/8 1/2 3/4	HC-20-4 HC-20-5 HC-20-6 HC-20-8 HC-20-12	27/64	1/8
3/16 - F 4.75 - 6.50MM	.1875 - .2570 .1870 - .2559	13/32	.4078 - .4075 .421 - .416	1/4 5/16 3/8 1/2 3/4 1"	HC-26-4 HC-26-5 HC-26-6 HC-26-8 HC-26-12 HC-26-16	1/2	5/32
3/16 - O 4.75 - 8.00MM	.1875 - .3160 .1870 - .3150	1/2	.5017 - .5014 .520 - .515	3/8 1/2 3/4 1" 1-3/8	HC-32-6 HC-32-8 HC-32-12 HC-32-16 HC-32-22	39/64	7/32
5/16 - 7/16 8.80 - 11.00MM	.3125 - .4375 .3465 - .4331	5/8	.6267 - .6264 .645 - .640	3/8 1/2 3/4 1" 1-3/8 1-3/4	HC-40-6 HC-40-8 HC-40-12 HC-40-16 HC-40-22 HC-40-28	51/64	7/32
3/8 - 17/32 9.60 - 14.00MM	.3750 - .5312 .3780 - .5512	3/4	.7518 - .7515 .770 - .765	1/2 3/4 1" 1-3/8 1-3/4	HC-48-8 HC-48-12 HC-48-16 HC-48-22 HC-48-28	59/64	7/32
1/2 - 21/32 12.50 - 16.50MM	.5000 - .6562 .4921 - .6496	7/8	.8768 - .8765 .895 - .890	1/2 3/4 1" 1-3/8 1-3/4	HC-56-8 HC-56-12 HC-56-16 HC-56-22 HC-56-28	1-7/64	1/4
1/2 - 49/64 12.50 - 19.50MM	.5000 - .7656 .4921 - .7677	1"	1.0018 - 1.0015 1.020 - 1.015	1/2 3/4 1" 1-3/8 1-3/4 2-1/8	HC-64-8 HC-64-12 HC-64-16 HC-64-22 HC-64-28 HC-64-34	1-15/64	5/16
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	3/4 1" 1-3/8 1-3/4 2-1/8	HC-88-12 HC-88-16 HC-88-22 HC-88-28 HC-88-34	1-39/64	3/8
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	1" 1-3/8 1-3/4 2-1/8 2-1/2	HC-112-16 HC-112-22 HC-112-28 HC-112-34 HC-112-40	1-63/64	3/8
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	1" 1-3/8 1-3/4 2-1/8 2-1/2	HC-144-16 HC-144-22 HC-144-28 HC-144-34 HC-144-40	2-31/64	3/8
I. D. RANGES		O. D. SIZES		OVER-ALL LENGTH	A N S I SYMBOL	F	G

RA-89-91 RC-72-79



**HC
TUNGSTEN
CARBIDE BODY**

**STEEL HEAD
PRESS FIT**

PRICES
AVAILABLE
ON REQUEST

TOLERANCE ON INSIDE DIAMETER FOR ANSI STANDARD DRILL SIZES	
ANSI For DRILL BUSHINGS	
NOM. I. D. RANGE	TOLERANCE
#80 to 1/4"	+0.0001 to +0.0004
Over 1/4" to 3/4"	+0.0001 to +0.0005
Over 3/4" to 1-1/2"	+0.0002 to +0.0006
Over 1-1/2"	+0.0003 to +0.0007
ANSI For REAMER BUSHINGS	
Up to 1/4"	+0.0005 to +0.0008
Over 1/4" to 1"	+0.0006 to +0.0010
Over 1"	+0.0008 to +0.0012

All Carbide Bushings are manufactured non-counterbored unless specified otherwise.

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 RA 89-91 RC 72-79.

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

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

Circuit Board Bushings-Standard

UNITED's Circuit Board Bushings

Type CBD

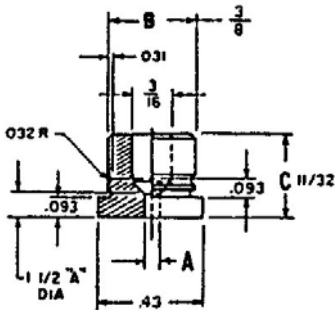


For A

To Order, specify Type & I.D.

Example:
CBD-1/16"

Standard Bushings are Oil Hardened Tool Steel.



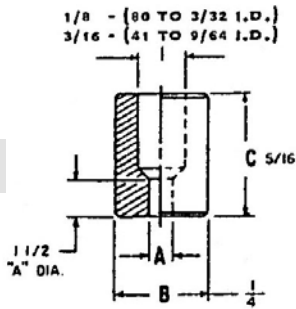
FOR DIGITAL SYSTEMS TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)	DECIMAL	B O.D. SIZE	C (OAL) LENGTH
80 - 78	.0135 - .0160	.3749 .3747	11/32
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		
27 - 11	.1440 - .1910		
10 - 1/4	.1935 - .2500		

Type CBE



Wide

I.D. Tolerance is Nominal +.0001 +.0004.



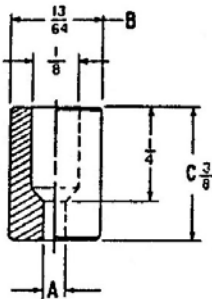
FOR EXCELLON TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)	DECIMAL	B O.D. SIZE	C (OAL) LENGTH
80 - 78	.0135 - .0160	.2516 .2513	5/16
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		

Type CBH



Variety

Concentricity is .0005 T.I.R. Maximum at Exit End.



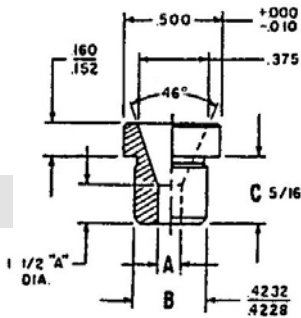
FOR HUGHES TYPE MACHINES					
A I.D. RANGE (STD. DRILL SIZES)	DECIMAL	B O.D. SIZE	C (OAL) LENGTH		
80 - 78	.0135 - .0160	.2042 .2040	3/8		
77 - 70	.0180 - .0280				
69 - 3/64	.0292 - .0469				
55 - 1/16	.0520 - .0625				
52 - 3/32	.0635 - .0937				

Type CBL



of

Specify Quantity and Type Desired.



FOR LELAND-GIFFORD TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)	DECIMAL	B O.D. SIZE	C under Hd LENGTH
80 - 78	.0135 - .0160	.4232 .4228	5/16
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		
27 - 11	.1440 - .1910		
10 - 1/4	.1935 - .2500		

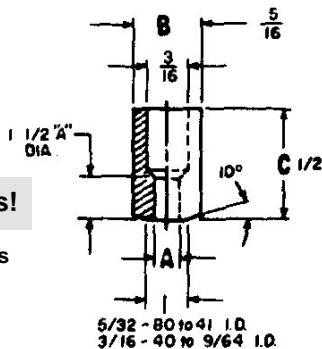
Type CBM



Machines!

See Pages A67, A68 & A69.

To Order Include Inside Dia. 'A' or Drill Size Required.



FOR ELECTRO-MECHANO TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)	DECIMAL	B O.D. SIZE	C (OAL) LENGTH
80 - 78	.0135 - .0160	.3125 .3123	1/2
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		

Circuit Board Bushings are not returnable for Credit.

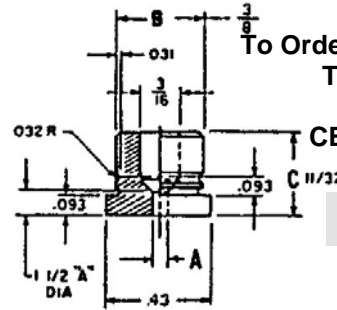
UNITED's Circuit Board Bushings

Circuit Board Bushings-Carbide

FOR DIGITAL SYSTEMS TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)		B	C (OAL)
NOMINAL	DECIMAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.3749 .3747	11/32
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		
27 - 11	.1440 - .1910		
10 - 1/4	.1935 - .2500		

New from UNITED...TUNGSTEN CARBIDE

Carbide Bushings are Tungsten Carbide.



To Order, specify Type & I.D. Example: CBDC-1/16"

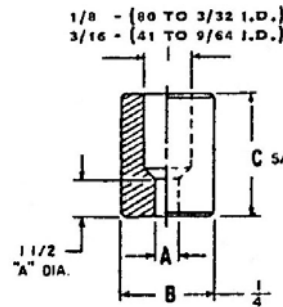
For A

Type CBDC



FOR EXCELLON TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)		B	C (OAL)
NOMINAL	DECIMAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.2516 .2513	5/16
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		

I.D. Tolerance is Nominal +.0001 +.0004.



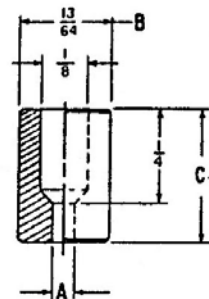
Wide

Type CBEC



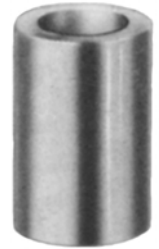
FOR HUGHES TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)		B	C (OAL)
NOMINAL	DECIMAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.2042 .2040	3/8
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		

Concentricity is .0005 T.I.R. Maximum at Exit End.



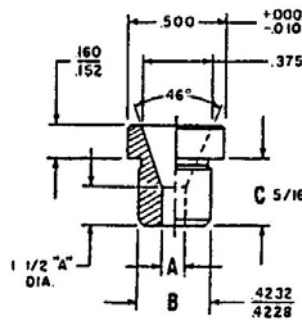
Variety

Type CBHC



FOR LELAND-GIFFORD TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)		B	C under Hd
NOMINAL	DECIMAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.4232 .4228	5/16
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		
27 - 11	.1440 - .1910		
10 - 1/4	.1935 - .2500		

Specify Quantity and Type Desired.



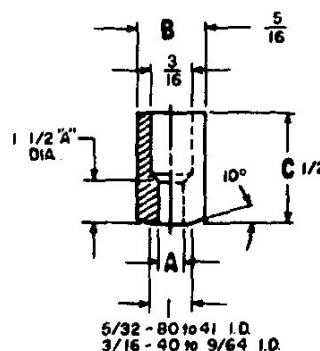
of

Type CBLC



FOR ELECTRO-MECHANO TYPE MACHINES			
A I.D. RANGE (STD. DRILL SIZES)		B	C (OAL)
NOMINAL	DECIMAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.3125 .3123	1/2
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		

To Order Include Inside Dia. 'A' or Drill Size Required.



Machines!

See Pages A66, A68 & A69.

Type CBMC



Circuit Board Bushings are not returnable for Credit.

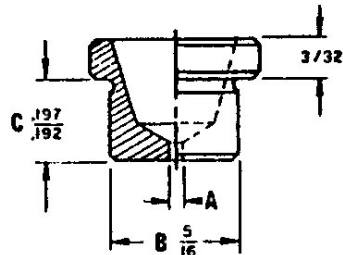
Circuit Board Bushings-Standard

UNITED's Circuit Board Bushings

Type CBN



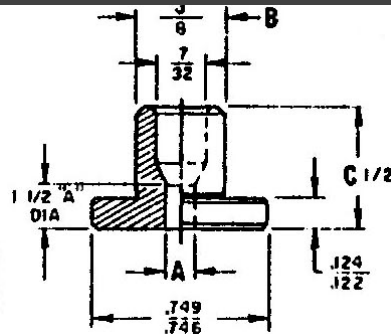
To Order, specify Type & I.D.
Example: CBN-1/16"



Standard Bushings are Oil Hardened Tool Steel.

FOR NATIONWIDE TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C under Hd
	NOMINAL	O.D. SIZE	LENGTH
80	- 78	.0135 - .0160	.197 .192
77	- 70	.0180 - .0280	
69	- 3/64	.0292 - .0469	
55	- 1/16	.0520 - .0625	
52	- 3/32	.0635 - .0937	
41	- 9/64	.0960 - .1406	
27	- 11	.1440 - .1910	

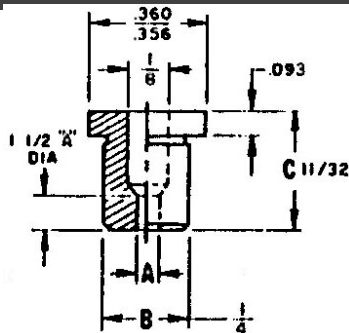
Type CBP



I.D. Tolerance is Nominal +.0001 +.0004.

FOR PALOMAR TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C (OAL)
	NOMINAL	O.D. SIZE	LENGTH
80	- 78	.0135 - .0160	1/2
77	- 70	.0180 - .0280	
69	- 3/64	.0292 - .0469	
55	- 1/16	.0520 - .0625	
52	- 3/32	.0635 - .0937	
41	- 9/64	.0960 - .1406	

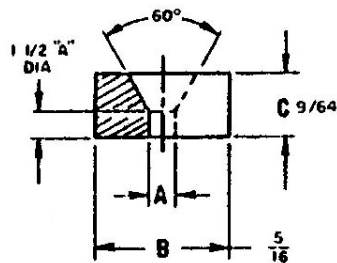
Type CBR



Concentricity is .0005 T.I.R. Maximum at Exit End.

FOR RAPIDRILL TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C (OAL)
	NOMINAL	O.D. SIZE	LENGTH
80	- 78	.0135 - .0160	11/32
77	- 70	.0180 - .0280	
69	- 3/64	.0292 - .0469	
55	- 1/16	.0520 - .0625	
52	- 3/32	.0635 - .0937	
41	- 9/64	.0960 - .1406	

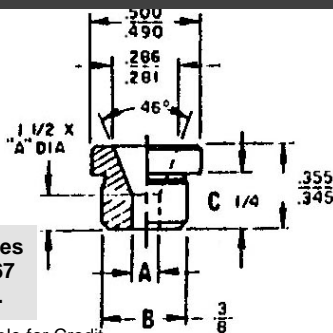
Type CBRE



Specify Quantity and Type Desired.

FOR RELIABLE TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C (OAL)
	NOMINAL	O.D. SIZE	LENGTH
80	- 78	.0135 - .0160	9/64
77	- 70	.0180 - .0280	
69	- 3/64	.0292 - .0469	
55	- 1/16	.0520 - .0625	
52	- 3/32	.0635 - .0937	
41	- 9/64	.0960 - .1406	

Type CBTE



See Pages A66, A67 & A69.

To Order Include Inside Dia. 'A' or Drill Size Required.

FOR TEKTRONICS & EDLUND TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C under Hd
	NOMINAL	O.D. SIZE	LENGTH
80	- 78	.0135 - .0160	1/4
77	- 70	.0180 - .0280	
69	- 3/64	.0292 - .0469	
55	- 1/16	.0520 - .0625	
52	- 3/32	.0635 - .0937	
41	- 9/64	.0960 - .1406	
27	- 11	.1440 - .1910	
10	- 1/4	.1935 - .2500	

Circuit Board Bushings are not returnable for Credit.

UNITED's Circuit Board Bushings

Circuit Board Bushings-Carbide

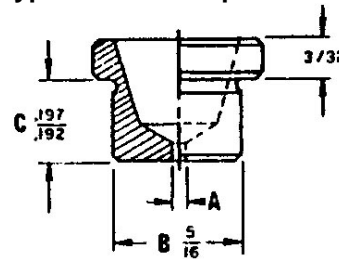
New from UNITED...TUNGSTEN CARBIDE

To Order, specify
Type & I.D. Example: CBNC-1/16"

Type CBNC

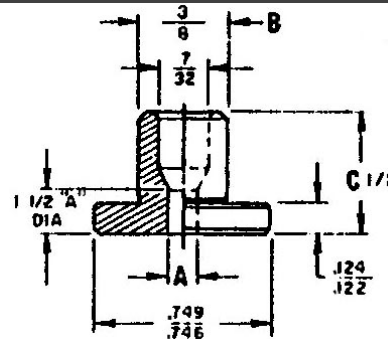
FOR NATIONWIDE TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C under Hd
	NOMINAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.3125 .3123	.197 .192
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		
27 - 11	.1440 - .1910		

Carbide Bushings are Tungsten Carbide.



FOR PALOMAR TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C (OAL)
	NOMINAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.3750 .3748	1/2
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		

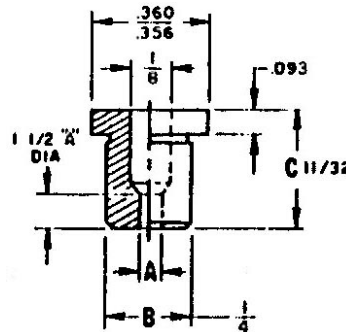
I.D. Tolerance is Nominal +.0001 +.0004.



Type CBPC

FOR RAPIDRILL TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C (OAL)
	NOMINAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.2500 .2498	11/32
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		

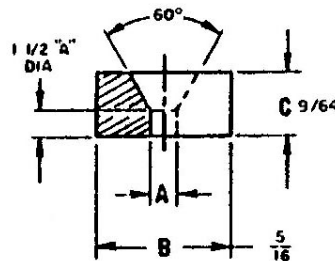
Concentricity is .0005 T.I.R. Maximum at Exit End.



Type CBRC

FOR RELIABLE TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C (OAL)
	NOMINAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.3125 .3123	9/64
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		

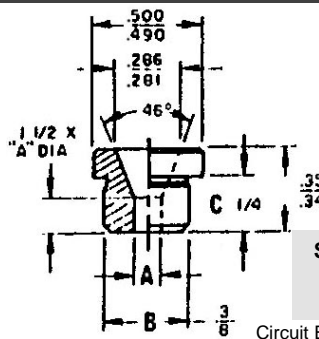
Specify Quantity and Type Desired.



Type CBREC

FOR TEKTRONICS & EDLUND TYPE MACHINES			
A	I.D. RANGE (STD. DRILL SIZES)	B	C under Hd
	NOMINAL	O.D. SIZE	LENGTH
80 - 78	.0135 - .0160	.3766 .3763	1/4
77 - 70	.0180 - .0280		
69 - 3/64	.0292 - .0469		
55 - 1/16	.0520 - .0625		
52 - 3/32	.0635 - .0937		
41 - 9/64	.0960 - .1406		
27 - 11	.1440 - .1910		
10 - 1/4	.1935 - .2500		

To Order Include Inside Dia. 'A' or Drill Size Required.



Type CBTEC

See Pages A66, A67 & A68.

Circuit Board Bushings are not returnable for Credit.