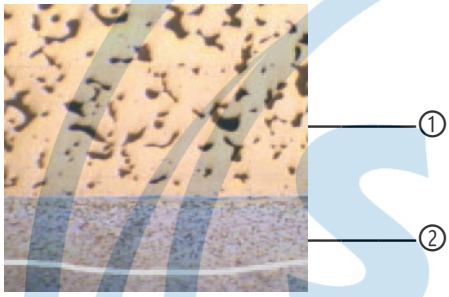
Self-Lubricating Bushings

SPT800, SPT750, SPT720, SPT700 Series Bi-metal Bushings

Structure

1. **Bronze Lead Sintered Alloy**, provides good self lubricating feature and has good fatigue resistance and anti-seizure feature.
2. **Steel Backing**, provides the mechanical strength of the bearing.



Features

The bronze lead alloy of SPT800 is CuSb10Pb10, the lead free material SPT750 with the alloy CuSn6.5Pb0.1 is also available. These materials have low friction coefficient and good wear resistance and they are suitable for lubricated working conditions. To improve the lubricating performance, oil grooves or oil deposits could be optional designs.

Tech. Data				
Max. load	Static	250N/mm^2	Alloy Hardness	≥HB70
	Dynamic	140N/mm^2	Operation Temperature range	-40°C~+250°C
Max. Speed (lubricated)		2.5m/s	Friction coefficient	0.05~0.20
Max. PV		2.8N/mm^2*m/s	Thermal conductivity	60 W(m*K)$^{-1}$
Tensile Strength		350N/mm^2	Coefficient of thermal expansion	14*10^{-6}*K^{-1}

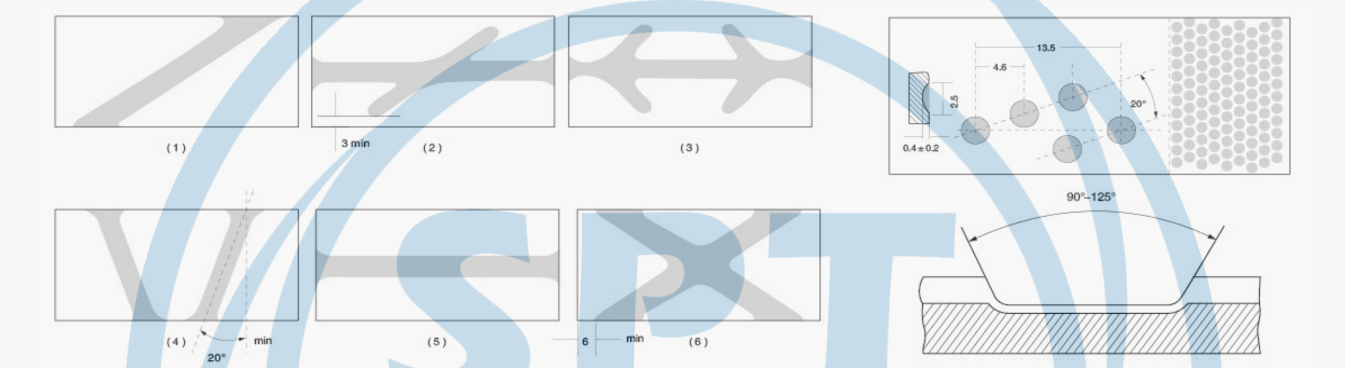
Typical Applications

These materials are suitable for using under middle load and middle to low speed conditions. The good imbedibility of the alloy provides anti-dust feature of the bearings. The bearings can be used under dust environment and where containments existed. The typical applications include connection rods, undercarriage rollers, hydraulic cylinder rod eyes, material handling machinery, agriculture machinery, forest machinery and so on. These two materials are with lead which is restricted to be used for some special parts according therelative laws or regulations.

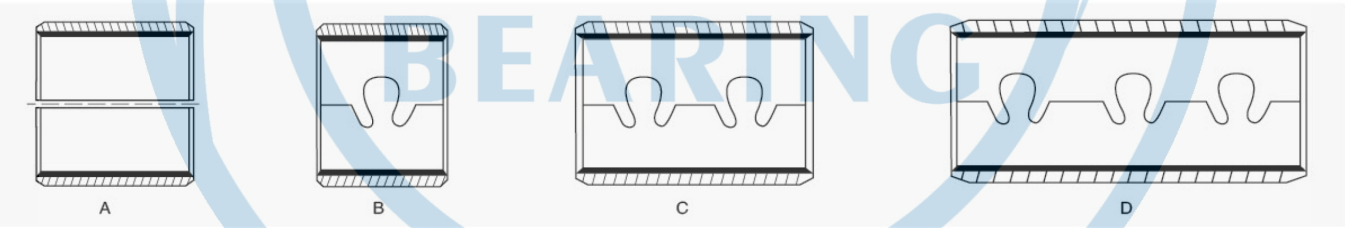
Bimetal bushings composition Analysis of alloy

Chemical elements	Cu	Pb	Sn	Zn	P	Fe	Ni	Sb	Al	Si	Mn	Ti	Other
SPT800(CuPb10Sn10)	Remainder	9.0~11.0	9.0~11.0	0.5	0.1	0.7	0.5	0.2	/	/	/	/	0.5
SPT750(CuSn6.5P0.1)	Remainder	/	6.5	0.5	0.1	0.7	0.5	0.2	/	/	/	/	0.5
SPT720(CuPb24Sn4)	Remainder	21.0~27.0	3.0~4.5	0.5	0.1	0.7	0.5	0.2	/	/	/	/	0.5
SPT700(CuPb30)	Remainder	26.0~33.0	0.5	0.5	0.1	0.7	0.5	0.2	/	/	/	/	0.5

Lubricating groove types for bimetal bushings



Lock types for bimetal bushings



In order to fully lubricate the bushing when in the performance, the oil holes with size as follow are recommended.
They should be manufactured according to the standard below if without special requirements.

Bearing OD.	12~23	25~39	42~80	85~155
Lubricating hole	4	6	8	9.5

Standard thickness of the SPT800 Bimetal and their tolerances

Tolerance Thickness	1	1.5	2	2.5	3	3.5	4	5
Thickness of steel backing	0.6	1	1.4	1.9	2.3	2.8	3.2	4
Thickness of bronze layer	0.4	0.5	0.6	0.6	0.7	0.7	0.8	1.0
Manufacturable thickness	$1^{+0.25}_{+0.15}$	$1.5^{+0.25}_{+0.15}$	$2^{+0.25}_{+0.15}$	$2.5^{+0.25}_{+0.15}$	$3^{+0.25}_{+0.15}$	$1^{+0.25}_{+0.15}$	$1^{+0.25}_{+0.15}$	$1^{+0.25}_{+0.15}$
Manufactured thickness	$1^{}_{-0.025}$	$1.5^{}_{-0.030}$	$2^{}_{-0.035}$	$2.5^{}_{-0.040}$	$3^{}_{-0.045}$	$3.5^{}_{-0.050}$	$4^{}_{-0.055}$	$5^{}_{-0.060}$

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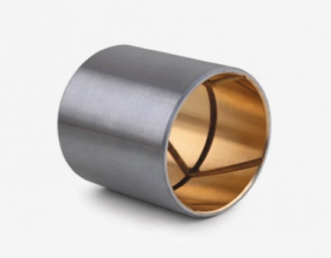

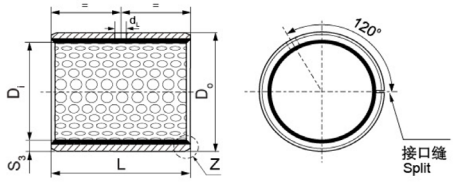

内外倒角 ID and OD chamfers

S_3	C_o	C_i	β
0.75	0.5±0.3	0.25±0.2	35°±5°
1.00	0.6±0.3	0.30±0.2	35°±5°
1.50	0.7±0.3	0.50±0.3	35°±5°

S_3	C_o	C_i	β
2.00	1.2±0.4	0.50±0.3	30°±5°
2.50	1.8±0.6	0.60±0.3	45°±5°

Unit: mm

d	D	Wall Thickness	Go	No-Go	Housing bore H7	Journal Diameter	f_1	f_2	Length$_{+0.40}$										
									10	15	20	25	30	40	50	60	80	90	100
10	12	0.03	12.057	12.035	$12^{+0.018}$	10 -0.013 -0.028	0.5	0.3	1010	1015	1020								
12	14		14.075	14.035	$14^{+0.018}$	12 -0.016 -0.034	0.5	0.3	1210	1215	1220								
14	16		16.075	16.035	$16^{+0.018}$	14 -0.016 -0.034	0.5	0.3	1410	1415	1420								
15	17		17.075	17.035	$17^{+0.018}$	15 -0.016 -0.034	0.5	0.3	1510	1515	1520								
16	18		18.085	18.040	$18^{+0.018}$	16 -0.016 -0.034	0.8	0.4	1610	1615	1650								
18	20		20.085	20.040	$20^{+0.021}$	18 -0.016 -0.034	0.8	0.4	1810	1816	1820	1825							
20	23	$1.5_{-0.030}$	23.085	23.040	$23+^{0.021}$	20 -0.020 -0.041	0.8	0.4	2010	2015	2020	2025							
22	25		25.085	25.040	$25^{+0.021}$	22 -0.020 -0.041	0.8	0.4	2210	2215	2220	2225							
24	27		27.085	27.040	$27^{+0.021}$	24 -0.020 -0.041	1.0	0.5	2410	2415	2420	2425	2430						
25	28		28.085	28.040	$28^{+0.021}$	25 -0.020 -0.041	1.0	0.5		2515	2520	2525	2530						
26	30	$2_{-0.035}$	30.105	30.060	$30^{+0.021}$	26 -0.020 -0.041	1.0	0.5		2615	2620	2625	2630						
28	32		32.105	32.060	$32^{+0.025}$	28 -0.020 -0.041	1.0	0.5		2815	2820	2725	2830	2840					
30	34		34.105	34.060	$34^{+0.025}$	30 -0.020 -0.041	1.2	0.6		3015	3020	2825	3030	3040					
32	36		36.105	36.060	$36^{+0.025}$	32 -0.025 -0.050	1.2	0.6		3215	3520	3025	3230	3240					
35	39		39.105	39.060	$39^{+0.025}$	35 -0.025 -0.050	1.2	0.6		3515	3521	3525	3530	3540	3550				
38	42		42.105	42.060	$42^{+0.025}$	38 -0.025 -0.050	1.2	0.6			3820	6525	3830	3840	3850				
40	44		44.105	44.060	$44^{+0.025}$	40 -0.025 -0.050	1.2	0.6			4020	3825	4030	4040	4050				
45	50	$2.5_{-0.040}$	50.125	50.075	$50^{+0.025}$	45 -0.025 -0.050	1.5	1.0			4520	4025	4530	4540	4550				
50	55		55.125	55.075	$55^{+0.030}$	50 -0.025 -0.050	1.5	1.0			5020	4525	5030	5040	5050	5060			
55	60		60.125	60.075	$60^{+0.030}$	55 -0.030 -0.060	1.5	1.0					5530	5540	5550	5560			
60	65		65.145	65.085	$65^{+0.030}$	60 -0.030 -0.060	1.5	1.0					6030	6040	6050	6060			

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d	D	Wall Thickness	Go	No-Go	Housing Bore H7	Journal Diameter f7	f_1	f_2	Length$_{+0.040}$										
									10	15	20	25	30	40	50	60	80	90	100
65	70	$2.5_{-0.\ 040}$	70.145	70.085	$70^{+0.030}$	$65^{-0.030}_{-0.060}$	1.5	1.0					6530	6540	6550	6560			
70	75		75.145	75.085	$75^{+0.030}$	$70^{-0.030}_{-0.060}$	1.5	1.0					7030	7040	7050	7060	7080	7080	
75	80		80.145	80.085	$80^{+0.035}$	$75^{-0.030}_{-0.060}$	1.5	1.0					7530	7540	7550	7560			
80	85		85.145	85.085	$85^{+0.035}$	$80^{-0.030}_{-0.060}$	1.5	1.0						8040	8050	8060	8080		
84	90	$3_{-0.045}$	90.165	90.100	$90^{+0.035}$	$84^{-0.036}_{-0.071}$	1.8	1.2						8440	8450	8460	8480		
89	95		95.165	95.100	$95^{+0.035}$	$89^{-0.036}_{-0.071}$	1.8	1.2						8940	8950	8960	8980		
94	100		100.165	100.100	$100^{+0.035}$	$94^{-0.036}_{-0.071}$	1.8	1.2							9450	9460	9480	9490	
99	105		105.185	105.115	$105^{+0.035}$	$99^{-0.036}_{-0.071}$	1.8	1.2							9950	9960	9980	9990	
104	110		110.185	110.115	$110^{+0.035}$	$104^{-0.036}_{-0.071}$	1.8	1.2							10450	10460	10480		
109	115		115.185	115.115	$110^{+0.035}$	$109^{-0.036}_{-0.071}$	1.8	1.2							10950	10960	10980		
114	120		120.185	120.115	$120^{+0.040}$	$114^{-0.036}_{-0.071}$	1.8	1.2							11450	11460	11480		
119	125	$3.5_{-0.050}$	125.205	125.130	$125^{+0.040}$	$119^{-0.036}_{-0.071}$	1.8	1.2							11950	11960	11980		
123	130		130.205	130.130	$130^{+0.040}$	$123^{-0.043}_{-0.083}$	2	1.5							12350	12360	12380		123100
128	135		135.205	135.130	$135^{+0.040}$	$128^{-0.043}_{-0.083}$	2	1.5							12850	12860	12880		128100
133	140		140.205	140.130	$140^{+0.040}$	$133^{-0.043}_{-0.083}$	2	1.5							13350	13360	13380		133100
138	145		145.205	145.130	$145^{+0.040}$	$138^{-0.043}_{-0.083}$	2	1.5								13860	13880		138100
143	150		150.235	150.150	$150^{+0.040}$	$143^{-0.043}_{-0.083}$	2	1.5								14360	14380		143100
148	155		155.235	155.150	$155^{+0.040}$	$148^{-0.043}_{-0.083}$	2	1.5								14860	14880	14890	
153	160		160.235	160.150	$160^{+0.040}$	$153^{-0.043}_{-0.083}$	2	1.5								15360	15380	15390	
158	165		165.235	165.150	$165^{+0.040}$	$158^{-0.043}_{-0.083}$	2	1.5								15860	15880		158100
163	170		170.255	170.170	$170^{+0.040}$	$163^{-0.043}_{-0.083}$	2	1.5								16380	16380		163100
168	175		175.255	175.170	$175^{+0.046}$	$168^{-0.043}_{-0.083}$	2	1.5								16860	16880		168100
173	180		180.255	180.170	$180^{+0.046}$	$173^{-0.043}_{-0.083}$	2	1.5								17360	17380		173100