

JF BIMETAL BEARING

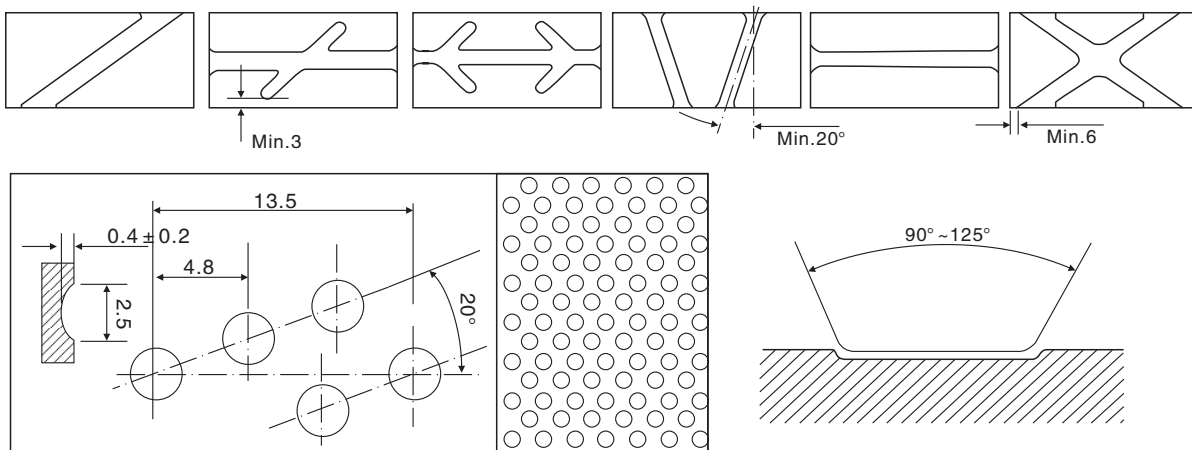
TECHNICS DESIGN

JF bimetal bearings are widely used in oil lubricating situations. Normally under low speed and oil lubricating situations assemble with grease and work with adding oil periodically, such as suspension, steering ball joints, brake pedal points, redirector, connecting rod, slide part of punch, construction and earth-moving equipment, etc. Under middle speed work: with oil, such as connecting rod, shaft and transportation parts of cut machine. Under high speed work within oil, such as gear box, fuel pump, engine, clutch, etc.

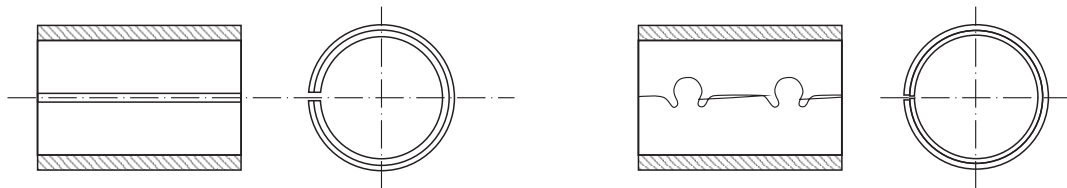
APPLICATION FEATURES

JF bimetal bearings take steel as base. The bearings surface are sintered with CuPbSn10, CuPb24Sn4, CuPb30, CuSn6Zn6Pb3 or AlSn20Cu. It can insure the bearings' O.D. precision against the friction between O.D. and housing after pressing it into housing because of mild steel as its base. The chemical changes of inner alloy layer can make the bearings work well under various load presses, different working temperatures and sliding speeds. Different structures of oil grooves and oil indentations can satisfy different adding oil ways and prevent the bearings from gripping shaft.

TYPES FOR JF BUSH'S GROOVES&INDENTATIONS



JOINT TYPES OF JF WRAPPED BUSHES



THE DESIGNING OF OIL INDENTATIONS

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

Bush O.D	14~22	22~40	40~50	50~100	100~180
Lubricating hole	3	4	5	6	7

The lubricating hole should be away from butt joint and loading area and designed to be easy-oil-feeding as well.



THICKNESS AND TOLERANCES OF THE JF DOUBLE LAYER METAL

Nominal 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 wall 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}	3.5 ^{+0.25} / _{+0.15}	4 ^{+0.25} / _{+0.15}	5 ^{+0.25} / _{+0.15}
Manufactured wall thickness	1 _{-0.025}	1.5 _{-0.03}	2 _{-0.035}	2.5 _{-0.04}	3 _{-0.045}	3.5 _{-0.05}	4 _{-0.055}	5 _{-0.06}

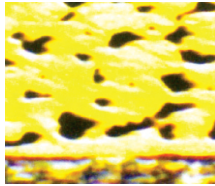
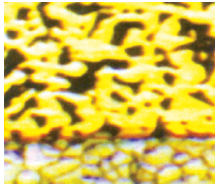
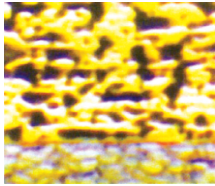
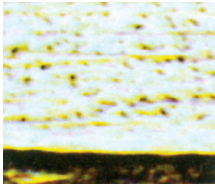
COMPOSITION ANALYSIS OF ALLOY

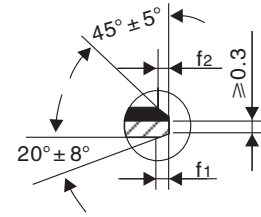
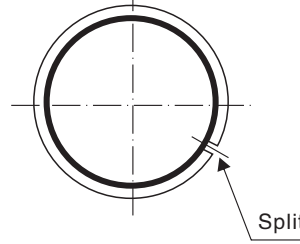
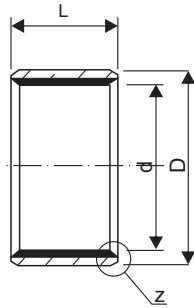
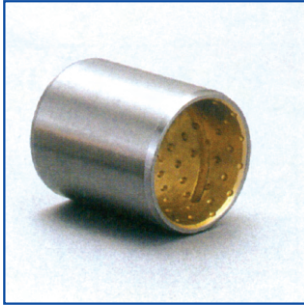
Chemical elements	JF-800	JF-720	JF-700	JF-20
Cu	Allowance	Allowance	Allowance	0.7~1.3
Pb	9.0~11.0	21.0~27.0	26.0~33.0	---
Sn	9.0~11.0	3.0~4.5	0.5	17.5~22.5
Zn	0.5	0.5	0.5	---
P	0.1	0.1	0.1	---
Fe	0.7	0.7	0.7	0.7
Ni	0.5	0.5	0.5	0.1
Sb	0.2	0.2	0.2	---
Al	---	---	---	Allowance
Si	---	---	---	0.7
Mn	---	---	---	0.7
Ti	---	---	---	0.2
Other	0.5	0.5	0.5	0.5

PHYSICAL CHARACTERISTICS OF JF MATERIAL

Physical performance	JF-800	JF-720	JF-700	JF-20	
Load limit	150	130	120	100	
Tensile strength	150	150	200	200	
Speed limit v max.	5	10	15	25	
Friction coefficient(oil)	0.06~0.14	0.06~0.16	0.08~0.16	0.08~0.17	
PV limit N/mm ² · m/s	Grease	2.8	2.8	2.5	---
	oil	10	10	8	6
"Sapphire"fatigue class	125	115	105	85	

SPECIFICATIONS FOR JF STEEL-LEAD BRONZE ALLOYS

Material type	JF-800	JF-720	JF-700	JF-20
Specification of bronze alloy	CuPb10Sn10	CuPb24Sn4	CuPb30	AlSn20Cu
Equivalent standard code	USA.:SAE-797 GERMANY: GLYCO 66 JAPAN: JIS-LBC3	USA.:SAE-799 GERMANY: GLYCO 69 JAPAN: JIS-LBC6	USA.:SAE-48 GERMANY: JIS-KJ3	USA.:SAE-783 GERMANY: GLYCO 74 JAPAN: JIS-AJL
Metallographies				
Hardness of bronze alloy HB	70~100	45~70	30~45	30~40
Max. dynamic Load N/mm ²	65	38	25	30
Hardness of mating surface	53 HRC	50 HRC	270 HB	250 HB
Max. Temperature °C	260	200	170	150
	The strongest type, wide application field, most suitable for high impact vibrating load bushes and washers.	Relative high fatigue strength&load capacity, good sliding performance, poor oil corrosion resistance. Fit for middle load, middle speed. Normally applied in main bushes of inner-combustion engine, connecting rod when plated.	Good seizing resistance, good capacity to submerge foreign, overlayer plated. Normally applied in main bearings of high speed, low to moderate load inner-combustion engine & connecting rod bearing.	Moderate fatigue strength&load capacity good corrosion resistance, relative good sliding performance .Normally applied in half bushes of high speed. Low load inner combustion engine, aircompressor,refrigerator bearings.



Magnified Z

mm

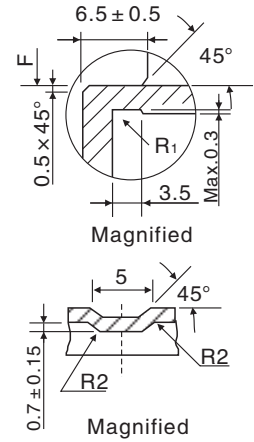
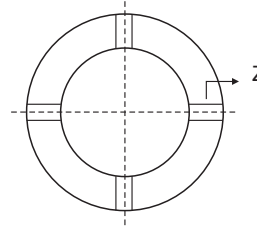
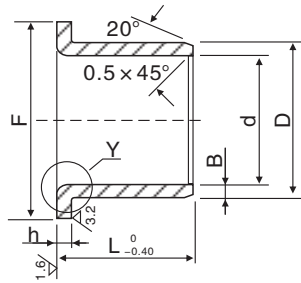
d	D	Wall Thickness	O.D. Tolerance	I.D.(H8) Tolerance	H7 Housing bore	f ₇ Shaft Dia.	f ₁	f ₂	L ⁰ _{-0.40}						
									10	15	20	25	30	40	50
10	12		12 ^{+0.065} / _{+0.030}	10 ^{+0.022}	12 ^{+0.018}	10 ^{-0.013} / _{-0.028}	0.5	0.3	1010	1015	1020				
12	14		14 ^{+0.065} / _{+0.030}	12 ^{+0.027}	14 ^{+0.018}	12 ^{-0.016} / _{-0.034}	0.5	0.3	1210	1215	1220				
14	16	1 _{-0.025}	16 ^{+0.065} / _{+0.030}	14 ^{+0.027}	16 ^{+0.018}	14 ^{-0.016} / _{-0.034}	0.5	0.3	1410	1415	1420				
15	17		17 ^{+0.065} / _{+0.030}	15 ^{+0.027}	17 ^{+0.018}	15 ^{-0.016} / _{-0.034}	0.5	0.3	1510	1515	1520				
16	18		18 ^{+0.075} / _{+0.035}	16 ^{+0.027}	18 ^{+0.018}	16 ^{-0.016} / _{-0.034}	0.8	0.4	1610	1615	1620				
18	20		20 ^{+0.075} / _{+0.035}	18 ^{+0.033}	20 ^{+0.021}	18 ^{-0.016} / _{-0.034}	0.8	0.4	1810	1815	1820	1825			
20	23		23 ^{+0.075} / _{+0.035}	20 ^{+0.033}	23 ^{+0.021}	20 ^{-0.020} / _{-0.041}	0.8	0.4	2010	2015	2020	2025			
22	25	1.5 _{-0.030}	25 ^{+0.075} / _{+0.035}	22 ^{+0.033}	25 ^{+0.021}	22 ^{-0.020} / _{-0.041}	0.8	0.4	2210	2215	2220	2225			
24	27		27 ^{+0.075} / _{+0.035}	24 ^{+0.033}	27 ^{+0.021}	24 ^{-0.020} / _{-0.041}	1.0	0.5	2410	2415	2420	2425	2430		
25	28		28 ^{+0.075} / _{+0.035}	25 ^{+0.033}	28 ^{+0.021}	25 ^{-0.020} / _{-0.041}	1.0	0.5		2515	2520	2525	2530		
26	30		30 ^{+0.075} / _{+0.035}	26 ^{+0.033}	30 ^{+0.021}	26 ^{-0.020} / _{-0.041}	1.0	0.5		2615	2620	2625	2630		
28	32		32 ^{+0.085} / _{+0.045}	28 ^{+0.033}	32 ^{+0.025}	28 ^{-0.020} / _{-0.041}	1.0	0.5		2815	2820	2825	2830	2840	
30	34		34 ^{+0.085} / _{+0.045}	30 ^{+0.039}	34 ^{+0.025}	30 ^{-0.020} / _{-0.041}	1.2	0.6		3015	3020	3025	3030	3040	
32	36	2 _{-0.035}	36 ^{+0.085} / _{+0.045}	32 ^{+0.039}	36 ^{+0.025}	32 ^{-0.025} / _{-0.050}	1.2	0.6		3215	3220	3225	3230	3240	
35	39		39 ^{+0.085} / _{+0.045}	35 ^{+0.039}	39 ^{+0.025}	35 ^{-0.025} / _{-0.050}	1.2	0.6			3520	3525	3530	3540	3550
38	42		42 ^{+0.085} / _{+0.045}	38 ^{+0.039}	42 ^{+0.025}	38 ^{-0.025} / _{-0.050}	1.2	0.6			3820	3825	3830	3840	3850
40	44		44 ^{+0.085} / _{+0.045}	40 ^{+0.039}	44 ^{+0.025}	40 ^{-0.025} / _{-0.050}	1.2	0.6			4020	4025	4030	4040	4050
45	50	2.5 _{-0.040}	50 ^{+0.085} / _{+0.045}	45 ^{+0.039}	50 ^{+0.025}	45 ^{-0.025} / _{-0.050}	1.5	1.0			4520	4525	4530	4540	4550



mm

d	D	Wall Thickness	O.D. Tolerance	I.D. (H ₈) Tolerance	H7 Housing bore	f ₇ Shaft Dia.	f ₁	f ₂	L ⁰ _{-0.40}					
									30	40	50	60	80	90
50	55		55 +0.100 +0.055	50 +0.039	55 +0.030	50 -0.030 -0.060	1.5	1.0	5030	5040	5050			
55	60		60 +0.100 +0.055	55 +0.046	60 +0.030	55 -0.030 -0.060	1.5	1.0	5530	5540	5550	5560		
60	65	2.5 _{-0.040}	65 +0.100 +0.055	60 +0.046	65 +0.030	60 -0.030 -0.060	1.5	1.0	6030	6040	6050	6060		
65	70		70 +0.100 +0.055	65 +0.046	70 +0.030	65 -0.030 -0.060	1.5	1.0	6530	6540	6550	6560		
70	75		75 +0.100 +0.055	70 +0.046	75 +0.030	70 -0.030 -0.060	1.5	1.0	7030	7040	7050	7060	7080	
75	80		80 +0.100 +0.055	75 +0.046	80 +0.035	75 -0.030 -0.060	1.5	1.0	7530	7540	7550	7560		
80	85		85 +0.120 +0.070	80 +0.054	85 +0.035	80 -0.030 -0.060	1.5	1.0		8040	8050	8060	8080	
84	90		90 +0.120 +0.070	84 +0.054	90 +0.035	84 -0.036 -0.071	1.8	1.2		8440	8450	8460	8480	
89	95		95 +0.120 +0.070	89 +0.054	95 +0.035	89 -0.036 -0.071	1.8	1.2		8940	8950	8960	8980	
94	100		100 +0.120 +0.070	94 +0.054	100 +0.035	94 -0.036 -0.071	1.8	1.2			9450	9460	9480	9490
99	105	3 _{-0.045}	105 +0.120 +0.070	99 +0.054	105 +0.035	99 -0.036 -0.071	1.8	1.2			9950	9960	9980	9990
104	110		110 +0.120 +0.070	104 +0.054	110 +0.035	104 -0.036 -0.071	1.8	1.2			10450	10460	10480	
109	115		115 +0.120 +0.070	109 +0.054	115 +0.035	109 -0.036 -0.071	1.8	1.2			10950	10960	10980	
114	120		120 +0.120 +0.070	114 +0.054	120 +0.040	114 -0.036 -0.071	1.8	1.2			11450	11460	11480	
119	125		125 +0.170 +0.100	119 +0.054	125 +0.040	119 -0.036 -0.071	1.8	1.2			11950	11960	11980	
123	130		130 +0.170 +0.100	123 +0.054	130 +0.040	123 -0.043 -0.083	1.8	1.2			12350	12360	12380	123100
128	135		135 +0.170 +0.100	128 +0.063	135 +0.040	128 -0.043 -0.083	2	1.5			12850	12860	12880	128100
133	140		140 +0.170 +0.100	133 +0.063	140 +0.040	133 -0.043 -0.083	2	1.5			13350	13360	13380	133100
138	145		145 +0.170 +0.100	138 +0.063	145 +0.040	138 -0.043 -0.083	2	1.5				13860	13880	138100
143	150	3.5 _{-0.050}	150 +0.170 +0.100	143 +0.063	150 +0.040	143 -0.043 -0.083	2	1.5				14360	14380	143100
148	155		155 +0.170 +0.100	148 +0.063	155 +0.040	148 -0.043 -0.083	2	1.5				14860	14880	14890
153	160		160 +0.170 +0.100	153 +0.063	160 +0.040	153 -0.043 -0.083	2	1.5				15360	15380	15390
158	165		165 +0.170 +0.100	158 +0.063	165 +0.040	158 -0.043 -0.083	2	1.5				15860	15880	158100
163	170		170 +0.170 +0.100	163 +0.063	170 +0.040	163 -0.043 -0.083	2	1.5				16360	16380	163100
168	175		175 +0.170 +0.100	168 +0.063	175 +0.046	168 -0.043 -0.083	2	1.5				16860	16880	168100
173	180		180 +0.170 +0.100	173 +0.063	180 +0.046	173 -0.043 -0.083	2	1.5				17360	17380	173100

Not: I.D. Tolerance is inspected when bush assembly into housing indicating zero tolerance.



mm

Model No.	F _{-0.5}	D ^{+0.28} _{+0.20}	d ^{+0.20} _{+0.15}	L ⁰ _{-0.04}	h	B
M4040	60	46	40	39.5	3.5	3.0
M4035	62	47	40	35	3.5	3.5
M4055	68	55	45	55	3.5	5.0
M5040A	72	57	50	40	3.5	3.5
M5040B	70	57	50	40	3.5	3.5
M5050	70	57	50	50	3.5	3.5
M5460	92	60.6	54	60	3.5	3.3
M6053	83	67	60	53	3.5	3.5
M6060	87	67	60	60	3.5	3.5
M6065	77	67	60	65	3.5	3.5
M6060A	88	68	60	60	4.0	4.0
M6060B	87	68	60	60	4.0	4.0
M6465	102.6	70.4	63.5	65	3.5	3.5
M6473	103	70.8	63.8	73	3.5	3.5
M6553	85	72	65	53	3.5	3.5
M6564	87	72	65	64	3.5	3.5
M6575	108	72	65	75	3.5	3.5
M7060	93	77	70	60	3.5	3.5
M7090	108	80	70	90	5.0	5.0
M7560	100	82	75	60	3.5	3.5
M8060	105	87	80	68	3.5	3.5
M8580	127	92	85	80	3.5	3.5
M85103	128	92.6	85	103.5	3.5	3.8
M89126	138	97.5	89.2	126.5	4.2	4.2
Mq5197	144	105	95	127	5.0	5.0