

JDB 固体自润滑轴承 JDB Metallic self-lubricating bearings



结构特性 Structure Characteristics

JDB 系列固体自润滑轴承以高强度铜合金为基体并按工况需要有规律的排布一定比列的固体润滑剂，这种铜基镶嵌式固体润滑轴承结合了铜合金的高承载高耐磨及固体润滑剂的自润滑性能，使其在使用过程中大大降低了轴承和设备的维护成本。在此基础上开发了适合于经济型和耐冲击型运用的 JDB550 钢基铜合金镶嵌型固体润滑轴承、JDB250 铸铁镶嵌型固体润滑轴承和 JDB850 弥散型固体润滑轴承。

JDB solid self-lubricating bearing materials consist of high strength metal with solid lubricants embedded, the metal has high load capacity and solid lubricants provided low friction during the operation, this construction reduces maintenance cost for both bearing and machinery. Based on the above technique theory, we developed JDB550 steel shell cast bronze with graphite plug bearings for economic and impact load application, JDB250 steel with graphite plug bearings and JDB850 dispersed solid lubrication bearings for lower friction applications.

材料特点 Material Properties

- 可以长期使用而无需维护；
- 设计用于很高的静承载和动承载；
- 具有很低的且平稳的摩擦系数，无“粘着”现象；
- 具有耐粉尘、耐腐蚀、耐冲击和耐边缘负载能力；
- 金属基材具有很好的吸震能力；
- 能够在很宽的温度范围内使用；
- 适合于往复、旋转和摆动等启动频繁又难以形成油膜的场合；
- 具有极低的磨损率，使用寿命长。

- Allows maintenance-free and long-life operation;
- Suitable for high static and dynamic loads;
- With low and smoothly coefficient of friction and without stick-slip effects;
- Suitable for dirty, corrosion, impact load and edge loading;
- The base material provided a good shock-absorbing capacity;
- Can be used over a large temperature range;
- Suitable for reciprocating, rotating and oscillating movement with start frequency and difficulty to form oil film occasions;
- With low wear rate and long life service.

产品应用 Application

注塑机模架、汽车模具、工程机械、液压油缸、大型齿轮箱、冶金连铸机、列车支架、轧钢设备、矿山机械、船舶、气轮机、吊车支撑、食品机械、水轮机轴承等。



Injection molding machine, automotive moulds, hydrocylinder, gear case, gas turbine, water turbine, Crane support...

实际运用中根据使用工况的不同，基体可以采用不同牌号的合金，产品范围包括：JDB-1、JDB-2、JDB-3、JDB-4、JDB-5各系列产品。

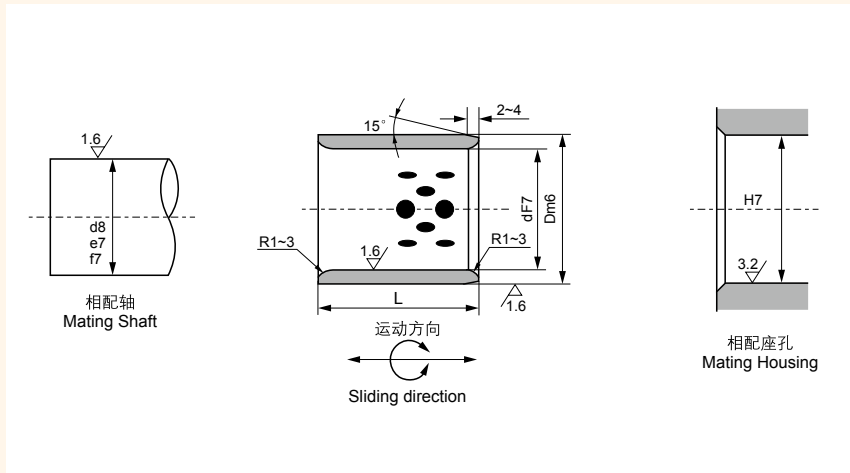
According to the different working conditions, different type of alloy can be chosen, product range includes JDB-1、JDB-2、JDB-3、JDB-4、JDB-5.

代号 Grade	JDB-1	JDB-2	JDB-3	JDB-4	JDB-5
除了目录中显示的标准产品外，还可以提供非标产品或根据客户要求订购。 We can also develop according to customers special request while out of this table.					
材料 Material	CuZn25Al5Mn4Fe3	CuSn5Pb5Zn5	钢/Steel+ CuZn25Al5Mn4Fe3	铸铁/HT250	钢/Gcr15
密度 g/cm ³ Density	8.0	8.0	7.6	7.3	7.8
硬度 HB Hardness	210-250	80-120	60-90	180-230	55-60
抗拉强度 N/mm ² Tensile strength	>600	>200	>500	>250	>1500
延伸率 % Elongation	>10	> 4	> 10	-	-
线胀系数 10 ⁻⁵ /°C Coefficient of linear expansion	1.6-2.0	1.6-2.0	1.6-2.0	1.7-1.9	1.6-1.8
最高使用温度 °C Max Working Temperature	300	350	300	400	350
最大动承载 P (N/mm ²) Max Move Load Capacity	100	60	70	60	250
最大滑动速度 V (m/s) Max Sliding Speed	干0.4 油5	2	2	0.5	0.1
最高PV值 (N/mm ² ·m/s) Max PV Value Limit	3.8	0.5	0.6	0.8	2.5
摩擦系数μ Friction coefficient	油润滑: 0.03 Oil Lubrication: 0.03			干摩擦: 0.16 Dry Friction: 0.16	

固体润滑剂 Solid Lubricants

固体润滑剂 Lubricant	特性 Features	典型用途 Typical application
高纯石墨+添加剂 Graphite+add 	很好的耐磨性和化学稳定性，使用温度 < 400°C Good wear performance and chemical stability, temperature limit 400°C	应用于一般机械，在大气中使用 Suit for general machines and under atmosphere
PTFE+添加剂 PTFE+add 	极低的摩擦系数和很好的水润滑性，使用温度 < 300°C Lowest friction coefficient and good water lubrication, temperature limit 300°C	应用于水、海水润滑，如船舶 Suit for water and seawater lubricant, such as ship

JDB 自润滑直套轴承标准公制尺寸 JDB Self-lubricating Sleeve Bearings Standard Metric Size



材料：高力黄铜+固体润滑剂
Material: CuZn25Al5Mn4Fe3
+Graphite (650#SP)

单位unit:mm

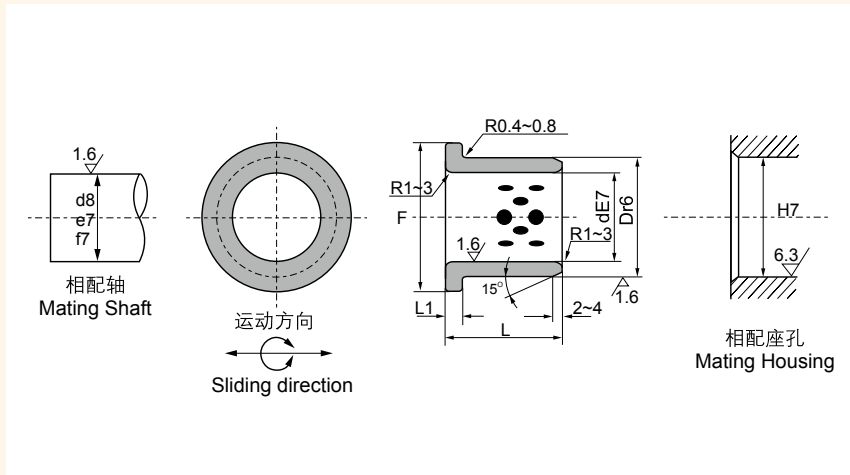
d	D	d F7	D m6	L															
				8	10	12	15	16	20	25	30	35	40	50	60	70	80		
8	12	8	12	081208	081210	081212	081215												
		+0.028 +0.013	14	101408	101410	101412	101415	101416	101420										
12	18	12	18		121810	121812	121815	121816	121820	121825	121830								
13	19	13	19		131910	131912	131915	131916	131920	131925	131930								
14	20	14	20		142010	142012	142015	142016	142020	142025	142030								
		+0.034 +0.016	21		152110	152112	152115	152116	152120	152125	152130	152135							
16	22	16	22		162210	162212	162215	162216	162220	162225	162230	162235	162240						
			+0.021 +0.008	24		182410	182412	182415	182416	182420	182425	182430	182435	182440					
20	28	20	28		202810	202812	202815	202816	202820	202825	202830	202835	202840	202850					
22	32	22	32			223212	223215	223216	223220	223225	223230	223235	223240	223250					
		+0.041 +0.020	33			253312	253315	253316	253320	253325	253330	253335	253340	253350	253360				
30	38	30	38			303812	303815	303816	303820	303825	303830	303835	303840	303850	303860				
35	45	35	45						354520	354525	354530	354535	354540	354550	354560	354570			
			+0.025 +0.009	50					405020	405025	405030	405035	405040	405050	405060	405070	405080		
40	50	40	50																
		+0.050 +0.025	55								455530	455535	455540	455550	455560	455570	455580		
45	55	45	55																
50	60	50	60								506030	506035	506040	506050	506060	506070	506080		

JDB 自润滑直套轴承标准公制尺寸 JDB Self-lubricating Sleeve Bearings Standard Metric Size

d	D	d F7	D m6	L ^{-0.10} / _{-0.30}													
				30	35	40	50	60	70	80	100	120	130	140	150		
50	62	50	62		506230	506235	506240	506250	506260	506270							
50	65	50	65		506530	506535	506540	506550	506560	506570	506580	5065100					
55	70	55	70		557030	557035	557040	557050	557060	557070	557080	5570100					
60	74	60	75	^{+0.030} / _{+0.011}	607430	607435	607440	607450	607460	607470	607480	6074100					
60	75	60	75		607530	607535	607540	607550	607560	607570	607580	6075100					
63	75	63	75			637535	637540	637550	637560	637570	637580	6375100					
65	80	65	80			658035	658040	658050	658060	658070	658080	6580100					
70	85	70	85	^{+0.060} / _{+0.030}		708535	708540	708550	708560	708570	708580	7085100					
70	90	70	90			709035	709040	709050	709060	709070	709080	7090100					
75	90	75	90				759040	759050	759060	759070	759080	7590100					
75	95	75	95				759540	759550	759560	759570	759580	7595100	7595120				
80	96	80	96	^{+0.035} / _{+0.013}			809640	809650	809660	809670	809680	8096100	8096120	8096130			
80	100	80	100				8010040	8010050	8010060	8010070	8010080	80100100	80100120	80100130	80100140		
90	110	90	110					9011050	9011060	9011070	9011080	90110100	90110120	90110130	90110140		
100	120	100	120	^{+0.071} / _{+0.036}					10012060	10012070	10012080	100120100	100120120	100120130	100120140		
110	130	110	130								11013080	110130100	110130120	110130130	110130140		
120	140	120	140								12014080	120140100	120140120	120140130	120140140		
125	145	125	145									125145100	125145120	125145130	125145140		
130	150	130	150	^{+0.040} / _{+0.015}								130150100	130150120	130150130	130150140	130150150	
140	160	140	160	^{+0.083} / _{+0.043}								140160100	140160120	140160130	140160140	140160150	
150	170	150	170									150170100	150170120	150170130	150170140	150170150	
160	180	160	180									160180100	160180120	160180130	160180140	160180150	

JFB 自润滑翻边轴承标准公制尺寸

JFB Self-lubricating Flange Bearings Standard Metric Size

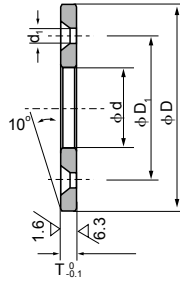
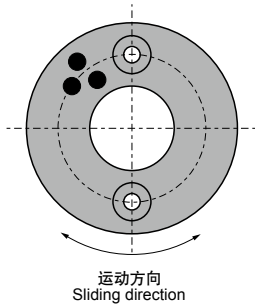


材料：高力黄铜+固体润滑剂
Material: CuZn25Al5Mn4Fe3
+Graphite (650#SP)

单位unit:mm

d	D	d E7	D r6	F	L ₁	L ^{-0.10} L _{-0.30}														
						15	20	25	30	35	40	50	60	80	100					
10	14	10	14 ^{+0.040} / _{+0.025}	22	2	1015	1020													
12	18	12	18 ^{+0.034} / _{+0.023}	25		1215	1220													
13	19	13	19	26		1315	1320													
14	20	14	20 ^{+0.050} / _{+0.032}	27	3	1415	1420	1425												
15	21	15	21 ^{+0.041} / _{+0.028}	28		1515	1520	1525	1530											
16	22	16	22	29		1615	1620	1625	1630											
20	30	20	30	40			2020	2025	2030	2035										
25	35	25	35 ^{+0.061} / _{+0.040}	45			2520	2525	2530	2535	2540									
30	40	30	40 ^{+0.050} / _{+0.034}	50			3020	3025	3030	3035	3040	3050								
35	45	35	45	60	5			3525	3530	3535	3540	3550								
40	50	40	50 ^{+0.075} / _{+0.050}	65					4030	4035	4040	4050								
45	55	45	55	70					4530	4535	4540	4550	4560							
50	60	50	60 ^{+0.060} / _{+0.041}	75						5035	5040	5050	5060							
55	65	55	65	80							5540	5550	5560							
60	75	60	75 ^{+0.062} / _{+0.043}	90	7.5					6040	6050	6060	6080							
70	85	70	85 ^{+0.090} / _{+0.060}	105								7050	7060	7080						
75	90	75	90 ^{+0.073} / _{+0.051}	110								7550	7560	7580	75100					
80	100	80	100	120										8060	8080	80100				
90	110	90	110 ^{+0.076} / _{+0.054}	130	10									9060	9080	90100				
100	120	100	120 ^{+0.107} / _{+0.072}	150										10060	10080	100100				
120	140	120	140 ^{+0.088} / _{+0.063}	170										12060	12080	120100				

JTW 自润滑止推垫片标准公制尺寸 JTW Self-lubricating Thrust Washer Standard Metric Size

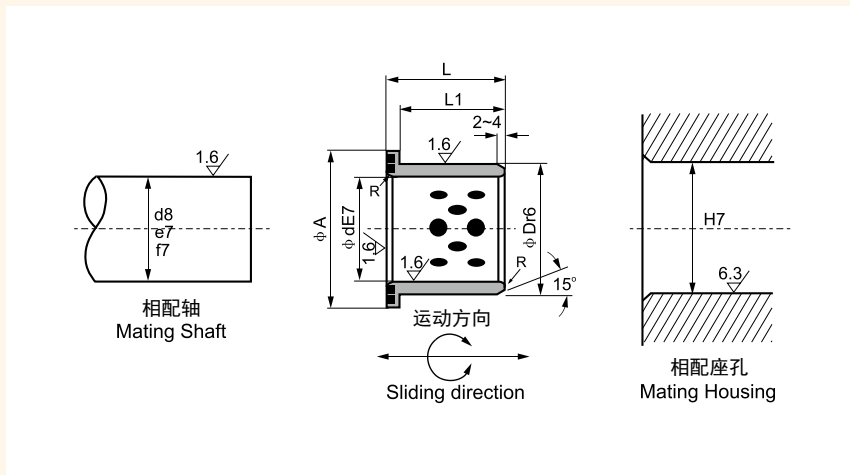


材料：高力黄铜+固体润滑剂
Material: CuZn25Al5Mn4Fe3
+Graphite (650#SP)

单位Unit: mm

型号规格 Standard No.	φd	φD	T _{-0.10} ⁰	螺孔 Bolt Hole				
				φD ₁	平头螺钉 Crop Bolt	φd ₁	孔数 Bore Number	
JTW-10	10.2	30	3	20	M3	3.5	2	
JTW-12	12.2	40		35				
JTW-13	13.2							28
JTW-14	14.2							
JTW-15	15.2		50					
JTW-16	16.2	M5		6				
JTW-18	18.2				40			
JTW-20	20.2					45		
JTW-25	25.2		55					
JTW-30	30.2	60						
JTW-35	35.2			70				
JTW-40	40.2				80			
JTW-45	45.3		90					
JTW-50	50.3	100						
JTW-55	55.3			110				
JTW-60	60.3				120			
JTW-65	65.3		125					
JTW-70	70.3	130						
JTW-75	75.3			140				
JTW-80	80.3				150			
JTW-90	90.5		170					
JTW-100	100.5	190						
JTW-120	120.5			200				

JDBB 自润滑翻边轴套标准公制尺寸 JDBB Self-lubricant Flange Bushings Standard Metric Size

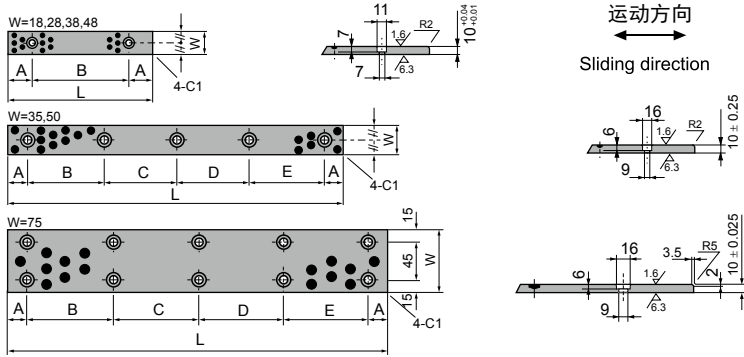


材料：高力黄铜+固体润滑剂
Material: CuZn25Al5Mn4Fe3
+Graphite (650#SP)

单位unit:mm

型号规格 Standard No.	φd E7	φD r6	φA	L1	L
JDBB-12×15	12	18	25	11	15
JDBB-16×20	16	22	30	15	20
JDBB-20×25	20	28	36	20	25
JDBB-25×30	25	33	43	25	30
JDBB-30×35	30	38	48	30	35
JDBB-40×45	40	50	60	40	45
JDBB-50×55	50	62	75	49	55
JDBB-60×65	60	74	90	58	65

JSP 滑板标准公制尺寸
JSP Wear Plates Standard Metric Size



材料：高力黄铜+固体润滑剂
Material: CuZn25Al5Mn4Fe3
+Graphite (650#SP)

单位Unit: mm

型号规格 Standard No.	W	L	A	B	C	D	E	平头螺钉尺寸 Flat Head Screw Size	孔数 Q'ty of holes				
JSP-1875	18	75	15	45				M6	2				
JSP-18100		100		50									
JSP-18125		125	25	75									
JSP-18150		150		100									
JSP-2875	28	75	15	45				M6	2				
JSP-28100		100		50									
JSP-28125		125	25	75									
JSP-28150		150		100									
JSP-35100	35	100		60				M8	3				
JSP-35150		150		55	55								
JSP-35200		200	20	55	50	55				M8	4		
JSP-35250		250		70	70	70							
JSP-35300		300		65	65	65	65					M8	5
JSP-35350		350		80	75	75	80						
JSP-3875	38	75	15	45				M6	2				
JSP-38100		100		50									
JSP-38125		125	25	75									
JSP-38150		150		100									
JSP-4875	48	75	15	45				M6	2				
JSP-48100		100		50									
JSP-48125		125	25	75									
JSP-48150		150		100									
JSP-50100	50	100		60				M8	3				
JSP-50150		150		55	55								
JSP-50200		200	20	55	50	55				M8	4		
JSP-50250		250		70	70	70							
JSP-50300		300		65	65	65	65					M8	5
JSP-50400		400		90	90	90	90						
JSP-75150	75	150		110				M8	4				
JSP-75200		200		80	80					M8	6		
JSP-75250		250	20	105	105								
JSP-75300		300		85	90	85						M8	8
JSP-75400		400		120	120	120							
JSP-75500		500		115	115	115	115						

JDB600 油沟铜衬套 JDB600 Oil Groove Bronze Bushing



JDB600铜套，是一种以油沟涌油作为润滑的高力黄铜轴承。该产品具有传统的锡青铜轴承功能，由于采用高力黄铜(ZCuZn25Al6Fe3Mn3)后，它的HB硬度提高了一倍，所以在低速的场合使用该产品，比一般青铜套寿命可以延长一倍，而且其承载压力大，能适应重载的场合使用。并可按客户要求提供如下材质。

JDB600 copper sleeve, is a kind of groove Bay oil as lubrication oil of high strength brass bearings. The product has a function of the traditional bronze bearings, the use of high strength brass (ZCuZn25Al6Fe3Mn4), its hardness HB doubling the occasion so low to use the product, than the average life span can be extended twice bronze sets, and its bearing pressure, can adapt to overloaded occasions.

材料型号 Material type	600#Strong Cast bronze 高力黄铜	600S1 CuSn5Zn5Pb5	600S2 CuAl10Ni5Fe5	600S3 CuSn12	600S4 CuSn10Pb10	600S5 CuZn25Al5
化学元素 Chemical elements	Cu	65	85	80	88	65
	Sn		5		12	
	Pb		5			10
	Zn	25	5			25
	Ni			5		
	Al	6		10		6
	Fe			5		
	Mn	4				
密度 Density	8.0	8.8	7.6	8.8	8.9	8.0
屈服强度 Yield point	>350	>90	>260	>150	>100	>450
抗拉强度 Tensile Strength	>750	>250	>500	>270	>210	>800
延伸率 Extension Rate	>12	>15	>10	>5	>8	>8
硬度 Hardness	210	70	150	95	75	250

JDB600精加工铜合金轴套提供了简单、经济的轴承运用方式，具有承载高，耐腐蚀性好，尺寸加工任意性等特点。同时HCOB可以根据不同的使用情况提供不同牌号的铜合金，并按照要求加工出不同的形式，它比卷制类铜轴承具有更高尺寸精度。

Machined st bronze bearings offer technically and economically favorable bearings solutions. It is with high load pability, low weight and good corrosion sistance. HCOB can offer diffe-ant types of bronze alloys accoring to the required life time, service etc. The tolerance is much tighter than wrapped bronze bushes.

技术参数 Technical Parameters

最大承载压力	250N/mm ²	最高适用温度	300°C
最高线速度	5m/s	硬度	HB > 180
摩擦系数	<0.14	允许最高 PV 值 (干)	1.65N/mm ² .m/s

可供形式 Available

直套 Cylindrical bushes 垫片 Flange bushes JDB600可以根据客户要求加工，公差参照标准的JDB尺寸表。
翻边 Thrust washers 滑板 Plate JDB600 supplied by customer ordering, the tolerance is according to JDB standard dimension.

油槽 OilGroove



JDB-3 钢基铜合金镶嵌型固体润滑轴承

JDB-3 Steel Shell Cast Bronze With Graphite Plug Bushes



材料特点 Material Properties

1. 结合了铜合金的耐磨性和钢的高机械强度性能；
2. 可以根据工况要求铸造不同的铜合金材料包括低摩擦性能的铅铜合金；
3. 由于内外层材料具有的不同摩擦系数，可以防止轴承在高载低速工况下的窜动和走外圆；
4. 可以根据需要在工作面覆盖或镶嵌固体润滑剂以达到自我润滑的目的；
5. 相比纯铜套更具有成本优势，节约利用资源；
6. 可以进行后期加工，比如钢基体的热处理、合金层车加工等；
7. 可以根据设计需要在不同的面或者复杂的面上进行一层或多层的铜合金铸造；
8. 与传统的铜套在使用特性上具有类似的特性，可以适合于不同温度下不同润滑条件下的工况；
9. 相比纯铜套具有更好的机械承载性能，特别是抗冲击强度。

1. Combined with the resistance of copper alloy and high mechanical strength properties of steel;
2. Different cast copper alloy material is available according to work condition, including lower friction lead bronze;
3. The different coefficient of friction of the inner and outer material can protect the axial and rotating movement of the bearing in the housing under extremely high load with low speed;
4. The solid lubricant plug can be embedded to achieve the self-lubricating performance;
5. Compare with pure bronze bearing, the cost is reduced obviously;
6. The steel backing allowed to heat treatment to get high hardness, meanwhile the inner layer can be re-machined if necessary;
7. The bronze layer can be casted on one or more layers to complex structure;
8. This material have same characteristic as pure bronze bearing, suitable for wide temperature range, different oil condition;
9. The CRB650GT have better mechanical load performance compare with bronze material, especially the impact strength.

JDB-3 钢基铜合金镶嵌型固体润滑轴承

JDB-3 Steel shell cast bronze with graphite plug bushes



基材特征 Structure

在优质碳钢表面浇铸高强度铜合金作为轴承的基础材料，这种制造工艺使得铜和钢结合面达到完全的冶金结合，在降低了材料成本的同时也提高了其承载能力；而根据使用工况在其工作面镶嵌固体润滑剂大大降低了轴承的摩擦系数并达到了自我润滑的目的。

Steel shell with cast bronze bearing material liner with specially formulated solid lubricants embedded into the holes in the liner material. The process of casting bronze on steel achieves an integral metallurgical structure between bronze and steel with an increased carrying capacity while the material cost is considerably reduced. The solid lubricant can reduce the coefficient of friction and performs the self-lubricating function.

金相组织 Features



石墨镶嵌方式 Graphite Mosaic



A: 内径 (ID) ≤ 100

B: 内径 (ID) ≥ 100

材料特点 Material Properties

从金相图可以看出临界区的钢与铜合金之间产生了相互扩散，这种在铸造过程中产生的扩散层大约在 $3\mu\sim 5\mu$ 之间使得两种材料达到了完全的冶金结合形成了很好的结合强度，在任何情况下这种机械强度超过了铜合金本身。

钢和铜相互之间扩散的组织结构提供了这种材料优秀的机械性能，同时可将轴承运作过程中产生的热量及时转移。薄壁的铜合金层使得这种双层材料的热膨胀系数相近，因此JDB-3材料可以在铸造后根据需要进行热处理，也就是说这种新型的材料可以确保在使用过程中保持很高的精度和机械配合。

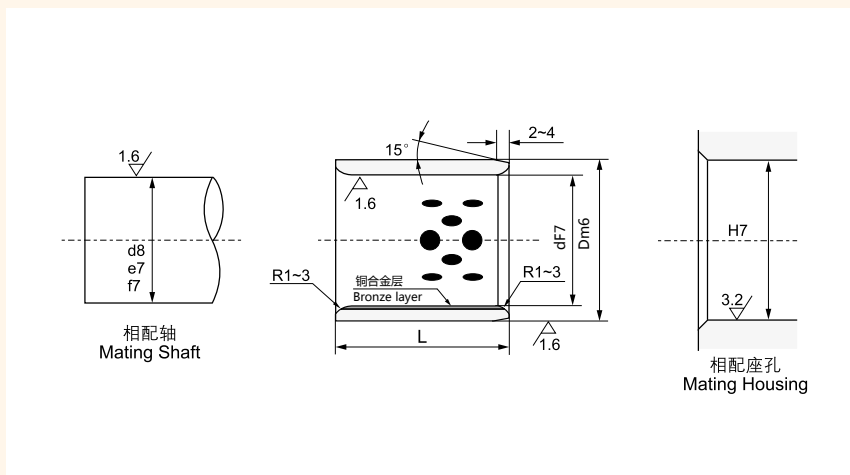
- 结合了铜合金的耐磨性和钢的高机械强度性能；
- 可以根据工况要求铸造不同的铜合金材料包括低摩擦性能的铅铜合金；
- 由于内外层材料具有的不同摩擦系数，可以防止轴承在高载低速工况下的窜动和走外圆；
- 可以根据需要在工作面覆着或镶嵌固体润滑剂以达到自我润滑的目的；
- 相比纯铜套更具有成本优势，节约利用资源；
- 可以进行后期加工，比如钢基体的热处理、合金层车加工等；
- 可以根据设计需要在不同的面或者复杂的面上进行一层或多层的铜合金铸造；
- 与传统的铜套在使用特性上具有类似的特性，可以适合于不同温度下不同润滑条件下的工况；
- 相比纯铜套具有更好的机械承载性能，特别是抗冲击强度。

JDB-3 combines the advantages of a metallic bearing and the self lubricating of graphite. It is particularly good for low-speed and high load applications, where external lubrication is not practical. The new based material provides economic solution and even good resistance to shock loads.

- Cylindrical bushes
- Thrust washers
- Flange bushes
- Non-standard parts as design
- JDB-3 supplied by customer ordering, the tolerance is according to JDB-3 standard dimension.

This type of products can be widely used under high temperature and high load with low speed conditions, such as successive casting machinery, mineral machinery, injection molding machinery, dock machinery and so on

JDB-3 钢基铜合金镶嵌型固体润滑轴承 JDB-3 Steel shell cast bronze with graphite plug bushes



OD 外径: S45C
ID 内径: KSOB550铜合金+石墨
Graphite

单位unit:mm

ID	F7	OD	m6	Wall Thick 壁厚	Bronze Thick 铜层厚	L-0.10/0.30															
						30	35	40	50	60	70	80	90	100	120	130	140	150	200		
50	+0.050 +0.025	60	+0.030 +0.011	5	1.5	●	●	●	●	●	●	●									
"	"	65	"	7.5	"	●	●	●	●	●	●	●	●	●							
55	+0.060 +0.030	70	"	"	"	●	●	●	●	●	●	●									
60	"	75	"	"	"	●	●	●	●	●	●	●	●	●							
65	"	80	"	"	"				●	●	●	●									
70	"	85	+0.035 +0.013	"	"		●	●	●	●	●	●	●	●							
"	"	90	"	10	"				●	●	●	●									
75	"	90	"	7.5	"					●	●	●	●	●							
"	"	95	"	10	"					●	●	●	●	●							
80	"	95	"	7.5	"			●	●	●	●	●	●	●	●						
"	"	100	"	10	"			●	●	●	●	●	●	●	●	●					
85	+0.071 +0.036	100	"	7.5	"			●	●	●	●	●	●	●	●	●	●				
90	"	110	"	10	2				●	●	●	●	●	●	●	●	●	●			
100	"	120	"	"	"					●	●	●	●	●	●	●	●	●			
110	"	130	+0.040 +0.015	"	"						●	●	●	●	●	●	●	●			
120	"	140	"	"	"						●	●	●	●	●	●	●	●			
125	+0.083 +0.043	145	"	"	"							●	●	●	●	●	●	●			
130	"	150	"	"	"								●	●	●	●	●	●			
140	"	160	"	"	"							●	●	●	●	●	●	●			
150	"	170	"	"	"								●	●	●	●	●	●			
160	"	180	"	"	"									●	●	●	●	●	●		
170	"	190	+0.046 +0.017	"	"										●	●	●	●	●	●	
180	"	200	"	"	"											●	●	●	●	●	
190	+0.096 +0.050	210	"	"	"												●	●	●	●	
200	"	230	"	15	3													●	●	●	
225	"	255	+0.046 +0.017	"	"														●	●	
250	"	280	"	"	"															●	
280	+0.108 +0.056	320	+0.057 +0.021	20	4															●	
300	"	340	"	"	"															●	
350	+0.119 +0.062	390	"	"	"															●	
400	"	450	+0.063 +0.023	25	5															●	
450	+0.131 +0.068	500	"	"	"															●	