



HKB BEARING

嘉兴昊凯精密机械有限公司

JIAXING HKB PRECISION MACHINERY CO., LTD

PRECISION MACHINERY

滑动轴承专业制造商

Professional manufacturer of plain bearings



INTRODUCTION

昊凯轴承介绍



嘉兴昊凯精密机械有限公司是一家专业从事无油轴承的生产企业，位于素有“无油轴承之乡”美称的浙江省嘉善县罗星街道加速器内，东距上海虹桥机场60公里，西距杭州100公里，北临苏州80公里。地理位置优越，交通极其便捷。

我们的产品畅销海内外主要产品：FB 青铜卷制轴承、JDB 固体润滑轴承、JF 双金属轴承、SF-1无油润滑轴承、SF-2边界润滑轴承、FR 青铜四氟轴套、FD 填充四氟材料等。产品广泛应用于液压行业、汽车行业、工程机械、冶金设备、矿山机械、注塑、模具、纺织、印刷、灌装、包装、等各个机械制造领域，产品销售江苏、四川、山西、广东、山东、重

庆、浙江、上海、福建等全国各地而且部分出口外销，企业将不断引进人才，完善管理机制，诚信、开拓、创新，争创一流品牌。

自开办以来，我们始终坚持管理和技术的创新，坚持以科技为先导，以质量求发展，企业的技术水平和产品质量不断提升，公司以质量过关，服务到位得到了客户的高度信赖。我们本着以市场为导向，以质量求生存，开拓创新的原则，竭诚欢迎社会各界同仁亲临指导，同时接受客户的来料加工。

滑动轴承专业制造商

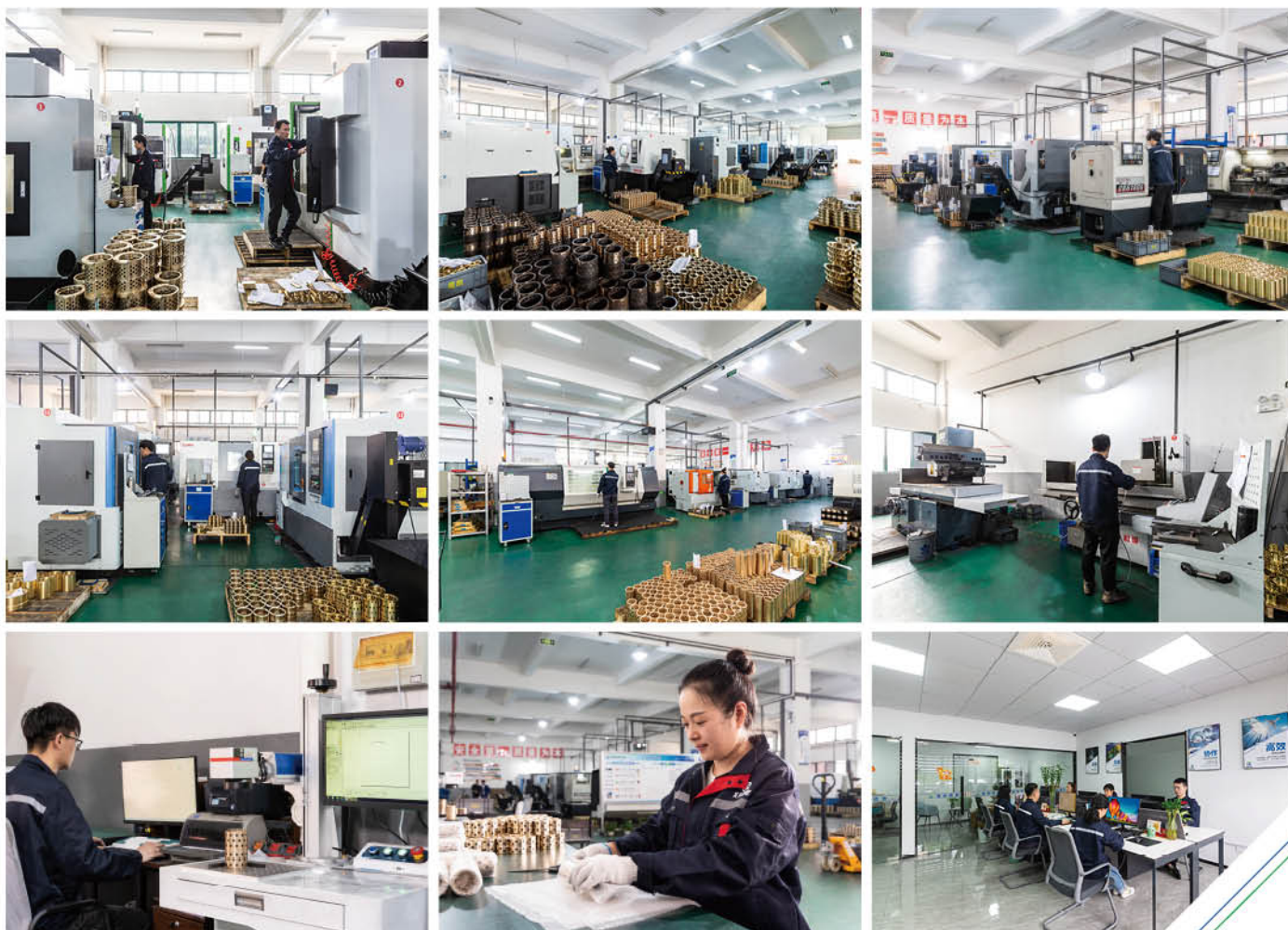
Professional Manufacturer of Plain Bearings

Jiaxing Haokai Precision Machinery Co., Ltd. is a professional manufacturer of oil-free bearings, located in the accelerator of Luoxing Street, Jiashan County, Zhejiang Province, known as the hometown of oil-free bearings. It is 60 kilometers from Shanghai Hongqiao Airport in the east, 100 kilometers from Hangzhou in the west, and 80 kilometers from Suzhou in the north. The geographical location is excellent, and the transportation is extremely convenient.

Our products sell well at home and abroad Main products: FB bronze coil bearings, JDB solid lubricated bearings, JF bimetal bearings, SF-1 oil-free lubricated bearings, SF-2 boundary lubricated bearings, FR bronze PTFE bushings, FD filled PTFE materials, etc. Products are widely used in hydraulic industry, automobile industry, engineering machinery, metallurgical equipment, mining machinery, injection molding, mold, textile, printing, filling, packaging, and other

machinery manufacturing fields, products are sold in Jiangsu, Sichuan, Shanxi, Guangdong, Shandong, Chongqing, Zhejiang, Shanghai, Fujian and other parts of the country and exported, enterprises will continue to introduce talents, Improve the management mechanism, integrity, development, innovation, striving for first-class brand.

Since its inception, we always adhere to the innovation of management and technology, adhere to science and technology as the guide, quality and development, the technical level of enterprises and product quality continue to improve, the company to pass the quality, service in place has been highly trusted by customers. We are in line with the market-oriented, quality of survival, pioneering and innovative principles, we sincerely welcome colleagues from all walks of life to visit the guidance, while accepting customer processing.



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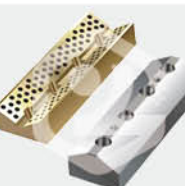
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法兰一体型无油衬套

Flange Integrated Type Oil-free Bushing

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代替直线LM系列

代替直线LM系列

Instead of linear LM series

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代替LMF/K/H... UU系列

代替LMF/K/H... UU系列

Instead of LMF/K/H... UU Series

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HKB-650GT

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HKB-650GT

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应用领域
Application



Application of Self-Lubricating Bearing In Automotive Field

自润滑轴承在汽车领域应用



油门和制动系统



后门铰链



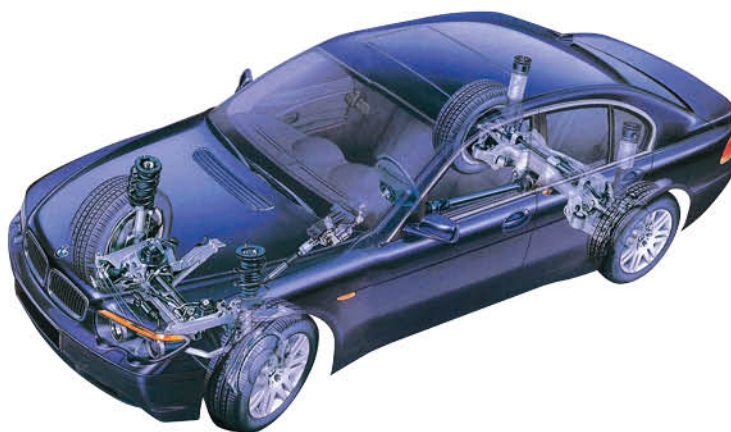
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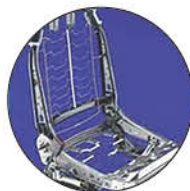
行李箱铰链



转向器



发动机涨紧轮



座椅



减震器



车桥、车轴



离合器

保护环境

Protect the environment



保护地球环境 为建设理想社会而做出贡献的

作为自润滑轴承的专业厂商，我们旨在成为
世界顶级企业，为现代工业工业贡献我们的技术。

As a professional manufacturer of self-lubricating bearing, we aim to become the world's top companies and contribute our technologies to modern industrial.

- | | |
|-------------------------------------|---|
| ◎ 昊凯的经营理念： | ◎ HKB BUSINESS PHILOSOPHY: |
| ◎ 用我们的质量赢的您的信任， | ◎ Our quantity win your trust, |
| ◎ 用我们的服务得到您的订单。 | ◎ Our service gain your orders. |
| ◎ 我们将以常年的累积的经验和创新的技术开发能力去克服未来的各种挑战。 | ◎ Based on our perennial technical experience and creative development capabilities, we will overcome all the difficulties. |
| ◎ 我们秉承取之于社会用之于社会的生产理念。 | ◎ We use from the world and contribute to the world. |

RoHS指令 限制的六种物质



铅



镉



多氯联苯醚



多氯联苯



六价铬



汞

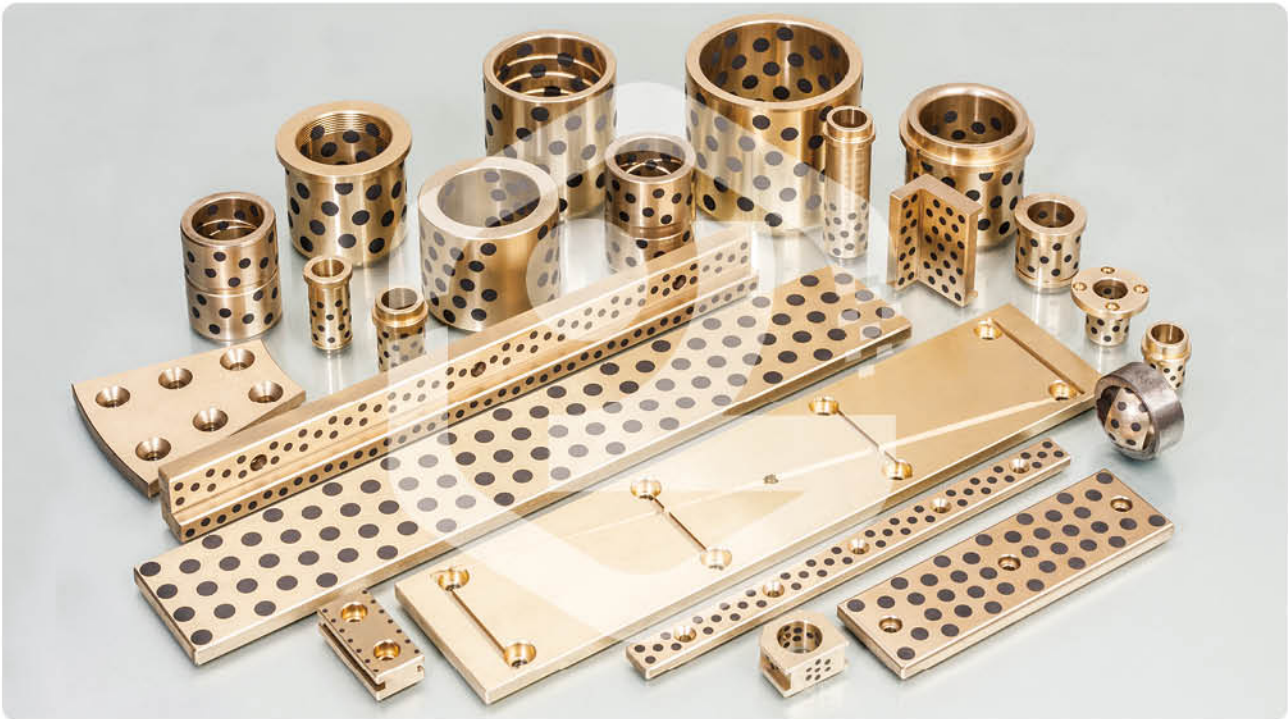
自润树脂类、复层类、“全产品”
已经实现了无铅化

Self-lubricating resin, Composite class and 'All kind' achieve lead free.

自润树脂类复层制品已经可以对应RoHS指令

Self-lubricating resin meet RoHS Directive.

HRB-650 铜基镶嵌固体润滑轴承 HRB-650 Cast Bronze Bearings With Graphite



JDB-650产品特长 Product Features

1. 无需供油装置、注油孔、油槽加工
供油装置的费用、加工费、组装费等多余的成本与时间的节省，能大幅降低制造成本。
2. 运行成本的降低
大幅降低润滑油的使用量与设备的维护保养费，另外也免除了由于供油不足造成的风险。
3. 设计时间的缩短
无油化可以使设计，结构等大幅简化，降低成本，节约设计时间，此外，使用自润滑轴承还可以提高机械性能，延长使用寿命及提高可靠性等方面获得显著效果。
4. 润滑油的回收和环保
无需废油回收处理，有利于环境保护。
HKB650 自润滑轴承作为机械行业零部件，有一定广义上的使用。为了使机械传动运行正常，下了不少功夫。将轴承区分为滚动轴承和滑动轴承。一般的滑动轴承在高负荷运动方式、异物混入、温度条件、供油、维护保养不完善等情况下，会引起拉毛。像这样一般的滑动轴承无法使用的严酷条件下，固体镶嵌型金属自润滑轴承的耐磨性，耐拉毛性上，发挥轴承应有的性能，实现机械的高性能化和免维护保养的作用。

1. No need to oil installations, the filling hole processing tank
The cost of oil installations, processing fees, assembly fees, the extra cost and time savings can significantly reduce manufacturing costs.
2. Lower operating costs
Substantially reduce the use of lubricants and equipment maintenance costs, while also eliminating the risk caused due to insufficient oil supply.
3. The shortening of design time
Non-oil can make the design, structure, and greatly simplify and reduce costs, save design time and to obtain significant results, in addition, the use of self-lubricating bearings can also improve the mechanical properties and extend the service life and higher reliability.
4. Lubricating oil recycling and environmental protection
No need to waste oil recycling, are environmentally friendly.
HKB650, self-lubricating bearing parts of the machinery industry, the use of certain generalized. In order to make the mechanical drive is operating normally,

a lot of effort. The bearing area is divided into Rolling and plain bearings. Sliding bearings in high-load movement, foreign substances, temperature, fuel, maintenance, imperfect circumstances, can cause galling. Like sliding bearings can not be used under harsh conditions, the solid inlaid metal self-lubricating bearings, wear resistance, resistance to galling, to play the bearings of the due performance, the role of mechanical performance and maintenance-free.

使用注意事项 Application Notes

1. 在可能情况下，设计时尽量采用标准规格；
 2. 装配时请注意表面有无异物；
 3. 使用后的滑动面，因固体润滑剂形成的油膜导致表面有黑色或灰色现象，请不要擦洗，照常使用；
 4. 装配前，若以润滑油涂于对磨件上，可减短走合期，利于机械操作、运转；
 5. 装配时应徐徐压入，严禁敲打，以免损伤轴承及引起变形；
 6. 设计时，不同的部位应选用适当的材质，以便提高机械性能，延长轴承的使用寿命；
 7. 在高承载，往复运动中，建议使用螺钉固定；
 8. 在淡水中、海水中及在海上作业时，对磨轴建议使用不锈钢或表面镀铬。
1. Use standard designation when designing if possible;
 2. Note if there are any foreign matters on the surface when assembling;
 3. Do not erase the black or grey phenomenon on the sliding surface caused by the oil film that is formed by the solid lubricant after using;
 4. It is good for mechanical operation and running if lay the lubricant on the corresponding friction set before installing;
 5. Pressing should be carried out slowly when installing. Do not beat in the event of damaging the bushing or causing the distortion to the bushing;
 6. Using proper material in different parts when designing in order to enhance the mechanical properties and prolong the service life of the bushing;
 7. It would be better to fix with bolt in high load and reciprocating motion;
 8. It is recommended to use stainless steel or plate chrome on the surface of the corresponding friction shaft when working in the water or in the sea.

HRB-650 铜基镶嵌固体润滑轴承

HRB-650 Cast Bronze Bearings With Graphite



选择使用HKB自润滑轴承的基体材料：

材料成份和性能 Material Composition and Properties

HKB Code	HRB-650	HRB-650S1	HRB-650S2	HRB-650S3	HRB-650S4	HRB-650S5	HRB (HT250)	HRB (Gcr15)
材料牌号 Code	CuZn25Al5Mn3Fe3	CuSn5Pb5Zn5	CuAl10Ni5Fe5	CuSn12	CuAl10Fe3	CuZn25Al5Mn3Fe3	HT250	Gcr15
密度 Density	8.0	8.9	7.8	9.05	8.5	8.0	7.3	7.8
硬度 Hardness HB	> 210	> 70	≥150	> 80	> 160	> 250	> 190	HRC > 58
抗拉强度 N/mm ² Tensile strength	> 750	> 200	≥500	> 260	> 590	> 800	> 250	> 1500
伸长率 Elongation%	> 12	> 10	≥10	> 8	> 15	> 8	> 5	> 15
热胀系数 Coefficient of linear expansion 10 ⁻⁵ /°C	1.9	1.8	1.6	1.8	1.9	1.9	1.0	1.1
温度 Limit Temp °C	-40~+300	-40~+400	-40~+400	-40~+400	-40~+400	-40~+300	-40~+400	-40~+400
最大动承载 Max.load N/mm ²	100	60	50	70	150	150	80	200
最大线速度 m/min Max.speed (Dry)	15	10	20	10	20	15	8	5
Max.PV最大PV N/mm ² *m/min	200	60	60	80	60	200	40	150
压缩永久变形量 300N/mm ²	< 0.01	< 0.05	< 0.04	< 0.05	< 0.04	< 0.005	< 0.015	< 0.002

材料对应表 Base Material Interchange

材料代号 Material Codes	中国 China Brands GB1176-87	国际 Intenational ISO 1338	德国 Germany DIN	日本 Japan JIS	美国 America ASTM(UNS)	英国 England BS	法国 France NF	适用情况 Applicable conditions
JDB650 高力合金铜	ZCuZn25Al6Fe3Mn3	GCuZn25Al6Fe3Mn3	DIN1709 G-CuZn25Al5	H5102 CAC304	B30-92 C86300	HTB2		高载荷，低速，一般用 High-load, low speed Commonly used
JDB650S1 铸造锡青铜	ZCuSn5Pb5Zn5	GCuPb5Sn5Zn5	DIN1705 G-CuSn5Zn5Pb	H5111 BC6	B30-92 C83600	LG2	CuPb5Sn5Zn5	中载荷，低速 Mid-load, low speed
JDB650S4 铸造铝青铜	CuAl10Fe3	CuAl10Fe3	DIN17656 GB-CuAl10Ni/2.1096	H5114 CAC703	B30-92 C95800			中载荷，中速，一般用 Mid-load, mid-speed, Commonly used
JDB650S5 高力合金铜	ZCuZn25Al6Fe3Mn3	GCuZn25Al6Fe3Mn3	DIN1709 G-CuZn25Al5	H5102 CAC304	B30-92 C86300	HTB2		超高载荷，低速，高承载用 Over high load, low speed, High load used
JDB(HT250) 铸铁	GB5675-85HT250			FC250	ASTM Class40			中载荷，低速 Mid-load, low speed

固体润滑剂 Solid Lubricant

固体润滑剂 Lubricant	特性 Features	典型用途 Typical application
SL1 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 Excellent resistance against chemical attacks and low friction, Temp limit 400°C	应用于一般机械，在大气中使用 Suit for general machines and under atmosphere
SL4 PTFE+添加剂 PTFE+add	极低的摩擦系数和很好的水润性，使用温度 < 300°C Lowest in friction and good of water Lubrication, Temp limit 300°C	应用于水、海水润滑、如船舶，水工弧门，水轮机，制药 饮料机械等。 Ship, hydraulic turbine, gas turbine etc.

HRB-650 铜基镶嵌固体润滑轴承 HRB-650 Cast Bronze Bearings With Graphite



轴承的寿命 The Life The Bushing

HRB-650固体润滑轴承的寿命，除急剧的烧焦外，通常由轴承内径的磨损量来决定，磨损量主要受摩擦条件的影响，而摩擦又受承载、速度、杂质、材质、表面粗糙度、工作温度、不同运行方式、所使用润滑剂等条件影响，因此，磨损量只能是一个理论估计值，轴承的寿命取决于各种复杂的条件。

The life of HRB-650 Solid-lubricant-inlaid depends on the wear depth of the inside diameter of the bushing except such condition as acute Singe, etc. The wear depth is influenced by the load speed, foreign matter, material, surface roughness, working temperature, different operating methods and the lubricant used. So the wear depth is only a theoretical estimate value and the life of the bushing depends on all kinds of the complex conditions.

若因供油不良，杂质渗入而使磨损急剧变化时，就很难预测磨损情形。下式为正常情况下由实验得出的磨损量计算式。

If the oil is not provided well, it is hard to estimate the abrasion state when the foreign matters intermingling. the following formula is the computing method.

$$W = K \times P \times V \times T$$

K: 摩擦系数 Coefficient of Friction
[mm/(N/mm²·m/min·hr)]

W: 磨损量 Wear Depth (mm)

P: 承载压力 Load Pressure (N/mm²)

V: 线速度 Linear speed (m/min)

T: 磨损时间 Wear Time (hr)

从上式中可以看出，若摩擦系数(K)已知，便可根据承载压力(P)、线速度(V)和磨损时间(T)计算出轴承实际磨损量。但是，在各种实际条件下准确计算出摩擦系数K是件非常困难的事情。在理想条件下，摩擦系数K由影响其值的因素因子Ci来决定。

工况条件 Working Conditions

1. 承载压力 Loading pressure

通常所谓承载压力是指轴承承受载荷时，轴承支持的最大载荷除以受压面积。所谓受压面积，当轴承为圆柱时，取与轴承接触部分的载荷方向的投影面积。

2. 线速度 Linear speed

轴承的发热量，主要是由轴承的摩擦作用引起的，根据经验可知，对摩擦面温度的上升，滑动速度V的影响远大于承载压力P的影响。轴承若使用同一PV值，速度V愈大，轴承面温度上升愈快，因此在高温使用时，最好能供给润滑油，增大冷却效果和流体润滑；以求降低摩擦系数，以防高磨损和烧焦现象的发生。

From the above formula you can see that if the coefficient of the friction "K" is known the real wear depth can be computed according to the pressure "P", linear speed "V" and wear time "T". But it is very difficult to calculate "K" under various actual conditions. Under ideal conditions, "K" depends on the factor "Ci" which influences it.

即 i. e. $K = C_i \times k$

Ci: 影响磨损量的因素因子 $C_i = C_1 \times C_2 \times C_3 \times \dots$

Ci: $C_i = C_1 \times C_2 \times C_3 \times \dots$ Factor genes that influence the wear depth.

K: 理想条件下的摩擦系数 And k is the coefficient of friction under ideal conditions.

$K = (1-5) \times 10^{-8} [\text{mm}/(\text{N}/\text{mm}^2 \cdot \text{m}/\text{min} \cdot \text{hr})]$

C₀: 滑动条件系数 Coefficient of sliding conditions

C ₀		线速度 Linear speed V(m/min)		
		≤1	1~10	10~30
承载压力 Loading pressure P(N/mm ²)	≤5	8~10	10~12	12~18
	5~25	12~18	18~25	25~30
	25~50	18~25	25~30	30~40

C₁: 温度条件系数 Coefficient of temperature conditions

工作温度 Working temperature(°C)	≤100	100 ~ 200	200 ~ 400
C ₁	1~2	3~5	5~10

C₂: 环境条件系数 Coefficient of surrounding temperature

环境 Surrounding	一般场所 general place	室外 outside	粉尘较多场合 Places with much powder
C ₂	1~2	5~10	10~30

C₃: 使用场所系数 Coefficient of places used

使用场所 Places used	大气中 Atmosphere	水中 Water	海水中 Sea
C ₃	1.9	0.8	1.2

The so-called loading pressure generally means that when the bushing is loading, the max load it bears divides the pressed area. And the loading pressed area means the projection area of the connecting parts when the bushing is cylindrical.

The heat radiated by the bushing is mainly caused by the friction of the bushing. According to the experience we know that the sliding speed "V" affects more than load pressure "P" to the surface temperature. If the bushing uses the same PV value, the higher speed the more quickly temperature ascends. So it would.

HRB-600 铜基精加工轴承 HRB-600 Solid Bronze Turned Bushes



基材特征 Structure

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HRB可以根据不同的使用工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。材质有强力黄铜CuZn25Al6Mn4Fe3；锡青铜CuSn5Pb5Zn5，CuSn12；铝青铜CuAl10Ni5Fe5，CuAl10Fe3；铍青铜，YS/T334-1995的QBe2.0合金，QBe1.9合金，铍青铜材；铍镍铜材；铍钴铜材。

The finished copper alloy bushing provides a simple and economical way of bearing operation, which has the characteristics of high load, good corrosion resistance and arbitrary dimensional processing. At the same time, HRB can provide different grades of copper alloys according to different working conditions, and process different forms according to the requirements, which has higher dimensional accuracy than coil copper bearings. The material is high force brass CuZn25Al6Mn4Fe3; Tin bronze CuSn5Pb5Zn5, CuSn12; Aluminum bronze CuAl10Ni5Fe5, CuAl10Fe3; Beryllium bronze, QBe2.0 alloy of YS/T334-1995, QBe1.9 alloy, beryllium bronze; Beryllium nickel copper; Beryllium cobalt copper.

油槽 Oil Grppve

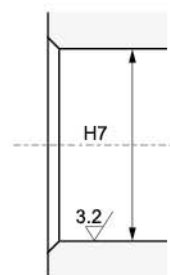
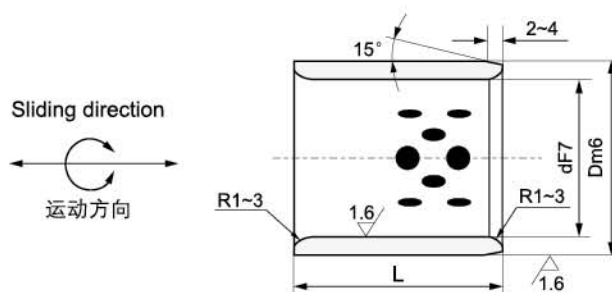


技术参数 Technical Data

材料牌号	HRB-600	HRB-600S1	HRB-600S2	HRB-600S3	HRB-600S4	HRB-600S5
	CuZn25Al6Mn4Fe3	CuSn5Pb5Zn5	CuAl10Ni5Fe5	CuSn12	CuAl10Fe3	CuZn25Al6Mn4Fe3
密度	8.0	8.9	7.8	8.9	8.5	8.0
屈服强度N/mm ²	> 450	> 90	> 260	> 150	> 160	> 450
抗拉强度N/mm ²	> 750	> 200	> 600	> 260	> 590	> 800
延伸率 %	> 12	> 15	> 10	> 8	> 15	> 8
硬度 HB	> 210	> 70	> 150	> 95	> 160	> 250

HKB-650 自润滑轴套

HKB-650 Metric Cylindrical Bushes



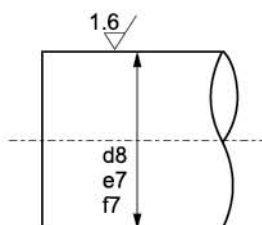
Mating Housing
相配座孔

单位Unit: mm

内径		外径		长度 L ^{-0.1} _{-0.3}							
Ø d		Ø D		8	10	12	15	16	19	20	25
6	+0.022 +0.010	10	+0.015 +0.006	061008	061010	061012					
8	+0.028 +0.013	12	+0.018 +0.007	081208	081210	081212	081215				
10		14		101408	101410	101412	101415			101420	
12		18		121808	121810	121812	121815	121816	121819	121820	121825
13		19			131910	131912	131915			131920	131925
14	+0.034 +0.016	20			142010	142012	142015			142020	142025
15		21			152110	152112	152115	152116		152120	152125
16		22	+0.021 +0.008		162210	162212	162215	162216	162219	162220	162225
17		23					172315				
18		24			182410	182412	182415	182416		182420	182425
19		26					192615			192620	
20		28			202810	202812	202815	202816	202819	202820	202825
		30		203010	203012	203015	203016		203020	203025	
22	+0.041 +0.020	32				223212	223215			223220	223225
25		33				253312	253315	253316		253320	253325
		35				253512	253515	253516		253520	253525
28		38	+0.025 +0.009							283820	283825
30		40				303812	303815			303820	303825
					304012	304015			304020	304025	
31.5		42									
32		44								324220	
35	+0.050 +0.025	45								354420	354425
		48							354520	354525	
50					405015				405020	405025	
40	55	+0.030 +0.011				405515					
	56										
	60										

HKB-650 自润滑轴套

HKB-650 Metric Cylindrical Bushes



d8: High load 高负荷
e7: Light load 轻负荷
f7: High precision 高精度

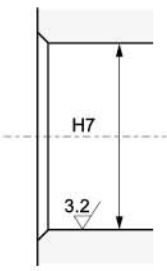
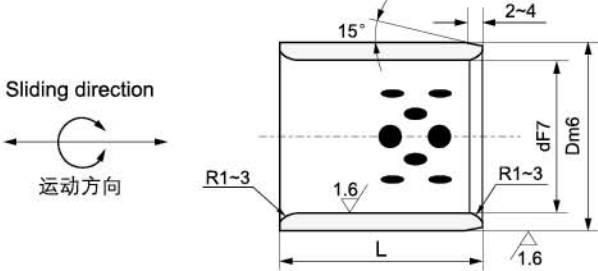
Mating Shaft
相配轴

材质	高力黄铜 + 固体润滑剂
Material	650#+Graphite

单位 Unit: mm

长度 L $\begin{smallmatrix} -0.1 \\ -0.3 \end{smallmatrix}$							压入后 内径公差	适用垫圈	内径
30	35	40	50	60	70	80		HKB-JTW	Ø d
							+0.019 +0.007	0603	6
							+0.025 +0.010	0803	8
								1003	10
121830							+0.031 +0.013	1203	12
131930								1303	13
142030								1403	14
152130	152135	152140					+0.030 +0.012	1503	15
162230	162235	162240						1603	16
								1803*	17
182430	182435	182440						1803	18
								2005*	19
202830	202835	202840	202850					2005	20
203030	203035	203040	203050					2505*	22
253330	253335	253340	253350	253360			+0.037 +0.016	2505	25
253530	253535	253540	253550	253560				3005*	28
283830		283840						3005	30
303830	303835	303840	303850	303860					
304030	304035	304040	304050	304060				3505	31.5
314030		314040							32
324230		324240							
354430	354435	354440	354450	354460			+0.046 +0.021	3505	35
354530	354535	354540	354550	354560				4007*	38
		384840							
405030	405035	405040	405050	405060	405070	405080		4007	40
405530	405535	405540	405550	405560				4507*	
455530	455535	455540	455550	455560			+0.045 +0.020		
455630	455635	455640	455650	455660				4507	45
456030	456035	456040	456050	456060	456070	456080			

HKB-650 自润滑轴套
HKB-650 Metric Cylindrical Bushes



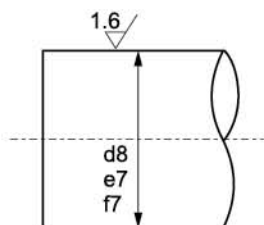
Mating Housing
相配座孔

单位Unit: mm

内径		外径		长度 L ^{+0.1} _{-0.3}							
Ø d		Ø D		20	30	35	40	50	60	70	80
50	+0.050 +0.025	60		506020	506030	506035	506040	506050	506060	506070	506080
		62			506230	506235	506240	506250	506260	506270	506280
		65			506530		506540	506550	506560	506570	506580
55		70	+0.030 +0.011		557030	557035	557040	557050	557060	557070	
60		74			607430	607435	607440	607450	607460	607470	607480
63		75			607530	607535	607540	607550	607560	607570	607580
65		80					658040	658050	658060	658070	658080
70	+0.060 +0.030	85			708530	708535	708540	708550	708560	708570	708580
		90						709050	709060	709070	709080
75		95							759050	759060	759070
		96	+0.035 +0.013				809640	809650	809660	809670	809680
80		100					8010040	8010050	8010060	8010070	8010080
85		110							8510060		8510080
90	+0.071 +0.036	120						9011050	9011060		9011080
100		130						10012050	10012060	10012070	10012080
110		140						11013050		11013070	11013080
120		145								12014070	12014080
125		150	+0.040 +0.015								
130		160									
140		170									15017080
150	+0.083 +0.043	180									16018080
160		190									
170		200	+0.046 +0.017								
180		210									
190	+0.096 +0.050	230									
200											

HKB-650 自润滑轴套

HKB-650 Metric Cylindrical Bushes



Mating Shaft
相配轴

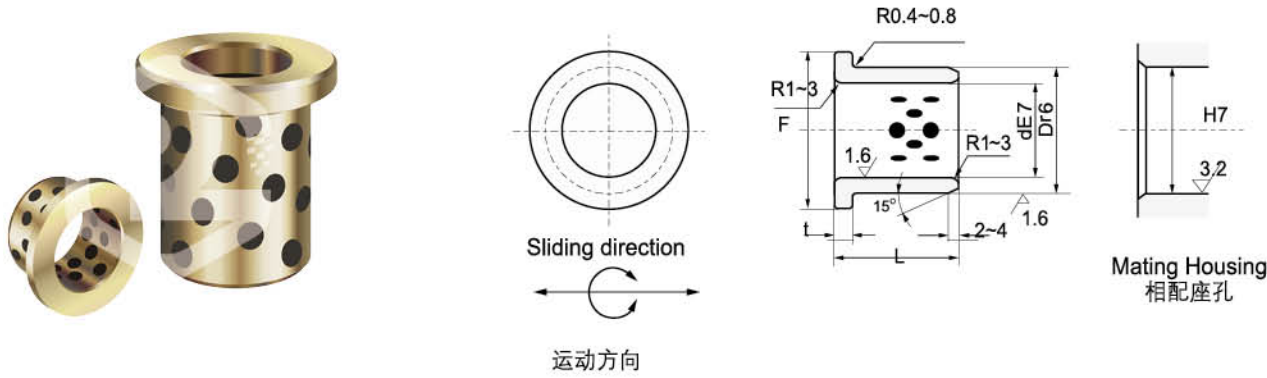
d8: High load 高负荷
e7: Light load 轻负荷
f7: High precision 高精度

材质	高力黄铜 + 固体润滑剂
Material	650#+Graphite

单位 Unit: mm

长度 L ^{-0.1} / _{-0.3}							I.D.After Press-Fitting 压装后内孔	HKB-JTW 适用垫片	内径
90	100	120	130	140	150	200			Ø d
							+0.045 +0.020	50	50
	5065100								
							+0.055 +0.025	55	55
	6075100							60	60
								65	63
								65	65
	7085100						+0.054 +0.024	70	70
	7590100							75	75
	7595100								
	8096100	8096120						80	80
	80100100	80100120		80100140					
							+0.065 +0.030	90	85
9011090	90110100	90110120							90
10012090	100120100	100120120		100120140				100	100
	110130100	110130120					+0.064 +0.029	120	110
12014090	120140100	120140120		120140140					120
	125145100	125145120					+0.076 +0.036	-	125
	130150100		130150130						130
	140160100			140160140					140
	150170100				150170150		+0.088 +0.042	-	150
	160180100				160180150				160
	170190100				170190150				170
	180200100				180200150		+0.088 +0.042	-	180
	190210100				190210150				190
					200230150	200230200			200

HKB-650F 自润滑翻边轴套
HKB-650F Metric Flange Bushes

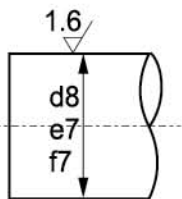


单位Unit: mm

内径		外径		法兰		长度 L ^{+0.1} _{-0.3}								
Ø d		Ø D		F	t		10	12	15	17	18	20	23	25
6	+0.032 +0.020	10	+0.028 +0.019	16	2		0610	0612						
8	+0.040 +0.025	12	+0.034 +0.023	20			0810	0812	0815					
10		14		22			1010	1012	1015	1017		1020		
12		18		25			1210	1212	1215			1220		1225
13		19		26	1310	1312	1315			1320		1325		
14		+0.050 +0.032	20	27			1415			1420		1425		
15			21	28	1510	1512	1515			1520		1525		
16		22	+0.041 +0.028	29			1612	1615		1618	1620	1623	1625	
18		24		32			1815			1820		1825		
20		30		40			2015			2020		2025		
25		+0.061 +0.040		35	45			2515			2520		2525	
30	40		+0.050 +0.034	50						3020		3025		
31.5		+0.075 +0.050		45	60	5					3120			
35				50	65						3520		3525	
40				55	70						4020		4025	
45	60		75											
50		65	+0.060 +0.041	80	0 -0.1									
55		75		85										
60		75		+0.062 +0.043		90								
63						80	95	7.5						
65	+0.090 +0.060	85	105											
70		90	+0.073 +0.051	110										
75		100	+0.076 +0.054	120										
80		110		130										
90		120		150										
100		+0.107 +0.072		140		+0.088 +0.063	170							
120	150		180											
130	160		+0.090 +0.065	190										
140	+0.125 +0.085		170	+0.093 +0.068	200									
150		180	210											
160														

HKB-650F 自润滑翻边轴套

HKB-650F Metric Flange Bushes



Mating Shaft
相配轴

d8: High load 高负荷

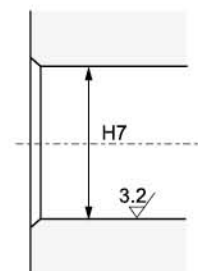
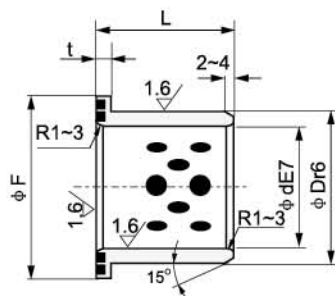
e7: Light load 轻负荷

f7: High precision 高精度

材质	高力黄铜 + 固体润滑剂
Material	650#+Graphite

单位 Unit: mm

长度 L $\begin{smallmatrix} +0.1 \\ -0.3 \end{smallmatrix}$									压入后 内径公差	内径 Ø d
30	35	40	50	60	67.5	80	100	120		
									+0.016 +0.004	6
									+0.021 +0.006	8
										10
1230									+0.031 +0.013	12
1330										13
										14
1530									+0.026 +0.008	15
1630	1635	1640								16
1830	1835	1840								18
2030	2035	2040							+0.037 +0.016	20
2530	2535	2540	2550						+0.032 +0.011	25
3030	3035	3040	3050							30
3130	3135	3140								31.5
3530	3535	3540	3550						+0.046 +0.021	35
4030	4035	4040	4050							40
4530	4535	4540	4550	4560					+0.040 +0.015	45
5030	5035	5040	5050	5060						50
		5540		5560					+0.055 +0.025	55
		6040	6050	6060		6080				60
					6367				+0.053 +0.023	63
				6560						65
			7050			7080				70
				7560					+0.046 +0.016	75
				8060		8080	80100			80
				9060		9080			+0.060 +0.025	90
						10080	100100			100
						12080	120100		+0.052 +0.017	120
						13080	130100			130
						14080	140100		+0.068 +0.028	140
							150100	150120	+0.065 +0.025	150
							160100	160120		160



Mating Housing
相配座孔

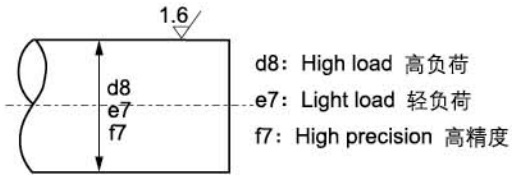
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HKB-JDBB 自润滑翻边轴套

HKB-JDBB Metric Flange Bushes



材质	高力黄铜 + 固体润滑剂
Material	650#+Graphite



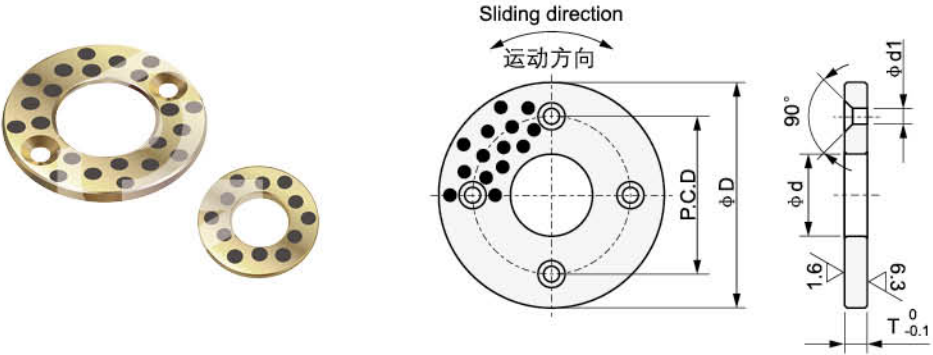
d8: High load 高负荷
e7: Light load 轻负荷
f7: High precision 高精度

Mating Shaft
相配轴

单位 Unit: mm

长度 L ^{-0.1} _{-0.3}												压入后 内径公差	内径
27	35	37	38	47	48	50	58	60	68	80	90		Ø d
												+0.016 +0.004	6
												+0.021 +0.006	8
													10
												+0.031 +0.013	12
												+0.026 +0.008	13
													15
													16
													18
												+0.037 +0.016	20
												+0.032 +0.011	25
	3035												30
	3535											+0.046 +0.021	35
4027		4037		4047									40
			5038		5048		5058					+0.040 +0.015	50
			6038		6048		6058		6068			+0.053 +0.023	60
						7075				7080		+0.046 +0.016	70
								8060			8090		80

HKB-JTW 止推垫片
HKB-JTW Metric Thrust Washer



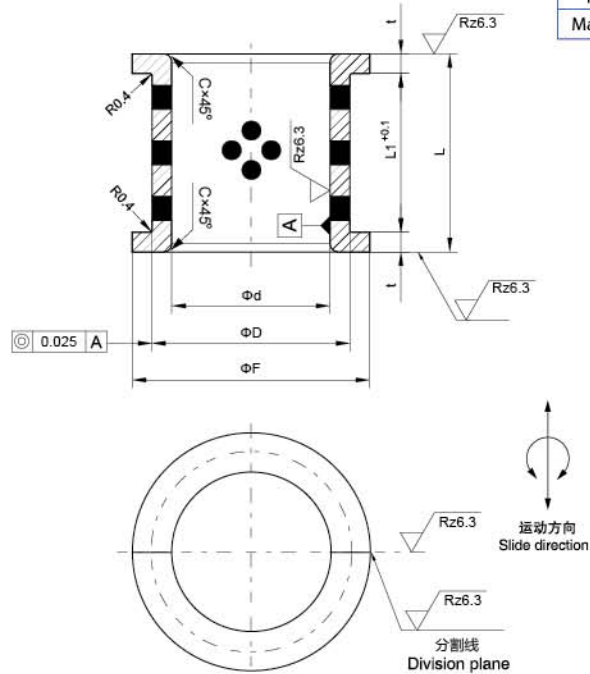
材质	高力黄铜 + 固体润滑剂
Material	650# + Graphite

单位Unit: mm

Parts No.	内径		外径	厚度		定位孔			
	ϕd		ϕD	T		P.C.D	个数	定位螺栓	d1
HKB-JTW-0603	6.2		25			15			
HKB-JTW-0803	8.2		28			18			
HKB-JTW-1003	10.2		30			20			
HKB-JTW-1203	12.2					28			
HKB-JTW-1203N			40			无定位孔			
HKB-JTW-1303	13.2			3		28			
HKB-JTW-1403	14.2								
HKB-JTW-1503	15.2								
HKB-JTW-1603	16.2	+0.2 +0.1				35			
HKB-JTW-1603N			50			无定位孔			
HKB-JTW-1803	18.2					35		M3	3.5
HKB-JTW-2005	20.2								
HKB-JTW-2505	25.2		55			40		M5	6
HKB-JTW-2505N						无定位孔			
HKB-JTW-3005	30.2		60	5	0 -0.1	45	2	M5	6
HKB-JTW-3005N						无定位孔			
HKB-JTW-3505	35.2		70			50		M5	6
HKB-JTW-4007	40.2	+0.2 +0.1	80			60	2		
HKB-JTW-4507	45.2		90	7		70			
HKB-JTW-5008	50.3		100			75		M6	7
HKB-JTW-5508	55.3		110			85			
HKB-JTW-6008	60.3		120	8		90			
HKB-JTW-6508	65.3		125			95			
HKB-JTW-7010	70.3	+0.3 +0.1	130			100		M8	9
HKB-JTW-7510	75.3		140			110			
HKB-JTW-8010	80.3		150			120			
HKB-JTW-9010	90.5		170	10		140			
HKB-JTW-10010	100.5		190			160		M10	11
HKB-JTW-12010	120.5		200			175			

HKB-JFFB 自润滑轴瓦

HKB-JFFB Half-Bearing



材质	高力黄铜 + 固体润滑剂
Material	650#+Graphite

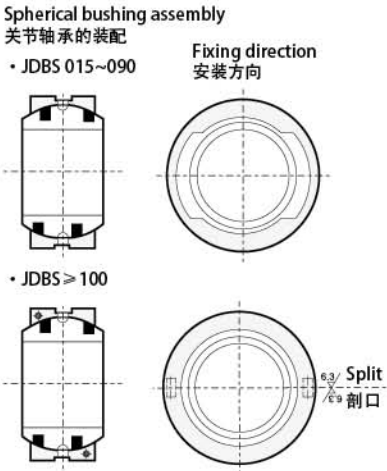
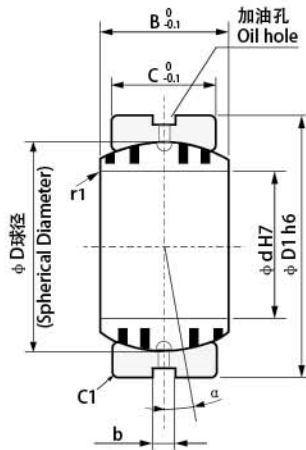
单位Unit: mm

产品代号 Part No.	I.D. Φd 内径 H7	O.D. ΦD 外径	ΦF d11	L h12	L1+0.1 0	t	C
HKB-JFFB-030	30	38 s6	48	34	22	6	1
HKB-JFFB-035	35	45 "	55	45	32	6.5	"
HKB-JFFB-040	40	50 "	60	50	35	7.5	"
HKB-JFFB-045	45	55 "	65	55	40	7.5	"
HKB-JFFB-050	50	60 "	70	60	45	7.5	"
HKB-JFFB-060	60	70 "	80	70	50	10	2
HKB-JFFB-070	70	85 "	95	80	60	10	"
HKB-JFFB-080	80	95 "	110	95	70	12.5	"
HKB-JFFB-090	90	105 "	120	105	80	12.5	"
HKB-JFFB-100	100	115 "	130	115	90	12.5	"
HKB-JFFB-110	110	125 r6	140	125	100	12.5	"
HKB-JFFB-120	120	135 "	150	140	110	15	"
HKB-JFFB-140	140	160 "	175	160	120	20	"
HKB-JFFB-160	160	180 "	200	180	140	20	"

HKB-JDBS 自润滑关节轴承
HKB-JDBS Metric Sphericar Plain Bushes



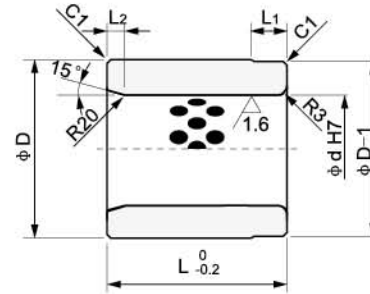
外圈	高力黄铜 + 固体润滑剂
Outer ring	CuZn25Al5Mn3Fe3+Graphite (500#5P)
内圈	材料 Material: S45C
Inner ring	硬度 Hardness: HRC 25~30



单位Unit: mm

产品代号 Part No.	d	H7	D1	h6	B	C	D	b	调整角度 Alignment Angle α°	径向承载Allowable Radial Load (kN)	径向承载Allowable Thrust Load (kN)
HKB-JDBS-015	15	^{+0.018} ₀	26	⁰ _{-0.013}	12	9	22	4	8	6.5	0.5
HKB-JDBS-020	20	^{+0.021} ₀	32	⁰ _{-0.016}	16	14	28	"	4	12.6	1.4
HKB-JDBS-025	25	"	42	"	21	18	36	"	5	21.8	2.5
HKB-JDBS-030	30	"	50	"	27	23	44	"	6	32.0	3.5
HKB-JDBS-035	35	^{+0.025} ₀	55	⁰ _{-0.019}	30	26	49	"	5	43.7	4.8
HKB-JDBS-040	40	"	62	"	33	28	55	"	6	54.7	5.7
HKB-JDBS-045	45	"	72	"	36	31	62	"	5	69.7	7.2
HKB-JDBS-050	50	"	80	"	42	36	70	"	"	92.4	10
HKB-JDBS-060	60	^{+0.030} ₀	100	⁰ _{-0.022}	53	45	90	"	6	143	16
HKB-JDBS-070	70	"	110	"	58	50	99	"	5	181	20
HKB-JDBS-080	80	"	130	"	70	60	115	"	6	254	30
HKB-JDBS-090	90	^{+0.035} ₀	140	⁰ _{-0.025}	76	65	125	"	"	313	36
HKB-JDBS-100	100	"	160	"	88	75	145	6	"	544	64
HKB-JDBS-110	110	"	170	"	93	80	155	"	5	642	73
HKB-JDBS-120	120	"	190	⁰ _{-0.029}	105	90	17	"	6	797	94
HKB-JDBS-130	130	^{+0.040} ₀	200	"	110	95	180	"	5	880	105
HKB-JDBS-140	140	"	210	"	90	70	"	"	7	668	56
HKB-JDBS-150	150	"	220	"	120	105	200	"	5	1135	129
HKB-JDBS-160	160	"	230	"	105	80	"	"	8	891	73
HKB-JDBS-180	180	"	260	⁰ _{-0.032}	105	"	225	"	6	1002	74
HKB-JDBS-200	200	^{+0.046} ₀	290	"	130	100	250	"	7	1434	117
HKB-JDBS-220	220	"	320	⁰ _{-0.036}	135	"	275	"	8	1577	118
HKB-JDBS-240	240	"	340	"	140	"	300	9	"	1720	"
HKB-JDBS-260	260	^{+0.052} ₀	370	"	150	110	325	"	7	2072	143
HKB-JDBS-280	280	"	400	"	155	120	350	"	6	2455	172
HKB-JDBS-300	300	"	430	⁰ _{-0.040}	165	120	375	"	7	2630	"

HKB-JPBW, HKB-JPBF 自润滑导套
HKB-JPBW, HKB-JPBF Oilless Guide Bushes

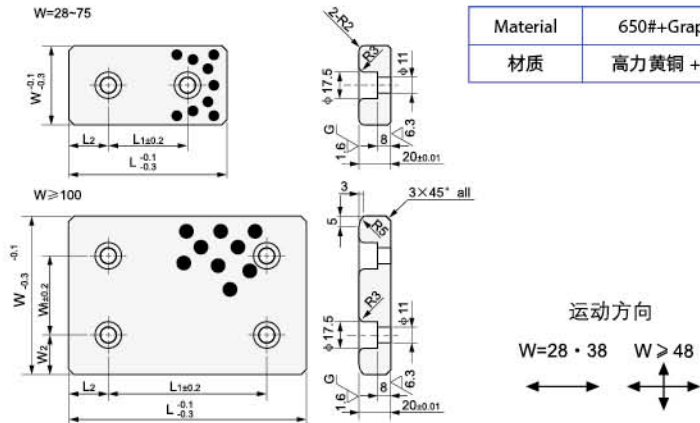


HKB-JPBF	高力黄铜 + 固体润滑剂
	650#+Graphite
HKB-JPBW	铸铁 + 固体润滑剂
	FC250#+Graphite

单位 Unit: mm

Material	d	d H7		D		L	L ₁	L ₂
HKB-JPBW HKB-JPBF	25	25	+0.021 0	40	±0.008	40	10	5
	30	30		50		50		
	35	35		60		55	15	
	40	40	+0.025 0	70	±0.0095	60	10	10
	50	50		80		75	15	
	60	60		100		90	20	
	80	80	+0.030 0	120	±0.01	120	25	10
	100	100		140		150		
	120	120		180		180		

HKB-ESW 自润滑板
HKB-ESW Oilless Wear Plate

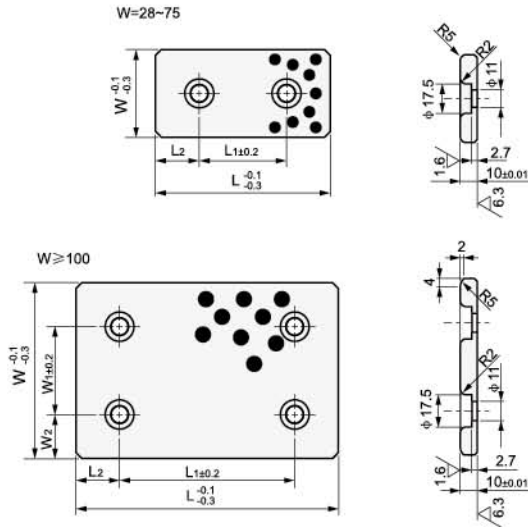


单位Unit: mm

Parts No.	宽		长度		厚度		定位孔间隙				定位孔 个数		
	W		L		T		W ₁		W ₂	ℓ ₁		ℓ ₂	
HKB-ESW-28x75	28	-0.1 -0.3	75	-0.1 -0.3	20	±0.01	±0.2	-	45	±0.2	15	2	
HKB-ESW-28x100			100						50		25		
HKB-ESW-28x150			150						100		25		
HKB-ESW-38x75	38		75						45		15		
HKB-ESW-38x100			100						50		25		
HKB-ESW-38x150			150						100		25		
HKB-ESW-48x75	48		75						45		15		
HKB-ESW-48x100			100						50		25		
HKB-ESW-48x125			125						75		25		
HKB-ESW-48x150			150						100		25		
HKB-ESW-48x200	58		200						150		25		
HKB-ESW-58x75			75						45		15		
HKB-ESW-58x100			100						50		25		
HKB-ESW-58x150			150						100		25		
HKB-ESW-75x75	75		75						25		15	4	
HKB-ESW-75x100			100						50		25		
HKB-ESW-75x125			125						75		25		
HKB-ESW-75x150			150						100		25		
HKB-ESW-75x200	100		200						150		25		
HKB-ESW-100x100			100				50	25	50	25			
HKB-ESW-100x125			125						75	25			
HKB-ESW-100x150			150						100	25			
HKB-ESW-100x200			200						150	25			
HKB-ESW-100x250			250						200	25			
HKB-ESW-100x300	125		300						300	25			
HKB-ESW-125x125			125				37.5	200	75	25			
HKB-ESW-125x150			150						100	25			
HKB-ESW-125x200			200						150	25			
HKB-ESW-125x250			250						200	25			
HKB-ESW-125x300			300						300	25			
HKB-ESW-125x350	150		350						350	25			
HKB-ESW-150x150			150				100	25	100	25			
HKB-ESW-150x200			200						150	25			
HKB-ESW-150x250			250						200	25			

HKB-TWP 自润滑板

HKB-TWP Oilless Wear Plate



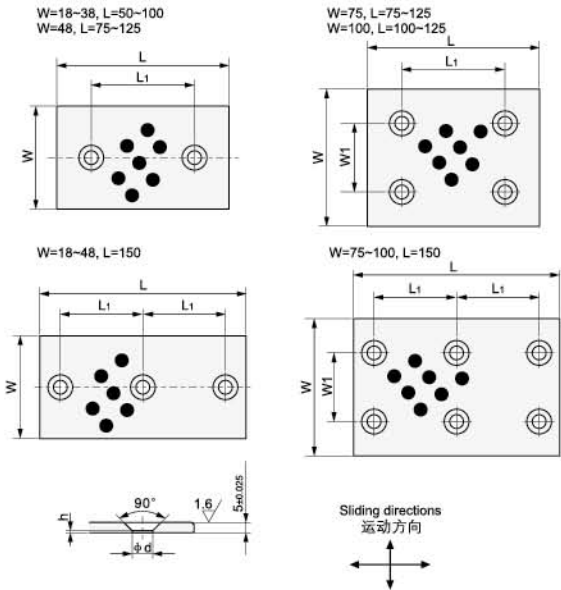
Material	650#+Graphite
材质	高力黄铜 + 石墨



单位Unit: mm

Parts No.	宽		长度		厚度		定位孔间隙					定位孔 个数
	W		L		T		W ₁	W ₂	ℓ ₁	ℓ ₂		
HKB-TWP-28x75	28	-0.1 -0.3	75	-0.1 -0.3	10	±0.01	±0.2	-	-	45	15	2
HKB-TWP-28x100			100							50	25	
HKB-TWP-28x125			125							75		
HKB-TWP-28x150			150							100		
HKB-TWP-38x75	38		75							45	15	
HKB-TWP-38x100			100							50	25	
HKB-TWP-38x125			125							75		
HKB-TWP-38x150			150							100		
HKB-TWP-48x75	48		75							45	15	
HKB-TWP-48x100			100							50	25	
HKB-TWP-48x125			125							75		
HKB-TWP-48x150			150							100		
HKB-TWP-48x200			200							150		
HKB-TWP-58x75	58		75							45	15	
HKB-TWP-58x100			100							50	±0.2	
HKB-TWP-58x150	150		100									
HKB-TWP-75x75	75	75	25									
HKB-TWP-75x100		100	50									
HKB-TWP-75x125		125	75									
HKB-TWP-75x150		150	100									
HKB-TWP-75x200		200	150									
HKB-TWP-100x100	100	100	50									
HKB-TWP-100x125		125	75									
HKB-TWP-100x150		150	100									
HKB-TWP-100x200		200	150									
HKB-TWP-100x250		250	200									
HKB-TWP-125x150		150	100									
HKB-TWP-125x200		200	150									
HKB-TWP-125x250		250	200									
HKB-TWP-150x150	150	150	100									
HKB-TWP-150x200		200	150									

HKB-UWP 自润滑板
HKB-UWP Oilless Wear Plate

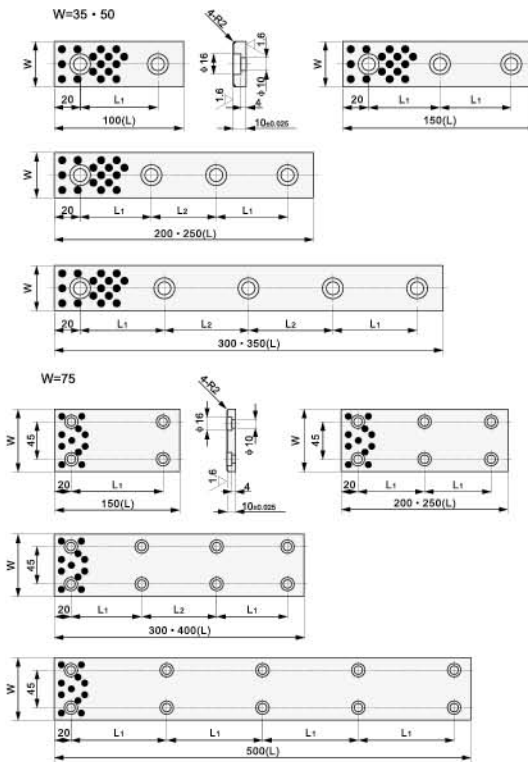


Material	650#+Graphite
材质	高力黄铜 + 石墨

单位Unit: mm

Parts No.	宽	长度	定位孔间隙		定位孔内径	倒角厚度	螺栓
	W	L	W ₁	ℓ ₁	d	h	Mounting
HKB-UWP-18x50	18	50	10	20	6.5	1.5	M6
HKB-UWP-18x75		75		45			
HKB-UWP-18x100		100		70			
HKB-UWP-18x150		150		60			
HKB-UWP-28x50	28	50		20	10	0.8	M8
HKB-UWP-28x75		75		45			
HKB-UWP-28x100		100		70			
HKB-UWP-28x150		150		60			
HKB-UWP-38x50	38	50		20			
HKB-UWP-38x75		75		45			
HKB-UWP-38x100		100		70			
HKB-UWP-38x150		150		60			
HKB-UWP-48x75	48	75		45			
HKB-UWP-48x100		100		70			
HKB-UWP-48x125		125		95			
HKB-UWP-48x150		150		60			
HKB-UWP-75x75	75	75		45			
HKB-UWP-75x100		100		70			
HKB-UWP-75x125		125		95			
HKB-UWP-75x150		150		60			
HKB-UWP-100x100	100	100		70			
HKB-UWP-100x125		125		95			
HKB-UWP-100x150		150		60			

HKB-OLP 自润滑板 HKB-OLP Oilless Wear Plate



Material	650#+Graphite
材质	高力黄铜 + 石墨

Sliding directions
运动方向

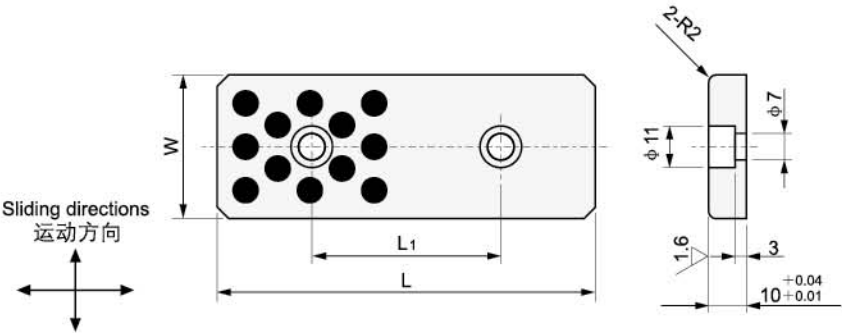
单位 Unit: mm

Parts No.	宽	长	螺栓位置		螺栓数量
	W	L	L ₁	L ₂	
HKB-OLP-35x100	35	100	60	-	2
HKB-OLP-35x150		150	55	-	3
HKB-OLP-35x200		200	55	50	4
HKB-OLP-35x250		250	70	70	4
HKB-OLP-35x300		300	65	65	5
HKB-OLP-35x350		350	80	75	5
HKB-OLP-50x100	50	100	60	-	2
HKB-OLP-50x150		150	55	-	3
HKB-OLP-50x200		200	55	50	4
HKB-OLP-50x250		250	70	70	4
HKB-OLP-50x300		300	65	65	5
HKB-OLP-50x350		350	80	75	5
HKB-OLP-75x150	75	150	110	-	4
HKB-OLP-75x200		200	80	-	6
HKB-OLP-75x250		250	105	-	6
HKB-OLP-75x300		300	85	90	8
HKB-OLP-75x400		400	120	120	8
HKB-OLP-75x500		500	115	-	10

HKB-OML 自润滑板
HKB-OML Oilless Wear Plate



Material	650#+Graphite
材质	高力黄铜 + 石墨



单位Unit: mm

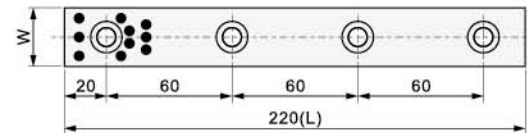
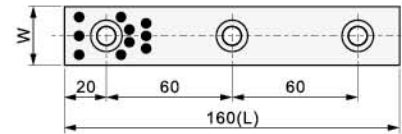
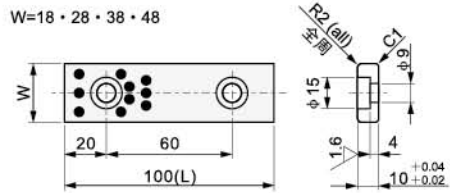
Parts No.	宽	长	螺栓位置
	W	L	L ₁
HKB-OML-18x75	18	75	45
HKB-OML-18x100		100	50
HKB-OML-18x125		125	75
HKB-OML-18x150		150	100
HKB-OML-28x75	28	75	45
HKB-OML-28x100		100	50
HKB-OML-28x125		125	75
HKB-OML-28x150		150	100
HKB-OML-38x75	38	75	45
HKB-OML-38x100		100	50
HKB-OML-38x125		125	75
HKB-OML-38x150		150	100
HKB-OML-48x75	48	75	45
HKB-OML-48x100		100	50
HKB-OML-48x125		125	75
HKB-OML-48x150		150	100

HKB-TLP 自润滑板 HKB-TLP Oilless Wear Plate

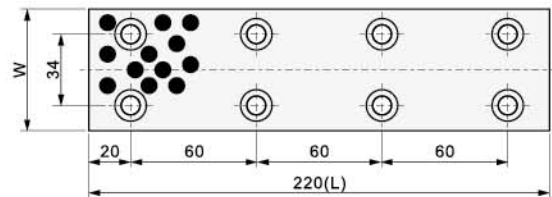
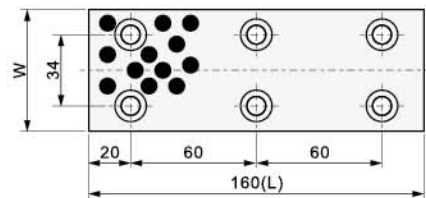
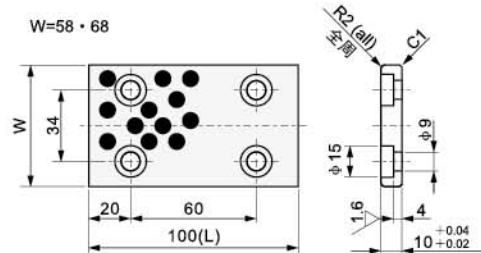


Material	650#+Graphite
材质	高力黄铜 + 石墨

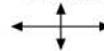
W=18 • 28 • 38 • 48



W=58 • 68



Sliding directions
运动方向



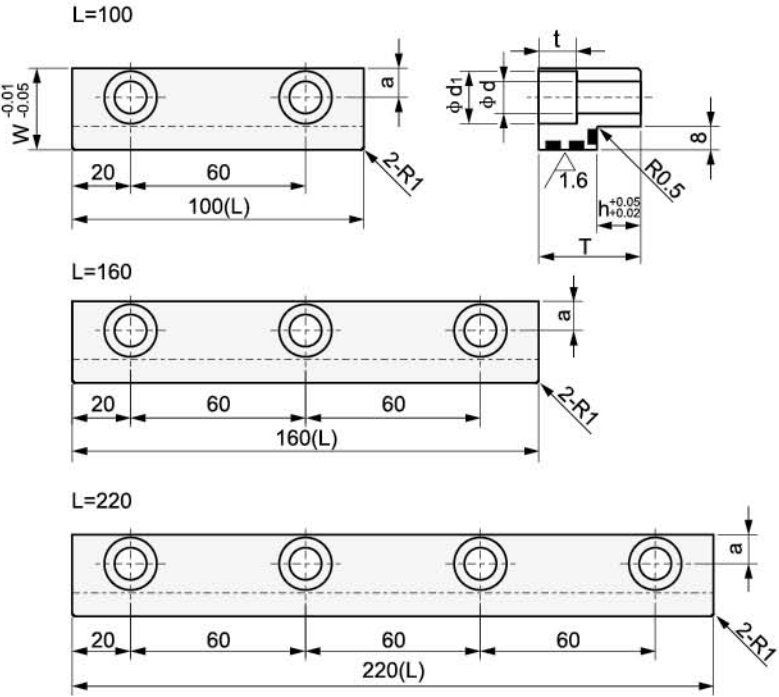
单位Unit: mm

Parts No.	宽	长
	W	L
HKB-TLP-18x100	18	100
HKB-TLP-18x160		160
HKB-TLP-18x220		220
HKB-TLP-28x100	28	100
HKB-TLP-28x160		160
HKB-TLP-28x220		220
HKB-TLP-38x100	38	100
HKB-TLP-38x160		160
HKB-TLP-38x220		220
HKB-TLP-48x100	48	100
HKB-TLP-48x160		160
HKB-TLP-48x220		220
HKB-TLP-58x100	58	100
HKB-TLP-58x160		160
HKB-TLP-58x220		220
HKB-TLP-68x100	68	100
HKB-TLP-68x160		160
HKB-TLP-68x220		220

HKB-GLDW 自润导轨
HKB-GLDW Oilless Guide Rail



Material	650#+Graphite
材质	高力黄铜 + 石墨



单位 Unit: mm

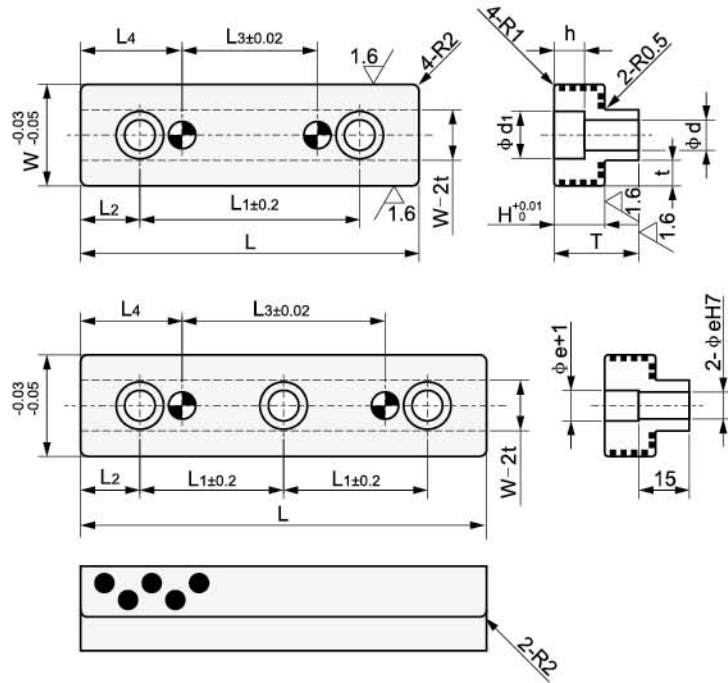
Parts No.	W	L	T	a	d	d ₁	h	t
HKB-GLDW-23x100	23	100	30	7.5	7	11	15	7
HKB-GLDW-23x160		160						
HKB-GLDW-23x220		220						
HKB-GLDW-23x100		100	41				26	
HKB-GLDW-23x160		160						
HKB-GLDW-23x220		220						
HKB-GLDW-28x100	28	100	25	10	11	18	10	13
HKB-GLDW-28x160		160						
HKB-GLDW-28x220		220						
HKB-GLDW-28x100		100	35				15	
HKB-GLDW-28x160		160						
HKB-GLDW-28x220		220						
HKB-GLDW-28x100		100	56				26	
HKB-GLDW-28x160		160						
HKB-GLDW-28x220		220						

HKB-TGLW 自润导轨 HKB-TGLW Oilless Guide Rail



Material	650#+Graphite
材质	高力黄铜 + 石墨

Sliding directions
运动方向



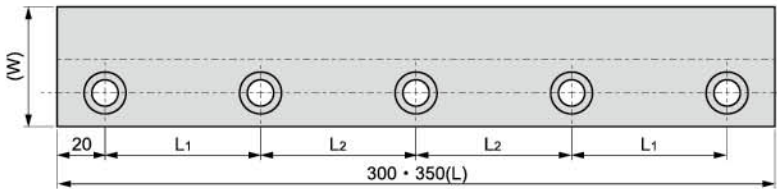
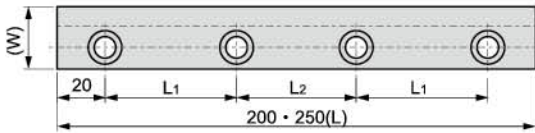
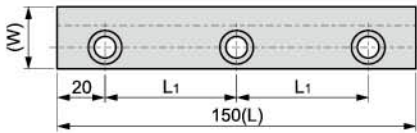
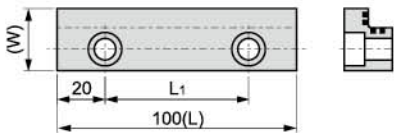
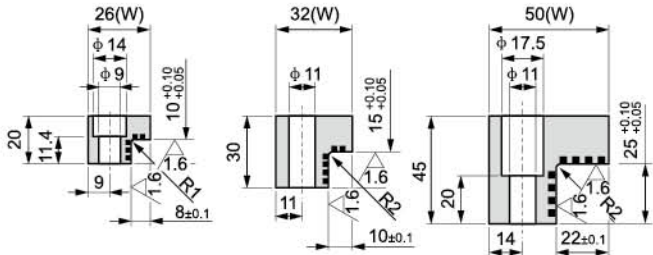
单位 Unit: mm

Parts No.	W	L	L ₁	L ₂	L ₃	L ₄	T	H	t	d	d ₁	h	e H7
HKB-TGLW-20x60	20	60	35	12.5	15	22.5	15	8	4.5	5.5	9.5	6	$6^{+0.012}_0$
HKB-TGLW-20x80		80	55		35								
HKB-TGLW-20x100		100	75		55								
HKB-TGLW-25x80	25	80	50	15	20	30	20	10	5.5	6.5	11	7	$6^{+0.012}_0$
HKB-TGLW-25x100		100	70		40								
HKB-TGLW-25x120		120	45		60								
HKB-TGLW-30x100	30	100	65	17.5	40	40	25	15	7.5	9	14	9	$8^{+0.015}_0$
HKB-TGLW-30x120		120	42.5		60								
HKB-TGLW-30x140		140	52.5		80								
HKB-TGLW-40x120	40	120	40	20	40	40	30	15	11	11	18	11	$8^{+0.015}_0$
HKB-TGLW-40x140		140	50		60								
HKB-TGLW-40x160		160	60		80								
HKB-TGLW-40x180		180	70		100								

HKB-SOL 自润滑板
HKB-SOL Oilless Wear Plate



Material	650 # + Graphite
材质	高力黄铜 + 石墨



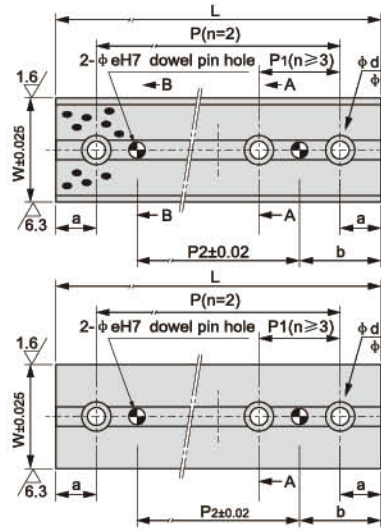
Sliding directions
运动方向

单位Unit: mm

型号规格 Standard No.	W	L	螺栓孔位置 Bolt Position		螺栓孔 Mounting Bolt	
			L1	L1	尺寸 Size	数量 Quantity
HKB-SOL-26×100	26	100	60	-	M8	2
HKB-SOL-26×150		55	150			3
HKB-SOL-26×200			200	50		4
HKB-SOL-32×100	32	100	60	-	M10	2
HKB-SOL-32×150		55	150			3
HKB-SOL-32×200			200	50		4
HKB-SOL-32×250		250	70	70		
HKB-SOL-50×200	50	200	55	50		4
HKB-SOL-50×250		250	70	70		
HKB-SOL-50×300		300	65	65		5
HKB-SOL-50×350		350	80	75		

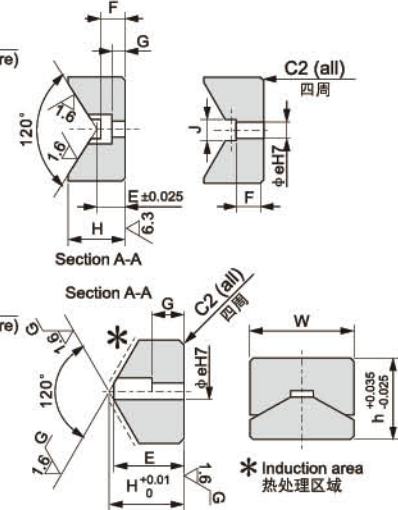
HKB-CBS, HKB-CBSP 凸轮底部导板

HKB-CBS, HKB-CBSP Oilless Cam Broke Guide Plate



W	h	d	D
35	35	9	14
50	50	11	17.5
65	65	11	17.5

HKB-CBSP	S45C+Graphite 钢基+石墨 HRC≥55
HKB-CBS	650 # + Graphite 高力黄铜+石墨



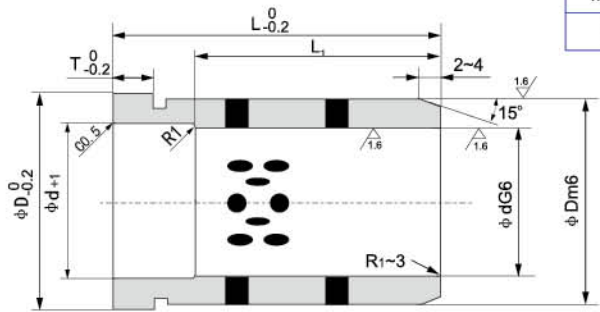
单位Unit: mm

型号规格 Standard No.	W	L	H	a	b	P	P1	No. of Bolt Holes 螺栓数量	e	P2	E	F	G	J		
HKB-CBS-75×35	35	75	24	15	30	45			8	15	15		4	11		
HKB-CBS-100×35		100		20	40	60				20						
HKB-CBS-125×35		125				85				45						
HKB-CBS-150×35		150				110				70						
HKB-CBS-75×50	50	75	31	15	30	45	-	2		15		15				
HKB-CBS-100×50		100		20	40	60				20						
HKB-CBS-125×50		125		25	50	75				25						
HKB-CBS-150×50		150				100				50						
HKB-CBS-100×65	65	100	35	20	40	60			10	20	18		8	13		
HKB-CBS-150×65		150		25	50	-				50					50	
HKB-CBS-200×65		200													4	100
HKB-CBS-250×65		250													5	150
HKB-CBS-300×65		300													6	200

单位Unit: mm

型号规格 Standard No.	W	L	H	a	b	P	P1	No. of Bolt Holes 螺栓数量	e	P2	E	G
HKB-CBSP-75×35	35	75	20	15	30	45	-	2	8	15	17	4
HKB-CBSP-100×35		100		20	40	60				20		
HKB-CBSP-125×35		125		20	40	85				45		
HKB-CBSP-150×35		150		20	40	110				70		
HKB-CBSP-75×50	50	75	32	15	30	45	-	2	10	15	29	10
HKB-CBSP-100×50		100		20	40	60				20		
HKB-CBSP-125×50		125		25	50	75				25		
HKB-CBSP-150×50		150		25	50	100				50		
HKB-CBSP-100×65	65	100	47	20	40	60	50	3	10	20	44	20
HKB-CBSP-150×65		150		20	40	60		4		50		
HKB-CBSP-200×65		200		25	50	-		5		100		
HKB-CBSP-250×65		250		25	50	-		6		150		
HKB-CBSP-300×65		300		25	50	-		6		200		

HKB-GBF 自润滑翻边导向套
HKB-GBF Oilless Ejector Guide Bushings



Material	650 # + Graphite
材质	高力黄铜 + 石墨

单位Unit: mm

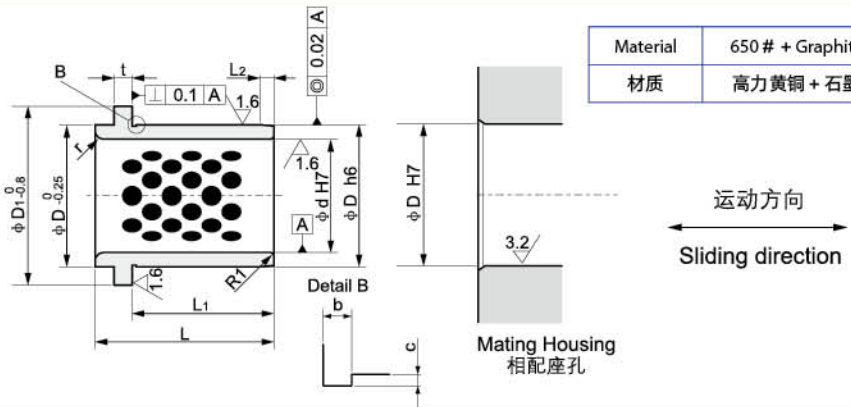
型号规格 Standard No.	d	L	d G6	D m6	D ₁	T	L ₁
HKB-GBF-12×19	12	19	12	18	+0.018 +0.007	25	4
HKB-GBF-12×24		24					
HKB-GBF-12×29		29					
HKB-GBF-12×34		34					
HKB-GBF-16×19	16	19	16	25	+0.016 +0.006	30	6
HKB-GBF-16×24		24					
HKB-GBF-16×29		29					
HKB-GBF-16×34		34					
HKB-GBF-16×39	16	39	16	25	+0.016 +0.006	30	6
HKB-GBF-16×49		49					
HKB-GBF-20×24	20	24	20	30	+0.025 +0.009	35	4
HKB-GBF-20×29		29					
HKB-GBF-20×34		34					
HKB-GBF-20×39		39					
HKB-GBF-20×49	20	49	20	30	+0.025 +0.009	35	4
HKB-GBF-20×59		59					
HKB-GBF-25×24	25	24	25	35	+0.020 +0.007	40	8
HKB-GBF-25×29		29					
HKB-GBF-25×34		34					
HKB-GBF-25×39		39					
HKB-GBF-25×49	25	49	25	35	+0.020 +0.007	40	8
HKB-GBF-25×59		59					
HKB-GBF-25×69		69					
HKB-GBF-30×29	30	29	30	42	+0.025 +0.009	47	10
HKB-GBF-30×34		34					
HKB-GBF-30×39		39					
HKB-GBF-30×49		49					
HKB-GBF-30×59	30	59	30	42	+0.025 +0.009	47	10
HKB-GBF-30×69		69					
HKB-GBF-30×79		79					

单位Unit: mm

型号规格 Standard No.	d	L	d G6	D m6	D ₁	T	L ₁
HKB-GBF-35×39	35	39	35	48	+0.025 +0.009	54	39
HKB-GBF-35×49		49					
HKB-GBF-35×59		59					
HKB-GBF-35×69		69					
HKB-GBF-35×79	35	79	35	48	+0.025 +0.009	54	39
HKB-GBF-35×89		89					
HKB-GBF-35×99		99					
HKB-GBF-40×39		39					
HKB-GBF-40×49	40	49	40	55	+0.025 +0.009	61	10
HKB-GBF-40×59		59					
HKB-GBF-40×69		69					
HKB-GBF-40×79		79					
HKB-GBF-40×89	40	89	40	55	+0.025 +0.009	61	10
HKB-GBF-40×99		99					
HKB-GBF-40×109		109					
HKB-GBF-50×49		49					
HKB-GBF-50×59	50	59	50	70	+0.030 +0.011	76	12
HKB-GBF-50×69		69					
HKB-GBF-50×79		79					
HKB-GBF-50×89		89					
HKB-GBF-50×99	50	99	50	70	+0.030 +0.011	76	12
HKB-GBF-50×109		109					
HKB-GBF-50×119		119					
HKB-GBF-60×99		99					
HKB-GBF-60×109	60	109	60	80	+0.029 +0.010	86	15
HKB-GBF-60×119		119					
HKB-GBF-60×129		129					
HKB-GBF-60×149		149					

DIN9834 自润导套

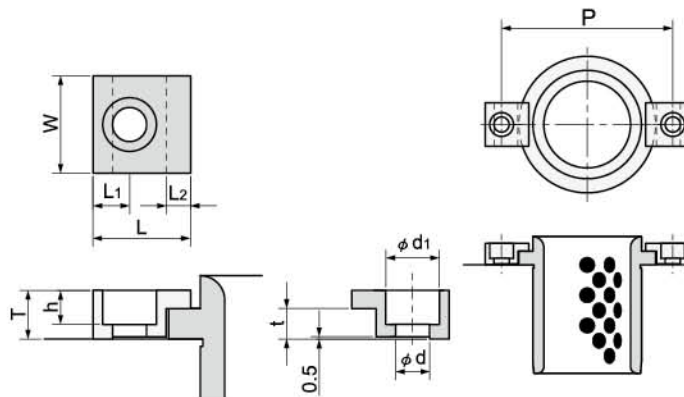
DIN9834 Oilless Guide Bushes



单位Unit: mm

型号规格 Standard No.	d H7		D h6		L	D ₁	L ₁	L ₂	t	r	bxc	P
DIN9834 -025	25	+0.021 0	32	0 -0.016	40	40	30	3	6.3	3	0.6x0.3	58
DIN9834 -032	32	+0.025 0	40		50	50	40	4				66
DIN9834 -040	40		50		63	63	50	5				79
DIN9834 -050	50	+0.030 0	63	0 -0.019	71	71	56	6.3	10	5	1.0x0.4	89
DIN9834 -063	63		80		80	90	63	8		6		123
DIN9834 -080	80		100		100	112	80	10		8		143
DIN9834 -100	100	+0.040 0	125	0 -0.025	125	140	106	12.5		10		168
DIN9834 -125	125		160		160	180	132	16		12		203
DIN9834 -160	160		200		200	220	170	16		18		243

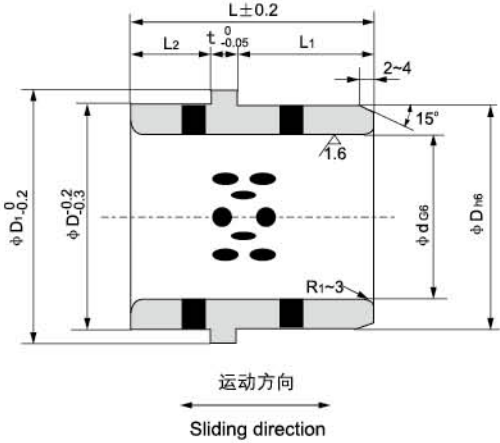
Clamp FVDI-KL(DIN9834)



单位Unit: mm

型号规格 Standard No.	W	L	T	L ₁	L ₂	t	d	d ₁	h	Applicable bushes ID
FVDI-KL-6	20	20	10	7.5	5	6.3	7	11	7	Ø25~Ø50
FVDI-KL-10	32	32	16	11	10	10	11.5	17.5	11.5	Ø63~Ø160

HKB-EGB, HKB-EGBK 塑胶模射出座导套
HKB-EGB, HKB-EGBK Oilless Ejector Guide Bushing



Material	650 # + Graphite
材质	高力黄铜 + 石墨

单位Unit: mm

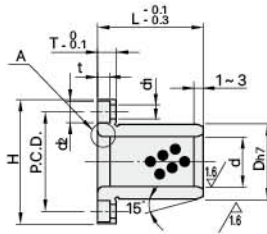
型号规格 Standard No.	d	L	d G6	D h6	D ₁	L ₁	L ₂	t
HKB-EGB-16×26	16	26	+0.017 +0.006	25	30	12		
HKB-EGB-16×28	16	28				14		
HKB-EGB-16×33	16	33				19		
HKB-EGB-16×38	16	38				24		
HKB-EGB-20×26	20	26		30	35	12	10	
HKB-EGB-20×28	20	28				14		
HKB-EGB-20×33	20	33				19		
HKB-EGB-20×38	20	38				24		
HKB-EGB-25×26	25	26	+0.020 +0.007	35	40	12		4
HKB-EGB-25×28	25	28				14		
HKB-EGB-25×33	25	33				19		
HKB-EGB-25×38	25	38				24		
HKB-EGB-30×33	30	33		46	50	14	15	
HKB-EGB-30×38	30	38				19		
HKB-EGB-30×46	30	43				24		
HKB-EGB-35×38	35	38				19		
HKB-EGB-35×43	35	43	+0.025 +0.009	52	57	24	20	
HKB-EGB-35×48	35	48				29		
HKB-EGB-40×48	40	48				24		
HKB-EGB-40×53	40	53				29		
HKB-EGB-50×48	50	48		62	67	24		
HKB-EGB-50×53	50	53				29		

单位Unit: mm

型号规格 Standard No.	d	L	d G6	D h6	D ₁	L ₁	L ₂	t
HKB-EGBK-25×33	25	33	+0.020 +0.006	40	45	19	11	8
HKB-EGBK-25×38	25	38				24		
HKB-EGBK-30×48	30	48				29		
HKB-EGBK-30×47	30	47				24		
HKB-EGBK-30×52	30	52	+0.025 +0.009	55	60	29	30	
HKB-EGBK-35×63	35	63				39		
HKB-EGBK-40×60	40	60				32		
HKB-EGBK-40×70	40	70				42		
HKB-EGBK-40×78	40	78	0 -0.019	62	67	21	40	
HKB-EGBK-40×57	40	57				24		
HKB-EGBK-40×67	40	67				29		
HKB-EGBK-45×88	45	88				59		
HKB-EGBK-45×95	45	95	+0.029 +0.010	74	82	21	40	
HKB-EGBK-50×67	50	67				29		
HKB-EGBK-50×87	50	87				39		
HKB-EGBK-60×67	60	67				29		
HKB-EGBK-60×87	60	87				39		

MPTZ/MPTSZ/MPTNZ/MPTP/MPTNP

法兰一体型无油衬套 Flange Integrated Type Oil-free Bushing



圆法兰型

MPTZ (内径F7)
MPTP (内径G6)

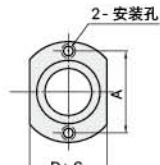
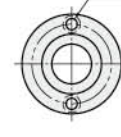
方法兰型

MPTSZ (内径F7)
MPTNP (内径G6)

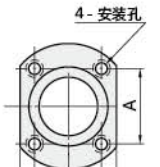
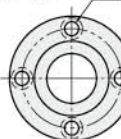
两面切割法兰型

MPTNZ (内径F7) $6.3/^{1.6}_{\sqrt{\vee}}$
MPTNP (内径G6)

d = 6 ~ 13



d = 16 ~ 50



MPTZ/MPTSZ/MPTNZ/MPTP/MPTNP

材料：高力黄铜+固体润滑剂
Material: CuZn25Al5Mn3Fe3
+Graphite(500#sp)

内径F7型推荐配套轴 d8: 一般用(高负载)
e7: 一般用(轻负载)
内径G6型推荐配套轴 g6: 高精度用
使用注意事项 推荐用止转螺丝固定衬套。

f8: 高精度用
g6: 高精度用(间歇运转)

材质 高强度黄铜合金类
镶嵌固体润滑剂
附件 短头内六角螺栓2~4个

单位Unit: mm

型式		L		Dh7		H	T	t	d1	d2	P.C.D.	W	F	A	附件 短头内六角螺栓
Type	dF7														
内径 F7 型 MPTZ MPTSZ MPTNZ	6	+0.022 +0.010	15 20	10	$0^{-0.015}$	25					17	20		17	M3 - 10x2 * (4)
	8	+0.028 +0.013	20 25	12		27	4	2.2	3.5	6	19	22		19	
	10		20 25 30	14	$0^{-0.018}$	29					21	23	-	21	
	12		20 25 30	18		36					26	28		26	M4 - 12x2 * (4)
	13	+0.034 +0.016	20 25 30 35	19		37	5	3	4.5	7.5	27	29		27	
	16		20 25 30 35 40	22	$0^{-0.021}$	40					30	31	18	24	M4 - 12x4
	20		25 30 35 40 50	28		49	6	3.7	5.5	9	38	38	22	31	M5 - 16x4
	25	+0.041 +0.020	30 35 40 50 60	33		54					43	42	25	35	
	30		35 40 50 60 70	38	$0^{-0.025}$	63	8	4.2	6.6	11	50	50	30	40	M6 - 20x4
	35		50 60 70	44		69					56	54	36	43	
	40	+0.050 +0.025	60 70 80	50		82	10	5.2	9	14	66	64	38	54	M8 - 25x4
	50		70 80	62	$0^{-0.030}$	94					78	73	50	60	

型式		L		Dh7		H	T	t	d1	d2	P.C.D.	W	F	A	附件 短头内六角螺栓
Type	dG6														
内径 G6 型 MPTP MPTNP	6	+0.012 +0.004	15	10	$0^{-0.015}$	25					17	20		17	M3 - 10x2
	8	+0.014 +0.005	20	12		27	4	2.2	3.5	6	19	22		19	
	10		25	14	$0^{-0.018}$	29					21	23	-	21	
	12		25 30	18		36					26	28		26	M4 - 12x2
	13	+0.017 +0.006	25 30 35	19		37	5	3	4.5	7.5	27	29		27	
	16		25 30 35 40	22	$0^{-0.021}$	40					30	31	18	24	M4 - 12x4
	20		30 35 40	28		49	6	3.7	5.5	9	38	38	22	31	M5 - 16x4
	25	+0.020 +0.007	30 35 40	33	$0^{-0.025}$	54					43	42	25	35	
	30		35 40 50	38		63	8	4.2	6.6	11	50	50	30	40	M6 - 20x4

* () 为MPTSZ的螺栓数量

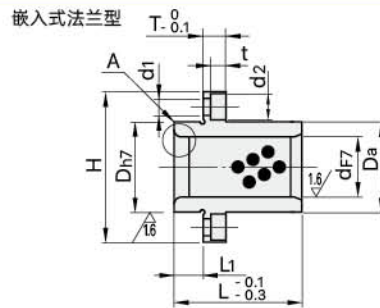
MPIZ/MPCZ/MPITZ/MPCTZ

法兰一体型无油衬套 Flange Integrated Type Oil-free Bushing



MPIZ/MPCZ/MPITZ/MPCTZ

材料：高力黄铜+固体润滑剂
Material: CuZn25Al5Mn3Fe3
+Graphite(500#sp)

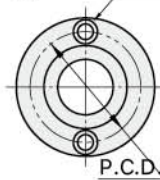


圆法兰型

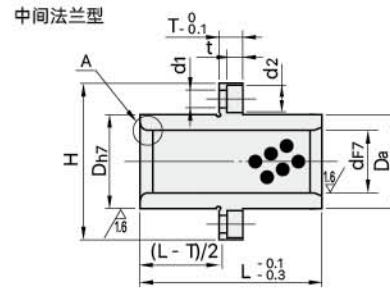
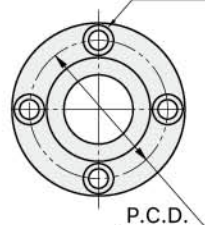
MPIZ (嵌入式法兰型)

MPCZ (中间法兰型)

d=8~13



d=16~50

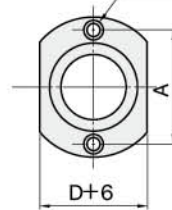


两面切割法兰型

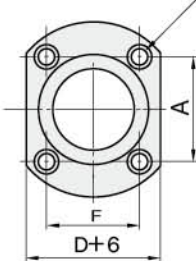
MPITZ (嵌入式法兰型)

MPCTZ (中间法兰型)

2-安装孔

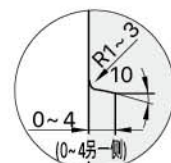


4-安装孔



6.3/(1.6)

A部详图



推荐配套轴
d8：一般用(重载)
e7：一般用(轻载)
f8：高精度用
g6：高精度用(间歇运转)
使用注意事项
推荐用止转螺丝固定衬套。

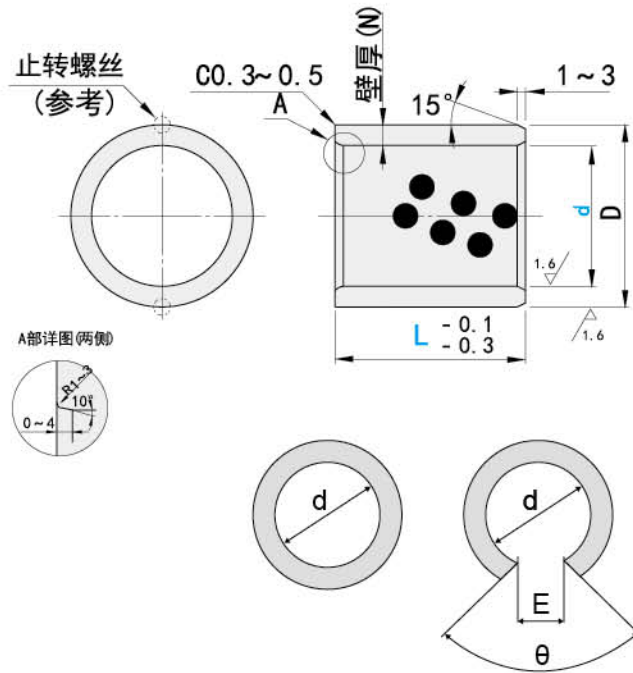
☑ 材质 高强度黄铜合金类
镶嵌固体润滑剂

☐ 附件 短头内六角螺栓
2~4根

单位Unit: mm

型式		L		Dh7		Da		L1		H		T		t		d1		d2		P.C.D.		F		A		附件 短头内六角螺栓
Type	dF7																									
嵌入式法兰型 MPIZ MPITZ	8 ^{+0.028 +0.013}	20 (25)		12	0 -0.018	11.5	5	27	6	4	2.2	3.5	6	19	—	19	M3 - 10×2									
	10	25 30		14		13.5	29	21						21												
	12	25 30		18		17.5	36	26						26		M4 - 12×2										
	13 ^{+0.034 +0.016}	(25) (30) 35		19		18.5	37	5						3				4.5	7.5	27	27					
中间法兰型 MPCZ MPCTZ	16	25 30 35 40		22 ^{0 -0.021}	21.5	8	40	6	3.7	5.5	9	30	18	24	M4 - 12×4											
* () 内的 L 尺寸仅限嵌 入式法兰型	20	30 35 40 50		28	27.5		49					38	22	31	M5 - 16×4											
	25 ^{+0.041 +0.020}	(30) (35) (40) (50) 60		33	32.5		54					43	25	35												
	30	(35) 40 (50) (60) 70		38 ^{0 -0.025}	37.5		10					63	8	4.2		6.6	11	50	30	40	M6 - 20×4					
	35	(50) 70		44	43.5	69		56	36	43																
	40 ^{+0.050 +0.025}	(60) (70) 80		50	0 -0.030	49.5	13	82	10	5.2	9	14	66	38	54	M8 - 25×4										
	50	(70) 100		62		61.5		94					78	50	60											

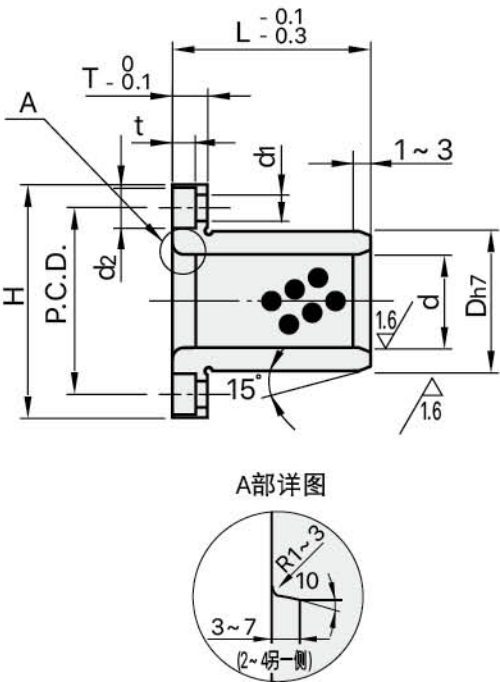
代替直线LM系列 Instead of linear LM series



单位Unit: mm

轴承型号	尺寸公差								LM...LUU 加长版	
LM...UU (标准化)	d(mm)	公差 (mm)	D (mm)	公差 (mm)	L (mm)	公差 (mm)	E (mm)	θ	L	公差 (mm)
LM6UU	6	+0.015 +0.035	12	0 -0.02	19	0 -0.02	-	-	35	0 -0.30
LM8UU	8		15		24		-	-	45	
LM10UU/-OP	10		19		29		6.8	80°	55	
LM12UU/-OP	12		21		30		8	80°	57	
LM13UU/-OP	13		23		32		9	80°	61	
LM16UU/-OP	16	+0.020 +0.045	28	0 -0.02	37	0 -0.3	11	80°	70	0 -0.40
LM20UU/-OP	20		32		42		11	60°	80	
LM25UU/-OP	25		40		59		12	50°	112	
LM30UU/-OP	30	+0.025 +0.050	45	0 -0.4	64	0 -0.4	15	50°	123	0 -0.40
LM35UU/-OP	35		52		70		17	50°	135	
LM40UU/-OP	40		60		80		20	50°	151	
LM50UU/-OP	50		80		100		25	50°	192	
LM60UU/-OP	60	+0.030 +0.060	90		110		30	50°	209	

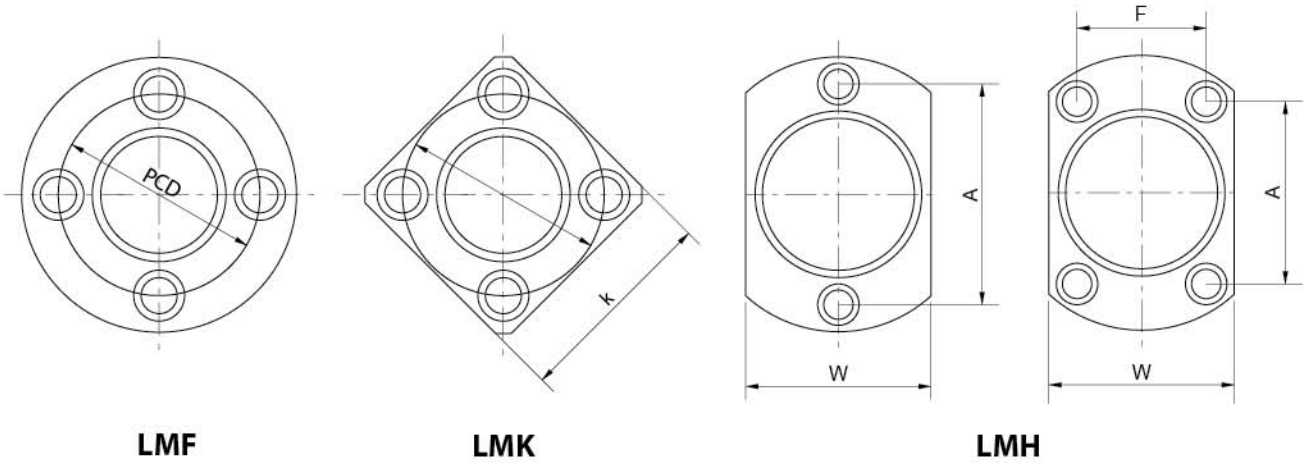
代替LMF / K / H... UU系列
Instead of LMF / K / H... UU Series



单位Unit: mm

型号	内径		尺寸 (mm)						LMF/K/H...LUU 加长版	
			D		L		H		L	公差 (mm)
圆形 / 方 / 椭圆形	d(mm)	公差 (mm)	(mm)	公差 (mm)	L (mm)	公差 (mm)	(mm)	公差 (mm)		
LMF/K/H6UU	6	+0.015 +0.035	12	0 -0.03	19	0 -0.02	28	0 -0.02	35	0 -0.30
LMF/K/H8UU	8		15		24		32		45	
LMF/K/H10UU	10		19		29		40		55	
LMF/K/H12UU	12		21		30		42		57	
LMF/K/H13UU	13		23		32		43		61	
LMF/K/H16UU	16		28		37		48		70	
LMF/K/H20UU	20	+0.020 +0.045	32		42	0 -0.3	54	0 -0.3	80	0 -0.40
LMF/K/H25UU	25		40		59		62		112	
LMF/K/H30UU	30		45		64		74		123	
LMF/K/H35UU	35	+0.025 +0.050	52	0 -0.3	70		82	0 -0.3	135	
LMF/K/H40UU	40		60		80		96		151	
LMF/K/H50UU	50		80		100		116		192	
LMF/K/H60UU	60		90		110		134		209	

代替LMF / K / H... LUU系列
Instead of LMF / K / H... LUU Series



LMH内径6-13为两孔

16-50为四孔

单位Unit: mm

型号	尺寸 (mm)						
圆形 / 方 / 椭圆形	T	PCD	K	W	A	F	d1×d2×t
LMF/K/H6UU	5	20	22	18	20	-	3.4×6.5×3.3
LMF/K/H8UU	5	24	25	21	24	-	3.4×6.5×3.3
LMF/K/H10UU	6	29	30	25	29	-	4.5×8×4.4
LMF/K/H12UU	6	32	32	27	32	-	4.5×8×4.4
LMF/K/H13UU	6	33	34	29	33	-	4.5×8×4.4
LMF/K/H16UU	6	38	37	34	31	22	4.5×8×4.4
LMF/K/H20UU	8	43	42	38	36	24	5.5×9.5×5.4
LMF/K/H25UU	8	51	50	46	40	32	5.5×9.5×5.4
LMF/K/H30UU	10	60	58	51	49	35	6.6×11×6.5
LMF/K/H35UU	10	67	64	60	55	38	6.6×11×6.5
LMF/K/H40UU	13	78	75	70	64	45	9×14×8.6
LMF/K/H50UU	13	98	92	86.5	80	56	9×14×8.6
LMF/K/H60UU	18	112	106	-	-	-	11×17.5×10.8

HKB-650GT 双合金导板

HKB-50GT Double Alloy Guide Plate



节约成本 30% 以上

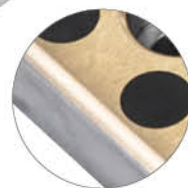
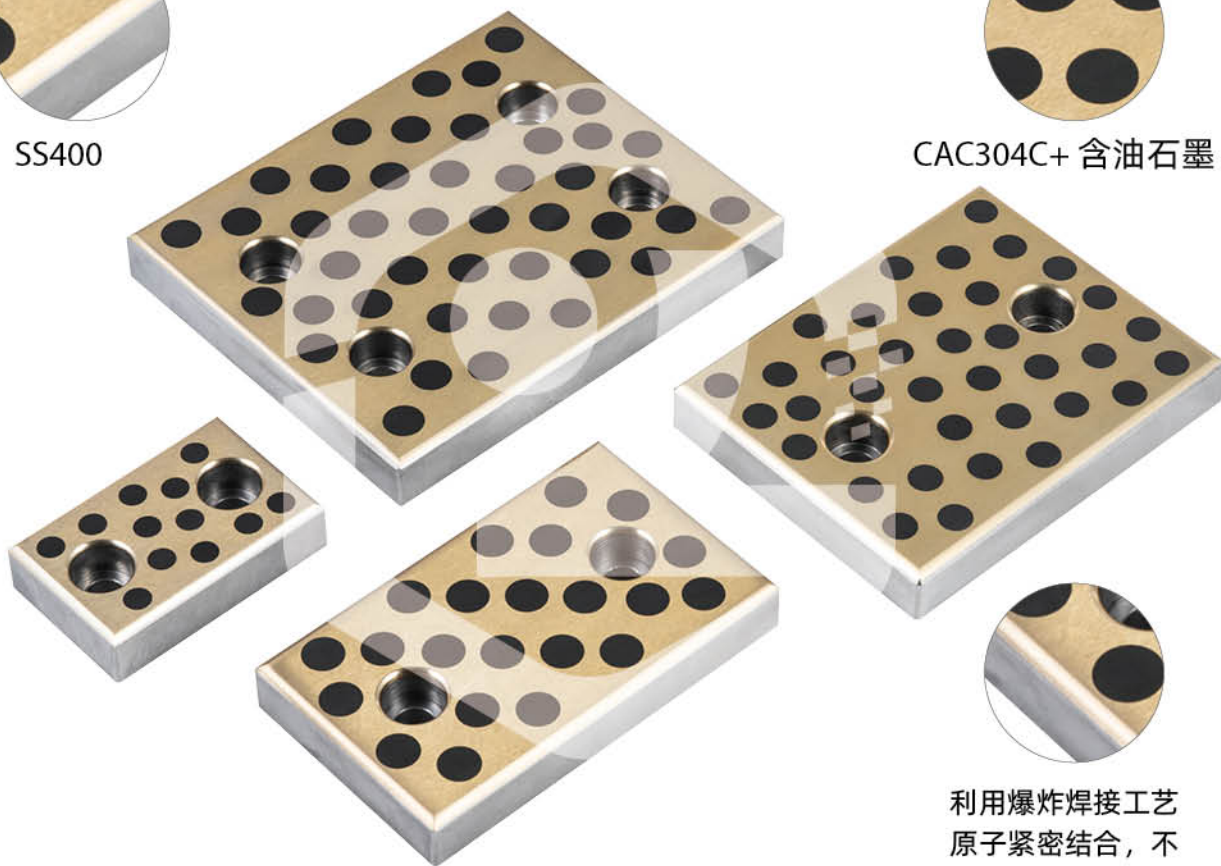
性能与高力黄铜导板完全相同



SS400



CAC304C+ 含油石墨



利用爆炸焊接工艺
原子紧密结合，不
易剥落。

昊凯双合金导板 4 大优势

1. 采用钢位基体、内层为高力黄铜的双合金新型导板，节约成本 30% 以上！
2. 嵌入世界顶级石墨柱，应用自主研发的独特石墨排列技术和石墨孔加工方式，配合先进的真空浸油技术，使其自润滑导向性能发挥的淋漓尽致。
3. 昊凯双合金导板采用爆炸焊接工艺，能够让原子紧密结合，增加了产品强度，使用时更加耐磨。
4. 铜合金表面硬度检测达标，HB180 以上；平行度、平面度可以绝对保证；耐热试验，证明形状无任何改变，膨胀系数极小；抗弯试验，正面、反面均无剥落现象发生；可以根据客户来图定制。
5. 材料特点详见 P:42、43；尺寸参照 HKB-ESW，P:23。

HKB-650GT 钢基铜合金镶嵌型固体润滑轴承 HKB-650GT Steel shell cast bronze with graphite plug



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 in 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 HKB-650GT have better mechanical load performance compare with bronze material, especially the impact strength.

HKB-650GT 钢基铜合金镶嵌型固体润滑轴承 HKB-650GT Steel shell cast bronze with graphite plug

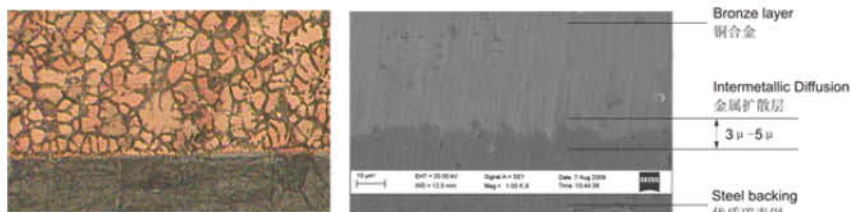


基材特征Structure

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



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650GT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

HKB-650GT 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

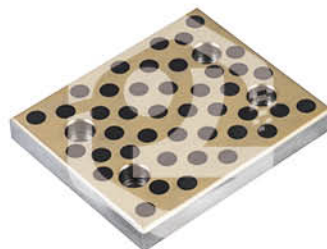
Thrust washers

Flange bushes

Non-standard parts as design

HKB-650GT supplied by customer ordering, the tolerance is according to HKB-650 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



石墨镶嵌方式 Graphite plug embedded type



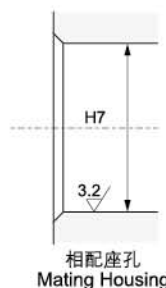
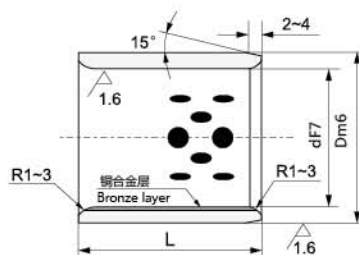
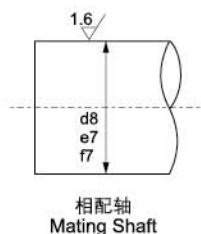
A: 内径 (ID) ≤ 100



B: 内径 (ID) ≥ 100

HKB-650GT 自润滑轴套

HKB-650GT Metric Cylindrical Bushes



OD 外径	S45C
ID 内径	650#+GR铜合金 + 石墨

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	1.5	■	■	■	■	■	■	■	■						
55	70	7.5		1.5	■	■	■	■	■	■	■								
60		75		7.5	1.5	■	■	■	■	■	■	■	■						
65		80		7.5	1.5				■	■	■	■							
70	+0.060 +0.030	85	+0.035 +0.013	7.5	1.5		■	■	■	■	■	■	■	■					
				90	10	1.5			■	■	■	■							
75		90		7.5	1.5				■	■	■	■	■						
		95		10	1.5				■	■	■	■	■						
80		+0.071 +0.036		95	7.5	1.5			■	■	■	■	■	■	■	■	■		
	100		10	1.5			■	■	■	■	■	■	■	■	■	■			
85	100		7.5	1.5			■	■	■	■	■	■	■	■	■	■	■		
90	+0.083 +0.043	110	+0.040 +0.015	10	2				■	■	■	■	■	■	■	■	■		
100		120		10	2				■	■	■	■	■	■	■	■			
110		130		10	2						■	■	■	■	■	■	■		
120		140		10	2						■	■	■	■	■	■	■		
125		145		10	2								■	■	■	■	■	■	
130	+0.096 +0.050	150	+0.046 +0.017	10	2								■	■	■	■	■		
140		160		10	2						■	■	■	■	■	■	■		
150		170		10	2								■	■	■	■	■		
160		180		10	2								■	■	■	■	■	■	
170		190		10	2									■	■	■	■	■	■
180	+0.108 +0.056	200	+0.057 +0.021	10	2									■	■	■	■	■	■
190		210		10	2								■	■	■	■	■	■	
200		230		15	3									■	■	■	■	■	■
225		255		15	3										■	■	■	■	■
250		280		15	3											■	■	■	■
280	+0.119 +0.062	320	+0.063 +0.023	20	4									■	■	■	■	■	■
300		340		20	4										■	■	■	■	
350		390		20	4											■	■	■	■
400	+0.131 +0.068	450		25	5												■	■	■
450		500		25	5												■	■	■

HKB-200/250 钢基系列高承载轴承 HKB-200/250 Higher Load Harden Steel Bushes



HKB200C/HKB200G



HKB250C/HKB250G

材料特性 Material Characteristic

HKB-200以优质碳素钢为基体，通过合理的油路设计，在装配时涂上油脂使得其在工作时能较长时间的储存所需要的足够油脂，并且能均匀的分布在轴承及轴的表面上，从而达到了延长使用寿命缩短加油频率的目的；同时由于特殊的油路系统能够存入工作时侵入轴承的灰尘和其它异物，从而最大限度的降低对轴承使用过程中的影响。HKB-200另外一个特殊性是在轴承的工作表面经过一种特殊工艺的处理，使其表面覆盖了一层特殊的固体润滑剂，这层特殊的润滑剂在起始动作时能很快的转移到对磨轴的表面上，从而较快的降低了起始摩擦系数，提高了轴承的耐磨性。

HKB-200 is produced by carbon steel with oil groove, the initial grease given can be deposited the mass lubrication for long time working. The work surface has been sprayed a special solid lubricant, this solid lubricant can be transfer to the mating material during the operation and forming a solid lubrication film between the bearing and shaft which make the bearing material have high load capacity with lower friction and excellent wear resistance.

HKB-250则在HKB-200的基础上进行了改良，以固体润滑剂嵌入替代了原有的披覆方式，使得产品在使用过程中提供了源源不断的润滑源，从而达到免维护的目的。

The HKB-250 bearing material is developed from the HKB-200, the solid lubricant have been embedded instead of covering on surface which can provide the solid lubricant for much long time during the operation even without any oil given This material provides a maintenance-free design solution, particularly for high load, intermittent of oscillating motion with lower speed and excellent wear resistance required.



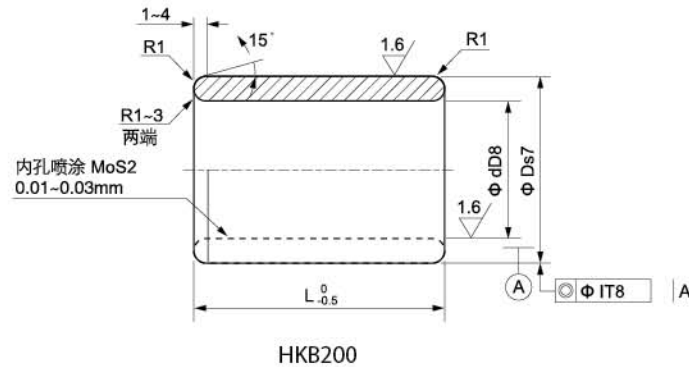
HKB-200/250 钢基系列高承载轴承 HKB-200/250 High Loading Series Harden Steel Bushes



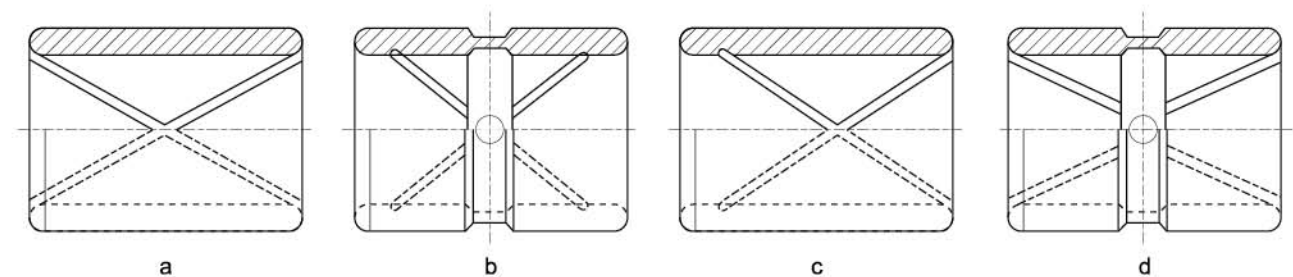
材料特性 Material Characteristic

HKB标准 Standard		HKB-200C	HKB-200G	HKB-250C	HKB2-50G
基材 Base material		S45C	Gcr15	S45C	Gcr15
线胀系数 Coe. of linear expansion		1.1×10 ⁻⁵ /°C	1.1×10 ⁻⁵ /°C	1.1×10 ⁻⁵ /°C	1.1×10 ⁻⁵ /°C
使用温度 Temp. °C		-100 ~ +300	-100 ~ +300	-100 ~ +300	-100 ~ +300
硬度 Hardness		HRC≥40	HRC≥50	HRC≥40	HRC≥50
最大承载 Max. Load (Mpa)		150Mpa	200Mpa	150Mpa	200Mpa
最大线速度 Max. Speed (m/min)		10	10	15	15
润滑剂形式 Solid Lubricant		表面覆盖 With film		镶嵌于基体 Solid embed	
		0.01-0.03mm			
公差配合 Mating tolerance		装配座孔 Mating Housing: H7 相配轴 Mating shaft: ef/f7			

轴套示意图 Bushes Sketch

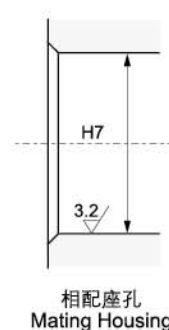
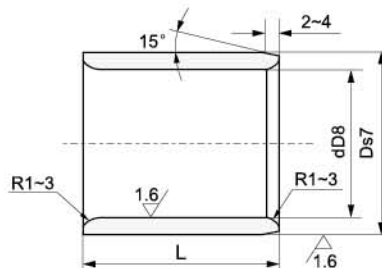
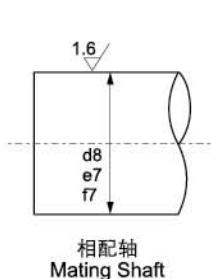


典型油槽形式 Typical Oil Groove Type



HKB-200 系列尺寸表

HKB-200 Serious Standard Size

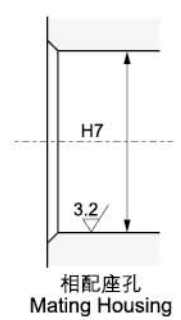
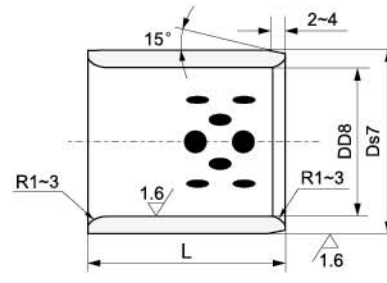
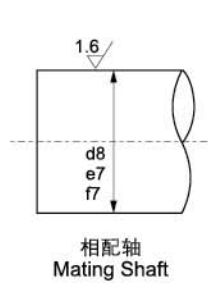


单位 Unit: mm

d	D8	D	s7	L 0/-0.5										
				20	25	30	35	40	50	60	70	80	100	120
30	+0.098 +0.065	38	+0.068 +0.043	■	■	■	■	■	■					
30		40		■	■	■	■	■	■					
32	+0.119 +0.080	42		■		■		■						
35		45		■	■	■	■	■	■					
38		48		■		■		■						
40		50		■	■	■	■	■	■	■	■			
40		55	■		■	■	■	■	■					
45		60			■	■	■	■	■	■				
50		60			■	■	■	■	■	■				
50		62			■		■	■	■	■				
50		65			■		■	■	■	■	■	■		
55		+0.146 +0.100	70	+0.089 +0.059			■	■	■	■	■	■		
60	75					■	■	■	■	■	■	■	■	
65	80							■	■	■	■	■	■	
70	85		+0.106 +0.071			■	■	■	■	■	■	■	■	
75	90							■	■	■	■	■	■	
75	95								■	■	■	■	■	
80	95							■	■	■	■	■	■	
80	100							■	■	■	■	■	■	
85	100									■		■		
90	+0.174 +0.120	110	+0.114 +0.079					■	■	■		■	■	
100		120						■	■	■	■	■	■	
110		130	+0.132 +0.092					■	■		■	■	■	■
120		140									■	■	■	■
130	+0.208 +0.145	150	+0.140									■	■	■
140		160	+0.100										■	■
150		170	+0.148 +0.108										■	■

HKB-250 系列尺寸表

HKB-250 Serious Standard Size



单位Unit: mm

d	D8	D	s7	L 0/-0.5										
				20	25	30	35	40	50	60	70	80	100	120
30	+0.098 +0.065	38	+0.068 +0.043	■	■	■	■	■	■					
30		40		■	■	■	■	■	■					
32	+0.119 +0.080	42		■		■		■						
35		45		■	■	■	■	■	■	■				
38		48		■		■		■						
40		50		■	■	■	■	■	■	■	■			
40		55	+0.083 +0.053	■		■	■	■	■	■				
45		60				■	■	■	■	■	■			
50		60				■	■	■	■	■	■			
50		62				■		■	■	■	■			
50		65				■		■	■	■	■	■	■	
55	+0.146 +0.100	70	+0.089 +0.059			■	■	■	■	■	■			
60		75				■	■	■	■	■	■	■	■	
65		80						■	■	■	■	■	■	
70		85	+0.106 +0.071			■	■	■	■	■	■	■	■	
75		90							■	■	■	■	■	
75		95							■	■	■	■	■	
80		95						■	■	■	■	■	■	
80		100						■	■	■	■	■	■	
85		100								■		■		
90		110	+0.114 +0.079					■	■	■		■	■	
100		120						■	■	■	■	■	■	
110	+0.174 +0.120	130	+0.132 +0.092					■	■		■	■	■	■
120		140									■	■	■	■
130		150	+0.140 +0.100									■	■	■
140	+0.208 +0.145	160											■	■
150		170	+0.148 +0.108									■	■	■

HKB-1 自润滑复合轴承

HKB-1 Self-lubricating Multilayer Composite Bearing



产品介绍 Product introduction

产品以钢板/铜板/不锈钢为基体，中间烧结球形青铜粉，表面轧制聚四氟乙烯和混合物卷制而成。它具有摩擦系数小、耐磨、抗腐蚀性好和无油润滑的特点。能降低成本、缩小机械体积、避免咬轴现象和降低噪音等优点。产品已广泛应用于各种机械的滑动部位，例如：印刷机、纺织机、烟草机械、汽车、摩托车与农林机械等。

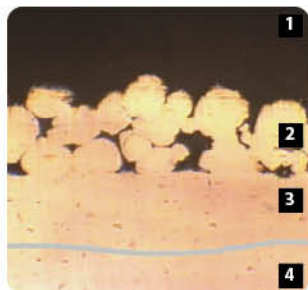
These wrapped bushings are made of a triple layers of composite materials which consist of a steel/bronze/stainless steel backing, a sintered porous bronze as interlayer and PTFE mixture as surface layer. It has character of low friction coefficient, anti-wear, anti-corrosion and can be used without oil, or only a trace of oil if needed. Moreover, it is of low cost, low vibration and low noise, compacted and light. This type of bushing is widely used in various sliding articles of different kind of machines, such as textile machines, tobacco machines, printing machines, automobiles, agricultural and forests machines and so on.

应用举例 Application case

产品广泛应用于印刷机、纺织机、烟草机、健身器材、摩托车减震器、汽车、液压油缸、汽缸、齿轮油泵、叶片泵等。

Products widely used in print machine, textile machine, tobacco machine, gymnastic machine, gear pumps, vane pumps, shock absorber of automobiles & motorcycles, hydraulic and pneumatic cylinder, etc.

金相组织 Features



1. 聚四氟乙烯与亲油性纤维
0.01~0.03mm
PTFE mixture
2. 球形青铜粉 0.20~0.35mm
Porous bronze
3. 基体
Steel Backing
4. 电镀层 0.002mm
Plating layer



摩托车
Motorcycle



齿轮泵
Hydraulic gear pump



减震器
Shock absorbers



汽车工业
Car

HKB-1 自润滑复合轴承

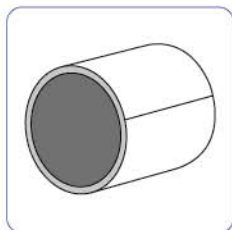
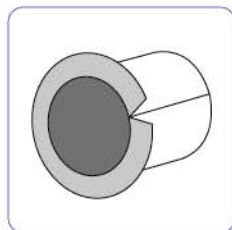
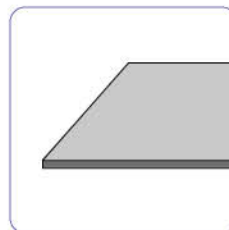
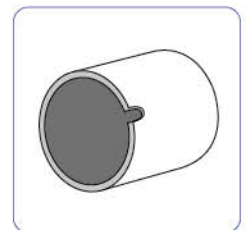
HKB-1 Self-lubricating Multilayer Composite Bearing



使用参数 The use of parameters

			HKB-1 无油润滑轴承 Oilless Bearing	HKB-1B 铜基无油润滑轴承 Bronze Based Bearing	HKB-1S 不锈钢耐腐蚀轴承 Bronze Based Bearing	HKB-1D 液压专用轴承 Hydraulic Bearing	HKB-1P 往复运动轴承 Reciprocating Bearing	HKB-1T 环保型钢基轴承 Gear Oil Pump Bearing
参数 Parameters								
材料 Material			低碳钢+铜粉+PTFE混合物 PTFE/Fiber+Bronze Powder+Steel	铜板+铜粉+PTFE混合物 PTFE/Fiber+Bronze Powder+Bronze	不锈钢+铜粉+PTFE混合物 PTFE/Fiber+Bronze Powder+Stainless steel	低碳钢+铜粉+PTFE混合物 PTFE/Fiber+Bronze Powder+Steel	低碳钢+铜粉+PTFE混合物 PTFE/Fiber+Bronze Powder+Steel	低碳钢+铜粉+(PTFE+填料) PTFE/Packing+Bronze Powder+Steel
最大承载压力P Max Load	静载 Static Load	N/mm ²	250	250	250	250	250	250
	动载 Dynamic Load	N/mm ²	140	140	140	140	140	140
	振动 Oscillation Load	N/mm ²	60	60	60	60	60	60
最大线速度V Linear Velocity	脂润滑 Grease Lubrication	m/s	2.5	2.5	2.5	2.5	2	2
	油润滑 Oil Lubrication	m/s	5	5	5	10	2.5	5
最高PV值 Max PV value	脂润滑 Grease Lubrication	N/mm ² ·m/s	3.6	3.6	3.6	3.6	3.6	3.6
	油润滑 Oil Lubrication	N/mm ² ·m/s	50	50	50	50	50	50
摩擦系数 Friction Coefficient	脂润滑 Grease Lubrication	μ	0.08~0.20	0.08~0.20	0.08~0.20	0.08~0.22	0.08~0.22	0.08~0.22
	油润滑 Oil Lubrication	μ	0.02~0.07	0.02~0.07	0.02~0.07	0.02~0.07	0.02~0.07	0.02~0.07
相配轴 Mating Axis	硬度 Hardness	HB	>120	>120	>120	>120	>120	>120
	粗糙度 Roughness		Ra=0.4~1.25	Ra=0.4~1.25	Ra=0.4~1.25	Ra=0.4~1.25	Ra=0.4~1.25	Ra=0.4~1.25
工作温度 Working Temperature		°C	-200°C~+280°C	-200°C~+280°C	-200°C~+280°C	-200°C~+280°C	-200°C~+280°C	-200°C~+280°C
导热系数 Heat-Conducting Coefficient		W(m·k)	40	60	40	40	40	40
热膨胀系数(轴向) Heat-expansion Coefficient(Axial)		10 ⁻⁶ K ⁻¹	11	18	16	11	11	11

可供形式 Availability

直套
Cylindrical翻边
Flange止推垫片
Thrust washer滑板
Slide plate非标产品定制
Customized



HKB-TEX 碳钢基PTFE织物轴承
HKB-TEX Steel With Ptfе Fibre Fabric Bearing

碳钢基+PTFE织物 Steel+PTFE fibre woven

基材特性 Material Features

该材料以各种优质金属为基体，表面覆着以PTFE和其它添加剂为主的低摩擦耐磨编织物材料。这种材料结构相比一般三层复合材料具有更高的承载能力和更长的使用寿命。基材可以为低碳钢(HKB-TEX)、不锈钢(HKB-TEX3)、铜(HKB-TEXB)等。主要运用于农用机械、建筑机械、汽机车底盘零部件、球阀、蝶阀各种阀门，水泵及化工工业等重载低速而无法加油的场合。

This new material use the PTFE fibre fabric overlay on metal backings, the fabric have very high load capacity and much longer operating life compare with conventional 3-layer bushes. The metal can be carbon steel(HKB-TEX), stainless steel(HKB-TEX3), bronze(HKB-TEXB)etc. Now have been used like suspenslon and auxiliary of agriculture and construction machines. cranes and hydraulic and mechanical jibs, ball butterfly and sluice valves, water pumps. chemical industries etc.

技术参数 Tech. Data

最大承载 Max. load	静承载 Static	350N/mm ²
	动承载 Dynamic	180N/mm ²
最高线速度 Max. speed	干 Dry	0.5m/s
	流体 Lubrication	>2m/s
最大PV (干) Max. PV (Dry)	短时间 Short-time	3.6N/mm ² ·m/s
	连续 Continuous	1.8N/mm ² ·m/s
使用温度 Temp.		-50°C~+250°C
摩擦系数 Friction coefficient		0.03~0.20
导热系数 Thermal conductivity		42W (m·k) ⁻¹
热膨胀系数 Coefficient of thermal expansion		11*10 ⁻⁶ K ⁻¹

尺寸公差参照HKB-10, P: 08、09



HKB-LBP 不锈钢基冲孔无给油轴承
HKB-LBP Metal Mesh With PTFE Layer Bearings

不锈钢冲孔基+PTFE Stainless steel mesh +PTFE layer

基材特性 Material Features

HKB-LBP以规则不锈钢网为基材，表面附着以PTFE为主的耐磨材料。产品广泛运用于化工行业、食品工业、港口机械等，如化工阀门，需在海水中润滑的部件等。此产品大大提高了耐腐蚀性，耐强酸、强碱性，而且又起到了自润滑的效果。

HKB-LBP consists of a stainless steel mesh shell laminated with compounded PTFE tape. This material structure enables the final goods have more light. The stainless steel provides good corrosion resistance. It is widely been used in chemical industries like chemical valves. medical industries, food industries, Port Machinery etc.

技术参数 Tech. Data

技术参数 Tech. Data		
最大承载 Max. load	静承载 Static	80N/mm ²
	动承载 Dynamic	40N/mm ²
最高线速度 Max. speed	干 Dry	1m/s
	油 Oil	>1m/s
使用温度 Temp.		-195°C~+260°C
摩擦系数 Friction coefficient		0.03~0.20

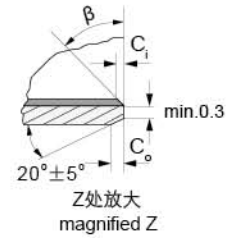
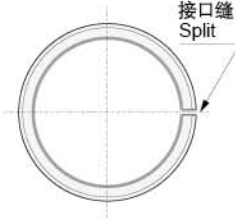
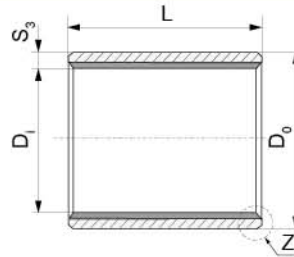
标准壁厚	0.80mm	+0.10 0
	1.20mm	0.75
	1.63mm	0 -0.18

尺寸可以按照图纸加工



HKB-1 轴套规格及公差

HKB-1 Sleeve Bushing Specification & Tolerance



内外倒角 ID and OD chamfers

S_3	C_0	C_1	β
0.75	0.5 ± 0.3	0.25 ± 0.2	$30^\circ \pm 5^\circ$
1.00	0.6 ± 0.3	0.30 ± 0.2	$30^\circ \pm 5^\circ$
1.50	0.7 ± 0.3	0.50 ± 0.3	$30^\circ \pm 5^\circ$

S_3	C_0	C_1	β
2.00	1.2 ± 0.4	0.50 ± 0.3	$30^\circ \pm 5^\circ$
2.50	1.8 ± 0.6	0.60 ± 0.3	$45^\circ \pm 5^\circ$

单位 Unit: mm

轴径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{ia}	配合间隙 Clearance D _D	壁厚 Wall thick- ness S ₃	长度 L ($\begin{matrix} ds\Phi 28 & L-0.30 \\ d>\Phi 30 & L-0.40 \end{matrix}$)												
						6	8	10	12	15	20	25	30	40	50			
6	-0.010 -0.022	8	+0.015	8	+0.055 +0.025	6.055 5.990	0.077 0.000	1.005 0.980	0606	0608	0610							
8	-0.013 -0.028	10	+0.015	10	+0.055 +0.025	8.055 7.990	0.083 0.003		0806	0808	0810	0812	0815					
10	-0.013 -0.028	12	+0.018	12	+0.065 +0.030	10.058 9.990	0.086 0.003		1006	1008	1010	1012	1015	1020				
12	-0.016 -0.034	14	+0.018	14	+0.065 +0.030	12.058 11.990	0.092 0.006		1206	1208	1210	1212	1215	1220	1225			
13	-0.016 -0.034	15	+0.018	15	+0.065 +0.030	13.058 12.990					1310	1312	1315	1320	1325			
14	-0.016 -0.034	16	+0.018	16	+0.065 +0.030	14.058 13.990					1410	1412	1415	1420	1425			
15	-0.016 -0.034	17	+0.018	17	+0.065 +0.030	15.058 14.990					1510	1512	1515	1520	1525			
16	-0.016 -0.034	18	+0.018	18	+0.065 +0.030	16.058 15.990					1610	1612	1615	1620	1625			
17	-0.016 -0.034	19	+0.021	19	+0.075 +0.035	17.061 16.990	0.095 0.006				1710	1712	1715	1720	1725			
18	-0.016 -0.034	20	+0.021	20	+0.075 +0.035	18.061 17.990					1810	1812	1815	1820	1825			
20	-0.020 -0.041	23	+0.021	23	+0.075 +0.035	20.071 19.990	0.112 0.010	1.505 1.475			2010	2012	2015	2020	2025	2030		
22	-0.020 -0.041	25	+0.021	25	+0.075 +0.035	22.071 21.990					2210	2212	2215	2220	2225	2230		
24	-0.020 -0.041	27	+0.021	27	+0.075 +0.035	24.071 23.990					2410	2412	2415	2420	2425	2430		
25	-0.020 -0.041	28	+0.021	28	+0.075 +0.035	25.071 24.990					2510	2512	2515	2520	2525	2530	2540	2550
28	-0.020 -0.041	32	+0.025	32	+0.085 +0.045	28.085 27.990	0.126 0.010	2.005 1.970				2812	2815	2820	2825	2830	2840	2850
30	-0.020 -0.041	34	+0.025	34	+0.085 +0.045	30.085 29.990						3012	3015	3020	3025	3030	3040	3050
32	-0.025 -0.050	36	+0.025	36	+0.085 +0.045	32.085 31.990	0.135 0.015					3212	3215	3220	3225	3230	3240	3250
35	-0.025 -0.050	39	+0.025	39	+0.085 +0.045	35.085 34.990						3512	3515	3520	3525	3530	3540	3550
38	-0.025 -0.050	42	+0.025	42	+0.085 +0.045	38.085 37.990						3812	3815	3820	3825	3830	3840	3850
40	-0.025 -0.050	44	+0.025	44	+0.085 +0.045	40.085 39.990						4012	4015	4020	4025	4030	4040	4050

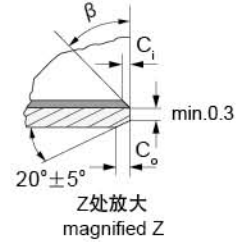
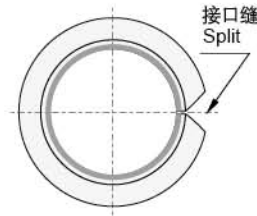
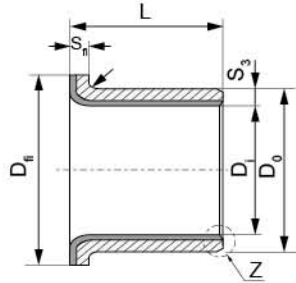


HKB-1 轴套规格及公差
HKB-1 Sleeve Bushing Specification & Tolerance

单位Unit: mm

轴径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{1a}	配合间隙 Clearance D _O	壁厚 Wall thick- ness S ₃	长度 L									
						20	25	30	40	50	60	70	80	100	115
45	-0.050 -0.025	50	+0.025	50	+0.085 +0.045	45.105 44.990	0.155 0.015								
50	-0.050 -0.025	55	+0.030	55	+0.100 +0.055	50.110 49.990	0.160 0.015								
55	-0.060 -0.030	60	+0.030	60	+0.100 +0.055	55.110 54.990									
60	-0.060 -0.030	65	+0.030	65	+0.100 +0.055	60.110 59.990									
65	-0.060 -0.030	70	+0.030	70	+0.100 +0.055	65.110 64.990	0.170 0.020								
70	-0.060 -0.030	75	+0.030	75	+0.100 +0.055	70.110 69.990									
75	-0.060 -0.030	80	+0.030	80	+0.100 +0.055	75.110 74.990									
80	-0.045	85	+0.035	85	+0.120 +0.070	80.155 80.020	0.201 0.020								
85	-0.054	90	+0.035	90	+0.120 +0.070	85.155 85.020									
90	-0.054	95	+0.035	95	+0.120 +0.070	90.155 90.020									
95	-0.054	100	+0.035	100	+0.120 +0.070	95.155 95.020	0.209 0.020								
100	-0.054	105	+0.035	105	+0.120 +0.070	100.155 100.020									
105	-0.054	110	+0.035	110	+0.120 +0.070	105.155 105.020									
110	-0.054	115	+0.035	115	+0.120 +0.070	110.115 110.020									
120	-0.054	125	+0.040	125	+0.170 +0.100	120.210 120.070	0.264 0.070								
125	-0.063	130	+0.040	130	+0.170 +0.100	125.210 125.070									
130	-0.063	135	+0.040	135	+0.170 +0.100	130.210 130.070									
140	-0.063	145	+0.040	145	+0.170 +0.100	140.210 140.070	0.273 0.070								
150	-0.063	155	+0.040	155	+0.170 +0.100	150.210 150.070									
160	-0.063	165	+0.040	165	+0.170 +0.100	160.210 160.070									
180	-0.063	185	+0.046	185	+0.210 +0.130	180.216 180.070	0.279 0.070								
190	-0.072	195	+0.046	195	+0.210 +0.130	190.216 190.070									
200	-0.072	205	+0.046	205	+0.210 +0.130	200.016 200.070	0.288 0.070								
220	-0.072	225	+0.046	225	+0.210 +0.130	220.216 220.070									
250	-0.072	255	+0.052	255	+0.260 +0.170	250.222 250.070	0.294 0.070								
260	-0.081	265	+0.052	265	+0.260 +0.170	260.222 260.070									
280	-0.081	285	+0.052	285	+0.260 +0.170	280.222 280.070	0.303 0.070								
300	-0.081	305	+0.052	305	+0.260 +0.170	300.222 300.070									

HKB-1F 翻边轴套规格及公差 HKB-1F Flange Bushing Specification & Tolerance

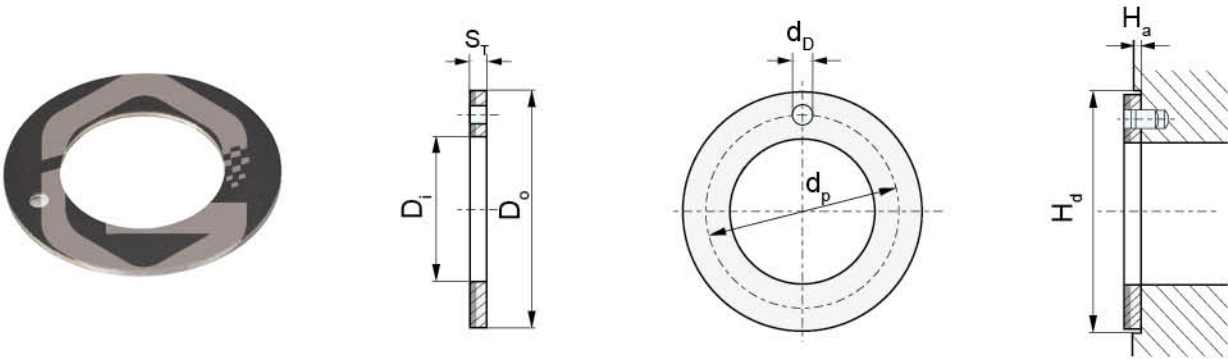


S_3	1.0	1.5	2.0	2.5
r	$1^{+0.5}$	1 ± 0.5	1.5 ± 0.5	2 ± 0.5

单位Unit: mm

轴 径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{i,a}	配合间隙 Clearance C _O	Designation 型号规格	壁厚 Wall thickness S ₃	尺寸 Dimension				
							D _i	D _O	D _h ±0.5	L±0.25	S _n -0.2
6 -0.013 -0.028	8 +0.015	8 +0.055 +0.025	6.055 5.990	0.077 0.000	HKB-1F06040		6	8	12	4	
					HKB-1F06070					7	
8 -0.013 -0.028	10 +0.015	10 +0.055 +0.025	8.055 7.990	0.083 0.003	HKB-1F08055		8	10	15	5.5	
					HKB-1F08075					7.5	
10 -0.016 -0.034	12 +0.018	12 +0.055 +0.025	10.058 9.990	0.086 0.003	HKB-1F10070		10	12	18	7	
					HKB-1F10090					9	
					HKB-1F10120					12	
12 -0.016 -0.034	14 +0.018	14 +0.065 +0.030	12.058 11.990		HKB-1F12070	1.005 0.980	12	14	20	7	1
					HKB-1F12090					9	
					HKB-1F12120					12	
					HKB-1F14120					12	
14 -0.016 -0.034	16 +0.018	16 +0.065 +0.030	14.058 13.990	0.092 0.006	HKB-1F14120		14	16	22	12	
					HKB-1F14170					17	
					HKB-1F15090					9	
15 -0.016 -0.034	17 +0.018	17 +0.065 +0.030	15.058 14.990		HKB-1F15120		15	17	23	12	
					HKB-1F15170					17	
					16 -0.016 -0.034					18 +0.018	
HKB-1F16170	17										
HKB-1F18120	12										
18 -0.016 -0.034	20 +0.021	20 +0.075 +0.035	18.061 17.990	0.095 0.006	HKB-1F18170		18	20	26	17	
					HKB-1F18200					20	
					20 -0.020 -0.041					23 +0.021	
HKB-1F20165	16.5										
HKB-1F20215	21.5										
22 -0.020 -0.041	25 +0.021	25 +0.075 +0.035	22.071 21.990	0.112 0.010	HKB-1F22150	1.005 0.980	22	25	32	15	1.5
					HKB-1F22200					20	
25 -0.020 -0.041	28 +0.021	28 +0.075 +0.035	25.071 24.990		HKB-1F25115		25	28	35	11.5	
					HKB-1F25165					16.5	
					HKB-1F25215					21.5	
30 -0.025 -0.050	34 +0.025	34 +0.075 +0.035	30.085 29.990	0.126 0.010	HKB-1F30160		30	34	42	16	
					HKB-1F30260					26	
35 -0.025 -0.050	39 +0.025	39 +0.085 +0.045	35.085 34.990	0.135 0.015	HKB-1F35160	2.005 1.970	35	39	47	16	2
					HKB-1F35260					26	
40 -0.025 -0.050	44 +0.025	44 +0.085 +0.045	40.085 39.990		HKB-1F40260		40	44	53	26	
					HKB-1F40400					40	

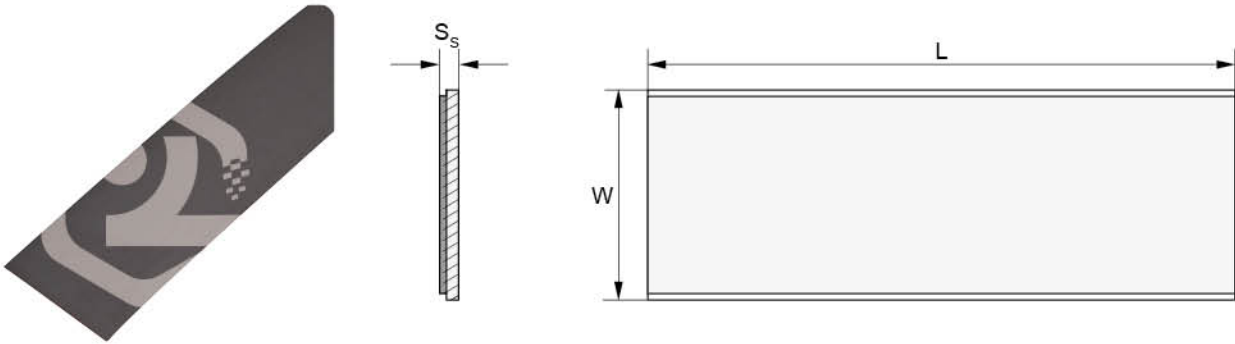
HKB-1WC 垫片规格及公差
HKB-1WC Thrust Washer Specification & Tolerance



单位Unit: mm

轴径 Shaft D _s	型号规格 Standard No.	垫片尺寸 Washer size				安装尺寸 Assemble size			H _d +0.12
		D _i +0.25	D _o -0.25	S _T -0.05	d _p ±0.125	d _o	+0.4 +0.1	H _a ±0.2	
8	W10	10	20	1.5	15	1.5	1	20	
10	W12	12	24		18			24	
12	W14	14	26		20			26	
14	W16	16	30		23	2		30	
16	W18	18	32		25			32	
18	W20	20	36		28	3		36	
20	W22	22	38		30			38	
22	W24	24	42		33			42	
24	W26	26	44		35			44	
26	W28	28	48		38			48	
30	W32	32	54	43	4	54			
36	W38	38	62	50		62			
40	W42	42	66	54		66			
46	W48	48	74	61		1.5	74		
50	W52	52	78	65			78		
60	W62	62	90	76			90		

HKB-1SP 板材规格及公差
HKB-1SP Strip Specification & Tolerance



单位Unit: mm

型号规格 Standard No.	长度 $L\pm 1$	宽度 $W\pm 1$	厚壁 Wall thickness $S_s-0.05$
SP	500	150	1.0
SP	500	150	1.5
SP	500	150	2.0
SP	500	150	2.5

HKB-2 边界润滑轴承

HKB-2 Marginal lubricating Bearing



产品介绍 Product Introduction

HKB-2 边界润滑轴承，是以优质冷轧钢板为基体，中间烧结多孔球形青铜粉，再在多孔球形青铜粉层表面轧粘一层改性聚甲醛，并经卷制制作而成的滑动轴承。此类轴承由于其表面轧制有排布规律的带有螺旋角度的储油坑，在装配时需涂满润滑油脂，特别适用于高载低速下难以形成流体润滑的场合，其表面的储油穴可以保证最佳的油脂分布，可长期不用加油保养。

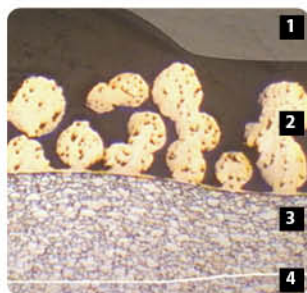
应用举例 Application Case

产品广泛应用于汽车底盘，锻压机床，冶金机械，矿山机械，水利行业，以及轧钢机等。

Products are widely used in vehicle chassis, forming machine tools, steel metallurgical machinery, mineral mountain machinery, hydraulic industry and rolling steel industry, etc.

HKB-2 Marginal Self-lubricating Bearings, It is a sliding bearing made of high-quality cold-rolled steel plate as the base body, porous spherical bronze powder sintered in the middle, and then a layer of modified polyoxymethylene is rolled on the surface of the porous spherical bronze powder layer and rolled. Because of the rolling oil storage pits with spiral angles on the surface of this type of bearing, it needs to be filled with lubricating grease during assembly. It is especially suitable for occasions where it is difficult to form fluid lubrication under high load and low speed. The holes can ensure the best grease distribution and can be maintained without refueling for a long time.

金相组织 Features



1. POM0.30~0.50mm改性聚甲醛
POM with lead 0.3~0.5mm
2. 铜粉层0.20~0.35mm
Porous bronze 0.2~0.35mm
3. 低碳钢背0.4~2.2mm
Steel backing 0.4~2.2mm
4. 铜/锡电镀层0.002mm
Cooper plating or tin plating 0.002mm



铲车
Loader



纺织机械
Textile machine



食品机械
Food Machine



冶金机械
Metallurgy

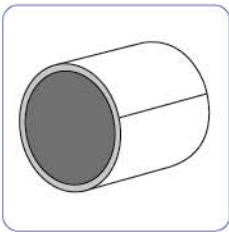
HKB-2 边界润滑轴承
HKB-2 Marginal lubricating Bearing



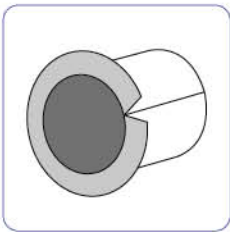
使用参数 The use of parameters

参数 Parameters			HKB-2 边界润滑轴承 Marginal Lubrication Bushing	HKB-2Y 边界润滑轴承 Marginal Lubrication Bushing	HKB-2S 边界润滑轴承 Marginal Lubrication Bushing	HKB-2L 边界润滑轴承 Marginal Lubrication Bushing
最大承载压力P Max Load	静载 Static Load	N/mm ²	250	250	250	250
	动载 Dynamic Load	N/mm ²	140	140	140	140
	振动 Oscillation Load	N/mm ²	70	70	70	70
最大线速度V Linear Velocity	脂润滑 Grease Lubrication	m/s	2.5	2.5	2.5	2.5
	油润滑 Oil Lubrication	m/s	>3	>3	>3	>3
最高PV值 Max PV value	脂润滑 Grease Lubrication	N/mm ² ·m/s	2.8	2.8	2.8	2.8
	油润滑 Oil Lubrication	N/mm ² ·m/s	50	50	50	50
摩擦系数 Friction Coefficient	脂润滑 Grease Lubrication	μ	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.25
	油润滑 Oil Lubrication	μ	0.05~0.15	0.05~0.15	0.05~0.15	0.05~0.15
相配轴 Mating Axis	硬度 Hardness	HB	>270	>270	>270	>270
	粗糙度 Roughness		Ra=0.4~1.25	Ra=0.4~1.25	Ra=0.4~1.25	Ra=0.4~1.25
工作温度 Working Temperature		°C	-40°C~+120°C	-40°C~+120°C	-40°C~+120°C	-40°C~+120°C
导热系数 Heat-Conducting Coefficient		W(m·k)	52	52	52	52
热膨胀系数（轴向） Heat-expansion Coefficient(Axial)		10 ⁻⁶ K ⁻¹	11	18	16	11

可供形式 Availability



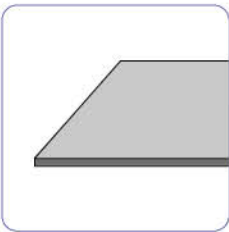
直套
Cylindrical



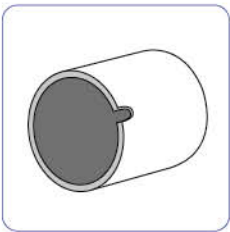
翻边
Flange



止推垫片
Thrust washer



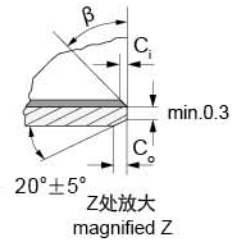
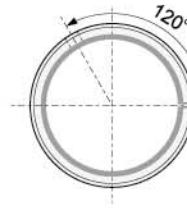
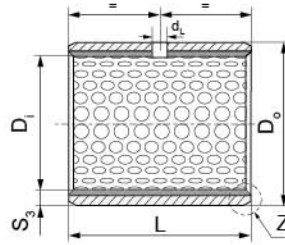
滑板
Slide plate



非标产品定制
Customized

HKB-2 轴承规格及公差

HKB-2 Sleeve Bushing Specification & Tolerance



内外倒角 ID and OD chamfers

S_3	C_o	C_i	β
1.0	0.6 ± 0.3	0.30 ± 0.2	$30^\circ \pm 5^\circ$
1.5	0.7 ± 0.3	0.50 ± 0.2	$30^\circ \pm 5^\circ$

S_3	C_o	C_i	β
2.00	1.2 ± 0.4	0.50 ± 0.3	$30^\circ \pm 5^\circ$
2.50	1.8 ± 0.6	0.80 ± 0.3	$45^\circ \pm 5^\circ$

单位 Unit: mm

轴径 Shaft D _s h8	座孔 Housing H7 D _H	(OD) 外径公差 Tolerance D _o	(ID)压装后 内孔公差 After fixed D _{1a}	配合间隙 Clearance D _D	壁厚 Wall thick- ness S ₃	油孔 Oil hole d _L	长度 L ⁰ -0.40									
							10	15	20	25	30	35	40	45	50	60
10 -0.022	12 ^{+0.018}	12 ^{+0.065} _{+0.030}	10.108 10.040	0.130 0.040	0.980 0.955	4	1010	1015	1020							
12 -0.027	14 ^{+0.018}	14 ^{+0.065} _{+0.030}	12.108 12.040	0.135 0.040			1210	1215	1220							
14 -0.027	16 ^{+0.018}	16 ^{+0.065} _{+0.030}	14.108 14.040					1415	1420							
15 -0.027	17 ^{+0.018}	17 ^{+0.065} _{+0.030}	15.108 15.040					1515	1520	1525						
16 -0.027	18 ^{+0.018}	18 ^{+0.065} _{+0.030}	16.108 16.040					1615	1620	1625						
18 -0.027	20 ^{+0.021}	20 ^{+0.075} _{+0.035}	18.111 18.040				0.138 0.040	1815	1820	1825						
20 -0.033	23 ^{+0.021}	23 ^{+0.075} _{+0.035}	20.131 20.050	0.164 0.050	1.475 1.445	6		2015	2020	2025	2030					
22 -0.033	25 ^{+0.021}	25 ^{+0.075} _{+0.035}	22.131 22.050					2215	2220	2225	2230					
25 -0.033	28 ^{+0.021}	28 ^{+0.075} _{+0.035}	25.131 25.050					2515	2520	2525	2530					
28 -0.033	32 ^{+0.025}	32 ^{+0.085} _{+0.045}	28.155 28.060				0.188 0.060		2820	2825	2830					
30 -0.033	34 ^{+0.025}	34 ^{+0.085} _{+0.045}	30.155 30.060	1.970 1.935		3020		3025	3030	3035	3040					
35 -0.039	39 ^{+0.025}	39 ^{+0.085} _{+0.045}	35.155 35.060		0.194 0.060			3520	3525	3530	3535	3540				
40 -0.039	44 ^{+0.025}	44 ^{+0.085} _{+0.045}	40.155 40.060	0.234 0.080	2.460 2.415	8			4020	4025	4030	4035	4040	4045	4050	
45 -0.039	50 ^{+0.025}	50 ^{+0.085} _{+0.045}	45.195 45.080						4520	4525	4530	4535	4540	4545	4550	
50 -0.039	55 ^{+0.030}	55 ^{+0.100} _{+0.055}	50.200 50.080				0.239 0.080				5030	5035	5040	5045	5050	5060
55 -0.046	60 ^{+0.030}	60 ^{+0.100} _{+0.055}	55.200 55.080				0.246 0.080				5530	5535	5540	5545	5550	5560
60 -0.046	65 ^{+0.030}	65 ^{+0.100} _{+0.055}	60.200 60.080						6030	6035	6040	6045	6050	6060		



HKB-2 轴承规格及公差

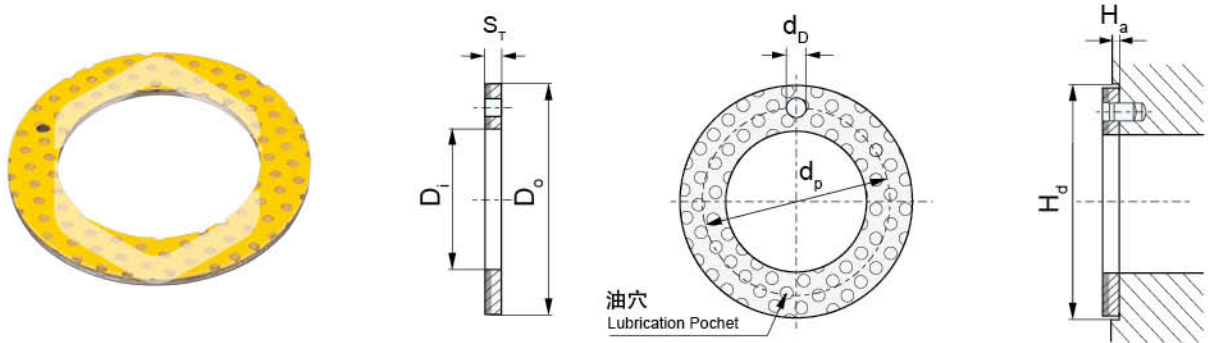
HKB-2 Sleeve Bushing Specification & Tolerance

单位 Unit: mm

轴径 Shaft D _s h8	座孔 Housing H7 D _H	(OD) 外径公差 Tolerance D _o	(ID)压装后 内孔公差 After fixed D _{la}	配合间隙 Clearance D _o	壁厚 Wall thick- ness S ₃	油孔 Oil hole d _L	长度 L ⁰ _{-0.40}								
							40	50	60	80	90	95	100	110	120
65 -0.046	70 +0.030	70 +0.100 +0.055	65.200 65.080				6540	6550	6560						
70 -0.046	75 +0.030	75 +0.100 +0.055	70.200 70.080	0.246 0.080	2.460 2.415	8	7040	7050	7060	7080					
75 -0.046	80 +0.030	80 +0.100 +0.055	75.200 75.080				7540	7550	7560	7580					
80 -0.046	85 +0.035	85 +0.120 +0.070	80.265 80.100	0.313 0.100			8040	8050	8060	8080					
85 -0.054	90 +0.035	90 +0.120 +0.070	85.265 85.100				8540	8550	8560	8580					
90 -0.054	95 +0.035	95 +0.120 +0.070	90.265 90.100				9040	9050	9060	9080	9090				
100 -0.054	105 +0.035	105 +0.120 +0.070	100.265 100.100	0.321 0.100				10050	10060	10080	10090	10095			
105 -0.054	110 +0.035	110 +0.120 +0.070	105.265 105.100					10550	10560	10580	10590	10595	105100	105110	
110 -0.054	115 +0.035	115 +0.120 +0.070	110.265 110.110			9.5		11050	11060	11080	11090	11095	110100	110110	
120 -0.054	125 +0.040	125 +0.170 +0.100	120.270 120.110					12050	12060	12080	12090	12095	120100	120110	
125 -0.063	130 +0.040	130 +0.170 +0.100	125.270 125.110					12550	12560	12580	12590	12595	125100	125110	
130 -0.063	135 +0.040	135 +0.170 +0.100	130.270 130.110					13050	13060	13080	13090	13095	130100	130110	
140 -0.063	145 +0.040	145 +0.170 +0.100	140.270 140.110	0.324 0.100				14050	14060	14080	14090	14095	140100	140110	
150 -0.063	155 +0.040	155 +0.170 +0.100	150.270 150.110		2.450 2.385			15050	15060	15080	15090	15095	150100	150110	
160 -0.063	165 +0.040	165 +0.170 +0.100	160.270 160.110					16050	16060	16080	16090	16095	160100	160110	
170 -0.063	175 +0.040	175 +0.170 +0.100	170.270 170.110					17050	17060	17080	17090	17095	170100	170110	
180 -0.063	185 +0.046	185 +0.210 +0.130	180.276 180.110			9.5		18050	18060	18080	18090	18095	180100	180110	
190 -0.072	195 +0.046	195 +0.210 +0.130	190.276 190.110					19050	19060	19080	19090	19095	190100	190110	190120
200 -0.072	205 +0.046	205 +0.210 +0.130	200.276 200.110	0.339 0.110				20050	20060	20080	20090	20095	200100	200110	200120
220 -0.072	225 +0.046	225 +0.210 +0.130	220.276 220.110					22050	22060	22080	22090	22095	220100	220110	220120
240 -0.072	245 +0.046	245 +0.210 +0.130	240.276 240.110					24050	24060	24080	24090	24095	240100	240110	240120
250 -0.072	255 +0.052	255 +0.260 +0.170	250.282 250.110					25050	25060	25080	25090	25095	250100	250110	250120
260 -0.081	265 +0.052	265 +0.260 +0.170	260.282 260.110	0.354 0.110		9.5		26050	26060	26080	26090	26095	260100	260110	260120
280 -0.081	285 +0.052	285 +0.260 +0.170	280.282 280.110					28050	28060	28080	28090	28095	280100	280110	280120
300 -0.081	305 +0.052	305 +0.260 +0.170	300.282 300.110					30050	30060	30080	30090	30095	300100	300110	300120

HKB-2WC 垫片规格及公差

HKB-2WC Thrust Washer Specification & Tolerance

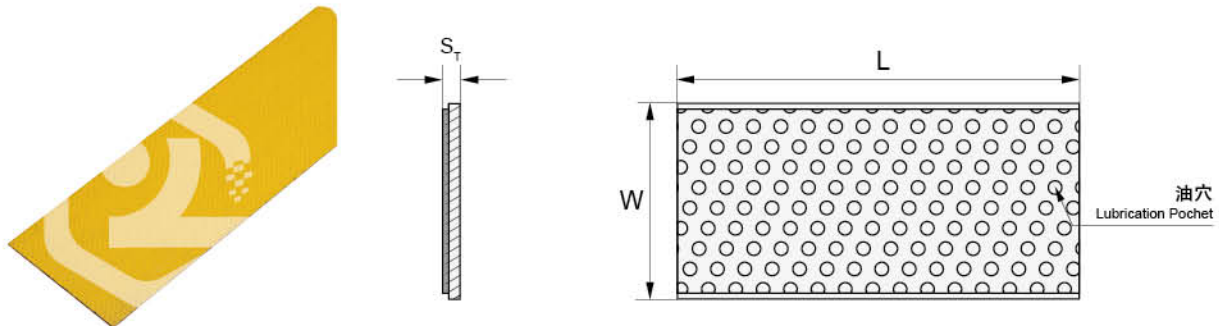


单位Unit: mm

轴径 Shaft D_s	型号规格 Standard No.	垫片尺寸 Washer size				安装尺寸 Assemble size		
		$D_i+0.25$	$D_o-0.25$	$S_T-0.05$	$d_p\pm 0.125$	$d_b^{+0.4}_{+0.1}$	$H_a\pm 0.2$	$H_d+0.12$
8	W10	10	20		15	1.5		20
10	W12	12	24		18			24
12	W14	14	26		20			26
14	W16	16	30		23	2		30
16	W18	18	32		25			32
18	W20	20	36		28			36
20	W22	22	38	1.5	30	3	1	38
22	W24	24	42		33			42
24	W26	26	44		35			44
26	W28	28	48		38			48
30	W32	32	54		43			54
36	W38	38	62		50			62
40	W42	42	66		54	4		66
46	W48	48	74		61		1.5	74
50	W52	52	78	2	65			78
60	W62	62	90		76			90

HKB-2SP 板材标准公制尺寸

HKB-2SP Strip Standard Metric Size



单位Unit: mm

型号规格 Standard No.	长度 $L\pm 1$	宽度 $W\pm 1$	厚壁 Wall thickness $S_s-0.05$
SP	500	150	1.0
SP	500	150	1.5
SP	500	150	2.0
SP	500	150	2.5

HKB-850BM 钢基铜合金弥散型固体润滑轴承
HKB-850BM Metal backed bronze powder with solid lubricants



金属基+铜合金粉+固体润滑剂 Metal Base+Bronze Powder with Graphite

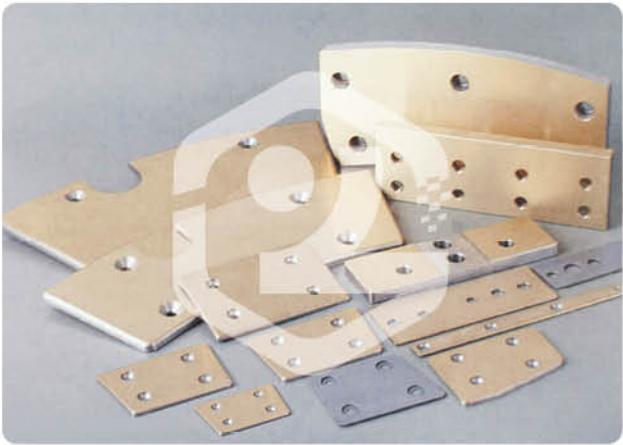
HKB-850BM以金属基为基体表面烧结含有固体润滑剂的铜合金粉，由于润滑剂弥散于工作表面因此润滑性更为充分。适用于高载低速而无法加油或无法形成润滑膜の場合，并具有较好的耐酸、碱性。产品被广泛用于水轮机、注塑机、汽车轮胎模具等。

HKB-850BM metal backed bronze with graphite lined bearing materials, sintered layers are of special copper alloy containing uniformly dispersed solid lubricants. Suitable for hostile environments, for high load application which lubrication is difficult. Now HKB850BM been widely used in water turbines, injection molding machinery, packing machines, construction equipment, tire moulds etc.



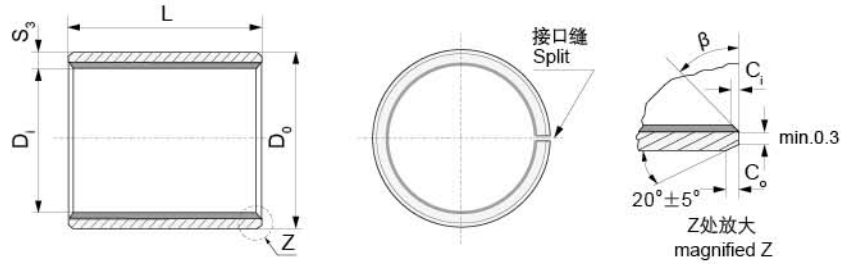
技术参数 Tech. Data

HKB标准 HKB standard 金属基材 Backing Metal		HKB-850BM1	HKB-850BM2	HKB-850BM3	HKB-850BM4
		碳钢 steel	碳钢 steel	不锈钢 S316	铜 Bronze
耐磨层 Lining layer	成份 Composition	CuSn12	CuSn10Pb10	CuSn12	CuSn12
	固体润滑剂 Solid Lubricants	6%	6%	6%	6%
	硬度 Hardness	> 40HB	> 40HB	> 40HB	> 40HB
	压缩变形 Compression deformation 150Mpa	< 0.005mm	< 0.005mm	< 0.005mm	< 0.005mm
最大承载 Max. Load	静承载 Static	150N/mm2	120N/mm2	150N/mm2	150N/mm2
	动承载 Dynamic	100N/mm2	80N/mm2	100N/mm2	100N/mm2
最大线速度	Max. Speed	0.5m/s	0.5m/s	0.5m/s	0.5m/s
最大PV	Max. PV N/mm ² *m/s	1.5	1.5	1.5	1.5
摩擦因数	Coefficient of friction	0.05~0.2	0.03~0.2	0.05~0.2	0.05~0.2
使用温度℃	Temp.℃	-195~+280	-195~+280	-195~+280	-195~+280



HKB-850BM 轴套规格及公差

HKB-850BM Metric Cylindrical Bushes



内外倒角 ID and OD chamfers

S_3	C_0	C_i	β
0.75	0.5 ± 0.3	0.25 ± 0.2	$35^\circ \pm 5^\circ$
1.00	0.6 ± 0.3	0.30 ± 0.2	$35^\circ \pm 5^\circ$
1.50	0.7 ± 0.3	0.50 ± 0.3	$35^\circ \pm 5^\circ$

S_3	C_0	C_i	β
2.00	1.2 ± 0.4	0.50 ± 0.3	$35^\circ \pm 5^\circ$
2.50	1.8 ± 0.6	0.60 ± 0.3	$45^\circ \pm 5^\circ$

单位unit:mm

内径 D_i ϕd	外径 D_o ϕD	轴径(h8) Shaft D_s	座孔(H7) Housing D_H	压装后 内孔公差 After fixed D_{ia}	配合间隙 Clearance C_0	壁厚 Wall thickness S_3	油孔 Oil hole d_L	长度 L $0_{-0.40}$						
								10	15	20	25	30	40	50
10	12	10 -0.022	12 +0.018		0.170 0.010			1010	1015	1020				
12	14	12 -0.027	14 +0.018					1210	1215	1220				
14	16	14 -0.027	16 +0.018	+0.148 +0.010	0.175 0.010	0.995 0.935	4	1410	1415	1420				
15	17	15 -0.027	17 +0.018					1510	1515	1520				
16	18	16 -0.027	18 +0.018					1610	1615	1620				
18	20	18 -0.027	20 +0.021	+0.151 +0.010	0.178 0.010			1810	1815	1820	1825			
20	23	20 -0.033	23 +0.021					2010	2015	2020	2025			
22	25	22 -0.033	25 +0.021	+0.161 +0.020	0.194 0.020	1.490 1.430		2210	2215	2220	2225			
24	27	24 -0.033	27 +0.021					2410	2415	2420	2425	2430		
25	28	25 -0.033	28 +0.021						2515	2520	2525	2530		
26	30	26 -0.033	30 +0.021	+0.181 +0.040	0.214 0.040		6		2615	2620	2625	2630		
28	32	28 -0.033	32 +0.025		0.218 0.040				2815	2820	2825	2830	2840	
30	34	30 -0.033	34 +0.025						3015	3020	3025	3030	3040	
32	36	32 -0.039	36 +0.025	+0.185 +0.040		1.980 1.920			3215	3220	3225	3230	3240	
35	39	35 -0.039	39 +0.025		0.224 0.040					3520	3525	3530	3540	3550
38	42	38 -0.039	42 +0.025				8			3820	3825	3830	3840	3850
40	44	40 -0.039	44 +0.025							4020	4025	4030	4040	4050

HKB-850BM 轴套规格及公差

HKB-850BM Metric Cylindrical Bushes



单位unit:mm

内径 D_i ϕd	外径 D_o ϕD	轴径(h8) Shaft D_s	座孔(H7) Housing D_H	压装后 内孔公差 After fixed D_{ia}	配合间隙 Clearance C_o	壁厚 Wall thickness S_3	油孔 Oil hole d_L	长度 L $\begin{smallmatrix} 0 \\ -0.40 \end{smallmatrix}$							
								25	30	40	50	60	80	90	100
45	50	45 - 0.039	50 + 0.025	+ 0.225 + 0.080	0.264 0.080			4525	4530	4540	4550				
50	55	50 - 0.039	55 + 0.030		0.269 0.080				5030	5040	5050	5060			
55	60	55 - 0.046	60 + 0.030						5530	5540	5550	5560			
60	65	60 - 0.046	65 + 0.030	+ 0.230 + 0.080	0.276 0.080		8		6030	6040	6050	6060			
65	70	65 - 0.046	70 + 0.030						6530	6540	6550	6560			
70	75	70 - 0.046	75 + 0.030						7030	7040	7050	7060	7080		
75	80	75 - 0.046	80 + 0.030						7530	7540	7550	7560	7580		
80	85	80 - 0.046	85 + 0.035		0.281 0.080				8030	8040	8050	8060	8080	8090	
85	90	85 - 0.054	90 + 0.035						8530	8540	8550	8560	8580	8590	85100
90	95	90 - 0.054	95 + 0.035							9040	9050	9060	9080	9090	90100
95	100	95 - 0.054	100 + 0.035	+ 0.235 + 0.080	0.289 0.080	2.460 2.400					9550	9560	9580	9590	95100
100	105	100 - 0.054	105 + 0.035								10050	10060	10080	10090	100100
105	110	105 - 0.054	110 + 0.035								10550	10560	10580	10590	105100
110	115	110 - 0.054	115 + 0.035				9.5				11050	11060	11080	11090	110100
115	120	115 - 0.054	120 + 0.035								11550	11560	11580	11590	115100
120	125	120 - 0.054	125 + 0.040								12050	12060	12080	12090	120100
125	130	125 - 0.063	130 + 0.040									12560	12580	12590	125100
130	135	130 - 0.063	135 + 0.040	+ 0.240 + 0.080	0.303 0.080							13060	13080	13090	130100
135	140	135 - 0.063	140 + 0.040									13560	13580	13590	135100
140	145	140 - 0.063	145 + 0.040									14060	14080	14090	140100
150	155	150 - 0.063	155 + 0.040									15060	15080	15090	150100

HKB-800 双金属轴承 HKB-800 Bimetal Bearing



产品介绍 Product Introduction

以优质碳钢为基体，表面烧结青铜粉；适用于高载低速下的摇摆运动、旋转运动，铜合金层表面可以根据工况需要加工出各种类型的油槽、储油坑，以适合于无法加油或难以加油的场合。具有摩擦系数低、耐磨性能好、使用寿命长、抗咬合性能好等特点。产品广泛用于工程机械用支重轮、托带轮、张紧轮；卡车用平衡轴衬套、钢板肖衬套、转向节主肖轴套；发动机连杆轴套、气门摇臂轴套、凸轮轴轴套；止推垫片、柱塞泵侧片、齿轮泵侧片等。

HKB-800 bi-metal bushing is backed on low carbon steel, sintered with SAE-797, SAE-799, SAE-48, or SAE-783, which has good wear resistance high load capacity and excellent fatigue properties. The inside surface can be machined with oil groove and pockets. Application: automotive, balance suspensions of heavy-duty trucks, power steering, pedal, king-pin, connecting rod, rock arm, mechanical handling, lifting equipment, track roller, auto chassis, agricultural machines, hydraulic pump side plates and so on.

应用举例 Application Case

产品广泛应用于汽车发动机、变速箱、汽车底盘、转向节、平衡轴、钢板弹簧、摩托车离合器、齿轮泵摩擦片、起重设备等。

Products are widely applied in various automobile engines, transmission cases, vehicle chassis, redirection joints, balance shafts, steel plate springs, motorcycle clutches, rubbing plate of gear pumps, as well as hoisting machines, etc.

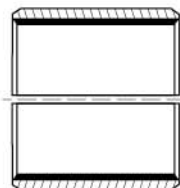


重型卡车
Truck

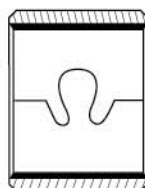


发动机
Engine

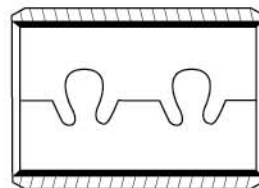
双金属轴套的搭扣形式 Clinch Lock of Bimetal Bushes



A



B



C

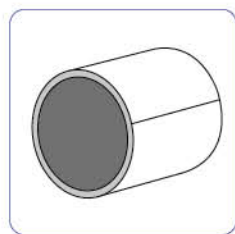
HKB-800 双金属轴承 HKB-800 Bimetal Bearing



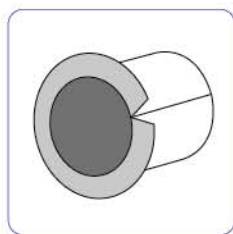
使用参数 The Use of Parameters

		HKB-800 双金属轴承 Bi-metallic Bearing	HKB-720 高铅双金属轴承 High Lead Bi-Metallic Bearing	HKB-700 双金属轴承 Bi-metallic Bearing	HKB-20 高锡铝基轴承 High Tin Aluminum Bearing	HKB-MP 摩擦焊接双金属轴承 Bi-metallic Bearing
技术参数 Tech. Data						
材料 Material		CuPb10Sn10 JIS-LBC3/SAE-797	CuPb24Sn4 JIS-LBC6/SAE-799	CuPb30 JIS-KJ3/SAE-48	AlSn20Cu JIS-AJL/SAE-783	CuPb10Sn10 JIS-LBC3/SAE-797
合金硬度 Alloy Hardness		HB70-100	HB45-70	HB30-45	HB30-40	HB70-100
最大承载力 Load Limit (N/mm ²)		150	120	130	100	150
抗拉强度 Tensile strength (N/mm ²)		150	200	150	200	150
最大线速度 Speed Limit V max (m/s)		5	15	10	25	5
最大PV值 PV Limit (N/mm ² *m/s)	脂润滑 Grease	2.8	2.5	2.8	-	208
	油润滑 oil	10	8	10	6	10
摩擦系数 Friction Coeffivient (oil)		0.06~0.14	0.08~0.16	0.06~0.16	0.08~0.17	0.06~0.14

可供形式 Availability



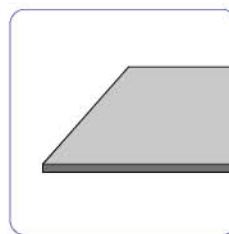
直套
Cylindrical



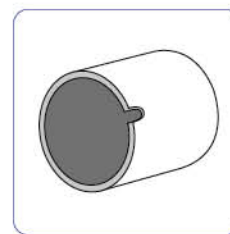
翻边
Flange



止推垫片
Thrust washer

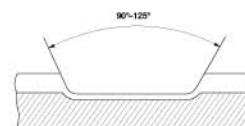
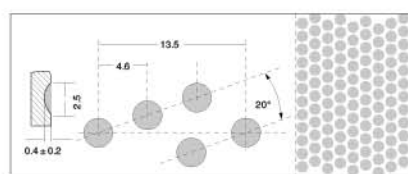
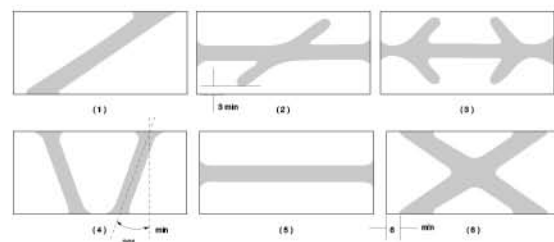


滑板
Slide plate



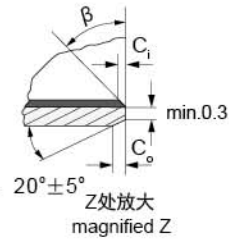
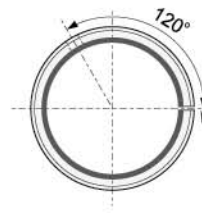
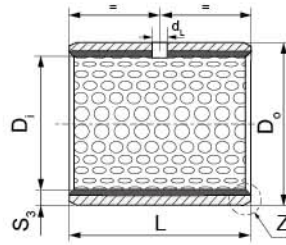
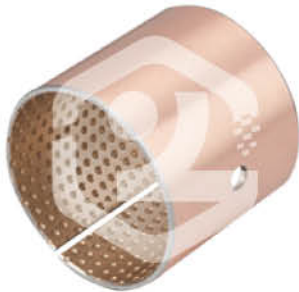
非标产品定制
Customized

双金属轴套的油槽油穴形式 Types For Bimetal Bushing Grooves & Indentations



HKB-800 双金属轴承规格及公差

HKB-800 Bimetal Sleeve Bushing Specification & Tolerance



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	$35^\circ \pm 5^\circ$
1.00	0.6 ± 0.3	0.30 ± 0.2	$35^\circ \pm 5^\circ$
1.50	0.7 ± 0.3	0.50 ± 0.3	$35^\circ \pm 5^\circ$

S_3	C_o	C_i	β
2.00	1.2 ± 0.4	0.50 ± 0.3	$35^\circ \pm 5^\circ$
2.50	1.8 ± 0.6	0.60 ± 0.3	$45^\circ \pm 5^\circ$

单位unit:mm

内径 D_i ϕd	外径 D_o ϕD	轴径(h8) Shaft D_s	座孔(H7) Housing D_H	压装后 内孔公差 After fixed D_{ia}	配合间隙 Clearance C_D	壁厚 Wall thickness S_3	油孔 Oil hole d_L	长度 L L -0.40						
								10	15	20	25	30	40	50
10	12	10 -0.022	12 +0.018		0.170 0.010			1010	1015	1020				
12	14	12 -0.027	14 +0.018					1210	1215	1220				
14	16	14 -0.027	16 +0.018	+0.148 +0.010	0.175 0.010	0.995 0.935	4	1410	1415	1420				
15	17	15 -0.027	17 +0.018					1510	1515	1520				
16	18	16 -0.027	18 +0.018					1610	1615	1620				
18	20	18 -0.027	20 +0.021	+0.151 +0.010	0.178 0.010			1810	1815	1820	1825			
20	23	20 -0.033	23 +0.021					2010	2015	2020	2025			
22	25	22 -0.033	25 +0.021	+0.161 +0.020	0.194 0.020	1.490 1.430		2210	2215	2220	2225			
24	27	24 -0.033	27 +0.021					2410	2415	2420	2425	2430		
25	28	25 -0.033	28 +0.021						2515	2520	2525	2530		
26	30	26 -0.033	30 +0.021	+0.181 +0.040	0.214 0.040		6		2615	2620	2625	2630		
28	32	28 -0.033	32 +0.025		0.218 0.040				2815	2820	2825	2830	2840	
30	34	30 -0.033	34 +0.025						3015	3020	3025	3030	3040	
32	36	32 -0.039	36 +0.025	+0.185 +0.040		1.980 1.920			3215	3220	3225	3230	3240	
35	39	35 -0.039	39 +0.025		0.224 0.040					3520	3525	3530	3540	3550
38	42	38 -0.039	42 +0.025				8			3820	3825	3830	3840	3850
40	44	40 -0.039	44 +0.025							4020	4025	4030	4040	4050

HKB-800 双金属轴承规格及公差

HKB-800 Bimetal Sleeve Bushing Specification & Tolerance



单位unit:mm

内径 D_i ϕd	外径 D_o ϕD	轴径(h8) Shaft D_s	座孔(H7) Housing D_H	压装后 内孔公差 Arterfixed D_{ia}	配合间隙 Clearance C_o	壁厚 Wall thickness S_3	油孔 Oil hole d_L	长度 L $\begin{smallmatrix} 0 \\ -0.40 \end{smallmatrix}$							
								25	30	40	50	60	80	90	100
45	50	45 -0.039	50 +0.025	+0.225 +0.080	0.264 0.080			4525	4530	4540	4550				
50	55	50 -0.039	55 +0.030		0.269 0.080				5030	5040	5050	5060			
55	60	55 -0.046	60 +0.030						5530	5540	5550	5560			
60	65	60 -0.046	65 +0.030	+0.230 +0.080			8		6030	6040	6050	6060			
65	70	65 -0.046	70 +0.030		0.276 0.080				6530	6540	6550	6560			
70	75	70 -0.046	75 +0.030						7030	7040	7050	7060	7080		
75	80	75 -0.046	80 +0.030						7530	7540	7550	7560	7580		
80	85	80 -0.046	85 +0.035		0.281 0.080				8030	8040	8050	8060	8080	8090	
85	90	85 -0.054	90 +0.035						8530	8540	8550	8560	8580	8590	85100
90	95	90 -0.054	95 +0.035							9040	9050	9060	9080	9090	90100
95	100	95 -0.054	100 +0.035	+0.235 +0.080		2.460 2.400					9550	9560	9580	9590	95100
100	105	100 -0.054	105 +0.035		0.289 0.080						10050	10060	10080	10090	100100
105	110	105 -0.054	110 +0.035								10550	10560	10580	10590	105100
110	115	110 -0.054	115 +0.035				9.5				11050	11060	11080	11090	110100
115	120	115 -0.054	120 +0.035								11550	11560	11580	11590	115100
120	125	120 -0.054	125 +0.040								12050	12060	12080	12090	120100
125	130	125 -0.063	130 +0.040									12560	12580	12590	125100
130	135	130 -0.063	135 +0.040	+0.240 +0.080								13060	13080	13090	130100
135	140	135 -0.063	140 +0.040		0.303 0.080							13560	13580	13590	135100
140	145	140 -0.063	145 +0.040									14060	14080	14090	140100
150	155	150 -0.063	155 +0.040									15060	15080	15090	150100

HKB-090 青铜卷制轴承 HKB-090 Wrapped Bronze Bushing



产品介绍 Product introduction

该系列轴套以CuSn8青铜为基材卷制而成的一种具有承载高，耐磨性能好的经济型轴承。HKB-090产品工作表面布满规则的菱形油穴，HKB-092产品工作表面布满规则的油孔，起到储油的作用，在起始运动时能较容易的形成油膜从而降低起始摩擦系数。主要运用于农用机械、森林机械、建筑机械等高载低速场合。

This series of bushings are rolled with CuSn8 bronze as the base material, which is an economical bearing with high load bearing and good wear resistance. The working surface of HKB-090 is covered with regular diamond-shaped oil holes, and the working surface of HKB-092 is covered with regular oil holes, which play the role of oil storage, and can easily form an oil film during the initial movement, thereby reducing the initial friction coefficient. It is mainly used in agricultural machinery, forest machinery, construction machinery and other high-load and low-speed occasions.

应用举例 Application case

产品主要应用于起重机械、建筑机械、汽车、拖拉机行业、机床工业及采矿机械。

Products are mainly used in lifting machinery, construction machinery, automobile, tractor industry, machine tool industry and mining machinery.



林业机械
Forestry machinery



汽车
Car



拖拉机
Tractor



工程机械
Engineering machinery

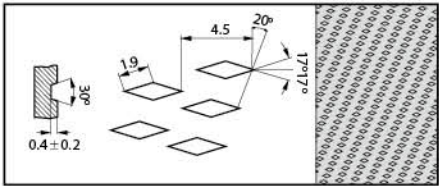
HKB-090 青铜卷制轴承
HKB-090 Wrapped Bronze Bushing



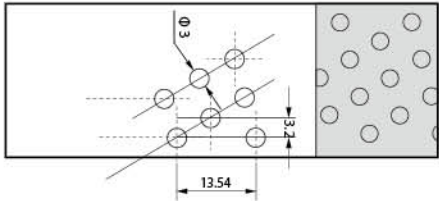
使用参数 The Use of Parameters

	HKB-090 青铜卷制轴承 Bronze-Wrapped Bushing	HKB-091 黄铜卷制轴承 Bronze-Wrapped Bushing	HKB-092 青铜卷制轴承 Bronze-Wrapped Bushing	HKB-09G 青铜固体卷制轴承 Bronze-Wrapped Bushing
参数 Parameters				
密度 Density	8.8g/cm ³	8.4g/cm ³	8.8g/cm ³	8.8g/cm ³
抗压强度 Pressure resistance strength	470N/mm ²	440N/mm ²	470N/mm ²	470N/mm ²
导热系数 Coefficient of heat conduction	58W/m.K	71W/m.K	58W/m.K	58W/m.K
线膨胀系统 Linear expansion coefficient	18.5×10 ⁻⁶ /K	19.2×10 ⁻⁶ /K	18.5×10 ⁻⁶ /K	18.5×10 ⁻⁶ /K
硬度 Hardness	90~120HB	80~110HB	90~120HB	90~120HB
延伸率 Elongation	40%	30%	40%	40%
材料名称 Alloy material	CuSn8P	CuZn31Si	CuSn8P	CuSn8P

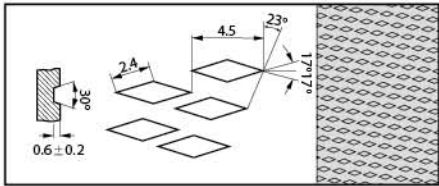
油穴设计 Types of Oil Pockets



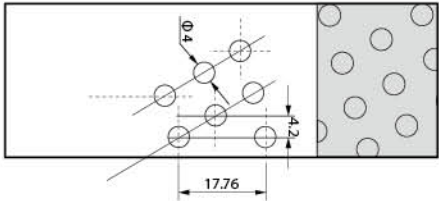
HKB-090油穴 (oil pockets)
适用内径≤φ22的轴承 (ID≤φ22)



HKB-092球形油孔形式 (oil holes)
适用内径≤φ25的轴承 (ID≤φ25)



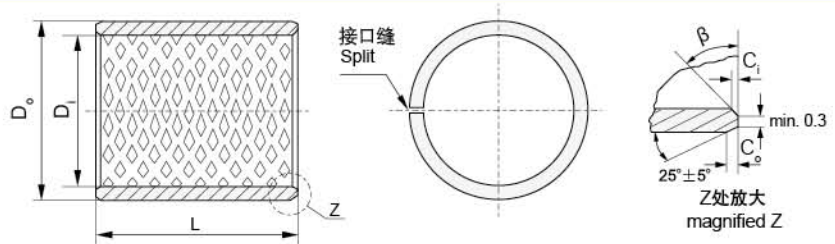
HKB-090油穴 (oil pockets)
适用内径>φ22的轴承 (ID>φ22)



HKB-092球形油孔形式 (oil holes)
适用内径>φ25的轴承 (ID>φ25)

HKB-090 青铜轴套规格及公差

HKB-090 Bronze Sleeve Bushing Specification & Tolerance



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	$35^\circ \pm 5^\circ$
1.00	0.6 ± 0.3	0.30 ± 0.2	$35^\circ \pm 5^\circ$
1.50	0.7 ± 0.3	0.50 ± 0.3	$35^\circ \pm 5^\circ$

S_3	C_o	C_i	β
2.00	1.2 ± 0.4	0.50 ± 0.3	$35^\circ \pm 5^\circ$
2.50	1.8 ± 0.6	0.60 ± 0.3	$45^\circ \pm 5^\circ$

单位 Unit: mm

内径 D_i ϕd	外径 D_o ϕD	长度 $L \begin{smallmatrix} 0 \\ -0.40 \end{smallmatrix}$												
		10	15	20	25	30	35	40	50	60	70	80	90	100
10	12	1010	1015	1020										
12	14	1210	1215	1220										
14	16	1410	1415	1420	1425									
15	17	1510	1515	1520	1525									
16	18	1610	1615	1620	1625									
18	20	1810	1815	1820	1825									
20	23	2010	2015	2020	2025									
22	25	2210	2215	2220	2225	2230								
24	27		2415	2420	2425	2430								
25	28		2515	2520	2525	2530								
28	31		2815	2820	2825	2830								
30	34		3015	3020	3025	3030	3035	3040						
32	36		3215	3220	3225	3230	3235	3240						
35	39		3515	3520	3525	3530	3535	3540						
40	44			4020	4025	4030	4035	4040	4050					
45	50			4520	4525	4530	4535	4540	4550					
50	55			5020	5025	5030	5035	5040	5050	5060				
55	60			5520	5525	5530	5535	5540	5550	5560				
60	65				6025	6030	6035	6040	6050	6060	6070			
65	70					6530	6535	6540	6550	6560	6570			
70	75					7030	7035	7040	7050	7060	7070	7080		
75	80					7530	7535	7540	7550	7560	7570	7580		
80	85					8030	8035	8040	8050	8060	8070	8080		
85	90					8530	8535	8540	8550	8560	8570	8580	8590	
90	95					9030	9035	9040	9050	9060	9070	9080	9090	
95	100							9540	9550	9560	9570	9580	9590	95100

HKB-090 青铜轴套规格及公差

HKB-090 Bronze Sleeve Bushing Specification & Tolerance

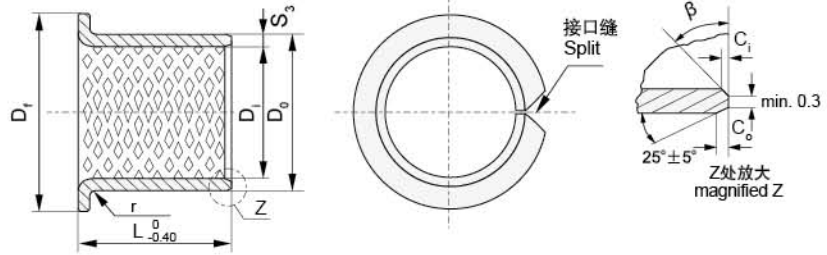


单位 Unit: mm

内径 D_i ϕd	外径 D_o ϕD	长度 $L \begin{smallmatrix} 0 \\ -0.40 \end{smallmatrix}$									
		25	30	35	40	50	60	70	80	90	100
100	105					10050	10060	10070	10080	10090	100100
105	110					10550	10560	10570	10580	10590	105100
110	115					11050	11060	11070	11080	11090	110100
115	120					11550	11560	11570	11580	11590	115100
120	125						12060	12070	12080	12090	120100
125	130						12560	12570	12580	12590	125100
130	135						13060	13070	13080	13090	130100
135	140						13560	13570	13580	13590	135100
140	145						14060	14070	14080	14090	140100
145	150						14560	14570	14580	14590	145100
150	155						15060	15070	15080	15090	150100
155	160						15560	15570	15580	15590	155100
160	165						16060	16070	16080	16090	160100
165	170						16560	16570	16580	16590	165100
170	175						17060	17070	17080	17090	170100
175	180						17560	17570	17580	17590	175100
180	185						18060	18070	18080	18090	180100
185	190						18560	18570	18580	18590	185100
190	195						19060	19070	19080	19090	190100
195	200						19560	19570	19580	19590	195100
200	205						20060	20070	20080	20090	200100
205	210						20560	20570	20580	20590	205100
215	220						21560	21570	21580	21590	215100
225	230						22560	22570	22580	22590	225100
230	235						23060	23070	23080	23090	230100
240	245						24060	24070	24080	24090	240100
250	255						25060	25070	25080	25090	250100
260	265						26060	26070	26080	26090	260100
270	275						27060	27070	27080	27090	270100
280	285						28060	28070	28080	28090	280100
290	295						29060	29070	29080	29090	290100
300	305						30060	30070	30080	30090	300100

HKB-090F 青铜翻边轴套规格及公差

HKB-090F Bronze Flange Bushing Specification & Tolerance

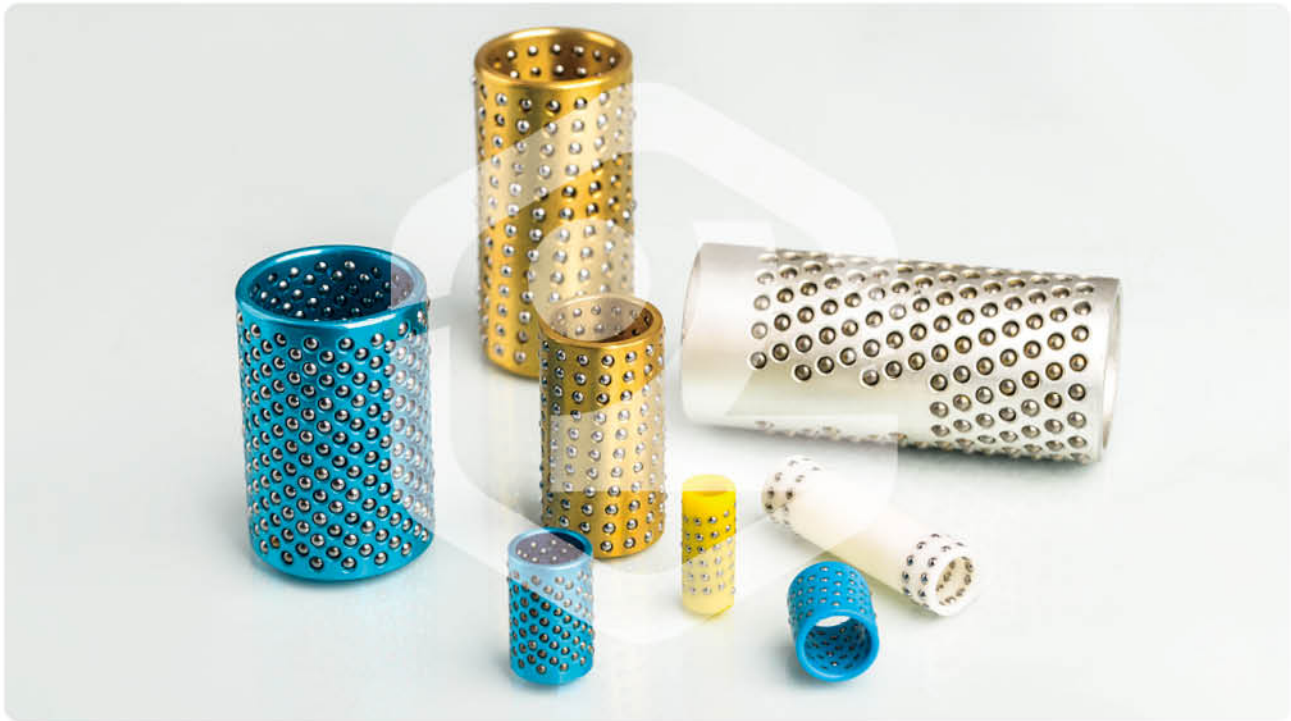


S_3	1.0	1.5	2.0	2.5
r	$1^{+0.5}$	1 ± 0.5	1.5 ± 0.5	2 ± 0.5

单位Unit: mm

内径 D_i ϕd	外径 D_o ϕD	法兰外径 D_n	长度 L $^{0}_{-0.40}$										
			15	20	25	30	35	40	50	60	70	80	90
25	28	35	25150	25200	25250								
30	34	45		30200	30250	30300							
35	39	50		35200	35250	35300	35350						
40	44	55			40250	40300	40350	40400					
45	50	60				45300	45350	45400	45500				
50	55	65				50300	50350	50400	50500				
55	60	70				55300	55350	55400	55500				
60	65	75				60300	60350	60400	60500	60600			
65	70	80				65300	65350	65400	65500	65600			
70	75	85					70350	70400	70500	70600	70700		
75	80	90					75350	75400	75500	75600	75700		
80	85	100					80350	80400	80500	80600	80700	80800	
90	95	110							90500	90600	90700	90800	90900
100	105	120							100500	100600	100700	100800	100900
110	115	130							110500	110600	110700	110800	110900
120	125	140							120500	120600	120700	120800	120900
130	135	155								130600	130700	130800	130900
140	145	165								140600	140700	140800	140900
150	155	180								150600	150700	150800	150900
160	165	190								160600	160700	160800	160900
170	175	200								170600	170700	170800	170900
180	185	215								180600	180700	180800	180900
190	195	225								190600	190700	190800	190900
200	205	235								200600	200700	200800	200900
225	230	260								225600	225700	225800	225900
250	255	290								250600	250700	250800	250900
265	270	305								265600	265700	265800	265900
285	290	325								285600	285700	285800	285900
300	305	340								300600	300700	300800	300900

HKB-FZ 直线轴承
HKB-FZ Ball Retainer Bearing



产品介绍 Product introduction

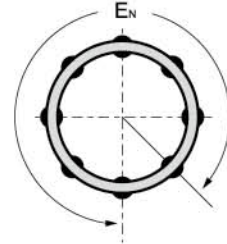
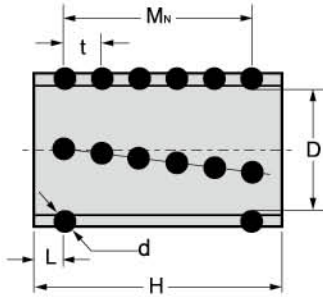
HKB-FZH（铜基）、HKB-FZL（铝基）、HKB-FZP（树脂基）钢球保持固，分别以铜合金、硬铝合金、POM树脂为基体，并在其外圆表面上，加工出排列有序、大小适当，形状特殊的孔穴，在其孔穴中镶入滚动轴承钢球。口采用最新的沟槽圆周锁球工艺，有效地解决了传统式锁球和压痕式锁球不能完全防止钢球脱落的难题。孔底加工出90°止口使钢球在孔内自由转动而不脱落。由于钢球的直径大于保持圈的壁厚，所以在使用时钢球高出保持圈内、外圆表面，直接与相配的孔与轴接触，使基体(保持圈)浮于中间，并且相配的孔与轴半径之差小于钢球直径，即钢球与之配合为过盈配合，配合精度高，轴与孔相对运动灵活。是保持圈的更新换代产品。

HKB-FZH. HKB-FZL. HKB-FZP. ball retainer are as copper, aluminium, POM base. they are machined some regular holes and embedded the steel-ball into. The new work-craft will prevent the ball getting out of as old. as the ball diameter is larger than the retainer s thickness, so it will face to face directly with 90° guide bushing, that will bring high precision match now the ball retainer series items are designed to rotate on the post, as well as maintainits vertical motion. we believe this will give you the benefit of increasing accijracy.

参数 Parameters	HKB-FZH	HKB-FZL	HKB-FZP
材质 Material	铜基 Cooper	铝基 Aluminium	树脂基 POM
最大承载压力 Max load capacity	30N/mm ²	30N/mm ²	30N/mm ²
装配过盈量 Shrink fit	0.01 mm ~0.02mm	0.01 mm ~0.02mm	0.01 mm ~0.02mm
最高滑动速度 Max sliding speed	6m/s	6m/s	6m/s
摩擦系数 Coef friction	0.01~0.08 μ	0.01~0.08 μ	0.01~0.08 μ
滚动直径偏差 Rolling diameter deviation	<0.002mm	<0.002mm	<0.002mm
应用领域 Typicai Application	HKB-FZH、HKB-FZL、FZP钢球保持架是传统导柱套的更新换代产品，能高速运动，主要用于高精度冲压模具，高精度机床等领域。 HKB-FZH、HKB-FZL、HKB-FZP ball retainer is a new generation replacement of guide pin bush with high speed movement which is mainly used in high presicion punching tool, high presicion machine tool etc.		

HKB-FZ 直线轴承

HKB-FZ Ball Retainer Bearing



单位Unit: mm

Model	D	H	d	E _N	M _N	Balls	t	L
HKB-FZ(X)-1950	19	50	3	12	8	96	5.5	5.75
HKB-FZ(X)-1960	19	60	3	12	10	120	5.5	5.25
HKB-FZ(X)-2050	20	50	3	12	8	96	5.5	5.75
HKB-FZ(X)-2060	20	60	3	12	10	120	5.5	5.25
HKB-FZ(X)-2250	22	50	3	14	8	112	5.5	5.75
HKB-FZ(X)-2260	22	60	3	14	10	140	5.5	5.25
HKB-FZ(X)-2360	23	60	3	14	10	140	5.5	5.25
HKB-FZ(X)-2475	24	75	3	16	13	208	5.45	4.8
HKB-FZ(X)-2550	25	50	3	16	8	128	5.5	5.75
HKB-FZ(X)-2560	25	60	3	16	10	160	5.5	5.25
HKB-FZ(X)-2575	25	75	3	16	13	208	5.45	4.8
HKB-FZ(X)-2775	27	75	3	16	13	208	5.45	4.8
HKB-FZ(X)-2860	28	60	4	14	8	112	6.5	7.25
HKB-FZ(X)-2875	28	75	4	14	11	154	6.5	5.0
HKB-FZ(X)-3060	30	60	4	14	8	112	6.5	7.25
HKB-FZ(X)-3075	30	75	4	14	11	154	6.5	5.0
HKB-FZ(X)-3260	32	60	4	16	8	128	6.5	7.25
HKB-FZ(X)-3275	32	75	4	16	11	176	6.5	5.0
HKB-FZ(X)-3290	32	90	4	16	13	208	6.5	6.0
HKB-FZ(X)-3685	36	85	4	16	12	192	6.5	6.75
HKB-FZ(X)-3690	36	90	4	16	13	208	6.5	6.0
HKB-FZ(X)-3870	38	70	5	16	8	128	8.0	7.0
HKB-FZ(X)-3890	38	90	5	16	11	176	7.9	5.5
HKB-FZ(X)-4090	40	90	5	16	11	176	7.9	5.5
HKB-FZ(X)-4590	45	90	5	18	11	198	7.9	5.5
HKB-FZ(X)-45110	45	110	5	18	13	234	8.0	7.0
HKB-FZ(X)-5090	50	90	5	20	11	220	7.9	5.5
HKB-FZ(X)-50110	50	110	5	20	13	260	8.0	7.0
HKB-FZ(X)-6090	60	90	5	22	11	242	7.9	5.5
HKB-FZ(X)-60110	60	110	5	22	13	286	8.0	7.0
HKB-FZ(X)-80130	80	130	5	28	15	420	8.0	9.0

HKB-FR 自润滑网纹复合轴承
HKB-FR Self-lubricating Meshed Composite Bearing



使用参数 The Use of Parameters

			HKB-FR200	HKB-FR202
技术参数 Tech. Data				
材质 Material			编织铜网+PTFE+Pb Bronze wire mesh+PTFE+Pb	冲压铜网+PTFE Perforated Bronze mesh+PTFE
最大承载 Max Load	静载 Static Load	N/mm ²	100	100
	动载 Dynamic Load	N/mm ²	80	65
相配轴 Mating Shaft	硬度 Hardness	HRC	50~60	50~60
	粗糙度 Roughness		0.32~0.63	0.32~1.0
最高线速度 Max Linear Velocity		m/s	1	1
最高PV值 Max PV Value		N/mm ² ·m/s	1.65	1.65
适用温度 Working Temperature		°C	-200~+260	-60~+260
摩擦系数 Friction Coefficient		μ	0.05~0.2	0.05~0.15
应用领域 Typical Application		该产品以青铜网为基本，单面或者双面轧制以聚四氟乙烯(PTFE)为主的混合物加工而成。产品广泛应用于纺织机械，轿车门铰链。 It's made of bronze mesh and the compound of PTFE which is processed by rolling on single or both sides. It is widely used in textile machines, door hinges and joystick of automobiles etc.		

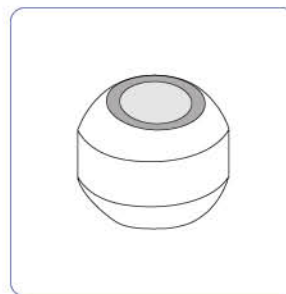
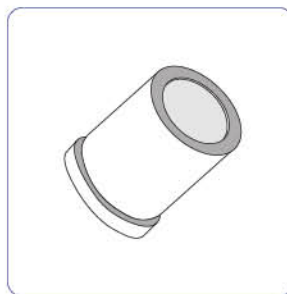
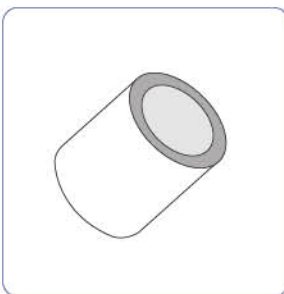
HKB-FU 含油烧结轴承 HKB-FU Oil Retaining Sintered Bearing



使用参数 The Use of Parameters

性能指标 Performance index	有关数据 Data	该产品是以铜粉或铁粉为原料，经模具压制、高温烧结、真空浸油后加工而成。产品广泛应用于家用电器、电动工具、纺织机械、化工机械、汽车工业等。 HKB-FU sintered bushings are made of bronze or iron powder, mold pressed in high pressure, sintered in high temperature and oil soaked in vacuum. The products is widely used in electric appliances, electric tools, textiles machinery, chemical machinery and automobile industry, etc.
最大承载压力 Maximum load capacity	150 N/mm ²	
适用温度范围 Temperature range	-60°C~+200°C	
最高滑动速度 Maximum sliding speed	2.5m/s	
合金材质 Alloy material	CuSn6Zn6Pb3 or customized	
允许最高PV值 Maximum PV value	2.45 N/mm ² ·m/s	

粉末冶金含油轴承的形状 Shape of Sintered Bushing



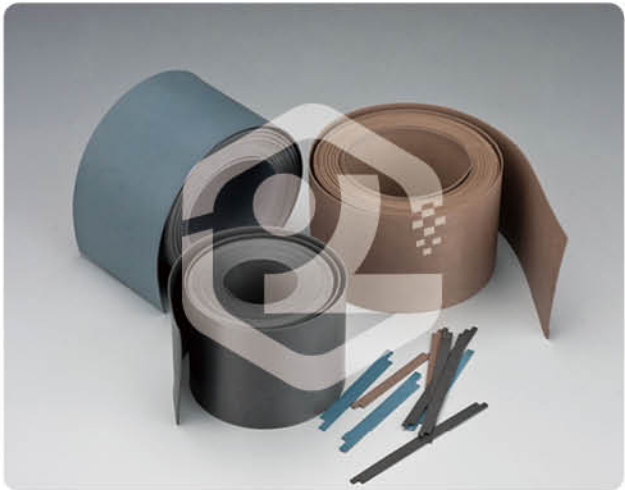
HKB-FD 含铜四氟软带
HKB-FD PTFE Soft Strip



结构特性 Structure Characteristics

HKB-FD以PTFE为主材，以铜粉及其它高分子添加剂为辅的耐磨性材料。产品广泛运用化工行业、油压、油缸、汽摩减振器、机床导轨、印刷机械、纺织机械等轻载但需要自润滑的场合。产品如经过特殊处理，可粘帖于钢质或者橡胶面上，产品在使用过程中无爬行现象。

HKB-FD consist of PTFE with bronze powder and additive material, This material structure enables the final goods have more light and easy for install. It is widely been used in chemical industries, medical industries, fluid hydraulic industries, textile machines, OA machines, Door/window hinges etc.



技术参数 Tech. Data

最大承载 Max. Load	静承载 Static Load	30N/mm2
	动承载 Dynamic Load	20N/mm2
使用温度 Temp. Limit		-40℃ ~+250℃
最高滑动速度	干摩擦 Dry Friction	0.5m/s
Tiptop Sliding Velocity	油摩擦 Oil Friction	2m/s
摩擦系数 Friction Coeff.		0.10-0.20
允许最高 PV 值 PV limit	干摩擦 Dry Friction	1.65N/mm2*m/s

HKB-FD 产品活塞环尺寸 Size of Piston Ring

20×18×2	25×23.2×8	30×28.2×8
20×18×3	25×23×8	30×28×8
25×22.2×2.5	27×25×8	30×28.2×11.4
25×22×2.5	30×28×9	32×30.2×8

HKB-FD 产品带材尺寸 Strip Measurement

100×1.5	100×1	200×0.5
8×2.5	12×2.5	25×2.5
6.1×2.5	7.9×2.5	14.8×2.5
19.5×2.5	24.5×2.5	29.5×2.5

相关设计 The Technical



P值/V值/PV值的概念

P值：轴承所承载的最大负荷（W）与在轴承上的投影面积（ $\phi d \times L$ ）相除后即为面压P。

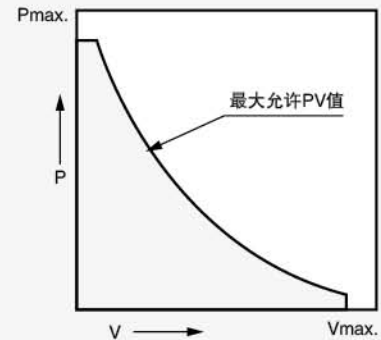
V值：速度V是对偶轴与轴承之间的相对速度。

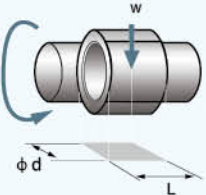
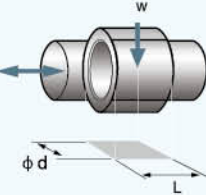
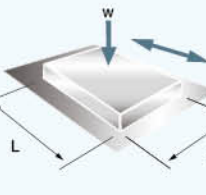
PV值：轴承面压P与速度V的乘积为PV值。

P值、V值、PV值并不是各自独立的最大允许值，而是相互关联的设计参数。设计中，请在图表表示的范围内选择参数。

最大允许PV值 < 最大允许面压：Pmax. × 最大允许速度：Vmax.

最大允许PV值



轴套	P值N/mm ² [kgf/cm ²]	V值m/s[m/min]	PV值N/mm ² ·m/s[kgf/cm ² ·m/min]
单向旋转运动 	$P = \frac{W}{\phi d \times L}, \left[\frac{10^3 W}{\phi d \times L} \right]$ 负荷 W : N[kgf] 内径 ϕd : mm 长度 L : mm 计算例 内径 20mm、长度 10mm 的轴承、1000N 的径向负荷的情况下。 $\frac{1000}{20 \times 10} = 5 \text{ (N/mm}^2\text{)}$	$v = \frac{\pi \phi d n}{10^3}, \left[\frac{\pi \phi d n}{10^3} \right]$ 转数 n : s-1[rpm] 内径 ϕd : mm 计算例 内径 20mm 的轴承、转数 120rpm 的情况下。 $\frac{\pi \times 20 \times 2}{10^3} = 0.126 \text{ (m/s)}$	$PV = \frac{\pi W n}{10^3 \times L}, \left[\frac{\pi W n}{10 \times L} \right]$ 负荷 W : N[kgf] 转数 n : s-1[rpm] 长度 L : mm 计算例 内径 20mm、长度 10mm 的轴承、转数 120rpm、1000N 的径向负荷的情况下。 $\frac{\pi \times 1000 \times 2}{10^3 \times 10} = 0.63 \text{ (N/mm}^2\text{·m/s)}$
往复运动 	$P = \frac{W}{\phi d \times L}, \left[\frac{10^3 W}{\phi d \times L} \right]$ 负荷 W : N[kgf] 内径 ϕd : mm 长度 L : mm	$v = \frac{2cS}{10^3}, \left[\frac{2cS}{10^3} \right]$ 往复周期速度 c : s-1[cpm] 行程距离 S : mm	$PV = \frac{2WcS}{10^3 \times \phi d \times L}, \left[\frac{WcS}{5 \times \phi d \times L} \right]$ 负荷 W : N[kgf] 周期速度 c : s-1[cpm] 行程距离 S : mm 内径 ϕd : mm 长度 L : mm
板块 	$P = \frac{W}{B \times L}, \left[\frac{10^3 W}{B \times L} \right]$ 负荷 W : N[kgf] 长度 L : mm 宽度 B : mm	$v = \frac{2cS}{10^3}, \left[\frac{2cS}{10^3} \right]$ 周期速度 c : s-1[cpm] 行程距离 S : mm	$PV = \frac{2WcS}{10^3 \times B \times L}, \left[\frac{WcS}{5 \times B \times L} \right]$ 负荷 W : N[kgf] 周期速度 c : s-1[cpm] 行程距离 S : mm 长度 L : mm 宽度 B : mm

技术资料
Technical Information



对偶材的选择

轴承性能和对偶轴的材质、硬度、表面粗糙度、有无表面处理等有很大影响，以下推荐对偶材料可供参考。另外，在海水、化学液体等腐蚀条件下，请施加二重或三重镀铬处理。

轴承	面压N/mm ² {kgf/cm ² }	材质	硬度	表面粗糙度Ra(Ry)
金属类	~ 24.5{250}	机械构造用碳钢、合金钢（例：S45C、SNC415、SCM435） 腐蚀环境下用耐腐蚀钢（例：SUS304、SUS403、SUS420）	HB150以上	1.6a(6.3s)以下
	24.5{250} ~ 49.0{500}	以上材质进行高频淬火、渗碳等表面处理	HB250以上	
	49.0{500} ~ 98.0{1,000}	以上材质进行渗碳、镀铬等表面处理	HRC50以上	
树脂类 复层类	~ 49.0{500}	机械构造用碳钢、合金钢（例：S45C、SNC415、SCM435） 腐蚀环境下用耐腐蚀钢（例：SUS304、SUS403、SUS420）	HB120以上	0.8a(3.2s)以下
	49.0{500} ~ 98.0{1,000}	以上材质进行高频淬火、渗碳、渗氮、镀铬等表面处理	HRC45以上	

自润滑轴承的冷装配要领

冷装配方法

(1) 必须材料

冷媒：液氮、干冰

容器：保温容器（足够大的尺寸，四周敷保温材料的容器）

(2) 作业步骤

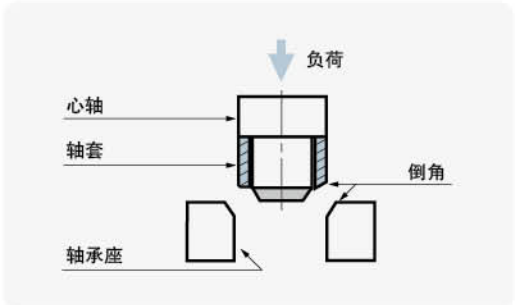
- ① 作为冷媒的液氮或干冰的标准冷冻温度为-40 ~ 70℃。
- ② 冷冻时间一般为1小时以上。冷冻时间在配合公差较小的情况下，有必要延长冷冻时间。
另外，冷冻时间较短的情况下，和液压压入方法并用也十分有效
- ③ 再次测量轴承的外轴尺寸以及套筒的内径尺寸。
在装配过程中，如果异常没有及时发现，可能会造成重大故障。
- ④ 将轴套装入套筒时，边转动边迅速装入。
在中途如果中断的话，尺寸将还原，拔出再装配将非常困难。
- ⑤ 在摩擦面涂上润滑剂。

注）冬季等温度差不是很大的情况下，将套筒加热至20 ~ 30℃

注）有关不明之处，请咨询昊凯轴承销售部。

自润滑轴承的压入方法

自润滑轴承和一般的滑动轴承一样，装配进轴承座后使用的情况较多。
压入轴承的情况下，利用心轴或使用液压方式装入轴承座内。
压入间隙较小的金属轴承的情况下，对轴承的外径及轴承座的内径进行倒角，使用心轴能轻易压入。



技术资料

Selection and calculation of bearing



◎ 轴承选型 Bearing Selection

昊凯轴承根据不同的工况条件设计了不同的轴承材料。一般来说，用户在使用和设计时应当根据轴承的使用温度、轴承的承载面压、线速度、耐磨性能要求、运动类型、安装情况、轴承成本等各方面因素综合考虑。

HKB bearing have developed kinds of bearing material According to difference work condition, The user can select the material base on bearing work environment, load, speed, wear resistance request, moving method, installation, the cost of the material etc.

◎ 面压计算 Bearing Load:

○ 直套、翻边产品 Cylindrical bushes, flange bushes

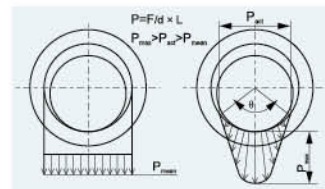
$$P = \frac{F}{d \times L} \quad \begin{array}{l} F = \text{轴承承载值 Load (N)} \\ d = \text{轴径 Shaft (mm)} \\ L = \text{轴承长度 Bearing Length (mm)} \end{array}$$

○ 止推垫片 Thrust washer

$$P = \frac{4F}{\pi(D^2 - d^2)} \quad \begin{array}{l} F = \text{垫片承载值 Load (N)} \\ D = \text{垫片外径 Washer OD (mm)} \\ d = \text{垫片内径 Washer ID (mm)} \end{array}$$

由于受配合间隙、材料强度、轴承倒角、内部油槽等原因的影响，轴承的真正承载面压(P_{act})会大于理论计算值(P_{mean})。

As the factor of clearance, bushes chamfer, oil groove etc., The actually load (P_{act}) is higher than theory of calculation (P_{mean}).



◎ 线速度计算 Velocity:

○ 旋转运动 Rotating motion

$$V = \frac{\pi \times d \times n}{1000 \times 60} \quad \begin{array}{l} d = \text{轴径 Shaft (mm)} \\ n = \text{转速/分 Rpm} \end{array}$$

○ 往复运动 Reciprocating motion

$$V = \frac{2s \times c}{60} \quad \begin{array}{l} s = \text{行程长度 Stoke distance (m)} \\ c = \text{往复频率 frequency (次数/分)} \end{array}$$

○ 摇摆运动 Oscillating motion

$$V = \frac{\pi \times d \times C \times \theta}{1000 \times 360 \times 60} \quad \begin{array}{l} d = \text{轴径 Shaft (mm)} \\ C = \text{摇摆频率 frequency (次数/分)} \\ \theta = \text{摇摆角度 Oscillating angle} \end{array}$$

◎ PV值计算 $PV = P \times V$ ($N/mm^2 \times m/s$)

PV是指轴承在一定的承载和线速度条件下的乘积之和，PV值与轴承的使用寿命成反比关系。因此建议设计时尽量使用比较低的安全的PV值，以确保轴承会有更长的使用寿命。同时在选择材料时也要注意不能超过承载、线速度、使用温度等极限值，并尽可能地小。

PV is the product of the specific bearing load P and the sliding speed V which is very important design data. We recommend design lower PV value will leads to longer service life. Also don't exceed the max. of material load, speed, temp. and lower if possible.

滑动轴承与座孔的装配 The Installation of The Sliding Bushing And The Housing

SF系列轴承在装配前宜先用煤油或柴油清洗干净，然后在机油内浸油、沥干。轴承与座孔装配时，即要保证轴承在座孔中不发生转动和轴向移动，要使轴承外表面与座孔充分接触，一般应保证接触面积大于70%以上，以利于承受载荷和传导摩擦热，SF系列轴承内表面是自润滑塑料，外表面是铜背，钢对钢的摩擦系数比钢对塑料的摩擦系数大，因此采用较轻盈配合，既保证使用时衬套不会在座孔内发生相对移动，又不会使衬套外径过大致使衬套内孔变形较大。

对于工作压力较高的场合为避免轴套走外圆，推荐用以下二方法：

1、加大轴套外径尺寸，内孔变形用较正芯棒校正。

2、安装时，座孔涂ZY801厌氧胶，增强轴套与座孔的结合强度。

对于外 $<55\text{mm}$ 的轴承可按图A所示，利用一个带有手柄的压头轴芯，小心操作，轻轻压力座孔中。

当轴套外径 $>55\text{mm}$ 时可按图B所示，利用带台肩的手柄以及一个“O”形圈和一个辅助圈小心操作，将轴套压入座孔中。

The Installation of SF Bush

SF bushes should be cleaned in kerosene or diesel oil first, immersed in engine oil and then dried up. When the bush is installed into housing, make sure the bush not rotating in the housing or moving in the axial direction and at the same time make the

outer surface surface fully contact to the base hole, generally guarantee the contact area over 70% thus to improve load capacity and transmission of friction heat. The inner surface of SF bush is made of self-lubricating plastic, the outer surface steel backing. The friction coefficient of steel to steel is bigger than that of steel to plastic. So we should choose the light-graded tight fit, preventing the axle sleeve from moving in the base when working, and also preventing the inner holes from getting deformed and too big because of the large tight fit of the outer diameter.

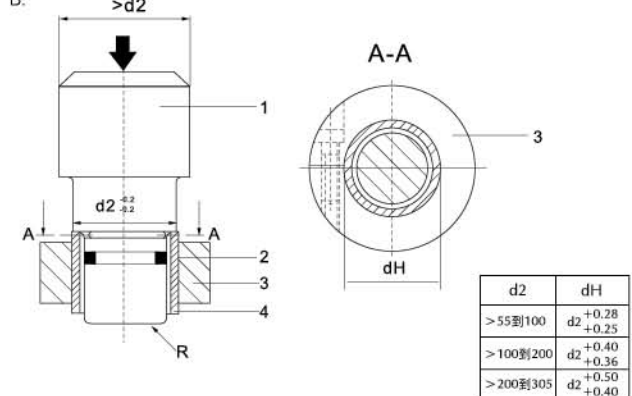
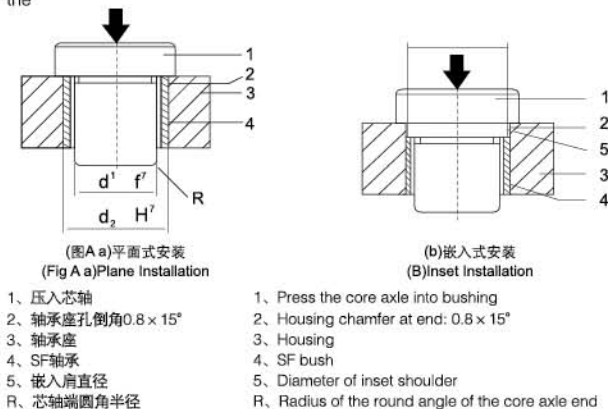
Out circle of the axle sleeve should be avoided in the high-pressure working conditions. Two methods are recommended here:

1. Increase the outer diameter of the axle sleeve, and the deformation of inner holes can be calibrated with calibrating core stick.

2. When installing, apply ZY 801 Oxygen-hatred glue in the housing to strengthen the combination strength between the axle sleeve and base hole.

For bush (outer diameter $<55\text{mm}$), press the bush into the housing gently and carefully using an core axle with a handle. Fig A.

For bush (outer diameter $>55\text{mm}$), press the bush into the housing gently and carefully using a handle with a shoulder, an "O" ring and an assisting circle. Fig B.





制造商：

嘉兴昊凯精密机械有限公司

地址：浙江省嘉兴市嘉善县罗星街道
世纪大道3088号

电话：18457359696

邮箱：596468350@qq.com

Manufacture:

JIAXING HKB PRECISION MACHINERY CO., LTD

Add: No. 3088 Century Avenue, Luoxing Street, Jiashan
County, Jiaxing City, Zhejiang Province, China.

Tel: 18457359696

E-mail: 596468350@qq.com
