

The background of the advertisement features a light green background with a pattern of small, perforated cylindrical and ring-shaped components. A central green band with a repeating pattern of small yellow circles contains the main text.

EPEN BEARING

欧本轴承





嘉善欧本轴承有限公司是一家专业生产滑动轴承，金属塑料复合轴承的企业，秉承做专于精、精益求精、为客户不断创造价值的理念，致力于滑动轴承、复合新材料的研究、开发、推广和应用。公司现有主要产品为金属塑料复合系列滑动轴承、双金属系列轴承、单金属系列滑动轴承等，被广泛应用于汽车工业、冶金、工程机械、建筑机械、塑料机械、机床工业、水利水电等30多个领域。

公司以不断满足顾客对产品多样化、高品质的需求为导向，运用现代技术和设备对产品进行持续改进、提升，从而为客户提供更多产品、更高品质的滑动轴承。

Jiashan Epen Bearing Co.Ltd. is a professional manufacturer of plain bearings and wear plates, and has grown rapidly to a point where now all types of plain bearings can be supplied. Standard catalogue sizes, special sizes and designs can be produced at competitive prices and to a high quality standard. Jiashan Epen Bearing Co.Ltd. serves both the domestic and international markets. The Jiashan Epen Bearing Company intend to stay at the forefront of this market.

The self-lubricating bearings supplied by Jiashan Epen Bearing Co.Ltd. are maintenance free and are ideally suitable to oscillatory motion, linear motion, difficult working environments, high temperature applications, etc.



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1.4 EMT 产品介绍 EMT Brief Description

EMT 双金属系列产品是用碳钢为基材，表面烧结青铜粉或轧制铝锡合金。工作表面可以设计排布油槽或油穴以适应有油条件下润滑工作。EMT双金属可以代替一般滑动部件的铜套，具有薄壁，重量轻的特点,有较好的耐疲劳强度和承载能力。

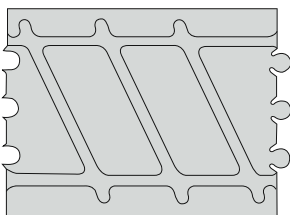
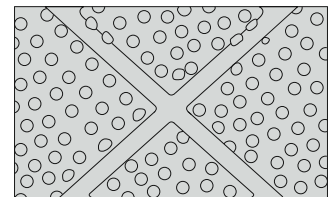
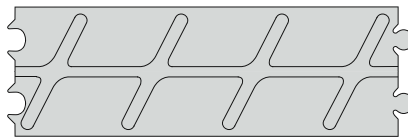
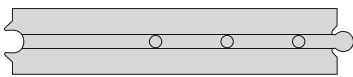
EMT bi-metallic bushing is formed from steel strips with alloy lining material. The alloy lined surface can be machined oil grooves, holes, formed indentations etc according to different application. It is suitable for high load, lower speed oscillation & rotation movement.



1.4² EMT 双金属轴承技术参数 EMT Bimetallic Material Characteristics

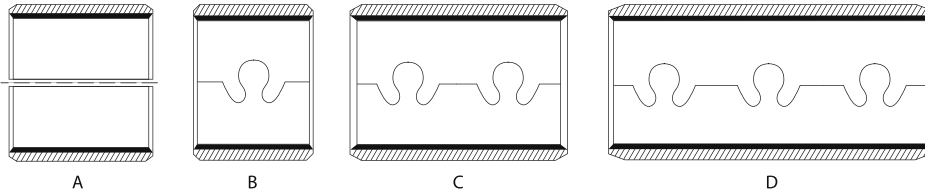
技术参数 Data	型号 Part No	EMT-1	EMT-2	EMT-3	EMT-4
EMT 产品结构 EMT Structure					
		钢 Steel + CuPb ₁₀ Sn ₁₀	钢 Steel + CuPb ₂₄ Sn ₄	钢 Steel + CuPb ₃₀	钢 Steel + AlSn ₂₀ Cu
相应代号	Corresponding Code	SAE-792(SAE797). JIS-LBC3.	SAE-799. JIS-LBC6.	SAE-48. JIS-KJ3	SAE-783. JIS-AJL.
		Clevite F100. GGB-SY. Daido L10. Federal Mogul HF-2F. Glyco 66.	Daido L23. Glyco 68		Federal Mogul TR-20. Glyco 74.
最大承载压力P	Max Load Capacity P	150N/mm ²	130N/mm ²	120N/mm ²	100N/mm ²
脂润滑	Greases Lubrication				
最大线速度V	Max Speed	2.5m/s	2.5m/s		
最高PV值	Maximum PV Value	2.8N/mm ² · m/s	2.8N/mm ² · m/s	2.5N/mm ² · m/s	
摩擦系数u	Coefficient of friction	0.05~0.15	0.06~0.16		
流体(油)润滑	(Oil)Lubrication				
最大线速度V	Max Speed	10m/s	10m/s	15m/s	25m/s
最高PV值	Maximum PV Value	10N/mm ² · m/s	10N/mm ² · m/s	8N/mm ² · m/s	6N/mm ² · m/s
摩擦系数u	Coefficient of friction	0.05~0.12	0.05~0.15	0.06~0.17	0.06~0.17
最高温度	Max Working Temperature				
脂润滑	Greases Lubrication	150°C	150°C	170°C	150°C
流体润滑	Lubrication	250°C	250°C	250°C	250°C
合金硬度	Alloy Hardness	60~100HB	45~70HB	30~45HB	30~40HB

1.4³ EMT 产品润滑设计 EMT Lubrication Design





1.4⁴ EMT 产品搭口形式 EMT Split Gap Design



1.4⁵ EMT 产品油孔设计 EMT Oil Hole Design

在产品设计中，如使用以下推荐油孔，能使EMT产品在使用中得到充分的油润滑。如无特殊要求，此油孔设计亦可适用。

Oil Hole is necessary to design if EMT have lubricated sufficiently; the following oil hole design is recommended, which is also suitable for EMT series without special requirements.

轴套外径 (D) Bushing O.D. (D)	$\Phi 14 > D \leq 22$	$\Phi 22 > D \leq 40$	$\Phi 40 > D \leq 50$	$\Phi 50 > D \leq 100$	$\Phi 100 > D \leq 180$
油孔直径 (mm) Oil Hole Diameter (mm)	3	4	5	6	7

油孔的位置应避开接缝和承载区域，并应有利于进油。

Oil hole location should keep away from the split gap & loading area, and in favor of oil-taking.

1.4⁶ EMT 产品运用 EMT Application

EMT-1	<p>有很高的耐疲劳强度，高承载能力，高的抗冲击能力及耐磨损，适用于中载，中到高速的场合如齿轮箱，摇臂轴套，主梢，传动装置，普通轴套等</p> <p>Advantageous in high load carrying capacity, anti-impact, lower wear. Suitable for Mid-load capacity & Mid-higher Sliding velocities. Bushings for Gearbox, Rocker arm, King Pin, transmission etc.</p>
EMT-2	<p>有较高的抗疲劳强度、承载能力及抗冲击力、有较好的表面滑动性能，产品适用于中速、中载。表面镀软合金时可用于高速内燃机主轴套和连杆轴套。</p> <p>Higher fatigue strength & load carrying capacity, good running characteristics at higher sliding velocities. Suitable for Mid-load capacity & Mid-Sliding velocities. Bushings for lubricating oil pumps. After surface specific treatment, Bushings for Main bushes of high speed internal-combustion engine, Connecting Rod etc.</p>
EMT-3	<p>有很好的滑动性能，良好的抗咬性。是一种特殊的材料，表面不宜加工油槽和油穴，一般需镀软合金。适用于高速中低载荷的内燃机主轴套和连杆轴套轴套，也可用于液压泵，自动齿轮箱等。</p> <p>Very Good sliding Characteristics, good anti-seizure property, special material, Punched oil grooves & oil pockets are not feasible. Bushings suitable for hydraulic Pump, automatic gearbox. After surface specific treatment, bushings for main bushes of high speed, medium-low load internal-combustion engine, Connecting Rod etc.</p>
EMT-4	<p>有中等疲劳强度和承载能力，较好的滑动性能，产品适用于高速低载内燃机轴瓦、空压机、制冷机、准双曲面齿轮箱、液压泵、齿轮箱等。</p> <p>Mid fatigue strength & load carrying capacity, very good fatigue strength & load carrying capacity, very good sliding characteristics. Bushings for half-bearing of high speed, lower load internal-combustion engine, aircompressor, refrigerator, hypoid gearbox, hydraulic pump, gearbox etc.</p>



2 轴承的选型、接触面形式、装配 Bushing Design, Mating Surface, Install

2.1 轴承的选型 Bushing Design

与轴承寿命有关的六个因素:

(1) 载荷 P [N/mm²] Load

载荷越大，轴承使用寿命越短；载荷波动越大，对轴承寿命的影响也越大，轴承寿命越短；无论在任何情况下，最大载荷不可超过理论最大允许负载值。载荷大小等于实际工作载荷除以轴承的投影面积，公式为 $P=F/(D*B)$ 。

(2) 速度 V [m/s]与PV 值

Velocity V & PV Value

轴承的工作寿命取决于PV值的大小，即实际负载 P [N/mm²] 与滑动速度 V [m/s]乘积，PV 值越小，轴承寿命越长。

(3) 温度 T [°C]

Tempature

轴承的寿命也取决于轴承使用时的温度，因此在设计选型时应尽量考虑相关部件的散热特性。

(4) 对磨部件的表面粗糙度

Ra [μm] Roughness of Mating Surface

与轴承对磨的部件接触面粗糙度应在 Ra0.2~Ra0.8之间，轴承在装配和使用的过程中不可有锐利的介质损坏轴承的工作表面。

(5) 对磨部件表面材料，对磨部件表面粗糙度是影响轴套使用寿命的一个因素，一般情况下某表面要求达到 $\leq 0.4 \mu m ka$ 。

(6) 其他因素如轴承座的设计、润滑条件等

Factors of bushing service life:

(1) Operation load is an important factor for

bushing service life, and steady load is beneficial for it. Generally, the specific load determined by the type of loading, and should not exceed theorial value. Specifical load obtained from operation load divided by the projected area of bushing.

(2) Bushing service life determined by PV Value,

$PV = P \times V$.

PV value is smaller, service life of bushing is longer.

(3) Environment tempture and Thermal

Generated from the different movements like Oscillating, rotary & reciprocating will influence the bushing service life. The resions has higher thermal expansion rate with poor thermal conductivity. It is necessary to control the bushing size and clearance.

(4) The roughness of mating surface should be

Ra 0.2-Ra 0.8. During the process of installing, the sharp or burrs etc forbidden to damage the mating surface.

(5) Material of Mating Surface will effected service

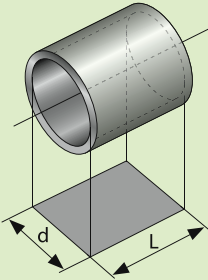
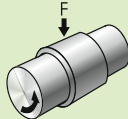
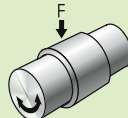
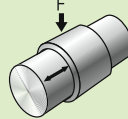
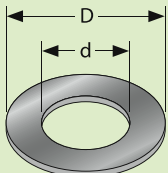
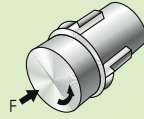
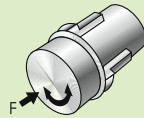
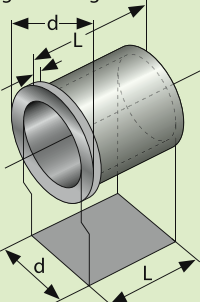
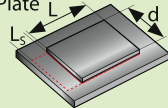
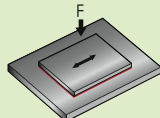
life of bushing the mating surface finish should $\leq 0.4 \mu m ka$.

(6) Other Factors like Design of housing,

Lubrication condition etc



2.2 PV值
PV Value

轴套 BUSHING		压力 PRESSURE, P	速度 VELOCITY, V	PV值 PV Value
		PN/mm ² {kgf/cm ² }	m/s {m/min}	N/mm ² *m/s {kgf/cm ² *m/min}
直套 Sleeve Bushing 	1.径向单向旋转 Rotating motion in single direction of radial journal 	$\frac{F}{dL}$ $\left\{ \frac{10^2 F}{dL} \right\}$	$\frac{\pi dn}{10^3}$ $\left\{ \frac{\pi dn}{10^3} \right\}$	$\frac{\pi Fn}{10^3 L}$ $\left\{ \frac{\pi Fn}{10 L} \right\}$
	2.摇摆运动 Oscillating motion 	$\frac{F}{dL}$ $\left\{ \frac{10^2 F}{dL} \right\}$	$\frac{dc \theta}{10^3}$ $\left\{ \frac{\pi dc \theta}{180 \times 10^3} \right\}$	$\frac{Fc \theta}{10^3 L}$ $\left\{ \frac{\pi Fc \theta}{180 \times 10^2 L} \right\}$
	3.往复运动 Reciprocating motion 	$\frac{F}{dL}$ $\left\{ \frac{10^2 F}{dL} \right\}$	$\frac{2cS}{10^3}$ $\left\{ \frac{2cS}{10^3} \right\}$	$\frac{2FcS}{10^3 dL}$ $\left\{ \frac{FcS}{5dL} \right\}$
止推垫片 Thrust Washer 	1.旋转 Rotating motion 	$\frac{4F}{\pi(D^2-d^2)}$ $\left\{ \frac{400F}{\pi(D^2-d^2)} \right\}$	$\frac{\pi Dn}{10^3}$ $\left\{ \frac{\pi Dn}{10^3} \right\}$	$\frac{4FDn}{10^3(D^2-d^2)}$ $\left\{ \frac{4FDn}{10(D^2-d^2)} \right\}$
	2.摇摆运动 Oscillating motion 	$\frac{4F}{\pi(D^2-d^2)}$ $\left\{ \frac{400F}{\pi(D^2-d^2)} \right\}$	$\frac{DC \theta}{10^3}$ $\left\{ \frac{\pi Dc \theta}{180 \times 10^3} \right\}$	$\frac{4FDC \theta}{10^3 \pi(D^2-d^2)}$ $\left\{ \frac{4FDc \theta}{180 \times 10(D^2-d^2)} \right\}$
翻边轴套 Flange Bushing 	1.直套 Sleeve Bushing 翻边直套承载计算用上述直套承载计算公式，但L=l+t。 Use above formulas for sleeve bushing (L=l+t)		翻边直套轴速度计算用上述直套速度计算公式。 Use above formulas for sleeve bushing	翻边直套轴PV值计算用上述直套PV值计算公式。 Use above formulas for sleeve bushing
	2.法兰面 Flange surface 翻边法兰面承载计算按上述垫片承载计算公式。 Use above formulas for thrust washer 翻边法兰面速度计算按上述垫片计算公式。 Use above formulas for thrust washer 翻边法兰面PV值计算按上述垫片PV值计算公式。 Use above formulas for thrust washer			
滑块 Slide Plate 	1.往复运动 Reciprocating motion 	$\frac{F}{BL}$ $\left\{ \frac{10^2 F}{WL} \right\}$	$\frac{2cS}{10^3}$ $\left\{ \frac{2cS}{10^3} \right\}$	$\frac{2FcS}{10^3 BL}$ $\left\{ \frac{FcS}{5WL} \right\}$

- F : 承载 load N {kgf}
- N : 转速 Rotations S-1{rpm}
- c : 往复圆周速度或摇摆 Cylindrical velocity of reciprocating
or oscillating motion S-1{cpm}
- S : 往复运动距离 Stroke distance m {mm}
- θ : 摇摆角度 Oscillating angle rad { }
- d : 轴套内径 Bushing ID mm {mm}
- D : 轴套外径 Bushing OD mm {mm}
- L : 轴套长度 Bushing length mm {mm}
- W : 板材或滑动宽度 Stirp/Slide way width mm {mm}



3 轴套装配 Bushing Installation

3.1 轴套接触面设计 Bushing Arrangement Design

错误的装配形式会破坏或缩短轴承的使用寿命，下面列出了相关的装配形式，请在设计时参考：

Wrong assemble will broken or reduced useful life the following assemble should be referred when design:

	错误 Error	正确 Correct
翻边套与轴肩接触形式 Flang Bushing & Shaft		
垫片与轴肩接触形式 Thrust Washer & Shaft		
轴套与轴的油槽形式 Bushing & Oil grooves		
润滑油槽及油孔的形式 Oil grooves & Oil hole		
轴肩与轴套的接触面形式 Bushing & Shaft		
轴槽与轴套的接触面形式 Shaft groove & Bushing		
轴与轴套的同心度装配要求 Concentricity between Shaft & Bushing		



3.2 轴套座孔设计 Housing Design

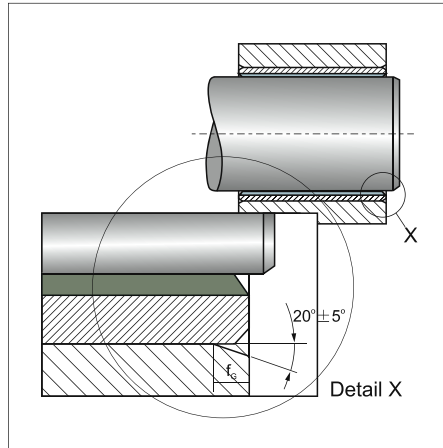
直套装配设计

为了更易于装配，轴承的座孔均应有一个倒角，如表。

Bushing

It's necessary there should have a chamfer on housing bore, it make bushing easier to be pressed into housing.

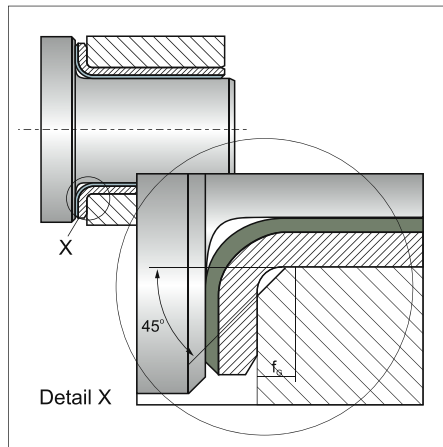
座孔 Housing bore diameter d_G	倒角 Chamfer with f_G
$d_G \leq 30$	0.8 ± 0.3
$30 < d_G \leq 80$	1.2 ± 0.4
$80 < d_G \leq 180$	1.8 ± 0.8
$180 < d_G$	2.5 ± 1.0



翻边套装配设计

Flange Bushing

座孔 Housing bore diameter d_G	倒角 Chamfer with f_G
$d_G \leq 10$	1.2 ± 0.2
$180 < d_G$	1.7 ± 0.2

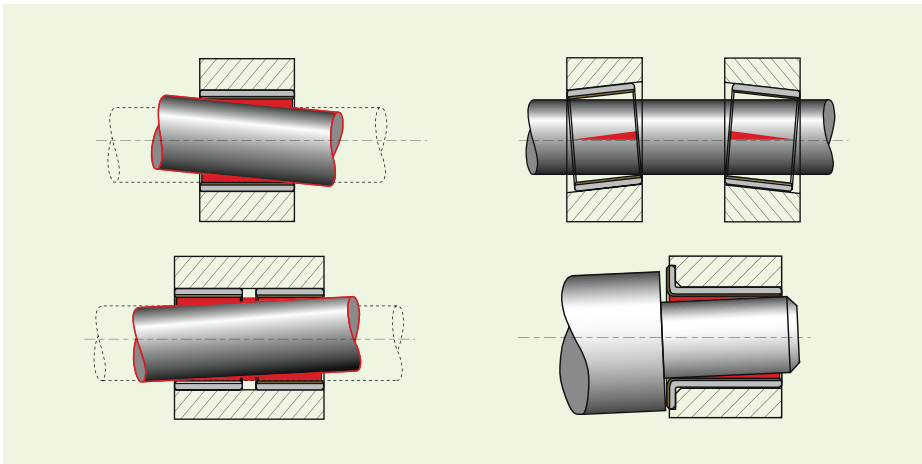


同轴度

Concentricity

精确的同轴度对所有的轴承装配都是一个重要的考虑因素。轴承在一个轴套（或两个）长度内的不同轴度或在止推垫圈直径值内的不同轴度不应该超过0.020mm，如图所示

Concentricity is an important factor for bushing installation.

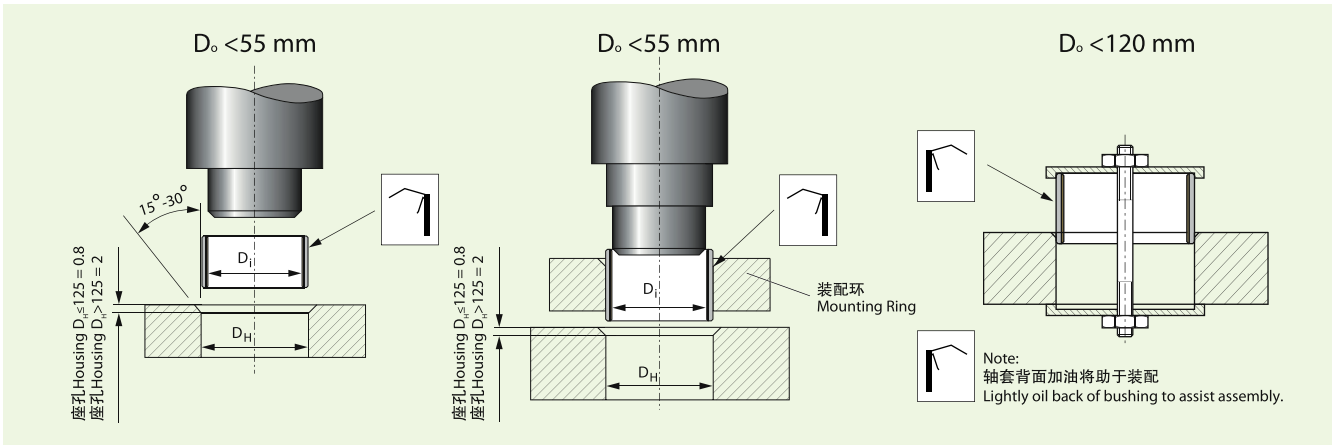




3.3 轴套压装 Bushing Installation

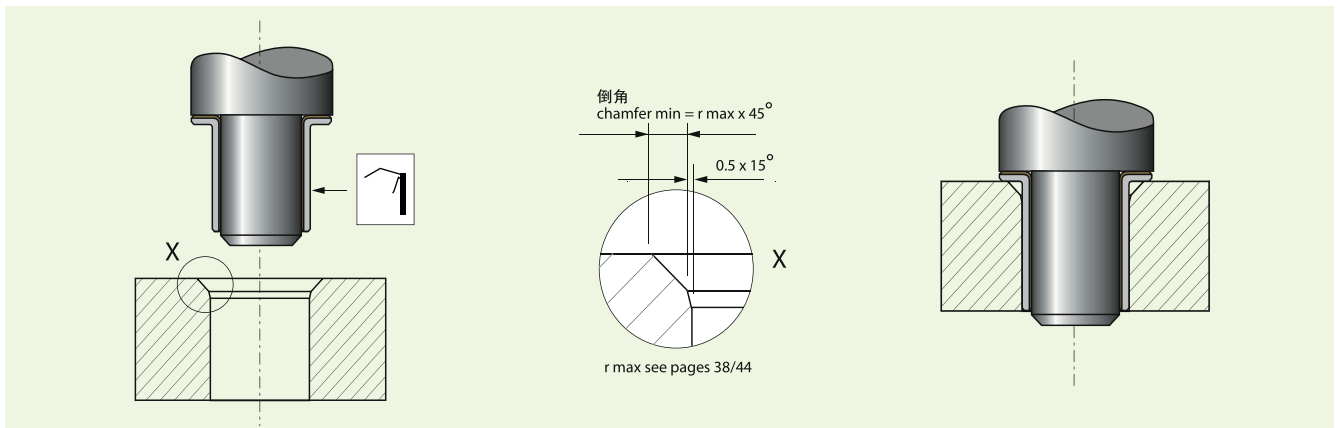
直套压装

Fitting of Cylindrical Bushing



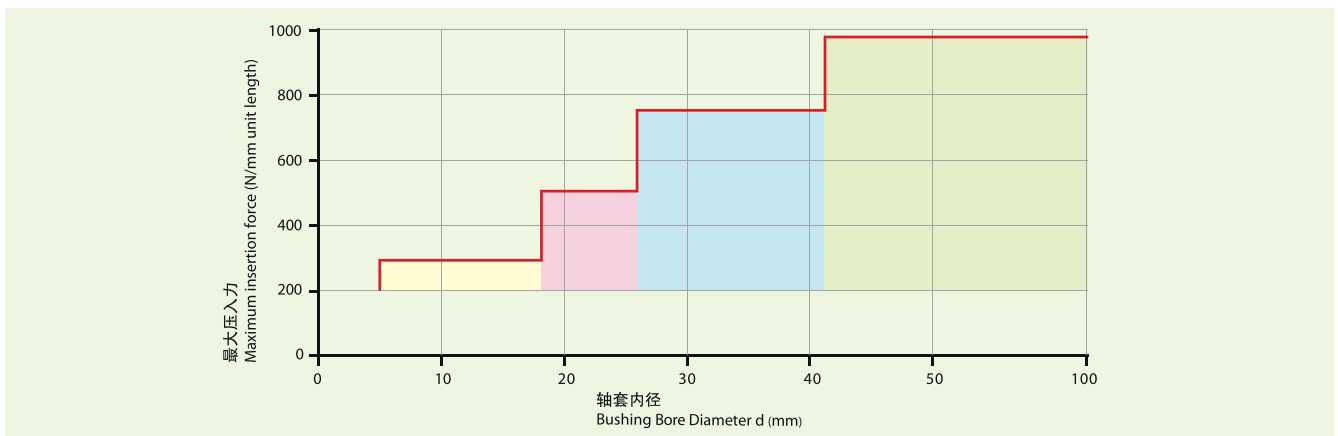
翻边轴套压装

Fitting of Flanged Bushing



压入力

Insertion Force





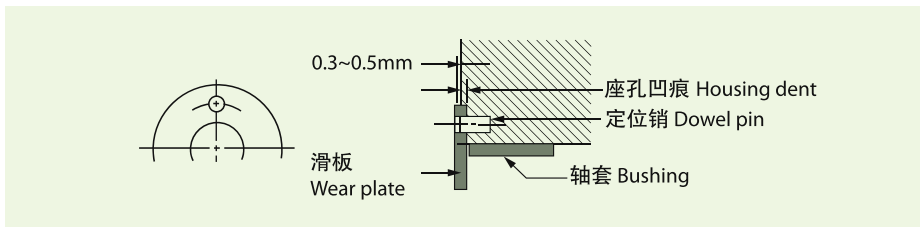
3.4 止推垫片和滑块装配 Thrust washers & Plate Installation

装配止推垫片和滑块时座孔肩有凹穴，定位销则应用于防止产品旋转。

Housing should have hollow dents for installing thrust washer and sliding plates. Dowel pins used for prevent turning.

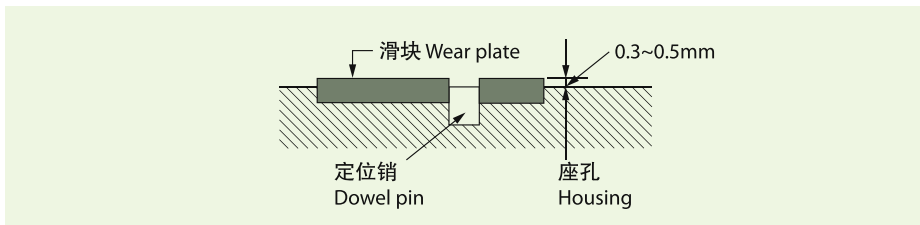
定位销应用（止推垫片）

Dowel Pin Application (Thrust Washer)



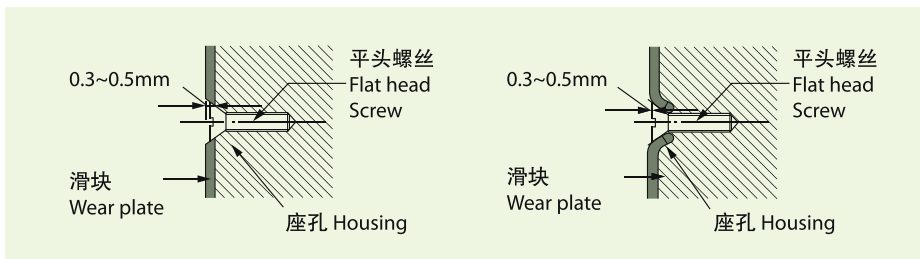
滑块镶嵌装配（滑板）

Inlaid Installation (Plate)



平头螺丝应用

Flat Head Screw Application



1 安装后，垫圈的内径不能碰到旋转轴。

After install, ID of washer can not contact shaft.

2 垫圈的钢背与轴承座相接触。

Backing of washer contact housing.

3 定位销应比止推垫圈表面下凹0.25 ~ 0.50mm。

Dowel pin should 0.25 ~ 0.50mm lower than surface of thrust washer

4 平头螺丝应比止推垫圈表面下沉0.25 ~ 0.50mm。

Flat head screw should 0.25 ~ 0.50mm lower than surface of thrust washer.



4 产品应用 Application

4.1 EU 产品应用 EU Application

由于材料的特性和性能的结合，EU产品比一般的自润轴承得到了更广泛的应用和推广。薄壁结构，体积小，重量轻，使EU轴套方便使用。基于耐磨层PTFE混合物的材料特性，EU产品适用于难维护的无法加油或难加油，无油润滑和少油润滑的场合。在使用过程中，PTFE混合物形成转移膜保护对磨轴从而避免咬轴现象。PTFE混合物具有出色的耐磨性能和低摩擦系数，还有适量的弹塑性，能将应力分布在较宽的接触面上，从而提高EU产品的承载能力(见)，所以EU产品适用于旋转，摇摆，轴向滑动等场合。

Base on the combinations of properties & performance capabilities; Eu has greater application range than other self-lubricating bearings. Thin-wall compact, lightweight, Eu bearings are economic & convenient to use. EU's PTFE-based bushing surface permits smooth, low coefficient of friction, low wear rate operation with no lubricant, no maintenance & dry running. During operation, the transfer film created will protect the mating shaft surface. EU bearings has great capacity of load & wild range of operation temperatures from -190 to 280, can be suitable for rotary, oscillating and axial sliding motion.

具体的应用。

Detailed application.

下列是有关EU轴承的部分具体应用

The following list covers some of the many types of EU bearing applications.

汽车工业 Automotive

在这个行业的典型的应用包括:

油门、制动、离合器踏板、反光镜调节机构、雨刮器、玻璃窗提升机构、天窗机构、操纵杆、车门铰链车门锁、安全带张紧机构、座椅调节机构、减震器、引擎减震、化油器、行李箱、引擎盖铰链、横直拉杆及球头、节流阀、驾驶杆、转向装置、弹簧钢板等。

Typical applicaiton in this area include:

accelerator linkages, brake, clutch foot pedal, reflector control, windscreen wipers, windscreen lift system, roof window system, gear level, door hinges, door lock, seat belt system, seating system, shock absorbers, engin absorbers, carburetor, trunk & bonnet hinges, suspension ball joint, throttle valves, steering columns, steering rods, king-pin assemblies etc.

农业机械和食品机械

Agricultural Machinery/Equipments

拖拉机、联合收割机、(干草、稻草等的)打包机; 压捆机、肉类加工设备、土豆收获机、喷雾机、谷物干燥机、栽(种植)设备、酿造设备等。

Tractors, combine harvesters, balers, meat processing equipment, potato harvesters, crop sprayers, grain dryers, planting apparatus, brewing equipment, etc.





4.1 EU 产品应用 EU Application

工程机械、运输机械

Construction Equipments

挖掘机、液压升降机、混凝土搅拌机、叉式提升搬运车、液压缸、传动带张紧装置、起重机、砂浆车、托盘叉式起重车、气力升降机、推土机、自动扶梯、自动行人道、重型挂车、液体灌输设备、侧向装卸机等。

Excavator hydraulic lifts, concrete mixers, fork lift trucks, hydraulic cylinders, tensioning pulleys, crane, mortar vehicles, pallet fork lift trucks, pneumatic lifts, graders, escalators, moving walkways, heavy-duty trailers, Liquid filling equipment, side loader roller assemblies, power take-off units etc.

家用电器、商业电器、医院设备

Home Appliances, Hospital Equipments

空调、吸尘器、洗碗机、缝纫机、洗衣机、冰箱、复印机、打印机、扫描仪、邮件处理系统、信件分类装置、牙科设备、X射线设备、手术台等。

Air conditioners, cleaners, dish-washing machine, sewing machines, clothes washing machines, refrigerator, copy machines, automatic print machines, scanner, mail processing machinery,

mail sorters, dental equipment, x-ray equipment, operating table etc.

液压行业

Hydraulics

齿轮泵、水泵、活塞泵、球阀、蝶阀、混合阀、控制阀、往复式空压机、液压制动器、离心式压缩机、液压油缸等。

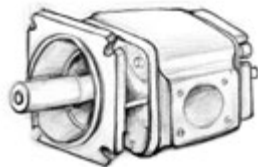
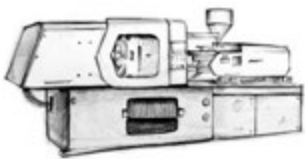
Gear pump, water pump, piston pump, ball valves, butterfly valves, mixing valves, pilot valve, reciprocating air compressors, hydraulic actuators, centrifugal compressors, hydraulic cylinder etc.

其它应用

Other Applications

自行车、摩托车、工具、蒸纱机、往复锯、割绒机、纺织机、编织机、纽扣机、包装系统、钉装机械设备、玻璃制造设备等。

Bike, motobicycle, hand tools, yarn & wool machinery, reciprocating saws, cutting machines, spinning machines, knitting machines, button machines, packaging system, bookbinding equipment, glass manufacturing equipments etc.





4.2 EX 产品应用 EX Application

EX轴套通常被推荐用于间断运行和边界润滑的环境中，特别是轴套内孔的油穴设计，很好的适用于不能连续不断或重复加油的场合，但在无润滑条件下，EX轴套的工作长短取决于承载，表面速度，具体的环境温度等的相互作用。同时，轴套内表面的塑料层可以在加工成型前留有余量，在装入座孔后可加工到更好的装配尺寸。

EX bushings have been recommended for application involving intermittent operation or boundary lubrication. Base on the unique lubrication-retaining pockets on surface, EX bushings are well suitable for application, where lubricant can not be supplied continuously or repeated. Under the no lubrication, the EX operating life depends on interaction of the specific load, surface velocity and temperature etc. EX bushings can be supplied as machining allowance on POM, it can be machined to Better assembly dimensions after installed into housing.

具体的应用。

Detailed application.

下列是有关EX轴承的部分具体应用

The following list covers some of the many types of EX bushing applications.

汽车工业

Automotive

悬挂系统，悬挂接头，大王销主件，汽车驱动联合铰链，转向及连杆机构，转向及关节接头，后部底盘铰链等。

Suspension system, suspension joints, king-pin assemblies, automobile driving joint hinges, steering and other linkages, steering and articulation joints, rear chassis hinges etc.

农业机械

Agricultural Machinery/Equipments

齿轮箱、离合器、收割机主销轴承、前桥支点轴承、转向托辊轴承箱、拖拉机的配件中的起重齿轮、播种设备等。

Gearbox, clutch, kingpin bearings for harvesters, front axle pivot bearings, steering idler box bearings, seeding equipment, etc.

机床制造业

Machine Tool Building Industry

磨床、铣床、钻机主轴、精密磨床的偏心驱动单元等。

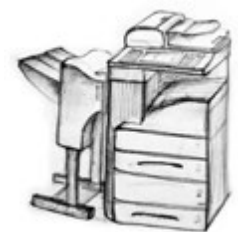
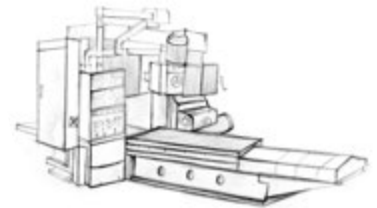
Grinding machines, milling machines, spindles in drill; Eccentric drive unit in precision grinding machines etc

其它应用

Other Applications

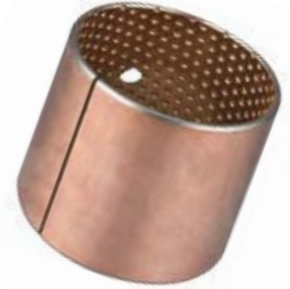
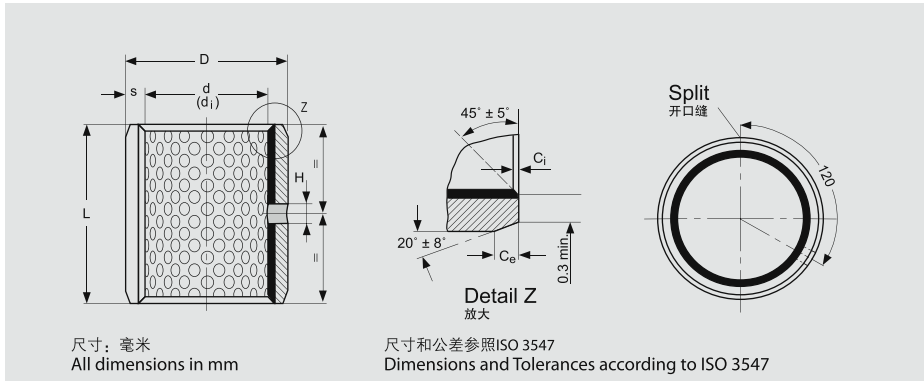
油齿轮泵、旋转器支持轴承、液压泵变量斜盘耳轴轴承、液压缸和气动缸活塞杆导承、叉车变速箱、起重机变速箱和传输托链链轮、车输送机、蜗杆传动齿轮等。

Oil gear pumps, support bearings in rotary actuators; variable swash plate trunnion bearings in hydraulic pumps, piston rod guide in hydraulic and pneumatic cylinders; Transfer gearbox for forklift trucks, gearbox and in idler chain sprockets for crane transmissions, car conveyors, worm drive gear, etc.





5.13 EMT 直套规格及公差 EMT Sleeve Bushing Specification & Tolerance



内外倒角尺寸表
Inside & Outside Chamfers

壁厚 Wall thickness S	内倒角 Inside Chamfer C _i	外倒角 Outside Chamfer C _e
1.00	0.30 ± 0.20	0.60 ± 0.40
1.50	0.40 ± 0.30	0.60 ± 0.40
2.00	0.40 ± 0.30	1.20 ± 0.40
2.50	0.60 ± 0.30	1.80 ± 0.60

直套型号标注方式
Bushing Symbol

直套型号标注方式 Bushes Symbol	EMT - □	× ×	× ×
直套型号 Bushing Type			
直套内径 Bushing I. D.			
直套高度 Bushing Length			

内径 Internal Diameter			外径 External Diameter			高度 Length	壁厚 Wall Thickness	油孔直径 Oil Hole-Φ H	型号 Part No						
内径 d	装配轴径 Shaft-Φ d _s	装配后内径 Φ d ₃	外径 D	装配座孔 Housing-Φ D _H	理论外径公差 O.D. Φ D _t	ID<80 L ± 0.25 ID>80 L ± 0.50	S								
15	15.000 14.973	15.148 15.010	17	17.018 17.000	+0.065 +0.030	10	0.995 0.935	4	EMT 1510						
						15			EMT 1515						
						20			EMT 1520						
16	16.000 15.973	16.148 16.010	18	18.018 18.000	+0.065 +0.030	10			0.995 0.935	4	EMT 1610				
						15					EMT 1615				
						20					EMT 1620				
18	18.000 17.973	18.151 18.010	20	20.021 20.000	+0.065 +0.030	15					0.995 0.935	4	EMT 1815		
						20							EMT 1820		
						25							EMT 1825		
20	20.000 19.967	20.181 20.020	23	23.021 23.000	+0.075 +0.035	10							1.490 1.430	6	EMT 2010
						15									EMT 2015
						20									EMT 2020
						25	EMT 2025								
22	22.000 21.967	22.181 22.020	25	25.021 25.000	+0.075 +0.035	30	1.490 1.430	6							EMT 2030
						10									EMT 2210
						15			EMT 2215						
						20			EMT 2220						
						25									EMT 2225



内径 Internal Diameter			外径 External Diameter			高度 Length	壁厚 Wall Thickness	油孔直径 Oil Hole-Φ H	型号 Part No		
内径 d	装配轴径 Shaft-Φd _s	装配后内径 Φd _a	外径 D	装配座孔 Housing-ΦD _H	理论外径公差 O.D. ΦD _L	ID<80 L ± 0.25 ID>80 L ± 0.50	S				
25	25.000 24.967	25.181 25.020	28	28.021 28.000	+0.075 +0.035	15	1.490 1.430	6	EMT 2515		
						20			EMT 2520		
						25			EMT 2525		
						30			EMT 2530		
28	28.000 27.967	28.205 28.030	32	32.025 32.000		15	1.980 1.920		EMT 2815		
						20			EMT 2820		
						25			EMT 2825		
						30			EMT 2830		
						40			EMT 2840		
30	30.000 29.967	30.205 30.030	34	34.025 34.000		15			1.980 1.920	EMT 3015	
						20				EMT 3020	
						25				EMT 3025	
						30				EMT 3030	
						40				EMT 3040	
32	32.000 31.961	32.205 32.030	36	36.025 36.000	+0.085 +0.045	20				1.980 1.920	EMT 3220
						30					EMT 3230
						40		EMT 3240			
						50		EMT 3250			
35	35.000 34.961	35.205 35.030	39	39.025 39.000		20		1.980 1.920			EMT 3520
						25					EMT 3525
						30	EMT 3530				
						40	EMT 3540				
40	40.000 39.961	40.205 40.030	44	44.025 44.000		20	2.460 2.400				EMT 4020
						25					EMT 4025
						30					EMT 4030
						40			EMT 4040		
						50			EMT 4050		
45	45.000 44.961	45.205 45.030	50	50.025 50.000		25			2.460 2.400		EMT 4525
						30					EMT 4530
						40					EMT 4540
						50				EMT 4550	
50	50.000 49.961	50.210 50.030	55	55.030 55.000	+0.100 +0.055	30				2.460 2.400	EMT 5050
						40					EMT 5030
						50					EMT 5040
						60		EMT 5050			



内径 Internal Diameter			外径 External Diameter			高度 Length	壁厚 Wall Thickness	油孔直径 Oil Hole-Φ H	型号 Part No
内径 d	装配轴径 Shaft-Φ d _s	装配后内径 Φ d _a	外径 D	装配座孔 Housing-Φ D _H	理论外径公差 O.D. Φ D _t	ID<80 L ± 0.25 ID>80 L ± 0.50	S		
55	55.000 54.954	55.210 55.030	60	60.030 60.000		40			EMT 5540
						50			EMT 5550
						60			EMT 5560
60	60.000 59.954	60.210 60.030	65	65.030 65.000		30			EMT 6030
						40			EMT 6040
						50			EMT 6050
						60			EMT 6060
65	65.000 59.954	65.210 65.030	70	70.030 70.000	+0.100 +0.055	40		8	EMT 6540
						50			EMT 6550
						60			EMT 6560
						70			EMT 6570
70	70.000 69.954	70.210 70.030	75	75.030 75.000		40			EMT 7040
						50			EMT 7050
						60			EMT 7060
						80			EMT 7080
75	75.000 74.954	75.210 75.030	80	80.030 80.000		40	2.460 2.400		EMT 7540
						50			EMT 7550
						60			EMT 7560
						80			EMT 7580
80	80.000 79.954	80.215 80.030	85	85.035 85.000		40			EMT 8040
						50			EMT 8050
						60			EMT 8060
85	85.000 84.946	85.215 85.030	90	90.035 90.000	+0.120 +0.070	80		9.5	EMT 8080
						60			EMT 8560
						80			EMT 8580
90	90.000 89.946	90.215 90.030	95	95.035 95.000		50			EMT 9050
						60			EMT 9060
						80			EMT 9080
100	100.000 99.946	100.215 100.030	105	105.035 105.000		60			EMT 10060
						70			EMT 10070
						80			EMT 10080
120	120.000 119.946	120.220 120.030	125	125.040 125.000	+0.170 +0.100	50			EMT 12050
						60			EMT 12060
135	135.000 134.937	135.220 135.030	140	140.040 140.000		60			EMT 13560
						80			EMT 13580



6 轴公差表(250)
Shaft Tolerance Table (250)

≥	<	c9	d8	e7	e8	f7	g6	h5	h6	h7	h8	js6	js7	k6	m6	n6	p6	p7	r6	s6		
-	3	-60 -85	-20 -34	-14 -24	-14 -28	-6 -16	-2 -8	0 -4	0 -6	0 -10	0 -14	± 3	± 5	+6 0	+8 +2	+10 +4	+12 +6	+16 +6	+16 +10	+20 +14		
3	6	-70 -100	-30 -48	-20 -32	-20 -38	-10 -22	-4 -12	0 -5	0 -8	0 -12	0 -18	± 4	± 6	+9 +1	+12 +4	+16 +8	+20 +12	+24 +12	+23 +15	+27 +19		
6	10	-80 -116	-40 -62	-25 -40	-25 -47	-13 -28	-5 -14	0 -6	0 -9	0 -15	0 -22	± 4.5	± 7	+10 +1	+15 +6	+19 +10	+24 +15	+30 +15	+28 +19	+32 +23		
10	18	-95 -138	-50 -77	-32 -50	-32 -59	-16 -34	-6 -17	0 -8	0 -11	0 -18	0 -27	± 5.5	± 9	+12 +1	+18 +7	+23 +12	+29 +18	+36 +18	+34 +23	+39 +28		
18	24	-110 -162	-65 -98	-40 -61	-40 -73	-20 -41	-7 -20	0 -9	0 -13	0 -21	0 -33	± 6.5	± 10	+15 +2	+21 +8	+28 +15	+35 +22	+43 +22	+41 +28	+48 +35		
24	30																					
30	40	-120 -182	-80 -119	-50 -75	-50 -89	-25 -50	-9 -25	0 -11	0 -16	0 -25	0 -39	± 8	± 12	+18 +2	+25 +9	+33 +17	+42 +26	+51 +26	+50 +34	+59 +43		
40	50	-130 -192																				
50	65	-140 -214	-100 -146	-60 -90	-60 -106	-30 -60	-10 -29	0 -13	0 -19	0 -30	0 -46	± 9.5	± 15	+21 +2	+30 +11	+39 +20	+51 +32	+62 +32	+60 +41	+72 +53		
65	80	-150 -224																			+62 +43	+78 +59
80	100	-170 -257	-120 -174	-72 -107	-72 -126	-36 -71	-12 -34	0 -15	0 -22	0 -35	0 -54	± 11	± 17	+25 +3	+35 +13	+45 +23	+59 +37	+72 +37	+73 +51	+93 +71		
100	120	-180 -267																			+76 +54	+101 +79
120	140	-200 -300	-145 -208	-85 -125	-85 -148	-43 -83	-14 -39	0 -18	0 -25	0 -40	0 -63	± 12.5	± 20	+28 +3	+40 +15	+52 +27	+68 +43	+83 +43	+88 +63	+117 +92		
140	160	-210 -310																			+90 +65	+125 +100
160	180	-230 -330																			+93 +68	+133 +108
180	200	-240 -355	-170 -242	-100 -146	-100 -172	-50 -96	-15 -44	0 -20	0 -29	0 -46	0 -72	± 14.5	± 23	+33 +14	+46 +17	+60 +31	+79 +50	+96 +50	+106 +77	+151 +122		
200	225	-260 -375																			+109 +80	+159 +130
225	250	-280 -395																			+113 +84	+169 +140
250	280	-300 -430																			+126 +94	+190 +158
280	315	-330 -460	-210 -299	-125 -182	-125 -214	-62 -119	-18 -54	0 -25	0 -36	0 -57	0 -89	± 16	± 26	+36 +14	+52 +20	+66 +34	+88 +56	+108 +56	+126 +94	+190 +158		
315	355	-360 -500																			+130 +98	+202 +170
355	400	-400 -540	-230 -327	-135 -198	-135 -232	-68 -131	-20 -60	0 -27	0 -40	0 -63	0 -97	± 18	± 28	+40 +4	+57 +21	+73 +37	+98 +62	+119 +62	+114 +108	+226 +190		
400	450	-440 -595																			+150 +114	+244 +208
450	500	-480 -635																			+166 +126	+272 +232



7 座孔公差表(250) Housing Tolerance Table (250)

≥	<	B10	C9	D8	E7	E8	F7	G7	H6	H7	H8	JS7	K7	M7	N7	P7	R7	S7	T7														
-	3	+180 +140	+85 +60	+34 +20	+24 +14	+28 +14	+16 +6	+12 +2	+6 0	+10 0	+14 0	±5	0 -10	-2 -12	-4 -14	-6 -16	-10 -20	-14 -24	-														
3	6	+188 +140	+100 +70	+48 +30	+32 +20	+38 +20	+22 +10	+16 +4	+8 0	+12 0	+18 0	±6	+3 -9	0 -12	-4 -16	-8 -20	-11 -23	-15 -27	-														
6	10	+208 +150	+116 +80	+62 +40	+40 +25	+47 +25	+28 +13	+20 +5	+9 0	+15 0	+22 0	±7	+5 -10	0 -15	-4 -19	-9 -24	-13 -28	-17 -32	-														
10	14	+200 +150	+138 +95	+77 +50	+50 +32	+59 +32	+34 +16	+24 +6	+11 0	+18 0	+27 0	±9	+6 -12	0 -18	-5 -23	-11 -29	-16 -34	-21 -39	-														
14	18																																
18	24	+244 +160	+162 +110	+98 +65	+61 +40	+73 +40	+41 +20	+28 +7	+13 0	+21 0	+33 0	±10	+6 -15	0 -21	-7 -28	-14 -35	-20 -41	-27 -48	-														
24	30																				-33 -54												
30	40	+270 +170	+182 +120	+119 +80	+75 +50	+89 +50	+50 +25	+34 +9	+16 0	+25 0	+39 0	±12	+7 -18	0 -25	-8 -33	-17 -42	-25 -50	-34 -59	-39 -64														
40	50	+280 +180	+192 +130																		-45 -70												
50	65	+310 +190	+214 +140	+146 +100	+90 +60	+106 +60	+60 +30	+40 +10	+19 0	+30 0	+46 0	±15	+9 -21	0 -30	-9 -39	-21 -51	-30 -60	-42 -72	-55 -85														
65	80	+320 +200	+224 +150																-32 -62	-48 -78	-64 -94												
80	100	+360 +220	+257 +170	+174 +120	+107 +72	+125 +72	+71 +36	+47 +12	+22 0	+35 0	+54 0	±17	+10 -25	0 -35	-10 -45	-24 -59	-38 -73	-58 -93	-78 -113														
100	120	+380 +240	+267 +180																-41 -76	-66 -101	-91 -126												
120	140	+420 +260	+300 +200	+208 +145	+125 +85	+148 +85	+83 +43	+54 +14	+25 0	+40 0	+63 0	±20	+12 -28	0 -40	-12 -52	-28 -68	-48 -88	-77 -117	-107 -147														
140	160	+440 +280	+310 +210																											-50 -90	-85 -125	-119 -159	
160	180	+470 +310	+330 +230																												-53 -93	-93 -133	-131 -171
180	200	+525 +340	+355 +240	+242 +170	+146 +100	+172 +100	+96 +50	+61 +15	+29 0	+46 0	+72 0	±23	+13 -33	0 -46	-14 -60	-33 -79	-60 -106	-105 -151	-149 -195														
200	225	+565 +380	+375 +260																												-63 -109	-113 -159	-163 -209
225	250	+605 +420	+395 +280																													-67 -113	-123 -169
250	280	+690 +480	+430 +300	+271 +190	+162 +110	+191 +110	+108 +56	+69 +17	+32 0	+52 0	+81 0	±26	+16 -36	0 -52	-14 -66	-36 -88	-74 -126	-138 -190	-198 -250														
280	315	+750 +540	+460 +330																													-78 -130	-150 -202
315	355	+830 +600	+500 +360	+299 +210	+182 +125	+214 +125	+119 +62	+75 +18	+36 0	+57 0	+89 0	±28	+17 -40	0 -57	-16 -73	-41 -98	-87 -144	-169 -226	-247 -304														
355	400	+910 +680	+540 +400																													-93 -150	-187 -224
400	450	+1010 +760	+595 +440	+327 +230	+198 +135	+232 +135	+131 +68	+83 +20	+40 0	+63 0	+97 0	±31	+18 -45	0 -63	-17 -80	-45 -108	-103 -166	-209 -272	-307 -370														
450	500	+1090 +840	+635 +480																													-109 -172	-229 -292



8 卷制轴套检测 Wrapped Bushing Measurement

在自由状态下，卷制类轴套有一定的开口缝，不能精确的测量外径和内径。所以，卷制类轴承的内径应有专业的测量工具和设备进行。

In free state, wrapped bushing will not be closed, which is impossible to accurately measure External diameter & Internal diameter. When wrapped bushing Measured, special gauges and test equipments is necessary.

外径检测

Test external diameter ISO 3547-2 TEST B

轴套用力压入环规通规（最大加力250N）通过
Press the bushing into Go ring gage. And push bushing through by hand (Max. force 250N)
用上述同样方法和相同力压入环规止端不通过
Use the above same way & press, bushing can not go into No Go ring gauge.



内径检测

Test Internal diameter ISO 3547-2 TEST C

当轴套压入环规，塞规通端通过用较小力，塞规止端通过用较大力不超过250N

Press the bushing into ring gauge. The Go plug gauge could be inserted by a light pressure. The No Go plug gauge could not be inserted by heavy pressure (Max. force 250N)

注意：轴套压入环规，轴套外径可能会永久减小

Note: When the bushing is pressed into ring gauge, external diameter could be permanent reduction.

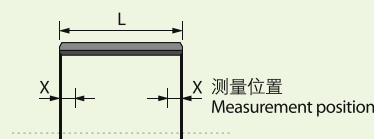


壁厚测量

Wall thickness Meaurment

轴套壁厚测量：按轴套高度在轴套轴向上测量一点，两点或三点。

The wall thickness of bushing is measured by profession gauge at one, two, or three positions according to bushing length.



L [mm]	X [mm]	Measurement position
$L \leq 15$	$L/2$	1
$15 < L \leq 50$	4	2
$50 < L \leq 90$	6 and $L/2$	3
$L > 90$	8 and $L/2$	3

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嘉善欧本轴承有限公司
JIASHAN EPEN BEARING CO., LTD

地址 浙江嘉善经济开发区 (惠民街道) 成功路161号
邮编 314100

电话 +86 573 8482 4388
传真 +86 573 8482 4386
网址 www.cnepen.cn
邮件 epen@cnepen.cn

No 161 ChengGong Road, Economic Development
Zone (HuiMin Street) Jiashan Zhejiang China
Post Code 314100

Tel +86 573 8482 4388
Fax +86 573 8482 4386
Http www.cnepen.cn
E-mail epen@cnepen.cn