

# EOPEN BEARING

欧本轴承

eopen®  
EOPEN SLIDING BEARING





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.



# 目录

## INDEX

<b>1 轴套材质</b>	<b>Bushing Material</b>		
1.1 EU 产品介绍 .....	P 3	5.3 EU 垫片规格及公差 .....	P 32
EU Brief Description		EU Thrust Washer Specification & Tolerance	
1.2 EUR 产品介绍 .....	P 6	5.4 EU 板材规格及公差 .....	P 33
EUR Brief Description		EU Strip Specification	
1.3 EX 产品介绍 .....	P 7	5.5 EU 英制直套规格及公差 .....	P 34
EX Brief Description		EU Inch Sleeve Bushing Specification & Tolerance	
1.4 EMT 产品介绍 .....	P 9	5.6 EU 英制翻边规格及公差 .....	P 37
EMT Brief Description		EU Inch Flange Bushing Specification & Tolerance	
1.5 E90/E92 产品介绍 .....	P 12	5.7 EU 英制垫片规格及公差 .....	P 38
E90/E92 Brief Description		EU Inch Thrust Washer Specification & Tolerance	
<b>2 轴套设计</b>	<b>Bushing Design</b>		
2.1 轴套选型 .....	P 15	5.8 EX 直套规格及公差 .....	P 39
Bushing Design		EX Sleeve Bushing Specification & Tolerance	
轴套PV值 ( 承载 P 和速度 V )		5.9 EX 垫片规格及公差 .....	P 45
2.2 Bushing PV Value .....	P 16	EX Thrust Washer Specification & Tolerance	
(Load P & Velocity V)		5.10 EX 板材规格及公差 .....	P 46
<b>3 轴套装配</b>	<b>Bushing Installation</b>		
3.1 轴套接触面设计 .....	P 17	EX Strip Specification & Tolerance	
Bushing Arrangement Design		5.11 EX 英制直套规格及公差 .....	P 47
3.2 轴套座孔设计 .....	P 18	EX Inch Bushing Specification & Tolerance	
Housing Design		5.12 EX 英制垫片规格及公差 .....	P 50
3.3 轴套压装 .....	P 19	EX Inch Thrust Washer Specification & Tolerance	
Bushing Installation		5.13 EMT 规格及公差 .....	P 51
3.4 止推垫片和滑块装配 .....	P 20	EMT Bushing Specification & Tolerance	
Thrust Washers & Plate Installation		5.14 E09/E92 直套规格及公差 .....	P 54
<b>4 产品应用</b>	<b>Application</b>		
4.1 EU 产品应用 .....	P 21	5.15 E09/E92 翻边规格及公差 .....	P 64
EU Application		E09/E92 Flange Bushing Specification & Tolerance	
4.2 EX 产品应用 .....	P 23		
EX Application			
<b>5 规格和公差</b>	<b>Specification &amp; Tolerance</b>		
5.1 EU 直套规格及公差 .....	P 24	<b>6 轴公差表</b>	P 68
EU Sleeve Bushing Specification & Tolerance		<b>Shaft tolerance table</b>	
5.2 EU 翻边轴套规格及公差 .....	P 30	<b>7 座孔公差表</b>	P 69
EU Flange Bushing Specification & Tolerance		<b>Housing tolerance table</b>	
<b>8 卷制轴套检测</b>	<b>Wrapped Bushing Measurement</b>		



## 1

## 轴承材质 Bushing Material



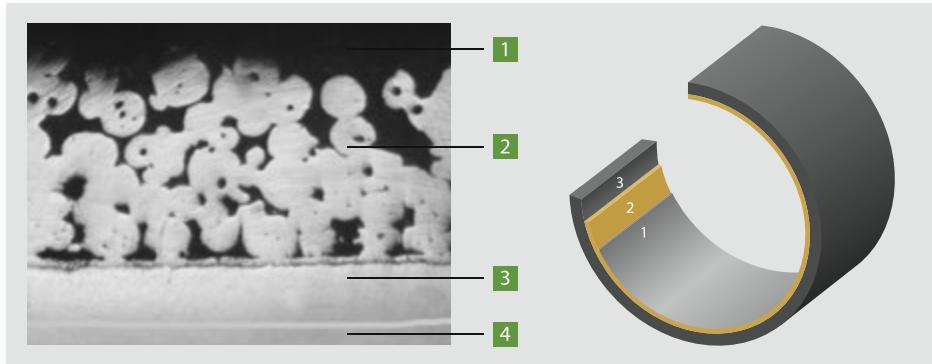
### 1.1 EU 产品介绍 EU Brief Description

EU 是用碳钢基材、青铜粉、聚四氟乙烯、纤维等材料经过特殊工艺制造而成的自润滑产品，具有环保的特点。它不仅具有一定的化学性能，同时具有良好的物理性能和机械性能，可应用在各种机械的滑动、转动、摆动及直线往复运动部位，工作时具有自润滑、耐磨损、摩擦系数低、走合性能好、噪音低等特点。

EU tri-layer maintenance-free bushing have a base of lower carbon steel, onto which a porous bronze layer is sintered. PTFE mixtures are impregnated into the intersice of this bronze layer after rolling process completed. Eu has good physical & mechanical properties, also has certainly chemical properties. It is suitable for rotary, oscillating movement with performance of self-lub. Anti-wear, lower friction, lower noise.



## 1.1<sup>1</sup> EU 产品结构及工作机理 EU Structure



- 1 自润滑层，厚度为0.01~0.03mm，是聚四氟乙烯与纤维等减摩材料的混合物，通过制板工艺进入铜粉组织内部和覆在铜层表面。作为工作面，工作中形成转移膜，可以显著地降低摩擦系数及很好的保护对磨部件。
- 2 青铜粉层，作为自润滑层的附着体。
- 3 低碳钢层，工作中起到良好的承载和散热作用。
- 4 镀铜/锡层，具有良好的耐腐蚀性。

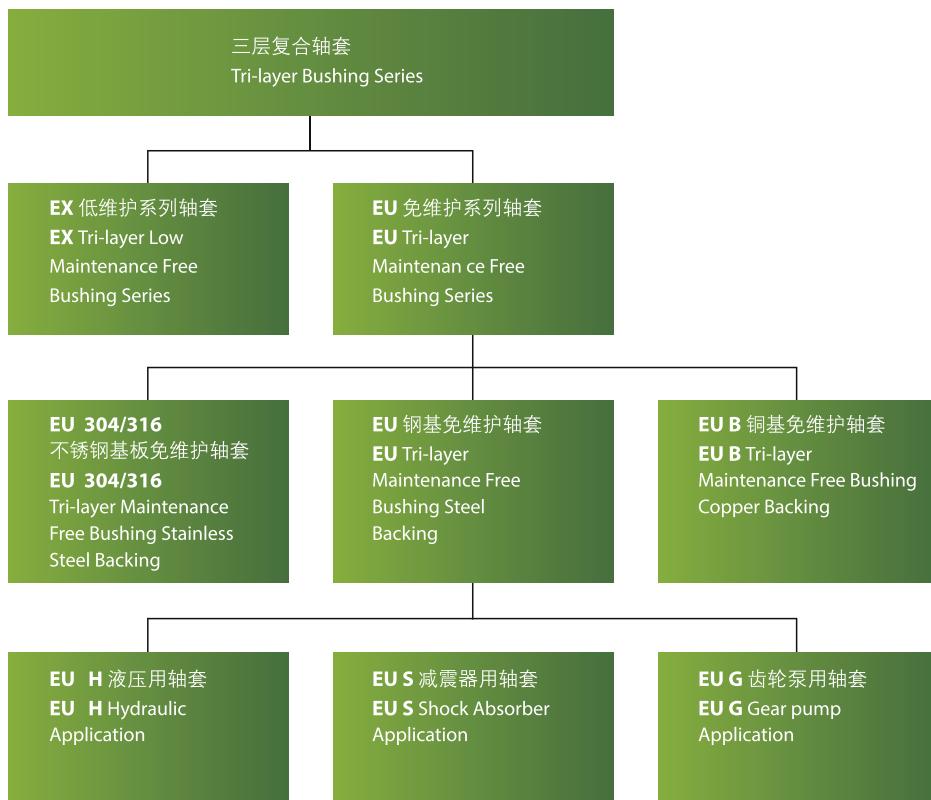
- 1 Self-lub. Layer PTFE Mixture 0.01-0.03mm.  
After rolling process completed, PTFE mixtures are filled in intersice of bronze layer. Under normal operation, Part of PTFE mixture on top layer will be removed and transferred on the mating surface, forms a physically lubricating film, which will reduced the firction coe. and protect the mating shaft.
- 2 Porous Bronze layer;  
The layer provides bonded strength of Self-Lub. Layer.
- 3 Steel Backing  
The layer provides load & thermal conductivity
- 4 Copper / Tin layer

## 1.1<sup>2</sup> EU 产品技术参数 EU Material Characteristics

最大承载 P	Max. Load Capacity		
静载	Static Load	N/mm <sup>2</sup>	250
动载	Dynamic Load	N/mm <sup>2</sup>	140
最高线速度 V	Max. Speed		
干式运行	Dry Running	m/s	2.0
液体运行	Hydrodynamic Operation	m/s	>2
最高PV值(干摩擦)	Max. PV Value		
短期	Short-Term Operation	N/mm <sup>2</sup> · m/s	3.6
连续	Continuous Operation	N/mm <sup>2</sup> · m/s	1.8
摩擦系数	Coefficient of Friction	$\mu$	0.03~0.25
使用温度	Operation Temperature Range	°C	-195~280
导热系数	Thermal Conductivity	W(m · k <sup>-1</sup> )	42
热膨胀系数	Coefficient of Thermal Expansion	$\lambda_{st}$	$11 \cdot 10K^{-1}$



### 1.1<sup>3</sup> EU 产品类别 EU Materiace Category



### 1.1<sup>4</sup> EU 产品耐化学性能表 EU Material Chemical Characteristic

轴承型号 Type	淡水 Water	海水 Sea Water	空气 Air	碱溶液 Alkaline Solutions	中性溶剂 Neutral Solutions	油润滑 Fuels & Lubricatins	强酸 Strong Acid	弱酸 Weak Acid
EU	□	▲	□	□	★	★	▲	▲
EU G	□	▲	□	□	★	★	▲	▲
EU H	□	▲	□	□	★	★	▲	▲
EU S	□	▲	□	□	★	★	▲	▲
EU B	□	□	□	□	★	★	□	□
EU 304/316	□	□	□	□	★	★	□	□
EX	□	□	□	□	★	★	▲	▲

★ 良好 Good    □ 一般 Common    ▲ 差 Poor



## 1.2 EU R 产品介绍 EU R Brief Description

该产品以青铜丝网为基体，通过特殊工艺，表面轧制聚四氟乙烯和亲油性纤维。它具有较低的摩擦系数、较好的耐磨损性以及柔软性好。产品广泛应用于纺织机械关节轴承、汽车门铰链、汽车操纵杆等场合。

EU R is two-layer structure, which consists of a bronze mesh Laminated with PTFE Tape. The weight of final products is lighter and easy to install due to advantages of this structure. Automotive door hinges is one of typical applications.

## 1.2<sup>1</sup> EU R 产品技术参数 EU R Material Characteristics

最大承载 P	Max. Load Capacity		
静载	Static Load	N/mm <sup>2</sup>	80
动载	Dynamic Load	N/mm <sup>2</sup>	40
最高线速度 V	Max. Speed		
干式运行	Dry Running	m/s	1
液体运行	Hydrodynamic Operation	m/s	>1
摩擦系数	Coefficient of Friction	μ	0.03~0.25
使用温度	Operation Temperature Range	°C	-195~260



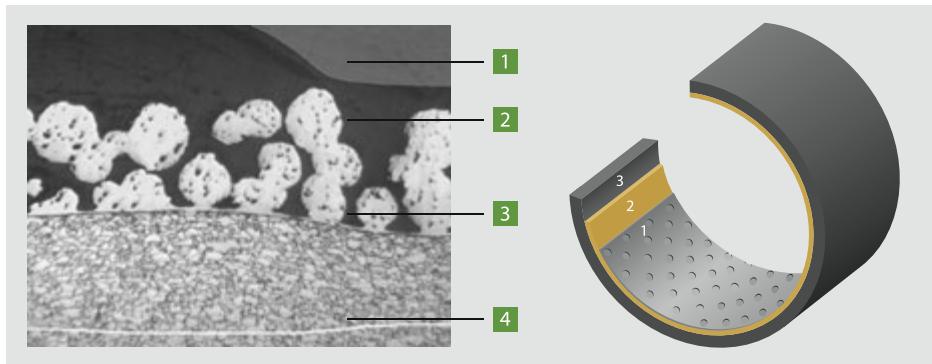
### 1.3 EX 产品介绍 EX Brief Description

EX 是用碳钢基材、青铜粉、改性聚甲醛等其它润滑剂材料经过特殊工艺制造而成的边界无铅自润滑产品，具有环保的特点。它不仅具有一定的化学性能，同时具有良好的物理性能和机械性能，可应用在各种低速中载，取代传统轴承的滑动、转动、摆动及直线往复运动部位，因减磨层表面有储油孔便于装配前涂抹油脂，工作时具有摩擦系数低、走合性能好、耐磨损等特点。

EX tri-layer low maintenance plain bushing have a base of lower carbon steel, onto which a porous bronze layer is sintered. Acetalcopolyer (POM) is impregnated into the intersice of this bronze layer after rolling process completed. Lubrication indents are stamped into this layer. EX has good physical & mechanical properties, also has certainly chemical properties. This material has good machining performance if required.



### 1.3<sup>1</sup> EX 产品断面微观组织及工作机理 EX Material



- 1 减摩层，厚度为0.3~0.5mm，是聚甲醛与润滑剂等减摩材料的混合物，通过制板工艺进入铜粉组织内部和覆在铜层表面。工作面表层有储油孔，可以显著地降低摩擦系数及很好的保护对磨部件。
- 2 青铜粉层，作为自润滑层的附着体。
- 3 低碳钢层，工作中起到良好的承载和散热作用。
- 4 镀铜层，具有良好的耐腐蚀性。

- 1 Self-lub. Layer POM 0.3-0.5mm.  
After rolling process completed, POM are filled in intersice of bronze layer, lubrication indents are stamped, which are full of oil grease, which will be removed and transferred on the mating surface, forms a physically lubricating film, which will reduced the friction coe. and protect the mating shaft.
- 2 Porous bronze layer;  
The layer provides bonded strength of self-lub. Layer.
- 3 Steel Backing  
The layer provides load & thermal conductivity
- 4 Copper / Tin layer.

### 1.3<sup>2</sup> EX 产品技术参数 EX Material Characteristics

最大承载 P	Max. Load Capacity		
静载	Static Load	N/mm <sup>2</sup>	250
动载	Dynamic Load	N/mm <sup>2</sup>	140
最高线速度 V	Max. Speed		
预润滑	Pre-Lubricated	m/s	2.0
油脂润滑连续	Oil Grease Lubrication Continuous Operation	m/s	>2.0
最高PV值(干摩擦)	Max. Pv Value	N/mm <sup>2</sup> · m/s	2.8
摩擦系数	Coefficient of Friction	$\mu$	0.05~0.20
使用温度	Operation Temperature Range	°C	-40~110
导热系数	Thermal Conductivity	W(m · k <sup>-1</sup> )	42
热膨胀系数	Coefficient of Thermal Expansion	$\lambda_{ST}$	$11 \cdot 10K^6$

※ 推荐在装配时内孔涂润滑油脂 Initial pre-lubrication at assembly is necessary.



## 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/mm<sup>2</sup>] 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/mm<sup>2</sup>] 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]

Temperture

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 [ μ m] 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. Specifica load obtained from operation load divided by the projected area of bushing.

(2) Bushing service life determined by PV Valve,

$$PV = PxV.$$

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 <sup>2</sup> {kgf/cm <sup>2</sup> }	m/s {m/min}	N/mm <sup>2</sup> *m/s {kgf/cm <sup>2</sup> *m/min}
直套 Sleeve Bushing	1.径向单向旋转 Rotating motion in single direction of radial journal	$\frac{F}{dL}$ $\left\{ \frac{10^2 F}{dL} \right\}$	$\frac{\pi dn}{10^3}$ $\left\{ \frac{\pi dn}{10^3} \right\}$	$\frac{\pi Fn}{10^3 L}$ $\left\{ \frac{\pi Fn}{10L} \right\}$
	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 whscher	翻边法兰面速度计算按上述垫片计算公式。 Use above formulas for thrust whscher	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 whscher
滑块 Slide Plate	1.往复运动 Reciprocating motion	$\frac{F}{BL}$ $\left\{ \frac{10^2 F}{WL} \right\}$	$\frac{2cS}{10^3}$ $\left\{ \frac{2cS}{10^3} \right\}$	$\frac{2FcS}{10^3 BL}$ $\left\{ \frac{FcS}{5WL} \right\}$

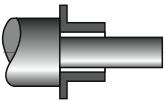
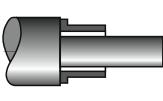
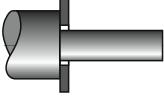
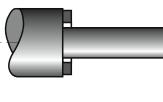
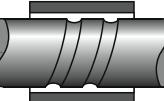
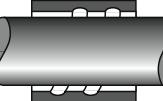
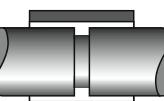
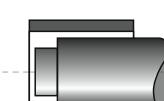
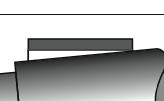
F : 承载 load ..... N {kgf}  
 N : 转速 Rotations ..... S-1{rpm}  
 c : 往复圆周速度或摇摆 Cylindrical velocity of reciprocating or oscillating motion ..... S-1{cpm}  
 S : 往复运动距离 Stroke distance ..... m {mm}  
 θ : 摆摆角度 Oscillating angle ..... rad { }  
 d : 轴套内径 Bushing ID ..... mm {mm}  
 D : 轴套外径 Bushing OD ..... 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

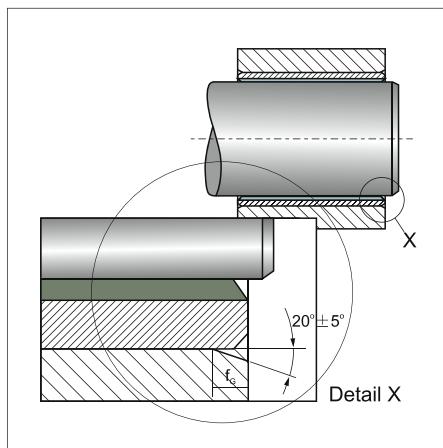
### 直套装配设计

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.

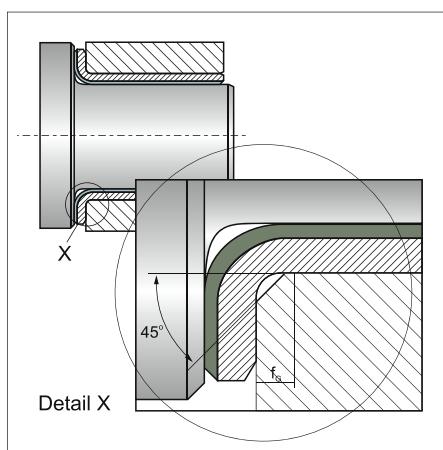
座孔 Housing bore diameter $d_g$	倒角 Chamfer with $f_g$
$d_g \leq 30$	$0.8 \pm 0.3$
$30 < d_g \leq 80$	$1.2 \pm 0.4$
$80 < d_g \leq 180$	$1.8 \pm 0.8$
$180 < d_g$	$2.5 \pm 1.0$



### 翻边套装配设计

#### Flange Bushing

座孔 Housing bore diameter $d_g$	倒角 Chamfer with $f_g$
$d_g \leq 10$	$1.2 \pm 0.2$
$180 < d_g$	$1.7 \pm 0.2$

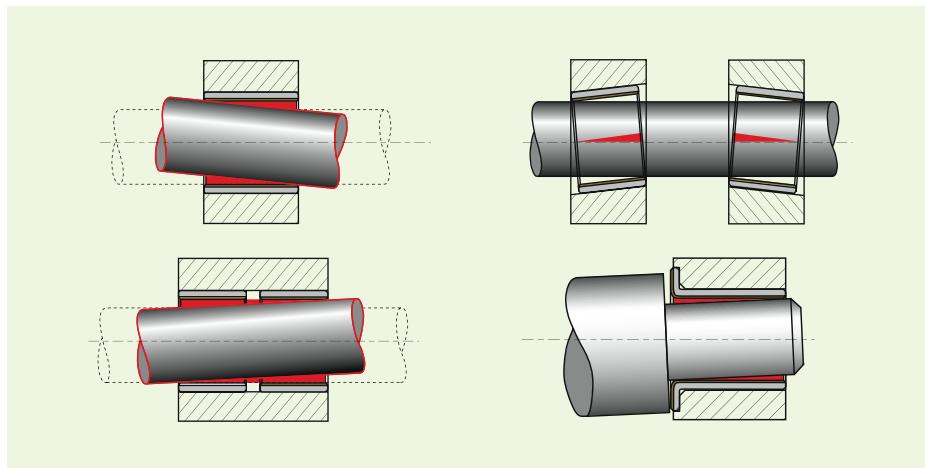


### 同轴度

#### 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.

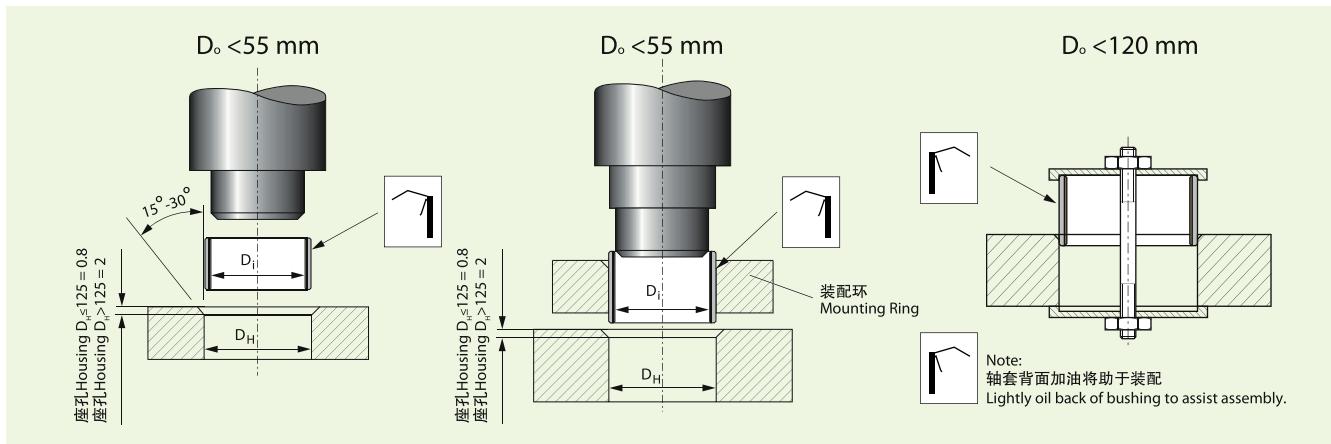




### 3.3 轴套压装 Bushing Installation

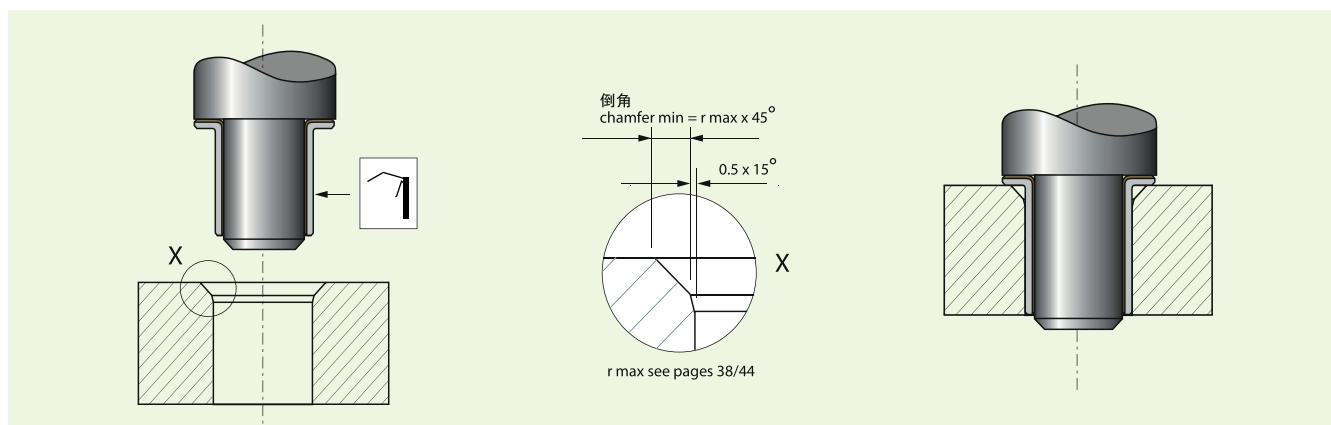
#### 直套压装

#### Fitting of Cylindrical Bushing



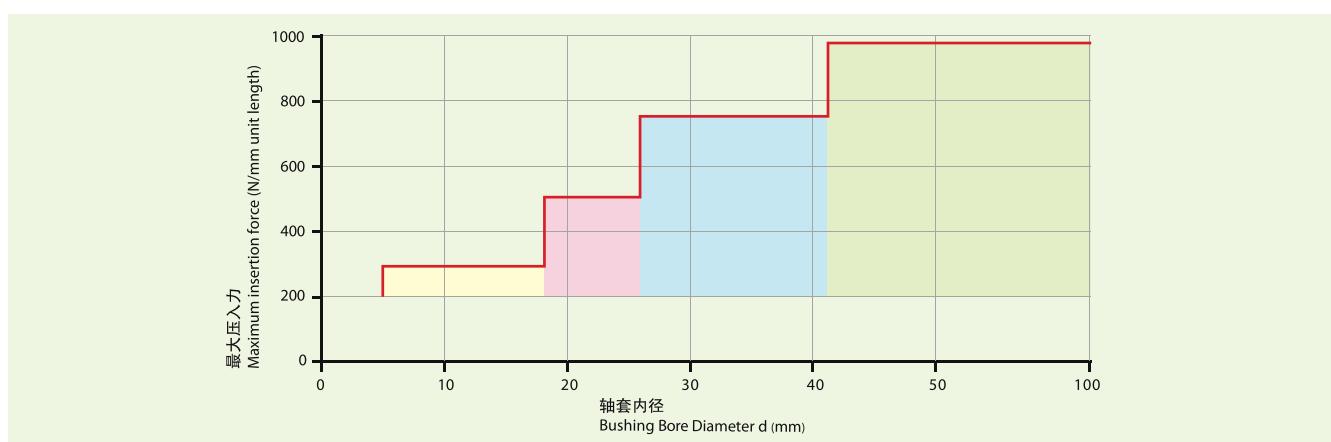
#### 翻边轴套压装

#### Fitting of Flanged Bushing



#### 压入力

#### Insertion Force





### 3.4 止推垫片和滑块装配

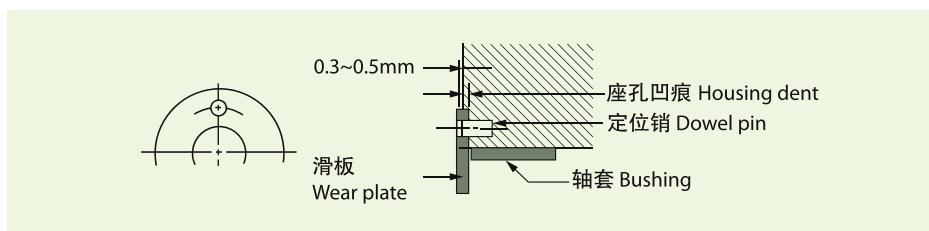
#### Thrust washers & Plate Installation

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.

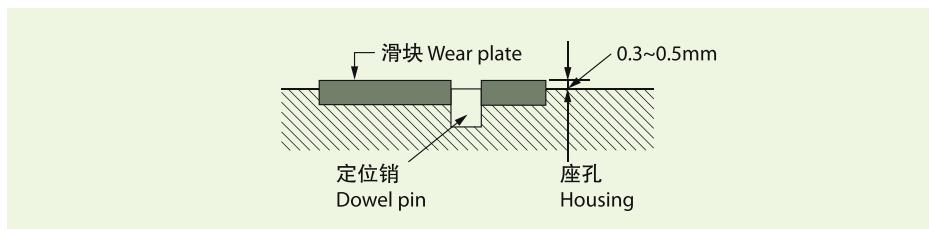
**定位销应用（止推垫片）**

##### 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磨擦系数，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 & wide 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.



#### 汽车行业

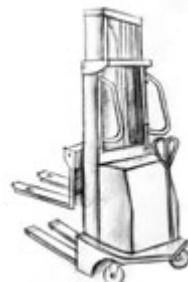
#### Automotive

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 application in this area include:

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

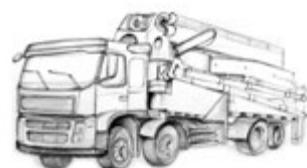


#### 农业机械和食品机械

#### 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, auttomatic 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。

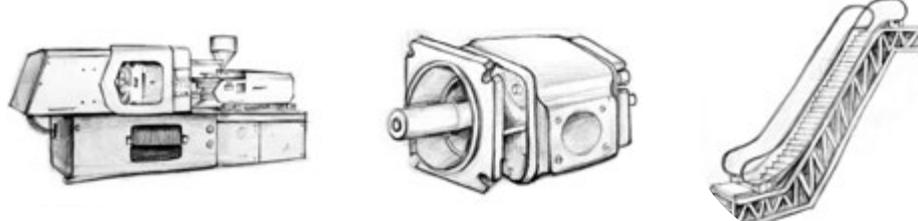
Gear pump, water pump, piston pump, ball valves, butterfly valves, mixing valves, pilot valve, reciprocating air compressors, hydraulic actuators, centrifugal compressors, hydraulic cylinder etc.

### 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.

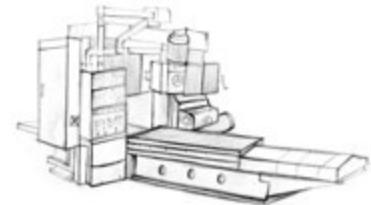


### 机床制造工业

#### 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.



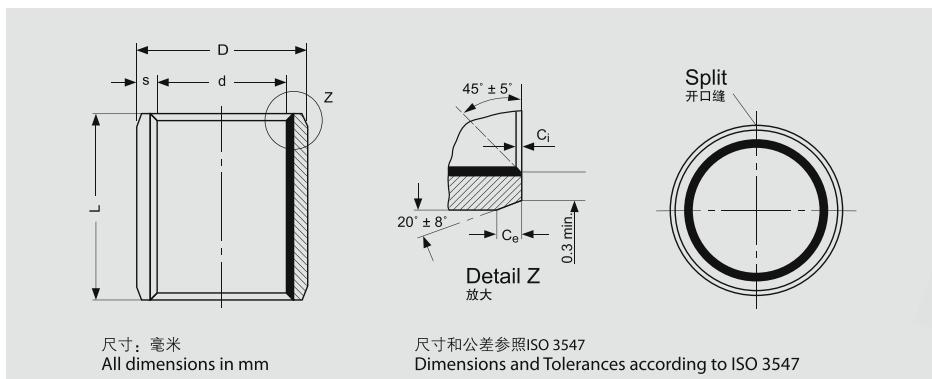


## 5 规格和公差

### Specification & Tolerance

#### 5.1 EU 直套规格及公差

#### EU Sleeve Bushing Specification & Tolerance



内外倒角尺寸表  
Inside & Outside Chamfers

直套型号标注方式  
Bushing Symbol

壁厚 Wall thickness S	内倒角 Inside Chamfer C <sub>i</sub>	外倒角 Outside Chamfer C <sub>e</sub>
0.75	0.25 ± 0.15	0.50 ± 0.30
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 ± 0.40	1.80 ± 0.60

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

内径 Internal Diameter (I.D.)			外径 External Diameter (O.D.)			高度 Length	壁厚 Wall Thickness	型号 Part No
内径 d	装配轴径 Shaft-Φd <sub>s</sub>	装配后内孔尺寸 Φd <sub>i</sub>	外径 D	装配座孔 Housing-ΦD <sub>H</sub>	理论外径公差 O.D. ΦD <sub>t</sub>			
4	4.000 3.992	4.048 4.000	5.5	5.508 5.500		4	0.750 0.730	EU 0404
						6		EU 0406
						10		EU 0410
5	4.990 4.978	5.055 4.990	7	7.015 7.000		5	1.005 0.980	EU 0505
						8		EU 0508
						10		EU 0510
6	5.990 5.978	6.055 5.990	8	8.015 8.000	+0.055 +0.025	4	1.005 0.980	EU 0604
						6		EU 0606
						8		EU 0608
7	6.987 6.972	7.055 6.990	9	9.015 9.000		10	1.005 0.980	EU 0610
						5		EU 0705
						10		EU 0710
8	7.987 7.972	8.055 7.990	10	10.015 10.000		6	1.005 0.980	EU 0806
						8		EU 0808
						10		EU 0810
						12		EU 0812



内径 Internal Diameter(I.D.)			外径 External Diameter(O.D.)			高度 Length	壁厚 Wall Thickness	型号 Part No	
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	理论外径公差 O.D. $\Phi D_t$	ID<80 L±0.25	S		
						ID>80 L±0.50			
10	9.987 9.972	10.058 9.990	12	12.018 12.000			8	EU 1008 EU 1010 EU 1012 EU 1015 EU 1020	
							10		
							12		
							15		
							20		
12	11.984 11.966	12.058 11.990	14	14.018 14.000			8	EU 1208 EU 1210 EU 1212 EU 1215 EU 1220 EU 1225	
							10		
							12		
							15		
							20		
							25		
13	12.984 12.966	13.058 12.990	15	15.018 15.000		+0.065 +0.030	10	EU 1310 EU 1315 EU 1320	
							15		
							20		
							5		
							10		
14	13.984 13.966	14.058 13.990	16	16.018 16.000			12	EU 1405 EU 1410 EU 1412 EU 1415 EU 1420 EU 1425	
							15		
							20		
							25		
							10		
							12		
15	14.984 14.966	15.058 14.990	17	17.018 17.000			15	EU 1510 EU 1512 EU 1515 EU 1520 EU 1525	
							20		
							25		
							10		
							12		
16	15.984 15.966	16.058 15.990	18	18.018 18.000			15	EU 1610 EU 1612 EU 1615 EU 1620 EU 1625	
							20		
							25		
							10		
							12		
18	17.984 17.966	18.061 17.990	20	20.021 20.000	+0.075 +0.035		15	EU 1810 EU 1815 EU 1820 EU 1825	
							20		
							25		



内径 Internal Diameter(I.D.)			外径 External Diameter(O.D.)			高度 Length	壁厚 Wall Thickness	型号 Part No	
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	理论外径公差 O.D. $\Phi D_t$	ID<80 L ± 0.25	ID>80 L ± 0.50	S	
20	19.980 19.959	20.071 19.990	23	23.021 23.000			10		EU 2010
							15		EU 2015
							20		EU 2020
							25		EU 2025
							30		EU 2030
22	21.980 21.959	22.071 21.990	25	25.021 25.000			15		EU 2215
							20		EU 2220
							25		EU 2225
							30		EU 2230
24	23.980 23.959	24.071 23.990	27	27.021 27.000	+0.075 +0.035		15	1.505 1.475	EU 2415
							20		EU 2420
							25		EU 2425
							30		EU 2430
							15		EU 2515
25	24.980 24.959	25.071 24.990	28	28.021 28.000			20		EU 2520
							25		EU 2525
							30		EU 2530
							40		EU 2540
							50		EU 2550
							15		EU 2815
28	27.980 27.959	28.085 27.990	32	32.025 32.000			20		EU 2820
							25		EU 2825
							30		EU 2830
							10		EU 3010
30	29.980 29.959	30.085 29.990	34	34.025 34.000	+0.085 +0.045		15		EU 3015
							20		EU 3020
							25	2.005 1.970	EU 3025
							30		EU 3030
							40		EU 3040
32	31.975 31.950	32.085 31.990	36	36.025 36.000			20		EU 3220
							25		EU 3225
							30		EU 3230
							35		EU 3235
							40		EU 3240



内径 Internal Diameter(I.D.)			外径 External Diameter(O.D.)			高度 Length	壁厚 Wall Thickness	型号 Part No	
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	理论外径公差 O.D. $\Phi D_t$	ID<80 L±0.25	S		
						ID>80 L±0.50			
35	34.975 34.950	35.085 34.990	39	39.025 39.000			20	EU 3520 EU 3530 EU 3535 EU 3540 EU 3550	
							30		
							35		
							40		
							50		
40	39.975 39.950	40.085 39.990	44	44.025 44.000	+0.085 +0.045		12	2.005 1.970 EU 4012 EU 4020 EU 4025 EU 4030 EU 4040 EU 4050	
							20		
							25		
							30		
							40		
45	44.975 44.950	45.105 44.990	50	50.025 50.000			50	EU 4520 EU 4530 EU 4540 EU 4545 EU 4550	
							20		
							30		
							40		
							45		
50	49.975 49.950	50.110 49.990	55	55.030 55.000			50	EU 5020 EU 5030 EU 5040 EU 5050 EU 5060	
							20		
							30		
							40		
							50		
55	54.970 54.940	55.110 54.990	60	60.030 60.000	+0.100 +0.055		60	EU 5520 EU 5525 EU 5530 EU 5540 EU 5550 EU 5555 EU 5560	
							20		
							25		
							30		
							40		
60	59.970 59.940	60.110 59.990	65	65.030 65.000			50	EU 6020 EU 6030 EU 6040 EU 6050 EU 6060 EU 6070	
							60		
							70		



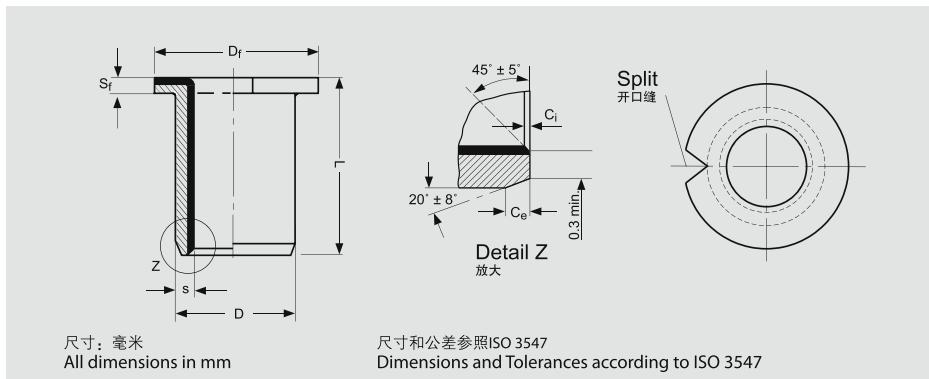
内径 Internal Diameter(I.D.)			外径 External Diameter(O.D.)			高度 Length	壁厚 Wall Thickness	型号 Part No			
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	理论外径公差 O.D. $\Phi D_t$	ID<80 L ± 0.25	ID>80 L ± 0.50	S			
65	64.970 64.940	65.110 64.990	70	70.030 70.000	+0.100 +0.055	30		EU 6530 EU 6550 EU 6570 EU 7040 EU 7050 EU 7070			
						50					
						70					
	69.970 69.940	70.110 69.990				40	2.505 2.460				
				50							
				70							
75	74.970 74.940	75.110 74.990	80	80.030 80.000	+0.100 +0.055	60		EU 7560 EU 7580 EU 8060 EU 8080 EU 80100 EU 8560			
						80					
						100					
	85.000 84.946	85.155 85.020				60					
				80							
				100							
85	90.000 89.946	90.155 90.020	90	90.035 90.000	+0.100 +0.055	60		EU 8580 EU 85100 EU 9060 EU 9080 EU 90100 EU 9560			
						80					
						100					
	90.000 89.946	90.155 90.020				60					
				80							
				100							
95	95.000 94.946	95.155 95.020	100	95.035 100.000	+0.120 +0.070	60		EU 9580 EU 95100 EU 10050 EU 10060 EU 10080 EU 100100			
						80					
						100	2.490 2.440				
	100.000 99.946	100.155 100.020				60					
				80							
				100							
100	105.000 104.946	105.155 105.020	105	105.035 105.000	+0.120 +0.070	60		EU 10560 EU 10580 EU 105100 EU 11060 EU 11080 EU 110100			
						80					
						100					
	110.000 109.946	110.155 110.020				60					
				80							
				100							
115	115.000 114.946	115.155 115.020	120	120.035 120.000	+0.120 +0.070	60		EU 11560 EU 11570 EU 12050 EU 12060 EU 120100 EU 12560			
						70					
						50					
	120.000 119.946	120.210 120.070				60					
				100							
				100							
125	125.000 124.937	125.210 125.070	130	130.040 130.000	+0.170 +0.100	60		EU 12580 EU 125100 EU 13060 EU 13080 EU 130100			
						80					
						100					
	130.000 129.937	130.210 130.070				60					
				80							
				100							



内径 Internal Diameter(I.D.)			外径 External Diameter(O.D.)			高度 Length	壁厚 Wall Thickness	型号 Part No	
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_H$	理论外径公差 O.D. $\Phi D_t$	ID<80 L±0.25	S		
ID>80 L±0.50						ID>80 L±0.50			
135	135.000 134.937	135.210 135.070	140	140.040 140.000			60	EU 13560 EU 13580 EU 135100	
							80		
							100		
140	140.000 139.937	140.210 140.070	145	145.040 145.000		+0.170 +0.100	60	EU 14060 EU 14080 EU 140100	
							80		
							100		
150	150.000 149.937	150.210 150.070	155	155.040 155.000			60	EU 15060 EU 15080 EU 150100	
							80		
							100		
160	160.000 159.937	160.210 160.070	165	165.040 165.000			80	EU 16080 EU 160100	
							100		
							80		
180	180.000 179.937	180.216 180.070	185	185.046 185.000			80	EU 18080 EU 180100	
							100		
							80		
200	200.000 199.928	200.216 200.070	205	205.046 205.000		+0.210 +0.130	100	EU 20080 EU 200100	
							80		
							100		
210	210.000 209.928	210.216 210.070	215	215.046 215.000			80	EU 21080 EU 210100	
							100		
							80		
220	220.000 219.928	220.216 220.070	225	225.046 225.000			100	EU 22080 EU 220100	
							80		
							100		
250	250.000 249.928	250.222 250.070	255	255.052 255.000			80	EU 25080 EU 250100	
							100		
							80		
280	280.000 279.948	280.222 280.070	285	285.052 285.000		+0.260 +0.170	100	EU 28080 EU 280100	
							80		
							100		
300	300.000 299.919	300.222 300.070	305	305.052 305.000			80	EU 30080 EU 300100	
							100		



## 5.2 EU 翻边轴套规格及公差 EU Flange 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 $C_e$
0.75	0.25 ± 0.15	0.50 ± 0.30
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 ± 0.40	1.80 ± 0.60

**翻边套型号标注方式**  
**Flange Bushing Symbol**

翻边套型号标注方式 Flange Bushing Symbol	EU - □	F	× ×	× ×
轴承型号 Flange Bushing Type				
翻边套 Flange				
翻边套内径 Flange Bushing Inner Diameter				
翻边套高度 Flange Bushing Length				

内径 Internal Diameter			外径 External Diameter			法兰厚度 Flang Wall $s_f$	法兰外径 Flang Ø $D_f$	高度 Length	壁厚 Wall Thickness	型号 Part No			
内径 d	装配轴径 Shaft Ø $d_s$	装配后内孔尺寸 Ø $d_i$	外径 D	装配座孔 Housing Ø $D_h$	理论外径公差 O.D. Ø $D_t$	max. min.	max. min.	$L \pm 0.25$	S				
6	5.990 5.978	6.055 5.990	8	8.015 8.000	+0.055 +0.025	12.50 11.50	15.50 14.50	4	1.005 0.980	EU F06040			
								8		EU F06080			
8	7.987 7.972	8.055 7.990	10	10.015 10.000				5.5		EU F08055			
								7.5		EU F08075			
								9.5		EU F08095			
								7		EU F10070			
10	9.987 9.972	10.058 9.990	12	12.018 12.000	1.050 0.800	18.50 17.50	20.50 19.50	9	1.005 0.980	EU F10090			
								12		EU F10120			
								17		EU F10170			
								7		EU F12070			
12	11.984 11.966	12.058 11.990	14	14.018 14.000	+0.065 +0.030	20.50 19.50	20.50 19.50	9	1.005 0.980	EU F12090			
								12		EU F12120			
								17		EU F12170			

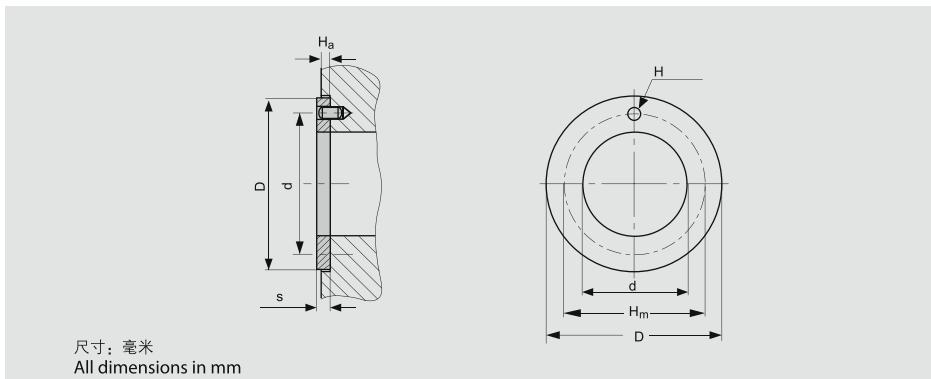


内径 Internal Diameter			外径 External Diameter			法兰厚度 Flang Wall $s_f$	法兰外径 Flang Ø $D_f$	高度 Length $L \pm 0.25$	壁厚 Wall Thickness $S$	型号 Part No
内径 d	装配轴径 Shaft Ø $d_s$	装配后内孔尺寸 Ø $d_i$	外径 D	装配座孔 Housing Ø $D_h$	理论外径公差 O.D. Ø $D_t$	max. min.	max. min.			
14	13.984 13.966	14.058 13.990	16	16.018 16.000	+0.065 +0.030	1.050 0.800	22.50 21.50	12	1.005 0.980	EU F14120
							23.50 22.50	17		EU F14170
15	14.984 14.966	15.058 14.990	17	17.018 17.000	+0.065 +0.030	1.050 0.800	9	1.005 0.980	EU F15090	
							12		EU F15120	
16	15.984 15.966	16.058 15.990	18	18.018 18.000	+0.075 +0.035	1.600 1.300	17	1.005 0.980	EU F15170	
							24.50 23.50		EU F16120	
18	17.984 17.966	18.061 17.990	20	20.021 20.000	+0.075 +0.035	1.600 1.300	12	1.005 0.980	EU F16170	
							26.50 25.50		EU F18120	
20	19.980 19.959	20.071 19.990	23	23.021 23.000	+0.075 +0.035	1.600 1.300	17	1.005 0.980	EU F18170	
							22		EU F18220	
25	24.980 24.959	25.071 24.990	28	28.021 28.000	+0.075 +0.035	1.600 1.300	11.5	1.505 1.475	EU F20115	
							30.50 29.50		EU F20165	
30	29.980 29.959	30.085 29.990	34	34.025 34.000	+0.075 +0.035	1.600 1.300	16.5	1.505 1.475	EU F20215	
							21.5		EU F25115	
35	34.975 34.950	35.085 34.990	39	39.025 39.000	+0.085 +0.045	2.100 1.800	35.50 34.50	2.005 1.970	EU F25165	
							11.5		EU F25215	
40	39.975 39.950	40.085 39.990	44	44.025 44.000	+0.085 +0.045	2.100 1.800	16.5	2.005 1.970	EU F30160	
							26		EU F30260	
45	44.975 44.950	45.105 44.990	50	50.025 50.000	+0.085 +0.045	2.100 1.800	47.50 46.50	2.005 1.970	EU F35160	
							16		EU F35260	
							53.50 52.50	2.005 1.970	EU F40160	
							26		EU F40260	
							2.600 2.300	16	EU F45160	
							58.50 57.50	26	EU F45260	



### 5.3 EU 垫片规格及公差

### EU Thrust washer Specification & Tolerance



#### 垫片型号标注方式

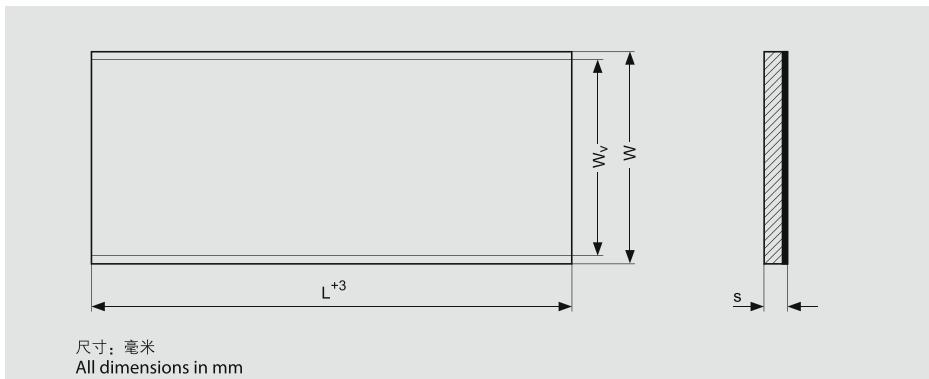
#### Washer Symbol

垫片型号标注方式 Washer Symbol	WC	$\times \times$	EU - □
垫片 Washer			
垫片内径 Washer I.D.			
垫片型号 Washer Type			

内孔 Internal Diameter $\Phi d$		外径 External Diameter $\Phi D$		壁厚 Thickness $s$	定位孔大小 Dowel Hole $\Phi H$	定位孔中心距 Dowel Hole PCD $\Phi H_m$	装配深度 Recess Depth $H_a$	型号 Part No
min	max	min.	max.	max. min.	max. min.	$\Phi \pm 0.125$	max. min.	
10.00	10.25	19.75	20.00	1.50 1.45	无孔 No Hole	无孔 No Hole	1.20 0.80	WC 10 EU
12.00	12.25	23.75	24.00		1.90 1.60	18		WC 12 EU
14.00	14.25	25.75	26.00			20		WC 14 EU
16.00	16.25	29.75	30.00		2.40 2.10	22		WC 16 EU
18.00	18.25	31.75	32.00			25		WC 18 EU
20.00	20.25	35.75	36.00			28		WC 20 EU
22.00	22.25	37.75	38.00		3.40 3.10	30		WC 22 EU
24.00	24.25	41.75	42.00			33		WC 24 EU
26.00	26.25	43.75	44.00			35		WC 26 EU
28.00	28.25	47.75	48.00			38		WC 28 EU
32.00	32.25	53.75	54.00			43		WC 32 EU
38.00	38.25	61.75	62.00			50		WC 38 EU
42.00	42.25	65.75	66.00		4.40 4.10	54		WC 42 EU
48.00	48.25	73.75	74.00	2.00 1.95		61	1.70 1.30	WC 48 EU
52.00	52.25	77.75	78.00			65		WC 52 EU
62.00	62.25	89.75	90.00			76		WC 62 EU



## 5.4 EU 板材规格及公差 EU Strip Specification



### 板材标注方式

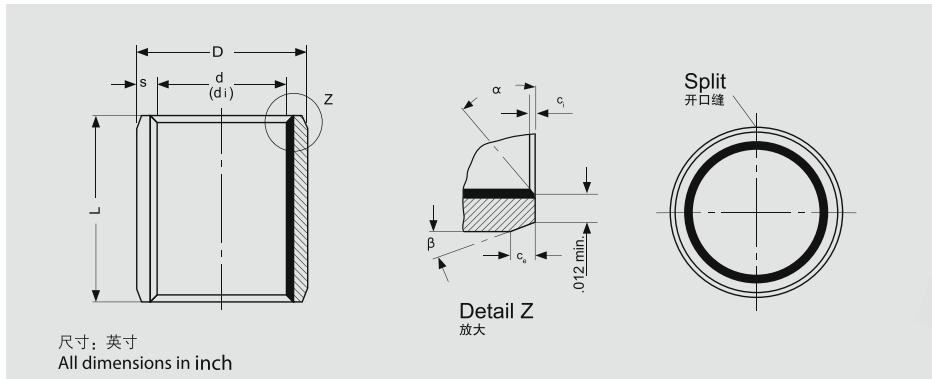
### Strip Symbol

板材标注方式 Strip Symbol	S	$\times \times$	$\times \times$	EU - □
板材 Strip				
板材厚度 Strip Wall Thickness				
板材宽度 Strip Width				
板材型号 Strip Type				

长度 Length L	宽度 Total Width W	有效宽度 Useable Width W <sub>v</sub>	厚度 Thickness S-0.05	型号 Part No
500	160	150	0.75	S 07150 EU
500	225	215	1.00	S 10215 EU
500	254	245	1.50	S 15245 EU
500	254	245	2.00	S 20245 EU
500	254	245	2.50	S 25245 EU
500	254	245	3.00	S 30245 EU



## 5.4 EU 英制直套规格及公差 EU Inch Sleeve Bushing Specification & Tolerance



**内外倒角尺寸表**  
**Inside & Outside Chamfers**

**直套型号标注方式**  
**Bushing Symbol**

壁厚 Wall thickness	内倒角 ID Chamfer		外倒角 OD Chamfer	
	$c_i$	$\alpha$	$c_o$	$\beta$
0.0315"	0.008"- 0.024"	30°- 45°	0.004"- 0.012"	30°- 45°
0.0471"	0.020"- 0.040"	20°- 30°	0.005"- 0.025"	40°- 55°
0.0627"-0.0928"	0.020"- 0.040"	15°- 25°	0.005"- 0.025"	40°- 50°

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

内径 Internal Diameter			外径 External Diameter		高度 Length	壁厚 Wall Thickness	型号 Part No
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	$L \pm 0.01"$	S	
$3/16$	0.1865 0.1858	0.1893 0.1867	$1/4$	0.2503 0.2497	0.1875		03EU03 03EU04 03EU06
					0.2500		
					0.3700		
$1/4$	0.2490 0.2481	0.2518 0.2492	$5/16$	0.3128 0.3122	0.2500		0.0315 0.0305
					0.3750		
$5/16$	0.3115 0.3106	0.3143 0.3117	$3/8$	0.3753 0.3747	0.5000		04EU04 04EU06 05EU06 05EU08
					0.3750		
$3/8$	0.3740 0.3731	0.3769 0.3742	$15/32$	0.4691 0.4684	0.5000		06EU06 06EU08 06EU12
					0.7500		
					0.7500		
$7/16$	0.4365 0.4355	0.4394 0.4367	$17/32$	0.5316 0.5309	0.5000		07EU08 07EU12
					0.7500		
$1/2$	0.4990 0.4980	0.5019 0.4992	$19/32$	0.5941 0.5934	0.3750		08EU06 08EU08 08EU10 08EU14
					0.5000		
					0.6250		
					0.8750		



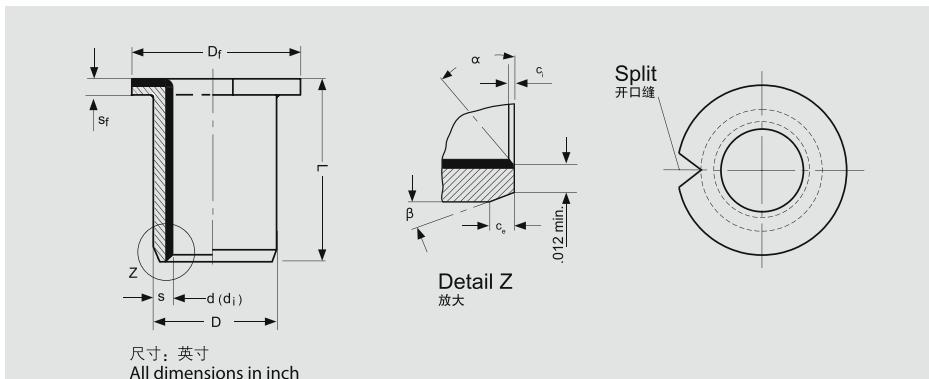
内径 Internal Diameter			外径 External Diameter		高度 Length	壁厚 Wall Thickness	型号 Part No
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	$L \pm 0.01"$	S	
$9/16$	0.5615 0.5605	0.5644 0.5617	$21/32$	0.6566 0.6559	0.5000	0.0471 0.0461	09EU08
					0.7500		09EU12
$5/8$	0.6240 0.6230	0.6270 0.6242	$23/32$	0.7192 0.7184	0.5000	0.0471 0.0461	10 EU 08
					0.6250		10 EU 10
					0.7500		10 EU 12
					0.8750		10 EU 14
					0.5000		12 EU 08
$3/4$	0.7491 0.7479	0.7525 0.7493	$7/8$	0.8755 0.8747	0.7500	0.0627 0.0615	12 EU 12
					0.7500		12 EU 16
					1.0000		14 EU 12
					0.7500		14 EU 14
$7/8$	0.8741 0.8729	0.8775 0.8743	1	1.0005 0.9997	0.8750	0.0627 0.0615	14 EU 16
					1.000		16 EU 12
					0.7500		16 EU 16
					1.0000		16 EU 24
$1\frac{1}{8}$	1.1238 1.1226	1.1278 1.1240	$19/32$	1.2818 1.2808	0.7500	0.0784 0.0770	18 EU 12
					1.0000		18 EU 16
$1\frac{1}{4}$	1.2488 1.2472	1.2528 1.2490	$1\frac{13}{32}$	1.4068 1.4058	0.7500	0.0784 0.0770	20 EU 12
					1.0000		20 EU 16
					1.2500		20 EU 20
					1.7500		20 EU 28
					1.0000		22 EU 16
$1\frac{3}{8}$	1.3738 1.3722	1.3778 1.3740	$1\frac{17}{32}$	1.5318 1.5308	1.3750	0.0784 0.0770	22 EU 22
					1.7500		22 EU 28
					1.0000		24 EU 16
					1.2500		24 EU 20
$1\frac{1}{2}$	1.4988 1.4972	1.5028 1.4990	$1\frac{21}{32}$	1.6568 1.6558	1.5000	0.0941 0.0923	24 EU 24
					2.0000		24 EU 32
					1.0000		26 EU 16
					1.5000		26 EU 24
$1\frac{3}{4}$	1.7487 1.7471	1.7535 1.7489	$1\frac{15}{16}$	1.9381 1.9371	1.0000	0.0941 0.0923	28 EU 16
					1.5000		28 EU 24
					1.7500		28 EU 28
					2.0000		28 EU 32



内径 Internal Diameter			外径 External Diameter		高度 Length	壁厚 Wall Thickness	型号 Part No
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内孔尺寸 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	$L \pm 0.01"$	S	
$1\frac{7}{8}$	1.8737 1.8721	1.8787 1.8739	$2\frac{1}{16}$	2.0633 2.0621	1.0000	0.0941 0.0923	30EU16
					1.8750		30EU30
					2.2500		30EU36
2	1.9987 1.9969	2.0037 1.9989	$2\frac{3}{16}$	2.1883 2.1871	1.0000	0.0941 0.0923	32EU16
					1.5000		32EU24
					2.0000		32EU32
					2.5000		32EU40
$2\frac{1}{4}$	2.2507 2.2489	2.2573 2.2509	$2\frac{7}{16}$	2.4377 2.4365	2.0000	0.0941 0.0923	36EU32
					2.2500		36EU36
					2.5000		36EU40
					3.0000		36EU48
$2\frac{1}{2}$	2.5011 2.4993	2.5077 2.5013	$2\frac{11}{16}$	2.6881 2.6869	2.0000	0.0941 0.0923	40EU32
					2.5000		40EU40
					3.0000		40EU48
					3.5000		40EU56
$2\frac{3}{4}$	2.7500 2.7482	2.7566 2.7502	$2\frac{15}{16}$	2.9370 2.9358	2.0000	0.0941 0.0923	44EU32
					2.5000		44EU40
					3.0000		44EU48
					3.5000		44EU56
3	3.0000 2.9982	3.0068 3.0002	$3\frac{3}{16}$	3.1872 3.1858	2.5000	0.0928 0.0902	48EU32
					3.0000		48EU48
					3.7500		48EU60
$3\frac{1}{2}$	3.5000 3.4978	3.5068 3.5002	$3\frac{11}{16}$	3.6872 3.6858	2.5000	0.0928 0.0902	56EU40
					3.0000		56EU48
					3.7500		56EU60
4	4.0000 3.9978	4.0068 4.0002	$4\frac{3}{16}$	4.1872 4.1858	3.0000	0.0928 0.0902	64EU48
					3.7500		64EU60
					4.7500		64EU76
5	4.9986 4.9961	5.0056 4.9988	$5\frac{3}{16}$	5.1860 5.1844	3.0000	0.0928 0.0902	80EU48
					3.7500		80EU60
6	6.0000 5.9975	6.0070 6.0002	$6\frac{3}{16}$	6.1874 6.1858	3.0000	0.0928 0.0902	96EU48
					3.7500		96EU60
7	6.9954 6.9929	7.0026 6.9956	$7\frac{3}{16}$	7.1830 7.1812	3.7500		112EU60



## 5.6 EU 英制翻边规格及公差 EU Inch Flange Bushing Specification & Tolerance



内外倒角尺寸表  
Inside & Outside Chamfers

翻边套型号标注方式  
Flange Bushing Symbol

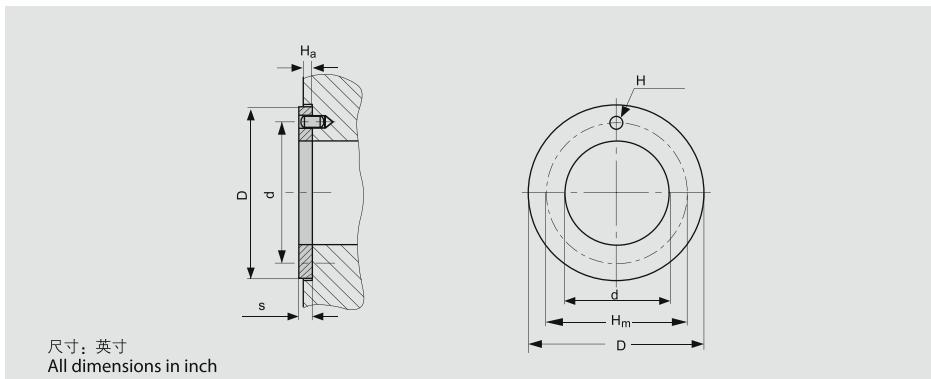
壁厚 Wall thickness	内倒角 ID Chamfer		外倒角 OD Chamfer		翻边套型号标注方式 Flange Bushing Symbol	F	EU - □	× ×
	C <sub>i</sub>	α	C <sub>e</sub>	β				
0.0315"	0.008"- 0.024"	30°- 45°	0.004"- 0.012"	30°- 45°	翻边套内径 Flange Bushing I.D.			
0.0471"	0.020"- 0.040"	20°- 30°	0.005"- 0.025"	40°- 55°	翻边套 Flange			
0.0627"-0.0928"	0.020"- 0.040"	15°- 25°	0.005"- 0.025"	40°- 50°	轴承型号 Flange Bushing Type			
					翻边套高度 Flange Bushing Length			

内径 d	装配轴径 Shaft-Φ d <sub>s</sub>	装配座孔 Housing Φ D <sub>H</sub>	装配后内孔尺寸 Φ d <sub>i</sub>	法兰厚度 Flang Wall S <sub>f</sub>	法兰外径 Flang Φ D <sub>F</sub>	高度 Length		型号 Part No
						L ± 0.01"		
3/8	0.3750 0.3740	0.4684 0.4691	0.3752 0.3779	0.047 0.039	11/16	1/4		06F EU04
						3/8		06F EU06
						1/2		06F EU08
1/2	0.5000 0.4990	0.5934 0.5941	0.5002 0.5029	0.047 0.039	13/16	1/4		08F EU04
						3/8		08F EU06
						1/2		08F EU08
5/8	0.6250 0.6240	0.7184 0.7192	0.6252 0.6280	0.047 0.039	15/16	3/8		10F EU06
						1/2		10F EU08
						5/8		10F EU10
3/4	0.7500 0.7488	0.8747 0.8755	0.7502 0.7534	0.063 0.055	1 1/8	3/8		12F EU06
						1/2		12F EU08
						3/4		12F EU12
7/8	0.8750 0.8738	0.9997 1.0005	0.8752 0.8784	0.063 0.055	1 1/4	1/2		14F EU08
						3/4		14F EU12
						1		14F EU16
1	1.0000 0.9988	1.1247 1.1255	1.0002 1.0034	0.063 0.055	1 3/8	1/2		16F EU08
						3/4		16F EU12
						1		16F EU16



## 5.7 EU 英制垫片规格及公差

### EU Inch Thrust Washer Specification & Tolerance



#### 垫片型号标注方式

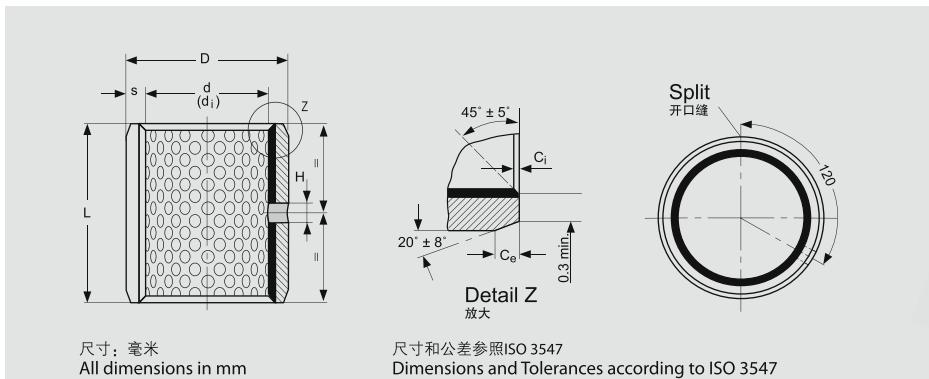
#### Washer Symbol

垫片型号标注方式 Washer Symbol	EU - □	WC	× ×
垫片型号 Washer Type			
垫片 Washer			

内径 Internal Diameter <i>d</i>		外径 External Diameter <i>D</i>		壁厚 Thickness <i>s</i>	定位孔中心 Dowel Hole PCD-Φ <i>H<sub>m</sub></i> ± 0.12	定位孔直径 Dowel Hole-Φ <i>H</i>	Recess Depth <i>H<sub>a</sub></i>	型号 Part No
min.	max.	min.	max.	max. min.	max. min.	± 0.005"	max. min.	
0.510	0.500	0.865	0.875		0.077	0.6870		EU 06
0.572	0.562	0.990	1.000		0.067	0.7810		EU 07
0.635	0.625	1.115	1.125			0.8750		EU 08
0.697	0.687	1.177	1.187		0.109	0.9370		EU 09
0.760	0.750	1.240	1.250		0.099	1.0000		EU 10
0.822	0.812	1.365	1.375			1.0940		EU 11
0.885	0.875	1.490	1.500		0.140	1.1870	0.050	EU 12
1.010	1.000	1.740	1.750		0.130	1.3750	0.040	EU 14
1.135	1.125	1.990	2.000			1.5620		EU 16
1.260	1.250	2.115	2.125		0.171	1.6870		EU 18
1.385	1.375	2.240	2.250		0.161	1.8020		EU 20
1.510	1.500	2.490	2.500			2.0000		EU 22
1.635	1.625	2.615	2.625			2.1250		EU 24
1.760	1.750	2.740	2.750		0.202	2.2500		EU 26
2.010	2.000	2.990	3.000		0.192	2.5000		EU 28
2.135	2.125	3.115	3.125	0.093		2.6250	0.080	EU 30
2.260	2.250	3.240	3.250	0.091		2.7500	0.070	EU 32



## 5.8 EX 直套规格及公差 EX 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 <sub>i</sub>	外倒角 Outside Chamfer C <sub>e</sub>
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	EX - □	× ×	× ×
直套型号 Bushing Type			
直套内径 Bushing I.D.			
直套高度 Bushing Length			

内径 d	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	
	装配轴径 Shaft-Φ d <sub>s</sub>	装配后内径 Φ d <sub>i</sub>	外径 D	装配座孔 Housing-Φ D <sub>H</sub>	理论外径公差 O.D. Φ D <sub>t</sub>					
10	10.000 9.978	10.108 10.040	12	12.018 12.000	+0.065 +0.030	10	S	3	EX 1010	
						12			EX 1012	
						15		4	EX 1015	
						20			EX 1020	
						10			EX 1210	
12	12.000 11.973	12.108 12.040	14	14.018 14.000		12	0.980 0.955	4	EX 1212	
						15			EX 1215	
						20			EX 1220	
						25			EX 1225	
						15			EX 1415	
14	14.000 13.973	14.108 14.040	16	16.018 16.000		20		3	EX 1420	
						25			EX 1425	
						10			EX 1510	
						12		4	EX 1512	
						15			EX 1515	
15	15.000 14.973	15.108 15.040	17	17.018 17.000		20			EX 1520	
						25			EX 1525	



内径 Internal Diameter			外径 External Diameter			高度 Length	壁厚 Wall Thickness	油孔直径-Φ Oil Hole-Φ H	型号 Part No		
内径 d	装配轴径 Shaft-Φ d <sub>s</sub>	装配后内径 Φ d <sub>i</sub>	外径 D	装配座孔 Housing-Φ D <sub>H</sub>	理论外径公差 O.D. Φ D <sub>t</sub>	ID<80 L±0.25					
16	16.000 15.973	16.108 16.040	18	18.018 18.000	+0.065 +0.030	15	0.980	4	EX 1615		
						20			EX 1620		
	18.000 17.973	18.111 18.040	20	20.021 20.000		25			EX 1625		
						15			EX 1815		
						20			EX 1820		
						25			EX 1825		
						10			EX 2010		
20	20.000 19.967	20.131 20.050	23	23.021 23.000	+0.075 +0.035	15	1.475	6	EX 2015		
						20			EX 2020		
						25			EX 2025		
						30			EX 2030		
						15			EX 2215		
	22.000 21.967	22.131 22.050	25	25.021 25.000		20	1.445		EX 2220		
						25			EX 2225		
						30			EX 2230		
						15			EX 2515		
						20			EX 2520		
25	25.000 24.967	25.131 25.050	28	28.021 28.000	+0.085 +0.045	25	1.970	6	EX 2525		
						30			EX 2530		
						20			EX 2820		
						25			EX 2825		
						30			EX 2830		
	28.000 27.967	28.155 28.060	32	32.025 32.000		20	1.935		EX 3020		
						30			EX 3030		
						40			EX 3040		
						20			EX 3220		
						30			EX 3230		
32	32.000 31.961	32.155 32.060	36	36.025 36.000	+0.085 +0.045	35	1.970	6	EX 3235		
						40			EX 3240		
						20			EX 3520		
						30			EX 3530		
						35			EX 3535		
	35.000 34.961	35.155 35.060	39	39.025 39.000		40	1.935		EX 3540		
						50			EX 3550		



内径 Internal Diameter			外径 External Diameter			高度 Length	壁厚 Wall Thickness	油孔直径 Oil Hole- $\Phi$ H	型号 Part No
内径 d	装配轴径 Shaft- $\Phi d_s$	装配后内径 $\Phi d_i$	外径 D	装配座孔 Housing- $\Phi D_h$	理论外径公差 O.D. $\Phi D_t$	ID<80 L±0.25	S		
						ID>80 L±0.50			
40	40.000 39.961	40.155 40.060	44	44.025 44.000	+0.085 +0.045	20	1.970 1.935		EX 4020
						30			EX 4030
						40			EX 4040
						50			EX 4050
45	45.000 44.961	45.195 45.080	50	50.025 50.000		25	8		EX 4520
						30			EX 4530
						40			EX 4540
						45			EX 4545
						50			EX 4550
									EX 5040
50	50.000 49.961	50.200 50.080	55	55.030 55.000		40	2.460 2.415		EX 5050
						50			EX 5060
						60			EX 5520
									EX 5525
55	55.000 54.954	55.200 55.080	60	60.030 60.000		20	8		EX 5530
						25			EX 5540
						30			EX 5550
						40			EX 5560
						50			EX 6030
						60			EX 6040
60	60.000 59.954	60.200 60.080	65	65.030 65.000	+0.100 +0.055	70	2.450 2.384		EX 6060
									EX 6070
						40			EX 6540
						50			EX 6550
65	65.000 64.954	65.262 65.100	70	70.030 70.000		60	8		EX 6560
						70			EX 6570
									EX 7040
						40			EX 7050
						50			EX 7065
						65			EX 7070
70	70.000 69.954	70.262 70.100	75	75.030 75.000		70	9.5		EX 7080
									EX 7540
						80			EX 7560
									EX 7580



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 <sub>s</sub>	装配后内径 Φ d <sub>i</sub>	外径 D	装配座孔 Housing-Φ D <sub>H</sub>	理论外径公差 O.D. Φ D <sub>t</sub>	ID<80 L ± 0.25	S		
						ID>80 L ± 0.50			
80	80.000 79.954	80.267 80.100	85	85.035 85.000		40			EX 8040
						60			EX 8060
						80			EX 8080
						100			EX 80100
85	85.000 84.946	85.267 85.100	90	90.035 90.000		30		2.450 2.384	EX 8530
						40			EX 8540
						60			EX 8560
						80			EX 8580
90	90.000 89.946	90.267 90.100	95	95.035 90.000		100		9.5	EX 85100
						40			EX 9040
						60			EX 9060
						80			EX 9080
95	95.000 94.946	95.267 95.100	100	100.035 100.000		90		+0.120 +0.070	EX 9090
						100			EX 90100
						100			EX 9560
						60			EX95100
100	100.000 99.946	100.267 100.100	105	105.035 105.000		50		9.5	EX 10050
						60			EX 10060
						80			EX 10080
						95			EX 10095
105	105.000 104.946	105.267 105.100	110	110.035 110.000		115		+0.170 +0.100	EX 100115
						60			EX 10560
						110			EX 105110
						115			EX 105115
110	110.000 109.946	110.267 105.100	115	115.035 115.000		60		+0.170 +0.100	EX 11060
						110			EX 110110
						115			EX 110115
						50			EX 11550
115	115.000 114.946	115.267 115.100	120	120.035 120.000		70		+0.170 +0.100	EX 11570
						60			EX 12060
						100			EX 120100
						110			EX 120110
120	120.000 119.946	120.272 120.100	125	125.040 125.000		60		+0.170 +0.100	EX 12560
						100			EX 125100
						110			EX 125110
						60			
125	125.000 124.937	125.272 125.000	130	130.040 130.000		100		+0.170 +0.100	
						110			



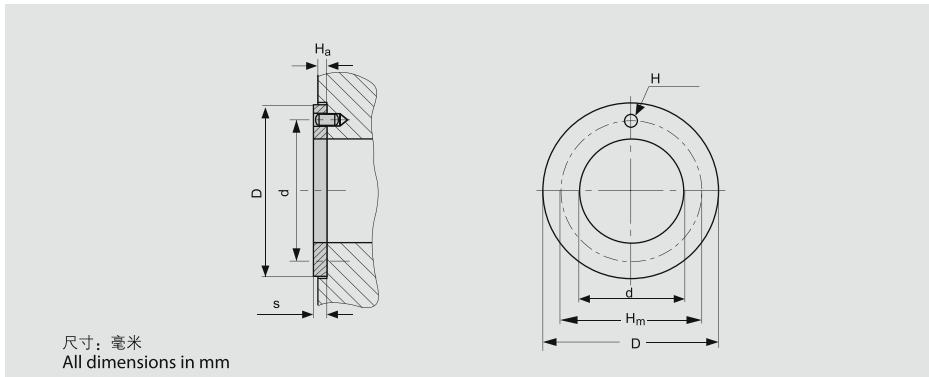
内径 Internal Diameter			外径 External Diameter			高度 Length	壁厚 Wall Thickness	油孔直径 Oil Hole-Φ H	型号 Part No			
内径 d	装配轴径 Shaft-Φ d <sub>s</sub>	装配后内径 Φ d <sub>t</sub>	外径 D	装配座孔 Housing-Φ D <sub>H</sub>	理论外径公差 O.D. Φ D <sub>t</sub>	ID<80 L±0.25	S					
						ID>80 L±0.50						
130	130.000 129.937	130.280 130.130	135	135.040 135.000			50					
							60					
							80					
							100					
	135.000 134.937	135.280 138.130					60					
135							80					
140.000 139.937	140.280 140.130	145	145.040 145.000			50						
						60						
						80						
						100						
140	150.000 149.937	150.280 150.130	155	155.040 155.000			50					
							60					
							80					
							100					
							50					
150	160.000 159.937	160.280 160.130	165	165.040 165.000			60					
							80					
							100					
							50					
							60					
160	170.000 169.937	170.280 170.130	175	175.040 175.000			80					
							100					
							50					
							60					
							80					
170	180.000 179.937	180.286 180.130	185	185.046 185.000			100					
							50					
							60					
							80					
							100					
180	190.000 189.928	190.286 190.130	195	195.046 195.000			50					
							60					
							80					
							100					
							120					
190	200.000 199.928	200.286 200.130	205	205.046 205.000			50					
							60					
							80					
							100					
							120					
200	200.000 199.928	200.286 200.130	205	205.046 205.000			50					
							60					
							80					



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 <sub>s</sub>	装配后内径 Φ d <sub>i</sub>	外径 D	装配座孔 Housing-Φ D <sub>H</sub>	理论外径公差 O.D. Φ D <sub>t</sub>	ID<80 L±0.25	S		
						ID>80 L±0.50			
200	200.000 199.928	200.286 200.130	205	205.046 205.000			80		
							100		
							120		
220	220.000 219.928	220.286 220.130	225	225.046 225.000	+0.210 +0.130		50		
							60		
							80		
							100		
							120		
							50		
240	240.000 239.928	240.286 240.130	245	245.046 245.000			60		
							80		
							100		
							120		
							50		
							60		
250	250.000 249.928	250.292 250.130	255	255.052 255.000			80	2.435 2.380	9.5
							100		
							120		
							50		
							60		
							80		
260	260.000 259.919	260.292 260.130	265	265.052 265.000	+0.260 +0.170		100		
							120		
							50		
							60		
							80		
							100		
280	280.000 279.919	280.292 280.130	285	285.052 285.000			120		
							50		
							60		
							80		
							100		
							120		
300	300.000 299.919	300.292 300.130	305	305.052 305.000			50		
							60		
							80		
							100		
							120		



## 5.9 EX 垫片规格及公差 EX Thrust washer Specification & Tolerance



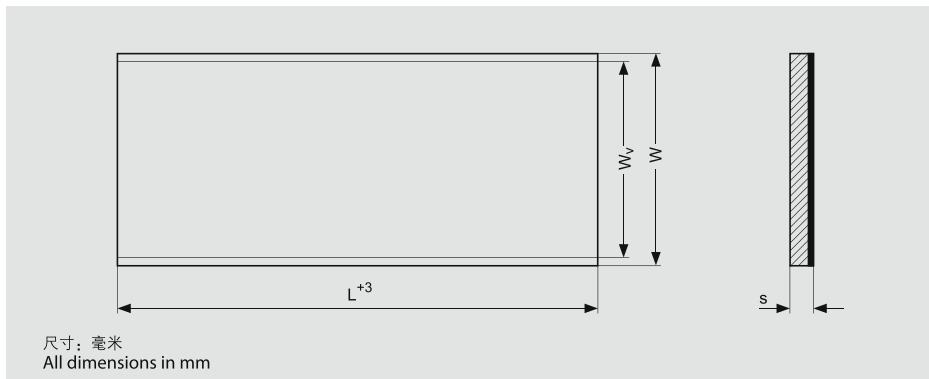
**垫片型号标注方式**  
**Washer Symbol**

垫片型号标注方式 Washer Symbol	WC	$\times \times$	EX - □
垫片 Washer			
垫片内径 Washer I.D.			
垫片型号 Washer Type			

内径 Internal Diameter d		外径 External Diameter D		壁厚 Thickness s	定位孔中心 Dowel Hole PCD- $\Phi$ $H_m \pm 0.12$	定位孔直径 Dowel Hole- $\Phi$ H	Recess Depth $H_a$	型号 Part No	
min.	max.	min.	max.	max. min.	max. min.	$\pm 0.005"$	max. min.		
12.00	12.25	23.75	24.00	1.50 1.45	18	1.9 1.6	1.20 0.80	WC 10 EX	
14.00	14.25	25.75	26.00		20	2.4 2.1		WC 12 EX	
16.00	16.25	29.75	30.00		22			WC 14 EX	
18.00	18.25	31.75	32.00		25			WC 16 EX	
20.00	20.25	35.75	36.00		28	3.4 3.1		WC 18 EX	
22.00	22.25	37.75	38.00		30			WC 20 EX	
24.00	24.25	41.75	42.00		33			WC 22 EX	
26.00	26.25	43.75	44.00		35			WC 24 EX	
28.00	28.25	47.75	48.00		38	4.4 4.1		WC 25 EX	
32.00	32.25	53.75	54.00		43			WC 30 EX	
38.00	38.25	61.75	62.00		50			WC 35 EX	
42.00	42.25	65.75	66.00		54			WC 40 EX	
48.00	48.25	73.75	74.00	1.95	61	1.70 1.30	WC 45 EX WC 50 EX	WC 45 EX	
52.00	52.25	77.75	78.00	2.00	65			WC 50 EX	



## 5.10 EX 板材规格及公差 EX Strip Specification & Tolerance



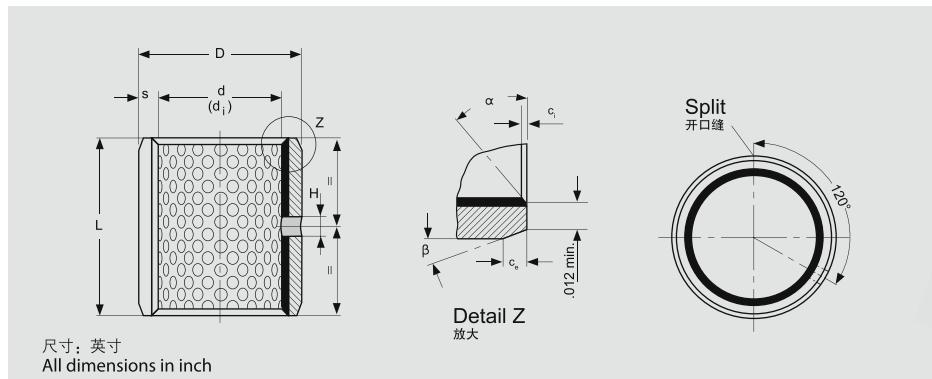
板材标注方式  
Strip Symbol

板材标注方式 Strip Symbol	S	x x x	x x x	EX - □
板材 Strip				
板材厚度 Strip Wall Thickness				
板材宽度 Strip Width				
板材型号 Strip Type				

长度 Length L	宽度 Width W <sub>v</sub>	壁厚 Thickness S-0.05	型号 Part No
500	130 – 150	1.00	S 100 90 EX
	130 – 150	1.50	S 152 00 EX
	130 – 150	2.00	S 202 00 EX
	130 – 150	2.50	S 252 00 EX



## 5.11 EX 英制规格及公差 EX Inch Bushing Specification & Tolerance



内外倒角尺寸表  
Inside and Outside Chamfers Unit mm

直套型号标注方式  
BushingSymbol

壁厚 Wall thickness	内倒角 ID Chamfer		外倒角 OD Chamfer		直套型号标注方式 Bushes Symbol	直套内径 Bushing I.D.	直套型号 Bushing Type	直套高度 Bushing Length
	C <sub>i</sub>	α	C <sub>e</sub>	β				
0.0315"	0.008"- 0.024"	30°- 45°	0.004"- 0.012"	30°- 45°				
0.0471"	0.020"- 0.040"	20°- 30°	0.005"- 0.025"	40°- 55°				
0.0627"-0.0929"	0.020"- 0.040"	15°- 25°	0.005"- 0.025"	40°- 50°				

内径 Internal Diameter			外径 External Diameter		高度 Width	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 <sub>s</sub>	供货内径 Φ d <sub>i</sub>	外径 D	装配座孔 D <sub>H</sub>	L ± 0.01"	S		
$\frac{3}{8}$	0.3648 0.3639	0.3694 0.3667	$\frac{15}{32}$	0.4694 0.4687	0.375		无孔 No hole	06 EX 06
					0.500			06 EX 08
					0.750			06 EX 12
$\frac{7}{16}$	0.4273 0.4263	0.4319 0.4292	$\frac{17}{32}$	0.5319 0.5312	0.500	0.0510 0.0500	08 EX 06	07 EX 08
					0.750			07 EX 12
$\frac{1}{2}$	0.4897 0.4887	0.4944 0.4917	$\frac{19}{32}$	0.5944 0.5937	0.375		08 EX 08	08 EX 08
					0.500			08 EX 10
					0.625			08 EX 14
					0.875			09 EX 08
$\frac{9}{16}$	0.5522 0.5512	0.5569 0.5542	$\frac{21}{32}$	0.6569 0.6562	0.500	5/32	09 EX 12	10 EX 08
					0.750			10 EX 10
$\frac{5}{8}$	0.6146 0.6136	0.6195 0.6167	$\frac{23}{32}$	0.7195 0.7187	0.500		10 EX 12	10 EX 14
					0.625			10 EX 08
					0.750			10 EX 10
					0.875			10 EX 12
$\frac{3}{4}$	0.7390 0.7378	0.7444 0.7412	$\frac{7}{8}$	0.8758 0.8750	0.500	0.0669 0.0657	12 EX 08	12 EX 12
					0.750			12 EX 16
					1.000			



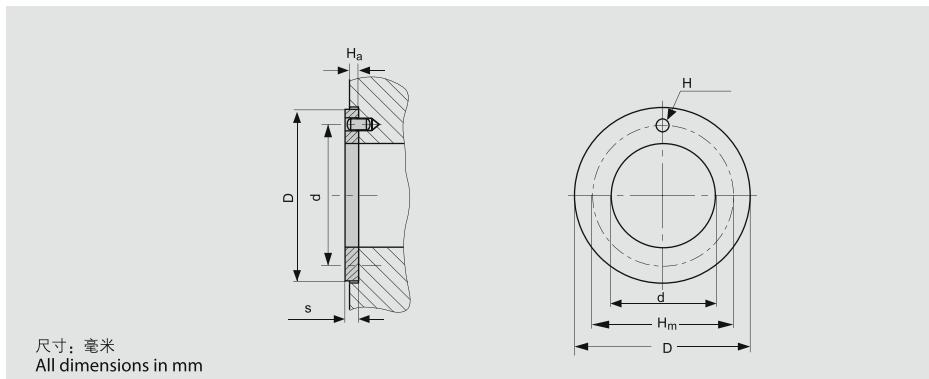
内径 Internal Diameter			外径 External Diameter		高度 Width	壁厚 Wall Thickness	油孔直径 Oil Hole- $\Phi$ H	型号 Part No
内径 d	装配轴径 Shaft- $\Phi d_s$	供货内径 $\Phi d_i$	外径 D	装配座孔 $D_H$	L $\pm 0.01"$	S		
$7/8$	0.8639 0.8627	0.8694 0.8662	1	1.0008 1.0000	0.750	0.0669 0.0657		14 EX 12
					0.755			14 EX 14
					1			14 EX 16
1	0.9888 0.9876	0.9944 0.9912	$1\frac{1}{8}$	1.1258 1.1250	0.750		$1/4$	16 EX 12
					1			16 EX 16
					1.500			16 EX 24
$1\frac{1}{8}$	1.1138 1.1126	1.1202 1.1164	$1\frac{9}{32}$	1.2822 1.2812	0.750		$1/4$	18 EX 12
					1			18 EX 16
$1\frac{1}{4}$	1.2387 1.2371	1.2452 1.2414	$1\frac{13}{32}$	1.4072 1.4062	0.750			20 EX 12
					1			20 EX 16
					1.250			20 EX 20
					1.750			20 EX 28
$1\frac{3}{8}$	1.3635 1.3619	1.3702 1.3664	$1\frac{17}{32}$	1.5322 1.5312	1	0.0824 0.0810		22 EX 16
					1.375			22 EX 22
					1.750			22 EX 28
$1\frac{1}{2}$	1.4884 1.4868	1.4952 1.4914	$1\frac{21}{32}$	1.6572 1.6562	1			24 EX 16
					1.250			24 EX 20
					1.500			24 EX 24
					2			24 EX 32
$1\frac{5}{8}$	1.6133 1.6117	1.6202 1.6164	$1\frac{25}{32}$	1.7822 1.7812	1			26 EX 16
					1.500			26 EX 24
$1\frac{3}{4}$	1.7383 1.7367	1.7461 1.7415	$1\frac{15}{16}$	1.9385 1.9375	1		$5/16$	28 EX 16
					1.500			28 EX 24
					1.750			28 EX 28
					2			28 EX 32
$1\frac{7}{8}$	1.8632 1.8616	1.8713 1.8665	$2\frac{1}{16}$	2.0637 2.0625	1.500	0.0980 0.0962		30 EX 16
					1.875			30 EX 30
					2.250			30 EX 36
2	1.9881 1.9863	1.9963 1.9915	$1\frac{3}{16}$	2.1887 2.1875	1			32 EX 16
					1.500			32 EX 24
					2			32 EX 32
					2.500			32 EX 40



内径 Internal Diameter			外径 External Diameter		高度 Width	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 <sub>s</sub>	供货内径 Φ d <sub>i</sub>	外径 D	装配座孔 D <sub>H</sub>	L ± 0.01"	S		
$2\frac{1}{4}$	2.2378 2.2360	2.2463 2.2415	$2\frac{7}{16}$	2.4387 2.4375	2.010 1.990	0.0980 0.0962	$5/16$	36 EX 32
					2.260 2.240			36 EX 36
					2.510 2.490			36 EX 40
$2\frac{1}{2}$	2.4875 2.4857	2.4963 2.4915	$2\frac{11}{16}$	2.6887 2.6875	2.010 1.990	$5/16$	40 EX 32	40 EX 32
					2.510 2.490			40 EX 40
$2\frac{3}{4}$	2.7351 2.7333	2.7457 2.7393	$2\frac{15}{16}$	2.9387 2.9375	2.010 1.990	0.0991 0.0965	$3/8$	44 EX 32
					2.510 2.490			44 EX 40
					3.010 2.990			44 EX 48
					3.510 3.490			44 EX 56
3	2.9849 2.9831	2.9959 2.9893	$3\frac{3}{16}$	3.1889 3.1875	2.010 1.990	$3/8$	48 EX 32	48 EX 32
					3.010 2.990			48 EX 48
					3.760 3.740			48 EX 60
$3\frac{1}{2}$	3.4844 3.4822	3.4959 3.4893	$3\frac{11}{16}$	3.6889 3.6875	2.510 2.490	$3/8$	56 EX 40	56 EX 40
					3.010 2.990			56 EX 48
					3.760 3.740			56 EX 60
4	3.9839 3.9817	3.9959 3.9893	$4\frac{3}{16}$	4.1889 4.1875	3.010 2.990	$3/8$	64 EX 48	64 EX 48
					3.760 3.740			64 EX 60
					4.760 4.740			64 EX 76



## 5.12 EX 英制垫片规格及公差 EX Inch Thrust washer Specification & Tolerance



### 垫片型号标注方式

### Washer Symbol

垫片型号标注方式 Washer Symbol	EX - □	WC	× ×
垫片型号 Washer Type			
垫片 Washer			
垫片内径 Washer I.D.			

内孔 Nominal Diameter $\Phi d$		外径 Outside $\Phi D$		壁厚 Thickness $s$	装配孔大小 Dowel hole $\Phi H$	装配孔中心距 Dowel Hole PCD $\Phi H_m$	装配深度 Recess Depth $H_a$	型号 Part No
min.	max.	min.	max.	max. min.	max. min.	$\pm 0.005"$	max. min.	
0.500	0.510	0.865	0.875	0.0660 0.0625	0.077	0.6870	0.050 0.040	EX 06
0.562	0.572	0.990	1.000		0.067	0.7810		EX 07
0.625	0.635	1.115	1.125			0.8750		EX 08
0.687	0.697	1.177	1.187		0.109 0.099	0.9370		EX 09
0.750	0.760	1.240	1.250			1.0000		EX 10
0.812	0.822	1.365	1.375			1.0940		EX 11
0.875	0.885	1.490	1.500		0.140 0.130	1.1870 1.3750		EX 12 EX 14
1.000	1.010	1.740	1.750			1.5620		EX 16
1.125	1.135	1.990	2.000		0.171 0.161	1.6870		EX 18
1.250	1.260	2.115	2.125			1.8020		EX 20
1.375	1.385	2.240	2.250	0.202 0.192		2.0000	0.080 0.070	EX 22
1.500	1.510	2.490	2.500			2.1250		EX 24
1.625	1.635	2.615	2.625			2.2500		EX 26
1.750	1.760	2.740	2.750			2.5000		EX 28
2.000	2.010	2.990	3.000			2.6250		EX 30
2.125	2.135	3.115	3.125	0.0970 0.0935		2.7500		EX 32
2.250	2.260	3.240	3.250					



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

$\geq$	$<$	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	$\pm 3$	$\pm 5$	+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	$\pm 4$	$\pm 6$	+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	$\pm 4.5$	$\pm 7$	+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	$\pm 5.5$	$\pm 9$	+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	$\pm 6.5$	$\pm 10$	+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	$\pm 8$	$\pm 12$	+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	$\pm 9.5$	$\pm 15$	+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	$\pm 11$	$\pm 17$	+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																	+88 +63	+117 +92
140	160	-210 -310	-145 -208	-85 -125	-85 -148	-43 -83	-14 -39	0 -18	0 -25	0 -40	0 -63	$\pm 12.5$	$\pm 20$	+28 +3	+40 +15	+52 +27	+68 +43	+83 +43	+90 +65	+125 +100
160	180	-230 -330																	+93 +68	+133 +108
180	200	-240 -355																	+106 +77	+151 +122
200	225	-260 -375	-170 -242	-100 -146	-100 -172	-50 -96	-15 -44	0 -20	0 -29	0 -46	0 -72	$\pm 14.5$	$\pm 23$	+33 +14	+46 +17	+60 +31	+79 +50	+96 +50	+109 +80	+159 +130
225	250	-280 -395																	+113 +84	+169 +140
250	280	-300 -430	-190 -271	-110 -162	-110 -191	-56 -108	-17 -49	0 -23	0 -32	0 -52	0 -81	$\pm 16$	$\pm 26$	+36 +14	+52 +20	+66 +34	+88 +56	+108 +56	+126 +94	+190 +158
280	315	-330 -460																	+130 +98	+202 +170
315	355	-360 -500																	+114 +108	+226 +190
355	400	-400 -540	-210 -299	-125 -182	-125 -214	-62 -119	-18 -54	0 -25	0 -36	0 -57	0 -89	$\pm 18$	$\pm 28$	+40 +4	+57 +21	+73 +37	+98 +62	+119 +62	+150 +114	+244 +208
400	450	-440 -595	-230 -327	-135 -198	-135 -232	-68 -131	-20 -60	0 -27	0 -40	0 -63	0 -97	$\pm 20$	$\pm 31$	+45 +5	+63 +23	+80 +40	+108 +68	+131 +68	+166 +126	+272 +232
450	500	-480 -635																	+172 +132	+292 +252



**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	+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	-
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	-33 -54
24	30	+280 +180	+192 +130	+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
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	+320 +200	+224 +150	+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 -51	-42 -72	-55 -85
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	-32 -51	-48 -78	-64 -94
65	80	+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
80	100	+380 +240	+267 +180	+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	-41 -76	-66 -101	-91 -126
100	120	+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
120	140	+440 +280	+310 +210	+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	-50 -90	-85 -125	-119 -159
140	160	+470 +310	+330 +230	+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	-53 -93	-93 -133	-131 -171
160	180	+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
180	200	+565 +380	+375 +260	+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	-63 -109	-113 -159	-163 -209
200	225	+605 +420	+395 +280	+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	-67 -113	-123 -169	-179 -225
225	250	+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
250	280	+750 +540	+460 +330	+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	-78 -130	-150 -202	-220 -272
280	315	+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
315	355	+910 +680	+540 +400	+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	-93 -150	-187 -224	-273 -330
355	400	+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
400	450	+1090 +840	+635 +480	+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	-109 -172	-229 -292	-337 -400



## 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，卷制类轴承的内外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 gauge. 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)

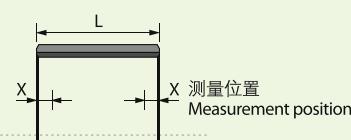
注意：轴套压入环规，轴套外径可能会永久减小  
Note: When the bushing is pressed into ring gauge, external diameter could be permanent reduction.



### 壁厚测量

Wall thickness Measurement

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≤15	L/2	1
15 < L≤50	4	2
50 < L≤90	6 and L/2	3
L > 90	8 and L/2	3





本样本所涉及的文字和数字说明是理论值仅供设计时参考且作为判断产品是否具有适用性，不作为产品性能和品质的保证。本公司有修改产品说明和变更技术数据的权利且恕不事先通知。

The information contained in this catalogue is for reference only. All data and values presented are theoretical and are intended to be offered strictly as a guideline for your reference and verification. There is no expressed or implied warranty for any of the product data presented. Epen Bearing Co. Ltd. reserves the right to change any of the product specifications or design values at any time without prior notice.

如无本公司书面声明，本公司将不承诺所描述的产品适用于某种目的和某种工况条件，本公司将不承担由此直接或间接产生的损失且本公司不承担赔偿义务及法律责任。

Unless previously agreed to in writing, Epen Bearings Co.Ltd. does not warranty the performance, suitability or quality of the products offered in this catalogue and assumes no legal responsibility or obligation for the use of the products or information presented. Please contact Epen Bearings Co. Ltd with any questions.



**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](http://www.cnepen.cn)  
邮件 [epen@cnepen.cn](mailto: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](http://www.cnepen.cn)  
**E-mail** [epen@cnepen.cn](mailto:epen@cnepen.cn)