LARRYSMAN (ZHEJIANG) PRECISION MACHINERY CO., LTD

莱瑞斯曼（浙江）精密机械有限公司

莱瑞斯曼
LARRYSMAN PRECISION

LARRYSM公司简介
INTRODUCTION

莱瑞斯曼（浙江）精密机械有限公司是专业研发、设计、制造和销售自润滑材料和产品的全球顶尖制造企业。我们有专业的设计和研发团队，完善的制造工艺和检验手段，制造适合于各种工况条件下的自润滑材料和产品，产品主要有：LM-10系列无油干式轴承、LM-50系列固体镶嵌自润滑轴承、LM-30系列耐高温轴承、LM系列高端陶瓷轴承等，被广泛应用于汽机车行业、建筑工程机械、水利机械、风力发电、高速列车、塑胶机械、自动化生产线、塑料包装机械等需要传动而无法加油或较难形成油膜的部位。

莱瑞斯曼为全球工业提供最顶尖的自润滑材料解决方案，高品质，高耐摩，抗高温，抗疲劳，低成本，最优质的服务是我们最大的亮点，自润滑材料的研发和设计是我们的专业。

选择像丝一般润滑的材料唯有莱瑞。 “控制滑动，挑战摩擦'

LARRYSMAN (ZHEJIANG) PRECISION MACHINERY CO.,LTD is a the Professional design、made and sales self-lubricating bearing company. we are always depend on mature technic, advanced equipment, perfect art and inspectartifice, manfacture the self-lubricating bearing suit for kinds of operating condition, the products: LM-10 oilless bearing、 LM-50 solid lubricant embedded bearing、etc. It is widely applied to bus industry、buliding engineering machine、 water conservancy machine、plastic machine printing packing machine and need drive or without oil or with little oil form lubrication. The product is deeply subjected to domestic and international customer's good opinion!

LARRYSM company will provide the best product、in reason price and flawless service to customers.

LARRYSM PRECISION MACHINERY

莱瑞斯曼为世界工业提供全球顶尖的自润滑材料解决方案

莱瑞斯曼
LARRYSMAN PRECISION

LARRYSM

Precision Mechinery

作为自润滑轴承的专业厂商，
成为世界的顶尖企业，为现代工业贡献我们的技术。

莱瑞斯曼将此作为经营理念：建设一个人人生活安心舒适，而且地球环境得到良好保护的理想社会。

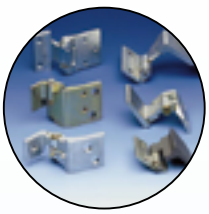
今后也将倾注我们独立的创新以及常年积累的技术开发能力和经验，积极挑战各种难关，所有都是为了能有益于社会，为了使之成为世界各国的人们所喜爱的企业……

自润树脂类、复层类、“全产品”
已经实现了无铅化

自润树脂类复层制品已经可以对应RoHS指令

LARRYSMAN (ZHEJIANG) PRECISION MACHINERY

莱瑞斯曼产品汽车行业的应用



后门铰链

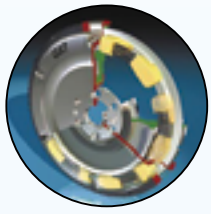
前门铰链

行李箱铰链

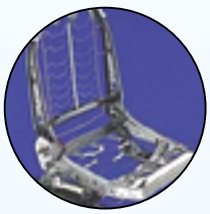
油门和制动系统

发动机涨紧轮

转向器



离合器



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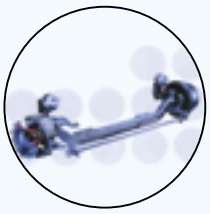


车桥、车轴

减震器

自润滑轴承使用领域

汽车模具滑动导向件—导套、滑块。

重载、低速自润滑，如水坝工作、孤门支铰轴承、事故门轴承，水轮机轴承等。

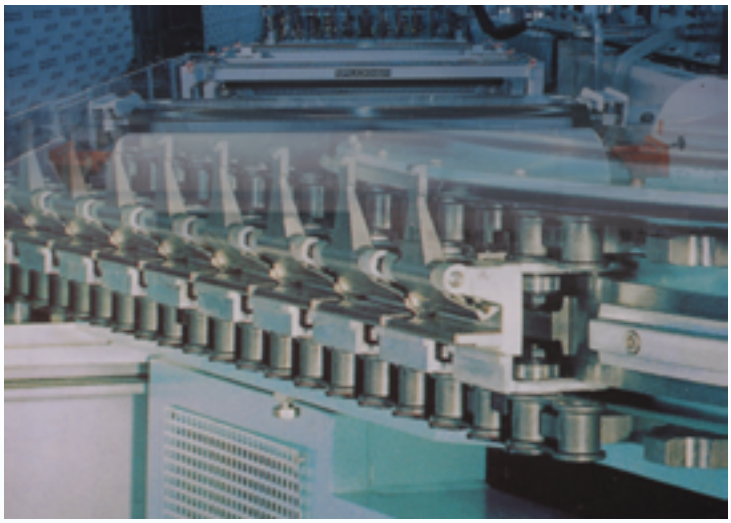
使用于高温场合，如钢铁厂、冶金设备，轧机、输送辊道、高温鼓风炉、烘干炉用轴承。

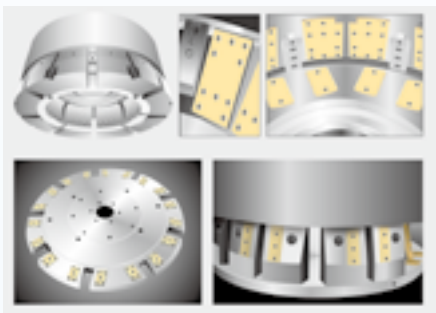
汽机车工业、覆盖件冲压模、组装流水线、传送带等用轴承。

其它工业用轴承、工程机械、注塑机、各种高精度模具等。

化工机械、食品机械、造纸机械、纺织印染机械等需耐腐蚀耐水浸润场合。

替代传统的铜套、滑块、无需加油润滑。





TYPICAL APLICATIONS

Automotive industry-tool support, die

Injection molding-machines and tool

Mechanical machine construction

Steel and/or rolling mills

Machine building-and stone industry

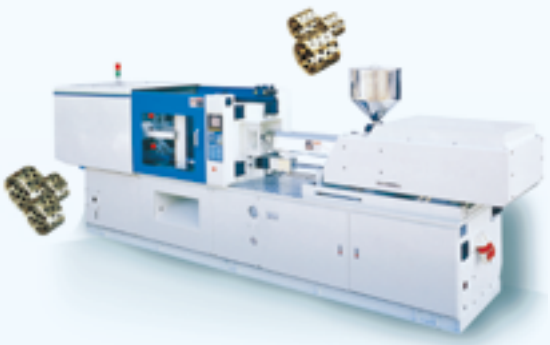
Weir plants / ship building

Heavy duty machine industry

Welding engineering

Packaging industry

Lift and/or conveying engineering



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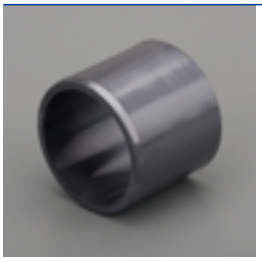


LM-70

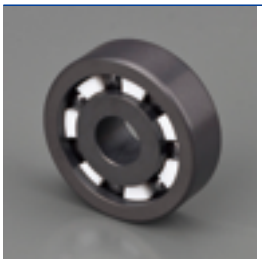
树脂系列自润轴承
PLASTIC BEARINGS

P 16、19

LM-GM6202

链夹轴承
BEARINGS

P 16



LM-TZ

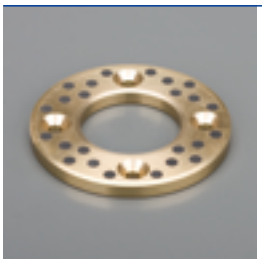
陶瓷滚动轴承
PLASTIC ROLLING BEARINGS

P 15

LM-50

铜基镶嵌式自润滑轴承
SOLID-LUBRICANT INLAID
BEARING

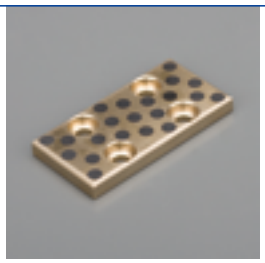
P 33



LM-50W

铜基镶嵌式自润滑垫片
SOLID-LUBRICANT INLAID
WASHER

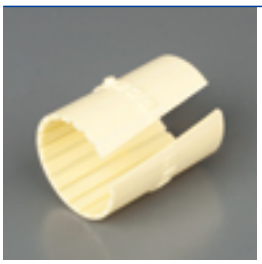
P 37



LM-50SW

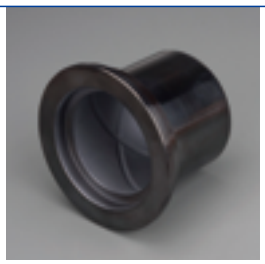
铜基镶嵌式自润滑轴承滑板
SOLID-LUBRICANT INLAID
PLATE

P 38



LM-LIN

塑料直线轴承
LINEAR BEARINGS



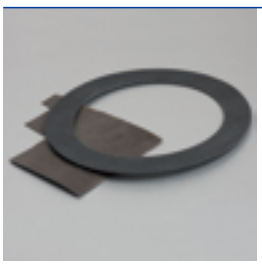
LM-100

耐磨钢套
STEEL BUSHINGS

LM-90

塑料关节轴承
ROD END BEARINGS

TDO-链夹轴
TDO-AXIS



LM-3F

网复合PTFE
316 MESH PTFE

TDO-链夹
TDO-CHAIN CLIP

LM-50 系列材料基本性能

材料成分和性能表						
材料牌号	50	50S1	50S2	50S3	50S5	50HP
日本JIS材料牌号	HBSC4	BC6	CuAl10Ni5Fe5	PBC-2	TM-3	P-31H
密度	8.9	8.9	8.9	8.9	8.9	8.9
硬度HB	> 230	> 70	> 150	> 95	> 260	> 300
抗拉强度 N/mm^2	> 750	> 200	> 600	> 260	> 800	> 540
屈服强度 N/mm^2	> 450	> 90	> 260	> 150	> 450	> 450
延伸率 %	> 12	> 15	> 10	> 8	> 10	> 10
线膨胀系数	1.9×10^{-5}/℃	1.8×10^{-5}/℃	1.6×10^{-5}/℃	1.8×10^{-5}/℃	1.9×10^{-5}/℃	1.8×10^{-5}/℃
使用温度℃	-40 ~ +300℃	-40 ~ +400℃	-40 ~ +400℃	-40 ~ +400℃	-40 ~ +150℃	-40 ~ +150℃
最大动承载 N/mm^2	100	60	50	70	120	150
最大线速度 m/min	15	10	20	10	15	15
最大PV值(润滑) N/mm^2 *m/min	200	60	60	80	200	200
永久压缩变形量 $300N/mm^2$	< 0.01mm	< 0.05mm	< 0.04mm	< 0.05mm	< 0.005mm	< 0.005mm

固体润滑剂		
固体润滑剂	特性	典型用途
高纯石墨+添加剂	很好的耐磨性和化学稳定性，使用温度 < 400℃	适用于一般机械，在大气中使用。
PTFE+添加剂	极低的摩擦系数和很好的水润滑性，使用温度 < 300℃	适用于、海水润滑、如船舶，水工弧门，水轮机，制药饮料机械等。

产品基本特征 PRODUCT BRIEF

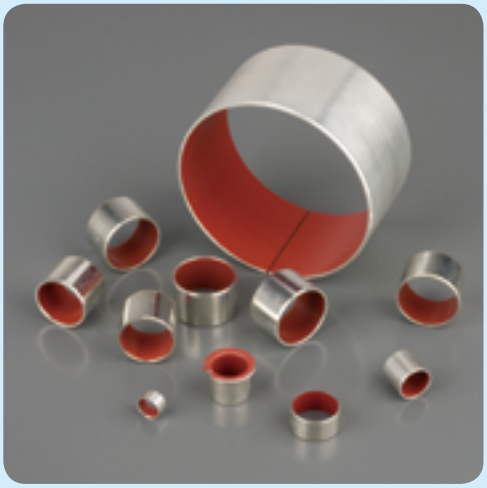
LM-10 无给油轴承 低碳钢+铜粉+PTFE/纤维
STEEL+BRONZE+PTFE(BLACK)

RoHS

适用于无法加油或较难的工作部位,耐磨性能好、摩擦系数小、使用寿命长;走合性能好、低噪音、无污染、耐腐蚀性好；运转中形成的转移膜起到保护对磨轴的作用，无咬轴现象；对磨轴的加工要求低，减轻了用户加工成本。另外，莱瑞开发了应用于齿轮泵、柱塞泵等流体润滑条件下高速自润滑轴承LM-10HP。在流体润滑条件下线速度可以达到10m/s，PV达到60N/mm^2·m/s。

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, forming a transfer film can protect the mating metal surface, suitable for rotary and oscillating movement. High chemical resistance, lower adsorption of water and swelling, Also performs well with lubrication.

最大承载 Max. Load	静承载 Static	300 N/mm^2	使用温度 Temp.	-195℃ ~ 280℃
	动承载 Dynamic	200 N/mm^2	摩擦系数 Friction coefficient	0.03 ~ 0.20
最高线速度 Max. Speed	干 Dry	4m/s	导热系数 Thermal conductivity	42W (m·k)$^{-1}$
	流体 Lubrication	> 5m/s		
最大PV(干) Max. PV(Dry)	短时间 Short-term	3.6 N/mm^2·m/s	热膨胀系数 coefficient of thermal expansion	11×10^{-6} k^{-1}
	连续 Continuos	1.8 N/mm^2·m/s		



LM-40 无给油轴承（红色） 低碳钢+铜粉+PTFE/纤维
STEEL+BRONZE+PTFE(RED)

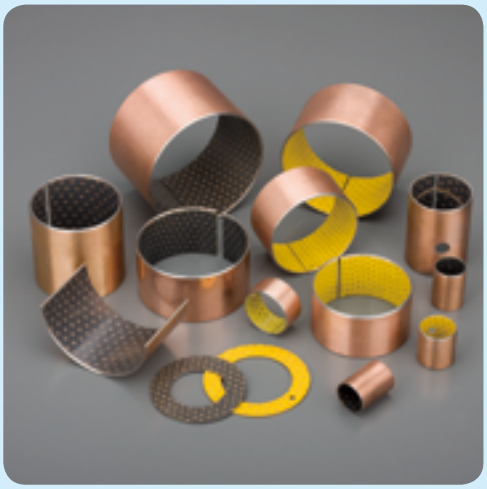
RoHS

适用于无法加油或较难的工作部位,耐磨性能好、摩擦系数小、使用寿命长;走合性能好、低噪音、无污染、耐腐蚀性好；运转中形成的转移膜起到保护对磨轴的作用，无咬轴现象；对磨轴的加工要求低，减轻了用户加工成本；同时LM-40特殊的耐磨层设计在润滑条件上比其他的干式轴承具有更良好的的耐磨性与极低的摩擦系数。

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, forming a transfer film can protect the mating metal surface. suitable for rotary and oscillating movement, Lower absorption of water and swelling. The LM-40 improved the friction and much good wear resistance over the common LM-10 under lubricated operation.

最大承载 Max. Load	静承载 Static	300 N/mm^2	使用温度 Temp.	-195℃ ~ 280℃
	动承载 Dynamic	200 N/mm^2	摩擦系数 Friction coefficient	0.03 ~ 0.20
最高线速度 Max. Speed	干 Dry	4m/s	导热系数 Thermal conductivity	42W (m·k)$^{-1}$
	流体 Lubrication	> 5m/s		
最大PV(干) Max. PV(Dry)	短时间 Short-term	3.6 N/mm^2·m/s	热膨胀系数 coefficient of thermal expansion	11×10^{-6} k^{-1}
	连续 Continuos	1.8 N/mm^2·m/s		
PV流体润滑	PV Hydrodynamic	30 N/mm^2·m/s		

产品基本特征 PRODUCT BRIEF



LM-20 边界润滑轴承 低碳钢+铜粉+PTFE/纤维
STEEL+BRONZE+POM

RoHS

适用于高载低速下的旋转、摇摆运动以及在重载下经常启闭而无法加油的部位，在边界润滑条件下可长期使用而不用加油，过程加油将会大大提高轴套的使用寿命。耐磨层表面有规格的油穴可以作为储油孔使用。目前已广泛使用于冶金机械、矿山机械、水利机械、汽机车、建筑机械、农用机械、轧钢机械等。

High wear resistance and low friction even only minute quantities of lubricant are supplied, the bearing surface carries a pattern of circular indents which should be filled with grease on assembly. Now this materials have been widely used in metallurgy machines, mine machines, water conservancy industries, automotive, agriculture machines, rolling mill etc which for rotary and oscillating movement.

最大承载 Max. Load	静承载 Static	300 N/mm^2	使用温度 Temp.		-195℃ ~ 280℃
	动承载 Dynamic	200 N/mm^2	摩擦系数 Friction coefficient	干 Dry	0.03 ~ 0.20
	旋转承载 Rotating oscillating	100 N/mm^2		流体 Lubrication	> 2m/s
最高线速度 Max. Speed	干 Dry	4m/s	导热系数 Thermal conductivity		42W (m·k)$^{-1}$
	流体 Lubrication	> 5m/s			
最大PV(干) Max. PV(Dry)	短时间 Short-term	3.6 N/mm^2·m/s	热膨胀系数 coefficient of thermal expansion		11×10^{-6} k^{-1}
	连续 Continuos	1.8 N/mm^2·m/s			

LM-30 无给油轴承 低碳钢+铜粉+PI/PEEK
STEEL+BRONZE+PI/PEEK

RoHS

适用于无法加油、较难加油或高温的工作部位，耐磨性能好、摩擦系数小、使用寿命长;走合性能好、低噪音、无污染、耐腐蚀性好；运转中形成的转移膜起到保护对磨轴的作用，无咬轴现象；对磨轴的加工要求低，减轻了用户加工成本；由于LM-30工作表面采用特殊材料，因此LM-30具有较好的耐高温性和高耐磨性。

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, forming a transfer film can protect the mating metal surface, suitable for rotary and oscillating movement. Very high chemical resistance, low absorption of water and swelling. Also performs well with lubrication. Stainless steel backing provides improved corrosion resistance compared with LM-10.

最大承载 Max. Load	静承载 Static	400 N/mm^2	使用温度 Temp.	-150℃ ~ 380℃
	动承载 Dynamic	250 N/mm^2		
	旋转承载 Rotating oscillating	100 N/mm^2	摩擦系数 Friction coefficient	0.03 ~ 0.20
最高线速度 Max. Speed	干 Dry	10m/s	导热系数 Thermal conductivity	50W (m·k)$^{-1}$
	流体 Lubrication	> 10m/s		
最大PV(干) Max. PV(Dry)	短时间 Short-term	4.8 N/mm^2·m/s	热膨胀系数 coefficient of thermal expansion	11*10^{-6}*k^{-1}
	连续 Continuos	3.6 N/mm^2·m/s		

产品基本特征 PRODUCT BRIEF

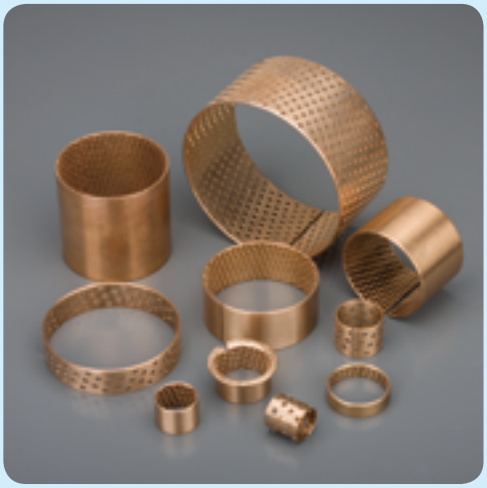
LM-33 涂喷无给油轴承
316+PTFE

RoHS

以不锈钢材料为基体，表面涂喷PTFE组成的高耐蚀、耐磨轴承。该材料特别适应强酸、强碱、轻载中低速的场合，其耐磨性能明显优于单体PTFE轴套和石墨轴套。目前该产品已广泛用于化工酸碱流量计、泵、阀以及海洋工业中耐腐蚀滑动的部位。

LM-33 Stainless steel Pb-free self-lubricating bearing used stinless steel material as base,spray painting PTFE on the surface.It is characterized by acid-resistant,alkaline-resistant,ocean water resistant and environmental protection.It is t is used widely as fluid valve of measuring acid and alkalizing flow in chemical industry,and corrosion resisting sliding position in marine industry.

最大承载 Max. Load	静承载 Static	250 N/mm^2	使用温度 Temp.	-195℃ ~ 280℃
	动承载 Dynamic	140 N/mm^2	摩擦系数 Friction coefficient	0.03 ~ 0.20
最高线速度 Max. Speed	干 Dry	2m/s	导热系数 Thermal conductivity	42W (m·k)$^{-1}$
	流体 Lubrication	> 2m/s		
最大PV(干) Max. PV(Dry)	短时间 Short-term	3.6 N/mm^2·m/s	热膨胀系数 coefficient of thermal expansion	11×10^{-6} k^{-1}
	连续 Continuos	1.8 N/mm^2·m/s		



LM-22 铜基卷制轴承
BRONZE WRAPPED BEARING WITH THROUGH HOLES

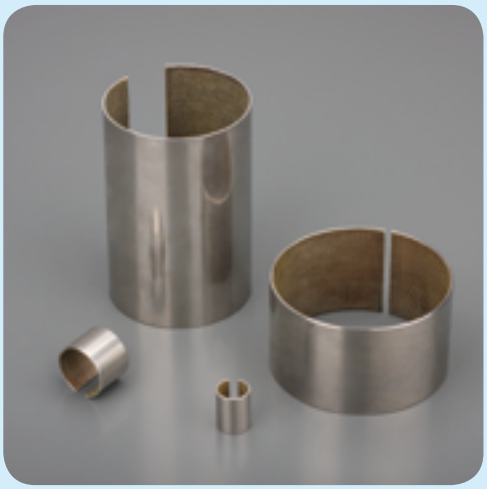
RoHS

该轴套以CuSn8青铜为基材卷制而成的一中具有承载高，耐磨性能好的经济型轴承。标准的LM-22产品工作表面不满规则的菱形油穴或穿孔油眼，起到储油或加油的作用，在起始运动时能较容易的形成油膜从而降低起始摩擦系数。主要运用农用机械、建筑机械等高载低速场合。

The bearings are wrapped of a cold formable homogenous bronze (CuSn8), which will obtain exceptional material properties. The standard size are fitted with holes. which are dispersed in a special Way over the whole bearing surface. These indents serve as lubricant reservoirs to rapidly build up a lubrication film in the start movement and therewith reduce the start friction. The material suitable for construections, agriculture etc where high load and slow movement are occurring.

最大承载 Max. Load	静承载 Static	120 N/mm^2	延伸率 Elongation	40%
	动承载 Dynamic	40N/mm^2	使用温度 Temp.	-100℃ ~ 200℃
最高线速度 (润滑)	Max. Speed (Lubrication)	2m/s	摩擦系数 Friction coefficient	0.08 ~ 0.25
最大PV	Max. PV	2.8 N/mm^2·m/s	导热系数 Thermal conductivity	58W (m·k)$^{-1}$
抗拉强度	Tensile strength	450 N/mm^2	热膨胀系数 Coef. of thermal expansion	18.5×10^{-6} k^{-1}
硬度	Hardness	HB 110-150		

产品基本特征 PRODUCT BRIEF



LM-36 无给油轴承 316 FIBER

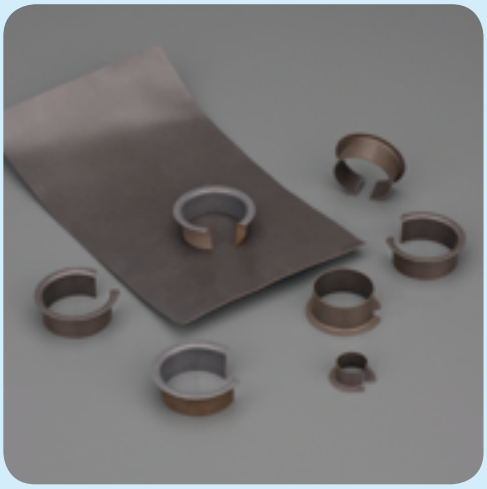
不锈钢316 stainless 316 +PTFE织物 fabric

RoHS

该材料以各种优质金属为基体，表面覆着以PTFE和其它添加剂为主的低摩擦耐摩编织物材料。这种材料结构相比一般三层复合材料具有更高的承载能力、抗高温性和更长的使用寿命。基材为低碳钢（LM-36T）、不锈钢（LM-36H）、钢（LM-36S）等。主要运用于高温生产线、建筑机械、汽机车底盘零部件、球阀、蝶阀各
种阀门，水泵及化工工业和高速火车等重载低速而无法加油的场合。

The material is in various high-quality metal for the substrate, the surface covered with PTFE and other additives to the low friction abrasion-based woven fabric material. This material is compared to the general three-layer composite structure has a higher carrying capacity, high-temperature and longer life. Substrate for low-carbon steel (LM-36T), stainless steel (LM-36H), steel (LM-36S) and so on. Mainly used in high temperature production lines, construction machinery, automobile chassis parts, ball valves, butterfly valves, pumps and chemical industries and high-speed trains and other heavy low and can not refuel occasion

最大承载 Max. Load	静承载 Static	450 N/mm^2	使用温度 Temp.	-150℃ ~ 380℃
	动承载 Dynamic	250 N/mm^2	摩擦系数 Friction coefficient	0.03 ~ 0.20
最高速度 Max. Speed	干运行 Dry	1.5m/s	导热系数 Thermal conductivity	42W (m·k)$^{-1}$
	流体 Lubrication	> 2.5m/s		
最大PV(干) Max. PV(Dry)	短时间 Short-term	3.6 N/mm^2·m/s	热膨胀系数 coefficient of thermal expansion	11·10^{-6}·k^{-1}
	连续 Continuos	1.8 N/mm^2·m/s		



LM-82 金属编织网无给油轴承 PTFE BRONZE MESH WITH PTFE LAYER BEARINGS

RoHS

LM-82以金属网为基材，表面附着以PTFE为主的耐磨材料。产品广泛运用化工行业、食品工业、汽机车、办公机械、纺织机械、汽车门铰链风轻载但需要自润滑材料，可运用于不同的领域。这种产品更容易于安装。

LM-82 consists of a bronze mesh shell, laminated with compounded PTFE tape. This material structure enables the final parts to be lighter and easier for installation. It is widely used in chemical industries, medical industries, food industries, textile machines, OA machines, and door/window hinges etc.

最大承载 Max. Load	静承载 Static	350 N/mm^2
	动承载 Dynamic	180 N/mm^2
最高速度 Max. Speed	干运行 Dry	1m/s
	流体 Lubrication	> 1m/s
使用温度	Temp.	-195℃ ~ 260℃
摩擦系数	Friction coefficient	0.03 ~ 0.20

产品基本特征 PRODUCT BRIEF

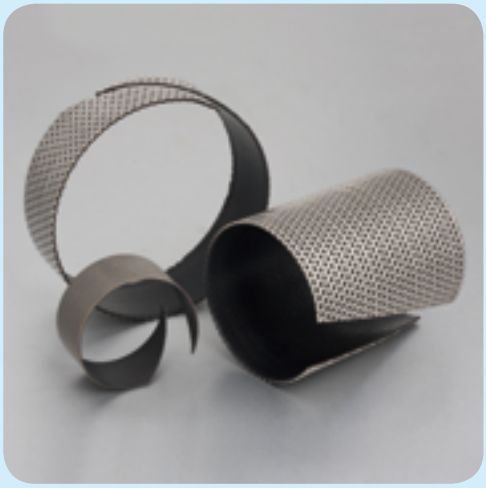
LM-LIN 塑料直线轴承
LINEAR BEARINGS

RoHS

免维护、长期干运行、无噪音；适合灰尘中长期运行；耐腐蚀，适合用消毒清洗；斜槽设计更强的对轴保护能力；减小了槽宽以增强承载能力；安装和替换简易；适合轻量化设计。

Maintenance-free, Drying working, noiseless; Suitable for long-time running in dusty environments; Corrosion resistance; Cleaning with disinfectant lotion; Inclined groove designation provides better protection to the shaft; Narrowed groove improves the load capacity; Easy installation and replacement; Suitable for lightweight design.

最大表面速度（直线运动）	15m/s
抗拉强度	100MPa
抗压强度	80MPa
颜色	奶黄色
洛氏硬度	HRR120
连续工作温度	-80℃~120℃



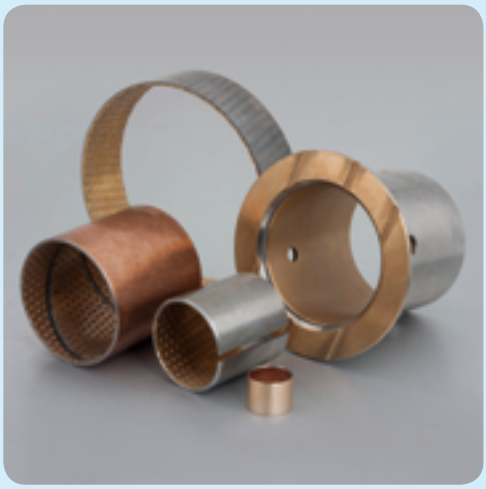
LM-3S 不锈钢基冲孔无给油轴承
STAINLESS WITH THROUGH HOLE SELF-LUBRICATING BEARING

LM-3S以规则不锈钢网为基材，表面附着以PTFE为主的耐磨材料。产品广泛运用于化工行业，食品工业等，如化工阀门，需在海水中润滑的部件等。此产品大大提高了耐腐蚀性，耐强酸、强碱性，而且又起到了自润滑的效果。

LM-3S consists of a stainless steeI mesh shell Iaminated with compounded PTFE tape. This materiaI structure enables the finaI goods have more light. The stainless steel provides good corrosion resistance. It is widely been used in chemicaI industries Iike chemicaI valves. medical industries, food industries etc.

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

产品基本特征 PRODUCT BRIEF



LM-800 双金属卷制轴承
BIMETALLIC SELF-LUBRICATING BEARING

RoHS

以碳钢为基体表面烧结铜粉，适用于高载低速下的旋转、摇摆运动，铜粉面可根据要求加工出各种油孔、油槽。目前已广泛使用于矿山机械、汽机车、建筑机械、农用机械、轧钢机械等。

Steel backed lead bronze lined bearing material for lubricated applications, high load capacity and good fatigue properties, have been widely used in automotive, common industrial like steering gear, power steering, pedal bushes, king-pin bushes, tailgate pivots, mechanical handling, lifting equipment, hydraulic motors, agricultural machines etc.

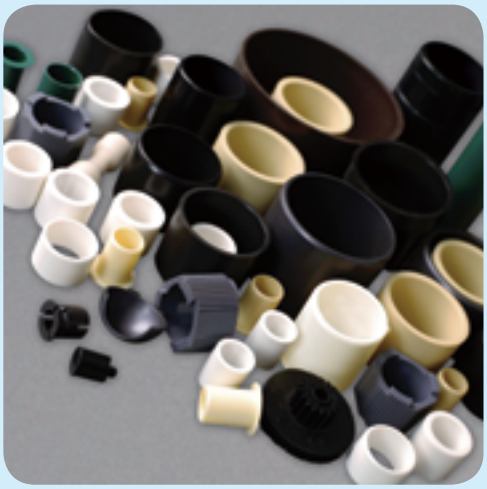
最大承载 Max. load	静承载 Static	250N/mm^2	屈服强度 Yield point	240N/mm^2
	动承载 Dynamic	140N/mm^2	使用温度 Temp.	-40℃~+250℃
最高线速度	Max. speed	2m/s	摩擦系数 Friction coefficient	0.08~0.20
最大PV	Max. PV	2.8N/mm^{2*}·m/s	导热系数 Thermal conductivity	60W (m*k)$^{-1}$
抗剪切强度	Breaking Load	350N/mm^2	热膨胀系数Coef. of thermal expansion	14*10^{-6}K^{-1}

LM- FU 粉末冶金
POWDER SINTERED BEARINGS

RoHS

该产品以锡青铜等金属为原料，经过模压制作，在高温中烧结整形，经润滑油真空浸湿后而含油状态。它广泛用于化工机械，纺织机械，汽车工业，电动工业等。

The base material for sintered parts such as sliding bearings or other formed parts are iron, bronze, iron with bronze and other metal in powder form. This powder is formed under high pressure in dies into a temperature which is just below the melting point. According to the work condition, the bearings can impregnated different oil or solid lubricants for the self-lubricating. Sintered self-lubricating bearings are the ideal and economical solution for applications where lubrication is difficult or can not be given.



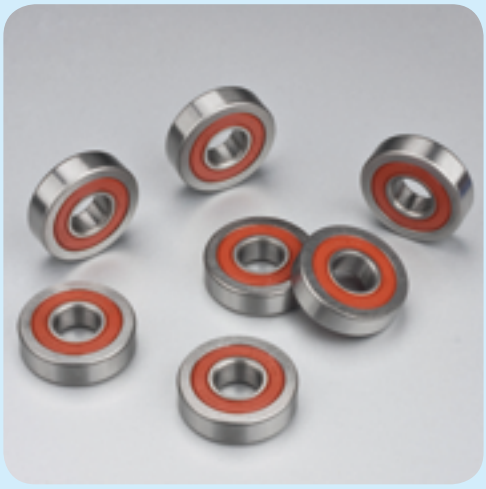
LM-70 树脂系列轴承
PLASTIC BEARINGS

RoHS

以各种优质工程塑料采用注塑工艺加工而成，适合于大批量生产，制造成本低。具有自润滑性能可免维护免加油，承载能力高，无咬轴现象，耐腐蚀性好，摩擦系数低，相比金属基轴承具有重量轻，生产成本低，生产效率高等特点。广泛运用于汽机车行业、传真机、复印机、食品机械、健身机械、化工行业等。

LM-70 series material is a thermal mould character plastic processed by crystal engineering plastic as basic material with proper intensifier and lubricant. The rigidity and high temperature engineer capability is greatly improved because of the use of intensifier, at the same time, the coefficient of thermal expansion, moulding shrinking rate and wriggle capability decreases, consequently, the size stability is improved, and EPB series material range is enlarged and keeps the intrinsic anti-wear capability and anti-drug capability.

最大承载 Max. Load	静承载 Static	180 N/mm^2	使用温度 Temp.	-40℃ ~ 80℃
	动承载 Dynamic	100 N/mm^2	摩擦系数 Friction coefficient	0.05 ~ 0.20
最高线速度 Max. Speed	干 Dry	1m/s	导热系数 Thermal conductivity	0.2W $(m·k)^{-1}$
	流体 Lubrication	> 1m/s		
最大PV(干) Max. PV(Dry)	短时间 Short-term	1 $N/mm^2·m/s$	热膨胀系数 coefficient of thermal expansion	$10^{-1}*k^{-5}$
	连续 Continuos	0.8 $N/mm^2·m/s$		



LM-GM6202 链夹轴承
BEARINGS

RoHS

专为BOPP、BOPET 双向拉伸薄膜生产线而设计的链夹轴承，耐高温200℃-300℃。成功解决了特种轴承货期长、寿命段、恶劣环境下易变形等缺点，为企业生产节约了时间，降低了成本，带来了良好的经济效益。

极限耐高温、高精度、高转速、噪音抵、寿命长；顶级耐高温油脂，进口核心材料，终身自润滑设计；不漏脂、不变形、可连续安全运转10000小时以上；可替代（Can replace）NTN TS3-6202/40C3、SNR AB40228S05(6202/42C4)、SNR AB12305S1(6201/34C4)。

Basic features for BOPP, BOPET biaxially oriented film production line designed chain clip bearings, high temperature 200 ℃ -300 ℃. Successfully resolved a long period of special bearing goods, life segment, harsh environments easily deformed and other shortcomings, for the production and save time, reduce costs, bring good economic

产品基本特征 PRODUCT BRIEF

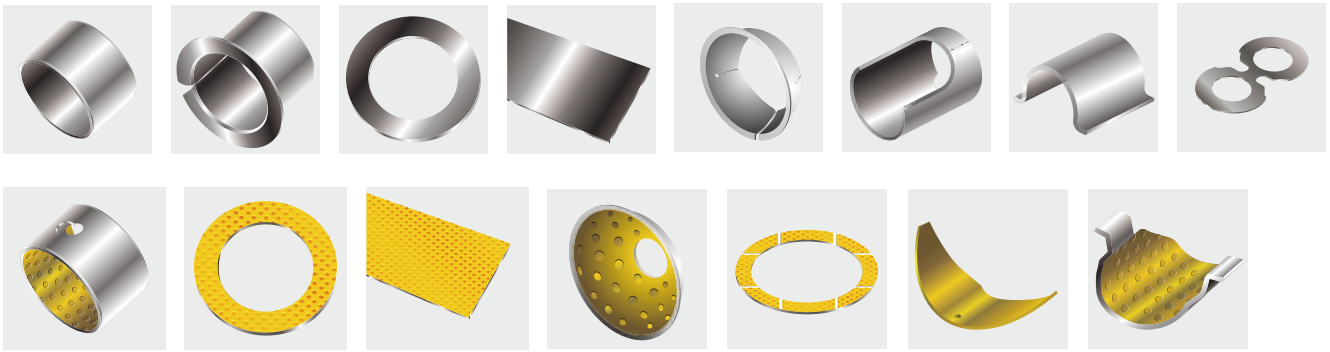
LM-TZ 陶瓷滚动轴承
PLASTIC ROLLING BEARINGS

RoHS

LM-TZ系列陶瓷滚动轴承具有良好的强度和耐磨性， 此材料耐高温高寒；使用温度-100℃～+600℃；最高转速：2000RPM；内外圈材料：ZrO2，保持架材料：Steel or PTFE，滚珠材料：ZrO2；此种轴承材料本身具有耐腐蚀的特性，可应用在强酸、强碱、无机、有机盐、海水等领域。

LM-TZ series ceramic bearing has good strength and wear resistance, cold temperature of this material; temperature -100 ℃ ~ +600 ℃; maximum speed: 2000RPM; inside and outside the ring material: ZrO2, cage material: Steel or PTFE, Ball material: ZrO2; such a bearing material itself has a corrosion-resistant properties, can be applied to acids, alkalis, inorganic, organic salt, water and other fields.

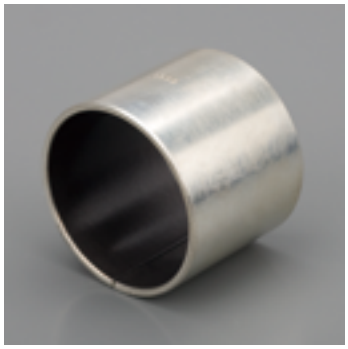
可供形式 AVAILABILITY



检测设备

LM-10,LM-40, LM-33

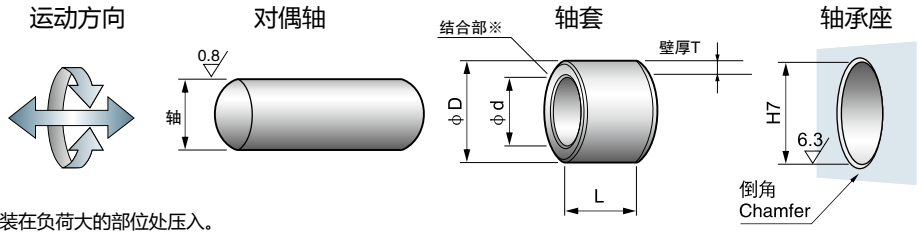
轴套 **Cylindrical bushes** (内径I.D⌀5~⌀40)



请从适用的内径、外径、长度中选择零件号
(例)内径15mm、长度10mm的情况下

LM-10 - 1510

请指定上述零件号

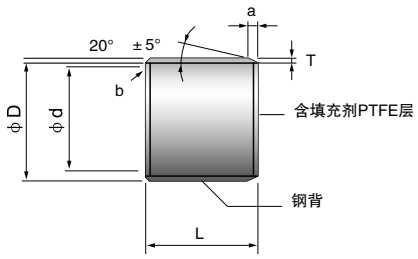


※结合部对于轴旋转没有影响，但尽量避免安装在负荷大的部位处压入。

轴 shaft		座孔housing		内径	外径		壁厚		长度 L $^{0}_{-0.40}$				
		H7		⌀d	⌀D		T		4	5	6	8	10
5	$^{-0.010}_{-0.022}$	7	$^{+0.015}_{0}$	5	7	$^{+0.055}_{+0.025}$	1.0	$^{+0.005}_{-0.020}$		0505			
6	$^{-0.013}_{-0.028}$	8	"	6	8	"	"	"	0604		0606	0608	0610
7	"	9	"	7	9	"	"	"					
8	"	10	"	8	10	"	"	"			0806	0808	0810
10	"	12	$^{+0.018}_{0}$	10	12	$^{+0.065}_{+0.030}$	"	"				1008	1010
12	$^{-0.016}_{-0.034}$	14	"	12	14	"	"	"				1208	1210
13	"	15	"	13	15	"	"	"					1310
14	"	16	"	14	16	$^{+0.065}_{+0.035}$	"	"		1405			1410
15	"	17	"	15	17	"	"	"					1510
16	"	18	"	16	18	"	"	"					1610
17	"	19	$^{+0.021}_{0}$	17	19	$^{+0.075}_{+0.035}$	"	"					1710
18	"	20	"	18	20	"	"	"					1810
20	$^{-0.020}_{-0.041}$	23	"	20	23	"	1.5	$^{+0.005}_{-0.025}$					2010
22	"	25	"	22	25	"	"	"					2210
24	"	27	"	24	27	"	"	"					
25	"	28	"	25	28	"	"	"					2510
28	"	32	$^{+0.025}_{0}$	28	32	$^{+0.085}_{+0.045}$	2.0	$^{+0.005}_{-0.030}$					
30	"	34	"	30	34	"	"	"					
32	$^{-0.025}_{-0.050}$	36	"	32	36	"	"	"					
35	"	39	"	35	39	"	"	"					
37	"	41	"	37	41	"	"	"					
38	"	42	"	38	42	"	"	"					
40	"	44	"	40	44	"	"	"					

LM-10, LM-40, LM-33

轴套 **Cylindrical bushes** (内径I.D⌀5 ~⌀40)



※外径倒角 内径　10以上(mm)

T	1.0	1.5	2.0
a	0.5	0.8	1.0

※内径倒角 内径　10以上(mm)

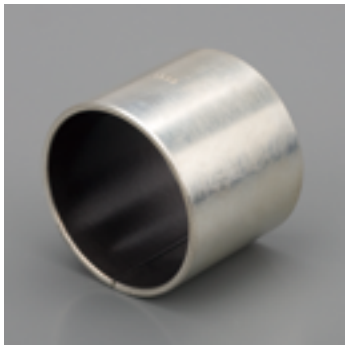
T	1.0	1.5	2.0
b	C0.5	C0.8	C1.0

※内径　10不到的内外径倒角去除毛刺程度即可

长度 L $^{0}_{-0.40}$								内径
12	15	20	25	30	35	40	50	⌀d
								5
								6
								7
0812	0815							8
1012	1015	1020						10
1212	1215	1220	1225					12
		1320						13
1412	1415	1420	1425					14
1512	1515	1520	1525					15
1612	1615	1620	1625					16
		1720						17
	1815	1820	1825					18
	2015	2020	2025	2030				20
	2215	2220	2225	2230				22
	2415	2420	2425	2430				24
	2515	2520	2525	2530			2550	25
	2815	2820	2825	2830				28
	3015	3020	3025	3030		3040	3050	30
		3220		3230				32
		3520		3530	3535	3540		35
		3720						37
		3820		3830		3840		38
		4020		4030		4040	4050	40

LM-10, LM-40, LM-33

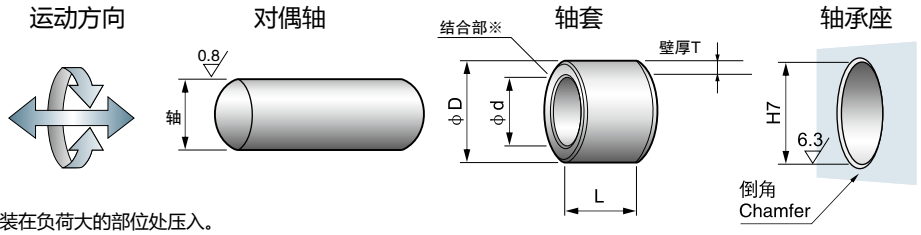
轴套 **Cylindrical bushes** (内径I.D⌀45 ~⌀260)



请从适用的内径、外径、长度中选择零件号
(例)内径60mm、长度50mm的情况下

LM-10 - 6050

请指定上述零件号

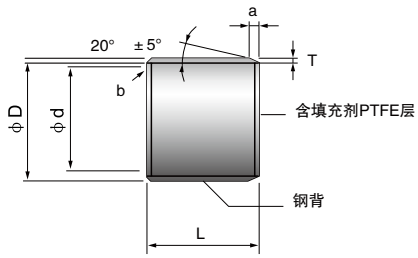


※结合部对于轴旋转没有影响，但尽量避免安装在负荷大的部位处压入。

轴 shaft		座孔housing		内径	外径		壁厚		长度 L $^{0}_{-0.40}$				
		⌀H7		⌀d	D		T		20	25	30	40	50
45	$^{-0.025}_{-0.050}$	50	$^{+0.025}_{0}$	45	50	$^{+0.085}_{+0.045}$	2.5	$^{+0.005}_{-0.040}$	4520	4525	4530	4540	4550
50	"	55	$^{+0.030}_{0}$	50	55	$^{+0.100}_{+0.055}$	"	"	5020		5030	5040	5050
55	$^{-0.030}_{-0.060}$	60	"	55	60	"	"	"			5530	5540	5550
60	"	65	"	60	65	"	"	"			6030	6040	6050
65	"	70	"	65	70	"	"	"			6530	6540	6550
70	"	75	"	70	75	"	"	"				7040	7050
75	"	80	"	75	80	"	"	"			7530	7540	7550
80	$^{0}_{-0.030}$	85	$^{+0.035}_{0}$	80	85	$^{+0.120}_{+0.070}$	"	$^{-0.010}_{-0.060}$				8040	8050
85	$^{0}_{-0.035}$	90	"	85	90	"	"	"				8540	
90	"	95	"	90	95	"	"	"				9040	9050
95	"	100	"	95	100	"	"	"					9550
100	"	105	"	100	105	"	"	"					10050
105	"	110	"	105	110	"	"	"					
110	"	115	"	110	115	"	"	"					
115	"	120	"	115	120	"	"	"					
120	"	125	$^{+0.040}_{0}$	120	125	$^{+0.170}_{+0.100}$	"	$^{-0.035}_{-0.085}$					
125	$^{0}_{-0.040}$	130	"	125	130	"	"	"					
130	"	135	"	130	135	"	"	"					
135	"	140	"	135	140	"	"	"					
140	"	145	"	140	145	"	"	"					
150	"	155	"	150	155	"	"	"					
160	"	165	"	160	165	"	"	"					
180	"	185	$^{+0.046}_{0}$	180	185	$^{+0.210}_{+0.130}$	"	"					
190	$^{0}_{-0.046}$	195	"	190	195	"	"	"					
200	"	205	"	200	205	"	"	"					
220	"	225	"	220	225	"	"	"					
250	"	255	$^{+0.052}_{0}$	250	255	$^{+0.260}_{+0.170}$	"	"					
260	"	265	"	260	265	"	"	"					

LM-10, LM-40, LM-33

轴套 **Cylindrical bushes** (内径I.D⌀ 45 ~⌀ 260)



a:外径倒角(mm)

T	2.0	2.5
a	1.0	1.0

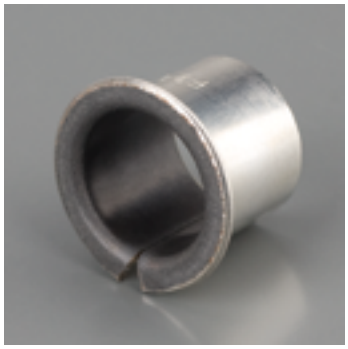
b:内径倒角(mm)

T	2.0	2.5
b	C0.5	C0.5

长度 L $^{0}_{-0.40}$					内径
60	70	80	100	115	⌀d
					45
5060					50
5560					55
6060	6070				60
6560	6570				65
7060	7070	7080			70
7560	7570	7580			75
8060	8070	8080	80100		80
8560		8580	85100		85
9060		9080	90100		90
9560		9580	95100		95
10060		10080		100115	100
10560		10580		105115	105
11060		11080		110115	110
11560		11580			115
12060		12080	120100		120
			125100		125
13060		13080	130100		130
		13580	135100		135
14060		14080	140100		140
15060		15080	150100		150
16060		16080	160100	160115	160
		18080	180100		180
		19080	190100		190
20060		20080	200100		200
		22080	220100		220
		25080	250100		250
		26080	260100		260

LM-10, LM-40, LM-33

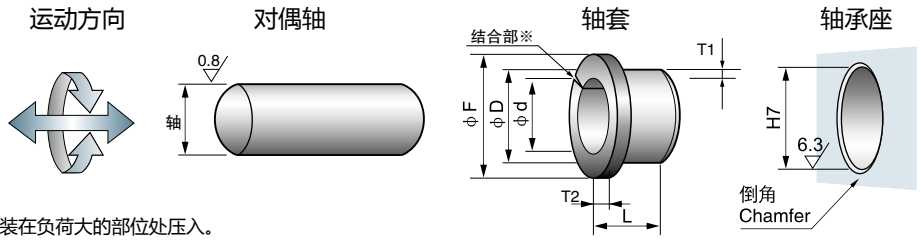
法兰轴套 Flanged bushes



请从适用的内径、外径、长度中选择零件号
(例)内径20mm、长度10mm的情况下

LM-10F - 2010

请指定上述零件号

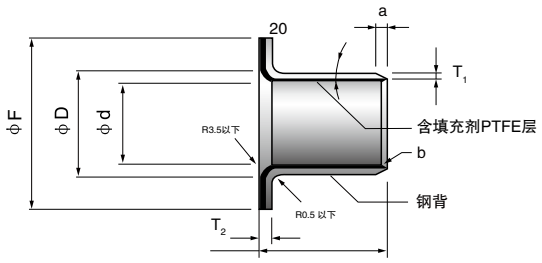


※结合部对于轴旋转没有影响，但尽量避免安装在负荷大的部位处压入。

轴 shaft		座孔housing		内径	外径	法兰		壁厚		长度 L±0.25			
		H7		⌀d	⌀D	⌀ $F_{\pm 0.5}$	$T_{2\ -0.2}^{\ 0}$	T1		3	4	5	6
5	-0.010 -0.022	7	+0.015 0	5	7	10	1.0	1.0	+0.005 -0.020			0505	0506
6	-0.013 -0.028	8	"	6	8	12	"	"	"			0605	0606
7	"	9	"	7	9	13	"	"	"			0705	
8	"	10	"	8	10	15	"	"	"				0806
9	"	11	+0.018 0	9	11	17	"	"	"				
10	"	12	"	10	12	18	"	"	"				1006
12	-0.016 -0.034	14	"	12	14	20	"	"	"				1206
13	"	15	"	13	15	21	"	"	"				
14	"	16	"	14	16	22	"	"	"				
15	"	17	"	15	17	23	"	"	"				
16	"	18	"	16	18	24	"	"	"				
18	"	20	+0.021 0	18	20	26	"	"	"				
20	-0.020 -0.041	23	"	20	23	30	1.5	1.5	+0.005 -0.025				
22	"	25	"	22	25	32	"	"	"				
24	"	27	"	24	27	34	"	"	"				
25	"	28	"	25	28	35	"	"	"				
26	"	30	"	26	30	38	2.0	2.0	+0.005 -0.030				
28	"	32	+0.025 0	28	32	40	"	"	"				
30	"	34	"	30	34	42	"	"	"				
31	-0.025 -0.050	35	"	31	35	43	"	"	"				
32	"	36	"	32	36	44	"	"	"				
35	"	39	"	35	39	47	"	"	"				
38	"	42	"	38	42	52	"	"	"				
40	"	44	"	40	44	53	"	"	"				
45	"	50	"	45	50	60	2.5	2.5	+0.005 -0.040				
50	"	55	+0.030 0	50	55	65	"	"	"				
55	-0.030 -0.060	60	"	55	60	70	"	"	"				
60	"	65	"	60	65	75	"	"	"				

LM-10, LM-40, LM-33

法兰轴套 **Flanged bushes**



a:外径倒角 内径⌀10以上(mm)

T	1.0	1.5	2.0
a	0.5	0.8	1.0

b:内径倒角 内径⌀10以上(mm)

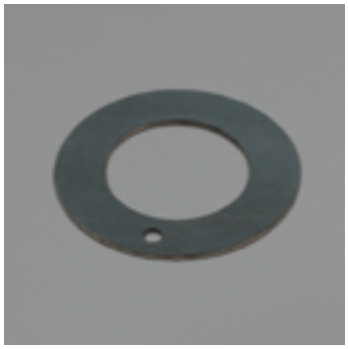
T	1.0	1.5	2.0
b	C0.5	C0.8	C1.0

※内径 ⌀10不到的内外径倒角去毛刺程度即可。

长度 L±0.25									内径
7	8	10	12	15	20	25	30	40	⌀d
									5
0607	0608								6
0707									7
	0808	0810	0812						8
		0910							9
1007	1008	1010	1012	1015					10
1207	1208	1210	1212	1215					12
		1310		1315					13
		1410	1412	1415					14
		1510	1512	1515	1520				15
		1610		1615	1620				16
		1810	1812	1815	1820				18
		2010	2012	2015	2020	2025			20
		2210	2212	2215	2220				22
				2415	2420	2425			24
		2510	2512	2515	2520	2525			25
				2615	2620				26
			2812	2815	2820				28
			3012	3015	3020	3025	3030		30
						3125			31
					3220	3225	3230		32
			3512		3520	3525	3530	3540	35
					3820				38
			4012		4020	4025	4030	4040	40
					4520	4525	4530	4540	45
					5020		5030	5040	50
							5530	5540	55
							6030	6040	60

LM-10W, LM-40W, LM-33W

止推垫圈 Thrust washers

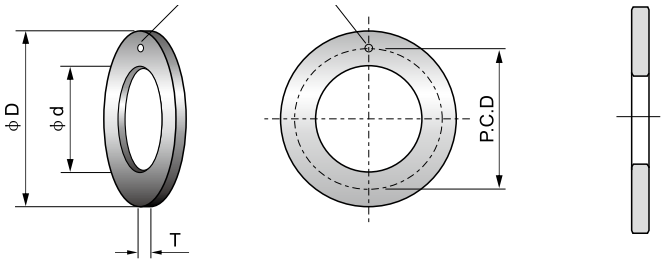


●摩擦面为树脂层。

请从适用的内径、外径、厚度中选择零件号
(例)内径20mm、厚度1.5mm的情况下

LM-10 - 2015

请指定上述零件号



Parts No.	内径		外径		厚度		销孔	柱销位置	
	⌀d		⌀D		T		H	P.C.D	
LM-10W-1015	10	$^{+0.25}_{0}$	20	$^{0}_{-0.25}$	1.5	$^{0}_{-0.05}$	1.10 ~ 1.50	15	±0.12
LM-10W-1215	12	"	24	"	"	"	1.625 ~ 1.875	18	"
LM-10W-1415	14	"	26	"	"	"	2.125 ~ 2.375	20	"
LM-10W-1615	16	"	30	"	"	"	"	22	"
LM-10W-1815	18	"	32	"	"	"	"	25	"
LM-10W-2015	20	"	36	"	"	"	3.125 ~ 3.375	28	"
LM-10W-2215	22	"	38	"	"	"	"	30	"
LM-10W-2415	24	"	42	"	"	"	"	33	"
LM-10W-2615	26	"	44	"	"	"	"	35	"
LM-10W-2815	28	"	48	"	"	"	4.125 ~ 4.375	38	"
LM-10W-3215	32	"	54	"	"	"	"	43	"
LM-10W-3815	38	"	62	"	"	"	"	50	"
LM-10W-4215	42	"	66	"	"	"	"	54	"
LM-10W-4820	48	"	74	"	2.0	"	"	61	"
LM-10W-5220	52	"	78	"	"	"	"	65	"
LM-10W-6220	62	"	90	"	"	"	"	76	"

LM-20W, LM-30W

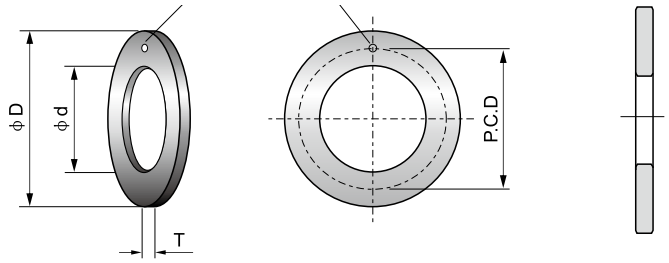
止推垫圈 Thrust washers

●摩擦面为树脂层。

请从适用的内径、外径、厚度中选择零件号
(例)内径20mm、厚度1.5mm的情况下

LM-20 - 2015

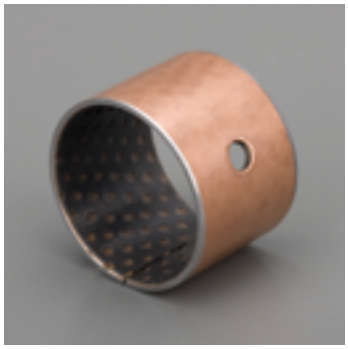
请指定上述零件号



Parts No.	内径		外径		厚度		销孔	柱销位置	
	⌀d		⌀D		T		H	P.C.D	
LM-20W-1015	10	$^{+0.25}_{0}$	20	$^{0}_{-0.25}$	1.5	$^{0}_{-0.05}$	1.10 ~ 1.50	15	±0.12
LM-20W-1215	12	"	24	"	"	"	1.625 ~ 1.875	18	"
LM-20W-1415	14	"	26	"	"	"	2.125 ~ 2.375	20	"
LM-20W-1615	16	"	30	"	"	"	"	22	"
LM-20W-1815	18	"	32	"	"	"	"	25	"
LM-20W-2015	20	"	36	"	"	"	3.125 ~ 3.375	28	"
LM-20W-2215	22	"	38	"	"	"	"	30	"
LM-20W-2415	24	"	42	"	"	"	"	33	"
LM-20W-2615	26	"	44	"	"	"	"	35	"
LM-20W-2815	28	"	48	"	"	"	4.125 ~ 4.375	38	"
LM-20W-3215	32	"	54	"	"	"	"	43	"
LM-20W-3815	38	"	62	"	"	"	"	50	"
LM-20W-4215	42	"	66	"	"	"	"	54	"
LM-20W-4820	48	"	74	"	2.0	"	"	61	"
LM-20W-5220	52	"	78	"	"	"	"	65	"
LM-20W-6220	62	"	90	"	"	"	"	76	"

LM-20, LM-30

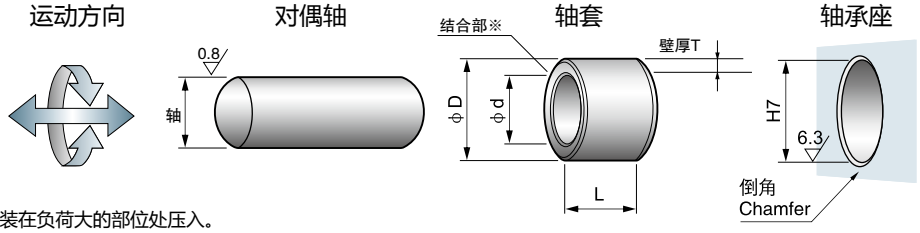
轴套 **Cylindrical bushes** (内径I.D⌀10 ~⌀60)



请从适用的内径、外径、长度中选择零件号
(例)内径15mm、长度10mm的情况下

LM-20 - 1510

请指定上述零件号

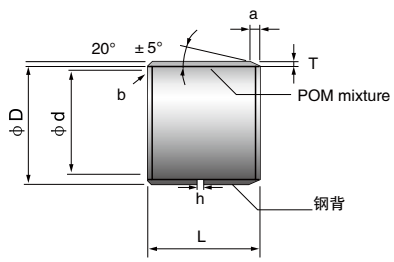


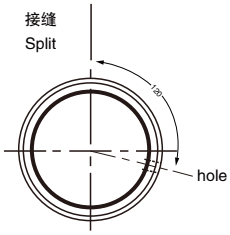
※结合部对于轴旋转没有影响，但尽量避免安装在负荷大的部位处压入。

轴 shaft		座孔 housing		内径	外径	壁厚	油孔	长度 L $^{0}_{-0.40}$					
h8		H7		⌀d	⌀D	T	h-⌀	10	12	15	20	25	30
10	$^{0}_{-0.022}$	12	$^{+0.018}_{0}$	10	12	0.980 0.955	4	1010	1012	1015	1020		
12	$^{0}_{-0.027}$	14	"	12	14	"	"	1210	1212	1215	1220	1225	
14	"	16	"	14	16	"	"			1415	1420	1425	
15	"	17	"	15	17	"	"	1510	1512	1515		1525	
16	"	18	"	16	18	"	"			1615	1620	1625	
18	"	20	$^{+0.021}_{0}$	18	20	"	"			1815	1820	1825	
20	$^{0}_{-0.033}$	23	"	20	23	1.475 1.445	"			2015	2020	2025	2030
22	"	25	"	22	25	"	6			2215	2220	2225	2230
24	"	27	"	24	27	"	"			2415	2420	2425	2430
25	"	28	"	25	28	"	"			2515	2520	2525	2530
28	"	32	$^{+0.025}_{0}$	28	32	1.970 1.935	"				2820	2825	2830
30	"	34	"	30	34	"					3020		3030
32	$^{0}_{-0.039}$	36	"	32	36	"	"				3220		3230
35	"	39	"	35	39	"	"				3520		3530
36	"	40	"	36	40	"	"						
37	"	41	"	37	41	"	"				3720		
40	"	44	"	40	44	"	8				4020		4030
45	"	50	"	45	50	2.460 2.415	"				4520		4530
50	"	55	$^{+0.030}_{0}$	50	55	"	"						
55	$^{0}_{-0.046}$	60	"	55	60	"	"				5520		
60	"	65	"	60	65	"	"						

LM-20, LM-30

轴套 **Cylindrical bushes** (内径I.D⌀10 ~⌀60)





a:外径倒角 内径⌀10以上(mm)

T	1.0	1.5	2.0
a	0.5	0.8	1.0

b:内径倒角 内径⌀10以上(mm)

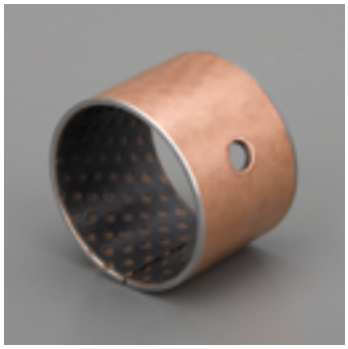
T	1.0	1.5	2.0
b	C0.3	C0.5	C0.5

※内径⌀10不到的内外径倒角去除毛刺程度即可。

长度 L $^{0}_{-0.40}$									内径
35	40	50	60	70	80	100	110	120	⌀d
									10
									12
									14
									15
									16
									18
									20
									22
									24
									25
									28
	3040								30
3235	3240								32
3535		3550							35
									36
									37
	4040	4050							40
	4540	4550							45
	5040	5050	5060						50
	5540	5550	5560						55
	6040		6060	6070					60

LM-20, LM-30

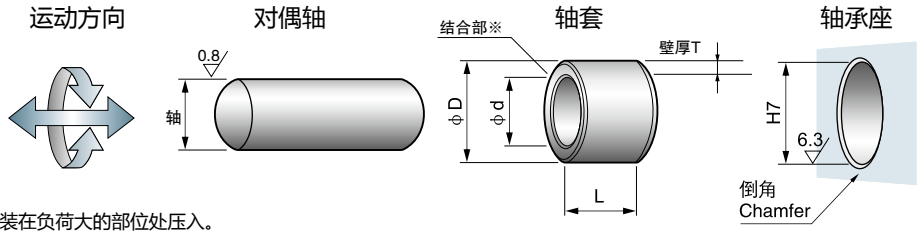
轴套 **Cylindrical bushes** (内径I.D⌀65 ~⌀300)



请从适用的内径、外径、长度中选择零件号
(例)内径60mm、长度50mm的情况下

LM-20 - 6550

请指定上述零件号

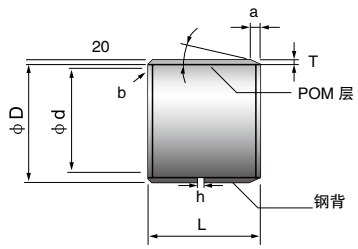


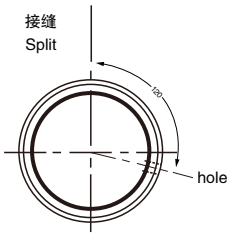
※结合部对于轴旋转没有影响，但尽量避免安装在负荷大的部位处压入。

轴 shaft		座孔housing		内径	外径	壁厚	油孔	长度 L $^{0}_{-0.40}$					
h8		H7		⌀d	⌀D	T	h-⌀	30	40	50	60	65	70
65	$^{0}_{-0.046}$	70	$^{+0.030}_{0}$	65	70	2.460 2.415	8	6530	6540	6550	6060		6570
70	"	75	"	70	75	"	"		7040	7050		7065	7070
75	"	80	"	75	80	"	"		7540		7560		
80	"	85	$^{+0.035}_{0}$	80	85	2.450 2.385	9.5				8060		
85	$^{0}_{-0.054}$	90	"	85	90	"	"	8530	8540		8560		
90	"	95	"	90	95	"	"		9040		9060		
95	"	100	"	95	100	"	"				9560		
100	"	105	"	100	105	"	"			10050	10060		
105	"	110	"	105	110	"	"				10560		
110	"	115	"	110	115	"	"				11060		
115	"	120	"	115	120	"	"						11570
120	"	125	$^{+0.040}_{0}$	120	125	"	"				12060		
125	$^{0}_{-0.063}$	130	"	125	130	"	"				12560		
130	"	135	"	130	135	"	"			13050	13060		
135	"	140	"	135	140	"	"			13550	13560		
140	"	145	"	140	145	"	"				14060		
150	"	155	"	150	155	"	"			15050	15060		
160	"	165	"	160	165	"	"			16050	16060		
170	"	175	"	170	175	"	"			17050	17060		
180	"	185	$^{+0.046}_{0}$	180	185	"	"			18050	18060		
190	$^{0}_{-0.072}$	195	"	190	195	"	"			19050	19060		
200	"	205	"	200	205	"	"			20050	20060		
220	"	225	"	220	225	"	"			22050	22060		
240	"	245	"	240	245	"	"			24050	24060		
250	"	255	$^{+0.052}_{0}$	250	255	"	"			25050	25060		
260	$^{0}_{-0.081}$	265	"	260	265	"	"			26050	26060		
280	"	285	"	280	285	"	"			28050	28060		
300	"	305	"	300	305					30050	30060		

LM-20, LM-30

轴套 **Cylindrical bushes** (内径I.D⌀65 ~⌀300)





a:外径倒角 (mm)

T	2.0	2.5
a	1.0	1.0

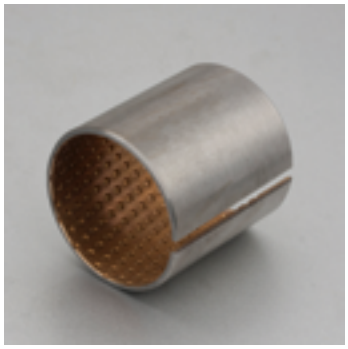
b:内径倒角 (mm)

T	2.0	2.5
b	C0.5	C0.5

长度 L $^{0}_{-0.40}$							内径
80	90	95	100	110	115	120	⌀d
							65
7080							70
7580							75
8080				80110			80
8580			85100	85110			85
9080	9090		90100	90110			90
				95110			95
10080		10095			100115		100
					105115		105
				110110	110115		110
							115
			120100	120110			120
			125100	125110			125
13080			130100				130
13580							135
14080			140100				140
15080			150100				150
16080			160100				160
17080			170100				170
18080			180100				180
19080			190100			190120	190
20080			200100			200120	200
22080			220100			220120	220
24080			240100			240120	240
25080			250100			250120	250
26080			260100			260120	260
28080			280100			280120	280
30080			300100			300120	300

LM-800

轴套 **Cylindrical bushes** (内径I.D 6 ~ 45)

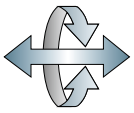


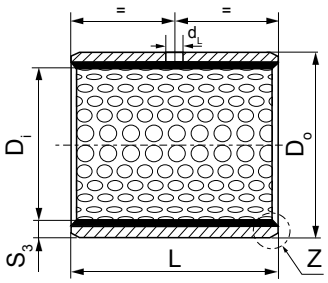
请从适用的内径、外径、长度中选择零件号
(例)内径60mm、长度50mm的情况下

LM-800 - 1015

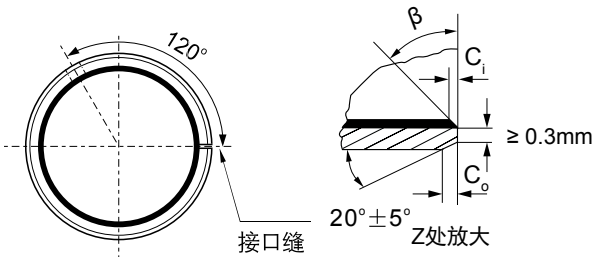
请指定上述零件号

运动方向





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



内外倒角

S_3	C_o	C_i	β
0.75	0.5 ± 0.3	0.25 ± 0.2	35° ± 5°
1.00	0.6 ± 0.3	0.30 ± 0.2	35° ± 5°
1.50	0.7 ± 0.3	0.50 ± 0.3	35° ± 5°

S_3	C_o	C_i	β
2.00	1.2 ± 0.4	0.50 ± 0.3	35° ± 5°
2.50	1.8 ± 0.6	0.60 ± 0.3	45° ± 5°

内径 D_i φd	外径 D_O φD	轴径 (h8) D_s	座孔 (H7) D_H	压装后内孔公差 $D_{i,a}$	配合间隙	壁厚 S_3	油孔 d_L	长度L $^{0}_{-0.40}$							
								25	30	40	50	60	80	90	100
45	50	$45_{-0.039}$	$50^{+0.025}$	+0.225 +0.080	0.264 0.080	2.460 2.400	8	4525	4530	4540	4550				
50	55	$50_{-0.039}$	$55^{+0.030}$	+0.230 +0.080	0.269 0.080				5030	5040	5050	5060			
55	60	$55_{-0.046}$	$60^{+0.030}$		0.276 0.080				5530	5540	5550	5560			
60	65	$60_{-0.046}$	$65^{+0.030}$						6030	6040	6050	6060			
65	70	$65_{-0.046}$	$70^{+0.030}$						6530	6540	6550	6560			
70	75	$70_{-0.046}$	$75^{+0.030}$						7030	7040	7050	7060	7080		
75	80	$75_{-0.046}$	$80^{+0.030}$				9.5		7530	7540	7550	7560			
80	85	$80_{-0.046}$	$85^{+0.035}$	+0.235 +0.080	0.281 0.080					8040	8050	8060	8080		
85	90	$85_{-0.054}$	$90^{+0.035}$		0.289 0.080				8530		8550	8560	8580		85100
90	95	$90_{-0.054}$	$95^{+0.035}$								9050	9060	9080		90100
95	100	$95_{-0.054}$	$100^{+0.035}$									9560	9580	9590	95100
100	105	$100_{-0.054}$	$105^{+0.035}$									10060	10080	10090	100100
105	110	$105_{-0.054}$	$110^{+0.035}$									10560	10580		105100
110	115	$110_{-0.054}$	$115^{+0.035}$									11060	11080		110100
115	120	$115_{-0.054}$	$120^{+0.035}$								11550		11580		
120	125	$120_{-0.054}$	$125^{+0.040}$	+0.240 +0.080							12050	12030			120100
125	130	$125_{-0.063}$	$130^{+0.040}$		0.303 0.080										125100
130	135	$130_{-0.063}$	$135^{+0.040}$									13060			130100
135	140	$135_{-0.063}$	$140^{+0.040}$									13560	13580		
140	145	$140_{-0.063}$	$145^{+0.040}$									14060	14080		140100
150	155	$150_{-0.063}$	$155^{+0.040}$									15060	15080		150100

LM-50

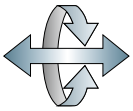
轴套 **Cylindrical bushes** (内径I.D⌀6 ~⌀45)

请从适用的内径、外径、长度中选择零件号
(例)内径25mm、 外径33mm、长度20mm的情况下

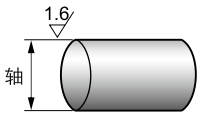
LM-50 - 253320

请指定上述零件号

运动方向

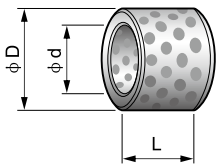


对偶轴

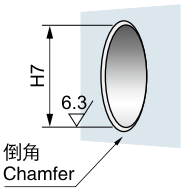


轴
d8:一般用(高负荷)
e7:一般用(低负荷)
f7:高精度用

轴套



轴承座



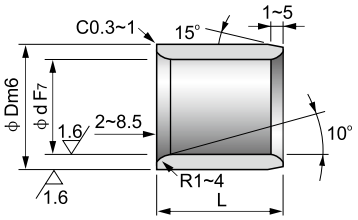
内径		外径		长度 L $^{-0.1}_{-0.3}$							
⌀d		⌀D		8	10	12	15	16	19	20	25
6	$^{+0.022}_{+0.010}$	10	$^{+0.015}_{+0.006}$	061008	061010	061012					
8	$^{+0.028}_{+0.013}$	12	$^{+0.018}_{+0.007}$	081208	081210	081212	081215				
10	"	14	"	101408	101410	101412	101415			101420	
12	$^{+0.034}_{+0.016}$	18	"	121808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

※压入后内径公差为参考值。

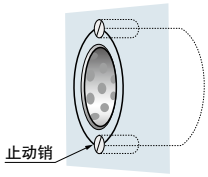
LM-50

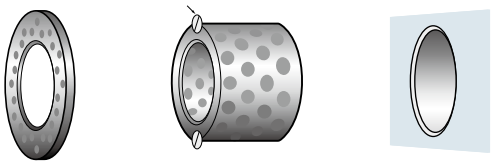
轴套 **Cylindrical bushes** (内径I.D⌀6 ~⌀45)

●能在旋转、摇动以及往复运动中使用。
●不能在海水中使用。
●内径31.5mm·63mm的轴套能适用于油压气缸中间轴套颈套上。



为了防止脱落。推荐使用止动销





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

LM-50

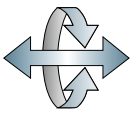
轴套 **Cylindrical bushes** (内径I.D⌀5 ~⌀200)

请从适用的内径、外径、长度中选择零件号
(例)内径80mm、外径96mm、长度70mm的情况下

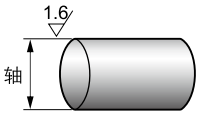
LM-50 - 809670

请指定上述零件号

运动方向

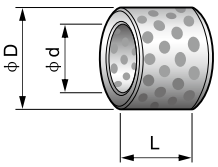


对偶轴

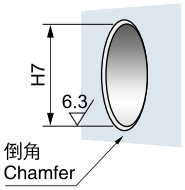


轴
d8:一般用(高负荷)
e7:一般用(低负荷)
f7:高精度用

轴套



轴承座



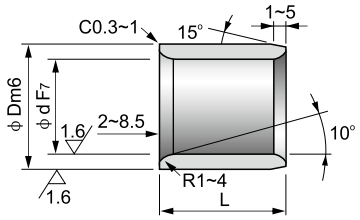
内径		外径		长度 L $^{-0.1}_{-0.3}$							
⌀d		⌀D		20	30	35	40	50	60	70	80
50	+0.050 +0.025	60	+0.030 +0.011	506020	506030	506035	506040	506050	506060	506070	506080
"	"	62	"		506230	506235	506240	506250	506260	506270	506280
"	"	65	"		506530		506540	506550	506560	506570	506580
55	+0.060 +0.030	70	"		557030	557035	557040	557050	557060	557070	
60	"	74	"		607430	607435	607440	607450	607460	607470	607480
"	"	75	"		607530	607535	607540	607550	607560	607570	607580
63	"	"	"						637560	637570	637580
65	"	80	"				658040	658050	658060	658070	658080
70	"	85	+0.035 +0.013		708530	708535	708540	708550	708560	708570	708580
"	"	90	"					709050	709060	709070	709080
75	"	"	"					759050	759060	759070	759080
"	"	95	"						759560	759570	759580
80	"	96	"				809640	809650	809660	809670	809680
"	"	100	"				8010040	8010050	8010060	8010070	8010080
85	+0.071 +0.036	"	"						8510060		8510080
90	"	110	"					9011050	9011060		9011080
100	"	120	"					10012050	10012060	10012070	10012080
110	"	130	+0.040 +0.015					11013050		11013070	11013080
120	"	140	"							12014070	12014080
125	+0.083 +0.043	145	"								
130	"	150	"								13015080
140	"	160	"								
150	"	170	"								15017080
160	"	180	"								16018080
170	"	190	+0.046 +0.017								
180	"	200	"								
190	+0.096 +0.050	210	"								
200	"	230	"								

※压入后内径公差为参考值。

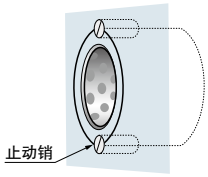
LM-50

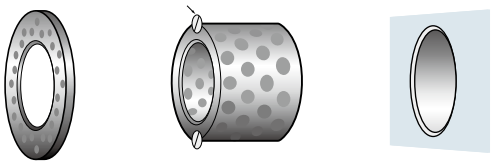
轴套 **Cylindrical bushes** (内径I.D⌀5 ~⌀200)

●能在旋转、摇动以及往复运动中使用。
●不能在海水中使用。
●内径31.5mm·63mm的轴套能适用于油压气缸中间轴套颈套上。



为了防止脱落。推荐使用止动销

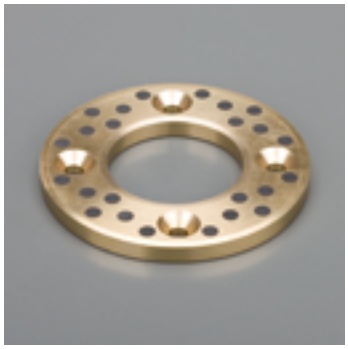




长度 L $^{-0.1}_{-0.3}$							压入后内径公差	适用垫圈	内径
90	100	120	130	140	150	200		SPW	⌀d
							$^{+0.045}_{+0.020}$	5008	50
							"	"	"
	5065100						"	"	"
							$^{+0.055}_{+0.025}$	5508	55
							"	6008	60
	6075100						"	"	"
							"	6508	63
							"	6508	65
	7085100						$^{+0.054}_{+0.024}$	7010	70
							"	"	"
	7590100						"	7510	75
	7595100						"	"	"
	8096100	8096120					"	8010	80
	80100100	80100120		80100140			"	"	"
							$^{+0.065}_{+0.030}$	9010	85
9011090	90110100	90110120					"	9010	90
10012090	100120100	100120120		100120140			"	10010	100
	110130100	110130120					$^{+0.064}_{+0.029}$	12010	110
12014090	120140100	120140120		120140140			"	12010	120
	125145100	125145120					$^{+0.076}_{+0.036}$	-	125
	130150100		130150130				"	"	130
	140160100			140160140			"	"	140
	150170100				150170150		"	"	150
	160180100				160180150		"	"	160
	170190100				170190150		"	"	170
	180200100				180200150		"	"	180
	190210100				190210150		$^{+0.088}_{+0.042}$	"	190
					200230150	200230200	"	"	200

LM-50W

止推垫圈 Thrust washers

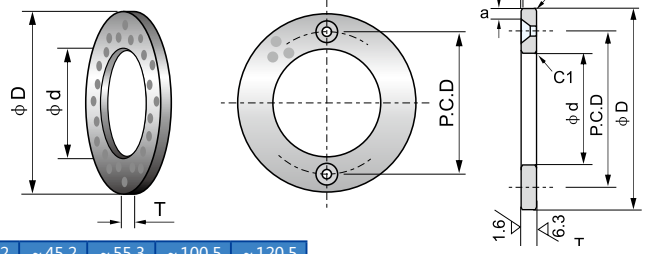


●能与LM-50组合使用。

请从适用的内径、外径、长度中选择零件号
(例)内径30.2mm、厚度5mm的情况下

LM-50W - 3005

请指定上述零件号



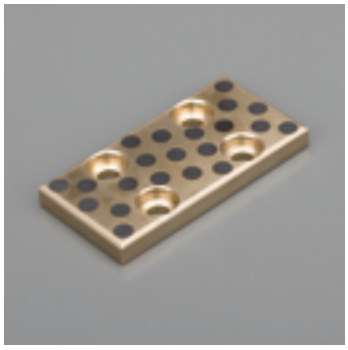
a b : 端面倒角 (mm)

d	~10.2	~18.2	~35.2	~45.2	~55.3	~100.5	~120.5
a	1.5	2	2.5	3	4	5	4
b	0.3	0.4	0.4	0.5	0.6	0.8	0.8

Parts No.	内径		外径	厚度		定位孔		
	⌀d		⌀D	T		P.C.D	个数	定位螺栓
LM-50W-0603	6.2	+0.2 +0.1	25	3	0 -0.1	15	2	M3
LM-50W-0803	8.2	"	28	"	"	18	"	"
LM-50W-1003	10.2	"	30	"	"	20	"	"
LM-50W-1203	12.2	"	40	"	"	28	"	"
LM-50W-1203N	"	"	"	"	"	无定位孔		
LM-50W-1303	13.2	"	"	"	"	28	2	M3
LM-50W-1403	14.2	"	"	"	"	"	"	"
LM-50W-1503	15.2	"	50	"	"	35	"	"
LM-50W-1603	16.2	"	"	"	"	"	"	"
LM-50W-1603N	"	"	"	"	"	无定位孔		
LM-50W-1803	18.2	"	"	"	"	35	2	M3
LM-50W-2005	20.2	"	"	5	"	"	"	M5
LM-50W-2505	25.2	"	55	"	"	40	"	"
LM-50W-2505N	"	"	"	"	"	无定位孔		
LM-50W-3005	30.2	"	60	"	"	45	2	M5
LM-50W-3005N	"	"	"	"	"	无定位孔		
LM-50W-3505	35.2	"	70	"	"	50	2	M5
LM-50W-4007	40.2	+0.2 +0.1	80	7	0 -0.1	60	2	M6
LM-50W-4507	45.2	"	90	"	"	70	"	"
LM-50W-5008	50.3	+0.3 +0.1	100	8	"	75	4	"
LM-50W-5508	55.3	"	110	"	"	85	"	"
LM-50W-6008	60.3	"	120	"	"	90	"	M8
LM-50W-6508	65.3	"	125	"	"	95	"	"
LM-50W-7010	70.3	"	130	10	"	100	"	"
LM-50W-7510	75.3	"	140	"	"	110	"	"
LM-50W-8010	80.3	"	150	"	"	120	"	"
LM-50W-9010	90.5	"	170	"	"	140	"	M10
LM-50W-10010	100.5	"	190	"	"	160	"	"
LM-50W-12010	120.5	"	200	"	"	175	"	"

LM-50SW

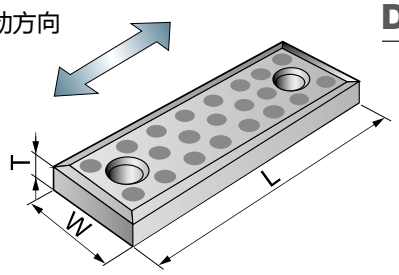
滑块 Wear plate-10mm thick



●运动方向为长度方向

请从适用的长度、宽度、厚度中选择零件号
(例)宽28mm、长度150mm的情况下

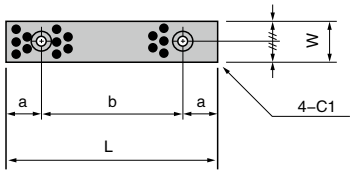
运动方向

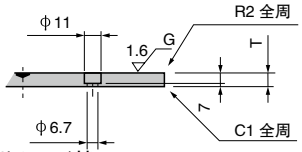


DK-50SW - 28150

请指定上述零件号

W=18、28、38、48





断面形状

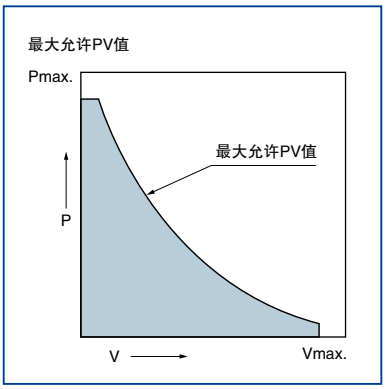
Parts No.	宽	长度	厚度		定位孔间隙		定位螺栓	
	W	L	T		a	b	种类	个数
LM-50SW-1875	18	75	10	+0.04 +0.01	15	45	M6 内六角螺栓	2
LM-50SW-18100	"	100	"	"	25	50	"	"
LM-50SW-18125	"	125	"	"	"	75	"	"
LM-50SW-18150	"	150	"	"	"	100	"	"
LM-50SW-2875	28	75	"	"	15	45	"	"
LM-50SW-28100	"	100	"	"	25	50	"	"
LM-50SW-28125	"	125	"	"	"	75	"	"
LM-50SW-28150	"	150	"	"	"	100	"	"
LM-50SW-3875	38	75	"	"	15	45	"	"
LM-50SW-38100	"	100	"	"	25	50	"	"
LM-50SW-38125	"	125	"	"	"	75	"	"
LM-50SW-38150	"	150	"	"	"	100	"	"
LM-50SW-4875	48	75	"	"	15	45	"	"
LM-50SW-48100	"	100	"	"	25	50	"	"
LM-50SW-48125	"	125	"	"	"	75	"	"
LM-50SW-48150	"	150	"	"	"	100	"	"

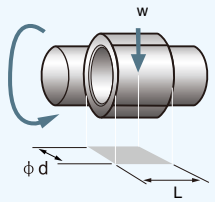
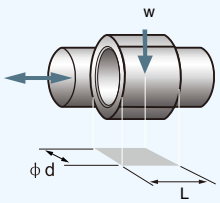
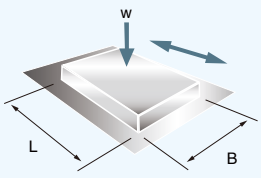
相关设计

■ P值/V值/PV值的概念

P值 ：轴承所承载的最大负荷（W）与在轴承上的投影面积（φd×L）
相除后即为面压P。
V值 ：速度V是对偶轴与轴承之间的相对速度。
PV值：轴承面压P与速度V的乘积为PV值。
P值、V值、PV值并不是各自独立的最大允许值，而是相互关联的设计参数。
设计中，请在图表表示的范围内选择参数。

最大允许PV值＜最大允许面压：Pmax.×最大允许速度：Vmax.



轴套	P值N/mm²[kgf/cm²]	V值m/s[m/min]	PV值N/mm²·m/s[kgf/cm²·m/min]
单向旋转运动  	$P=\frac{W}{\varphi d\times L}$, $\left[\frac{10^2W}{\varphi d\times L}\right]$ 负 荷 W:N{kgf} 内 径 φd:mm 长 度 L:mm 计算例 内径20mm、长度10mm的轴承、1000N的径向负荷的情况下。 $\frac{1000}{20\times10}=5(N/mm)^2$	$v=\frac{\pi\varphi dn}{10^3}$, $\left[\frac{\pi\varphi dn}{10^3}\right]$ 转 数 n : s-1{rpm} 内 径φd : mm 计算例 内径20mm的轴承、转数120rpm的情况下。 $\frac{\pi\times20\times2}{10^3}=0.126(m/s)$	$PV=\frac{\pi Wn}{10^3\times L}$, $\left[\frac{\pi Wn}{10\times L}\right]$ 负 荷 W : N{kgf} 转 数 n : s-1{rpm} 长 度 L : mm 计算例 内径20mm、长度10mm的轴承、转数120rpm、1000N的径向负荷的情况下。 $\frac{\pi\times1000\times2}{10^3\times10}=0.63(N/mm^2\cdot m/s)$
往复运动  	$P=\frac{W}{\varphi d\times L}$, $\left[\frac{10^2W}{\varphi d\times L}\right]$ 负 荷 W : N{kgf} 内 径φd : mm 长 度 L : mm	$v=\frac{2cS}{10^3}$, $\left[\frac{2cS}{10^3}\right]$ 往复周期速度 c : s-1{cpm} 行程距离 S : mm	$PV=\frac{2WcS}{10^3\times\varphi d\times L}$, $\left[\frac{WcS}{5\times\varphi d\times L}\right]$ 负 荷 W : N{kgf} 周期速度 c : s-1{cpm} 行程距离 s : mm 内 径φd : mm 长度 L : mm
板块	**P值N/mm²[kgf/cm²]**	**V值m/sec[m/min]**	**PV值N/mm²·m/s[kgf/cm²·m/min]**
平面往复运动  	$P=\frac{W}{B\times L}$, $\left[\frac{10^2W}{B\times L}\right]$ 负 荷 W : N{kgf} 长 度 L : mm 宽 度 B : mm	$v=\frac{2cS}{10^3}$, $\left[\frac{2cS}{10^3}\right]$ 周期速度 c : s-1{cpm} 行程距离 S : mm	$PV=\frac{2WcS}{10^3\ B\times L}$, $\left[\frac{WcS}{5\times B\times L}\right]$ 负 荷 W : N{kgf} 周期速度 c : s-1{cpm} 行程距离 s : mm 长 度 L : mm 宽 度 B : mm

机械性质

■ 对偶材的选择

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

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

自润滑轴承的冷装配要领

■ 冷装配方法

(1) 必须材料

冷媒 ：液氮、干冰

容器 ：保温容器（足够大的尺寸，四周敷保温材料的容器）

(2) 作业步骤

① 作为冷媒的液氮或干冰的标准冷冻温度为-40~70℃.

② 冷冻时间一般为1小时以上。冷冻时间在配合公差较小的情况下，有必要延长冷冻时间。另外，冷冻时间较短的情况下，和液压压入方法并用也十分有效

③ 再次测量轴承的外轴尺寸以及套筒的内径尺寸。

在装配过程中，如果异常没有及时发现，可能会造成重大故障。

④ 将轴套装入套筒时，边转动边迅速装入。

在中途如果中断的话，尺寸将还原，拔出再装配将非常困难。

⑤ 在摩擦面涂上润滑剂。

注）冬季等温度差不是很大的情况下，将套筒加热至20~30℃

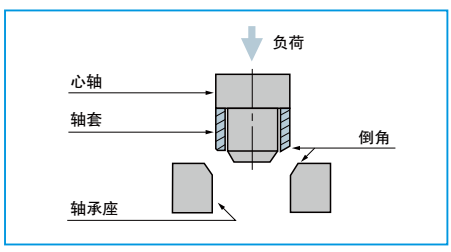
注）有关不明之处，请咨询莱瑞斯曼。

自润滑轴承的压入方法

自润滑轴承和一般的滑动轴承一样，装配进轴承座后使用的情况较多。

压入轴承的情况下，利用心轴或使用液压方式装入轴承座内。

压入间隙较小的金属轴承的情况下，对轴承的外径及轴承座的内径进行倒角，使用心轴能轻易压入。



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