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XLJG[®]
BEARING

翔力精工轴承



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翔力精工

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XLJG® 专业高精密调心轴承制造商
Professional High Precision Spherical Roller Bearing Manufacturer



现代化企业
Modern Enterprise
技术卓越
Technical Excellence
管理高效
Efficient Management

瓦房店翔力精工轴承制造有限公司

瓦店翔力精工轴承制造有限公司成立于2008年，年产70余万套，专业生产高精密调心滚子轴承、推力调心滚子轴承及定制非标轴承。

公司设有两大生产基地：瓦房店厂区主营内径260mm以上轴承，山东厂区生产内径260mm以下产品，满足客户一站式采购需求。公司2016年通过ISO 9001质量管理体系认证，所有产品严格依照国际标准制造。

产品广泛适配重载矿山机械、钢厂、油田等重工领域，长期服务中联重科、马鞍山钢铁、山马重工等国内知名企业，收获客户一致好评。

目前公司布局20余家国内经销商、5家海外代理商，可快速响应全球客户需求。打造高性价比高端调心滚子轴承，是企业始终坚守的发展目标。

Wafangdian XLJG Seiko Bearing Manufacturing Co., Ltd.

Wafangdian XLJG Seiko Bearing Manufacturing Co., Ltd. was founded in 2008 with an annual output of over 700,000 sets. We specialize in manufacturing high-precision spherical roller bearings, thrust spherical roller bearings and custom non-standard bearings.

We operate two production bases. The Wafangdian plant manufactures bearings with bore diameter ≥ 260 mm, while the Shandong plant produces items with bore diameter below 260 mm, enabling one-stop procurement for all clients. Our company obtained ISO 9001 Quality Management System Certification in 2016, and all products are manufactured in strict compliance with international standards.

Our bearings are widely applied in heavy-load mining machinery, steel plants, oil fields and other heavy industrial sectors. We have long-term cooperation with renowned domestic enterprises including Zoomlion, Maanshan Iron & Steel and Shanma Heavy Industry, and have won consistent recognition from all partners.

At present, we have established partnerships with more than 20 domestic distributors and 5 overseas agents to deliver rapid and efficient support for global customers. Our core mission is to develop premium spherical roller bearings with outstanding cost performance for worldwide clients.

Complete Equipment / Excellent Achievements

设备齐全 / 成就卓越

生产基地

Production Base

公司拥有从原材料处理、轴承制造、质量控制到成品检测等各个环节所需的专业设备。

拥有齐全的生产设备数控机床、磨床、热处理设备、测量仪器等。

通过不断引进和更新先进的生产设备，轴承公司可以提高生产效率和产品质量，满足客户的需求，并在激烈的市场竞争中保持领先地位。



Our company is fully equipped with professional machinery covering every workflow: raw material processing, bearing manufacturing, quality control and finished product testing.

We own a full set of production facilities including CNC machine tools, grinding machines, heat treatment equipment and precision measuring instruments.

By continuously introducing and upgrading advanced production equipment, we effectively boost manufacturing efficiency and product quality. This allows us to fully satisfy client demands and sustain a leading edge amid intense market competition.





Core Technology / Process Control

核心工艺 / 流程全控

生产流程

Production Process



通过中频加热技术锻造轴承材料，获得所需形状和尺寸。中频加热优势在于快速加热、精确控温及小热影响区，提升材料力学和加工性能。

We forge bearing blanks with medium-frequency heating technology to achieve precise target shapes and dimensions. This technology features rapid heating, accurate temperature control and narrow heat-affected zones, which greatly improves the mechanical properties and machinability of materials.



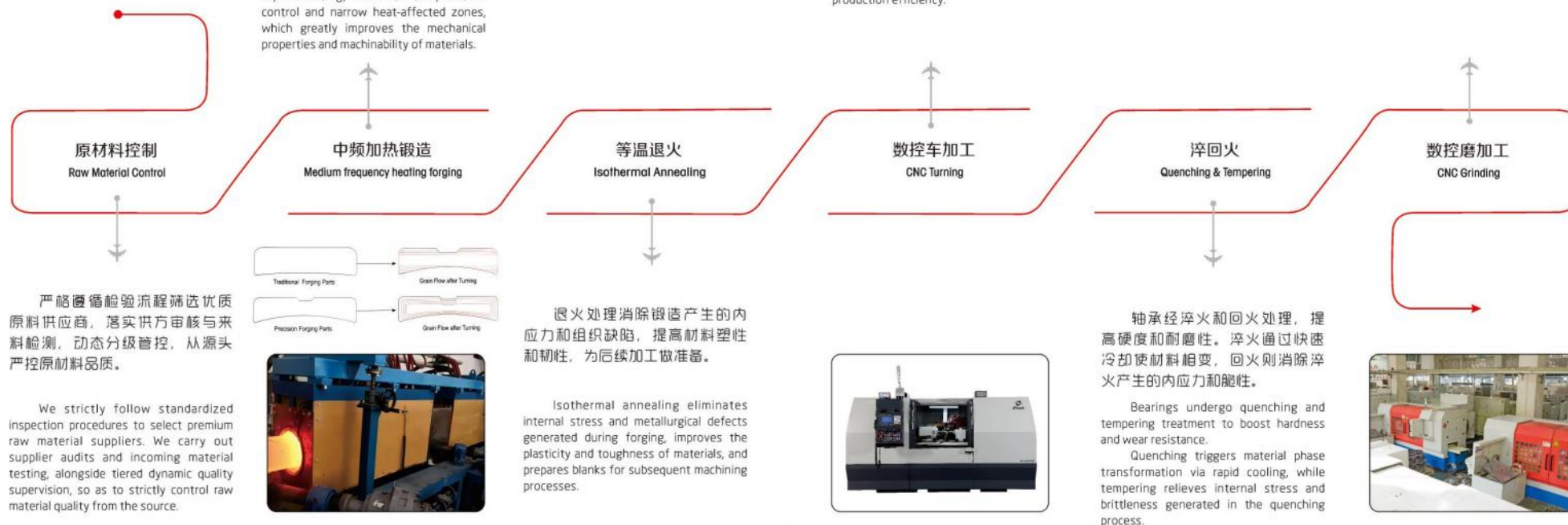
利用数控机床对轴承进行车削加工，确保尺寸精度和表面质量。数控车加工具有高精度和高效率的优点。

We conduct turning operations on bearing blanks with CNC machine tools to guarantee precise dimensional accuracy and superior surface finish. CNC turning delivers outstanding precision and high production efficiency.



淬火回火后的轴承进行数控磨削加工，进一步提高尺寸精度和表面质量。

We perform CNC grinding on bearings after quenching and tempering to further boost dimensional precision and superior surface finish.





Precision Inspection / Quality Assurance

精密检测 / 品质保证

检测中心

Testing Center

翔力精工轴承检测中心拥有先进的检测设备和专业的技术人员，能够为客户提供准确、可靠的检测结果和专业的技术支持。

同时，还提供轴承的选型建议、故障诊断和解决方案等服务，帮助客户优化设备性能和提高生产效率。

XLJG Seiko Bearing Testing Center is equipped with advanced testing instruments and professional technical teams. We deliver precise, reliable test reports and full technical support to all customers.

Furthermore, we supply a full range of value-added services including bearing model selection consultation, fault diagnosis and customized solutions, helping clients optimize equipment performance and boost overall production



Technological Innovation / System Certification 科技创新 / 体系认证

荣誉证书

Honor Certifications

质量是我们成长与发展的根本，一直把提高产品质量，提高服务质量作为我们发展的长期策略。先后通过了ISO9001:2015质量管理体系认证;ISO14000:2015环境管理体系;ISO45001:2018职业健康安全管理体系。

Quality lays the foundation for our growth and development. We have long taken the continuous improvement of product and service quality as our core development strategy.

We have obtained the following system certifications:
ISO 9001:2015 Quality Management System
ISO 14000:2015 Environmental Management System
ISO 45001:2018 Occupational Health and Safety Management System



XLJG®
BEARING
翔力精工轴承

Based in China, Serving the World
立足中国 / 走向世界

营销网络
Marketing Network

经过三十多年的发展，翔力轴承已经形成国内国外同步发展的营销体系，为企业的发展和可靠的服务提供了有力的支撑。

放眼未来，在全球贸易格局多变的新背景下，机遇与挑战并存只有推动变革与创新，通过更有深度的合作，提升核心竞争力才能加大品牌知名度和市场占有率，引导公司走向轴承行业幸福型强企之路！



With over 30 years of development, XLJG Bearings has built a dual domestic and international marketing system, which provides solid backing for our corporate growth and reliable customer services.

Looking ahead, amid volatile global trade landscapes, opportunities and challenges coexist.

Only through continuous reform, innovation and in-depth global cooperation can we strengthen our core competitiveness, raise brand recognition and expand market share, leading our company to become a robust, sustainable top-tier enterprise in the bearing industry.

专心 · 专注 · 专业



风机专用轴承 Special Bearings for Wind Turbines

CA 型 整体黄铜实体保持架对称滚子
CA Type – Solid Machined Brass Cage, Symmetrical Rollers

结构: 内圈双侧挡边, 单片车制黄铜保持架, 双列球面滚子配活动中隔圈, 外圈球面滚道。
特点: 铜架耐高温抗冲击, 调心好, 载荷匀, 噪音低, 重载耐用。
用途: 轧机、减速机、造纸、油田等重载高温设备



Structure: Double ribbed inner ring, one-piece turned brass cage, double-row symmetrical spherical rollers fitted with floating center spacer, spherical raceway on outer ring.
Features: The brass cage delivers outstanding high-temperature and shock resistance. The bearing boasts excellent self-aligning performance, uniform load distribution, low noise and long service life under heavy loads.
Applications: Heavy-load & high-temperature equipment including rolling mills, reducers, papermaking machinery and oilfield equipment.

破碎机专用轴承 Special Bearings for Crushers

MB 型 内圈固定中挡边双片铜保持架
MB Type – Two-Piece Brass Cage with Fixed Inner Center Rib

结构: 内圈双侧及固定中挡边, 分体铜保, 非对称球面滚子, 高刚性整体构造。
特点: 定位可靠、承压抗冲击强, 无法自主均分滚子载荷。
用途: 轧机、重型减速机等低速超重载设备支撑。



Structure: Double side ribs and fixed central rib on the inner ring, split brass cage, asymmetrical spherical rollers, high-rigidity integrated structure.
Features: Reliable positioning, excellent compression and impact resistance; unable to automatically equalize load between roller rows.
Applications: Support components for low-speed, ultra-heavy load equipment such as rolling mills and heavy-duty reducers.

钢厂专用轴承 Special Bearings for Steel Mills

CC 型 钢板冲压保持架优化型

CC Type – Optimized Stamped Steel Cage

结构：内圈无挡边，双列对称滚子，双片冲压钢保持架，优化滚道曲面。
特点：质轻易高速，受力均衡、抗振佳，性价比高、通用性好。
用途：振动筛、破碎机、工程机械等中载强振设备。



Structure: Unribbed inner ring, double-row symmetrical rollers, two-piece stamped steel cage, floating center ring, optimized raceway curvature.

Features: Light weight for high speed, uniform load, excellent vibration resistance, cost-effective & versatile.

Application: Medium-load heavy-vibration machinery: vibrating screens, crushers, construction machinery.

振动筛专用轴承 Special Bearings for Vibrating Screens

MA 型 外圈引导黄铜实体保持架

MA Type – Outer Ring Guided Solid Brass Cage

结构：外圈导向铜保持架，内圈双侧挡边，双列球面滚子配活动中隔圈，外圈球面滚道。
特点：滚子运转平稳，抗振耐冲击、抗偏载，适配大轴变形、耐高温。
用途：振动筛、破碎机等重载大挠度工矿设备。



Structure: Outer ring guided solid brass cage, double ribs on inner ring, double-row spherical rollers fitted with floating center spacer, spherical raceway on outer ring.

Features: Stable roller rotation, excellent shock resistance and anti-eccentric load performance, high temperature resistance, capable of accommodating large shaft deflection.

Application: Heavy-duty mining equipment with large deflection, including vibrating screens and crushers.

高速静音轴承 Special High-Speed Low-Noise Bearings

E 型 加强重载优化内部结构

E Type – Reinforced Heavy-Duty Optimized Internal Structure

结构：加强款，无挡边内圈，对称滚子，双片冲压钢保持架，优化滚子与中挡圈。
特点：滚子加多加长，载荷提升 30%+，摩擦小、极限转速高。
用途：冶金、齿轮箱、起重设备，替换老款可提质增效。



Structure: Reinforced heavy-duty design, unribbed inner ring, symmetrical spherical rollers, two-piece stamped steel cage, optimized rollers and central rib structure.

Features: Increased quantity and length of rollers, load capacity improved by over 30%, low friction coefficient and high limiting rotational speed.

Application: Metallurgical equipment, gearboxes, lifting machinery; replacing old bearing models can boost product quality and working efficiency.

重载抗振动轴承 Heavy-Duty Vibration-Resistant Bearings

E1 型 高精度加强重载升级版

E1 Type – High-Precision Upgraded Heavy-Duty Version

结构：优化滚道，加长对称滚子，优选接触角，加强钢保持架，内部强化。
特点：载荷升 30% 以上，调心准、震动小、寿命久，高速重载性能优越。
用途：风电、精密减速机、高端重工传动装置。



Structure: Optimized raceway surface, elongated symmetrical spherical rollers, optimized contact angle, reinforced stamped steel cage and strengthened internal structure.

Features: Load capacity increased by more than 30%, precise self-aligning performance, low vibration, long service life, excellent performance under high speed and heavy load conditions.

Application: Wind power equipment, precision reducers, transmission devices for high-end heavy industry machinery.

港口机械专用轴承 Bearings Special for Port Machinery

CCJA 型 低噪音精密冲压保持架 CCJA Type - Low-noise Precision Stamped Cage

结构：内圈无挡边，双列对称滚子，双片冲压钢保持架，浮动中心圈，优化滚道曲面。
特点：质轻易高速，受力均衡、抗振佳，性价比高、通用性好。
用途：振动筛、破碎机、工程机械等中载强振设备。



Structure: Unribbed inner ring, double-row symmetrical rollers, two-piece stamped steel cage, floating center ring, optimized raceway curvature.
Features: Light weight for high speed, uniform load, excellent vibration resistance, cost-effective & versatile.
Application: Medium-load heavy-vibration machinery: vibrating screens, crushers, construction machinery.

高速静音轴承 Special High-Speed Low-Noise Bearings

EJ 型 紧凑型加强重载轴承 EJ Type - Compact Reinforced Heavy-Duty Bearing

结构：无挡边内圈，加长对称滚子，加厚冲压钢保持架，优化中隔圈匹配间隙。
特点：承载高、自重紧凑，散热优良，极限转速优于常规 CC。
用途：小型减速机、输送辊筒、中小型矿山设备。



Structure: Unribbed inner ring, elongated symmetrical rollers, thickened stamped steel cage, optimized center spacer clearance.
Features: High load capacity, compact dimension, good heat dissipation, higher limiting speed than standard CC.
Application: Small reducers, conveyor rollers, medium & small mining machinery.

重载抗振专用轴承 Heavy Load Anti-Vibration Bearings

EAE4 型 高承载设计外圈带油槽油孔 EAE4 Type - High-load Design with Outer Ring Grooves & Lubrication Holes

结构：EA 型，对称滚子、冲压钢保持架，外圈带油槽及三注油孔。
特点：承载力提升 30%-35%，寿命翻倍，供油充足，适配高速重载。
用途：减速机、卷扬、风电主轴、轧机等严苛润滑工况。



Structure: Type EA, symmetrical rollers, stamped steel cage, outer ring with oil groove and three lubrication holes.
Features: 30%-35% higher load capacity, doubled service life, sufficient lubricant supply, suitable for high-speed and heavy-load applications.
Applications: Reducers, winches, wind power main shafts, rolling mills and other equipment operating under severe lubrication conditions.

恶劣工况密封轴承 Severe Condition Sealed Bearings

BS2 型 密封调心滚子专用款 E1 Type - High-precision Upgraded Heavy-duty Version

结构：双侧自带防尘密封结构，双列球面滚子，钢板冲压保持架，外圈球面滚道。
特点：防尘防泥水侵入，免频繁补脂，抗粉尘、抗震动。
用途：石料筛分、洗砂设备、户外恶劣粉尘工况机械。



Structure: Double-side integrated sealing, double-row spherical rollers, stamped steel cage, spherical outer raceway.
Features: Dust & muddy water proof, less frequent greasing, fine dustproof and anti-vibration performance.
Application: Sand screening, washing equipment, machinery working in dusty harsh environment.

免拆卸快装剖分轴承 Quick Fit Split Bearings (No Disassembly Required)

双列外圈剖分调心滚子轴承 Double-row split outer ring spherical roller bearing

结构: 双列鼓形滚子, 内圈整体, 外圈对半剖分配锁紧螺栓, 分体保持架。
特点: 具备调心能力, 重载耐冲击, 外圈可拆分, 拆装便捷。
用途: 适用于球磨机、回转窑、轧机等不便穿轴安装的重型设备。



Structure: Double-row barrel rollers, integral inner ring, split outer ring fixed with locking bolts, separate cage.
Features: Self-aligning capability, heavy load and impact resistance, split outer ring for easy mounting and dismounting.
Application: Suitable for heavy equipment such as ball mills, rotary kilns and rolling mills where shaft penetration assembly is inconvenient.

终身免维护轴承 Lifetime Maintenance-Free Bearing

固态油脂调心滚子轴承 Solid Grease Spherical Roller Bearing

结构: 双列鼓形滚子, 轴承内部填充长双固态润滑脂, 密封结构锁存润滑介质。
特点: 免维护周期长, 不漏油、耐粉尘, 自带调心, 承载高, 适配无供油工况。
用途: 矿山输送、风机、搅拌设备、户外重载低速机械。



Structure: Double-row barrel rollers, the bearing is filled with long-life solid lubricating grease inside, and the sealing structure locks the lubricant.
Features: Long maintenance-free cycle, no oil leakage, dust resistance, self-aligning performance and high load capacity, suitable for non-lubrication working conditions.
Application: Mine conveyors, fans, mixing equipment, outdoor heavy-duty low-speed machinery.

水泥搅拌车轴承 Cement Mixer Truck Bearing

混凝土搅拌车专用轴承 Special Bearings for Concrete Mixer Trucks

结构: 外圈为剖分式结构, 内、外圈宽度不等; 保持架为两体片式结构; 滚子为半对称形状。
特点: 承载能力强, 调心角度大 ($\geq \pm 6^\circ$); 带多重密封防尘防水; 可承受重载、冲击与振动。
用途: 用于混凝土搅拌车减速机输出端及罐体支撑, 承受倾斜罐体的大偏转与交变载荷。



Structure: Split outer ring, different widths of inner and outer rings; two-piece cage; semi-symmetric rollers.
Features: High load capacity, large self-aligning angle ($\geq \pm 6^\circ$); multi-sealed design for dust and water resistance; capable of bearing heavy loads, impacts and vibrations.
Application: Used for the output end of concrete mixer truck reducers and tank support, to withstand large deflection and alternating loads of inclined tanks.

推力调心滚子轴承 Spherical Thrust Roller Bearing

E 型 加强重载高承载轴承 E Type - Reinforced Heavy-Duty High Load Bearing

结构: 采用对称球面滚子, 两片冲压钢保持架及内圈无挡边设计。
特点: 属加强型重载设计, 额定负荷可提高20%~50%; 具有自动调心性, 能补偿安装误差与轴挠曲。
用途: 适用于齿轮箱、造纸机械、矿山及振动筛等重载、冲击工况。



Structure: Adopts symmetrical spherical rollers, two-piece stamped steel cage and inner ring without ribs.
Features: Reinforced heavy-load design with rated load increased by 20%~50%; self-aligning capability to compensate for mounting errors and shaft deflection.
Applications: Suitable for heavy-load and shock-load working conditions such as gearboxes, paper-making machinery, mining equipment and vibrating screens.

推力调心滚子轴承 Spherical Thrust Roller Bearing

M 型 黄铜保持架高速耐磨轴承

M Type - High-Speed Wear-Resistant Bearing with Brass Cage

结构: 整体黄铜实体保持架, 滚子引导, 内圈无挡边, 滚子对称排列。
特点: 高速性能优异, 耐磨性好, 温升低; 黄铜保持架强度高, 抗咬合能力强, 适用于中高速运转。
用途: 风机、压缩机、泵类、电机等中高速旋转设备, 以及对温升和耐磨性有较高要求的场合。



Structure: One-piece solid brass cage, roller-guided design, inner ring without ribs, symmetrically arranged rollers.
Features: Excellent high-speed performance and wear resistance with low temperature rise. The brass cage features high structural strength and strong anti-seizure capacity, suitable for medium and high-speed operation.
Applications: Medium & high-speed rotating equipment including fans, compressors, pumps and motors, as well as working scenarios with strict requirements on temperature rise and wear resistance.

推力调心滚子轴承 Spherical Thrust Roller Bearing

EM 型 内圈引导精密重载轴承

EM Type - Precision Heavy-Duty Bearing with Shaft Washer Guided Cage

结构: 分体两片式实体黄铜保持架, 内圈设有固定中挡边, 滚子对称排布。
特点: 采用内圈引导, 运转精度高、刚性强; 耐冲击, 额定承载能力突出, 适用于重载、中低速工作环境。
用途: 破碎机、轧钢机、减速机、振动筛等承受大载荷与冲击负荷的机械设备。



Structure: Two-piece solid brass cage, inner ring with fixed central rib, symmetrically arranged rollers.
Features: High precision and rigidity under inner ring guidance, outstanding shock resistance and load capacity; ideal for heavy-load, medium-low speed conditions.
Applications: Equipment subject to heavy and impact loads such as crushers, rolling mills, reducers and vibrating screens.

面粉机专用轴承 Flour Mill Special Bearings

面粉机专用轴承主要采用调心滚子轴承结构, 安装在磨粉机辊的两端。针对面粉加工高转速、长时间连续运转、高粉尘、温升快等特殊工况, 产品以高精度、低振动、免维护、长寿命为核心卖点。

磨粉机一般配置4辊或8辊, 每根磨辊两端各安装一套轴承。轴承需保证磨辊精确的同心回转, 承受高转速和磨辊压力。

Flour mill special bearings mainly adopt spherical roller bearing structures, fitted at both ends of flour mill rolls. Tailored for harsh operating conditions in flour processing—high rotational speed, long-term continuous operation, heavy dust exposure and rapid temperature rise—the products feature high precision, low vibration, maintenance-free performance and long service life as core selling points. Flour mills are generally equipped with 4 or 8 grinding rolls, with one set of bearings installed at each end of every roll. The bearings guarantee precise concentric rotation of the rolls and withstand high rotational speeds as well as rolling pressure from the grinding



翔力轴承在面粉机的应用
Xiangli Bearings for Flour Mill Applications



产品特点及应用 Product Features & Applications

高精度: 精度等级可达P5级 (国际先进水平), 确保磨辊运转平稳
低振动: 振动值稳定在V3标准, 有效降低设备运行时的振动
低噪音: 精密加工与优化设计, 运行安静
免维护: 无需频繁加注润滑油, 降低人工维护成本
长寿命: 优化滚道设计, 滚子长度加大, 额定载荷提高
100%检测: 确保产品合格率百分之百
轴承应用面粉机四辊及八辊磨粉机, 自衡震动筛, 提升机, 刮板带式输送机

High Precision: ISO P5 grade for smooth mill roll rotation
Low Vibration: Stable V3 vibration level
Low Noise: Precision machining for quiet running
Maintenance-Free: Rare grease refilling, lower maintenance cost
Long Service Life: Optimized raceways & longer rollers for higher load capacity
100% Full Inspection: Zero defective rate
Bearing Applications: 4-roll & 8-roll flour mills, self-balancing vibrating screens, elevators, scraper and belt conveyors



典型型号 Typical Models

高速主轴系列
22315EK-P5V3
22314E-P5V3-2RS
22313EK
22313E1-P5V3

重载磨辊系列
22322E1 23224CC
22314E1 22315E1
21313CC/W33

输送及通用部位
22209 22210 22211
22212 22213 22214
22215

◎ 回转窑轴承系列

轴承特点:

低速重载、耐磨抗振、性能稳定可靠
寿命可达到3万小时以上

轴承配套范围:

各种尺寸类别的窑配套

代表规格:

240/630CA/W33 24080CA/W33
24064CA/W33



◎ 立磨摇臂轴承系列

轴承特点:

低速重载、耐磨抗振、性能稳定可靠
寿命可达到3万小时以上

轴承配套范围:

各种尺寸类别立磨摇臂配套

代表规格:

24172CAK30/W33 23260CAW33
24152CAKS0/W33 24164CAK30/W33



◎ 振动筛轴承系列

轴承特点:

重载、高速、抗振耐磨、性能稳定可靠
寿命要求9000小时以上

轴承配套范围:

各类各尺寸振动筛设备

代表规格:

22326CB/C4 22328CB/C4
22330CB/C4



◎ 输送机轴承系列

轴承特点:

抗振耐磨、性能稳定可靠
寿命要求9000小时以上轴承

轴承配套范围:

各类各尺寸输送机设备

代表规格:

21310CA 32010 6210



◎ 选粉机轴承系列

轴承特点:

高转速、高可靠性
寿命3万小时以上

轴承配套范围:

各类选粉机和选粉装置

代表规格:

24032CA/W33 23122CA/W33 618/530MA
29432 718/530AGM 60/1060QJ10/1060A



◎ 制砂机轴承系列

轴承特点:

抗振耐磨、转速高、性能稳定可靠
寿命要求15000小时以上

轴承配套范围:

各类各尺寸制砂机

代表规格:

6328M NU2328M
NU328M



◎ 泵类轴承系列

轴承特点:

精度等级: P5
轴承承载力高, 使用寿命 $\geq 40000h$

轴承配套范围:

各种泵类

代表规格:

7220ACM
7324B



◎ 鼓风机轴承系列

轴承特点:

通过完善的表面结构、精密的内部几何构造优化
重要项目公差设计理念, 产品精度的最高至P4级

轴承配套范围:

各类各尺寸鼓风机设备

代表规格:

22316E
23032CC/C3W33



振动筛轴承 Vibrating screen bearing

型号 Bearing No.	动载 Dynamic Capacity KN	静载 Static Capacity KN	内径公差 Bore Tolerance in.	外径公差 O.D. Tolerance in.	最低游隙 Clearance Min.in.	最大游隙 Clearance Max.in.
22310MAC4F80W33	195	220	0/-0.007	-0.005/-0.013	0.085	0.100
22311MAC4F80W33	220	265	0/-0.009	-0.005/-0.013	0.100	0.120
22312MAC4F80W33	260	310	0/-0.009	-0.005/-0.013	0.100	0.120
22313MAC4F80W33	280	330	0/-0.009	-0.005/-0.013	0.100	0.120
22314MAC4F80W33	375	455	0/-0.009	-0.005/-0.013	0.120	0.145
22315MAC4F80W33	380	475	0/-0.009	-0.005/-0.018	0.120	0.145
22316MAC4F80W33	410	520	0/-0.009	-0.005/-0.018	0.120	0.145
22317MAC4F80W33	460	570	0/-0.012	-0.005/-0.018	0.150	0.180
22318MAC4F80W33	570	730	0/-0.012	-0.010/-0.023	0.150	0.180
22319MAC4F80W33	570	740	0/-0.012	-0.010/-0.023	0.150	0.180
22320MAC4F80W33	670	880	0/-0.012	-0.010/-0.023	0.150	0.180
22322MAC4F80W33	815	1080	0/-0.012	-0.010/-0.023	0.180	0.210
22324MAC4F80W33	930	1230	0/-0.012	-0.010/-0.023	0.180	0.210
22326MAC4F80W33	1080	1450	0/-0.015	-0.010/-0.023	0.205	0.240
22328MAC4F80W33	1240	1720	0/-0.015	-0.010/-0.023	0.205	0.240
22330MAC4F80W33	1400	1940	0/-0.015	-0.013/-0.028	0.240	0.280
22332MAC4F80W33	1520	2160	0/-0.015	-0.013/-0.028	0.240	0.280
22334MAC4F80W33	1690	2380	0/-0.015	-0.013/-0.028	0.260	0.310
22336MAC4F80W33	1900	2700	0/-0.015	-0.013/-0.028	0.260	0.310

混凝土搅拌车专用轴承 Vibrating screen bearing

针对混凝土搅拌车频繁启停、重载冲击、粉尘潮湿的严苛工况，翔力精工推出全系列专用轴承，涵盖 801806、800730、804312A 等主流型号。

产品采用强化结构优化设计，额定载荷高，抗冲击性能优异，使用寿命长。全系列精准匹配 ZF、PMP、邦飞利、萨奥、KYB、大金 等国际知名减速机品牌，规格齐全，配套简单，帮助客户实现快速维修、降低停机成本。

Xiangli Precision Engineering has launched a full range of special bearings tailored for the harsh working conditions of concrete mixers, including frequent start-stop cycles, heavy-load impacts, dusty and humid environments, covering mainstream models such as 801806, 800730 and 804312A. Featuring optimized reinforced structural design, these bearings deliver high rated load capacity, excellent shock resistance and extended service life. The full product line is precisely compatible with world-renowned reducer brands including ZF, PMP, Bonfiglioli, Sauer, KYB and Daikin. With complete specifications and easy installation, they enable customers to complete maintenance rapidly and cut downtime costs.

型号 Code NO.	保持器 Cage Type	尺寸 / mm Size	动载荷(KN) Load Ratings		转速 RPM	
			Cr	Cor	脂润滑 Grease (r/min)	油润滑 Oil (r/min)
BS2B248180	尼龙Nylon	100*165*52/65	330	520	1800	2300
534176	铜保Brass	110*180*69/82	472	798	1800	2200
540626AA	铜保Brass	100*150*50/62	325	560	1400	1500
801215A	尼龙Nylon	100*160*61/66	400	610	1600	1900
801806	尼龙Nylon	110*180*74/82	458	775	1800	2200
804182	尼龙Nylon	110*180*69/82	472	798	1800	2200
804312A	钢保Steel	120*215*58/80	484	698	1400	1800
809281	钢保Steel	120*215*76/98	750	1000	1400	1800
809281	尼龙Nylon	120*215*76/98	750	1000	1400	1800
400365	尼龙Nylon	100*160*61/66	400	610	1600	1900

公称外径 D(mm)	外径(μm) ΔDmp						宽度变动量(μm) Vcs				滚动径向跳动(μm) Kra						滚动轴向跳动 (μm)Sea				外径对端面的 跳动(μm) Sd		
	P0	P6	P5	P4	P2	P0 P6	P5	P4	P2	P0	P6	P5	P4	P2	P5	P4	P2	P5	P4	P2	P5	P4	P2
18 30	-9	-8	-6	-5	-4	20	5	2.5	1.5	15	9	6	4	2.5	8	5	2.5	8	4	1.5			
30 50	-11	-9	-7	-6	-4	20	5	2.5	1.5	20	10	7	5	2.5	8	5	2.5	8	4	1.5			
50 80	-13	-11	-9	-7	-4	25	6	3	1.5	25	13	8	5	4	10	5	4	8	4	1.5			
80 120	-15	-13	-10	-8	-5	25	8	4	2.5	35	18	10	6	5	11	6	5	9	5	2.5			
120 150	-18	-15	-11	-9	-5	30	8	5	2.5	40	20	11	7	5	13	7	5	10	5	2.5			
150 180	-25	-18	-13	-10	-7	30	8	5	2.5	45	23	13	8	5	14	8	5	10	5	2.5			
180 250	-30	-20	-15	-11	-8	30	10	7	4	50	25	15	10	7	15	10	7	11	7	4			
250 315	-35	-25	-18	-13	-8	35	11	7	5	60	30	18	11	7	18	10	7	13	8	5			
315 400	-40	-28	-20	-15	-10	40	13	8	7	70	35	20	13	8	20	13	8	13	10	7			
400 500	-45	-33	-23			45	15			80	40	23			23			15					
500 630	-50	-38	-28			50	18			100	50	25			25			18					

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调心滚子圆柱孔 Cylindrical hole of aligning roller 轴承径向游隙表 Bearing radial clearance gauge

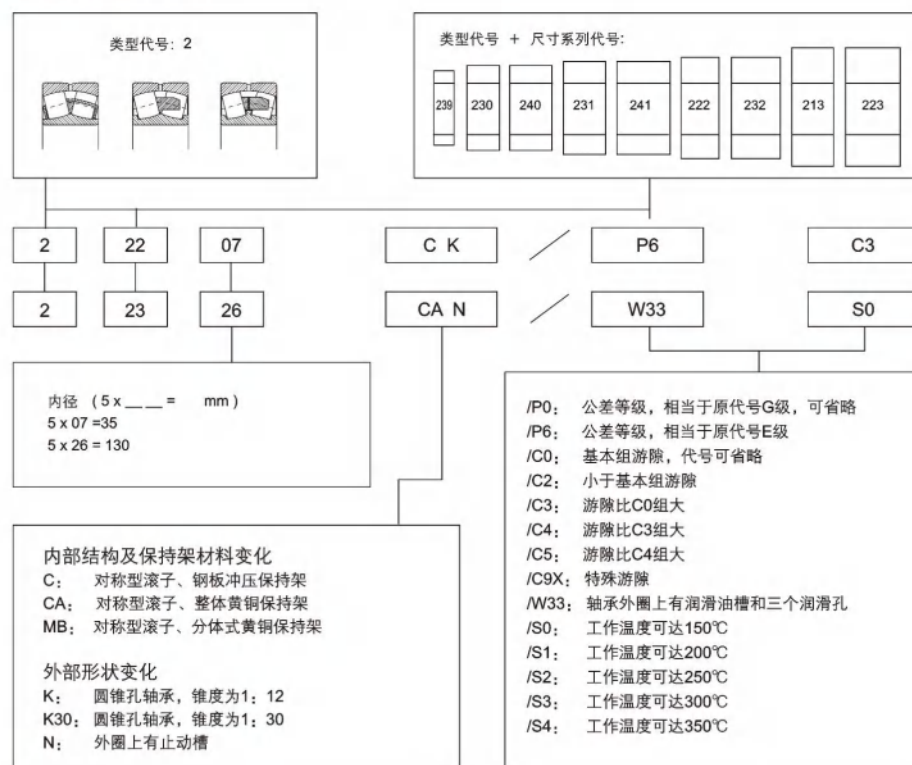
公称内径		原始径向游隙 original radial clearance									
d		C2		CN (普通型)		C3		C4		C5	
超过 Exceed	到 To	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max
14	18	18	20	20	35	35	45	45	60	60	75
18	24	24	20	20	35	35	45	45	60	60	75
24	30	30	25	25	40	40	55	55	75	75	95
30	40	40	30	30	45	45	60	60	80	80	100
40	50	50	35	35	55	55	75	75	100	100	125
50	65	65	40	40	65	65	90	90	120	120	150
65	80	80	50	50	80	80	110	110	145	145	180
80	100	100	60	60	100	100	135	135	180	180	225
100	120	120	75	75	120	120	160	160	210	210	260
120	140	140	95	95	145	145	190	190	240	240	300
140	160	160	110	110	170	170	220	220	280	280	350
160	180	180	120	120	180	180	240	240	310	310	390
180	200	200	130	130	200	200	260	260	340	340	430
200	225	225	140	140	220	220	290	290	380	380	470
225	250	250	150	150	240	240	320	320	420	420	520
250	280	280	170	170	260	260	350	350	460	460	570
280	315	315	190	190	280	280	370	370	500	500	630
315	355	355	200	200	310	310	410	410	550	550	690
355	400	400	220	220	340	340	450	450	600	600	750
400	450	450	240	240	370	370	500	500	660	660	820
450	500	500	260	260	410	410	550	550	720	720	900
500	560	560	280	280	440	440	600	600	780	780	1000
560	630	630	310	310	480	480	650	650	850	850	1100
630	710	710	350	350	530	530	700	700	920	920	1190
710	80	80	390	390	580	580	770	770	1010	1010	1300
800	900	900	430	430	650	650	860	860	1120	1120	1440
900	1000	1000	480	480	710	710	930	930	1220	1220	1570

调心滚子圆锥孔 Tapered roller hole 轴承径向游隙表 Bearing radial clearance gauge

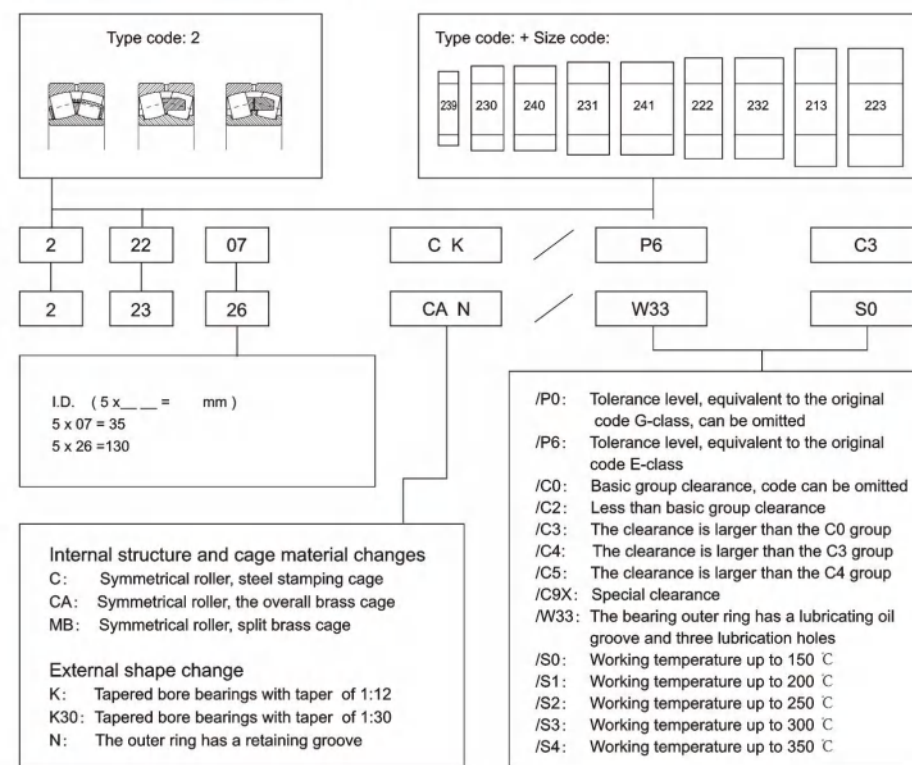
公称内径		原始径向游隙 original radial clearance									
d		C2		CN (普通型)		C3		C4		C5	
超过 Exceed	到 To	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max	最小 Min	最大 Max
18	24	15	25	25	35	35	45	45	65	65	75
24	30	20	30	30	40	40	55	55	75	75	95
30	40	25	35	35	50	50	65	65	85	85	105
40	50	30	45	45	60	60	80	80	100	100	130
50	65	40	55	55	75	75	95	95	120	120	160
65	80	50	70	70	95	95	120	120	150	150	200
80	100	55	80	80	110	110	140	140	180	180	230
100	120	65	100	100	135	135	170	170	220	220	280
120	140	80	120	120	160	160	200	200	260	260	330
140	160	90	130	130	180	180	230	230	300	300	380
160	180	100	140	140	200	200	260	260	340	340	430
180	200	110	160	160	220	220	290	290	370	370	470
200	225	120	180	180	250	250	320	320	410	410	520
225	250	140	200	200	270	270	350	350	450	450	570
250	280	150	220	220	300	300	390	390	490	490	620
280	315	170	240	240	330	330	430	430	540	540	680
315	355	190	270	270	360	360	470	470	590	590	740
355	400	210	300	300	400	400	520	520	650	650	820
400	450	230	330	330	440	440	570	570	720	720	910
450	500	260	370	370	490	490	630	630	790	790	1000
500	560	290	410	410	540	540	680	680	870	870	1100
560	630	320	460	460	600	600	760	760	980	980	1230
630	710	350	510	510	670	670	850	850	1090	1090	1360
710	800	390	570	570	750	750	960	960	1220	1220	1500
800	900	440	640	640	840	840	1070	1070	1370	1370	1690
900	1000	490	710	710	930	930	1190	1190	1520	1520	1860



调心滚子轴承代号



Spherical Roller Bearing Code



轴承参数表中英文对照与区别说明

Chinese-English Comparison and Explanation of Differences for Bearing Parameter Tables

基本尺寸 Basic Dimensions, mm

参数	英文	含义	区别说明
d	Bore diameter	轴承公称内径	安装到轴上的孔径, 决定轴的尺寸
D	Outside diameter	轴承公称外径	与轴承座配合的外径, 决定轴承座孔径
B	Width/Height	轴承公称宽度 / 高度	轴向厚度, 影响安装空间和承载能力
rmin	Minimum chamfer size	最小倒角尺寸	轴承内外圈边缘最小允许的倒角 / 圆角尺寸

基本额定载荷 Basic Load Ratings, kN

参数	英文	含义	区别说明
Cr	Radial basic dynamic load rating	径向基本额定动载荷	轴承能承受的恒定径向载荷, 在此载荷下轴承寿命为 100 万转
Cor	Radial basic static load rating	径向基本额定静载荷	轴承静止或极低转速下能承受的最大径向载荷

Cr: 衡量轴承抗疲劳能力, 适用于旋转工况

Cor: 防止滚动与滚动体接触区产生永久变形, 适用于静止或缓慢摆动工况

极限转速 Limiting Speeds, r/min

参数	英文	含义	区别说明
脂润滑	Grease lubrication limiting speed	脂润滑条件下的极限转速	使用润滑脂时, 轴承能长期安全运行的最高转速
油润滑	Oil lubrication limiting speed	油润滑条件下的极限转速	使用润滑油时, 轴承能长期安全运行的最高转速

油润滑转速 > 脂润滑转速: 油的散热和流动性更好, 允许更高转速

极限转速受轴承类型、尺寸、游隙、润滑方式和负荷条件影响

极限转速 Limiting Speeds, r/min

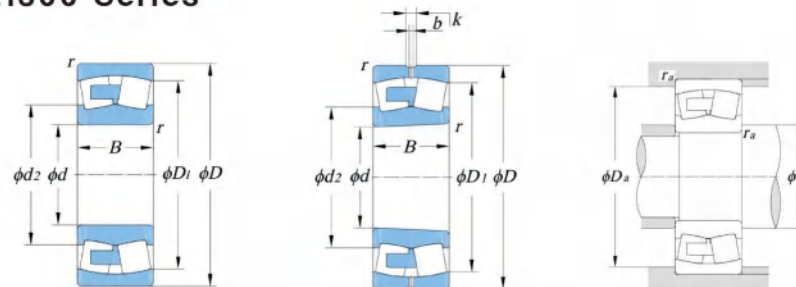
参数	英文	含义	区别说明
damin	Minimum shaft shoulder diameter	轴挡肩最小直径	轴上安装轴承处的挡肩最小允许直径, 确保轴肩提供足够支撑
damax	Maximum shaft shoulder diameter	轴挡肩最大直径	轴上安装轴承处的挡肩最大允许直径, 防止与轴承内圈干涉
Damin	Minimum housing shoulder diameter	轴承座挡肩最小直径	轴承座上安装轴承处的挡肩最小允许直径
Damax	Maximum housing shoulder diameter	轴承座挡肩最大直径	轴承座上安装轴承处的挡肩最大允许直径
ramax	Maximum chamfer radius	最大倒角半径	轴肩或轴承座挡肩处允许的最大圆角 / 倒角半径, 防止损伤轴承

damin/damax: 控制轴肩尺寸, 确保轴承内圈定位准确且装配顺畅

Damin/Damax: 控制轴承座挡肩尺寸, 确保轴承外圈定位准确且装配顺畅

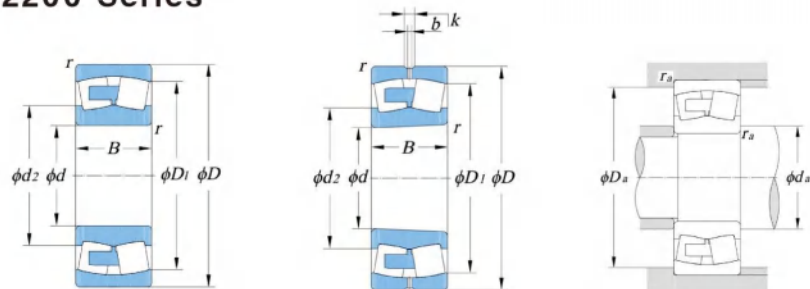
ramax: 保护轴承免受安装时轴肩 / 座肩锐边损伤, 同时便于装配

21300 系列 21300 Series



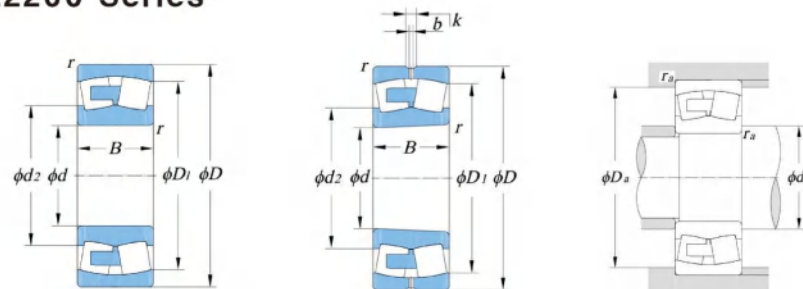
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings (kN)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da	Max	Min	Max	ra	
21308	40	90	23	1.5	82.6	89	4400	5300	46	54	77	84	1.5	0.751
21310	50	110	27	2	128	141	3400	4300	57	67	96	103	2	1.34
21311	55	120	29	2	153	164	3200	3900	62	71	105	113	2	1.67
21312	60	130	31	2.1	177	217	3000	3600	69	84	113	121	2	2.08
22213	65	120	31	1.5	164	208	3800	4800	71	79	107	114	1.5	1.58
21313	65	140	33	2.1	197	223	2800	3600	74	85	123	131	2	2.58
21314	70	150	35	2.1	215	247	2400	3200	79	93	131	141	2	3.02
21315	75	160	37	2.1	245	325	2400	2900	84	102	136	151	2	3.88
21316	80	170	39	2.1	278	370	2200	2700	89	109	143	161	2	4.59
21317	85	180	41	3	308	401	2000	2800	96	116	157	169	2.5	5.42
21318	90	190	43	3	337	427	2400	3200	101	121	163	179	2.5	5.82
21320	100	215	47	3	388	491	1700	2200	111	135	183	204	2.5	8.74
21322	110	240	50	3	462	554	1600	2000	121	147	206	229	2.5	11.7

22200 系列 22200 Series



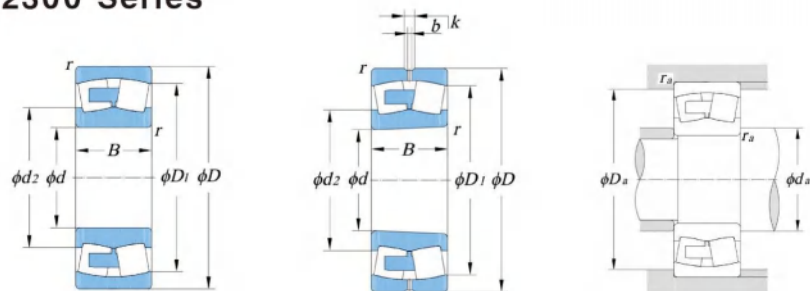
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
22206	30	62	20	1	56.1	61.1	6100	7400	34	39	54	58	1	0.295
22207	35	72	23	1.1	72.5	81.6	6000	7500	40	45	62	67	1.1	0.45
22208	40	80	23	1.1	82.9	93.7	4700	5700	45	51	72	75	1.1	0.544
22209	45	85	23	1.1	88	102	5300	6700	50	55	76	80	1.1	0.629
22210	50	90	23	1.1	88	105	5000	6300	55	59	81	85	1.1	0.658
22211	55	100	25	1.5	114	138	4500	5600	61	66	91	94	1.5	0.897
22212	60	110	28	1.5	136	167	4000	5000	66	72	98	104	1.5	1.03
22213	65	120	31	1.5	164	208	3800	4800	71	79	107	114	1.5	1.58
22214	70	125	31	1.5	164	208	3600	4500	76	84	113	119	1.5	1.61
22215	75	130	31	1.5	170	225	3400	4300	81	89	118	124	1.5	1.76
22216	80	140	33	2	189	250	3200	4000	87	96	127	133	2	2.03
22217	85	150	36	2	223	289	3000	3800	93	103	136	142	2	2.66
22218	90	160	40	2	269	361	2600	3400	98	108	143	152	2	3.45
22219	95	170	43	2.1	308	422	2400	3200	104	115	153	161	2	4.53
22220	100	180	46	2.1	344	469	2200	3000	109	121	161	171	2	5.04
22222	110	200	53	2.1	424	592	2000	2800	119	136	178	191	2	7.25
22224	120	215	58	2.1	514	731	1900	2600	129	146	192	206	2	9.89

22200 系列 22200 Series



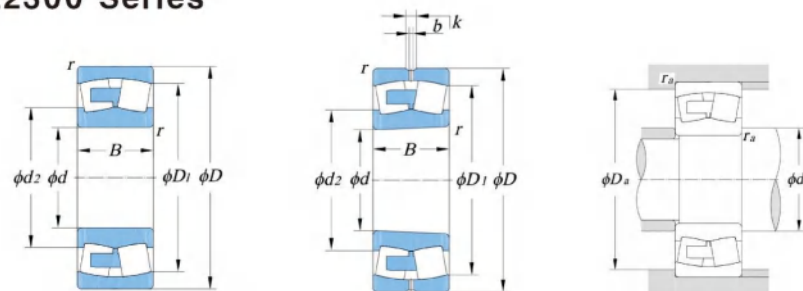
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
22226	130	230	64	3	600	876	1800	2400	141	157	205	219	2.5	11.4
22228	140	250	68	3	684	1010	1700	2200	151	172	222	239	2.5	15.2
22230	150	270	73	3	770	1130	1600	2000	161	185	239	259	2.5	18.5
22232	160	290	80	3	917	1380	1500	1900	171	197	254	279	2.5	24.2
22234	170	310	86	4	1030	1540	1300	1700	184	210	273	296	3	26.7
22236	180	320	86	4	1090	1660	1300	1700	194	218	284	306	3	29.4
22238	190	340	92	4	1140	1710	1200	1600	204	230	298	326	3	37.2
22240	200	360	98	4	1330	2080	1100	1500	214	244	314	346	3	44.7
22244	220	400	108	4	1670	2610	950	1300	234	271	350	386	3	60.6
22248	240	440	120	4	2090	3250	900	1200	254	298	386	426	3	84.8
22252	260	480	130	5	2290	3590	850	1100	277	323	421	463	4	106
22256	280	500	130	5	2290	3600	800	1000	297	342	442	483	4	111
22260	300	540	140	5	2660	4270	750	950	317	370	474	523	4	138
22264	320	580	150	5	3030	4880	670	850	337	395	509	563	4	175
22272	360	650	170	6	3760	6170	600	800	381	444	570	629	5	248
22280	400	720	185	6	4500	7530	320	390	421	493	633	699	5	332

22300 系列 22300 Series



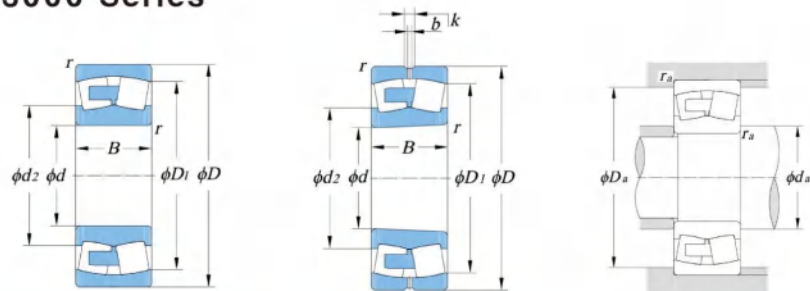
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
22308	90	33	33	1.5	127	140	4500	5600	46	54	78	84	1.5	1.02
22309	100	36	36	1.5	153	179	3800	4800	51	60	85	94	1.5	1.53
22310	110	40	40	2	193	226	3400	4300	57	65	95	103	2	2.02
22311	120	43	43	2	214	249	3200	4000	62	71	104	113	2	2.63
22312	130	46	46	2.1	248	291	3000	3800	69	78	112	121	2	3.25
22313	140	48	48	2.1	286	344	2600	3400	74	85	121	131	2	3.58
22314	150	51	51	2.1	321	394	2200	3000	79	92	130	141	2	4.45
22315	160	55	55	2.1	366	454	2200	3000	84	97	138	151	2	5.35
22316	170	58	58	2.1	399	500	2000	2800	89	106	146	161	2	6.48
22317	180	60	60	3	439	552	1900	2600	96	111	155	169	2.5	7.96
22318	190	64	64	3	518	677	1800	2400	101	120	164	179	2.5	9.66
22319	200	67	67	3	569	745	1800	2400	106	124	172	189	2.5	10.3
22320	215	73	73	3	658	874	1700	2200	111	134	183	204	2.5	13.3
22322	240	80	80	3	772	1030	1600	2000	121	147	202	229	2.5	18.2
22324	260	86	86	3	883	1190	1400	1800	131	161	220	249	2.5	22.8
22326	280	93	93	4	1020	1390	1300	1700	144	174	237	266	3	28.3

22300 系列 22300 Series



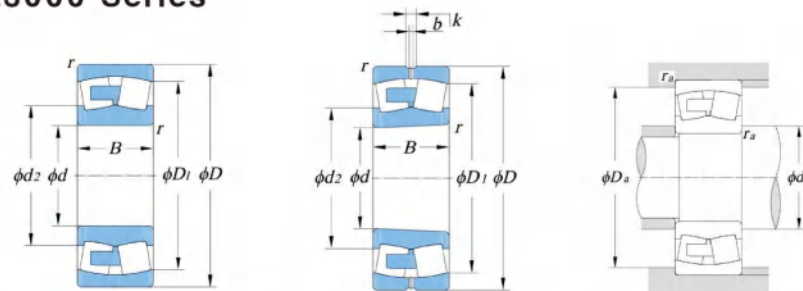
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
22328	140	300	102	4	1210	1700	1100	1500	154	187	254	286	3	35.6
22330	150	320	108	4	1290	1810	1000	1400	164	199	270	306	3	42.6
22332	160	340	114	4	1540	2190	950	1300	174	211	289	326	3	50.8
22334	170	360	120	4	1600	2280	950	1300	184	225	304	346	3	59.3
22336	180	380	126	4	1770	2560	900	1200	194	238	321	366	3	69.9
22338	190	400	132	5	1950	2820	850	1100	207	252	341	383	4	80.8
22340	200	420	138	5	2130	3090	850	1100	217	264	356	403	4	95.5
22344	220	460	145	5	2370	3470	980	1360	237	288	391	443	4	119
22348	240	500	155	5	2730	4040	650	800	257	314	425	483	4	147
22352	260	540	165	6	3210	4760	630	800	281	343	462	519	5	186
22356	280	580	175	6	3700	5660	600	750	301	357	492	559	5	221
22360	300	620	185	7.5	3960	5990	500	600	326	389	529	594	6	271
22364	320	670	200	7.5	4530	6850	450	600	346	423	573	644	6	351
22368	340	710	212	7.5	5020	7850	350	420	366	451	601	684	6	407
22372	360	750	224	7.5	5740	8850	400	500	386	471	638	724	6	468
22380	400	820	243	7.5	6580	10290	400	700	426	513	701	794	6	623

23000 系列 23000 Series



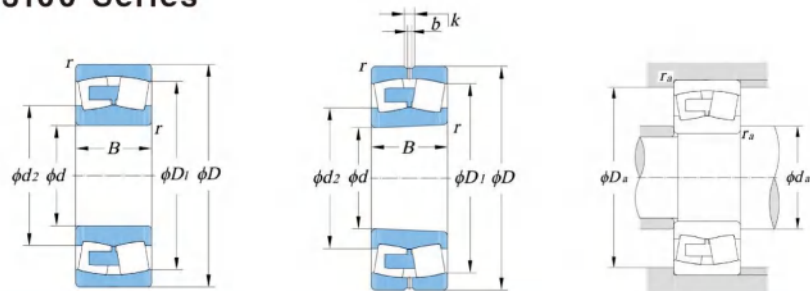
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23020	100	150	37	1.5	216	344	2400	3200	106	112	139	144	1.5	2.52
23022	110	170	45	2	305	489	2200	3000	118	126	155	162	2	3.52
23024	120	180	46	2	319	532	2000	2800	128	137	166	172	2	4.16
23026	130	200	52	2	411	681	1900	2600	138	150	183	192	2	6.18
23028	130	210	53	2	436	749	1800	2400	138	159	192	202	2	6.7
23030	150	225	56	2.1	462	794	1700	2200	159	171	206	216	2	8.01
23230	150	270	96	3	997	1600	1100	1500	161	185	232	259	2.5	24.4
23032	160	240	60	2.1	540	939	1700	2200	169	183	220	231	2	9.95
23034	170	260	67	2.1	660	1140	1600	2000	179	194	236	251	2	14.1
23036	180	280	74	2.1	761	1360	1400	1800	189	210	252	271	2	17.5
23038	190	290	75	2.1	807	1450	1300	1700	197	219	264	283	2	17.2
23040	200	310	82	2.1	972	1750	1200	1600	209	233	282	301	2	23.2
23044	220	340	90	3	1120	2010	1100	1500	231	256	308	329	2.5	30.1
23048	240	360	92	3	1180	2200	1000	1400	251	274	327	349	2.5	34.2
23052	260	400	104	4	1480	2730	900	1200	274	302	363	386	3	48.1
23056	280	420	106	4	1600	3040	850	1100	294	321	383	406	3	51.8
23060	300	460	118	4	1940	3660	800	1000	314	347	415	446	3	75.8
23064	320	480	121	4	2020	3920	800	1000	334	367	438	466	3	84.8
23068	340	520	133	5	2380	4650	700	900	357	395	473	503	4	115
23072	360	540	134	5	2490	4920	670	850	377	415	493	523	4	126

23000 系列 23000 Series



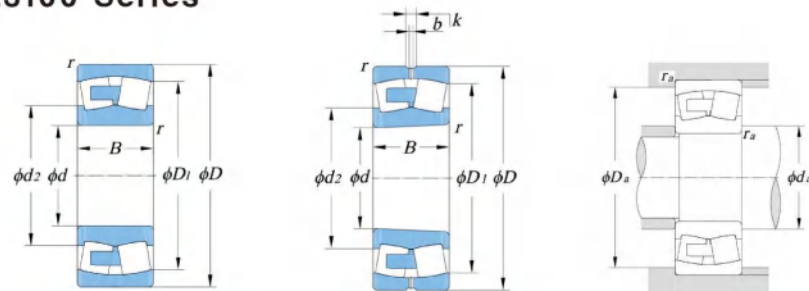
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23076	380	560	135	5	2560	5260	630	800	397	437	512	543	4	125
23080	400	600	148	5	2970	5920	600	750	417	456	548	583	4	147
23084	420	620	150	5	3120	6380	500	1000	437	480	565	603	4	149
23088	440	650	157	6	3370	6930	500	900	461	503	592	629	5	186
23092	460	680	163	6	3680	7610	500	850	481	524	620	659	5	229
23096	480	700	165	6	3760	7920	450	850	501	546	641	679	5	215
230/500	500	720	167	6	3890	8360	450	800	521	562	660	699	5	225
230/530	530	780	185	6	4680	10210	400	700	551	608	710	759	5	339
230/560	560	820	195	6	5200	11220	400	800	581	638	748	799	5	363
230/600	600	870	200	6	5650	12420	350	650	621	679	794	849	5	431
230/630	630	920	212	7.5	6130	13410	300	600	656	715	838	894	6	470
230/670	670	980	230	7.5	6890	15090	300	500	696	753	893	954	6	604
230/750	750	1090	250	7.5	8390	18860	250	450	776	840	994	1064	6	789
230/800	800	1150	258	7.5	8790	20070	250	450	826	902	1050	1124	6	883
230/900	900	1280	280	7.5	10550	24760			927	1009	1175	1253	6	1220
230/950	950	1360	300	7.5	11600	27080			977	1067	1244	1333	6	1444
230/1000	1000	1420	308	7.5	12720	30430			1027	1132	1311	1393	6	1602
230/1060	1060	1500	325	9.5	13380	32300			1091	1191	1391	1469	8	2300
230/1180	1180	1660	355	9.5	15190	37440			1212	1319	1524	1628	8	2476
230/1250	1250	1750	375	9.5	17350	43650			1281	1403	1624	1719	8	2850

23100 系列 23100 Series



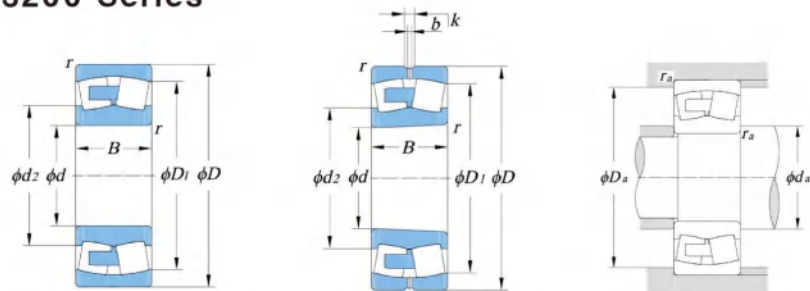
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23120	100	165	52	2	347	544	2000	2800	108	119	147	157	2	4.42
23121	105	175	56	2	380	584	1900	2700	113	123	155	167	2	5.48
23122	110	180	56	2	393	616	1900	2600	118	128	160	172	2	5.73
23124	120	200	62	2	487	765	1800	2400	128	144	179	192	2	12.2
23128	130	225	68	2.1	598	1000	1600	2000	139	162	200	216	2	10.9
23126	130	210	64	2	518	843	1700	2200	138	1543	187	202	2	8.66
23130	150	250	80	2.1	783	1310	1400	1800	159	178	220	241	2	16.5
23132	160	270	86	2.1	880	1440	1300	1700	169	192	238	261	2	20.2
23134	170	280	88	2.1	919	1540	1200	1600	179	202	248	271	2	21.7
23136	180	300	96	3	1080	1820	1100	1500	191	213	263	289	2.5	26.8
23138	190	320	104	3	1180	1960	1000	1400	201	228	281	309	2.5	33.4
23140	200	340	112	3	1400	2370	950	1300	211	240	297	329	2.5	42.5
23144	220	370	120	4	1640	2860	900	1200	234	265	326	356	3	53.1
23148	240	400	128	4	1820	3180	850	1100	254	285	352	386	3	67.6
23152	260	440	144	4	2230	3940	800	1000	274	312	385	426	3	88.9
23156	280	460	146	5	2390	4370	750	950	297	332	407	443	4	104
23160	300	500	160	5	2760	5010	670	850	317	356	440	483	4	127
23164	320	540	176	5	3290	6060	630	800	337	384	472	523	4	172

23100 系列 23100 Series



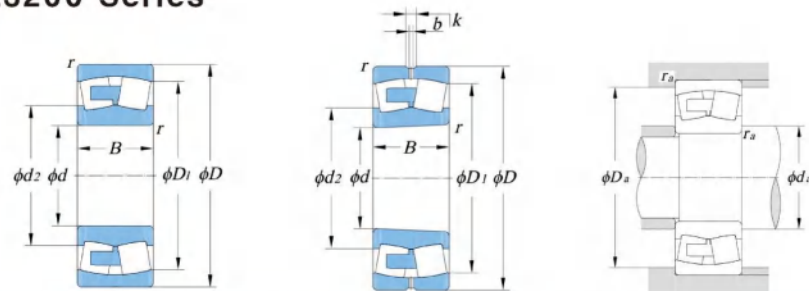
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23168	340	580	190	5	3680	6680	600	750	357	407	504	563	4	211
23172	360	600	192	5	3890	7250	560	700	377	429	524	583	4	224
23176	380	620	194	5	4050	7750	450	500	397	450	547	603	4	249
23180	400	650	200	6	4270	8200	450	560	421	474	575	629	5	273
23184	420	700	224	6	5120	9740	360	450	441	498	612	679	5	358
23188	440	720	226	6	5400	10560	400	750	461	516	633	699	5	375
23192	460	760	240	7.5	5930	11650	350	700	486	550	667	734	6	442
23196	480	790	248	7.5	6330	12620	350	700	506	571	696	764	6	520
231/500	500	830	264	7.5	7030	13800	350	650	526	595	726	804	6	588
231/530	530	870	272	7.5	7920	16090	300	600	556	634	770	844	6	665
231/560	560	920	280	7.5	8280	16590	300	550	586	670	809	894	6	756
231/600	600	980	300	7.5	9320	19320	190	230	626	710	862	954	6	901
231/630	630	1030	315	7.5	10050	20210	200	500	656	744	910	1004	6	1040
231/670	670	1090	336	7.5	11270	23930	200	450	696	800	957	1064	6	1256
231/800	800	1280	375	9.5	14280	30400			831	935	1128	1249	8	1880
231/850	850	1360	400	12	15600	33450			887	999	1218	1323	10	2260
231/950	950	1500	438	12	19290	43100			988	1113	1329	1462	10	2997
231/1000	1000	1580	462	12	20300	45600			1037	1172	1418	1543	10	3520

23200 系列 23200 Series



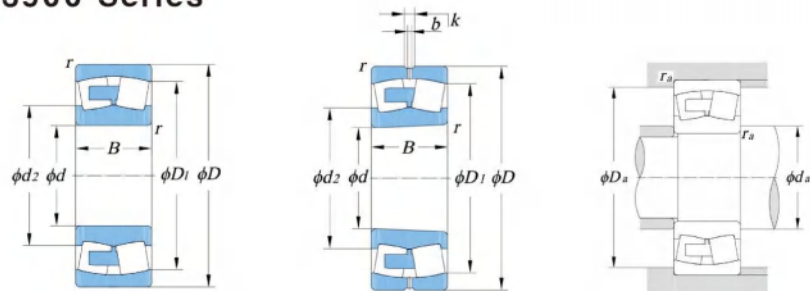
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23216	80	140	44.4	2	256	362	2600	3100	87	96	123	133	2	2.92
23218	90	160	52.4	2	350	507	1900	2600	98	109	140	152	2	4.6
23220	100	180	60.3	2.1	424	613	1700	2200	109	121	157	171	2	6.52
22320	100	215	73	3	658	874	1700	2200	111	134	183	204	2.5	13.3
23222	110	200	69.8	2.1	531	792	1600	2000	119	134	172	191	2	9.91
22322	110	240	80	3	772	1030	1600	2000	121	147	202	229	2.5	18.2
23224	120	215	76	2.1	643	993	1500	1900	129	146	186	206	2	12.1
22324	120	260	86	3	883	1190	1400	1800	131	161	220	249	2.5	22.8
23226	130	230	80	3	706	1090	1300	1700	141	156	198	219	2.5	15.9
22326	130	280	93	4	1020	1390	1300	1700	144	174	237	266	3	28.3
23228	140	250	88	3	982	1500	1200	1600	151	168	220	239	2.5	19.7
22328	140	300	102	4	1210	1700	1100	1500	154	187	254	286	3	35.6
23230	150	270	96	3	997	1600	1100	1500	161	185	232	259	2.5	24.4
223232	160	290	80	3	917	1380	1500	1900	171	197	254	279	2.5	24.2
23232	160	290	104	3	1150	1870	1000	1400	171	196	248	279	2.5	30.2
23234	170	310	110	4	1280	2050	950	1300	184	209	265	296	3	37.4
23236	180	320	112	4	1380	2270	900	1200	194	218	276	306	3	38.3
23238	190	340	120	4	1510	2500	850	1100	204	233	293	326	3	44.8
23240	200	360	128	4	1630	2660	850	1100	214	247	309	346	3	56.9

23200 系列 23200 Series



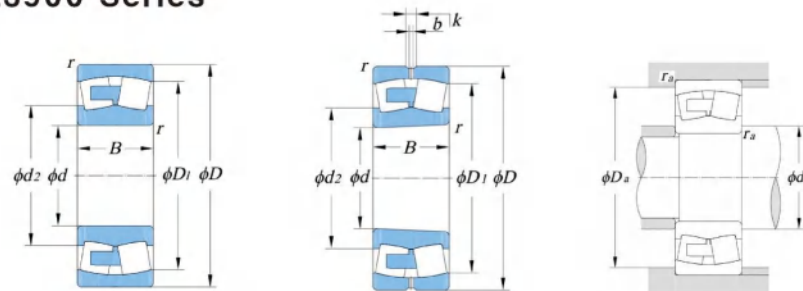
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23244	220	400	144	4	2020	3340	750	950	234	268	340	386	3	77.7
23248	240	440	160	4	2480	4160	670	850	254	296	374	426	3	102
23252	260	480	174	5	2920	4940	630	800	277	322	411	463	4	141
23256	280	500	176	5	3100	5430	600	750	297	342	431	483	4	147
23260	300	540	192	5	3450	5990	530	670	317	366	462	523	4	190
23264	320	580	208	5	4070	7160	500	630	337	393	497	563	4	250
23268	340	620	224	6	4620	8170	500	700	361	419	530	599	5	299
23272	360	650	232	6	5050	9050	500	700	381	436	554	629	5	332
23276	380	680	240	6	5230	9390	380	500	401	461	581	659	5	389
23280	400	720	256	6	6130	11230	400	600	421	492	613	699	5	467
23284	420	760	272	7.5	6740	12500	400	550	446	518	652	734	6	550
23288	440	790	280	7.5	7220	13590	350	500	466	545	678	764	6	611
23296	480	870	310	7.5	8660	16120	300	450	506	574	739	844	6	858
232/500	500	920	336	7.5	9910	18620	300	450	526	617	781	894	6	982
232/530	530	980	355	9.5	11060	20850	250	400	561	649	825	949	8	1208
232/600	600	1090	388	9.5	13070	24950	250	250	631	743	926	1059	8	1596
232/670	670	1220	438	12	16080	31700	200	350	707	829	1030	1183	10	2320
232/710	710	1280	450	12	17640	34630	160	300	747	868	1091	1243	10	2571

23900 系列 23900 Series



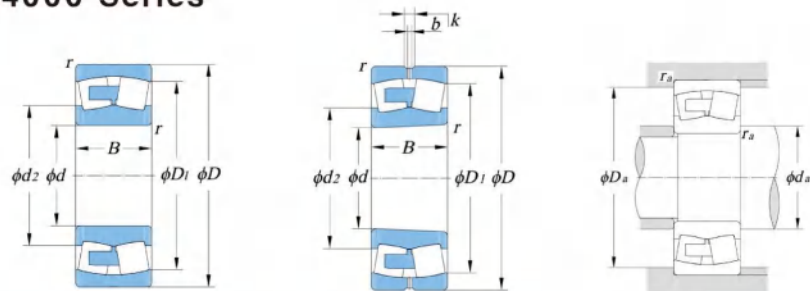
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23934	170	230	45	2	359	717	1700	2200	178	186	216	222	2	5.55
23936	180	250	52	2	448	870	1200	1500	188	201	234	242	2	7.4
23938	190	260	52	2	459	910	1600	2000	198	209	243	252	2	8.29
23940	200	280	60	2.1	604	1220	1100	1300	209	223	258	271	2	11.3
23944	220	300	60	2.1	614	1280	1500	1900	229	242	278	291	2	12.9
23948	240	320	60	2.1	664	1450	1300	1700	249	262	300	311	2	15.1
23952	260	360	75	2.1	860	1850	1100	1500	269	290	332	351	2	24.2
23956	280	380	75	2.1	844	1980	1000	1400	289	312	351	371	2	25.3
23960	300	420	90	3	1240	2640	950	1300	312	334	386	408	2.5	40.7
23964	320	440	90	3	1280	2810	900	1200	332	354	407	428	2.5	41.8
23968	340	460	90	3	1320	2950	900	1200	352	373	427	448	2.5	46
23972	360	480	90	3	1210	2920	850	1100	372	399	446	468	2.5	45.9
23976	380	520	106	4	1800	4100	800	1000	394	421	482	506	3	69.9
23980	400	540	106	4	1820	4230	750	950	414	440	503	526	3	72.9
23984	420	560	106	4	1840	4300	700	900	434	461	524	546	3	75.4
23988	440	600	118	4	2240	5100	450	560	454	487	559	586	3	101
23992	460	620	118	4	2280	5260	500	900	474	506	579	606	3	105

23900 系列 23900 Series



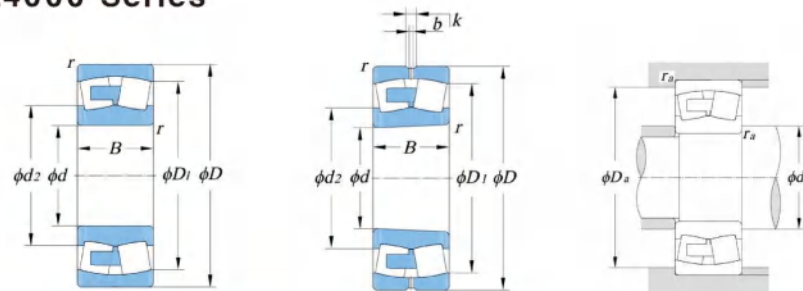
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
23996	480	650	128	5	2570	6010	500	900	497	527	603	633	4	126
239/500	500	670	128	5	2600	6200	450	900	517	549	626	653	4	120
239/530	530	710	136	5	3050	7100	400	800	547	581	665	693	4	155
239/560	560	750	140	5	3290	8010	400	800	577	616	699	733	4	176
239/600	600	800	150	5	3590	9030	400	700	617	661	744	783	4	217
239/630	630	850	165	6	4340	10410	300	600	651	691	791	829	5	292
239/670	670	900	170	6	4590	11260	190	230	691	736	838	879	5	313
239/710	710	950	180	6	5170	12760	250	310	731	780	889	929	5	367
239/750	750	1000	185	6	5520	13700	300	500	771	823	936	979	5	414
239/800	800	1060	195	6	6040	15090	250	500	821	874	995	1039	5	478
239/850	850	1120	200	6	6460	16430	250	450	872	927	1052	1098	5	538
239/900	900	1180	206	6	6580	17320			922	980	1104	1158	5	616
239/950	950	1250	224	7.5	7550	19770			977	1038	1171	1223	6	759
239/1000	1000	1320	236	7.5	8720	22870			1027	1090	1233	1293	6	892
239/1250	1250	1630	280	7.5	12570	34200			1277	1358	1530	1603	6	1569

24000 系列 24000 Series



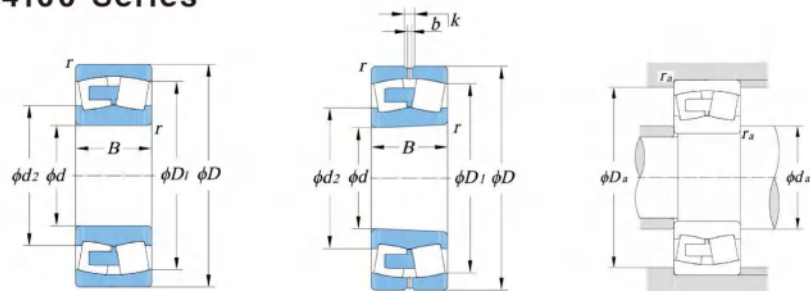
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
24013	65	100	35	1.1	130	205	3400	4200	70	74	89	95	1.1	1.01
24015	75	115	40	1.1	168	266	2900	3500	80	85	103	110	1.1	1.49
24018	90	140	50	1.5	254	415	2600	3400	96	103	126	134	1.5	3.25
24020	100	150	50	1.5	271	462	2400	3200	106	114	135	144	1.5	3.18
24022	110	170	60	2	361	610	2100	2800	118	125	152	162	2	4.9
24024	120	180	60	2	393	698	1600	2000	128	136	163	172	2	5.83
24026	130	200	69	2	487	849	1800	2400	138	148	177	192	2	7.76
24028	130	210	69	2	523	967	1800	2400	138	159	188	202	2	8.31
24030	150	225	75	2.1	597	1110	1300	1700	159	171	201	216	2	9.28
24032	160	240	80	2.1	685	1270	1100	1500	169	180	214	231	2	13.2
24034	170	260	90	2.1	842	1570	1000	1400	179	196	233	251	2	17.4
24036	180	280	100	2.1	996	1850	950	1300	189	206	247	271	2	25.7
24038	190	290	100	2.1	1020	1930	950	1300	199	215	257	281	2	22.9
24040	200	310	109	2.1	1210	2310	940	1200	209	229	272	301	2	30.9
22240	200	360	98	4	1330	2080	1100	1500	214	244	314	346	3	44.7
23240	200	360	128	4	1630	2660	850	1100	214	247	309	346	3	56.9
24044	220	340	118	3	1370	2610	850	1100	231	252	302	329	2.5	38.1
24048	240	360	118	3	1470	2920	800	1000	251	274	324	349	2.5	42.2
24052	260	400	140	4	1860	3650	700	900	274	298	353	386	3	64.1
24056	280	420	140	4	1930	3890	670	850	294	315	372	406	3	69
24060	300	460	160	4	2440	4940	600	750	314	342	406	446	3	99
24064	320	480	160	4	2440	5020	560	700	334	364	427	466	3	106

24000 系列 24000 Series



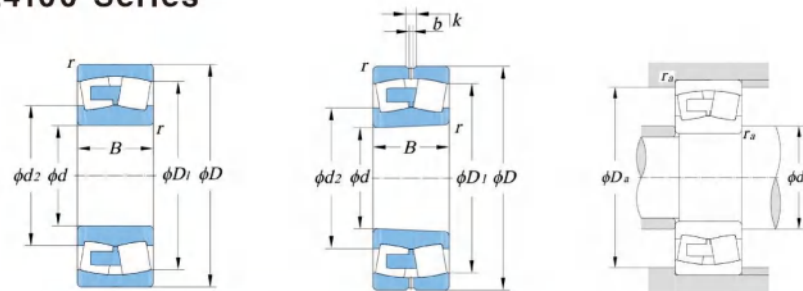
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
24068	340	520	180	5	2970	6090	530	670	357	389	460	503	4	137
24072	360	540	180	5	3040	6370	600	750	377	411	481	523	4	147
24076	380	560	180	5	3180	6850	480	600	397	430	503	543	4	151
24080	400	600	200	5	3780	8090	450	560	417	453	534	583	4	205
24084	420	620	200	5	3870	8440	380	480	437	474	557	603	4	202
24088	440	650	212	6	4130	9340	360	450	461	498	582	629	5	251
24092	460	680	218	6	4630	10230	340	430	481	522	606	659	5	308
24096	480	700	218	6	4650	10410	340	430	501	541	629	679	5	285
240/500	500	720	218	6	4620	10460	420	520	521	566	657	699	5	297
240/530	530	780	250	6	5660	12730	280	360	551	598	698	759	5	411
240/560	560	820	258	6	5910	13800	220	300	581	633	734	799	5	465
240/600	600	870	272	6	6840	16080	300	500	621	674	778	849	5	551
240/670	670	980	308	7.5	8830	20780	250	450	696	752	879	954	6	807
240/710	710	1030	315	7.5	9340	22290	160	190	736	802	929	1004	6	885
240/750	750	1090	335	7.5	10190	24690	170	220	776	849	976	1064	6	1057
240/800	800	1150	345	7.5	10620	25580	170	220	826	893	1038	1124	6	1094
240/850	850	1220	365	7.5	12520	30940			877	948	1099	1193	6	1416
240/900	900	1280	375	7.5	13270	33570			927	1002	1153	1253	6	1560
240/950	950	1360	412	7.5	15750	40120			977	1060	1222	1333	6	1971
240/1060	1060	1500	438	9.5	17750	46610			1092	1181	1352	1468	8	2540
240/1120	1120	1580	462	9.5	18100	48500			1151	1259	1435	1549	8	2940
240/1250	1250	1750	500	9.5	22460	61750			1282	1392	1579	1718	8	3834

24100 系列 24100 Series



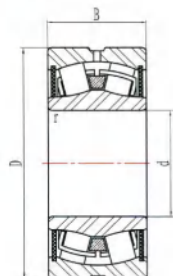
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
24120	100	165	65	2	403	659	2100	2600	108	115	143	157	2	5.6
24122	110	180	69	2	496	802	1000	1400	118	127	162	172	2	6.89
24124	120	200	80	2	589	976	1400	1800	128	142	174	192	2	10
24126	130	210	80	2	608	1040	1700	2200	138	149	184	202	2	10.6
24128	130	225	85	2.1	691	1210	850	1100	139	161	197	216	2	13.5
24130	150	250	100	2.1	858	1470	800	1000	159	176	217	241	2	19.2
24132	160	270	109	2.1	1030	1770	700	900	169	189	233	261	2	24.6
24134	170	280	109	2.1	1090	1920	670	850	179	199	245	271	2	25.4
24136	180	300	118	3	1210	2120	630	800	191	211	261	289	2.5	33.3
24138	190	320	128	3	1430	2520	600	750	201	222	272	309	2.5	41.9
24140	200	340	140	3	1640	2920	5601	700	211	237	294	329	2.5	51.4
24144	220	370	150	4	1890	3420	500	630	234	258	318	356	3	66.1
24148	240	400	160	4	1970	3530	480	600	254	281	343	386	3	79
24152	260	440	180	4	2500	4560	430	530	274	307	378	426	3	114
24156	280	460	180	5	2650	4990	400	500	297	328	400	443	4	118
24160	300	500	200	5	3160	5980	600	750	317	349	432	483	4	160
24164	320	540	218	5	3620	6810	340	430	337	375	464	523	4	206
24168	340	580	243	5	4380	8390	320	400	357	401	491	563	4	261
24172	360	600	243	5	4500	8790	300	380	377	423	516	583	4	270

24100 系列 24100 Series



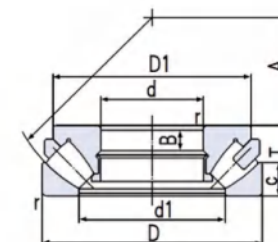
型号 Bearing No.	尺寸 Dimensions (mm)				载荷 Load Ratings(Kn)		转速 (RPM)		接触面与倒角尺寸 Contact Surface and Chamfer Dimension					重量 Weight (kg)
	d	D	B	rmin	Cr	Cor	Grease	Oil	da		Da		ra	
									Min	Max	Min	Max	Max	
24176	380	620	243	5	4760	9580	400	500	397	441	538	603	4	296
24180	400	650	250	6	4970	10000	320	400	421	469	569	629	5	326
24184	420	700	280	6	6040	11850	300	380	441	490	605	679	5	436
24188	440	720	280	6	6250	12510	300	380	461	510	624	699	5	463
24192	460	760	300	7.5	7220	14900	160	200	486	533	653	734	6	461
24196	480	790	308	7.5	7520	15520	240	320	506	561	686	764	6	594
241/500	500	830	325	7.5	7880	16010	300	380	526	583	713	804	6	719
241/530	530	870	335	7.5	8780	18350	190	280	556	622	751	844	6	807
241/560	560	920	355	7.5	9530	20190	120	160	586	653	786	894	6	969
241/600	600	980	375	7.5	10500	22500	300	500	626	702	845	954	6	1135
241/630	630	1030	400	7.5	11750	25470	160	210	656	735	885	1004	6	1333
241/670	670	1090	412	7.5	13440	29400	150	200	696	779	941	1064	6	1527
241/710	710	1150	438	9.5	14250	31190	90	120	741	829	992	1119	8	1777
241/750	750	1220	475	9.5	17200	37300	130	170	781	865	1059	1189	8	2174
241/850	850	1360	500	12	19450	44500			888	988	1170	1322	10	2854
241/900	900	1420	515	12	20740	47580			938	1047	1243	1382	10	3060
241/950	950	1500	545	7.5	22700	52200			976	1095	1316	1474	6	3600
241/1000	1000	1580	580	12	25300	58900			1037	1151	1386	1543	10	4350

密封调心滚子轴承 Sealed self-aligning roller bearing



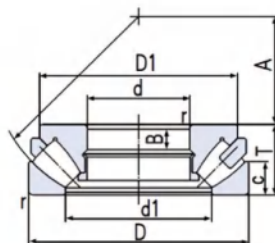
基本尺寸 Principal Dimension			动载 Dynamic Load	静载 Static Load	疲劳载荷限制 Fatigue Load Limit	转速 RPM	重量 Mass	圆柱型内孔 Bearings With Cylindrical Bore	圆锥型内孔 Bearings with Tapered Bore
d	D	B	C	C ₀	P ₀				
mm			kN		kN				
25	52	23	49	44	4.75	3600	0.26	BS2-2205-2CS/VTI43	——
30	62	25	64	60	6.4	2800	0.34	BS2-2206-2CS/VTI43	——
35	72	28	86.5	85	9.3	2400	0.52	BS2-2207-2CS/VTI43	——
40	80	28	96.5	90	9.8	2200	0.57	BS2-2208-2CS/VTI43	BS2-2208-2CSK/VT143
40	90	38	150	140	15	1900	1.2	BS2-2308-2CS/VTI43	——
45	85	28	102	98	10.8	2000	0.66	BS2-2209-2CS/VTI43	BS2-2209-2CSK/VT143
45	100	42	183	183	19.6	1500	1.6	BS2-2309-2CS/VTI43	——
50	90	28	104	108	11.8	1900	0.7	BS2-2210-2CS/VTI43	BS2-2210-2CSK/VT143
50	110	45	220	224	24	1400	2.1	BS2-2310-2CS/VTI43	——
55	100	31	125	127	13.7	1700	1	BS2-2211-2CS/VTI43	BS2-2211-2CSK/VTI43
55	120	49	270	280	30	1400	2.8	BS2-2311-2CS/VTI43	——
60	110	34	156	166	18.6	1600	1.3	BS2-2212-2CS/VTI43	BS2-2212-2CSK/VT143
60	130	53	310	335	36.5	1100	3.4	BS2-2312-2CS/VTI43	——
65	120	38	193	216	24	1500	1.6	BS2-2213-2CS/VTI43	BS2-2213-2CSK/VT143
65	140	56	340	360	38	1000	4.15	BS2-2313-2CS/VTI43	——
70	125	38	208	228	25.5	1400	1.8	BS2-2214-2CS/VTI43	BS2-2214-2CSK/VTI43
70	150	60	400	430	45	900	5.1	BS2-2314-2CS/VTI43	——
75	130	38	212	240	26.5	1300	2.1	BS2-2215-2CS/VTI43	BS2-2215-2CSK/VT143
75	160	64	440	475	48	950	6.5	BS2-2315-2CS/VTI43	——
80	140	40	236	270	29	1200	2.4	BS2-2216-2CS/VTI43	BS2-2216-2CSK/VT143
80	170	67	490	540	54	800	7.2	BS2-2316-2CS/VTI43	——
85	150	44	285	325	34.5	1100	3	BS2-2217-2CS/VTI43	BS2-2217-2CSK/VTI43
90	160	48	325	375	39	1000	3.7	BS2-2218-2CS/VTI43	BS2-2218-2CSK/VTI43
95	170	51	380	450	46.5	950	4.65	BS2-2219-2CS/VTI43	BS2-2219-2CSK/VT143

29200 系列 29200 Series



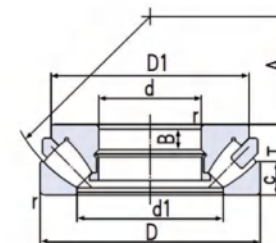
型号 Bearing No.	尺寸 Dimensions (mm)			载荷 Load Ratings(Kn)		转速 (RPM)		重量 Weight (kg)
	d	D	B	Cr	Cor	Grease	Oil	≈
29230	150	215	39	—	—	—	—	—
29232	160	225	39	—	—	—	—	—
29234	170	240	42	—	—	—	—	—
29236	180	250	42	—	—	—	—	7.5
29238	190	270	48	—	—	—	—	8
29240	200	280	48	536	2270	1600	—	8.9
29244	220	300	48	542	2490	1550	—	10
29248	240	340	60	822	3680	1250	—	16.7
29252	260	360	60	838	3720	1200	—	18.5
29256	280	380	60	862	4020	1150	—	19.5
29260	300	420	73	1070	4890	950	—	30.5
29264	320	440	73	1110	5170	900	—	32.9
29268	340	460	73	1150	5300	900	—	33.6
29272	360	500	85	1460	6450	750	—	51.8
29276	380	520	85	1580	7430	700	—	52.8
29280	400	540	85	1610	7850	700	—	55.3
29284	420	580	95	1990	9620	600	—	75.4
29288	440	600	95	2060	9830	600	—	77.9
29292	460	620	95	2150	10200	550	—	81
29296	480	650	103	2350	11600	500	—	89
292/500	500	670	103	2460	14800	500	—	101
292/530	530	710	109	2800	16200	400	—	108
292/560	560	750	115	3090	18100	350	—	140
292/600	600	800	122	3420	20100	300	—	172
292/630	630	850	132	4030	23900	250	—	218
292/670	670	900	140	4440	26500	200	—	224
292/710	710	950	145	4840	29400	150	—	261
292/750	750	1000	150	5180	31900	130	—	293
292/800	800	1060	155	5620	35300	100	—	339
292/850	850	1120	160	6080	38900	80	—	389
292/900	900	1180	170	6590	42000	60	—	444
292/950	950	1250	180	—	—	—	—	—
292/1060	1060	1400	206	—	—	—	—	—

29300 系列 29300 Series



型号 Bearing No.	尺寸 Dimensions (mm)			载荷 Load Ratings(Kn)		转速 (RPM)		重量 Weight (kg)
	d	D	B	Cr	Cor	Grease	Oil	≈
29317	85	150	39	287	927	2600		2.82
29318	90	155	30	299	966	2500		3.06
29320	100	170	42	355	1160	2300		3.81
29322	110	190	48	457	1530	2000		5.56
29324	120	210	54	553	1880	1800		7.63
29326	130	225	58	643	2220	1700		9.43
29328	140	240	60	707	2490	1600		11.1
29330	150	250	60	711	2500	1550		11.6
29332	160	270	67	862	3070	1400		15.4
29334	170	280	67	880	3170	1350		16.2
29336	180	300	73	1030	3730	1250		20.7
29338	190	320	78	1170	4230	1150		25.1
29340	200	340	85	1360	5040	1050		31.2
29344	220	360	85	1380	5240	1000		33.3
29348	240	380	85	1410	5500	950		35.5
29352	260	420	95	1810	6950	850		49.1
29356	280	440	95	1840	7150	800		53.2
29360	300	480	109	2250	8790	700		74.9
29364	320	500	109	2310	9380	650		78
29368	340	540	122	2700	10730	600		106
29372	360	560	132	2760	11300	550		110
29376	380	600	132	3380	13900	500		141
29380	400	620	132	3440	14200	500		152
29384	420	650	140	3610	14900	450		172
29388	440	680	145	4000	16400	420		182
29392	460	710	150	4290	18000	400		216
29396	480	730	150	4390	18600	390		218
293/500	500	750	150	4510	19700	380		233
293/530	530	800	160	5170	26300	320		270
293/560	560	850	175	5790	29700	280		320
293/600	600	900	180	6350	32600	250		368
293/630	630	950	190	7070	37000	200		438
293/670	670	1000	200	7720	40300	150		501

29400 系列 29400 Series



型号 Bearing No.	尺寸 Dimensions (mm)			载荷 Load Ratings(Kn)		转速 (RPM)		重量 Weight (kg)
	d	D	B	Cr	Cor	Grease	Oil	≈
29412	60	130	42	293	854	2700		2.61
29413	65	140	45	344	1000	2500		3.34
29414	70	150	48	378	1110	2300		4.06
29415	75	160	51	438	1270	2100		4.76
29416	80	170	54	468	1380	2000		5.91
29417	85	180	58	536	1610	1900		7.04
29418	90	160	60	598	1810	1800		8.18
29420	100	210	67	722	2220	1650		11.2
29422	110	230	73	845	2610	1500		14.7
29424	120	350	78	975	3080	1350		18.2
29426	130	270	85	1130	3530	1250		22.8
29428	140	280	85	1170	3790	1250		24.6
29430	150	300	90	1330	4320	1100		29.9
29432	160	320	95	1480	4860	1050		36.2
29434	170	340	103	1640	5340	950		44.3
29436	180	360	109	1870	6110	900		52.6
29438	190	380	115	2040	6730	850		60.7
29440	200	400	122	2250	7580	800		72.2
29444	220	420	122	2300	7910	750		74.9
29448	240	440	122	2390	8500	700		80
29452	260	480	132	2870	10400	650		104
29456	280	520	145	3380	12000	550		134
29460	300	540	145	3360	12000	550		142
29464	320	580	155	4060	15100	500		177
29468	340	620	170	4510	16800	450		221
29472	360	640	170	4680	18000	450		231
29476	380	670	175	4960	19300	410		261
29480	400	710	185	5630	21900	380		309
29484	420	730	185	5750	22500	370		326
29488	440	780	206	6600	26000	320		411
29492	460	800	206	6880	27900	300		425
29496	480	850	224	7840	31000	270		550
294/500	500	870	224	8000	32300	270		560

滚动轴承的失效分析及防治方法

滚动轴承的可靠性与滚动轴承的失效形式有着密切的关系，要提高轴承的可靠性，就必须从轴承的失效形式着手，仔细分析滚动轴承的失效原因，才能找出解决失效的具体措施。

The reliability of rolling bearings is closely related to the failure form of rolling bearings. To improve the reliability of bearings, we must start from the failure form of bearings, carefully analyze the failure causes of rolling bearings, in order to find out the specific measures to solve the failure.

一 轴承的失效机理 1. Failure mechanism of bearings

1. 接触疲劳失效

1. Contact fatigue failure

接触疲劳失效系指轴承工作表面受到交变应力的作用而产生的材料疲劳失效。

接触疲劳失效常见的形式是接触疲劳剥落。接触疲劳剥落发生在轴承工作表面，往往伴随着疲劳裂纹，首先从接触表面以下最大交变应力处产生，然后扩展到表面形成不同的剥落形状，如点状为点蚀或麻点剥落，剥落成小片状的浅层剥落。由于剥落面的逐渐扩大，会慢慢向深层扩展，形成深层剥落。深层剥落是接触疲劳失效的疲劳源。

Contact fatigue failure refers to the material fatigue failure caused by alternating stress on the bearing working surface. The common form of contact fatigue failure is contact fatigue spalling. Contact fatigue spalling occurs on the working surface of bearings, often accompanied by fatigue cracks, which are first generated from the maximum alternating shear stress below the contact surface, and then extended to the surface to form different spalling shapes, such as pitting or pitted spalling, spalling into small sheets called shallow spalling. Due to the gradual expansion of the spalling surface, it will slowly expand to the deep, forming deep spalling. Deep spalling is the fatigue source of contact fatigue failure.



2. 磨损失效 2. Wear failure

磨损失效系指表面之间的相对滑动摩擦导致其工作表面金属不断磨损而产生的失效。

持续的磨损将引起轴承零件逐渐损坏，并最终导致轴承尺寸精度丧失及其它问题。磨损失效是各类轴承常见的失效模式之一，按磨损形式通常可分为磨粒磨损和粘着磨损。

磨粒磨损是指轴承工作表面之间挤入外来坚硬粒子或硬质异物或金属表面的磨屑且接触表面相对移动而引起的磨损，常在轴承工作表面造成犁沟状的损伤。

粘着磨损是指由于摩擦表面的显微凸起或异物使摩擦面受力不均，在润滑条件严重恶化时，因局部摩擦生热，易造成摩擦面局部变形和摩擦显微焊合现象，严重时表面金属可能局部熔化，接触面上作用力将局部摩擦焊点从基体上撕裂而增大塑性变形。

Wear failure refers to the failure caused by the continuous wear of metal on the working surface caused by the relative sliding friction between surfaces.

Continuous wear will cause gradual damage to bearing parts, and eventually lead to loss of bearing dimensional accuracy and other problems. Wear failure is one of the common failure modes of all kinds of bearings, which can be divided into abrasive wear and adhesive wear.

Abrasive wear refers to the wear caused by extrusion of external hard particles or hard foreign bodies or abrasive scraps on metal surfaces between bearing working surfaces and relative movement of contact surfaces, often causing furrow abrasion on bearing working surfaces.

Adhesive wear means that the friction surface is stressed unevenly due to the micro-protrusion or foreign matter on the friction surface. When the lubrication condition deteriorates seriously, the local friction heat is generated, which is easy to cause the local deformation of the friction surface and the friction microwelding phenomenon. In severe cases, the surface metal may locally melt, and the contact surface force will tear the local friction welding points from the matrix and increase the plastic deformation.



Failure analysis and prevention method of rolling bearing

3. 断裂失效

3. Contact fatigue failure

轴承断裂失效主要原因是缺陷与过载两大因素。当外加载荷超过材料强度极限而造成零件断裂称为过载断裂。过载原因主要是主机突发故障或安装不当。轴承零件的微裂纹、缩孔、气泡、大块外来杂物、过热组织及局部烧伤等缺陷在冲击过载或剧烈振动时也会在缺陷处引起断裂，称为缺陷断裂。

应当指出，轴承在制造过程中，对原材料的入厂复验、锻造和热处理质量控制、加工过程控制中可通过仪器正确分析上述缺陷是否存在。但一般来说，通常出现的轴承断裂失效大多数为过载失效。

The main reason of bearing fracture failure is defect and overload. When the external load exceeds the strength limit of the material and the parts fracture is called overload fracture. The main cause of overload is the sudden failure of the host or improper installation. The defects of bearing parts such as microcracks, shrinkage holes, bubbles, large foreign debris, overheating tissue and local burns will also cause fracture at the defect when the impact overload or violent vibration, which is called defect fracture.

It should be pointed out that in the manufacturing process of bearings, whether the above defects exist can be correctly analyzed through instruments in the re-inspection of raw materials, quality control of forging and heat treatment, and control of processing process. But generally speaking, the most common bearing fracture failure is overload failure.



4. 腐蚀失效

4. Wear failure

滚动轴承在实际运行当中不可避免的接触到水、水汽以及腐蚀性介质，这些物质会引起滚动轴承的生锈和腐蚀。另外滚动轴承在运转过程中还会受到微电流和静电的作用，造成滚动轴承的电流腐蚀。

滚动轴承的生锈和腐蚀会造成套圈、滚动体表面的坑状锈、梨皮状锈及滚动体间隔相同的坑状锈、全面生锈及腐蚀。最终引起滚动轴承的失效。

Some rolling bearings in the actual operation of the inevitable contact with water, water vapor and corrosive media, these substances will cause rust and corrosion of rolling bearings. In addition, the rolling bearing will be affected by micro current and static electricity during operation, resulting in the current corrosion of the rolling bearing.

Rust and corrosion of rolling bearings will cause pitting rust, pear-skin rust on the surface of the ring, rolling body, pitting rust with the same spacing of the rolling body, overall rust and corrosion. Eventually cause the failure of the rolling bearing.



滚动轴承的失效分析及防治方法

滚动轴承的可靠性与滚动轴承的失效形式有着密切的关系，要提高轴承的可靠性，就必须从轴承的失效形式着手，仔细分析滚动轴承的失效原因，才能找出解决失效的具体措施。

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二、滚动轴承常见失效模式及对策

2. Common failure modes and countermeasures of rolling bearings

1. 沟道单侧极限位置剥落

1. Spalling in unilateral limit position of channel

沟道单侧极限位置剥落主要表现在沟道与挡边交界处有严重的剥落环带。产生原因是轴承安装不到位或运转过程中突发轴向过载。

采取的对策是确保轴承安装到位或将自由侧轴承外圈配合改为间隙配合，以期轴承过载时使轴承得到补偿。如果无法确保安装到位，可以提高润滑剂的油膜厚度(提高润滑油的粘度)，或降低轴承的负载等方法来减少轴承的直接接触。

The spalling at the limit position of single channel is mainly manifested in the serious spalling ring at the junction of channel and retaining edge. The reason is that the bearing is not installed in place or the burst axial overload during operation.

The countermeasures taken are to ensure that the bearing is installed in place or change the outer ring fit of the free side bearing to the clearance fit, so that the bearing can be compensated when the bearing is overloaded. If the installation cannot be ensured in place, direct bearing contact can be reduced by increasing the oil film thickness of the lubricant (improving the viscosity of the lubricating oil) or reducing the load of the bearing.



2. 沟道在圆周方向呈对称位置剥落

2. The channel is spalling symmetrically in the circumference direction

对称位置剥落表现在内圈为周围环带剥落，而外圈呈周向对称位置剥落(即椭圆形的短轴方向)，原因主要是因为外壳孔椭圆过大或两半分离式外壳孔结构。这在摩托车凸轮轴轴承中表现尤为明显。当轴承压入椭圆偏大的外壳孔中或两半分离式外壳孔时，轴承外圈产生椭圆，在短轴方向的游隙明显减少甚至负游隙。轴承在载荷的作用下，内圈旋转产生周向剥落痕迹，外圈只在短轴方向的对称位置产生剥落痕迹。这是该轴承早期失效的主要原因，经对该轴承失效件检验表明，该轴承外径圆度已从原工艺控制的0.8um变为27um，此值远远大于径向游隙值。因此，可以肯定该轴承是在严重变形及负游隙下工作的，工作面上易早期形成异常的急剧磨损与剥落。

采取的对策是提高外壳孔加工精度或尽可能不采用外壳孔两半分离结构。

The inner ring is spalling off in a symmetrical position, while the outer ring is spalling off in a symmetrical position in a circumferential direction (i.e. in the direction of the short axis of the ellipse). The main reason is that the shell holes are too elliptical or the two-half separated shell hole structure, which is particularly obvious in the camshaft bearings used in motorcycles. When the bearing is pressed into the shell hole with a larger ellipse or the two halves of the separated shell are fixed, the bearing outer ring produces an ellipse, and the clearance in the direction of the short axis is significantly reduced or even negative. Under the action of load, the inner ring rotates to produce circumferential spalling marks, while the outer ring only produces spalling marks in a symmetrical position in the direction of the short axis. This is the main reason for the early failure of the bearing. The test of the failure parts of the bearing shows that the roundness of the bearing outer diameter has changed from 0.8um controlled by the original process to 27um. This value is much larger than the radial clearance value. Therefore, it is certain that the bearing is working under serious deformation and negative clearance, and the working surface is easy to form abnormal rapid wear and spalling in the early stage.

The countermeasure is to improve the machining precision of shell holes or avoid using the two-half separation structure of shell holes as much as possible.



Failure analysis and prevention method of rolling bearing

3. 滚道倾斜剥落

3. Inclined spalling of raceway

在轴承工作面上呈倾斜剥落环带，说明轴承是在倾斜状态下工作的，当倾斜角达到或超过临界状态时易早期形成异常的急剧磨损与剥落。产生的原因主要是因为安装不良，轴有挠度，轴颈与外壳孔精度低等。

采取对策为确保轴承安装质量与提高轴肩、孔肩的轴向跳动精度，或提高润滑油的粘度以获得较厚的润滑油膜。

The inclined spalling ring belt on the bearing working surface shows that the bearing works in the inclined state. When the inclination Angle reaches or exceeds the critical state, it is easy to form abnormal sharp wear and spalling in the early stage. The reason is mainly because of poor installation, shaft deflection, journal and shell hole low accuracy. Countermeasures are taken to ensure the quality of bearing installation and improve the axial runout accuracy of shaft shoulder and hole shoulder, or improve the viscosity of lubricating oil to obtain a thicker lubricating oil film.



4. 套圈断裂

4. Ring fracture

套圈断裂失效比较少见，通常是突发性过载造成的。产生原因较为复杂，如轴承的原材料缺陷(气泡缩孔)、锻造缺陷(过烧)、热处理缺陷(过热)、加工缺陷(局部烧伤或表面微裂纹)、主机缺陷(安装不良、润滑贫乏、瞬时过载)等。受过载冲击负荷或剧烈振动均有可能使套圈断裂。

采取的对策是避免过载冲击载荷、选择适当的过盈量、提高安装精度、改善使用条件及加强轴承制造过程中的质量控制。

Ring fracture is rare and is usually caused by sudden overload. The causes are more complex, such as raw material defects of bearings (bubble shrinkage), forging defects (overburning), heat treatment defects (overheating), processing defects (local burns or surface micro-cracks), main engine defects (poor installation, poor lubrication, instantaneous overload), etc. The ring may be broken by overload shock load or violent vibration.

The countermeasures are to avoid the overload impact load, select the appropriate interference, improve the installation accuracy, improve the service conditions and strengthen the quality control in the bearing manufacturing process.



滚动轴承的失效分析及防治方法

5. 保持架断裂

5. The cage is broken



角接触轴承的保持架。
高强度黄铜车制保持架兜孔折断。
Cage for angular contact bearings.
High strength brass cage pocket hole broken.



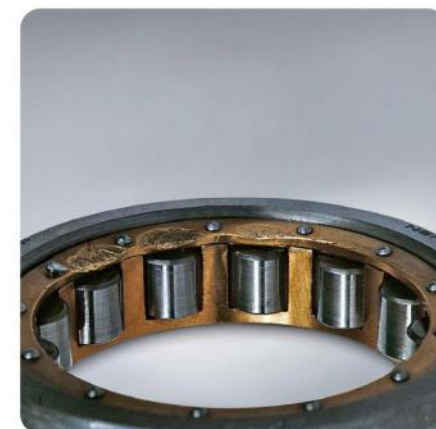
角接触轴承的保持架。
高强度黄铜车制保持架兜孔折断。
Cage for angular contact bearings.
High strength brass cage pocket hole broken.

损伤状态 Damaged state	原因 Cause	对策 Countermeasure
贫油状态, 黏着磨损。 Lean oil condition, adhesive wear.	轴承润滑不足, 润滑油或脂干掉, 没有及时添加 (维护保养), 润滑油或脂用的标号不对。 Insufficient bearing lubrication, lubricating oil or fat dry, Did not add (maintenance) in time, Wrong label for lubricating oil or grease.	改变润滑剂和润滑方法。 Change the lubrication benefit and method of lubrication.

Failure analysis and prevention method of rolling bearing



角接触球轴承的保持架。
钢板冲压保持架的变形。
原因是使用不当产生的冲击载荷。
Cage for angular contact ball bearings.
Deformation of steel plate stamping cage.
The reason is the impact load produced by improper use.



圆柱滚子轴承的保持架。
高强度黄铜车制保持架端面的变形。
安装时由过大的冲击载荷造成的。
Cage for cylindrical roller bearings.
Deformation of high strength brass cage end face.
Caused by excessive impact load during installation.

损伤状态 Damaged state	原因 Cause	对策 Countermeasure
柱的折损, 凹处面的磨损, 安装不良(轴承的非直线性) Column loss, concave surface wear, poor installation (bearing non-linearity)	安装问题。轴承安装不正确, 在安装时就损伤保持架, 钢板冲压保持架的变形。 Installation room problem. Bearing installation is not correct, during the installation will damage the cage, steel plate stamping cage change.	轴承的冲击负载。 防止冲击负载中激烈的震动产生滚动体对保持架的撞击。 Impact load of bearings. To prevent the impact of the rolling body on the cage caused by the violent vibration of the impact load.

滚动轴承的失效分析及防治方法

6. 卡伤 6. Stuck



所谓卡伤是由于在滑动面损伤产生的部分的微小烧伤汇总而产生的表面损伤。滑动面、滚动面圆周方向的线状伤痕。滚子端面的擦线状伤痕。靠近滚子端面的轴环面的卡伤。造成卡伤的主要原因有：过大载荷，过大预压，润滑不良，异物吸入，内圈外圈的倾斜，轴的挠度，轴、轴承箱的精度不良等。

可以通过适当的预压，改善润滑剂和润滑方法，提高轴、轴承箱的精度来解决。

The so-called stuck injury is the surface damage caused by the accumulation of small burns on the part of the sliding surface damage. A linear scar on the circumference of a square sentence. Swing line scar on the end face of the roller and stick wound on the axial torus near the end face of the roller. The main reasons for the stuck damage are: excessive load, excessive preload, poor lubrication, foreign body bite, the inclination of the inner ring and the outer ring, the deflection of the shaft, the poor accuracy of the shaft and the bearing box, etc.

It can be solved by proper preload, improving lubricant and lubrication method, and improving the accuracy of shaft and bearing box.

8. 擦伤 8. bruise



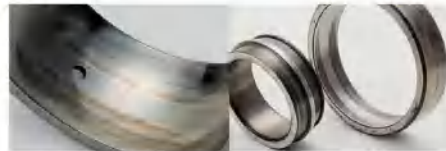
所谓擦伤，是在滚动面和滚动面上，有随着滚动的打滑和油膜热裂产生的微小烧伤的汇总而发生的表面损伤。产生带有粘着的粗糙表面。造成擦伤的原因主要有高速轻载荷、急加减速、润滑剂不适当、水的侵入等。

解决方法：改善预压，改善轴承游隙，使用油性好的润滑剂，改善润滑方法，改善密封装置等。

The so-called abrasion is the surface damage on the raceway surface and rolling surface, which occurs with the summary of the small burns caused by the sliding of the rolling and the hot cracking of the oil film. Produce a rough surface with adhesion. The main causes of abrasion are high-speed light load, rapid acceleration and deceleration, inappropriate lubricant, water intrusion and so on.

Solution: Improve preload, improve bearing clearance, use lubricants with good oil film, improve lubrication methods, improve sealing devices, etc.

7. 磨损 7. Wear and tear



磨损失效是指表面之间的相对滑动摩擦导致其工作表面金属不断磨损而产生的失效。造成磨损失效的因素主要有润滑剂失效或缺乏润滑剂，润滑方式不对，有磨粒进入轴承内部，负载过大等。解决方法可以通过改善润滑剂或改善润滑方法，增强密封机构等。

Wear failure refers to the failure caused by the continuous wear of metal on the working surface caused by the relative sliding friction between surfaces. The main factors that cause wear failure include lubricant failure or lack of lubricant, incorrect lubrication mode, abrasive particles entering the bearing interior, excessive load, etc. The solution can be improved by improving the lubricant or lubrication method, strengthen the sealing mechanism.

9. 压痕 9. Indentation



入了金属小粉末或异物时，在滚动面或转动面上产生的凹痕或由于安装时受到冲击，在滚动体的间距间隔上形成了凹面(布氏硬度压痕)。引起压痕的主要因素是：金属粉末等异物吸入，组装时或运输过程中受到的冲击载荷过大等。

解决方法：改善密封装置，过滤润滑油，改善组装及使用方法等。

When biting into a small metal powder or foreign body, the indentation generated on the raceway surface or rotating surface or due to the impact during installation, the formation of a concave surface (Brinell hardness indentation) on the spacing of the rolling body. The main factors causing indentation are: metal powder and other foreign bodies bite into the assembly or transportation process by the impact load is too large.

Solution: improve sealing device, filter lubricating oil, improve assembly and use methods, etc.

Failure analysis and prevention method of rolling bearing

10. 烧伤 10. Burn



滚道、滚动体以及保持架在旋转中急剧发热直至变色、软化、熔敷和破坏。造成烧伤的原因有润滑不良，过大载荷(预压过大)，转速过大，游隙过小，水、异物的侵入，轴、轴承箱的精度不良，轴的挠度大等。

可以通过改善润滑剂及润滑方法，纠正轴承的选择，研究配合、轴承间隙和预压，改善密封装置，检查轴和轴承箱的精度或改善安装方法来解决。

Raceway, rolling body and cage heat rapidly in rotation until discoloration, softening, melting and damage. The causes of burns include poor lubrication, excessive load (excessive prepressure), excessive speed, too small clearance, intrusion of water and foreign bodies, poor accuracy of shaft and bearing box, large deflection of shaft, etc. It can be solved by improving lubricant and lubrication method, correcting bearing selection, studying fit, bearing clearance and preload, improving sealing device, checking the accuracy of shaft and bearing box or improving installation method.

12. 生锈腐蚀 12. Rust and corrosion



轴承的生锈和腐蚀有滚道、滚动体表面的坑状锈、全面生锈及腐蚀。轴承的生锈和腐蚀会造成套圈、滚动体表面的坑状锈、剥皮状锈及滚动体间隔相同的坑状锈、全面生锈及腐蚀。造成滚动轴承生锈腐蚀失效的原因很多，主要有：水、腐蚀性物质(漆、煤气等)的侵入，润滑剂不合适，由于水蒸气的凝结而时有水滴，高温多湿时停转，运输过程中防锈不良，保管状态不合适，使用不合适等。

解决的方法有：改善密封装置，研究润滑方法，停转时的防锈措施，改善保管方法，使用时要加以注意。

Bearing rust and corrosion include raceway, rolling surface pit rust, overall rust and corrosion. Bearing rust and corrosion will cause pitting rust on the surface of the ring and rolling body, pear-skin rust and pitting rust with the same spacing of the rolling body, overall rust and corrosion. There are many reasons for the rust corrosion failure of rolling bearings, mainly: the intrusion of water, corrosive substances (paint, gas, etc.), inappropriate lubricant, due to the condensation of water vapor and water drops, high temperature and wet stop, poor rust prevention in the transportation process, improper storage state, inappropriate use.

The solutions are: improve the sealing device, study the lubrication method, stop the rust prevention measures, improve the storage method, use to pay attention to.

11. 电流腐蚀 11. Current corrosion



所谓电蚀是指电流在旋转中的轴承套圈和滚动体的接触部分流动时，通过薄薄的润滑油膜发出火花，其表面出现局部的熔化和凹凸现象。引起电流腐蚀的主要原因是外圈与内圈间的电位差以及静电的作用。

解决方法：在设定电路时，电流不通过轴承，对轴承进行绝缘，静电接地。

The so-called electric corrosion means that when the current flows in the contact part of the rotating bearing ring and the rolling body, the spark is sent out through the thin lubricating oil film, and the local melting and concave-convex phenomenon appears on the surface. The main cause of current corrosion is the potential difference between the outer ring and the inner ring and the electrostatic effect.

Solution: When setting the circuit, the current does not pass through the bearing, and the bearing is insulated and grounded by static electricity.

除上述常见的失效形式外，滚动轴承在实际运行中还有很多的失效形式，有待我们进一步的分析研究。综上所述，从轴承常见失效机理与失效模式可知，尽管滚动轴承是精密而可靠的机构基础件，但使用不当也会引起早期失效。

一般情况下，如果能正确使用轴承，可使用至疲劳寿命为止。轴承的早期失效多起于主机配合部位的制造精度、安装质量、使用条件、润滑效果、外部异物侵入、热影响及主机突发故障等方面的因素。

因此，正确合理地使用轴承是一项系统工程，在轴承结构设计、制造和装机过程中，针对产生早期失效的环节，采取相应的措施，可有效地提高轴承及主机的使用寿命。

In addition to the above common failure forms, there are many failure forms of rolling bearings in actual operation, which need to be further analyzed and studied. In summary, from the common failure mechanism and failure mode of bearings, it can be seen that although rolling bearings are precise and reliable mechanism foundation, improper use will also cause early failure.

In general, if bearings can be used correctly, they can be used until fatigue life. The early failure of bearings is mainly caused by the manufacturing accuracy, installation quality, service conditions, lubrication effect, external foreign body intrusion, thermal effect and sudden failure of the main engine.

Therefore, the correct and reasonable use of bearings is a system engineering, in the process of bearing structure design, manufacturing and installation, for the early failure of the link, take the corresponding measures, can effectively improve the service life of bearings and main engines.

轴承故障的原因及措施

深沟球轴承的外圈
滚道面上产生的梨皮状点蚀

Outer ring of deep groove ball bearing
Pear-skin pitting on raceway surface



轴承的损伤梨皮状点蚀 Bearing damage: pear skin pitting		
损伤状态 Damaged state	原因 Cause	对策 Countermeasure
在滚刀面上产生的若光泽的暗色梨皮状点蚀。 A glossy dark pitting of pear skin on the hob surface.	润滑过程中出现的异物吸入，由于空气中的水分而结露。润滑不良。 If a foreign object appears in the lubrication process, Condensation due to moisture in the air, oor lubrication.	改善密封装置。充分过滤润滑油。使用合适的润滑油。 Improve the sealing device. Filter the lubricating oil thoroughly. Use a suitable lubricant.

向心推力球轴承的内圈

整个经道面上产生的显著的微震磨损
Inner ring of centripetal thrust ball bearing
Significant microseismic wear throughout the channel surface



轴承的损伤微震磨损 Bearing damage: pear skin pitting		
损伤状态 Damaged state	原因 Cause	对策 Countermeasure
由于两个接触面间相对反复微小滑动而产生的磨损。在滚道面和滚动体的接触部分上产生。由于发生红褐色或黑色磨损粉末，因而也称微震磨损腐蚀。 Wear caused by relatively small repeated sliding between two contact surfaces. Generated on the contact part of the raceway surface and the rolling body. Because of the occurrence of reddish-brown or black wear powder, it is also called microseismic wear corrosion.	润滑不良。小振幅的摇摆运动。过盈量不足。 Poor lubrication. Swaying motion of small amplitude. Overfill and underfill.	使用适当的润滑油。加预压。检查过盈量。向配合而上涂润滑油。 Use the appropriate lubricant. Add preload. Check for interference. Apply grease to the fit.

Causes and measures of bearing failure

滚道面圆周方向上产生的擦伤。

原因是润滑剂封入过多造成滚子打滑。

Abrasions in the circumferential direction of the raceway surface.

The reason is the excessive sealing of lubricant causing the roller to slip.



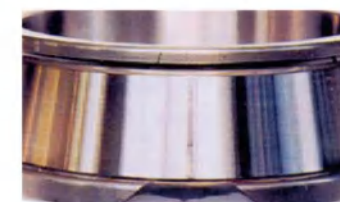
轴承的损伤擦伤 Bearing damage: pear skin pitting		
损伤状态 Damaged state	原因 Cause	对策 Countermeasure
所谓擦伤，是在滚道面或滚动面上，由随着滚动的打滑和油膜热裂产生的微小烧伤的汇总而发生的表面损伤。产生带有热粘着的表面粗糙。 The so-called abrasion is the surface damage on the raceway surface or rolling surface, which is caused by the summary of small burns caused by the sliding of the rolling and the hot cracking of the oil film. Produces surface roughness with thermal adhesion.	高速轻载荷。急加减速。润滑剂不适当。水的侵入。 High speed and light load. Rapid acceleration and deceleration. Improper lubricant. Water intrusion.	改善预压。改善轴承游隙。使用油膜性好的润滑剂。改善润滑方法。改善密封装置。 Improve preloading. Improve bearing clearance. Use a lubricant with a good oil film. Improve the lubrication method. Improve the sealing device.

圆锥滚子轴承的内圈

大挡边上产生的断裂

由安装时受到大的冲击而造成
Inner ring of tapered roller bearing
The break on the big guard edge

Caused by a large impact during installation



轴承的损伤断裂 Bearing damage: pear skin pitting		
损伤状态 Damaged state	原因 Cause	对策 Countermeasure
所谓断裂是指由于对滚道轮的挡边或滚子角的部分施加了冲击或过大载荷而一小部分断裂。 The so-called fracture refers to the impact or excessive load on the local part of the flange or roller Angle of the raceway wheel and a small part of the fracture.	安装时受到了打击。载荷过大。跌落等使用不良。 The installation took a hit. The load is too large. Poor use of drop etc.	改善安装方法。(采用热装，使用适当的工具)。纠正载荷条件。轴承安装到位，使挡边受支承。(using hot loading, using appropriate working fixture). Correct load conditions. The bearing is installed in place so that the guard edge is supported.

轴承故障的原因及措施

角接触球轴承的内圈

滚道面上产生的青紫色变色

原因是润滑不良造成的发热

Inner ring of angular contact ball bearing
Cyan purple discoloration on raceway surface
The reason is the heat caused by poor lubrication



轴承的损伤: 变色 Bearing damage: discoloration		
损伤状态 Damaged state	原因 Cause	对策 Countermeasure
由于温度上升和润滑剂的反应等, 滚道面和滚动体及保持架变色。 Due to temperature rise and lubricant reaction, raceway wheel and rolling body and cage change color.	润滑不良。 与润滑剂的反应造成热态浸油。 温度上升大。 Poor lubrication. Reaction with lubricant results in hot immersion. The temperature rises greatly.	改善润滑方法。 Improve the lubrication method.

自动调心滚子轴承的内圈/外圈

带有内径面上产生的卡伤的蠕变

因过盈量不足而造成的

Inner ring of self-aligning roller bearing
Creep with stuck bore surface
Caused by insufficient interference



轴承的损伤: 蠕变 Bearing damage: creep		
损伤状态 Damaged state	原因 Cause	对策 Countermeasure
所谓蠕变是指在轴承的配合面上产生间隙时, 在配合面之间相对发生滑动而言。 发生蠕变的配合面呈现出镜面光亮或暗面, 有时也带有卡伤磨损产生。 The so-called creep refers to the relative sliding between the mating surfaces when the clearance is generated on the bearing mating surface. The matching surfaces with creep show bright or dark mirror surface, sometimes with stuck wear.	过盈量不足或间隙配合。 紧定套紧固不够。 Insufficient interference or clearance fit. Tight sleeve is not tight enough.	检查过盈量, 实施止转措施。 适当紧固紧定套。 研究轴和轴承箱的精度。 轴向预压。滚道轮侧面紧固。 粘接配合面。 向配合面涂润滑剂。 Check the amount of interference and implement stop-turn measures. Tighten the sleeve properly. Study the accuracy of shaft and bearing box. Axial preloading. Raceway wheel side fastening. Bond the mating surface. Apply lubricant to the mating surface.

Causes and measures of bearing failure

深沟球轴承的内圈

滚道面上产生的假性布氏压痕

停转时由外部振动造成的损伤

Inner ring of deep groove ball bearing
False Brinell indentation on raceway surface
Damage caused by external vibration during stall



深沟球轴承的外圈

滚道面上产生的假性布氏压痕

停转时由外部振动造成的损伤

Outer ring of deep groove ball bearing
False Brinell indentation on raceway surface
Damage caused by external vibration during stall



推力球轴承的外圈

滚道面上产生的球间距假性布氏压痕

在小摆动角度下反复摆动造成的损伤

Outer ring of thrust ball bearing
False Brinell indentation of ball spacing on raceway surface
Damage caused by repeated swing at a small swing Angle



圆柱滚子轴承的滚子

转动面上产生的假性布氏压痕

停转时由外部振动造成的损伤

Roller for cylindrical roller bearings
False Brinell indentation on a rotating surface
Damage caused by external vibration during stall



轴承的损伤: 假性布氏压痕 Bearing damage: pear skin pitting		
损伤状态 Damaged state	原因 Cause	对策 Countermeasure
在微振期间, 在滚动体和滚道轮的接 触部分由于振动和摆动造成磨损有所发展, 产生类似布氏压痕的印痕。 During microvibration, wear develops in the contact part of the rolling body and raceway wheel due to vibration and shaking, resulting in an impression similar to the Brinell indentation.	运输过程中等轴承 在停转时的振动和摆动。 振幅小的摆动运动。 润滑不良。 The vibration and swing of medium bearing in the process of transpo- rtation. Oscillatory motion of small amplitude. Poor lubrication.	运输过程中要对轴和轴承箱加以固定。 运输时对内圈和外圈要分开包装。 加上预压减轻振动。 使用适当的润滑剂。 The shaft and bearing box should be fixed during transportation. The inner ring and the outer ring should be packed separately during transportation. Plus preloading to reduce vibration. Use the appropriate lubricant.