The Koyo EXSEV Bearing Series is a collection of high-performance bearings compatible with special operating environments and conditions, where conventional bearings are not applicable.

From among our varied collection of EXSEV Series bearings, this Guidebook includes products that are especially contributory to the semiconductor industry, such as in clean-room or vacuum-chamber applications.

Koyo is certain that the high-performance EXSEV Bearing Series, which is the materialization of new values, will assist the many engineers who pioneer unexplored fields beyond the boundaries of the normal semiconductor industry.

The information given in this catalog is subject to change without prior notice, to include future improvements of the bearings. Koyo pays close attention to the correctness of the information given in this catalog. Nonetheless, we disclaim liability for any damage resulting from errors, omissions, or missing pages in this catalog.
**HD Bearings**

**Typical bearing number**

**SV6003ZZST YS**

**Advantages**
The HD Bearings packed with an appropriate amount of lithium-base KHD grease, which is low in particle emissions.
Lubricated with grease, the HD Bearings offer superior lubrication reliability.

**Specifications**
- Outer/inner rings and balls: Martensitic stainless steel
- Cage: Austenitic stainless steel
- Shield: Austenitic stainless steel
- Lubrication: KHD grease

**Performance**
- Cleanliness: Class 1000 \(^1\)
- Ambient pressure: Atmospheric pressure
- Temperature: \(-30\) to \(120\) °C
- Limiting speed: \(dn < 5000\) \(^2\)

**Applications**
- Carrier systems
- Food-processing systems
- Cleaning systems

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**FA Bearings**

**Typical bearing number**

**SE6003ZZST FA**

**Advantages**
The FA Bearings are lubricated with a solid fluoropolymer lubricant, which offers superior lubrication performance.
The cage is made from a low-particle-emission fluorocarbon resin.

**Specifications**
- Outer/inner rings and balls: Martensitic stainless steel
- Cage: Fluorocarbon resin
- Shield: Austenitic stainless steel
- Lubrication: Fluoropolymer

**Performance**
- Cleanliness: Class 1000 \(^1\)
- Ambient pressure: Atmospheric pressure to \(10^{-5}\) Pa
- Temperature: \(-100\) to \(200\) °C
- Limiting speed: \(dn < 10000\); \(1000\) min\(^{-1}\) max.
- Permissible radial load: \(\leq 1\)% of the basic dynamic load rating \(^3\)

**Applications**
- Semiconductor manufacturing systems
- LCD manufacturing systems
- Carrier systems
- Inspection systems

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\(^1\) The cleanliness class number represents specific environments where the individual products are useful. The cleanliness of the products themselves may vary depending on operating conditions.
\(^2\) When used in an environment where cleanliness is not a significant factor, the product can be used at higher speed, reaching the same limiting speed as that of standard products.
\(^3\) The permissible radial load indicates the approximate size of radial load the bearing can carry. If the bearing carries an axial load, the permissible radial load may be lower.

Refer to the table at the end of the guidebook for each product's basic dynamic load rating (Cr).
Clean Pro Bearings

Typical bearing number
SE6003ZZSTPR YS

Advantages
The Clean Pro Bearings are finished with Clean Pro coating, which serves as the solid lubricant.
The Clean Pro coating provides excellent lubrication and is low in particle and gas emissions, making the Clean Pro Bearings useful in clean-room applications.

Specifications
- Outer/inner rings and balls: Martensitic stainless steel
- Cage: Austenitic stainless steel
- Shield: Austenitic stainless steel
- Lubrication: Clean Pro coating

Performance
- Cleanliness: Class 10 \(^1\): chemically clean
- Ambient pressure: Atmospheric pressure to \(10^{-5}\) Pa
- Temperature: \(-100\) to \(200\) °C
- Limiting speed: \(dn < 10000: 1000\) min\(^{-1}\) max.
- Permissible radial load: \(\leq 3\%\) of the basic dynamic load rating \(^3\)

Applications
- Semiconductor manufacturing systems
- LCD manufacturing systems
- Carrier systems
- Inspection and analysis systems
- Rotary drives
- Vacuum motors

High-temperature Clean Pro Bearings

Typical bearing number
SE6003ZZSTPRB YS

Advantages
The High-temperature Clean Pro Bearings are an upgraded version of the reliable Clean Pro Bearings, which have an excellent record in clean-room applications. With improved heat resistance, the High-temperature Clean Pro Bearings offer an expanded operating temperature range of up to \(260\) °C.

Specifications
- Outer/inner rings and balls: Martensitic stainless steel
- Cage: Austenitic stainless steel
- Shield: Austenitic stainless steel
- Lubrication: Clean Pro coating

Performance
- Cleanliness: Class 10 \(^1\)
- Ambient pressure: Atmospheric pressure to \(10^{-5}\) Pa
- Temperature: \(-100\) to \(260\) °C
- Limiting speed: \(dn < 10000: 1000\) min\(^{-1}\) max.
- Permissible radial load: \(\leq 3\%\) of the basic dynamic load rating \(^3\)

Applications
- Semiconductor manufacturing systems
- LCD manufacturing systems
- Vacuum evaporators
- Hard-disk manufacturing systems
**DL Bearings**

**Typical bearing number**

**SV6003ZZST YS**

**Advantages**

The DL Bearings packed with an appropriate amount of KDL grease (fluorine base), which is suitable for vacuum environments.

The low-particle-emission DL Bearings are suitable for use in a clean environment as well.

Lubricated with grease, the DL Bearings ensure superior lubrication reliability.

**Specifications**

- Outer/inner rings and balls
  - Martensitic stainless steel
- Cage
  - Austenitic stainless steel
- Shield
  - Austenitic stainless steel
- Lubrication
  - KDL grease

**Performance**

- **Cleanliness**: Class 100
- **Ambient pressure**: Atmospheric pressure to $10^{-5}$ Pa
- **Temperature**: $-30$ to $200$ °C
- **Limiting speed**: $dn < 40000$

**Applications**

- Semiconductor manufacturing systems
- LCD manufacturing systems
- Carrier robots
- Vacuum pumps

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**PN Bearings**

**Typical bearing number**

**SE6003ZZST PN**

**Advantages**

The PN Bearings are solid-lubricant bearings, provided with a solid lubricant and fluoropolymer.

The cage is made from a highly heat-resistant PEEK (poly-ether-ether-ketone) resin, enabling the bearings to operate stably under high temperatures.

**Specifications**

- Outer/inner rings and balls
  - Martensitic stainless steel
- Cage
  - PEEK resin
- Shield
  - Austenitic stainless steel
- Lubrication
  - Fluoropolymer and solid lubricant

**Performance**

- **Cleanliness**: —
- **Ambient pressure**: Atmospheric pressure to $10^{-5}$ Pa
- **Temperature**: $-30$ to $300$ °C
- **Limiting speed**: $dn < 10000 : 1000$ min$^{-1}$ max.
- **Permissible radial load**: $\pm 3\%$ of the basic dynamic load rating

**Applications**

- Drink-carton manufacturing systems
- LCD washing systems

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1) The cleanliness class number represents specific environments where the individual products are useful. The cleanliness of the products themselves may vary depending on operating conditions.

2) When used in an environment where cleanliness is not a significant factor, the product can be used at higher speed, reaching the same limiting speed as that of standard products.

3) The permissible radial load indicates the approximate size of radial load the bearing can carry. If the bearing carries an axial load, the permissible radial load may be lower.

Refer to the table at the end of the guidebook for each product's basic dynamic load rating (Cr).
**MO Bearings**

**Typical bearing number**

SE6003ZZSTMSA7 YS

**Advantages**

The MO Bearings are solid-lubricant bearings, lubricated with molybdenum disulfide coating. They are superior to polymer-lubricated bearings in load-carrying performance and lubrication performance.

**Specifications**

- Outer/inner rings and balls: Martensitic stainless steel
- Cage: Austenitic stainless steel
- Shield: Austenitic stainless steel
- Lubrication: Molybdenum disulfide coating

**Performance**

- Cleanliness: —
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to $300$ $^\circ$C
- Limiting speed: $dn < 10000: 1000$ min$^{-1}$ max.
- Permissible radial load: ≤ 3% of the basic dynamic load rating$^2$

**Applications**

- Semiconductor manufacturing systems
- LCD manufacturing systems
- Vacuum evaporators
- Turbo-molecular pump
- Rotary furnaces

**WS Bearings**

**Typical bearing number**

SE6003ZZST WS

**Advantages**

The WS Bearings are solid-lubricant bearings, lubricated with tungsten disulfide. They have excellent heat resistance and load-carrying performance. These bearings have a tungsten disulfide-including separator, in place of a cage, keeping the balls equally spaced.

**Specifications**

- Outer/inner rings and balls: Martensitic stainless steel
- Separator: Sintered composite material of tungsten disulfide base
- Shield: Austenitic stainless steel
- Lubrication: Solid lubricant of tungsten disulfide base

**Performance**

- Cleanliness: —
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to $350$ $^\circ$C
- Limiting speed: $dn < 4000: 500$ min$^{-1}$ max.
- Permissible radial load: ≤ 5% of the basic dynamic load rating$^3$

**Applications**

- Semiconductor manufacturing systems
- LCD manufacturing systems
- Vacuum evaporators
- PDP manufacturing systems
**MG Bearings**

**Typical bearing number**

**SE6003ZZSTMG3 YS**

**Advantages**

The MG Bearings are solid-lubricant bearings, lubricated with the silver-ion plating on the rolling elements (balls). They are suitable for ultra-high vacuum applications, because gas emissions are very low.

**Specifications**

- Outer/inner rings and balls: Martensitic stainless steel
- Cage: Austenitic stainless steel
- Shield: Austenitic stainless steel
- Lubrication: Silver

**Performance**

- Cleanliness: —
- Ambient pressure: $10^{-3}$ to $10^{-10}$ Pa
- Temperature: -200 to 350 °C
- Limiting speed: $dn < 10000: 1000 \text{ min}^{-1}$ max.
- Permissible radial load: $\leq 3\%$ of the basic dynamic load rating

**Applications**

- Semiconductor manufacturing systems
- LCD manufacturing systems
- Vacuum evaporators
- Vacuum motors
- Medical equipment

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**High-temperature Hybrid Ceramic Bearings**

**Typical bearing number**

**3NC6003HT4 GF**

**Advantages**

The High-temperature Hybrid Ceramic Bearings have bearing rings made from excellently heatproof high-speed tool steel with ceramic rolling elements (balls). These bearings are solid-lubricant bearings, with the cage made from highly heat-resistant graphite, which serves as the lubricant.

**Specifications**

- Outer/inner rings: High-speed tool steel
- Balls: Ceramics
- Cage: Graphite
- Lubrication: Graphite

The cage protruding on one side.

**Performance**

- Cleanliness: —
- Ambient pressure: Atmospheric pressure
- Temperature: -100 to 500 °C
- Limiting speed: $dn < 4000: 500 \text{ min}^{-1}$ max.
- Permissible radial load: $\leq 3\%$ of the basic dynamic load rating

**Applications**

- Carrier systems in baking furnaces
- Bogies in heating furnaces

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1) The cleanliness class number represents specific environments where the individual products are useful. The cleanliness of the products themselves may vary depending on operating conditions.
2) The permissible radial load indicates the approximate size of radial load the bearing can carry. If the bearing carries an axial load, the permissible radial load may be lower.

Refer to the table at the end of the guidebook for each product’s basic dynamic load rating (Cr).
**Full Complement Ceramic Ball Bearings**
(Angular Contact Ball Bearings)

**Typical bearing number**

**NC7003V**

**Advantages**
The Full Complement Ball Bearings are the ultimate result of our commitment to heat resistance.
The configuration of these bearings is of angular contact ball bearings.
The bearing rings and rolling elements (balls) are made of ceramic.
No cage is provided.

**Specifications**

- Outer/inner rings and balls: Ceramics
- Cage: Not provided
- Lubrication: Not provided

**Performance**
- Cleanliness : ——
- Ambient pressure : Atmospheric pressure to $10^{-10}$ Pa
- Temperature : $-200$ to $800$ °C
- Limiting speed : $dn < 4000$ : $500$ min$^{-1}$ max.
- Permissible radial load : $\leq 1\%$ of the basic dynamic load rating

**Applications**
- Carrier systems in baking furnaces
- Fans in furnaces

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**SK Bearings**

**Typical bearing number**

**SK6003ZZST YS**

**Advantages**
The SK Bearings are suitable for use in slightly corrosive environments.
The bearing rings and rolling elements (balls) are made from martensitic stainless steel, with an appropriate amount of lithium-base KHD grease sealed in.

**Specifications**

- Outer/inner rings and balls: Martensitic stainless steel
- Cage: Austenitic stainless steel
- Shield: Austenitic stainless steel
- Lubrication: KHD grease

**Performance**
- Cleanliness : ——
- Ambient pressure : Atmospheric pressure
- Temperature : $-30$ to $120$ °C

**Applications**
- Chemical processing systems
- Carrier systems
Corrosion-resistant SL Bearings

**Typical bearing number**

SL6003ZZMD4 FA

**Advantages**

With precipitation-hardened stainless steel bearing rings and carbon rolling elements (balls), the SL Bearings are useful in corrosive environments. These bearings are solid-lubricant bearings, lubricated with carbon and fluoropolymer.

**Specifications**

- **Outer/inner rings**: Precipitation-hardened stainless steel
- **Balls**: High-hardness carbon material
- **Cage**: Fluorocarbon resin
- **Shield**: Austenitic stainless steel
- **Lubrication**: Carbon and fluoropolymer

**Performance**

- Cleanliness: 100
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to 200 °C
- Limiting speed: $dn < 4000 : 500 \text{ min}^{-1}$ max.
- Permissible radial load: $\leq 0.3\%$ of the basic dynamic load rating

**Applications**

- Film manufacturing systems
- Electronic-device manufacturing systems
- Washing systems
- Chemical processing systems

Corrosion-resistant Hybrid Ceramic Bearings

**Typical bearing number**

3NC6003MD4 FA

**Advantages**

With the precipitation-hardened stainless steel bearing rings and ceramic rolling elements (balls), the Hybrid Ceramic Bearings are useful in corrosive environments. These bearings are solid-lubricant bearings, lubricated with fluoropolymer.

**Specifications**

- **Outer/inner rings**: Precipitation-hardened stainless steel
- **Balls**: Ceramics
- **Cage**: Fluorocarbon resin
- **Shield**: Austenitic stainless steel
- **Lubrication**: Fluoropolymer

**Performance**

- Cleanliness: Class 1000
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to 200 °C
- Limiting speed: $dn < 10000 : 1000 \text{ min}^{-1}$ max.
- Permissible radial load: $\leq 1\%$ of the basic dynamic load rating

**Applications**

- Semiconductor manufacturing systems
- Chemical processing systems
- Food machinery
- Washing systems

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1) The cleanliness class number represents specific environments where the individual products are useful. The cleanliness of the products themselves may vary depending on operating conditions.

2) The permissible radial load indicates the approximate size of radial load the bearing can carry. If the bearing carries an axial load, the permissible radial load may be lower. Refer to the table at the end of the guidebook for each product’s basic dynamic load rating (Cr).
Ceramic Bearings

**Typical bearing number**
NC6003 FA

**Advantages**
The ceramic-made bearing rings and rolling elements (balls) make the Ceramic Bearings useful in corrosive environments. These bearings are solid-lubricant bearings lubricated with fluoropolymer.

**Specifications**

- Outer/inner rings: Ceramics
- Cage: Fluorocarbon resin
- Lubrication: Fluoropolymer

**Performance**
- Cleanliness: Class 1000
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to $200^\circ$ C
- Limiting speed: $dn < 10000 : 1000$ min$^{-1}$ max.
- Permissible radial load: $\leq 1\%$ of the basic dynamic load rating

**Applications**
- Semiconductor manufacturing systems
- LCD manufacturing systems
- Semiconductor inspection systems
- Synthetic-fiber manufacturing systems
- Canning systems
- Ultrasonic motors

Corrosion-resistant Ceramic Bearings

**Typical bearing number**
NCT6003 FA

**Advantages**
With both the bearing rings and rolling elements (balls) made from highly corrosion-resistant silicon nitride ceramics, the Corrosion-resistant Ceramic Bearings are compatible with corrosive environments. These bearings are solid-lubricant bearings lubricated with fluoropolymer.

**Specifications**

- Outer/inner rings and balls: Silicon nitride ceramics
- Cage: Fluorocarbon resin
- Lubrication: Fluoropolymer

**Performance**
- Cleanliness: Class 1000
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to $200^\circ$ C
- Limiting speed: $dn < 10000 : 1000$ min$^{-1}$ max.
- Permissible radial load: $\leq 1\%$ of the basic dynamic load rating

**Applications**
- Liquid-crystal-film processing systems
- Aluminum-foil capacitor processing systems
- Plating systems
- Synthetic-fiber manufacturing systems
- Food-container washing systems
Highly Corrosion-resistant Ceramic Bearings

Typical bearing number

NCZ6003 FA

Advantages

These bearings are resistant to strong acid and alkaline solutions as well. Having the bearing rings and rolling elements (balls) made from highly corrosion-resistant silicon-carbide ceramics, the Highly Corrosion-resistant Ceramic Bearings are compatible with corrosive environments. These bearings are solid-lubricant bearings lubricated with fluoropolymer.

Specifications

- Outer/inner rings and balls: Silicon carbide ceramics
- Cage: Fluorocarbon resin
- Lubrication: Fluoropolymer

Performance

- Cleanliness: Class 100
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to $200$ °C
- Limiting speed: $dn < 100000: 1000$ min$^{-1}$ max.
- Permissible radial load: $\leq 1\%$ of the basic dynamic load rating

Applications

- Aluminum-foil capacitor manufacturing systems

Non-magnetic Hybrid Ceramic Bearings

Typical bearing number

3NC6003YH4 FA

Advantages

The Non-magnetic Hybrid Ceramic Bearings have non-magnetic stainless steel bearing rings and ceramic balls. These bearings are solid-lubricant bearings lubricated with fluoropolymer.

Specifications

- Outer/inner rings: Non-magnetic stainless steel
- Balls: Ceramics
- Cage: Fluorocarbon resin
- Lubrication: Fluoropolymer

Performance

- Cleanliness: Class 100
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to $200$ °C
- Limiting speed: $dn < 100000: 1000$ min$^{-1}$ max.
- Permissible radial load: $\leq 1\%$ of the basic dynamic load rating

Applications

- Semiconductor manufacturing systems
- Semiconductor inspection systems
- Canning systems
- Superconductivity-related systems
- Welding

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1) The cleanliness class number represents specific environments where the individual products are useful. The cleanliness of the products themselves may vary depending on operating conditions.
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High-speed Insulation

High-speed / Insulated Hybrid Ceramic Bearings

Typical bearing number

3NC6003 FG

Advantages
The High-speed Insulating Hybrid Ceramic Bearings have ceramic rolling elements (balls).

The lightweight ceramic balls produce low centrifugal force, making these bearings suitable for high-speed rotation.

The ceramic balls insulate the outer ring and the inner ring enabling the bearings to be used in environments where electrical pitting is possible.

Specifications

- Outer/inner rings: High-carbon chromium bearing steel
- Balls: Ceramics
- Cage: Reinforced polyamide resin
- Lubrication: Grease or oil

Performance

- Cleanliness: —
- Ambient pressure: Atmospheric pressure
- Temperature: −30 to 120 °C
- Limiting speed: Equal to or higher than 1.2 times the limiting speed of standard bearings

Applications

- Hard disk drives
- Motor spindles
- High-speed stranding machine guide rolls

Full Complement Hybrid Ceramic Ball Bearings

Typical bearing number

3NCKAA060V

Advantages
The Full Complement Hybrid Ceramic Ball Bearings have ceramic rolling elements (balls).

In place of a cage, a stainless-steel separator guides the ceramic balls, reducing particle emissions and making the bearings suitable for clean environments.

Specifications

- Outer/inner rings: Martensitic stainless steel
- Balls: Ceramics
- Separator: Martensitic stainless steel
- Cage: Not provided
- Lubrication: KDL grease

Performance

- Cleanliness: Class 100 1)
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: −30 to 200 °C

Applications

- Wafer-carrier robots
Clean Pro Linear Ball Bearings / Linear Way Bearing Units

Typical bearing number

(Linear Ball Bearings) SESDM10ST5PR12
(Linear Way Bearing Units) SELWHS20C2R500PR

Advantages

Both the Linear Ball Bearings and Linear Way Bearing Units are solid-lubricated bearings lubricated by means of the Clean Pro coating. The Clean Pro coating has superior lubrication performance and is low in particle and emissions, making the bearings useful in clean environments.

Specifications

(Linear Ball Bearings)
- External cylinder and balls
- Martensitic stainless steel
- Retainer
- Austenitic stainless steel
- Side plate
- Precipitation-hardened stainless steel
- Lubrication
- Clean Pro coating

(Linear Way Bearing Units)
- Casing, track rail and balls
- Martensitic stainless steel
- Side plate
- Austenitic stainless steel
- Lubrication
- Clean Pro coating

Performance

- Cleanliness: Class 100
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-100$ to $200$ °C

DL Linear Ball Bearings / Linear Way Bearing Units

Typical bearing number

(Linear Ball Bearings) SVSDM10ST5
(Linear Way Bearing Units) SVLWHS20C2R500

Advantages

Both the Linear Ball Bearings and Linear Way Bearing Units seal in an appropriate amount of KDL grease (fluorine base), which is low in particle emissions. These bearings are suitable for vacuum applications and in high-temperature environments.

Specifications

(Linear Ball Bearings)
- External cylinder and balls
- Martensitic stainless steel
- Retainer
- Austenitic stainless steel
- Side plate
- Precipitation-hardened stainless steel
- Lubrication
- KDL grease

(Linear Way Bearing Units)
- Casing, track rail and balls
- Martensitic stainless steel
- Side plate
- Austenitic stainless steel
- Lubrication
- KDL grease

Performance

- Cleanliness: 
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: $-30$ to $200$ °C

1) The cleanliness class number represents specific environments where the individual products are useful. The cleanliness of the products themselves may vary depending on operating conditions.
MO Linear Ball Bearings

Typical bearing number

SESMD12ST5MSA7

Advantages

The MO Linear Ball Bearings are lubricated with molybdenum disulfide, which is a solid lubricant. These bearings are suitable for high-temperature, vacuum applications. They are superior to polymer-lubricated bearings in load-carrying performance and lubrication performance.

Specifications

- External cylinder and balls: Martensitic stainless steel
- Retainer: Austenitic stainless steel
- Side plate: Precipitation-hardened stainless steel
- Lubrication: Molybdenum disulfide coating

Performance

- Cleanliness: 
- Ambient pressure: Atmospheric pressure to $10^{-5}$ Pa
- Temperature: -100 to 300 °C

Warning

- The EXSEV products that can be used for clean applications are seal-packaged. They are not to be unpacked until immediately before they are assembled in the systems.

- When handling bearings, wear polyethylene gloves or other appropriate material to keep the bearings free from oil stains or dust.

- Do not apply grease, oil, or other solid lubricants into the bearings, either before or during system operation.

- When the bearings are to be stored, place the bearings in a sealed, dry container, and store at room temperature, whether the bearing package has been opened or not.
# EXSEV Bearing Number Table

| Boundary dimensions (mm) | Basic load rating (kN) | HD Bearings | FA Bearings | Clean Pro Bearings | Clean Pro Bearings | DL Bearings | PN Bearings | MO Bearings | WS Bearings | MG Bearings | High-temperature Hybrid Ceramic Bearings | Full Complement Ceramic Bearings | SK Bearings | Ceramic Bearings | Ceramic Bearings | Ceramic Bearings | Ceramic Bearings | Ceramic Bearings | Ceramic Bearings | Ceramic Bearings | Ceramic Bearings | Ceramic Bearings |
|-------------------------|------------------------|-------------|-------------|-------------------|-------------------|-------------|-------------|-------------|-------------|-------------|----------------------------------------|-------------------------------|-------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Bore dia.               | Outside dia. | Width      | Cr          | CDr             | Prefix         | Series      | Bearing number | SV ST YS | SE ST FA | SE STPR YS | SE STPRB YS | SE ST PN YS | SE ST SAS YS | SE ST MG3 YS | JNC HT4 GF | NC ST V | SL MD4 FA | JNC MD4 FA | NC FA | NCT FA | NCT FA | NC FA | NCT FA | JNC YH4 FA | JNC FG |
| 4                      | 12 4 | 0.97 | 0.38 | 604 | | | | | | | | | | | | | | | | | | | | |
| 13                     | 1.30 | 0.49 | 624 | | | | | | | | | | | | | | | | | | | | | |
| 14                      | 5  | 1.30 | 0.49 | 605 | | | | | | | | | | | | | | | | | | | | |
| 16                      | 5  | 1.75 | 0.67 | 625-5 | | | | | | | | | | | | | | | | | | | | | |
| 17                      | 6  | 1.95 | 0.74 | 606 | | | | | | | | | | | | | | | | | | | | | |
| 19                      | 6  | 2.60 | 1.05 | 626 | | | | | | | | | | | | | | | | | | | | | |
| 19                      | 6  | 2.60 | 1.05 | 607 | | | | | | | | | | | | | | | | | | | | | |
| 22                      | 7  | 3.30 | 1.35 | 627 | | | | | | | | | | | | | | | | | | | | | |
| 22                      | 7  | 3.30 | 1.35 | 608 | | | | | | | | | | | | | | | | | | | | | |
| 24                      | 8  | 3.35 | 1.40 | 628 | | | | | | | | | | | | | | | | | | | | | |
| 26                      | 8  | 4.55 | 1.95 | 629 | | | | | | | | | | | | | | | | | | | | | |
| 9.525                   | 22.225 | 7.142 | 2.83 | 1.13 | EE3S | | | | | | | | | | | | | | | | | | | | | |
| 10                     | 26 8 | 4.55 | 1.95 | 6000 | | | | | | | | | | | | | | | | | | | | | |
| 30                     | 9  | 5.10 | 2.40 | 6200 | | | | | | | | | | | | | | | | | | | | | |
| 12                     | 28 8 | 5.10 | 2.40 | 6001 | | | | | | | | | | | | | | | | | | | | | |
| 32                     | 10 6.80 | 3.05 | 6201 | | | | | | | | | | | | | | | | | | | | | |
| 15                     | 32 9 | 5.60 | 2.85 | 6002 | | | | | | | | | | | | | | | | | | | | | |
| 35                     | 11 7.65 | 3.75 | 6202 | | | | | | | | | | | | | | | | | | | | | |
| 17                     | 35 10 | 6.00 | 3.25 | 6003 | | | | | | | | | | | | | | | | | | | | | |
| 40                     | 12 9.55 | 4.80 | 6203 | | | | | | | | | | | | | | | | | | | | | |
| 20                     | 42 12 | 9.40 | 5.05 | 6004 | | | | | | | | | | | | | | | | | | | | | |
| 47                     | 14 12 | 12.8 | 6.65 | 6204 | | | | | | | | | | | | | | | | | | | | | |
| 25                     | 47 12 | 10.1 | 5.85 | 6005 | | | | | | | | | | | | | | | | | | | | | |
| 52                     | 15 14 | 10.0 | 7.85 | 6205 | | | | | | | | | | | | | | | | | | | | | |
| 30                     | 55 13 | 13.2 | 8.25 | 6006 | | | | | | | | | | | | | | | | | | | | | |
| 62                     | 16 19.5 | 11.3 | 6206 | | | | | | | | | | | | | | | | | | | | | |
| 35                     | 62 14 | 15.9 | 10.3 | 6007 | | | | | | | | | | | | | | | | | | | | | |
| 72                     | 17 25.7 | 15.4 | 6207 | | | | | | | | | | | | | | | | | | | | | |
| 40                     | 68 15 | 16.7 | 11.5 | 6008 | | | | | | | | | | | | | | | | | | | | | |
| 80                     | 18 29.1 | 17.8 | 6208 | | | | | | | | | | | | | | | | | | | | | |

Note 1: The internal clearance of the in-stock bearings is as shown on the right.

Note 2: Because the configuration of these bearings is that of angular contact ball bearings, their basic bearing number and basic load ratings differ from those shown in this table.

Note 3: Packed with KHD grease. The 9552 Series bearings are also available with these specifications.

Note 4: The bearings of the numbers marked with an asterisk have a C3 clearance.
Cleanliness, Vacuum and Heat-resistance Characteristics of the Typical EXSEV Bearings

<table>
<thead>
<tr>
<th>Performance</th>
<th>Cleanliness class</th>
<th>Ambient pressure (Pa)</th>
<th>Operating temperature (°C)</th>
<th>Insulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td></td>
<td>Atmospheric to 10⁻¹⁰ to 10⁻⁷ to 10⁻⁵ to 10⁻³</td>
<td>Lower limit</td>
<td>Upper limit</td>
</tr>
<tr>
<td>HD Bearings</td>
<td></td>
<td></td>
<td>-200</td>
<td>-100</td>
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<tr>
<td>FA Bearings</td>
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<tr>
<td>Clean Pro Bearings</td>
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<tr>
<td>High-temperature Clean Pro Bearings</td>
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<tr>
<td>DL Bearings</td>
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<tr>
<td>PN Bearings</td>
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<td>MO Bearings</td>
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<tr>
<td>WS Bearings</td>
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<tr>
<td>MG Bearings</td>
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<tr>
<td>High-temperature Hybrid Ceramic Bearings</td>
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<tr>
<td>Full Complement Ceramic Bearings</td>
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<tr>
<td>SK Bearings</td>
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<tr>
<td>Corrosion-resistant SL Bearings</td>
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<tr>
<td>Corrosion-resistant Hybrid Ceramic Bearings</td>
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<tr>
<td>Ceramic Bearings</td>
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<tr>
<td>Corrosion-resistant Ceramic Bearings</td>
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<tr>
<td>Highly corrosion-resistant Ceramic Bearings</td>
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<tr>
<td>Non-magnetic Hybrid Ceramic Bearings</td>
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</tr>
</tbody>
</table>

Note 1) The colored sections and circles indicate the characteristics of individual products.
2) The cleanliness class number represents the environments where the individual products are useful.
   The cleanliness of the products themselves may vary depending on operating conditions (loads and rotational speed). 
3) Please consult Koyo when planning to use a bearing under conditions close to the limit conditions specified in this table, 
or under the conditions that are outside the operating range indicated in this table.
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*: QS-9000 certified. **: ISO 9001 certified.

ISO9001/QS-9000 Certificate No. 927265
Hybrid Ceramic Bearing