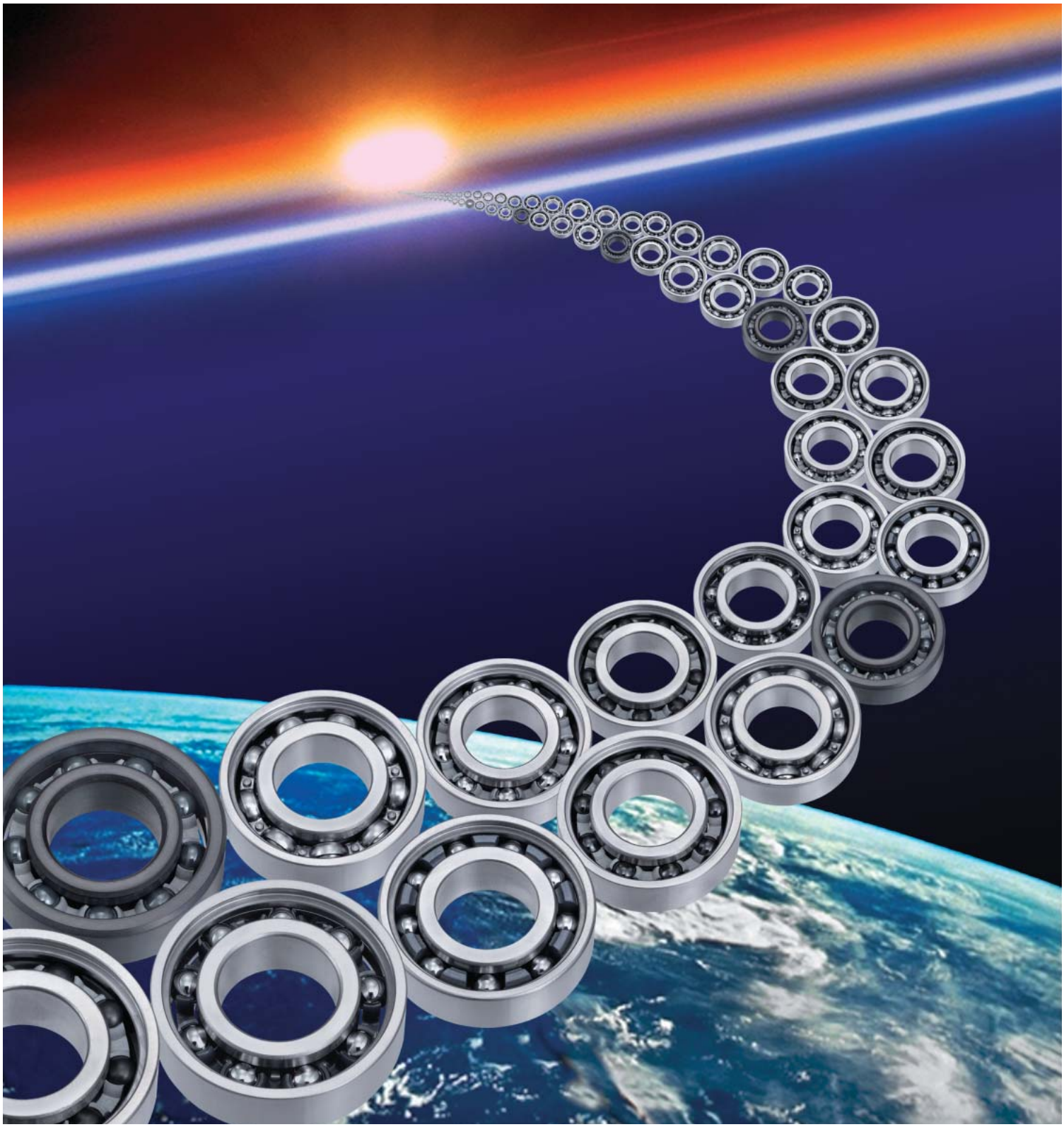
Koyo®

—Extreme Special Environment Bearings Compatible with Advanced Applications—

EXSEV Bearing Series Product Guidebook



KOYO SEIKO CO.,LTD.

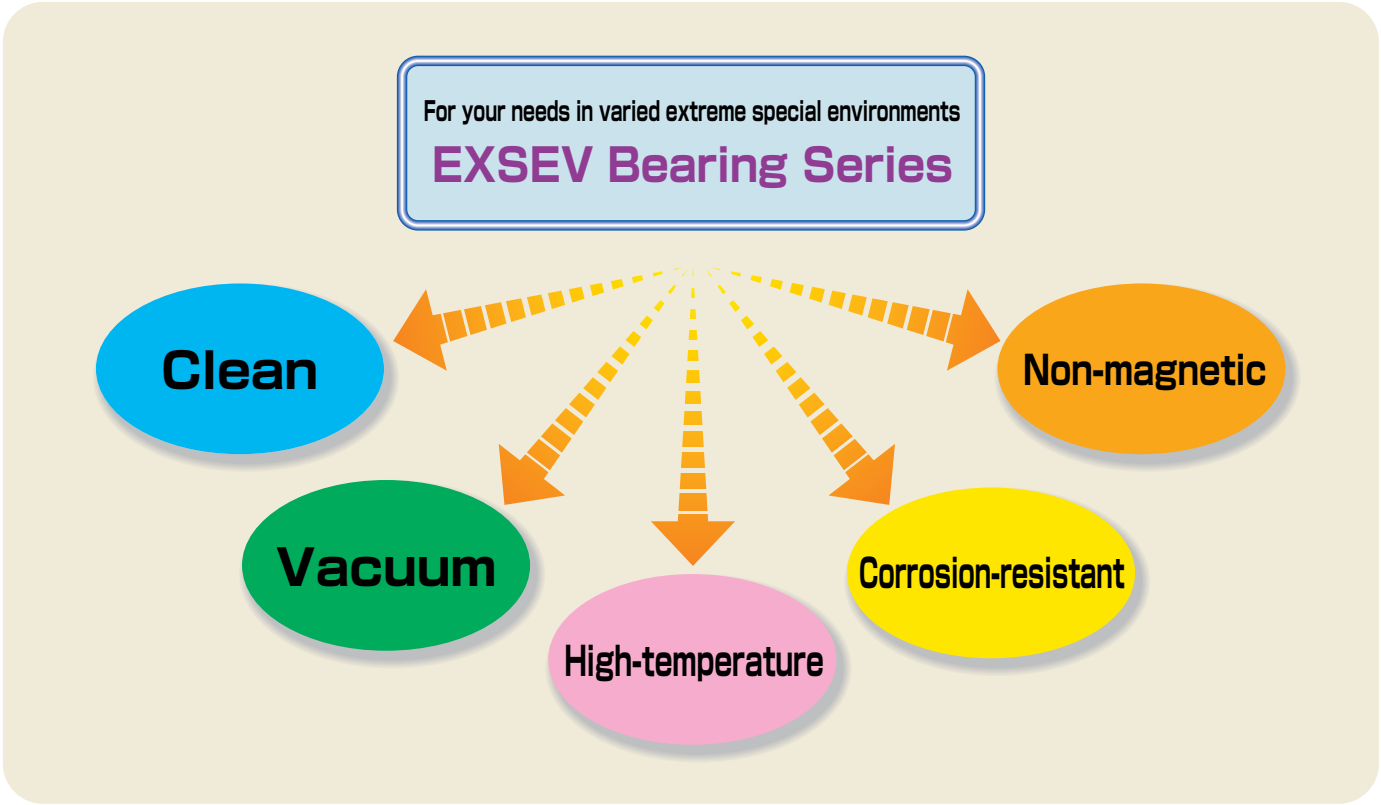
CAT.NO.457E

EXSEV Bearing Series
Product Guidebook

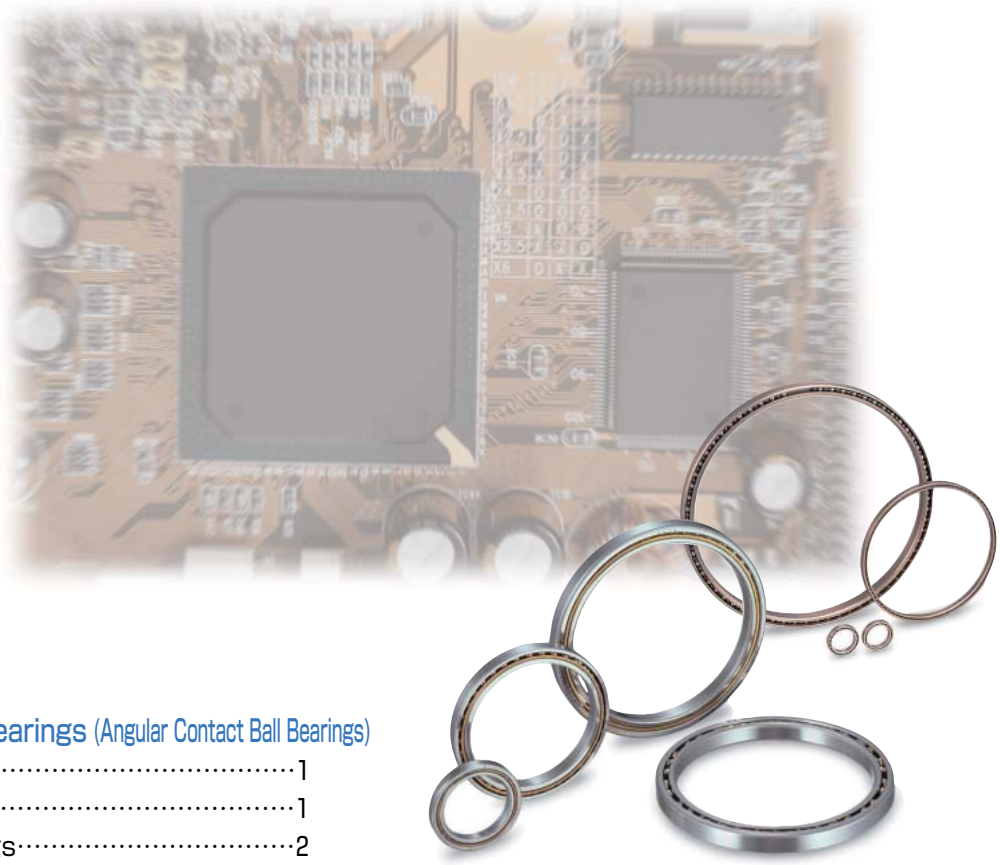
The Koyo EXSEV Bearing Series is a collection of high-performance bearings compatible with special operating environments and conditions, where conventional bearings are not applicable.

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.



Contents

HD Bearings

Typical bearing number

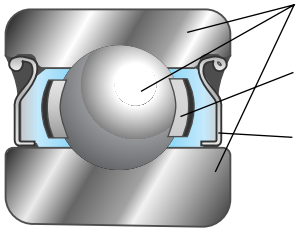
SV6003ZZST YS

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 ℃
- Limiting speed : dn < 5000 [2)]

Applications

Carrier systems
Food-processing systems
Cleaning systems

FA Bearings

Typical bearing number

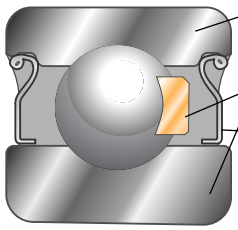
SE6003ZZST FA

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 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 1% of the basic dynamic load rating [3)]

Applications

Semiconductor manufacturing systems
LCD manufacturing systems
Carrier systems
Inspection systems

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

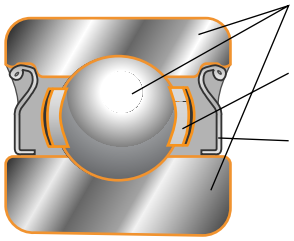
SE6003ZZSTPR YS

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 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 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

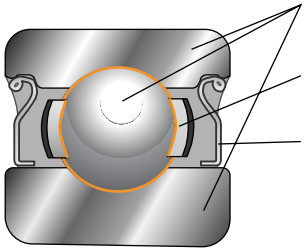
SE6003ZZSTPRB YS

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 ℃.

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 ℃
  The long service life of the High-temperature Clean Pro Bearings is especially significant in an environment where temperatures exceed 200 ℃.
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 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

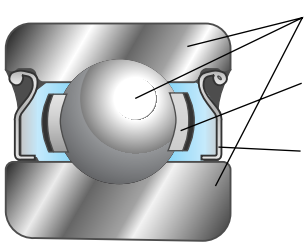
Advantages

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



Performance

- Cleanliness : Class 100 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −30 to 200 ℃
- Limiting speed : dn < 40000 [2)]

Applications

Semiconductor manufacturing systems
LCD manufacturing systems
Carrier robots
Vacuum pumps

PN Bearings

Typical bearing number

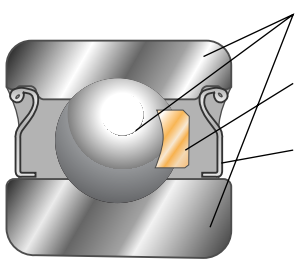
SE6003ZZST PN

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



Performance

- Cleanliness : ——
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −30 to 300 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 3% of the basic dynamic load rating [3)]

Applications

Drink-carton manufacturing systems
LCD washing systems

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

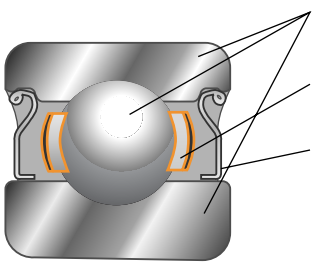
SE6003ZZSTMSA7 YS

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 ℃
- 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

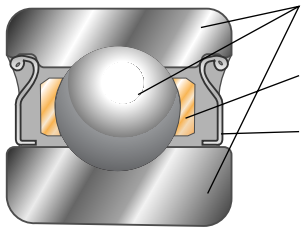
Advantages

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 ℃
- 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

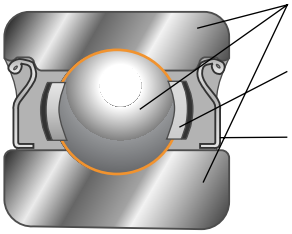
SE6003ZZSTMG3 YS

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 ℃
- 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
Vacuum motors
Medical equipment

High-temperature Hybrid Ceramic Bearings

Typical bearing number

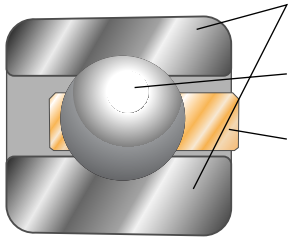
3NC6003HT4 GF

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 steell

Balls
Ceramics

Cage
Graphite

Lubrication
Graphite

The cage protruding on one side.

Performance

- Cleanliness : ——
- Ambient pressure : Atmospheric pressure
- Temperature : −100 to 500 ℃
- Limiting speed : dn < 4000 ; 500 min^{-1} max.
- Permissible radial load : ≦ 3% of the basic dynamic load rating [2)]

Applications

Carrier systems in baking furnaces
Bogies in heating furnaces

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

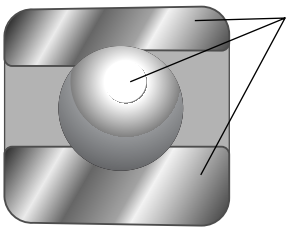
The Full Complement Ball Bearings are the ultimate result of our commitment to heat resistance.

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 ℃
- Limiting speed : dn < 4000 ; 500 min^{-1} max.
- Permissible radial load : ≦ 1% of the basic dynamic load rating [2)]

Applications

Carrier systems in baking furnaces
Fans in furnaces

SK Bearings

Typical bearing number

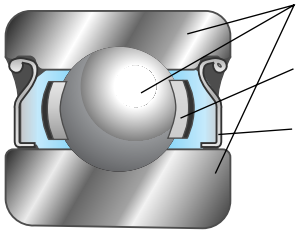
SK6003ZZST YS

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 ℃

Applications

Chemical processing systems
Carrier systems

Corrosion-resistant SL Bearings

Typical bearing number

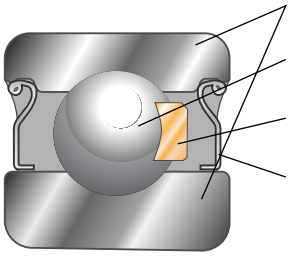
SL6003ZZMD4 FA

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 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −100 to 200 ℃
- Limiting speed : dn < 4000 ; 500 min^{-1} max.
- Permissible radial load : ≦ 0.3% of the basic dynamic load rating [2)]

Applications

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

Corrosion-resistant Hybrid Ceramic Bearings

Typical bearing number

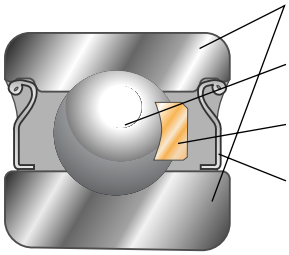
3NC6003MD4 FA

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 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −100 to 200 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 1% of the basic dynamic load rating [2)]

Applications

Semiconductor manufacturing systems
Chemical processing systems
Food machinery
Washing systems

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

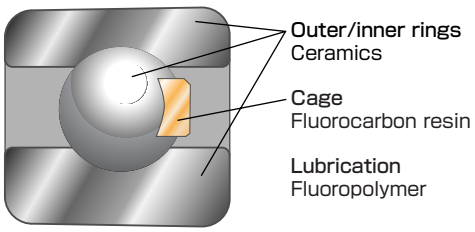
NC6003 FA

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



Performance

- Cleanliness : Class 1000 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −100 to 200 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 1% of the basic dynamic load rating [2)]

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

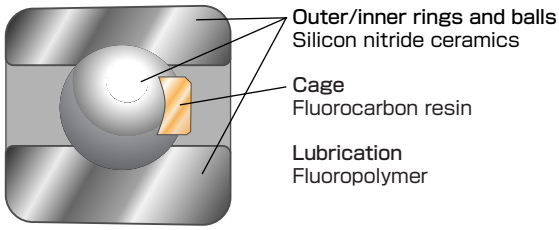
NCT6003 FA

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



Performance

- Cleanliness : Class 1000 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −100 to 200 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 1% of the basic dynamic load rating [2)]

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

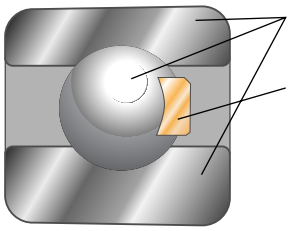
Advantages

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



Performance

- Cleanliness : Class 100 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −100 to 200 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 1% of the basic dynamic load rating [2)]

Applications

Aluminum-foil capacitor manufacturing systems

Non-magnetic Hybrid Ceramic Bearings

Typical bearing number

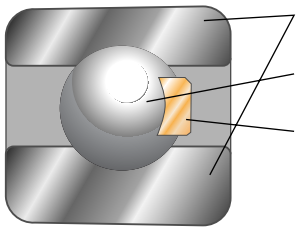
3NC6003YH4 FA

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



Performance

- Cleanliness : Class 1000 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −100 to 200 ℃
- Limiting speed : dn < 10000 ; 1000 min^{-1} max.
- Permissible radial load : ≦ 1% of the basic dynamic load rating [2)]

Applications

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

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).

High-speed / Insulated Hybrid Ceramic Bearings

Typical bearing number

3NC6003 FG

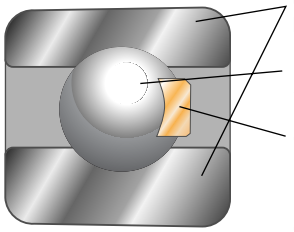
Advantages

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 chrominum bearing steel

Balls
Ceramics

Cage
Reinforced polyamide resin

Lubrication
Grease or oil

Performance

- Cleanliness : ——
- Ambient pressure : Atmospheric pressure
- Temperature : −30 to 120 ℃
- 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

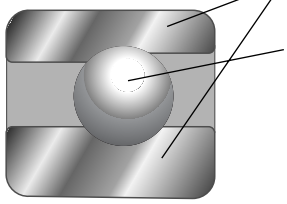
3NCKAA060V

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 ℃

Applications

Wafer-carrier robots

Clean Pro Linear Ball Bearings / Linear Way Bearing Units

(Linear Ball Bearings) (Linear Way Bearing Units)

Typical bearing number

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

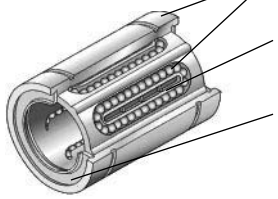
Advantages

Both the Linear Ball Bearings and Linear Way Bearing Units are solid-lubricant 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)



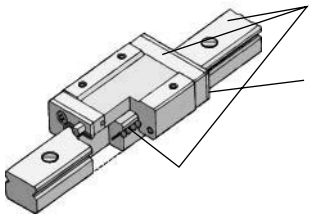
External cylinder and balls
Martensitic stainless steel

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 [1)]
- Ambient pressure : Atmospheric pressure to 10^{-5} Pa
- Temperature : −100 to 200 ℃

DL Linear Ball Bearings / Linear Way Bearing Units

(Linear Ball Bearings) (Linear Way Bearing Units)

Typical bearing number

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

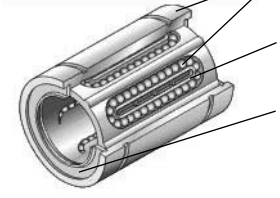
Advantages

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)



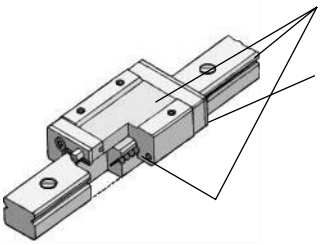
External cylinder and balls
Martensitic stainless steel

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 ℃

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

SESDM12ST5MSA7

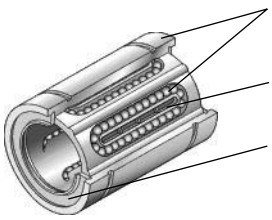
Advantages

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 ℃

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

Delivery guideline (Ex-factory basis)

- Available from stock
- 30 days after receiving an order
- 45 days after receiving an order
- Determined after consultation on each inquiry

Boundary dimensions (mm)			Basic load ratings (kN)		Series / Bearing number	HD Bearings	FA Bearings	Clean Pro Bearings	High-temperature Clean Pro Bearings	DL Bearings	PN Bearings	MO Bearings	WS Bearings	MG Bearings	High-temperature Hybrid Ceramic Bearings	Full Complement Ceramic Bearings (Angular Contact Ball Bearings)	SK Bearings	Corrosion-resistant SL Bearings	Corrosion-resistant Hybrid Ceramic Bearings	Ceramic Bearings	Corrosion-resistant Ceramic Bearings	Highly corrosion-resistant Ceramic Bearings	Non-magnetic Hybrid Ceramic Bearings	High-speed Insulating Hybrid Ceramic Bearings
					Prefix	SV	SE	SE	SE	SV	SE	SE	SE	SE	3NC	NC	SK	SL	3NC	NC	NCT	NCZ	3NC	3NC
					Suffix	ST	ST	STPR	STPRB	ST	ST	STMSA7	ST	STMG3	HT4	V	ST	MD4	MD4				YH4	
Bore dia.	Outside dia.	Width	Cr	C0r	Basic number / Cage code	YS	FA	YS	YS	YS	PN	YS	WS	YS	GF		YS	FA	FA	FA	FA	FA	FA	FG
4	12	4	0.97	0.36	604																			
	13	5	1.30	0.49	624																			
5	14	5	1.30	0.49	605																			
	16	5	1.75	0.67	625-5																			
6	17	6	1.95	0.74	606																			
	19	6	2.60	1.05	626																			
7	19	6	2.60	1.05	607																			
	22	7	3.30	1.35	627																			
8	22	7	3.30	1.35	608															*				
	24	8	3.35	1.40	628																			
9	24	7	3.35	1.40	609																			
	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	12.8	6.65	6204																			
25	47	12	10.1	5.85	6005																			
	52	15	14.0	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.						— Packed with KHD grease	C3	C3	—	— Packed with KHD grease	C3	—	C4	C4	—	— Note 2)	C3 Note 3)	C3	CN Note 4)	CN	CN	—	—	—

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.
3) Packed with KHD grease. The 6900 Series bearings are also available with these specifications.
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

Performance / Series	Cleanliness class				Ambient pressure (Pa)				Operating temperature (℃)										Non-magnetic resistance	Insulation
									Lower limit			Upper limit								
	10	100	1000	—	Atmospheric	to 10^{-3}	to 10^{-5}	to 10^{-10}	−200	−100	−30	60	120	200	250	300	350			
HD Bearings FA Bearings			■	■	■						■	■	■							
Clean Pro Bearings High-temperature Clean Pro Bearings	■	■	■	■	■	■	■			■	■	■	■	■						
DL Bearings PN Bearings		■	■	■	■	■	■				■	■	■	■						
MO Bearings WS Bearings				■	■	■	■			■	■	■	■	■	■	■	■			
MG Bearings				■			■	■	■	■	■	■	■	■	■	■	■			
High-temperature Hybrid Ceramic Bearings				■	■					■	■	■	■	■	■	■	■			○
Full Complement Ceramic Bearings				■	■	■	■	■		■	■	■	■	■	■	■	■		○	○
SK Bearings				■	■						■	■	■							
Corrosion-resistant SL Bearings		■	■	■	■	■	■			■	■	■	■	■						
Corrosion-resistant Hybrid Ceramic Bearings			■	■	■	■	■			■	■	■	■	■						○
Ceramic Bearings			■	■	■	■	■			■	■	■	■	■					○	○
Corrosion-resistant Ceramic Bearings			■	■	■	■	■			■	■	■	■	■					○	○
Highly corrosion-resistant Ceramic Bearings			■	■	■	■	■			■	■	■	■	■					○	○
Non-magnetic Hybrid Ceramic Bearings			■	■	■	■	■			■	■	■	■	■					○	○

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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