

Koyo[®]

For Extreme Special Environments

EXSEV Product Guidebook



EXSEV
BEARING SERIES
BEARINGS FOR
EXTREME SPECIAL
ENVIRONMENT

JTEKT | JTEKT CORPORATION

JTEKT
Koyo | **TOYODA**

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EXSEV Bearing Series Product Guidebook

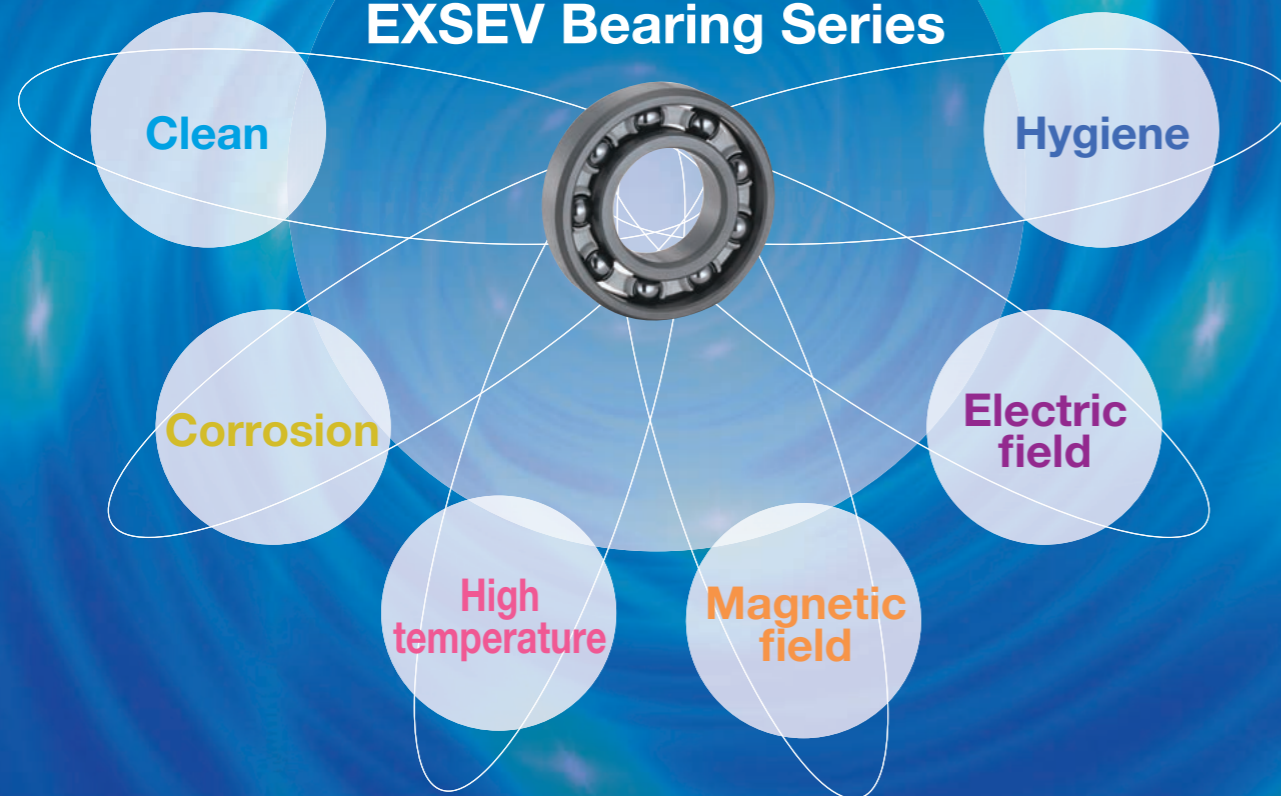
The Koyo EXSEV Bearing Series is a collection of high-performance bearings compatible with special operating environments and conditions, where conventional bearings are not applicable.

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 working not only in the semiconductor industry but in a variety of fields.

For your needs in varied extreme special environments

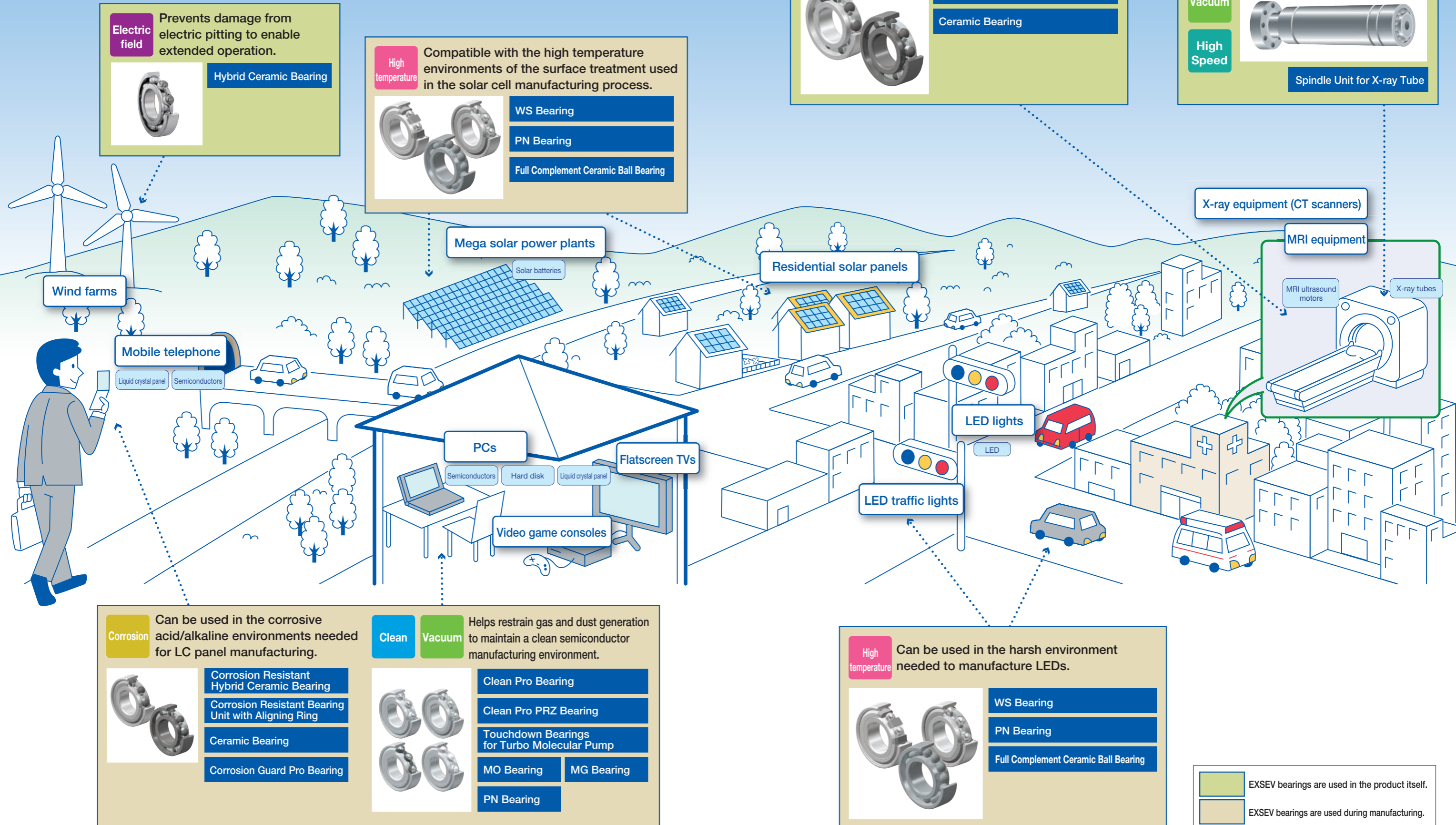
EXSEV Bearing Series



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EXSEV bearings in daily life and at the cutting edge of technology



Electric field Prevents damage from electric pitting to enable extended operation.

Hybrid Ceramic Bearing

High temperature Compatible with the high temperature environments of the surface treatment used in the solar cell manufacturing process.

WS Bearing
PN Bearing
Full Complement Ceramic Ball Bearing

Magnetic field Rotates smoothly even in magnetic fields.

Non-magnetic Hybrid Ceramic Bearing
Ceramic Bearing

High temperature Compatible with the harsh environment needed to generate X-rays.

Vacuum
High Speed

Spindle Unit for X-ray Tube

Corrosion Can be used in the corrosive acid/alkaline environments needed for LC panel manufacturing.

Clean **Vacuum** Helps restrain gas and dust generation to maintain a clean semiconductor manufacturing environment.

Corrosion Resistant Hybrid Ceramic Bearing
Corrosion Resistant Bearing Unit with Aligning Ring
Ceramic Bearing
Corrosion Guard Pro Bearing

Clean Pro Bearing
Clean Pro PRZ Bearing
Touchdown Bearings for Turbo Molecular Pump
MO Bearing MG Bearing
PN Bearing

High temperature Can be used in the harsh environment needed to manufacture LEDs.

WS Bearing
PN Bearing
Full Complement Ceramic Ball Bearing

EXSEV bearings are used in the product itself.
EXSEV bearings are used during manufacturing.

EXSEV Bearings: Table of Characteristics

Major Uses	Products	Applicable Environments ¹⁾														Performance and functions	Bearing Number ⁴⁾ (Cage Code)	Page	
		Limiting Speeds		Permissible radial load	Operating Temp. (°C)						Vacuum (Pa)			Cleanliness (class) ³⁾					
		dn value ²⁾	Max.(min ⁻¹)		~120	~200	~260	~300	~350	~800	Atmosphere	10 ⁻⁵	10 ⁻¹⁰	1000	100				10
Clean environment	Clean Pro PRZ Bearing	<10 000	1 000	Approximately 5% of Cr or less	→	→							→	→	→	High Low	SE□□□□ZZSTPRZ (YS)	Page 7	
	High Temperature Clean Pro Bearing	<10 000	1 000	Approximately 3% of Cr or less	→	→	→						→	→	→		SE□□□□ZZSTPRB (YS)	Page 7	
	Clean Pro Bearing	<10 000	1 000	Approximately 3% of Cr or less	→	→							→	→	→		SE□□□□ZZSTPR (YS)	Page 8	
	DL Bearing	<40 000	—	—	→	→							→	→			SV□□□□ZZST (YS)	Page 8	
	FA Bearing	<10 000	1 000	Approximately 1% of Cr or less	→	→							→	→			SE□□□□ZZST (FA)	Page 9	
Corrosive environment	High Corrosion Resistant Ceramic Bearing	<10 000	1 000	Approximately 1% of Cr or less	→	→							→	→		High Low	NCZ□□□□ (FA)	Page 9	
	Corrosion Resistant Ceramic Bearing	<10 000	1 000	Approximately 1% of Cr or less	→	→							→	→			NCT□□□□ (FA)	Page 10	
	Ceramic Bearing	<10 000	1 000	Approximately 1% of Cr or less	→	→							→	→			NC□□□□ (FA)	Page 10	
	Corrosion Guard Pro Bearing	<10 000	1 000	Approximately 3% of Cr or less	→	→	→						→	→			3NCT□□□□UN4 (PN)	Page 11	
	Corrosion Resistant Hybrid Ceramic Bearing	<10 000	1 000	Approximately 1% of Cr or less	→	→							→	→			3NC□□□□ZZMD4 (FA)	Page 11	
	SK Bearing	Equal to the dn value of normal bearings	—	—	—	→								→	→			SK□□□□ZZST (YS)	Page 12
High temperature environment	Full Complement Ceramic Ball Bearing	<4 000	1 000	Approximately 1% of Cr or less	→	→	→	→	→	→			→	→		High Low	NC□□□□V (-)	Page 12	
	WS Bearing	<4 000	500	Approximately 5% of Cr or less	→	→	→	→	→	→			→	→			SE□□□□ZZST (WS)	Page 13	
	MG Bearing	<10 000	500	Approximately 3% of Cr or less	→	→	→	→	→	→			→	→			SE□□□□ZZSTMG3 (YS)	Page 13	
	PN Bearing	<10 000	1 000	Approximately 3% of Cr or less	→	→	→	→	→	→			→	→			SE□□□□ZZST (PN)	Page 14	
	MO Bearing	<10 000	1 000	Approximately 3% of Cr or less	→	→	→	→	→	→			→	→			SE□□□□ZZSTMSA7 (YS)	Page 14	
Magnetic field environment	Non-magnetic Hybrid Ceramic Bearing	<10 000	1 000	Approximately 1% of Cr or less	→	→							→	→		3NC□□□□YH4 (FA)	Page 15		
Electric field environment	Hybrid Ceramic Bearing	No less than 1.2 times that of steel bearings	—	—	→								→	→		3NC□□□□ZZ (FG)	Page 15		
Hygiene	Grease-filled Bearing for Food Machinery	Equal to the dn value of normal bearings	—	—	→	→							→	→		□□□□ZZ (FG)	Page 16		

1) Solid lubricants are used in the majority of applicable environments.
 2) dn value: Bearing bore diameter (mm) × Rotational speed (min⁻¹)
 3) The cleanliness classes may vary depending on operating conditions.

4) The four blank boxes(□□□□) represent the basic number of the bearing. A basic number consists of three or four alphanumeric characters.
 A bearing number may be used as a convenience in the case of any queries to JTEKT.

EXSEV Bearing : Table of standard delivery times

*As situations may change, contact JTEKT regarding details such as the period for delivery.

Available as a finished product in stock Available as parts in stock, and assembled as ordered Produced upon the receipt of an order

Boundary dimensions (mm)			Basic load ratings ¹⁾ (kN)		Series Bearing number	Clean Pro PRZ Bearing	High Temperature Clean Pro Bearing	Clean Pro Bearing	DL Bearing	FA Bearing	High Corrosion Resistant Ceramic Bearing	Corrosion Resistant Ceramic Bearing		Ceramic Bearing	Corrosion Guard Pro Bearing	Corrosion Resistant Hybrid Ceramic Bearing	SK Bearing	SK Bearing (Seal)	Full Complement Ceramic Ball Bearing	WS Bearing	MG Bearing	PN Bearing	MO Bearing	Non-magnetic Hybrid Ceramic Bearing	Hybrid Ceramic Bearing	
Bore dia.	Outside dia.	Width	C _r	C _{0r}		Basic number	Prefix Suffix Cage code	SE ZZSTPRZ YS	SE ZZSTPRB YS	SE ZZSTPR YS	SV ZZST YS	SE ZZST FA	NCZ FA	NCT FA	NC FA	3NCT UN4 PN	3NC ZZMD4 FA	SK ZZST YS	SK 2RSST YS	NC V (No cage)	SE ZZST WS	SE ZZSTMG3 YS	SE ZZST PN	SE ZZSTMSA7 YS	3NC YH4 FA	3NC ZZ 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																					
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	22	6	2.30	1.00	6900																					
	26	8	4.55	1.95	6000																					
	30	9	5.10	2.40	6200																					
12	24	6	2.45	1.15	6901																					
	28	8	5.10	2.40	6001																					
	32	10	6.80	3.05	6201																					
15	28	7	3.65	1.80	6902																					
	32	9	5.60	2.85	6002																					
	35	11	7.65	3.75	6202																					
17	30	7	3.90	2.05	6903																					
	35	10	6.00	3.25	6003													*								
	40	12	9.55	4.80	6203																					
20	37	9	5.40	2.95	6904																					
	42	12	9.40	5.05	6004																					
	47	14	12.8	6.65	6204																					
25	42	9	5.95	3.65	6905																					
	47	12	10.1	5.85	6005																					
	52	15	14.0	7.85	6205																					
30	47	9	6.15	4.00	6906												*									
	55	13	13.2	8.25	6006											*										
	62	16	19.5	11.3	6206																					
35	55	10	9.25	6.20	6907												*									
	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) As a general rule, the internal clearance of bearings is as shown on the right.

1) The basic load rating (C_r) indicates the value for high-carbon steel chrome bearings. These values are used in the calculation of the permissible radial load.
 1) The basic load rating (C_r) of each bearing may differ from the values shown in this table.

2) The bearing number marked with an asterisk have a C3 clearance.
 3) 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.

Clean Pro PRZ Bearing



High Temperature Clean Pro Bearing



Clean Pro Bearing



DL Bearing



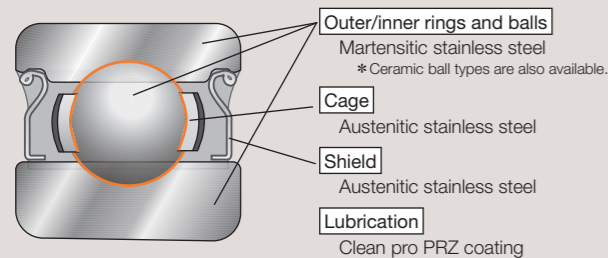
Typical bearing number

SE□□□□ZZSTPRZ (YS)

Advantages

This bearing has a fluoropolymer gel coating on its rolling surfaces as the lubricant.

Specifications



Performance

Cleanliness : Class 10¹⁾
 Ambient pressure : Atmospheric pressure to 10⁵ Pa
 Temperature : -30 to 200 °C
 Limiting speed : $dn < 10\,000$ ²⁾
 1 000 min⁻¹ max.
 Permissible radial load : $\leq 5\%$ of the basic dynamic load rating³⁾

Applications

- Semiconductor manufacturing equipment
- Lithography equipment
- Transfer systems
- Vacuum motors
- Vacuum equipment

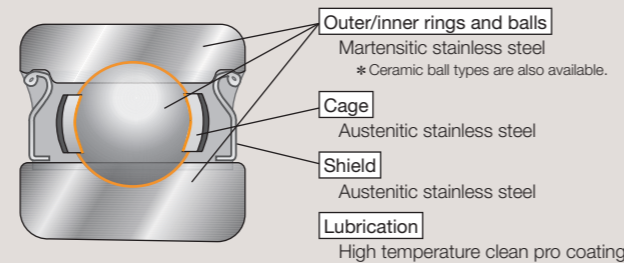
Typical bearing number

SE□□□□ZZSTPRB (YS)

Advantages

This bearing has a fluoropolymer coating on its rolling surface as the lubricant.

Specifications



Performance

Cleanliness : Class 10¹⁾
 Ambient pressure : Atmospheric pressure to 10⁵ Pa
 Temperature : -100 to 260 °C
 Limiting speed : $dn < 10\,000$ ²⁾
 1 000 min⁻¹ max.
 Permissible radial load : $\leq 3\%$ of the basic dynamic load rating³⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Transfer systems
- Vacuum equipment
- Sputtering equipment

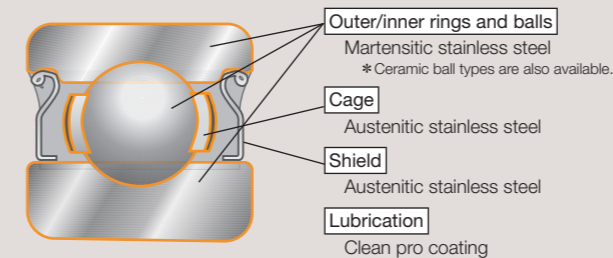
Typical bearing number

SE□□□□ZZSTPR (YS)

Advantages

This bearing is lubricated with a fluoropolymer coating over the entire surface of all bearing components.

Specifications



Performance

Cleanliness : Class 10¹⁾
 Ambient pressure : Atmospheric pressure to 10⁵ Pa
 Temperature : -100 to 200 °C
 Limiting speed : $dn < 10\,000$ ²⁾
 1 000 min⁻¹ max.
 Permissible radial load : $\leq 3\%$ of the basic dynamic load rating³⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Vacuum equipment
- Lithography equipment
- Sputtering equipment
- Vacuum motors

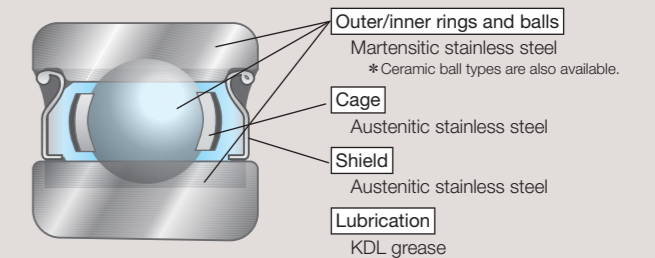
Typical bearing number

SV□□□□ZZST (YS)

Advantages

This bearing is lubricated with the packed fluorinated KDL grease, which is suitable for use in clean environments and vacuum environments.
 * KDL grease can also be sold as a standalone product. For details, see page 19.

Specifications



Performance

Cleanliness : Class 100¹⁾
 Ambient pressure : Atmospheric pressure to 10⁵ Pa
 Temperature : -30 to 200 °C
 Limiting speed : $dn < 40\,000$ ²⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Transfer robots
- Vacuum pumps

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 page 5 for each product's basic dynamic load rating (C_r).

FA Bearing



High Corrosion Resistant Ceramic Bearing



Corrosion Resistant Ceramic Bearing



Ceramic Bearing



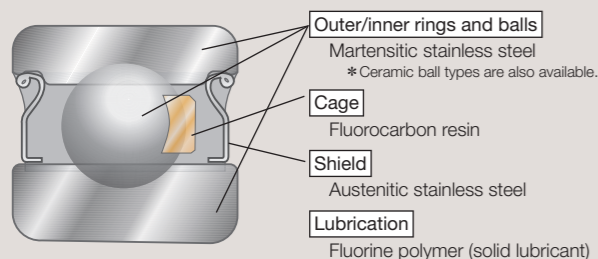
Typical bearing number

SE□□□□ZZST (FA)

Advantages

This bearing is lubricated with a solid fluoropolymer lubricant, which offers superior lubrication performance. The cage is made from a low-particle-emission fluorocarbon resin.

Specifications



Performance

Cleanliness : Class 1 000¹⁾
 Ambient pressure : Atmospheric pressure to 10⁻⁵ Pa
 Temperature : -100 to 200 °C
 Limiting speed : $dn < 10\,000$ ²⁾
 1 000 min⁻¹ max.
 Permissible radial load : $\leq 1\%$ of the basic dynamic load rating³⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Transfer systems
- Inspection systems

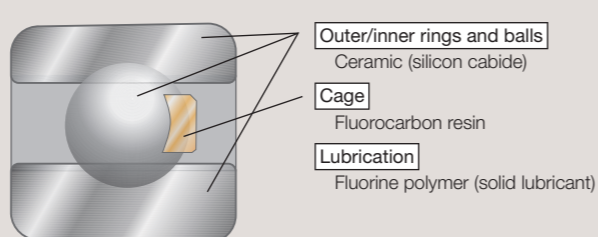
Typical bearing number

NCZ□□□□ (FA)

Advantages

This bearing uses a silicon carbide ceramic material, which is resistant to strong acids and alkalis.

Specifications



Performance

Cleanliness : Class 1 000¹⁾
 Ambient pressure : Atmospheric pressure to 10⁻⁵ Pa
 Temperature : -100 to 200 °C
 Limiting speed : $dn < 10\,000$
 1 000 min⁻¹ max.
 Permissible radial load : $\leq 1\%$ of the basic dynamic load rating³⁾

Applications

- Aluminum electrolytic capacitor manufacturing equipment

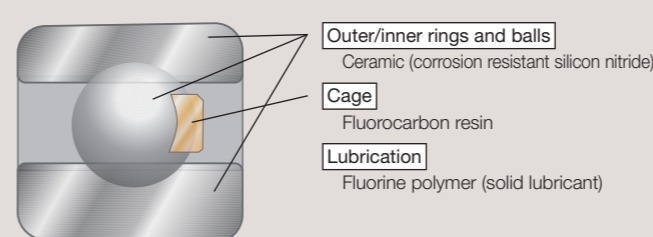
Typical bearing number

NCT□□□□ (FA)

Advantages

This bearing has its components made of corrosion resistant silicon nitride and is lubricated with fluoropolymer. This bearing can be used even in a highly corrosive solution.

Specifications



Performance

Cleanliness : Class 1 000¹⁾
 Ambient pressure : Atmospheric pressure to 10⁻⁵ Pa
 Temperature : -100 to 200 °C
 Limiting speed : $dn < 10\,000$
 1 000 min⁻¹ max.
 Permissible radial load : $\leq 1\%$ of the basic dynamic load rating³⁾

Applications

- Liquid crystal film manufacturing equipment
- Aluminum electrolytic capacitor manufacturing equipment
- Plating equipment
- Synthetic fiber manufacturing equipment
- Food container washing machine

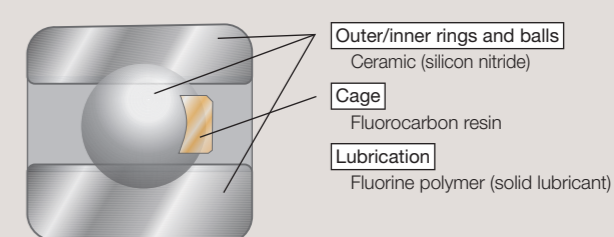
Typical bearing number

NC□□□□ (FA)

Advantages

This bearing has its components made of silicon nitride ceramic and uses fluoropolymer as the lubricant. It is typically used in vacuum and corrosive environments.

Specifications



Performance

Cleanliness : Class 1 000¹⁾
 Ambient pressure : Atmospheric pressure to 10⁻⁵ Pa
 Temperature : -100 to 200 °C
 Limiting speed : $dn < 10\,000$
 1 000 min⁻¹ max.
 Permissible radial load : $\leq 1\%$ of the basic dynamic load rating³⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Semiconductor inspection equipment
- Synthetic fiber manufacturing equipment
- Canning machinery
- Ultrasonic motors

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 page 5 for each product's basic dynamic load rating (Cr).

Corrosion Guard Pro Bearing



Corrosion Resistant Hybrid Ceramic Bearing



SK Bearing



Full Complement Ceramic Ball Bearing



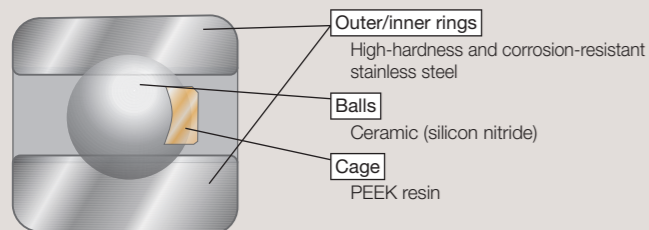
Typical bearing number

3NCT□□□□UN4 (PN)

Advantages

This bearing is harder than normal corrosion-resistant steel, which gives it a long service life and excellent load carrying capability. It is lubricated with the solid lubricant of the molded PEEK resin cage and can be used in corrosive liquids or water.

Specifications



Performance

Cleanliness : -
 Ambient pressure : Atmospheric pressure to 10^5 Pa
 Temperature : -30 to 300 °C
 Limiting speed : $dn < 10\,000$
 $1\,000\text{ min}^{-1}$ max.
 Permissible radial load : $\leq 3\%$ of the basic dynamic load rating²⁾

Applications

- High-performance film manufacturing equipment
- Cleaning equipment

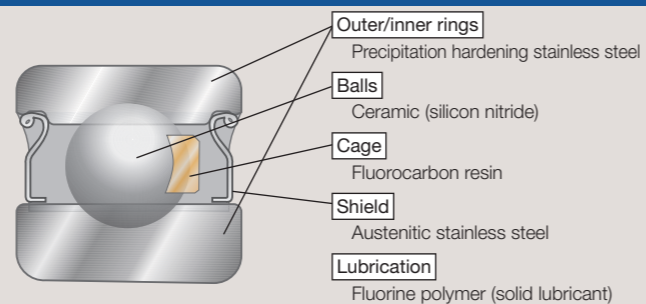
Typical bearing number

3NC□□□□ZZMD4 (FA)

Advantages

This bearing uses a stainless steel variety that has excellent corrosion resistance. As the lubricant, fluoropolymer is used. It is compatible with underwater use.

Specifications



Performance

Cleanliness : Class 1 000¹⁾
 Ambient pressure : Atmospheric pressure to 10^5 Pa
 Temperature : -100 to 200 °C
 Limiting speed : $dn < 10\,000$
 $1\,000\text{ min}^{-1}$ max.
 Permissible radial load : $\leq 1\%$ of the basic dynamic load rating²⁾

Applications

- Semiconductor manufacturing equipment
- Chemical manufacturing equipment
- Food machinery
- Cleaning equipment

Typical bearing number

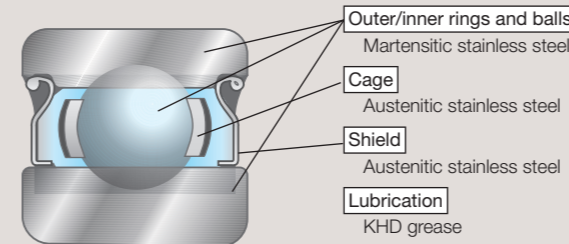
SK□□□□ZZST (YS)

Advantages

This bearing has its components made of stainless steel, and is lubricated with lithium containing KHD grease, which is packed in adequate amounts. This bearing is suitable for use in slightly corrosive environments.

* Unsuitable for clean environments due to anticorrosive treatment.

Specifications



Performance

Cleanliness : -
 Ambient pressure : Atmospheric pressure
 Temperature : -30 to 120 °C
 Limiting speed : Equal to the dn value of normal bearings

Applications

- Chemical equipment
- Transfer systems

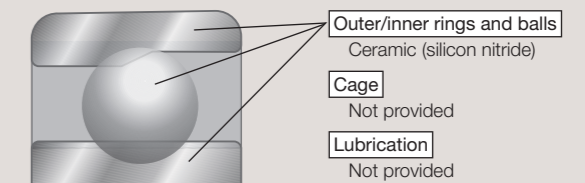
Typical bearing number

NC□□□□V (-)

Advantages

This bearing has all components made of ceramic for use in an ultrahigh temperature environments. No cage is provided. Being an angular contact ball bearing, this bearing is normally used in pairs.

Specifications



Performance

Cleanliness : -
 Ambient pressure : Atmospheric pressure to 10^{10} Pa
 Temperature : -200 to 800 °C
 Limiting speed : $dn < 4\,000$
 500 min^{-1} max.
 Permissible radial load : $\leq 1\%$ of the basic dynamic load rating²⁾

Applications

- Baking furnace cars
- Fans in 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 page 5 for each product's basic dynamic load rating (C_r).

WS Bearing



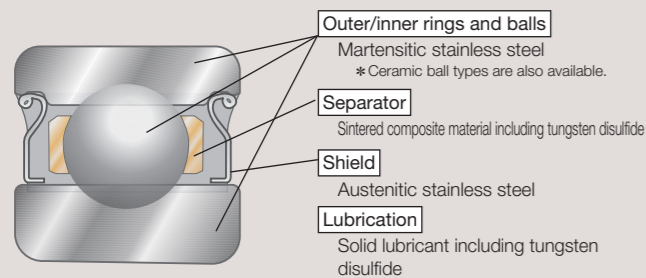
Typical bearing number

SE□□□□ZZST (WS)

Advantages

This bearing has extremely heat resistant tungsten disulfide included in the separator material as the lubricant.
* We recommend that this bearing is used with horizontal axes. For information on using this bearing with items other than horizontal axes, consult JTEKT.

Specifications



Performance

Cleanliness : -
Ambient pressure : Atmospheric pressure to 10^5 Pa
Temperature : -100 to 350 °C
Limiting speed : $dn < 4\,000$
500 min^{-1} max.
Permissible radial load : $\leq 5\%$ of the basic dynamic load rating¹⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Vacuum evaporator
- Plasma display panel manufacturing equipment

MG Bearing



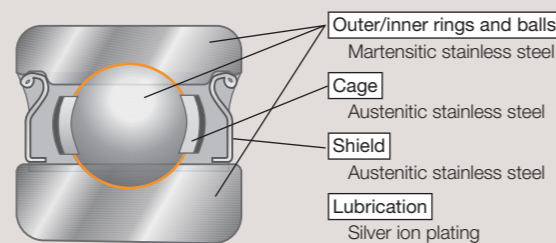
Typical bearing number

SE□□□□ZZSTMG3 (YS)

Advantages

This bearing has silver ion plated on the stainless steel balls, as the lubricant.

Specifications



Performance

Cleanliness : -
Ambient pressure : 10^{-3} to 10^{-10} Pa
Temperature : -250 to 350 °C
Limiting speed : $dn < 10\,000$
1 000 min^{-1} max.
Permissible radial load : $\leq 3\%$ of the basic dynamic load rating¹⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Vacuum evaporator
- Medical equipment
- Vacuum motors

PN Bearing



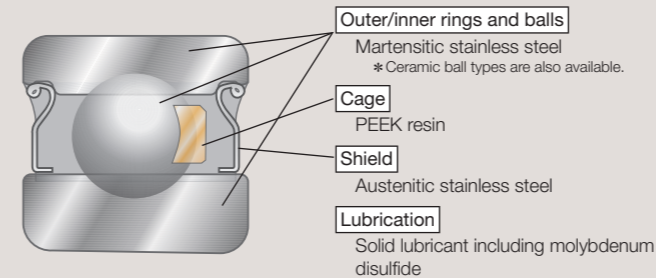
Typical bearing number

SE□□□□ZZST (PN)

Advantages

This bearing has a highly heat resistant solid lubricant, such as molybdenum disulfide included in the cage material.

Specifications



Performance

Cleanliness : -
Ambient pressure : Atmospheric pressure to 10^5 Pa
Temperature : -30 to 300 °C
Limiting speed : $dn < 10\,000$
1 000 min^{-1} max.
Permissible radial load : $\leq 3\%$ of the basic dynamic load rating¹⁾

Applications

- Carton manufacturing equipment
- LCD cleaning equipment

MO Bearing



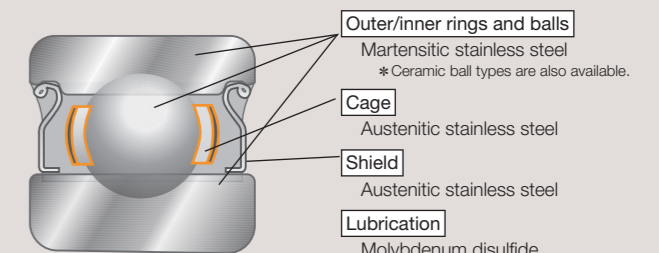
Typical bearing number

SE□□□□ZZSTMSA7 (YS)

Advantages

This bearing has molybdenum disulfide baked on the surface of the stainless steel cage, as the lubricant.

Specifications



Performance

Cleanliness : -
Ambient pressure : Atmospheric pressure to 10^5 Pa
Temperature : -100 to 300 °C
Limiting speed : $dn < 10\,000$
1 000 min^{-1} max.
Permissible radial load : $\leq 3\%$ of the basic dynamic load rating¹⁾

Applications

- Semiconductor manufacturing equipment
- LCD manufacturing equipment
- Vacuum evaporator
- Turbo molecular pump
- Rotary furnaces

1) 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 page 5 for each product's basic dynamic load rating (C_r).

Magnetic field environment

Electric field environment

Hygiene

Non-magnetic Hybrid Ceramic Bearing



Hybrid Ceramic Bearing



Grease-filled Bearing for Food Machinery



K Series Full Complement Hybrid Ceramic Ball Bearing



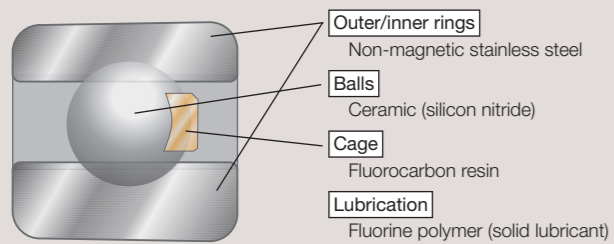
Typical bearing number

3NC□□□□YH4 (FA)

Advantages

This bearing uses non-magnetic stainless steel. It includes fluoropolymer as the lubricant. This bearing can be used in a vacuum environment.

Specifications



Performance

Cleanliness : Class 1 000¹⁾
 Ambient pressure : Atmospheric pressure to 10⁻⁵ Pa
 Temperature : -100 to 200 °C
 Limiting speed : $dn < 10\,000$ ²⁾
 1 000 min⁻¹ max.
 Permissible radial load : ≤ 1% of the basic dynamic load rating³⁾

Applications

- Semiconductor manufacturing equipment
- Semiconductor inspection equipment
- Canning machinery
- Superconductivity-related equipment
- Welder

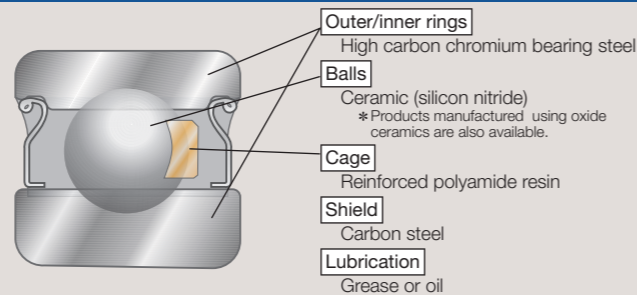
Typical bearing number

3NC□□□□ZZ (FG)

Advantages

This bearing is a standard hybrid ceramic bearing. Lubricated with grease or oil, it can be used as an insulating bearing or high speed bearing.

Specifications



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 steel bearings

Applications

- High speed stranding machine guide rollers
- Motors
- Generators

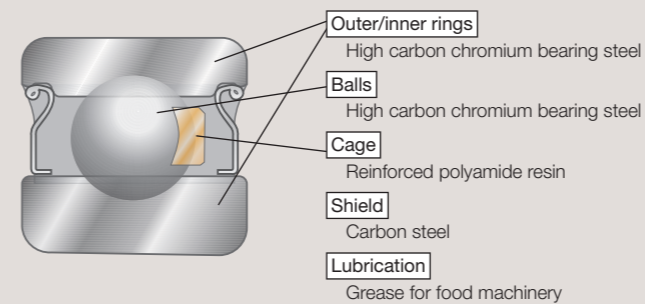
Typical bearing number

□□□□ZZ (FG)

Advantages

This bearing is filled with grease for food machinery. It can be used in hygienic environments such as food machinery or cosmetic/pharmaceutical production machinery.

Specifications



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 steel bearings

Applications

- Food machinery
- Chemical manufacturing equipment

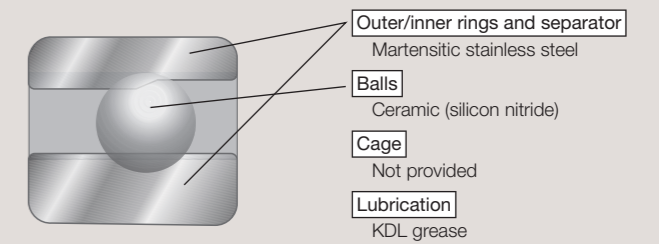
Typical bearing number

3NC□□□□VST-1

Advantages

This bearing is based on the K series super thin section ball bearing, which is widely used in industrial robots. Provided with some adaptations, this bearing is compatible with clean or vacuum environments. It uses fluorinated KDL grease as the standard lubricant. However, it can also be used with other solid greases such as Clean Pro.

Specifications



Performance

Cleanliness : Class 100¹⁾
 Ambient pressure : Atmospheric pressure to 10⁻⁵ Pa
 Temperature : -30 to 200 °C

Applications

- Wafer transfer robot
- LCD manufacturing equipment
- Semiconductor manufacturing equipment

Remark



For details, please refer to the EXSEV BEARINGS AND CERAMIC BEARINGS catalog (CAT.NO.B2004E) or consult JTEKT.

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 page 5 for each product's basic dynamic load rating (C_r).

Linear Motion Ball Bearings



Linear Way Bearing Units



Ceramic Balls



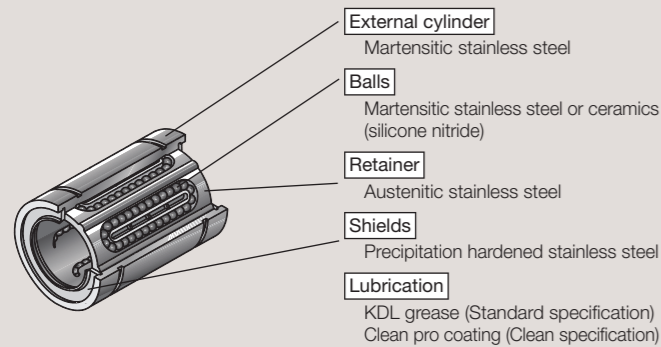
Typical bearing number

○○SDM□□ST△△

Advantages

The linear motion ball bearings are a high precision product that moves linearly in axial directions while having rolling contact with the shaft. Having balls, retainer and shields housed in an external cylinder, this compact bearing moves linearly without limit to the stroke distance.

Specifications



Performance

Lubrication specification	Performance		
	Cleanliness	Temperature	Ambient pressure
KDL	Class 100	-30 to 200 °C	Atmospheric pressure to 10 ⁻⁵ Pa
Clean Pro	Class 10	-100 to 200 °C	

Remark



Symbols determined according to factors such as the type, size, and material are entered in place of ○, □, and △. For more information, including details of factors other than those mentioned above, please refer to the EXSEV BEARINGS AND CERAMIC BEARINGS catalog (CAT.NO.B2004E) or consult JTEKT.

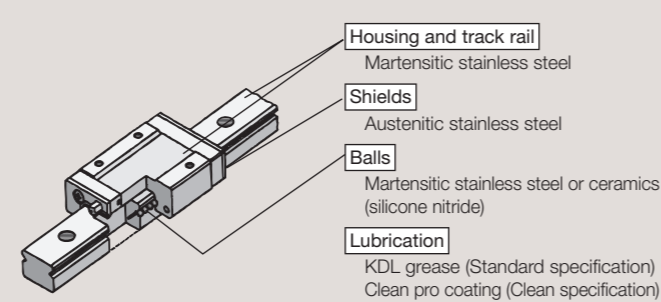
Typical bearing number

○○LW□□□△△

Advantages

The Linear Way Bearing Units have a slide unit in which balls circulate, allowing the slide unit to move linearly on the track rail without limit. High precision linear motion can be obtained easily by fixing the slide unit and track rail with bolts.

Specifications



Performance

Lubrication specification	Performance		
	Cleanliness	Temperature	Ambient pressure
KDL	Class 100	-30 to 200 °C	Atmospheric pressure to 10 ⁻⁵ Pa
Clean Pro	Class 10	-100 to 200 °C	

Remark



Symbols determined according to factors such as the type, size, and material are entered in place of ○, □, and △. For more information, including details of factors other than those mentioned above, please refer to the EXSEV BEARINGS AND CERAMIC BEARINGS catalog (CAT.NO.B2004E) or consult JTEKT.

Advantages

JTEKT also supplies Ceramic Balls (silicon nitride), which have excellent resistance to wear and seizure, and are usable in corrosive environments and ultrahigh vacuums. Other major features of these balls are excellent heat resistance (up to 800°C), high rigidity, lightweight (40% compared to bearing steel), non-magnetic, and have insulating characteristics. The Ceramic Balls are useful in many applications such as jigs, tools, gauges, solenoid valves, check valves, other valve varieties, high grade bicycle parts, automotive parts, and machine components.

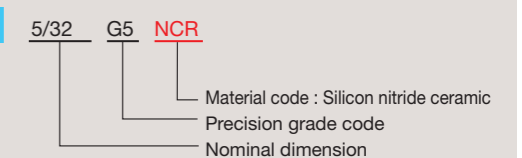
Table of Dimensions and Masses

Nominal dimension		Nominal outside diameter mm	Precision grade ¹⁾	Mass ²⁾ (per piece)
mm	inch			
0.8		0.800 00	3 and 5	0.866 mg
1.0		1.000 00		1.691 mg
1.2		1.200 00		2.922 mg
	1/16	1.587 50		6.766 mg
2.0		2.000 00		13.530 mg
	3/32	2.381 25		22.836 mg
	7/64	2.778 12		36.262 mg
	1/8	3.175 00		54.129 mg
3.5		3.500 00		72.511 mg
	5/32	3.968 75		0.105 7g
	3/16	4.762 50		0.182 7g
	7/32	5.556 25		0.290 1g
	15/64	5.953 12	0.356 8g	
	1/4	6.350 00	0.433 0g	
	17/64	6.746 88	5	0.519 4g
	9/32	7.143 75		0.616 6g
	5/16	7.937 50		0.845 8g
	11/32	8.731 25		1.125 7g
	3/8	9.525 00		1.461 5g
	13/32	10.318 75		1.858 2g

Notes 1) For the grades, those specified in JIS B 1501 shall apply.
2) The masses are calculated on the basis of 3.23 g/cm³ in density.

Nominal dimension		Nominal outside diameter mm	Precision grade ¹⁾	Mass ²⁾ (per piece)
mm	inch			
	7/16	11.112 75	5 and 10	2.320 8g
	15/32	11.906 25		2.854 5g
	1/2	12.700 00		3.46 g
	17/32	13.493 75		4.2g
	9/16	14.287 50	40	4.9g
	19/32	15.081 25		5.8g
	5/8	15.875 00		6.8g
	3/4	19.050 00		11.7g
	13/16	20.637 50		14.9g
	7/8	22.225 00		18.6g
	15/16	23.812 50		22.8g
	1	25.400 00		27.7g
	1 1/8	28.575 00		39.5g
	1 3/16	30.162 50		46.4g
	1 1/4	31.75000	60	54.1g
	1 5/16	33.337 50		62.7g
	1 1/2	38.100 00		93.5g

Numbering System



KDL Grease



Advantages

This is low-particle-emission fluorocarbon grease for use in vacuum environments.

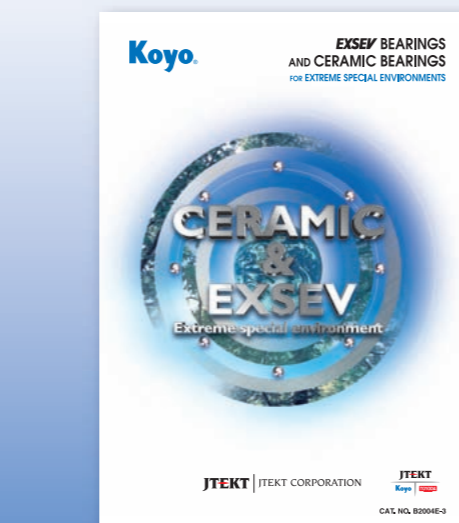
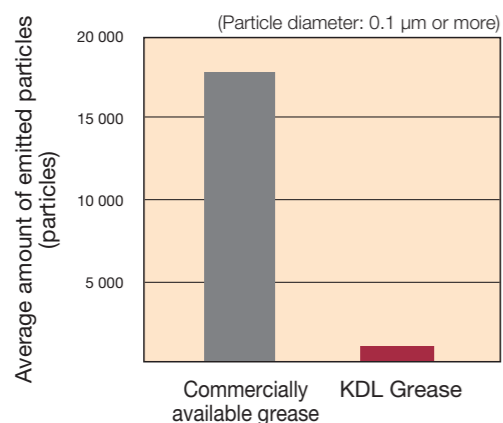
- KDL grease expresses its high properties when used with rolling bearings, linear-motion bearings, and ball screws.
- JTEKT also respond to requests only for grease, so consult JTEKT with such requests.
- This grease can be used up to an atmospheric pressure of 10^{-5} Pa, but consult JTEKT for information on using this grease under conditions combining high temperature and high vacuum.

Performance

Characteristics

Thickener		Fluorocarbon resin
Base oil		Fluorocarbon oil
Dropping point		None
Evaporation amount (200 °C for 22 h)		0.1 wt% or less
Degree of oil separation (100 °C for 24 h)		2 wt% or less
Operating temperature range	Atmosphere	-30 to 200 °C
	Vacuum	-30 to 100 °C

Particle-emission characteristic when used to lubricate a rolling bearing (number of particles per $2.83 \times 10^{-3} \text{m}^3$ [0.1 ft³])



For details on EXSEV products, please refer to the EXSEV BEARINGS AND CERAMIC BEARINGS FOR EXTREME SPECIAL ENVIRONMENTS catalog (CAT.NO.B2004E).



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For Extreme Special Environments

JTEKT



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