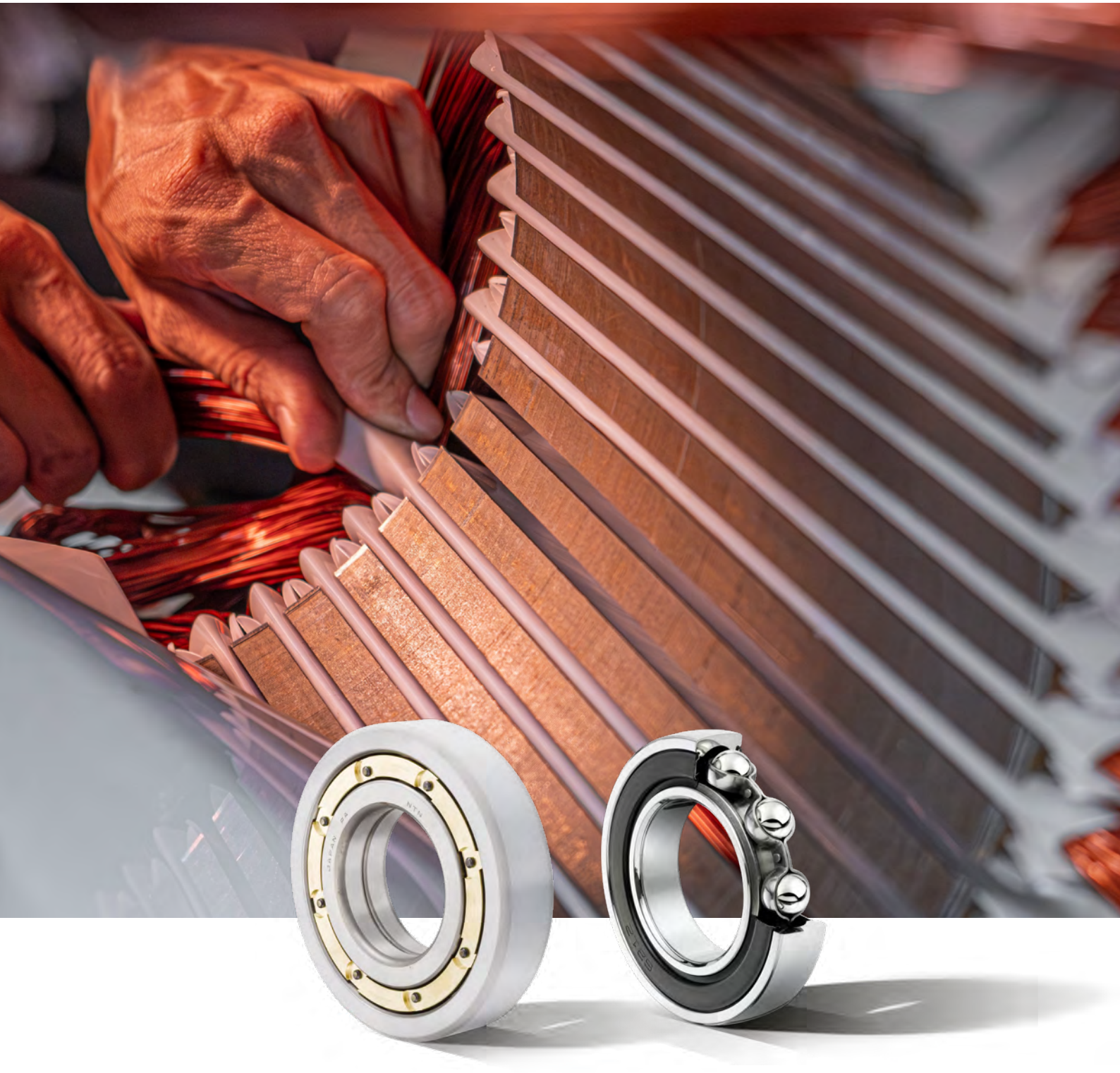
NTN

MAINTENANCE SOLUTIONS FOR ELECTRIC MOTORS

A tailored offering to ensure premium-quality service



NTN | SNR | Brands of NTN Group

A single guiding principle for every application condition

With 46% of the world's electricity consumed by electric motors, the challenges of performance and energy efficiency control are significant. In response to these challenges, industrial companies are looking for comprehensive maintenance solutions that combine expertise, reliability, and quality of service in order to optimise maintenance and extend the lifespan of their equipment.

NTN Europe, through its two brands, NTN and SNR, meets these expectations with a comprehensive range of solutions dedicated to electric motors. United by the same high standards, the two brands stand out through an offering that combines technical expertise, premium solutions, and availability, all in support of the performance and durability of installations.

STANDARD OPERATION

Deep groove ball bearings, angular contact bearings, or cylindrical roller bearings.

Our solutions

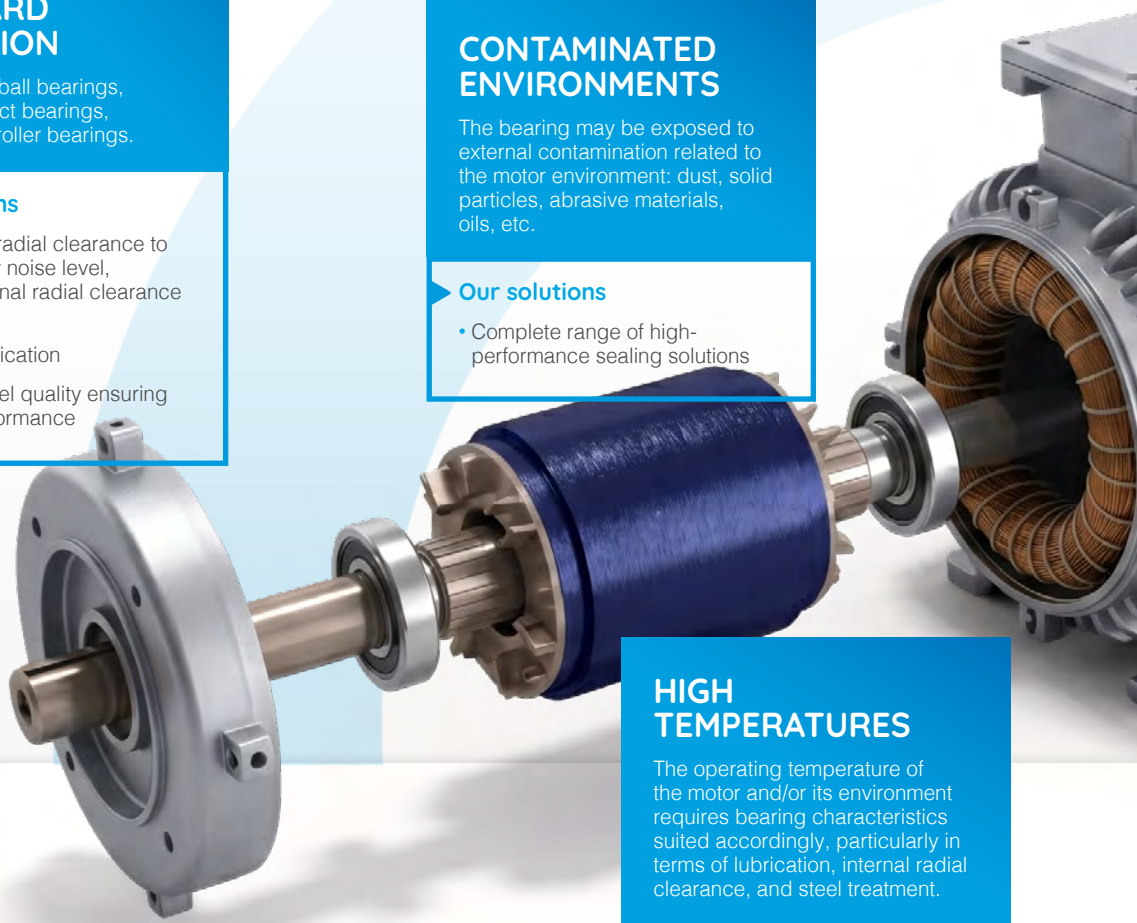
- CM internal radial clearance to ensure a low noise level, with C3 internal radial clearance as standard
- Suitable lubrication
- Premium steel quality ensuring optimal performance

CONTAMINATED ENVIRONMENTS

The bearing may be exposed to external contamination related to the motor environment: dust, solid particles, abrasive materials, oils, etc.

Our solutions

- Complete range of high-performance sealing solutions



HIGH TEMPERATURES

The operating temperature of the motor and/or its environment requires bearing characteristics suited accordingly, particularly in terms of lubrication, internal radial clearance, and steel treatment.

Our solutions

- **TOPLINE range** – high-temperature bearings:
  FT150, up to +150°C
  HT200, up to 200°C

VARIABLE FREQUENCY DRIVES

VFDs offer numerous benefits for installations in terms of reducing energy costs. However, they can cause bearing failures related to electrical erosion (pitting, lubricant degradation), making appropriate protection necessary.

Our solutions

- **MEGAOHM™** insulated bearings
- Hybrid bearings

HIGH SPEEDS

At high speeds, several phenomena become critical: significant heat generation, centrifugal effects, grease degradation, dynamic instabilities, and more.
A suitably designed bearing is therefore necessary.

Our solutions

- **TOPLINE range:** high-speed bearings: HVZZ, up to 51,000 rpm depending on size
- **Standard range:** polyamide cage

SERVOMOTORS

A servomotor is a motor that incorporates an encoder, whose role is to convert the mechanical movement of the shaft into digital pulses, which are then interpreted by a motion controller.
These components cannot tolerate any grease leakage.

Our solutions

- Complete range of high-performance sealing solutions

SHOCKS AND VIBRATIONS

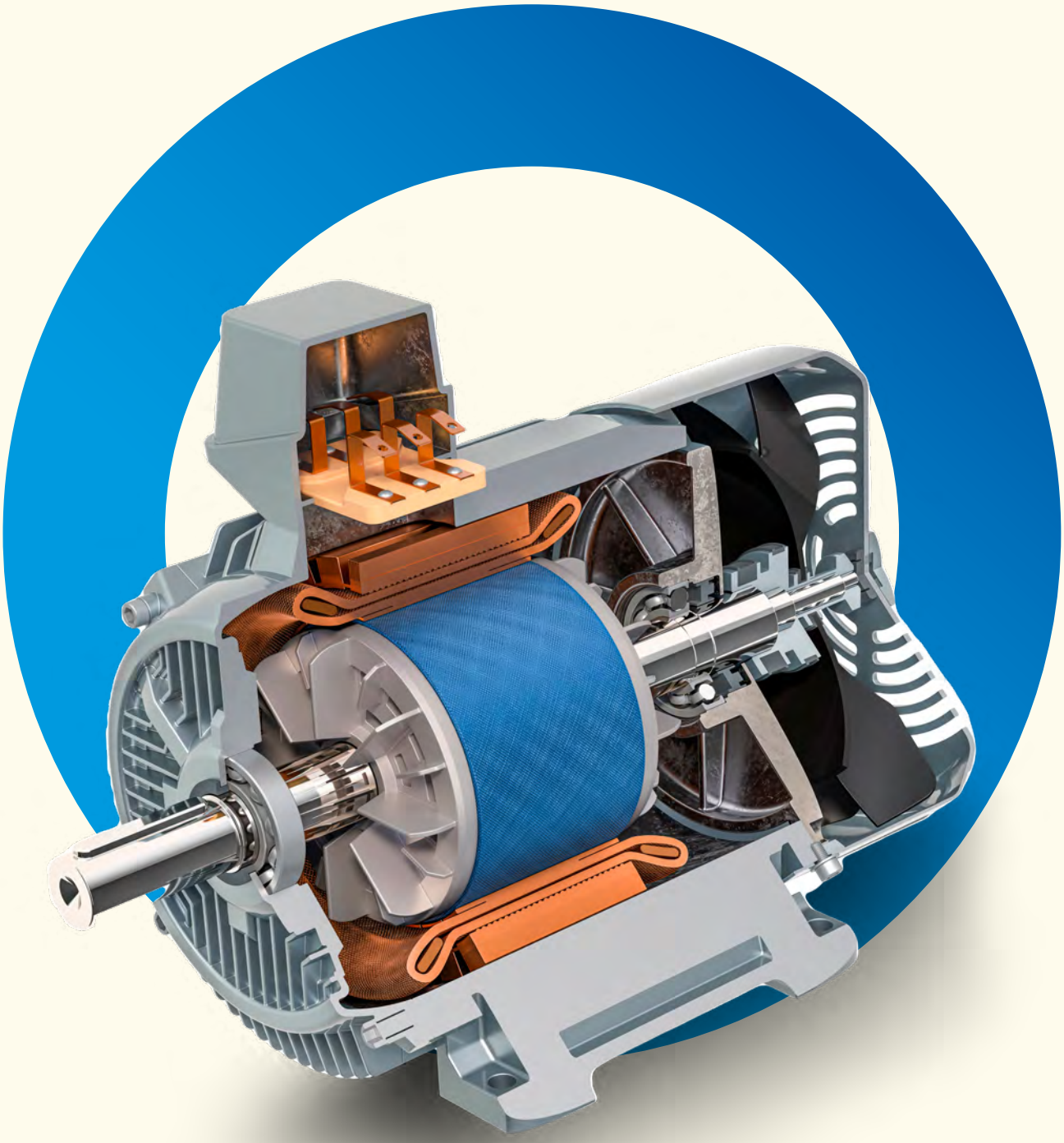
During operation, significant vibrations or cyclic shocks may occur, leading to wear at the contact points between the balls and the raceway.

Our solutions

- Premium lubrication range
- Brass cage for large-size bearings or bearings requiring high mechanical strength

The NTN and SNR brands' offering by electric motor type

	Power range	Need / Issue	Affected bearing component				NTN & SNR brands' response
			Rings	Cage	Grease	Sealing	
Asynchronous motors	From 100 W to 10,000 kW and above Speed ≤ 3,000 rpm on a 50 Hz supply Up to 10,000 rpm and above with electronic drive power supply	• Reduced motor losses • Longer maintenance intervals • Vibrating and unbalanced loads • High-speed rotation		X	X	X	**Standard range** Page 6 **TOPLINE** Page 10
Direct current motors	From 1 W to 10,000 kW and above From 0 to more than 10,000 rpm						
Motors equipped with VFDs	1,000 VAC ≥ Rated voltage > 100 VAC	• Electrical erosion	X		X		**MEGAOHM™** Page 9
Servomoteurs	From 1 W to 10 kW From 0 to 3,000 rpm	• Encoder error and brake slippage • Longer maintenance intervals • Increased reliability under demanding operating conditions		X	X	X	**Standard range** Page 6



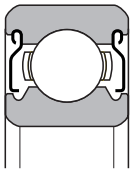
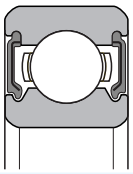
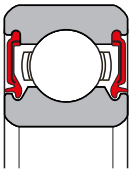
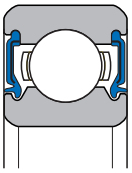
The standard offer

Ball bearings

More than 10,000 active references

- Series 6xx, 60xx, 62xx, 63xx, 16xxx, 68xx, 69xx
- Bore diameters from 1.5 to 1,320 mm
- A range of options for bearing design: steel, brass or polyamide cages, internal radial clearance, and precision class

A complete sealing solution

Types and codes		Shielded type	Sealed type		
		Non-contact, ZZ type	Non-contact, LLB type	Contact type, LLU / EE	Low torque, LLH type
Design					
		The outer ring of these bearings is fitted with metal shields; the inner ring features a V-shaped groove that creates a labyrinth effect.	The outer ring is fitted with a rubber seal reinforced with steel; its lip forms a labyrinth with the V-shaped groove of the inner ring.	The outer ring is fitted with a steel-reinforced double-lip rubber seal. The first lip contacts the V-groove to prevent grease leakage, while the second lip acts behind the V-groove to prevent any contamination from entering the bearing.	A double-lip design similar to the LLU seal, but with lower contact pressure on the V-groove, providing the best compromise between sealing performance and rotational speed for optimised torque.
Performance comparison	Torque	Low	Low	Relatively high	Medium
	Dust sealing	Good	Better than the ZZ type	Excellent	Significantly better than the LLB type
	Water sealing	Low	Low	Very good	Good
	High-speed capability	Identical to the open type	Identical to the open type	Limited by contact seals	Significantly better than the LLU type
	Permissible temperature range	Depends on the lubricant	-25 to 120°C	-25 to 110°C	-25 to 120°C

Other sealing solutions designed for servo motors are also developed in collaboration with motor manufacturers.

Our technical teams are available to assist you with any specific requirements.

CM internal clearance for quiet operation

- Available as standard: the reduced tolerances of the bearing internal clearance help reduce vibration and noise levels
- CM radial clearance available across **NTN**'s full range of 6xxx deep groove ball bearings
- Marketed for open, shielded and sealed versions (-ZZ, -LLU and -LLB)
- CN internal radial clearance, C3 and greater radial clearances are also available

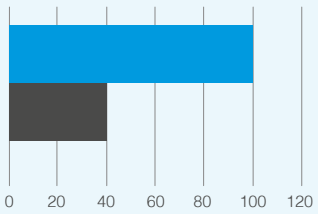
Lubrication solutions

Our expertise in providing the right lubrication solution:

- Semi-synthetic as standard (5K)
- Greases designed for electric motors
- Conductive greases...

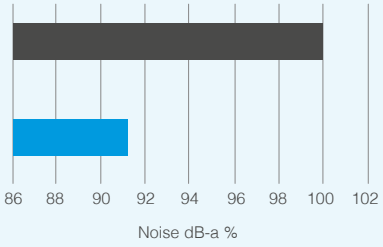
NTN-branded lubrication: a long-lasting partner for your application

Grease life
NTN 5K comparison vs. standard lithium-based grease



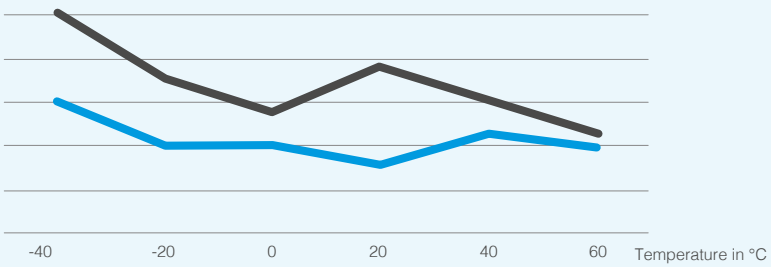
Speed test at 10,000 min - 1
– Axial load: 67 N
– Radial load: 67 N

Noise level comparison



Speed test at 2,200 min - 1
– Axial load: 20 N

Rotational torque



● 5K ● Standard lithium grease

Focus on 5K grease

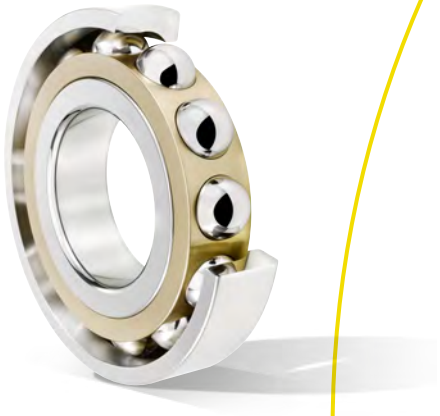
Standard grease used in NTN-branded DGBBs

- Semi-synthetic grease
- Wide temperature range from -40°C to 150°C, with high-temperature stability
- Optimised viscosity for even quieter bearings
- Water resistance
- Anti-rust and anti-contamination properties
- Longer service life than mineral-based lubrication

5K grease has been awarded an ecolabel in its country of origin, Japan, and is more than 60% biodegradable over 28 days.

The standard offer

Angular contact ball bearings



- 30° contact angle (no suffix) or 40° contact angle (suffix B)
- Pressed steel cage (no suffix) or solid brass cage (L1)
- Single-row series: 7000, 7200, 7300
- Universal matching capability (suffix G: Flush Ground or offset faces)
- Standard clearance

Cylindrical roller bearings

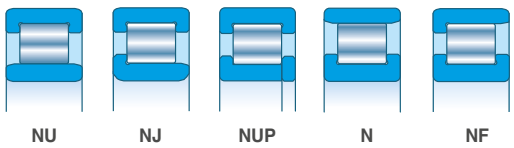
For heavily loaded front bearing supports

- Motors with belt drive (to withstand belt tension loads)
- Motors with a gear mounted on the shaft (to withstand gear tooth loads)
- High-power motors
- Vibrating motors (vibration loads)

Range overview

- 5 ring designs: NU, NJ, NUP, N and NF
- 6 main ISO dimensional series, from the lightest (series 10) to the heaviest (series 4)
- 3 cage technologies: polyamide, sheet steel, brass (one-piece or riveted) for large sizes and the most demanding applications
- Internal radial clearance from C2 to C5

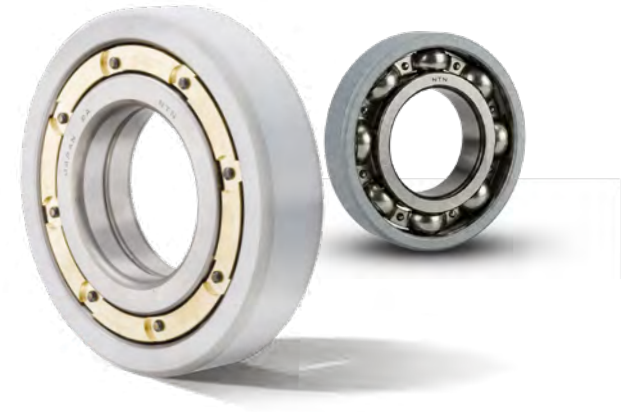
Design variants



MEGAOHM™: The insulated bearing range

Ball bearings with insulated outer ring
Ceramic coating

- Standard resistance up to 3,000 VDC: maximum protection against stray currents
- Compliant with ISO 492, DIN 620 and JIS 1514 standards: dimensional compatibility with standard bearings is ensured
- Steel cage as standard for 62xx series
- Brass cage for 63xx series (suffix L1B)



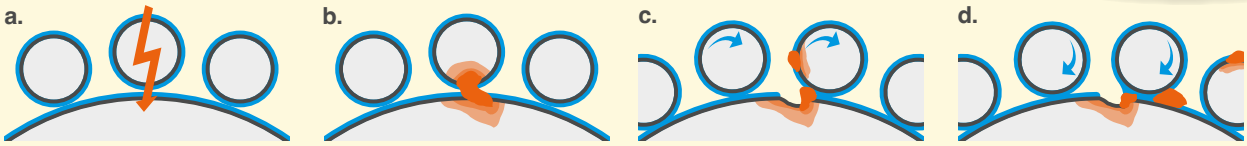
Benefits

Protect against the formation of micro-craters, fluting or grooves on the bearing raceways, as well as against lubricant burning and hardening.

Series	12	14	15	16	17	20	22	24	26	28
7MC3-62XXC3		■	■	■	■	■	■	■		
7MC3-63XXC3	■	■								
7MC3-63XXL1BC3	■	■	■	■	■	■	■	■	■	■

The MEGAOHM™ range also includes cylindrical roller bearings.

Focus on the phenomenon of electrical erosion



a. The current chooses the path of least resistance to reach the ground, sometimes passing through the bearing.

b. The current leakage then generates an arc between the rolling elements and the bearing ring raceways, resulting in material weakening.

c. Small metal particles are torn away from the bearing components.

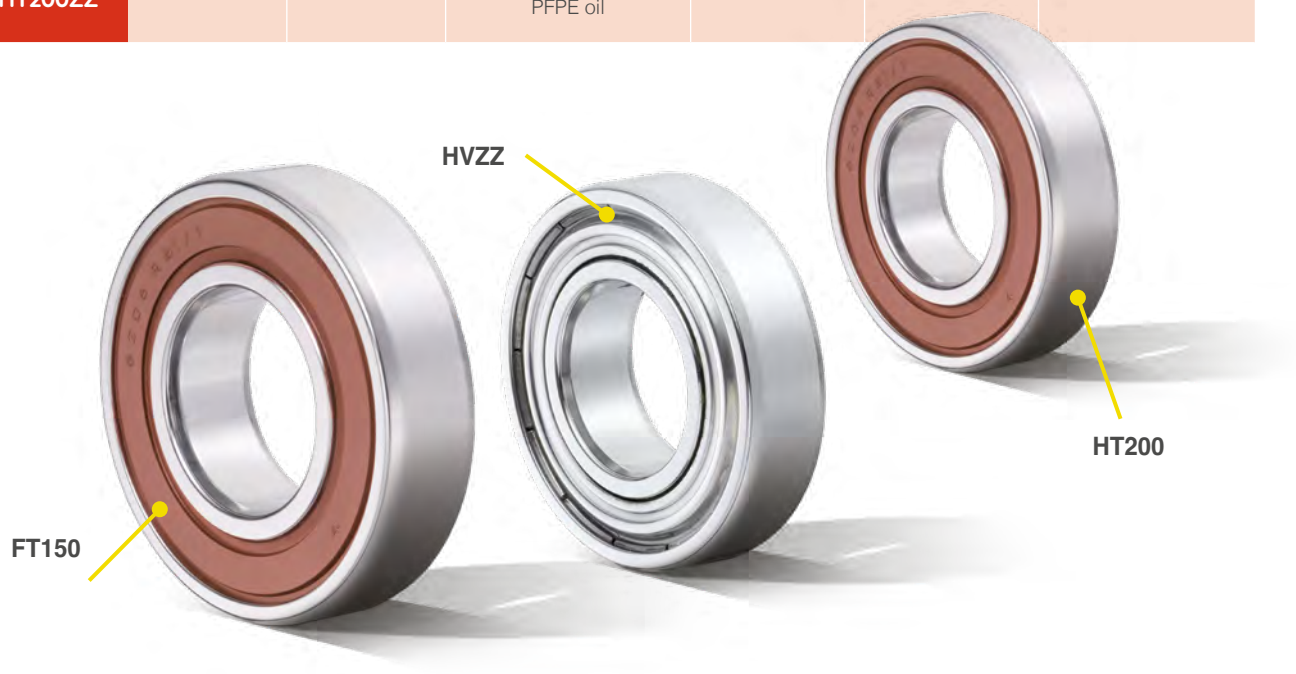
d. These particles move inside the bearing and may cause indentations in the bearing raceways.

To provide complete protection for your motor, it may be necessary to add a complementary shaft insulation solution in addition to the insulated bearing. Our teams are available to provide you with the appropriate advice.

TOPLINE: The range developed for extreme applications

- Deep groove ball bearings in the 6000, 6200 and 6300 series
- A unique, premium-quality range designed for specific application conditions
- A range available from stock to meet replacement needs quickly
- A range designed in France, backed by the technical support and expertise of NTN Europe teams

Products	Cage	Internal clearance	Grease	Sealing	Other	Operating conditions
HVZZ	Glass fibre-reinforced polyamide 6.6	C3	Premium quality Lithium thickener + synthetic base oil	Steel shields	P6, P5 precision. High-precision balls (≤ Class 10)	-20°C to +120°C
FT150 FT150ZZ	Steel	C3	Suitable for high temperatures. Polyurea thickener + synthetic base oil	Fluoroelastomer seals (FKM) or steel shields	-	-30°C to +150°C
HT200 HT200ZZ	Steel	C4	Suitable for high temperatures. PTFE solid lubricant and PFPE oil	Fluoroelastomer seals (FKM) or steel shields	Specific heat treatment	-40°C to +200°C



TOPLINE

Focus on electric motors: a constantly evolving range

Specific ranges

NTN Europe also offers specific bearings designed to meet the most demanding technical requirements:

- Anti-creep ball bearings (NTN brand, AC- prefix)
- Ball bearings with thermal expansion compensation (NTN brand, EC- prefix)
- Hybrid bearings with ceramic balls (NTN brand, 5S- prefix)
- Long-life bearings featuring special heat treatment for polluted environments (NTN brand, TMB or TAB prefix)
- EMTR ball bearings with an optimised design for electric motors (SNR brand)

To meet the growing needs of industry and actively contribute to the electrification of production, NTN Europe teams are continuously developing new products designed to address all issues related to electric motors: new cages, reduced weight and torque, seals dedicated to servo motors, etc.

YOUR SATISFACTION,
OUR GUIDING PRINCIPLE.

A complete range for the mounting and maintenance of your bearings

Our mounting and dismounting tools
to facilitate installation

Extraction tools

Self-centering hydraulic puller

4 references: 4 t / 12 t / 20 t / 30 t

Example of reference:
TOOL SCHP 4T / Self-center hyd puller

Self-centering manual puller

3 references: 2 t / 3 t / 5 t

Example of reference:
TOOL SCMP 2/3-120 / Self-center mech puller

Induction heater for hot mounting

SmartTEMP S, the ideal tool for mounting electric motor bearings

Example of reference: TOOL SMART TEMP S / induction heater

Our range of lubricants

HIGH TEMP MP grease
High temperature

High-performance extreme-pressure polyurea synthetic grease. An ideal solution for very long-term lubrication at both low and high temperatures, up to 180°C. This grease is also particularly suitable for high-speed applications.

Our training solutions

Synergy MRO training
At your premises or in our workshops

Training designed for maintenance technicians of all levels, across all industries and service activities involving the use of bearings.

This training course is delivered either at your premises or in our “Tech’Place” workshop and lasts at least 1 day (adaptable according to your needs).
It includes both a theoretical and a practical session, with a knowledge test at the end of the course to validate participants’ learning outcomes.

For training conditions (date, venue, price, etc.), please contact us.

Qualiopi processus certifié
RÉPUBLIQUE FRANÇAISE
La certification qualité a été délivrée au titre de la ou des catégories d'actions suivantes :
Actions de formation

Other services may be available on request:
technical sessions, live video workshops...

NTN, your business partner

NTN Europe and you

A dedicated sales team
with an assigned sales representative and our sales support team at your service

A technical support service
offering analysis of premature bearing failures

A European logistics center
ensuring flawless responsiveness

A comprehensive training offering
with different modules tailored to your teams’ needs

Make the world **NAMERAKA**

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NTN Europe - 1 rue des Usines - 74000 Annecy
RCS ANNECY B 325 821 072 - Code APE 2815Z - Code NACE 28.15
www.ntn-europe.com

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