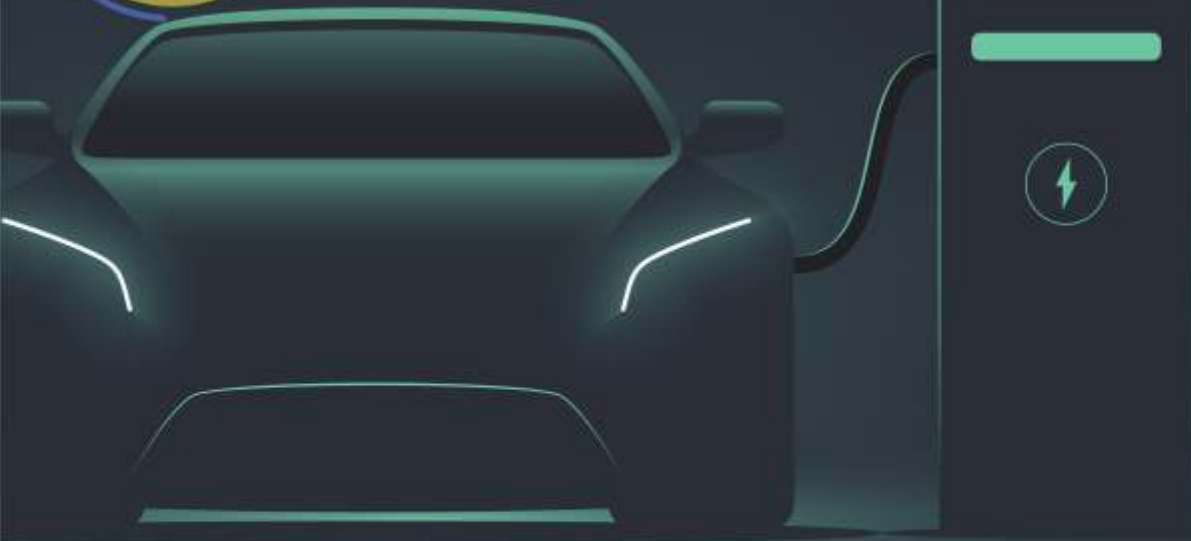


**ENABLING JOURNEYS
TOWARDS A
GREENER FUTURE!**



Bearings for Electric Vehicles

Founded in 1946, NBC is India's first bearings manufacturer and the last word in quality and durability. In 2020, the company acquired leading European manufacturer, Kinex Bearings to further boost its expertise.

75 years since its beginning, NBC remains India's leading bearings manufacturer and exporter. NBC is also the world's only bearings manufacturer to receive the prestigious Deming Grand Prize for Total Quality Management.



1946: India's first bearing manufacturer



200+ million bearings manufactured/ annum



2300+ variants of bearings offered



5 manufacturing locations



2800+ People



Happy customers in 30+ countries



Automotive



Industrial



Railway



Aerospace



R&D Centres in India, Slovakia, Germany



500+ Stockists
10000+ Retailers

Why NBC bearings are important for the Electric Vehicle Industry

With the advent of electric vehicles (EVs), there has been a paradigm shift in vehicle design norms. This is because electrically propelled vehicles are required to be more energy efficient, need lower maintenance, and perform better than modern internal combustion engines. And with the pressing need to reduce carbon emissions, electric vehicles are the need of the hour.

However, with vehicle electrification, the bearing has become more critical than before, as challenges in EV transmission are more complex than in a conventional transmission. Major application requirements for bearings used in electrical applications are:

- High speed to propel desired output from the motor
- Lower frictional losses to get higher efficiency
- Compact size for energy efficiency
- Low noise, vibration, and harshness
- Insulation to electric current



NBC has developed smart solutions for the EV market by focusing on advanced product technology that is not only reliable but also enhances vehicle performance. To meet the evolving demands of the automotive industry, we are introducing bearings with reliability improvement, sealing solutions, sensor integration, power-dense solutions, and application-specific customized bearing solutions that will solve all fundamental issues.

MOTOR

In an electric motor, the bearings support the rotor and transfer the motion from the shaft to the motor frame. Therefore, the bearings must be engineered to reduce frictional and power losses to increase efficiency.

Critical application requirements of bearings:

- Low noise
- High speed
- Low torque for high efficiency
- Resistance to current
- Lightweight and downsizing

NBC offers specific bearing solutions:

- Integrated solutions-Sensor Integrated Bearings for lightweight and downsizing
- EMB Series Bearing for high speed and low noise
- Alumina coated bearing
- Hybrid bearing



WHEEL END

The function of the wheel hub bearing of an EV is like that of a gasoline-powered vehicle; however, since EVs are heavy, the role of the bearing becomes critical from the perspective of load capacity and safety.

Critical application requirements of bearings:

- Plug and play system
- Rapid acceleration and deceleration
- Anti-lock braking system enabled
- High load rating
- Low friction for high efficiency
- High radial and axial load

NBC offers an application-specific bearing solutions:

- Gen 3 Hub Bearing
- Unitised Tapered Roller Bearing



STEERING COLUMN

The steering column bearing faces the challenges of re-greasing of bearings, noise, and increased steering effort. The bearing must be designed with low friction and high rigidity.

Critical application requirements of bearings:

- Ease of assembly
- Load carrying capacity
- Durability
- Avoid electrical pitting of the raceways (4-wheeler)

NBC offers specific bearing solutions:

- Oil Impregnated Bearing Cage Assembly (2-wheeler & 3-wheeler)
- Conductive Bearing
- 4-Point Contact Bearing



TRANSMISSION (4-wheeler)

Since EV motors are powerful; there are higher mechanical stresses on the bearing that support the vehicle's transmission system. So, the bearings used in EV transmission must be designed to withstand high torque and operating temperature.

Critical application requirements of bearings:

- Low torque and low noise
- Impact load
- High speed
- Resistance to contamination
- Current insulation
- Lightweight and downsizing

NBC offers an application-specific bearing solutions:

- Thin Series Bearings
- Low Torque Bearings
- Alternate material and heat-treated bearings



NBC ADVANCED SOLUTIONS

SENSOR BEARINGS FOR 4-WHEELERS

NBC's Sensor Bearings are a special kind of bearings in which sensors are integrated within the bearing unit to measure critical parameters like shaft speed (RPM), the direction of rotation, and temperature. They are compact, reliable, simple, and ready to mount.



Features

- High speed, low torque, and low noise bearing
- Integrated with sensors capable to measure

Benefits

- Compact & robust design yielding reliable results & ready to use
- Onboard condition monitoring of the system
- Hassle-free & integrated solution for EV OEM

SENSOR INTEGRATED BEARINGS FOR 2-WHEELERS

Sensor Integrated Bearing is a modern substitute for mechanical toner rings, which optimizes two-wheelers' performance by providing instantaneous feedback to the controller and ABS for better efficiency and controllability, especially in an electrically propelled vehicle.



Features

- Integrated two-part sub-assembly for easy fitment in a hub
- Torque management in electric propelled vehicles
- Minimizes torque ripple effect in motors

Benefits

- As a unitized complete solution, it provides more reliability, accuracy, and durability
- Eliminates usage of mechanical toner ring and toner ring sensor in the wheel
- The compact and integrated solution that reduces OEM's efforts in procurement and fitment of child parts

NBC ADVANCED SOLUTIONS

OIL IMPREGNATED BALL-CAGE ASSEMBLY

Oil-impregnated bearings are composed of 70-80% of synthetic lubricating oil. Oil is molded and solidified with polymer to form a casing that acts as a lubricant reservoir throughout the bearing's life.



Features

- Superior lubricant – Synthetic oil
- Lesser torque due to no churning phase
- Excellent performance in water and dusty environment

Benefits

- Long life and maintenance-free
- Higher operational reliability
- No re-lubrication needed

HIGH-SPEED ELECTRIC MOTOR BEARINGS

Electric Motor Bearings (EMB) are for high-speed applications with expectations are of lightweight, low friction, high transient ramp capability, high RPM, and low noise.



Features

- Lightweight cage design
- Optimized internal design
- Grease with noise suppression properties

Benefits

- High-speed stability
- Low noise
- Energy efficient bearing

NBC ADVANCED SOLUTIONS

LOW TORQUE BALL BEARINGS

Various studies show that only 13 to 15% of the energy is used to move the vehicle; the rest is lost due to mechanical and frictional losses. The low torque bearing technology reduces energy consumption by reducing torque in the bearing.



Features

- Optimization of bearing raceways curvature
- Effective sealing solution
- Modified cage geometry

Benefits

- Low carbon emissions
- Reduced heat loss and friction losses
- Enhanced fuel economy

LOW TORQUE ROLLER BEARINGS

Low torque bearing is designed with optimization of internal geometry to improve fuel efficiency. Low torque bearings reduce friction by 8-50% (From LT1 to LT4) and improve fuel efficiency.



Features

- High super finished on roller large face
- Roller multi-radius crowning
- Centre relief in cage rib profile

Benefits

- Low friction
- Reduced energy losses due to friction

NBC ADVANCED SOLUTIONS

INSUOHM BEARINGS

Electrical insulation coating prevents electrical pitting in the bearings and hence improves bearing life in motor bearings.



Features

- Improves a bearing's life in the electrical current passage
- High insulation resistance
- High dimensional stability after coating

Benefits

- Increased machine uptime
- Reduced overall operating costs
- Insulation over a wide range of operating temperatures

HYBRID BALL BEARINGS

Hybrid bearing also known as anti-friction ball bearing consists of rolling element made of Silicon nitride in place of steel. Silicon nitride rolling elements perform exceptionally well in high-speed operating conditions.



Features

- Lower friction
- Reduced weight
- Current insulation

Benefits

- High-speed capability
- Less wear under slippage
- Higher operational reliability

NBC ADVANCED SOLUTIONS

MEDIUM CARBON STEEL BEARINGS

In automotive applications, the bearings should be capable of taking shock-load in severe contaminated lubrication conditions. Medium Carbon Steel Bearings offer optimal performance due to their modified intrinsic microstructure properties.



Features

- High amount of retained austenite and hardness after heat treatment
- Consists of carbides or/and carbonitrides
- Hard surface and rigid core

Benefits

- Higher resistance to fractures and cracks
- Better performance in a contaminated environment



OTHER PRODUCTS FROM NBC

Since the challenges faced by industry are many, NBC offers a diverse range of exceptional bearings. NBC bearings are available in sizes from 06 mm bore to 2000 mm outer diameter.

- Deep Groove
- Gen - 1
- Gen - 3
- Angular Contact

Ball Bearings



Needle Bearings



- Ball thrust
- Roller thrust

- Single Row
- Double Row
- Four Row
- Unitised Tapered Roller Bearing
- Cartridge Tapered Roller Bearing (Railways)

Tapered Roller Bearings



Thrust Bearings



Cylindrical Bearings



Pillow Block Bearings

- UCP
- UCF
- UCT

- Single Row
- Double Row
- Four Row
- Cylindrical Bearing Unit (CBU)

Spherical Bearings



- Roller
- Plain

Special Products & Technology



- Oil Impregnated Polymer Lubricated
- EMB Series High Speed (EV application)
- SIB Series Sensor Integrated Bearing with Conductive Wire
- TRB Hub Unit
- Low Torque TRB
- Pre-set Hub
- Insuohm Series (Insulated)
- Ceramic Rolling Element (Hybrid)
- TRB Matched Set
- Black Oxide Treatment
- HCR Series

OUR GLOBAL REACH

The NBC Bearings: Product, Technology & Services

NBC provides a wide range of bearings and associated service solutions to diverse industries such as Industrial, Automotive, Railways, and Aerospace. As a company that has been established for over 75 years, NBC Bearings has an international presence with offices and R&D centers across the globe. For us, engineering goes beyond manufacturing; it is the fusion of Product, Technology, and Services that make us different and the most preferred choice of our customers worldwide.



Over 550 stockists and thousand of retailers across India



National Engineering Industries Ltd

Khatipura Road, Jaipur, Rajasthan, India 302 006

T: +91 141 2223 221 | F: +91 141 2222 259 | Toll free: 1800 3000 6222

E: neilsales@nbcbearings.in

Follow us on: | /nbcbearings | www.nbcbearings.com

