

# TECHNICAL INSIGHT

A PUBLICATION OF NSK EUROPE

## Give an Electric Motor the Silent Treatment

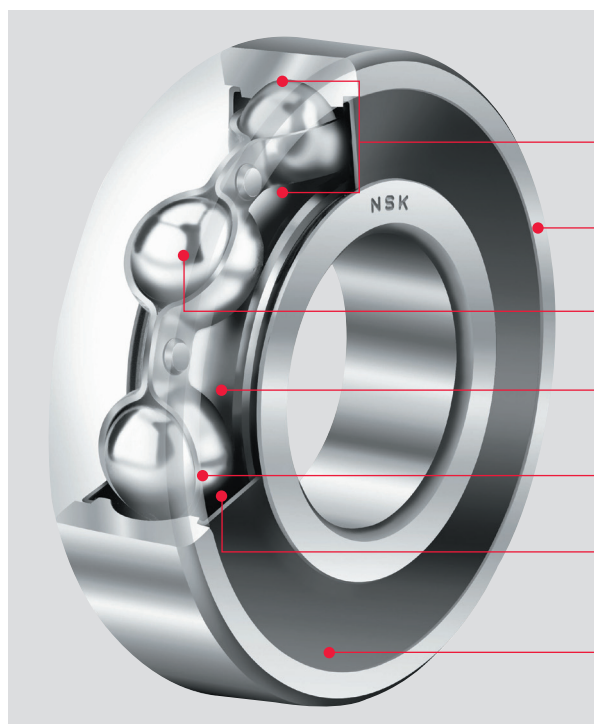
Selecting bearings for electric motors can make a big difference when you want to ensure long life and quiet operation. The design, manufacturing and quality measures NSK incorporates throughout production help minimise electric motor noise and ensure years of problem-free operation.

### Cleaner Steel

An innovator in bearing steel, NSK uses SUJ-2 steel for balls and rings. SUJ-2 steel is ultra-clean, vacuum-melted bearing steel, much cleaner than typical industry standard steel. This coupled with the correct heat treatment means that NSK electric motor bearings have extended the fatigue life.

### Superfinished Raceways and Maximum Sphericity

Rough bearing raceways inhibit lubrication and can lead to increased noise. At NSK, raceways for electric motor bearings are finished to an extremely smooth condition using a specially developed custom honing process. This finish aids lubrication and extends bearing life. To ensure the smoothest possible operation, NSK uses high-grade steel balls manufactured using a proprietary process. The result is an extremely quiet running bearing.



Both raceways are super-finished for added performance.

Every bearing starts with NSK's ultra-clean steel for exceptionally long life.

Precision steel balls deliver ultra-quiet operation.

Superior quality grade lubricants deliver low starting torque and extended service life.

Coined cage pockets deliver less noise and friction.

A range of radial internal clearance grades including the unique CM and the popular C3.

Enclosures are performance based, from light protection in clean conditions to full contact seals when things get rough.

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### Cage Advancements

NSK's two-piece riveted steel cages come with coined pockets for extremely close tolerances in the ball pocket. This design approach is more effective at reducing friction by providing even distribution of the lubricant on the rolling elements. The benefit is a strong cage with a lower operating temperature and higher speed limits. NSK also provides molded polyamide cages with optimised ball pocket designs. Their conformance with the rolling elements reduces friction for quieter operation with improved grease life. Bearings with polyamide cages also have lower torque at high speeds and are more tolerant of misalignment.

### High-Temperature Greases

NSK offers high-temperature greases with low noise characteristics in its electric motor bearings. Wide temperature ranges prolong grease life which in turn extend bearing life. You get smoother and quieter operation throughout the life of the bearing.

### Quality from Start to Finish

In the manufacturing process, NSK uses the latest in automated equipment to achieve superior consistency. At each step in the process Statistical Process Control (SPC) techniques are applied. NSK builds in quality you can count on, with thorough in process gauging. Each bearing is tested for noise and vibration levels in the manufacturing line. Any bearing that does not pass the low, medium and high-frequency tests is automatically rejected.

### Special Clearance

To improve the smooth and silent operation of electric motors, NSK offers CM clearance. CM is a clearance specially manufactured to fall into the lower part of the CN standard clearance range.

The reduced clearance in the bearing can control the gap between the rotor and stator in the motor. This result helps to minimise vibration in the motor.

### Specially Design Seals/Shields

Several sealing options are available depending on the demands of the application. Metal ZZ shields are for high-speed applications and protect against light contaminants, such as dust. They provide superb performance through a wide temperature range.

In applications calling for more protection, consider the benefits of NSK's patented non-contact labyrinth seal design innovation that seals effectively without an increase in torque or operating temperature. With better sealing capability than a shield, its non-contact lip reduces drag in the bearing compared to a contact seal. This is an important advantage when power loss is critical. The speed capability is comparable to the shielded bearing.

For additional protection in harsh environments, bearings with contact and light contact seals are available. Special design seals are also available in many bearing sizes.

### Guaranteed Results

You can rely on NSK for quieter running electric motor bearings with the design, manufacturing, and built in quality that you need.

**For more information, please visit  
[www.nskeurope.com](http://www.nskeurope.com)**