

NSK TechTalk

Protect your bearing investment

GIVE AN ELECTRIC MOTOR THE SILENT TREATMENT

Not all bearings are created equal and when it comes to electric motors, selecting the right bearing goes a long way to achieving maintenance-free, energy-efficient service.

A Clean Start

If there was ever an opportunity to cut corners, this would be it; use a steel of marginal quality, sell at a reduced price and hope no one notices the difference.

An innovator in bearing steel, NSK developed SUJ-2 ultra-clean, vacuum-melted bearing steel that is considered near aircraft quality. With minimal oxygen content, sub-surface initiated failures are dramatically reduced meaning fatigue life is increased.

A Super Finish

Super-finishing both raceways means less wear at start-up, better performance out of the lubricant and smooth, quiet operation. NSK accomplishes this through a proprietary method of honing the raceways to finishes at the sub-micron level. For added value, NSK tests every bearing for low noise and vibration characteristics before the “quiet” rating is applied.

Rolling With Confidence

The ball set plays an integral role in the smooth and efficient operation of a bearing. Not only do they need to be extremely close in size and tolerance, but are required to be nearly perfect in shape. At least by NSK standards.

Coined Cage Pockets

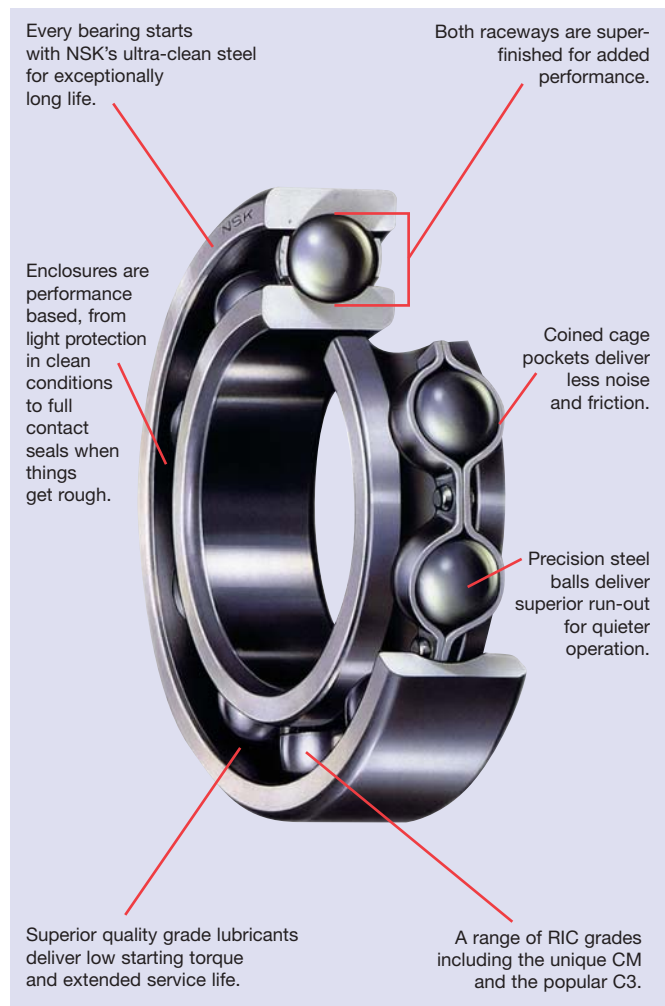
It's the small things that sometimes make the difference. Like the close tolerances NSK achieves by coining the cage pockets. The results are better distribution of the lubricant, less noise and reduced internal friction. Ultimately it means longer bearing life.

Greased for Life

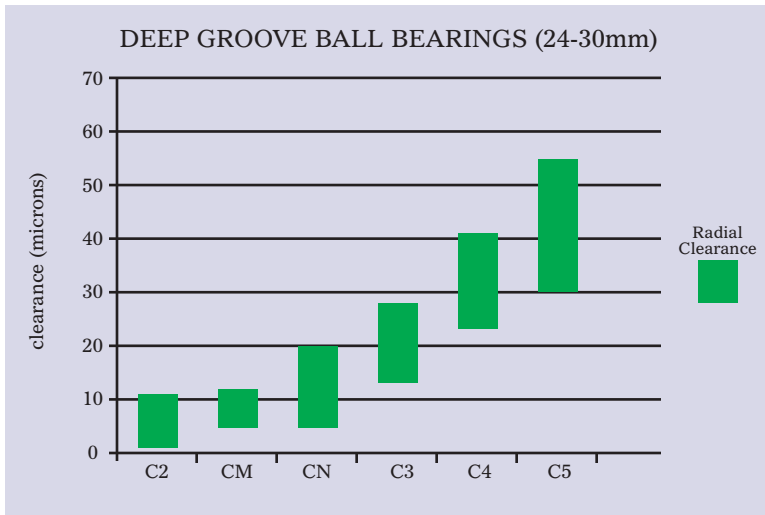
NSK offers a variety of lubricants to suit a wide range of applications. When it comes to electric motors, the AS2 and NS7 greases are superior quality grade lubricants formulated to deliver low starting torque and extended service life.

The Right Clearance

There's a fair amount of misinformation with regard to radial internal clearance (RIC). The science behind RIC is to achieve a running clearance at or just above zero; too much clearance can lead to excessive noise and a decrease in performance while a prolonged negative clearance, also known as preload, will cause temperatures to rise and lead to early failure. So the objective becomes: Avoid excessive preload during start-up and achieve a running clearance at or just above zero.



To accomplish that goal NSK identified the optimum RIC for electric motor bearings: CM. NSK believes this range provides the right amount of clearance to meet the goal while controlling the air gap between rotor and stator, delivering quiet operation and increased efficiency. NSK also provides bearings with CN and C3 clearances used in electric motors.



	ZZ	VV	DDU
Grease sealing efficiency	Good	Better than ZZ	Slightly better than VV
Dust resistance	Fair	Better than ZZ	Very good
Water resistance	Unsuitable	Unsuitable	Good, even for splash conditions
Torque	Low	Low	Higher than VV & ZZ
Speed capability	High	High	Lower than VV & ZZ

Shields, Seals and the VV

Bearings with two enclosures are pre-greased at the factory and are classified as “greased for life”. This simply means that the type and amount of grease is sufficient to outlast most general applications, with the exception of temperature extremes, contamination, high load and high speed.

Enclosures are defined as either contact or non-contact and refer to any gap at the inner ring. The popular Z metallic shield does a good job of keeping the grease in place and larger contaminants out of the bearing. NSK applies an anti-corrosive coating to their Z shield in the event of moisture and because they are non-contact, their operating speed and starting torque are unaffected.

For more arduous service conditions, the DU seal is in full contact with the inner ring, increasing grease retention and excluding a wider range of contaminants from entering the bearing but generate more heat and therefore have reduced operating speeds.

Enter the V seal from NSK. Zero drag, low starting torque, maximum operating speeds, no excessive heat and increased grease retention and contaminant protection over the shield design. The V seal from NSK delivers an alternative that’s fast becoming the standard in electric motor bearings.

Adding It Up

Ultra-clean steel, super-finished raceways, precision balls and coined cage pockets, CM clearance, the V seal and a reputation for getting it right – consider it all a no charge upgrade from NSK.

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