

TECHNICAL INSIGHT

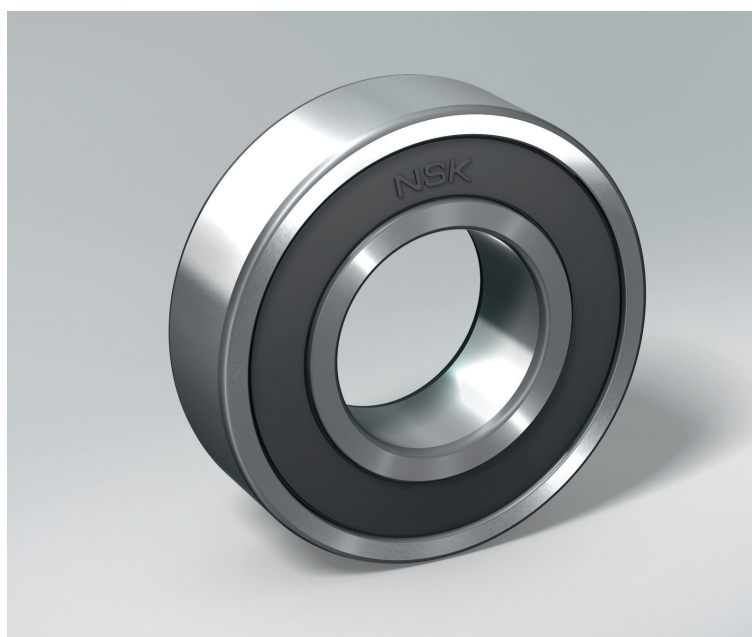
A PUBLICATION OF NSK EUROPE

Technology transfer from low-torque automotive bearings brings energy efficiency to the MRO sector

Across the global automotive sector, NSK is well known for providing bearing solutions that achieve reduced weight and size, and deliver low torque for automobile applications. These bearings meet the requirements of the automotive sector in reducing power consumption and emissions, enabling more efficient integration of the engine, electrical systems and the power transmission.

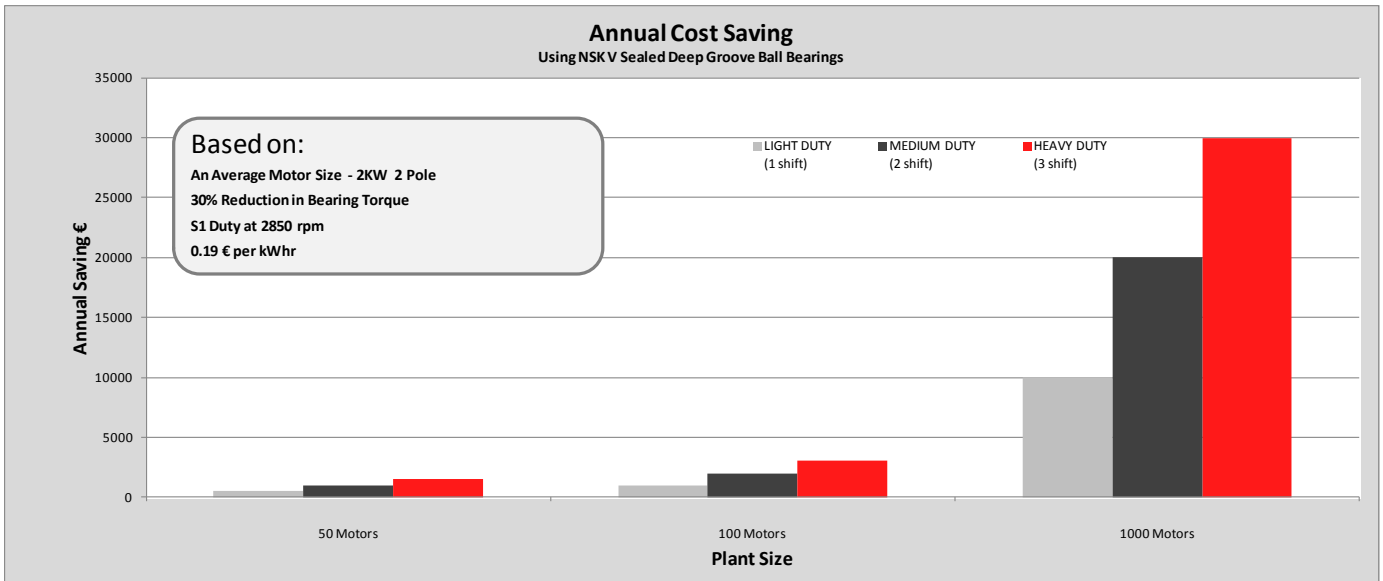
NSK has used technology transfer to effectively bring the same low torque, low power consumption benefits to general purpose bearings used in a wide range of industrial applications, from domestic appliances and power tools to industrial production plant, MRO, construction, quarrying and mining.

Calculations can be applied to determine the savings in power, and hence cost, when low torque bearings are applied instead of standard products. These cost and energy savings can be extended across a whole production site, or even a series of sites. This can be important when users are being assessed for carbon footprint and for evidence of green credentials.



Motor Efficiency Improvement

The results of this transfer initiative for NSK's standard deep groove ball bearings highlight up to a 47% torque saving for high speed domestic appliances compared to conventional ball bearings of the same size. These major savings are helping to improve efficiency and hence reduce energy use in high consumption equipment such as electric motors, air conditioners and domestic appliances.



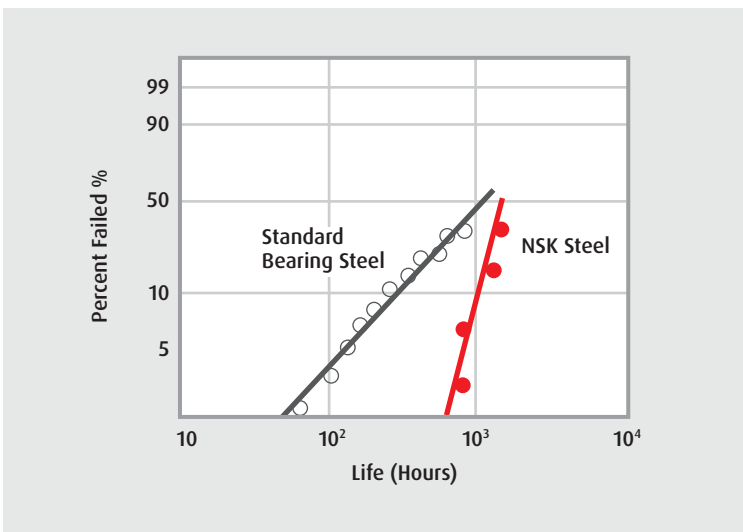
Bearing Steel

Through developments in materials technology and advancements in steel cleanliness, NSK bearings offer significantly improved steel fatigue life.

Bearings manufactured from NSK steel exhibit significantly extended fatigue life when compared to bearings manufactured from conventional bearing steel – up to 1.8 times longer. In addition, NSK steel also benefits from a more uniform response to heat treatment, a process that ensures good hardness and excellent wear resistance.

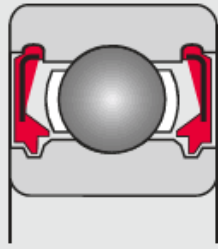
NSK has developed its ball bearing raceway surface geometry and finish – key factors in reducing power consumption. Through optimisation of the raceway geometry, ball contact friction has been reduced and lubricating oil film formation improved.

This is enhanced by a special honing process employed during manufacturing which ensures excellent raceway finish. The combined result is that operating noise levels, heat generation and wear are minimised which provides the added benefit of extending grease life in enclosed bearings.



High Performance Grease

Another key factor influencing bearing energy consumption is the constituent grease. NSK has developed greases that achieve the fine balance between minimising friction whilst still providing long term lubrication and low noise characteristics by utilising high quality synthetic base oils combined with polyurea thickeners. These proprietary greases are only available pre-filled in NSK bearings.



Non-contact V seals

NSK V Seal Technology

The NSK V seal is a design innovation that improves sealing effectiveness without an increase in torque or operating temperature. However, its speed capability is still comparable to that of a shielded bearing. The non-contact lip of the V design reduces drag in the bearing compared to standard contact seal designs – an important advantage where power loss is critical, such as in small electric motors.

NSK Eco-Efficiency Award

To quantitatively assess the degree to which products developed by NSK contribute to the environment, NSK Eco-efficiency Indicators (Neco) have been established. The effectiveness of this approach has been recognised in Japan with the top award of the Director-General of the Industrial Science and Technology Policy and Environment Bureau, Ministry of Economy, Trade and Industry (METI) being given to NSK.



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