



Alternatives to internal combustion



Environmental benefits

- Improved electric powertrain reliability and efficiency
- Contributes to reduced CO₂ and ICE exhaust emission



SKF eDrive Ball Bearings improve electric powertrain efficiency

For passenger cars, the popularity of electric and hybrid powertrains are growing as alternatives to internal combustion engines (ICE). This is resulting in significantly reduced CO₂ emissions. As our society transitions away from fossil fuel based energy sources to renewable energy (e.g., wind and photovoltaic solar cells) for electricity generation these benefits will increase still further.

To achieve competitive automotive goals for power, efficiency and compactness, E-powertrain motors are subjected to high revolutions and temperatures. To improve the performance of electric motors under these conditions, SKF designed SKF eDrive Ball Bearings.

The unique design features of SKF eDrive Ball Bearings allow electric motor and E-powertrain manufacturers to design E-powertrain motors that are more

efficient (reduce overall energy loss) and offer increased power density (motor size/weight versus output). SKF eDrive Ball Bearings reduce friction and generate less heat and so result in increased electric powertrain efficiency as well as extended motor and battery reliability.



SKF BeyondZero solutions can help reduce CO₂ emissions, preserve limited resources and protect the environment from the use and spread of toxic substances. For more details, including documentation of reduced environmental impact, visit www.beyondzero.com



Reducing friction in E-powertrain motors

SKF eDrive Ball Bearing design features increase motor efficiency

Operational benefits

- Low friction torque
- Virtually no friction torque variation during lifetime
- Virtually no friction torque variation under axial loading conditions
- High speed ability and low self-heating at high speed

Operational features

- Optimized internal geometry
- Patented high-speed polymer cage
- Ultra-low friction seal
- Long-life grease
- Optimized grease filling

SKF eDrive Ball Bearings benefit from a number of innovative bearing design features, including an optimized internal geometry, an ultra-low friction seal (efficiency predetermined based on specific application parameters) and a patented polymer cage that is extremely energy efficient at high speeds.

Due to its design, SKF eDrive Ball Bearings virtually eliminate friction torque variations over the bearing's lifetime and/or under axial loading conditions. SKF eDrive Ball Bearings use long-life grease that enables optimum performance in high speed applications and within a wide operational temperature range (-40 to 150 °C).

Together, these design features enable higher operating speeds with low heat and low friction torque, making SKF eDrive Ball Bearings optimal for use in electric and hybrid vehicle powertrains.

Combining standard bearing grade steel rings with rolling elements made of bearing grade silicon nitride (Si₃N₄) can further improve reliability and robustness of the SKF eDrive Ball Bearing in electric drives with extremely high speed requirements. Because silicon nitride balls are 40% less dense than steel balls, they operate with less centrifugal force and friction to promote faster, cooler running. Along with preventing electric current passage through the bearing, silicon nitride balls also experience less wear and provide better bearing service life under poor lubrication conditions compared with conventional steel bearings and other insulating methods.



© SKF is a registered trademark of the SKF Group.

™ BeyondZero is a trademark of the SKF Group.

© SKF Group 2012

The contents of this publication are the copyright of the publisher and may not be reproduced (even extracts) unless prior written permission is granted. Every care has been taken to ensure the accuracy of the information contained in this publication but no liability can be accepted for any loss or damage whether direct, indirect or consequential arising out of the use of the information contained herein. Any statements in this publication concerning environmental impacts, as well as cost savings and revenue increases, are based on results experienced by SKF customers and/or based on internal calculations by SKF personnel and do not constitute a guarantee that any future results will be the same.

PUB 10/S7 12710 EN · February 2013

Certain image(s) used under license from Shutterstock.com.

