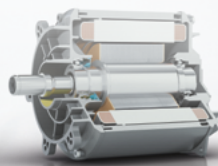


HiSpin® for EV traction motors

**HIGH-SPEED SEALING
ENGINEERED TO BOOST
EFFICIENCY AND DURABILITY**



Radial shaft seals on the input shaft of an electric drive must meet application demands that are unique to electric vehicle (EV) traction motors. With electric motors operating at 20,000 rpm or more, these seals are exposed to extremely high speeds. The HiSpin® product line has been developed specifically to deliver reliable performance under these demanding conditions.

When designing modern EV traction motors, a wide range of parameters must be carefully considered. These include lubrication, shaft conditions and the maximum surface speed at the seal lip. Because surface speed is a critical factor in seal performance, different application ranges require fundamentally different sealing solutions. Seals designed for speeds up to 20 m/s differ significantly from those engineered to operate at 50 m/s.

The HiSpin® portfolio

HiSpin® PDR RT

FOCUSED ON ULTRA-HIGH-SPEED PRECISION

- Suited for speeds over 40 m/s and up to 60 m/s
- PTFE lip delivers very low friction, enabling reliable performance in applications with minimal lubrication for optimized efficiency
- Optional electrically conductive lip provides shaft grounding

Did you know?

RT stands for “Reduced Torque”. Because oil at the seal lip is the primary cause of friction, motor designers minimize lubrication to boost the efficiency of ultra-high-speed motors.

Stefa® HiSpin® EV

ALL-ROUNDER FOR ELECTRIC MOBILITY

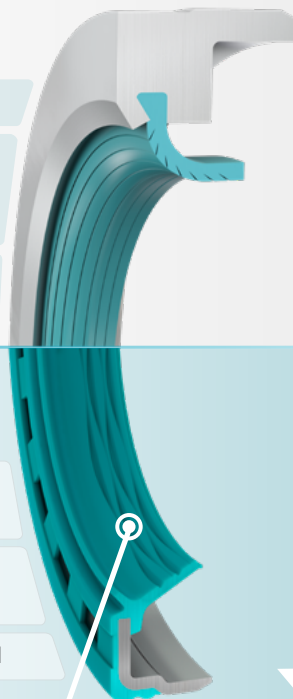
- Available in two versions: EV30 for speeds up to 30 m/s and EV40 for speeds up to 40 m/s
- FKM rubber lip engineered for low friction and high durability
- Handles lubrication from oil splash to quarter-shaft fill

Patented Phase-Shifted-Wave Technology

- ▶ Symmetrical design performs equally well in both directions of shaft rotation
- ▶ Excellent back-pumping capability

Did you know?

Fluorosurfactants, a type of PFAS, are commonly used to produce FKM polymers. Committed to sustainability, Trelleborg is actively developing new FKM grades that eliminate the use of fluorosurfactants.



Efficiency considerations

Friction on radial shaft seals is primarily driven by oil levels at the seal lip and secondarily by rotational speed, especially for rubber lips.

While PTFE lips offer lower friction than elastomer lips on dry shafts, most EV traction motors operate with significant lubrication at the seal lip.

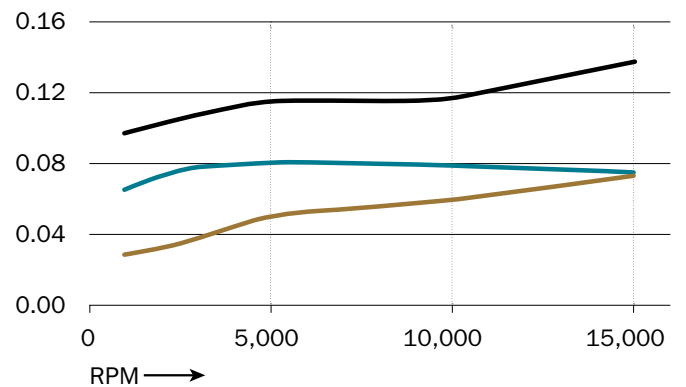
The Phase-Shifted-Wave Technology on the inner seal profile of Stefa® HiSpin® EV is optimized for these well-lubricated environments. Its innovative back-pumping mechanism reduces radial force on the shaft, minimizing friction without compromising sealing performance.

CONTACT US FOR EXPERT SUPPORT

Our team of experts is here to help you specify the ideal sealing solution for your electric motor design.
www.trelleborg.com/seals/contact-form



Friction torque with oil with 1/8 shaft fill [Nm]



— Standard radial shaft seal — Stefa® HiSpin® EV
 — HiSpin® PDR RT

This graph shows friction torque for a typical EV traction motor, highlighting the efficiency gains delivered by Stefa® HiSpin® EV.

Performance comparison

HiSpin® PDR RT

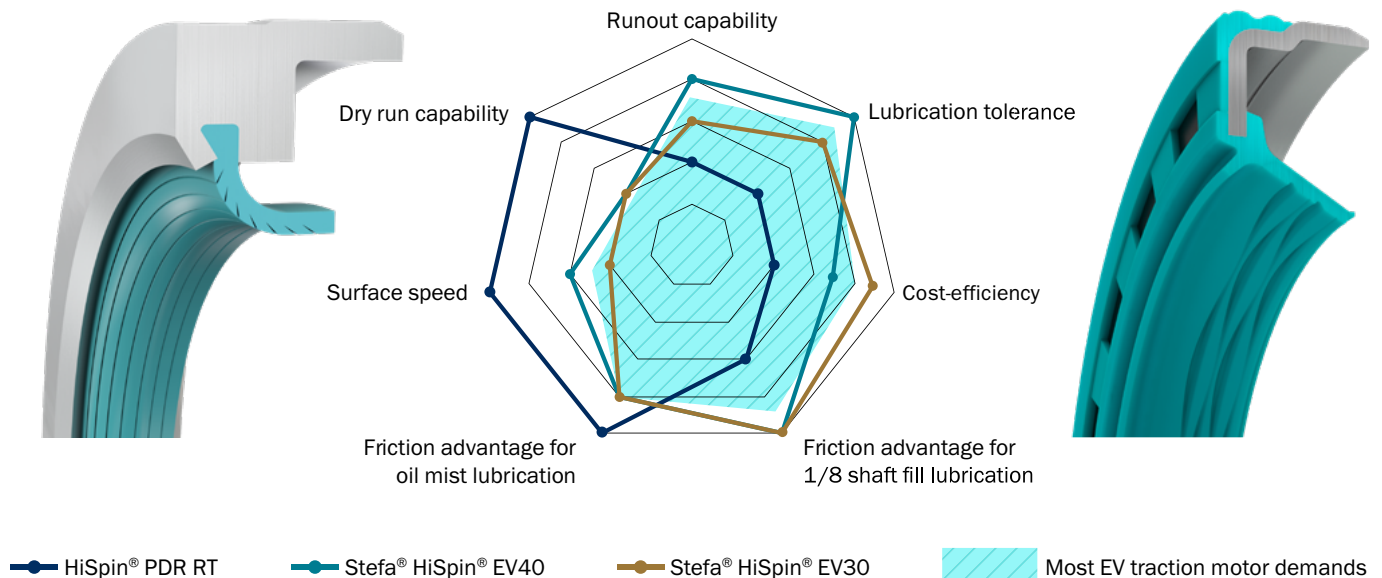
focused on ultra-high-speed precision

For ultra-high speeds (>40 m/s) with minimal lubrication (dry to slightly splashed), seals with PTFE lips, such as HiSpin® PDR RT, are ideal.

Stefa® HiSpin® EV

all-rounder for electric mobility

In contrast, the Stefa® HiSpin® EV is designed for the mainstream EV traction motor market, handling maximum speeds between 20 m/s and 42 m/s under higher lubrication levels.



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