

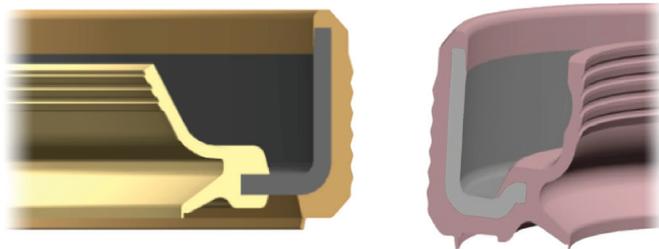
ENERGY SAVING SEALS— ESS™



Freudenberg Sealing Technologies radial shaft Energy Saving Seals (ESS™), demonstrate significant reduction of power loss in drive assemblies as opposed to standard sealing elements. By combining a special elastomer and a revolutionary new design, this shaft seal is able to maintain the pressure force at a consistently low level over a wide range of RPM, even at a higher sealing operating temperature. The low radial force of the main lip ensures the optimization of sealing function, abrasion resistance, and friction.

Features of Energy Saving Seals:

- High performing FKM rubber provides resistance to extreme engine conditions which include large temperature fluctuations and aggressive synthetic oil
- Optimized sealing design to reduce the friction up to 40% compared to a conventional PTFE lip
- Outer diameter in full rubber or half metal/rubber to ensure a safe assembly and proper retention over all engine conditions and application parameters



VALUES FOR THE CUSTOMER

The Energy Saving Seals (ESS) technology has been developed specifically to achieve the following advantages:

- Increases engine efficiency, reducing power consumption and improving fuel economy
- Significantly reduces friction between the seal lip and shaft
- Lowers seal lip temperature
- Virtually eliminates coked oil failure mode
- Reduces heat aging (hardening) of rubber
- Maintains sealing performance at large shaft to bore misalignments

Freudenberg Sealing Technologies superior customer service in all customer contact areas provides consistent and excellent service starting with the engineering team's commitment to design and validation support, through all aspects of production quality checks, order scheduling, and safe assembly.

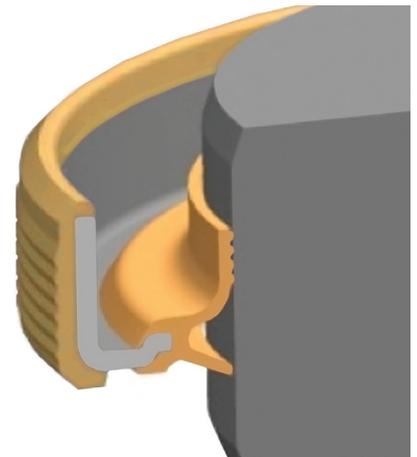
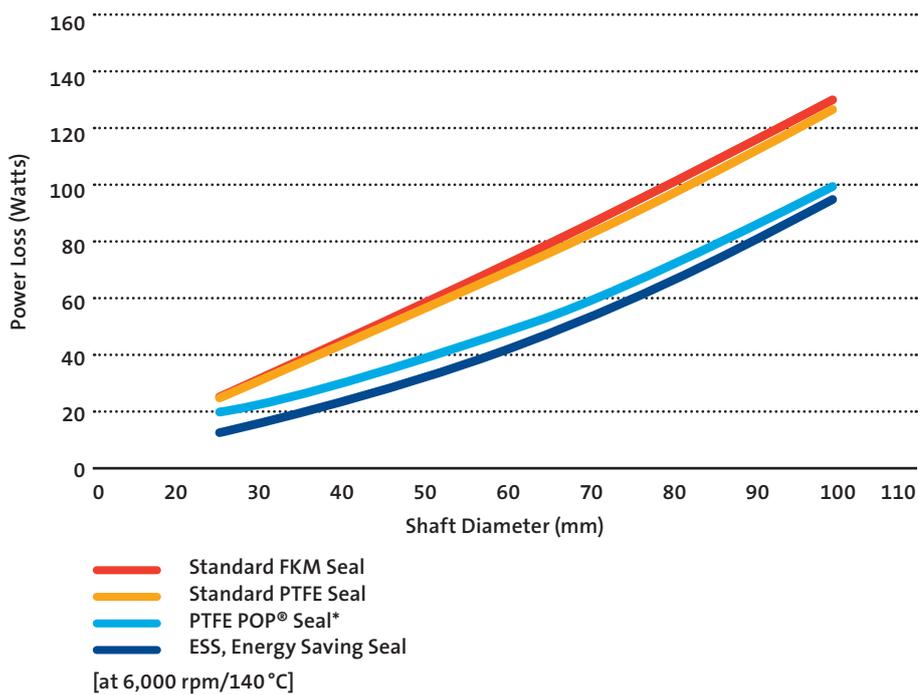
Our world-class manufacturing processes achieve consistent quality control in the production of ESS, Energy Saving Seals, and all our products.



FEATURES AND BENEFITS

Characteristic	Effect	Result for customer Standard
Optimized sealing design, fewer components	Sealing lip geometry creates reduced radial load that does not require a spring to provide consistent sealing as the seal ages. This reduced radial load coupled with helix geometry results in low friction sealing.	Reduced CO ₂ emissions and increased sealing system durability
Rubber sealing lip contact	Best-in-class performance for air leak test	Reduces “false failures” due to the air leak test on assembly lines
Rubber lip geometry and flexibility	Optimal lip contact on the shaft even in conditions that exceed manufacturing and assembly tolerances	Superior dynamic sealing in extreme running conditions
FKM rubber material	Best-in-class compression set allowing long running duration	Increased sealing life time

Power conservation with ESS, Energy Saving Seals



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