Benefits of the Enhanced Lubrication Seal
Enhanced Lubrication Seals (EL) provide high pressure sealing, even in applications with thin viscosity lubricants. The seal introduces the most effective lubricating geometry yet. This lubrication significantly reduces seal-generated heat, allowing for higher speeds and pressures.

Examples of relevant oilfield surface applications are rotary blowout preventers, rotary heads, and multi-port hydraulic swivels.

Enhanced Lubrication Seal Performance
The EL Seal can be designed to provide the maximum lubrication and seal performance for the allowable hydrodynamic pumping related leakage dictated by the application. This is made possible by varying the EL wave geometry attributes; providing lubrication ranging from performance near that of conventional Kalsi Seals all the way up to performance at the theoretical limits of full film hydrodynamic lubrication. Six EL wave variations are available. EL Seal performance data is provided in the Kalsi Seals Handbook, which is available at www.kalsi.com.

More Sacrificial Material for Longer Life
The 568-Series Kalsi Seals can be manufactured in both standard and extra wide footprint variations. The wider footprint variation that is shown has a dynamic lip that is 2.4 times wider at the minimum lip width, compared to Standard Kalsi Seals. Such wide lips not only provide significantly more sacrificial material to accommodate various wear mechanisms, they also experience less high pressure extrusion damage.

Enhanced Lubrication Seal for Extreme Conditions
The Enhanced Lubrication seal is the product of a multi-year development effort to create an extremely low torque rotary seal. The dynamic surface geometry aggressively pumps lubricant between the seal lip and shaft, producing a thick hydrodynamic lubricant film. The lubricating action is so effective that the seal operates near the full hydrodynamic range, as shown in the graph. This indicates that the running torque is due to viscous shear, and that almost no asperity contact occurs between the seal and shaft. By significantly reducing seal rubbing, the under-lip temperature is greatly reduced, extending the operating range and improving the life and reliability of the seal.

The Enhanced Lubrication Seal facilitates the use of thinner viscosity lubricants and higher pressures and speeds. The seals can be manufactured in standard or extra wide footprint versions.

High pressure even with thin viscosity lubricants
Availability
Enhanced Lubrication Seals are available in various diameters and gland depths. For a complete list of existing Enhanced Lubrication Seal sizes, see www.kalsi.com.

In an abrasive environment, the use of positive lubricant pressure differential or spring loading is recommended to prevent skew induced-wear.\(^2\)

Commitment to Customer Support
The Kalsi Seals Handbook, which is available at www.kalsi.com, provides detailed technical information, including installation dimensions and guidelines. Experienced Kalsi Engineering personnel are available to provide technical support, including review of the rotary seal application and implementation.

The engineering support team provides technical review and input for rotary seal implementations. The team has over 115 years of combined experience in rotary seals and oil field equipment.

Computer-controlled rotary test fixtures are available to evaluate seal performance with customer-specified lubricants, process fluids, speeds, pressures, temperatures, and other application-specific conditions.

Kalsi Engineering offers two training classes that provide detailed instruction on maintenance and engineering practices that will provide optimum life and reliability. The classes are available at the customer’s location, Kalsi Engineering’s facility, or via Web-X.

Commitment to Quality and Performance
The quality and consistent performance of Kalsi Seals are ensured through rigorous testing (compression set, rotary performance, and breakout torque tests), 100% visual inspection of all seals by trained personnel, and adherence to other rigorous quality control procedures.

Kalsi Engineering performs an average of 10,000 hours of rotary seal testing every year. Much of the testing is aimed at developing seals capable of surviving higher temperatures at higher pressures and speeds for longer durations.

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\(^1\) “Enhanced Lubrication Seals” and “Enhanced Lubrication Seal” are trademarks of Kalsi Engineering, Inc.

\(^2\) For a description of skew-induced wear, and combating it with springs or differential pressure, see the Kalsi Seals Handbook.