

Chapter C9

Filled Kalsi Seals



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Individual chapters of the Kalsi Seals Handbook are periodically updated. To determine if a newer revision of this chapter exists, please visit www.kalsi.com/seal-handbook.htm.

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1. Energizer reduces torque and seal-generated heat

The environment-end of the Filled Kalsi Seal incorporates a deep groove that is filled with a mechanically interlocked soft silicone energizer (Figure 1). This energizer significantly reduces interfacial contact pressure between the seal and the shaft. As with other Kalsi Seals, the dynamic lip incorporates a wavy lubricant side edge that hydrodynamically lubricates the dynamic sealing interface. This combination of features provides reduced breakout and running torque and less self-generated heat, compared to basic Kalsi Seals.

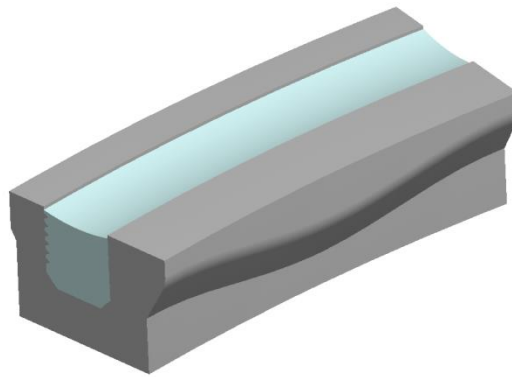


Figure 1
Filled Seals

The Filled Kalsi Seal features a soft energizer and hydrodynamic interfacial lubrication that significantly reduce torque and seal-generated heat. The seals are used to retain lubricant in high speed applications such as submerged dredge pumps and oilfield cement pumps.

Compared to Dual Durometer Kalsi Seals, the C-shaped shell construction permits the use of much softer energizing materials, because the seal torque is not carried by the energizer. Because the energizer is cast in place, the radial cross-sectional tolerance is minimized, compared to seals with insert-type energizers.

Because filled Kalsi Seals offer increased resistance to compression set and lubricant pressure-induced distortion, they are typically recommended over the older generation Grooved Kalsi Seals.

2. Typical applications for filled seals

Filled Kalsi Seals are used to retain lubricant in applications with high surface speed, such as oilfield cement pumps and large diameter submersible dredge pumps. In low differential pressure service, this type of rotary seal is being used at surface speeds

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of up to 1,250 ft/minute. Filled Seals are not ordinarily recommended for severe abrasive environments; contact Kalsi Engineering for application recommendations.

Filled Kalsi Seals are currently produced in diameters that range from 1.500" (38.1 mm) to 9.438" (239.7 mm), and in radial cross-sections that range from 0.335" (8.51 mm) to 0.450" (11.43 mm).

3. Filled construction is suitable for various wave patterns

Most filled seals use a conventional hydrodynamic wave form, as shown in Figure 1, to minimize hydrodynamic pumping-related leakage. When the filled seal cross-section is combined with the enhanced lubrication wave form, leakage and torque are similar to a solid cross-section High Film Seals, but in a bi-directional configuration. This special purpose arrangement achieves even lower torque than the conventional hydrodynamic wave, combined with a much higher hydrodynamic pumping rate. Contact Kalsi Engineering for additional information.

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