



## Mechanical Seal for Heavy Duty and High Pressure applications



## Mechanical Seals for high Pressure and Heavy Duty applications



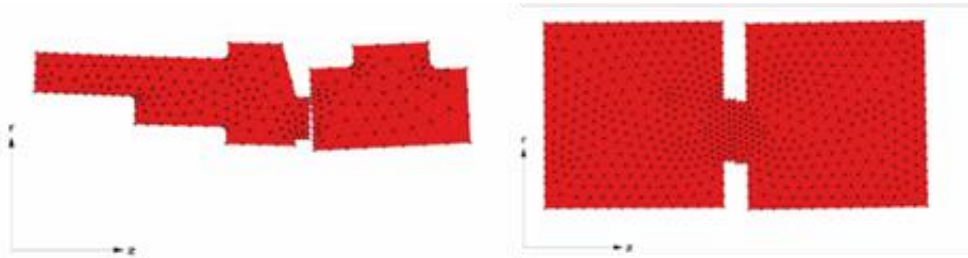
Many industrial processes and, particularly **Oil & Gas** and **Power**, more often require pumps capable to work at very high pressures.

Mechanical seal must guarantee a high level of reliability and avoid dangerous emissions for people and environment.

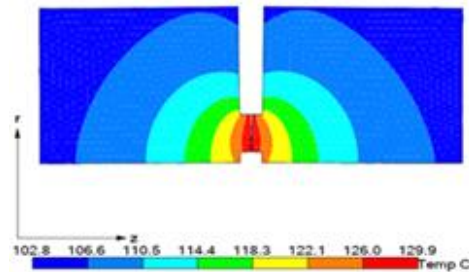
**API682 IV edition** standard limits covers applications with pressure up to 40 bar; beyond this limit, each manufacturer refers to his own experience and the seals are identified as "engineered". With API 682 V edition, an extension will be included, creating a guideline for this type of application.



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Comparison sliding faces deformation of a standard Seal and HPK model



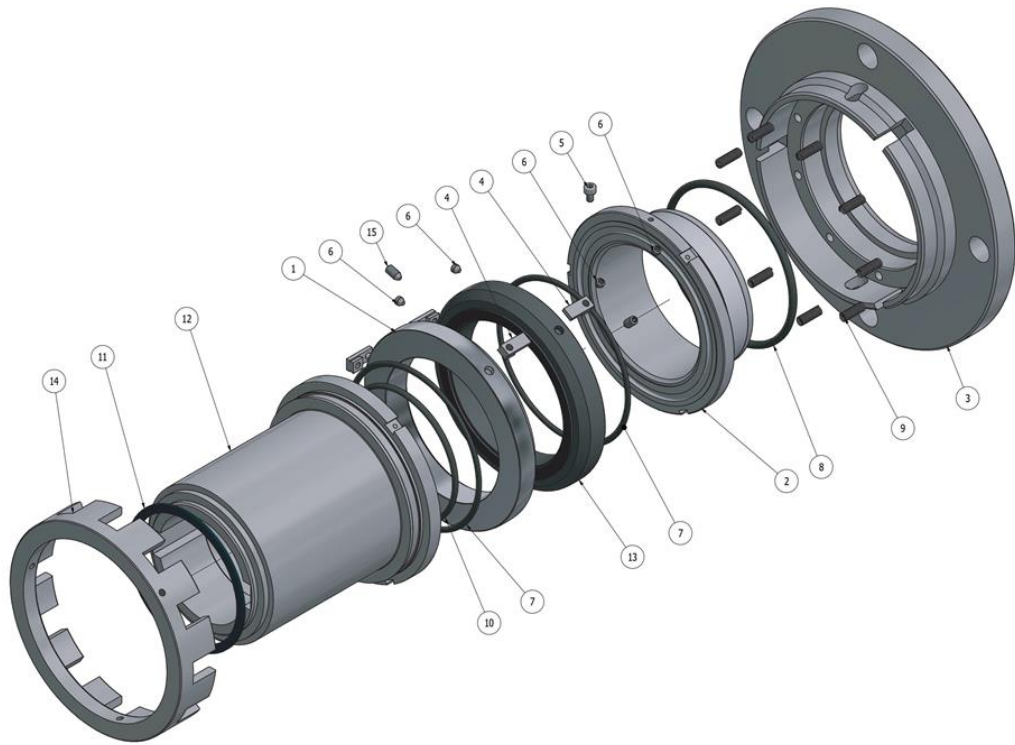
Sliding faces deformation can also be consequence of heat generated

Good seal operation is a combination of **good lubrication** (stable liquid film between sliding faces) and low leakage level.

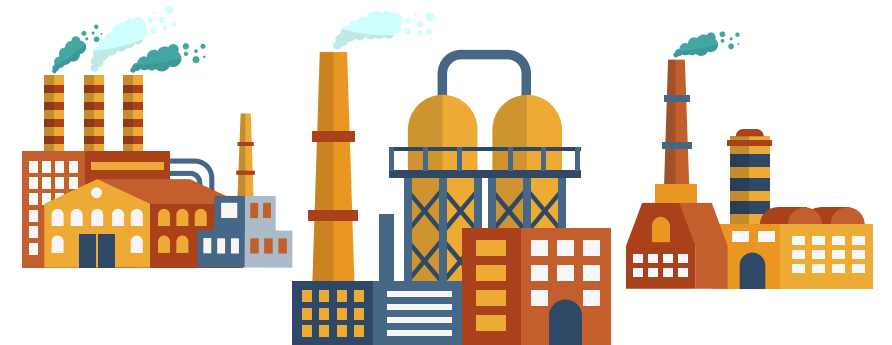
The difficulty to maintain a stable liquid film between the two **sliding surfaces** at high pressure is the engineer's goal. Lubrication's lack can be caused by many factors, including transient phases, such as start-up, which is one of the most critical phases for high pressure application, as the torque is 4 - 5 times greater than the operational torque. This lack could impact correct operation of the seal due to friction increase and over-heating.



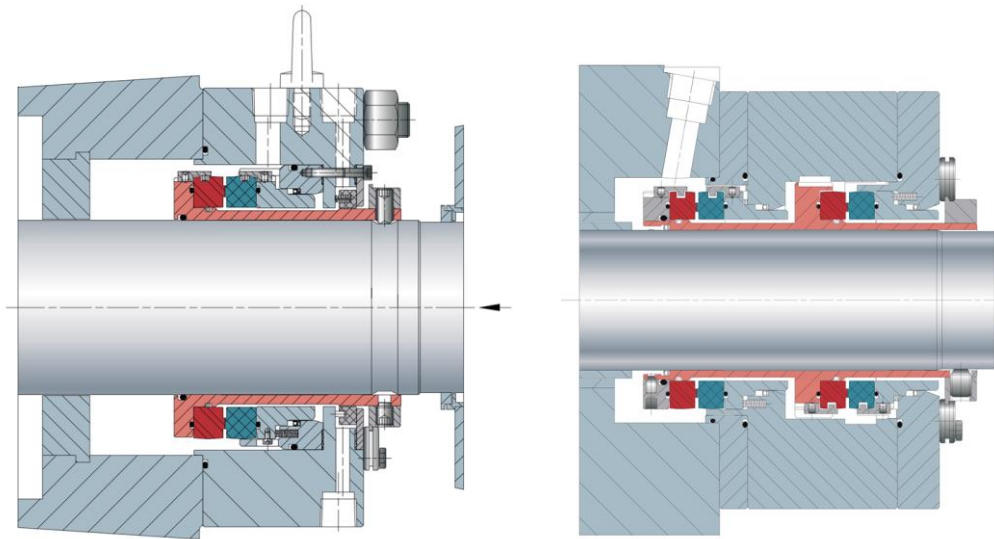
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**Seal designed by Fluiten** for these challenging operating conditions is developed with a patented drive device, which can withstand high run-out levels or even misalignment under high stressing conditions. Furthermore, this solution allows to maintain the planarity of the seal faces by using monolithic rings, with regular geometry and thickness. Last, but not least, seal faces can be designed incorporating the “Fluilift” groove technology, which maintains process liquid stability also at high  $P \times V$  factor (Pressure x Peripheral shaft speed).

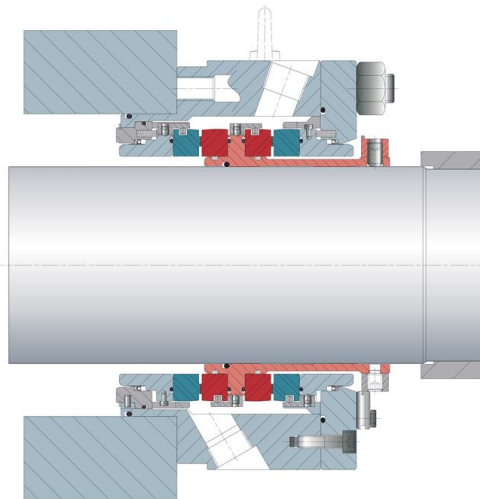


## Mechanical Seals for high Pressure and Heavy Duty applications



Single Seal  
HPKS

Dual Seal  
HPKT



Double face to Face  
HPKF

Developed with finite element analysis, engineered **Fluitem HPK** seal model is available in customized cartridge construction according to **API arrangements 1, 2, or 3**, which means single seals, dual unpressurized or double pressurized solutions.

MODEL	ARRANGEMENT	PLAN	T(°C)	V(m/sec)	P (bar)
HPKS	Single	11; 32	300	40	150
HPKT	Dual not pressurized	52; 55	300	40	150
HPKF	Face to Face	53; 54	300	40	150

