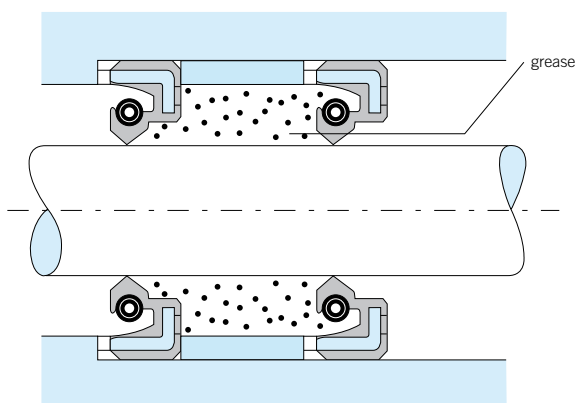


### Lubrication

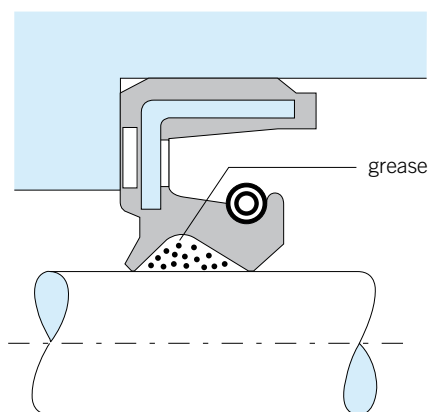
Oil seals for rotating or reciprocating shafts require a certain degree of lubrication of the moving surfaces.

#### Oil Seals must never run dry

When seals are adjacent to bearings, the bearing lubricant will generally provide sufficient lubrication for the seal. Sealing water as well, most of the time there is enough lubrication. However, in isolated locations or applications involving non-lubricating medium, provision should be made for lubricant to reach the seal. In such case, dual seals frequently provide an answer as the space between the sealing edges can be pre-packed with grease thus allowing a considerable period of operation without further attention. In such instances, the Oil Seals should be mounted in such a way that no pressure build-up can occur when adding the grease.



The presence of lubrication is important, not only during operation, but during assembly as well. Never assemble an Oil Seal dry. Both the shaft and the Oil Seal have to be lubricated with oil or grease in advance. This eases the assembly and ensures lubrication from the beginning.



If Oil Seals with fixed dust lips are being used, the space between the sealing lip and the dust lip may also be filled max. 40% with grease. The medium to be sealed will dissipate the heat developed.

### Friction losses

Because the sealing principle of Oil Seals relies on the friction between the sealing lip and shaft with a minimal fluid film, friction losses are inevitable. For a given shaft diameter and a given speed of rotation, the friction coefficient depends on the friction of the Oil Seal with respect to the shaft.

#### Determining factors are:

- the characteristics of the Oil Seal and the shaft materials
- the surface roughness of the shaft
- the presence and the characteristics of the lubricating film
- the pressure of the medium to be sealed
- the degree of interference of the sealing lip
- the operating temperature

It is difficult to measure precise values. However, the graph below gives useful information concerning friction losses of standard Oil Seals used in standard quality oil SAE-30 at 100°C on a correctly prepared shaft, after a short time of running in.

The graph shows the relationship between the power loss, shaft diameter and shaft speed.

