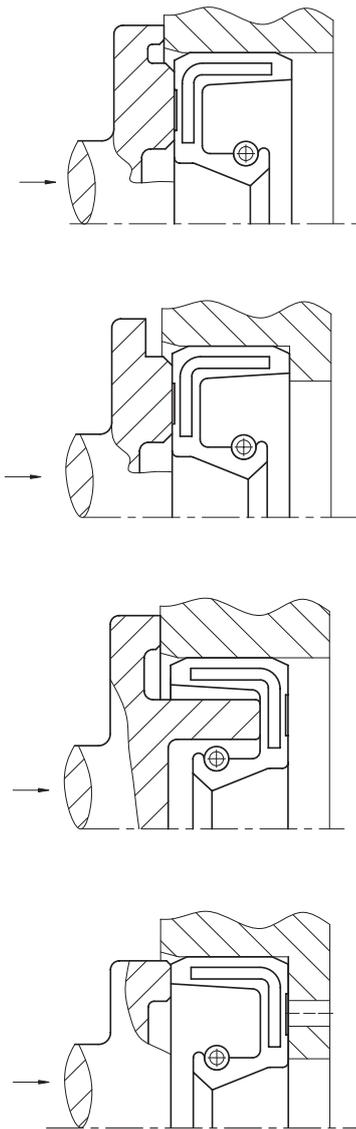


Installation



Various installation tools for rotary shaft seals

Correct installation is important. Approximately 30% of all failures and damage to the rotary shaft seals are caused by incorrect installation or unsuitable installation tools. The installation of rotary shaft seals is performed in accordance with DIN 3760.

Prior to installation, the installation space and the rotary shaft seal should be cleaned carefully. Otherwise adherent dirt particles may lead to leakage shortly after operation starts. Please also follow our installation guidelines on catalogue page 23.

Preferably, a hydraulic or mechanical press-fitting device should be used to press the rotary shaft seal into the housing bore. This grips a large area on the outside of the rotary shaft seal, with the result that the force of pressure is exerted as closely as possible to the outer diameter. Please make sure that the press-fitting tool is held in the final position for a while. This reduces spring-back or skew of the rotary shaft seal to a minimum.

If a rotary shaft seal has to be passed over sharp edges, e.g. grooves, threads or shaft ends, appropriate installation sleeves are to be provided. The sleeve must not have any damage such as scratches or rough surfaces.

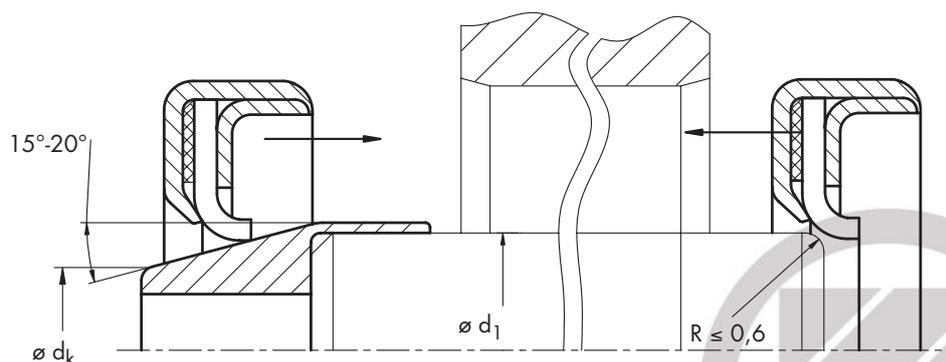
To guarantee a firm fit it must be ensured that the outer sheath rests completely against the inside of the housing bore. If the front chamfer of the rotary shaft seal protrudes slightly over the housing chamfer, the seating proportion is reduced, which can cause the rotary shaft seal to "wander" in the bore. If the space between the protective lip and the sealing lip is filled with grease, a defined application is to be provided. Application aids such as brushes can leave function-impairing residue behind on the seal. The space should be filled to a maximum of 2/3 with grease.

WCP21

The diagram shows the secure installation of the WCP21. To install the WCP21 over a chamfered shaft an installation cone is to be used so that the sealing lip is guided and not folded over.

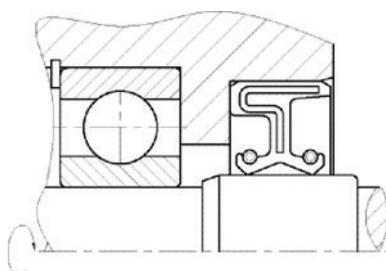
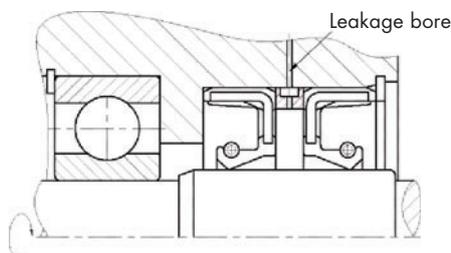
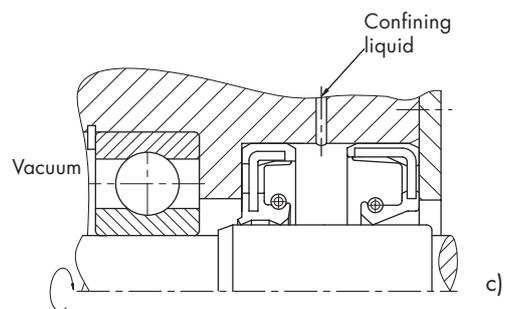
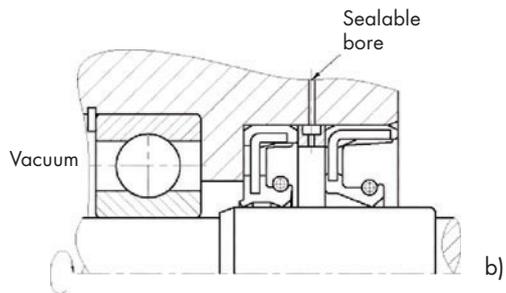
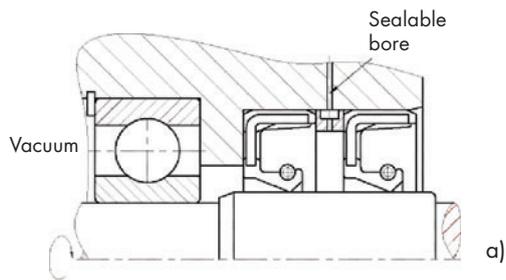
When installing the WCP21 with the outside at the front, bevelling or rounding must be performed. Otherwise, the general installation guidelines for rotary shaft seals apply.

$\varnothing d_1$	$\varnothing d_k$
6 - 60	$\varnothing d_1 - 3.5$
65 - 135	$\varnothing d_1 - 4.5$
140 - 170	$\varnothing d_1 - 6$



Installation cone WCP21

Special applications



Sealing against negative pressure or vacuum

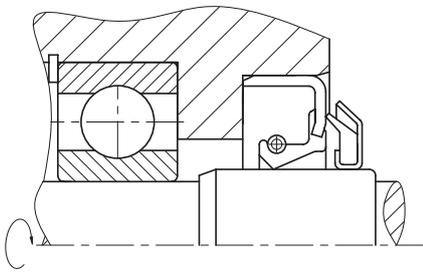
To seal a shaft against negative pressure, rotary shaft seals are used which correspond to the pressure gradient with the sealing lip on the air side. When grease is used, the outer rotary shaft seal must also be used with the sealing lip on the air side. Image a) and b)

To ensure lubrication of the sealing lip and to support the sealing action a confining medium should be used between two rotary shaft seals. If a liquid confining medium is used, the rotary shaft seals are installed with the sealing lips facing each other. Due to the negative pressure gradient the inner seal is pressurised by the confining medium. Here we recommend the use of our type WASY. Image c)

Separating two media

To separate two spaces containing different media, two rotary shaft seals are used back to back, i.e. with the sealing lips facing in opposite directions. We recommend making a leakage bore-hole in the space between the rotary shaft seals. Another possible way of separating two media at low to medium peripheral speeds is to use our type WAD which combines two back-to-back sealing lips in one seal. The space between the two sealing lips should be filled with grease during installation.

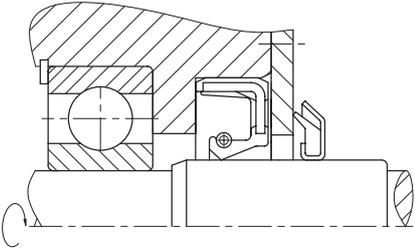




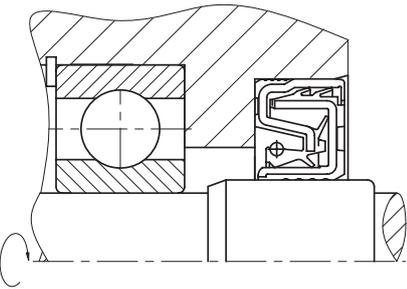
Sealing with excessive external dirt formation

External dirt leads to premature wear of the sealing and the shaft surface. Depending on the type and quantity of the dirt occurring, the sealing lip should be protected.

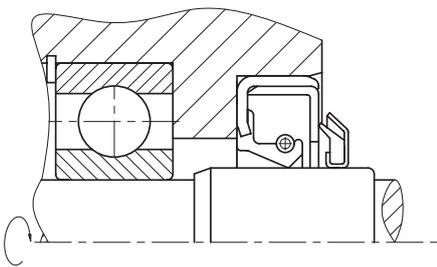
The simplest solution is to use type WAS with its outward-facing protective lip. The space between the sealing lip and the protective lip should be filled to a maximum of 2/3 with grease during installation.



If external dirt formation is excessive, a VRM axial seal can be connected in series to the rotary shaft seal. This VRM ring rotates with the shaft and propels the dirt away directly. In addition, the VRM ring seals against an axial housing surface with its elastomer lip (possibly directly against the rotary shaft seal type WB).

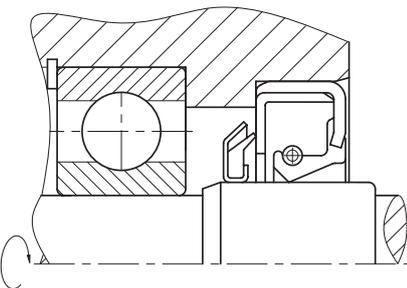


In extreme conditions, e.g. in agricultural and construction machinery, cassette seals are used. These seals are fully encapsulated and on the inside they form a grease-filled labyrinth with several protective lips. In this way the penetration of dirt is effectively prevented. The cassette seals also contain the completely pre-treated seal contact surface.



Sealing with contaminated media

Contaminated media or media with abrasive contents cause intensive wear in the sealing area. Particularly with vertical shafts, the lower seal is severely subjected to sinking particles. Connecting a second seal in series and/or using our axial seal VRM solves this problem.



Storage of elastomer products

Generally speaking, elastomers are suitable for storage. They remain almost unchanged in their properties for years, provided that certain minimum requirements regarding storage conditions are observed. These are described in DIN 7716 and ISO 2230.

The seals must be stored stress-free, i.e. without tension, pressure or other forms of deformation.

The seals should be protected from excessive ventilation, especially draughts. Storage in packaging, e.g. polythene bags or airtight containers, is recommended.

The storage location should be cool, dry, dust-free and moderately ventilated.

A constant storage temperature is optimal. It should be no lower than -10°C and no higher than $+20^{\circ}\text{C}$.

Heaters in storage rooms should be screened and placed at a distance of at least 1 m from the stored goods.

Relative humidity should not exceed 65%. Strong light, especially UV rays and direct sunlight should be avoided.

Electrical devices that produce ozone should not be placed in storage rooms for elastomers.

