

General technical information

Installation chamfers

Installation chamfers should be designed into the cylinder bore and onto the assembly end of the piston rod to ensure that the seal can easily transition from its free state diameter into its installed diameter. The installation chamfer should also be blended into the cylinder bore or piston rod diameter with a generous radius. The chamfer angle and minimum length recommendations are provided in the product tables of the relevant chapter.

Installing rod seals

The method of installation and the possible groove types for rod seals depend on the materials, seal design and ratio between the diameter and cross-sectional height. **Table 10** provides general recommendations for profiles made of rubber or TPU with a hardness ≤ 95 shA. PTFE or other harder materials may require a smaller radial depth S or even open grooves. The recommendations in **table 10** are not a substitute for careful installation tests in the particular application.

Installing rod seals in closed grooves

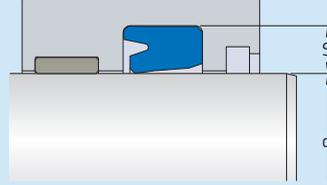
Rod seals can often be installed into closed grooves through carefully bending the profile similar to a kidney shape and then inserting it into the groove. It is very important to avoid sharp bending.

Thin and flexible profiles can be installed by hand (\rightarrow **figs. 13 a** and **b**). Installation tools for TPU rod seals help to install profiles of greater section thickness (\rightarrow **figs. 14 a** to **f**). After installation, the seal may need to be reshaped to a round form using a cone-shaped tool.

For PTFE seals, small diameter seals or for serial assembly, special assembly tools (\rightarrow **fig. 15, page 42**) may be required to save time or avoid seal damage. For additional information about such special installation tools, contact SKF.

Table 10

General recommendations for selecting the type of installation for rubber and TPU materials (hardness ≤ 95 shA)



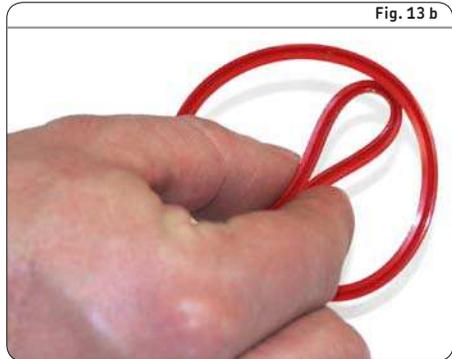
Diameter/radial depth ratio	Type of installation
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$d/S \leq 6$	Open groove
$6 < d/S \leq 10$	Closed groove, installation with tool
$d/S > 10$	Closed groove, installation by hand

Fig. 13 a



Fig. 13 b



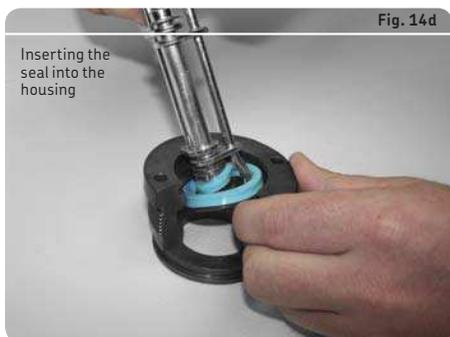
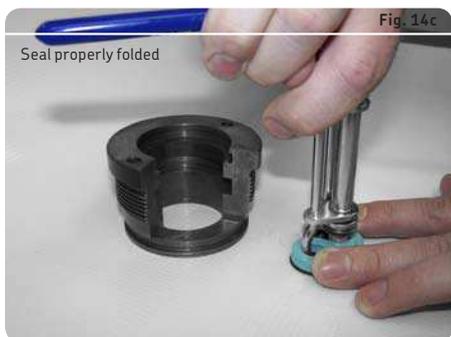
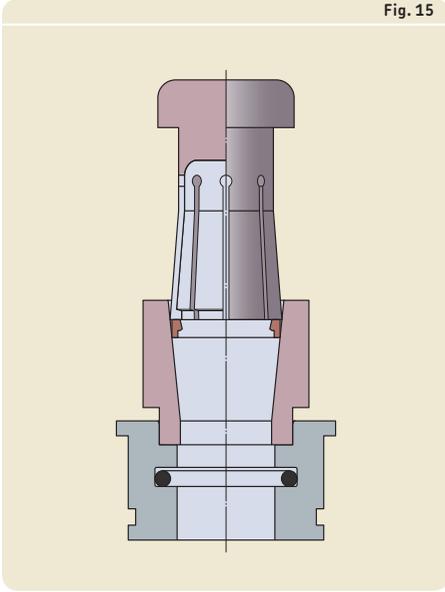


Fig. 15



Installing piston seals

Piston seals installed in closed grooves must be expanded or stretched into position. Seals with step cut slide rings such as CUT or SCP (→ *Piston seals with rigid split slide rings*, page 54) are relatively easy to expand into position. Non-split profiles should not be expanded to a material deformation of more than 20% for TPU or 30% for rubbers. Otherwise, the permanent deformation would be too large. Heating the seal, e.g. in an oil bath, decreases the required expansion force, but cannot increase the maximum material deformation.

Piston seals with a TPU slide ring can usually be installed by hand or with simple tools (→ fig. 16). PTFE seals or those with thicker radial sections may require special assembly tools to save time or avoid seal damage (→ fig. 17). For additional information about such special installation tools, contact SKF.

The recommendations cannot substitute for careful installation tests in the particular application.

Fig. 16

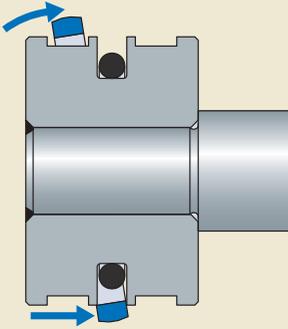
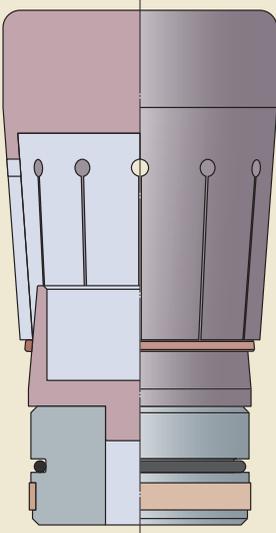


Fig. 17



Installing wiper seals

Snap-in wiper seals, which are installed in stepped grooves (→ **fig. 12, page 39**), are typically of a small radial section per diameter and close to the end of the cylinder head component. Therefore, installation by hand is usually possible.

Press-in wiper seals require special equipment and careful planning for ease of installation without damaging the wiper seal or housing. Assembly tools adapted for each press-in wiper seal size should be used in conjunction with appropriate steady force in a hand operated press. Installation by impact (e.g. striking the assembly tool with a hammer) is not advised. The press assembly tool should be configured to stop when the wiper seal has been pressed flush with the groove edge (→ **fig. 18**). Pressing beyond flush can damage the wiper seal.

Fig. 18

