
INSTALLATION GUIDE FOR RS PRO GLAND PACKING IN PUMPS AND VALVES

1. General Requirements

1.1. Preparation

Before installation, thoroughly clean the stuffing box and pump shaft, ensuring all remnants of old packing are removed. A packing extractor, such as the RS PRO Extraction Tool, can be used for this purpose. Any leftover packing material can negatively impact the performance of the new set.

1.2. Stuffing Box Requirements

- Radial shaft movement: < 0.003 of the valve diameter
- Shaft surface roughness: $Ra \leq 1.25 \mu\text{m}$
- Stuffing box inner surface roughness: $Ra \leq 16 \mu\text{m}$
- Clearance between the stuffing box bottom and shaft or stem: < 0.03 of the packing dimension

1.3. Selecting and Cutting the Packing

Choose the appropriate RS PRO Gland Packing that matches the stuffing box dimensions. To achieve the correct packing length, use a cutting device like the RS PRO Cutting Tool, which ensures precise cuts at a 45° angle.

1.4. Pre-Pressing the Rings

We recommend pre-pressing the cut rings in a mold matching the stuffing box dimensions. This step is especially important when the packing section exceeds the valve diameter.

Once the final ring is installed, place the gland and tighten the bolts manually. Start the pump and gradually tighten the bolts until leakage is reduced to an acceptable, uniform level. Do not completely eliminate leakage, as this could cause overheating and damage to the packing. Pumps without leakage must have a dedicated stuffing box cooling system.

2.2. Cooling System Considerations

If a cooling system is used, ensure it is functioning correctly before starting the pump.

2.3. Separator Placement

When a separator is used, position it correctly so that when tightened, it aligns with the inlet of the lubricating fluid.

3. Installation in Valves

3.1. Preparation

Follow the cleaning, roughness, and clearance requirements outlined in Sections 1.1 to 1.4.

3.2. Gland Pressure Calculation

The required gland pressure (P_c) can be determined using the formula:

$$P_c = n \times P_p \times e^{(2f \cdot h/s)}$$

Where:

- n – Proportion coefficient (1.4 - 1.6)
- P_p – Sealed fluid pressure (MPa)
- $f = \mu/n$ (where μ is the friction coefficient between the shaft and packing, and between packing and stuffing box wall, ranging from 0.03 to 0.05)
- h – Stuffing box depth (mm)
- s – Packing section (mm)

The tightening force (Q_c) required for the gland is:

$$Q_c = (\pi/4) \times (D^2 - d^2) \times P_c \text{ (N)}$$

Where:

- D – Inside stuffing box diameter (mm)
- d – Shaft diameter (mm)

Using the calculated force and valve construction parameters (stud count, diameter, etc.), determine the appropriate torque for tightening the studs. Use a torque wrench for even tightening, alternating between clockwise and counterclockwise directions. Avoid over-tightening, as this can cause the shaft to seize. Additional tightening is recommended after a few days, even if no leakage is observed.

