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Pump & Valve Packing Installation Procedures

*Assuring Effective Sealing and
Maximum Safety*

FLUID SEALING
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A Guide to Effective Pump and/or Valve Packing Installation

Effectively sealing a pump or valve is dependent upon the overall condition of the individual components. This pamphlet provides guidance to maintenance operators, engineers and fitters to ensure a successful packing installation. It is intended to complement other plant-approved installation procedures. Most of the guidelines are common to both pumps and valves; however, equipment-specific guidelines are noted as required.

Important Note: Before proceeding, make sure that the unit to be repacked has been properly isolated according to site or plant rules.

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Tools Required

Specific tools are required for removal of the old packing and installation of the new packing, as well as tensioning of the fasteners. In addition, always use standard safety equipment and follow good safety practices. Acquire the following equipment prior to installation:

- Calibrated packing ring cutter
- Calibrated torque wrench or spanner
- Flashlight
- Helmet
- Inside & outside calipers
- Lubricant for fasteners
- Mirror
- Packing extractor
- Packing knife
- Safety goggles
- Steel rule
- Tamping tool
- Vernier dial gauge
- Other plant-specified equipment



1

Clean and examine

Loosen gland follower nuts slowly and lift follower to release any trapped pressure under packing set.

Remove all old packing and thoroughly clean shaft/stem and stuffing box area following plant-specified procedures.

Examine the shaft/stem for corrosion, nicks, scoring or excessive wear.

Examine other components for burrs, cracks, or wear that could reduce packing life.

Check stuffing box for excessive clearances and shaft/stem for eccentricity.

Replace any components found defective. If in doubt, seek advice.

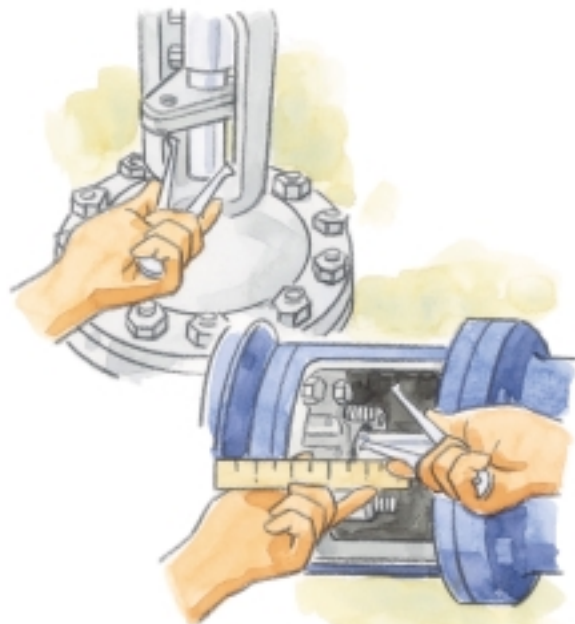
Inspect old packing as part of failure analysis for clues to cause of premature packing failure.



2

Measure and record

Document the shaft or stem diameter, stuffing box bore and depth, and, when using lantern rings, distance of port to bottom of stuffing box.



3

Select packing

Assure packing is as specified by packing manufacturer and/or plant engineering department to match service conditions.

Calculate packing cross section and number of rings needed from recorded measurements.

Examine packing to be sure it is free from defects.

Refer to any special installation instructions from packing manufacturer.

Ensure cleanliness of equipment and packing before proceeding.



4

Prepare rings

Braided

Wind packing around properly sized mandrel, or use calibrated packing ring cutter.

Cut packing cleanly, either butt (square) or skive (diagonal), per instructions from packing manufacturer or plant engineering department.

Cut one ring at a time, and, using shaft or stem, check for proper sizing.

Die formed/molded

Assure that rings are sized precisely to shaft or stem.

Cut rings, when necessary for installation, according to instructions from packing manufacturer or plant engineering department.



5

Install packing

Carefully install one ring of packing at a time.

Twist each ring over shaft/stem.

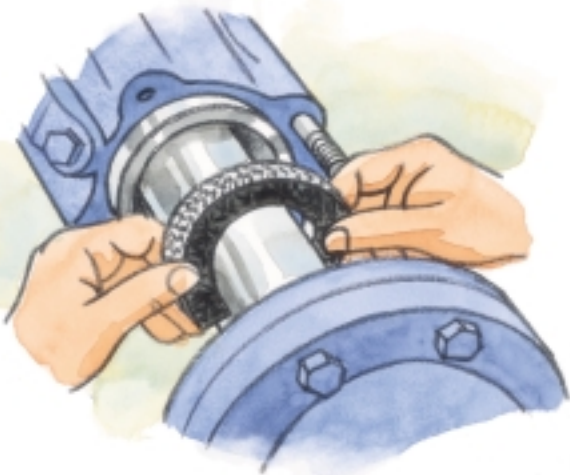
Ensure each ring is seated fully in stuffing box prior to installing next ring.

Stagger joints of subsequent rings a minimum of 90 degrees.

After last ring is installed, draw gland up evenly until nuts are finger-tight.

Check lantern ring, if used, for correct positioning relative to port.

Make sure shaft/stem turns freely.



Adjust packing (Pumps)

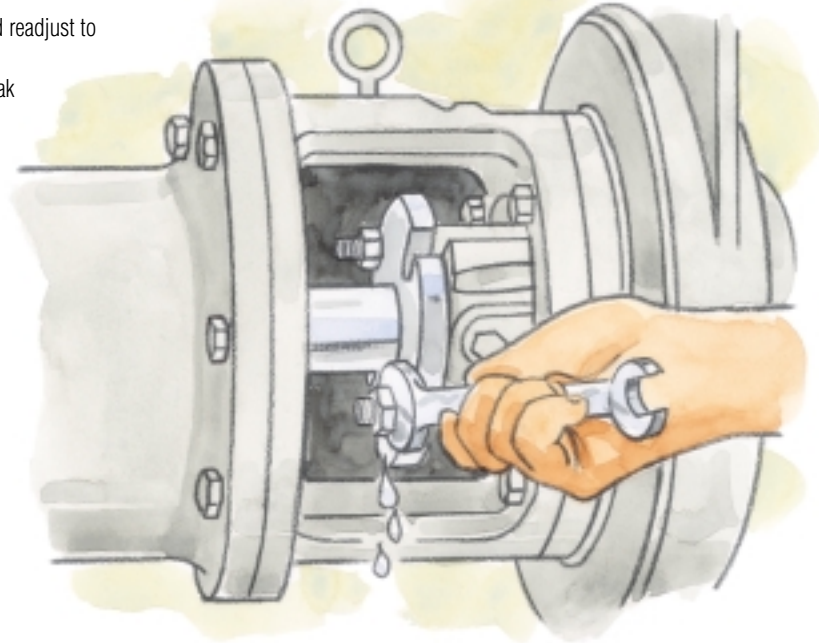
Take up gland nuts until finger-tight.

Start pump and tighten gland nuts allowing liberal leakage.

Reduce leakage gradually by tightening gland nuts slowly until leakage reaches acceptable level.

If leakage stops abruptly, back off the gland and readjust to prevent packing from overheating.

Allow sufficient time between adjustments for leak rate to stabilize.



Adjust packing (Valves)

Consult packing manufacturer and/or plant engineering department for guidance on torque specifications or percent of compression.

Tighten gland nuts in multiple steps:

Step 1 – Torque gland bolts to approximately 30% of full torque or appropriate compression percentage.

Step 2 – Cycle the valve a number of times and apply full torque while valve is in closed stroke position.

Step 3 – Repeat Step 2 three or four times.



7

Retightening and replacement

Caution: Consult your packing manufacturer and/or plant engineering department for guidance and recommendations on retightening.

It is advisable to check gland adjustment after a few hours of operation. Tighten as necessary.

Packing must be replaced when gland can not be adjusted further.



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For further details on the use of compression packings, please refer to the FSA/ESA Guidelines for the Use of Compression Packings, Revised Edition, available from the Fluid Sealing Association and the European Sealing Association.