James Walker®

Fitting guide for

Supagraf® fugitive emissions control packing for valves

Issue 1

This guide applies to Supagraf® fugitive emissions control packings, particularly when used in valves to TA Luft 'High Grade' certification, ISO 15848-1, or API 622.

1. Ensure valve is isolated, and all relevant personal protective equipment is worn to ensure a safe working environment.

2. Carefully remove all old packing, one ring at a time, using James Walker Packing Extractors.

3. Ensure stuffing box stem and bore are clean and free from debris. If required, use a suitable solvent-based cleaner to remove ingrained graphite.

4. Examine the stem, housing bore, gland follower and bolting for signs of wear or damage. Repair and/or refurbish as required. Housing recommendations include a maximum radial extrusion clearance of 0.2mm and a stem surface finish of 0.4μm to 0.6μmRa

   For detailed housing recommendations, please refer to the James Walker Compression Packing Guide, which can be downloaded from the website www.jameswalker.biz

5. Measure the valve stem and gland diameters, as well as the depth of the gland, so the correct size of packing ring can be chosen.

   The packing section (S) is calculated by:

   S = (Housing bore diameter - Valve stem diameter) / 2

James Walker®

Fitting guide for

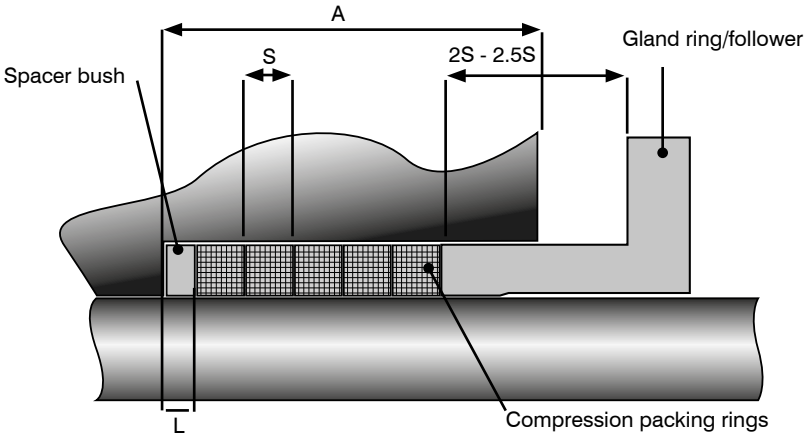
Supagraf® fugitive emissions control packing for valves

Issue 1

6 Measure the depth of the stuffing box cavity (A) to determine how many rings can be installed. Five or six packing rings should be used for optimum performance; with a gland entry of at least 1 times the packing section in length.

Ensure that the gland follower spigot length is at least 2 – 2.5 times the packing section in length, so that adequate compression can be applied to the packing without the follower 'bottoming out.'

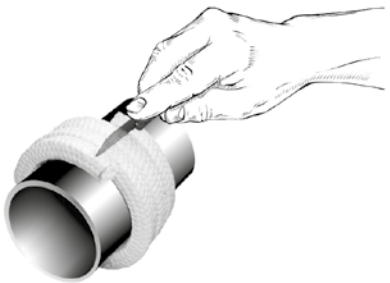
7 If the stuffing box cavity is too deep to accommodate a suitable number of packing rings; excess depth can be taken up by a spacer bush (L). The bush should be made from a suitable material for the process conditions.



8 Ensure bolt threads are clean. Then lubricate threads with an appropriate lubricant, suitable for the required temperature range and application, before applying any load.

Rings cut from length-form packing

9 Where length-form packing is used, spirally wrap the packing around a mandrel of the same diameter as the valve spindle. Using a sharp knife, cut axially along the mandrel to produce rings with a butt join.



ⓘ **A James Walker Compression Packing Cutter will simplify the ring cutting peration if scarf-split rings are to be used.**

James Walker®

Fitting guide for

Supagraf® fugitive emissions control packing for valves

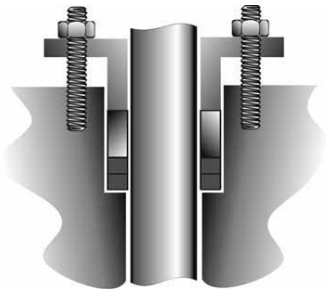
Issue 1

Ring installation: preformed rings & cut length form rings

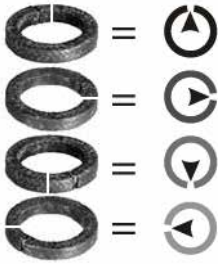
10 Install the rings individually. Partially enter both ends of the first ring together into the gland, then insert the portion of the ring 180° from the join. Subsequently fit both the points at 90° from the join. Tap the ring firmly to the bottom of the housing, using the gland follower and/or a distance piece, as required.

Fit the second ring, using the same technique, but ensure that the join is staggered about 90° from that of the first ring.

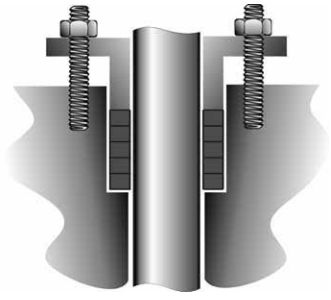
11 Insert the gland follower (a split extension to the follower may be required) and compress the first two rings to the full recommended torque (see Section 16) using a calibrated torque wrench set to the pre-determined bolt torque. This will generate the pre-determined stress in the assembly.



12 Fit the next two rings, staggering the joins, and compress again with the gland follower to the full recommended torque.



13 Fit the remaining one or two rings, staggering the joins, and compress again with the gland follower to the full recommended torque.



James Walker®

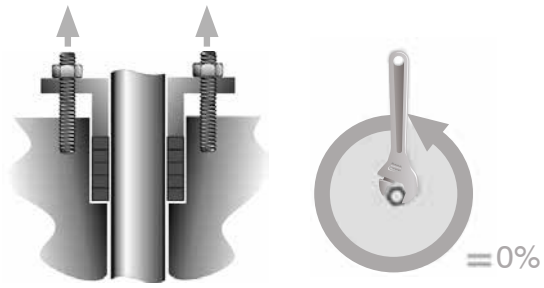
Fitting guide for

Supagraf® fugitive emissions control packing for valves

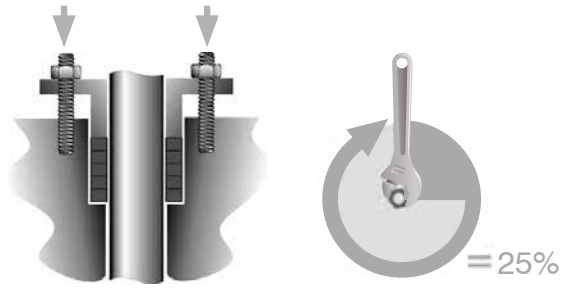
Issue 1

ⓘ **Before system pressure is applied, bed-in the packing set using the following sequence;**

14 A Unload the packing set completely by loosening the gland follower bolts.

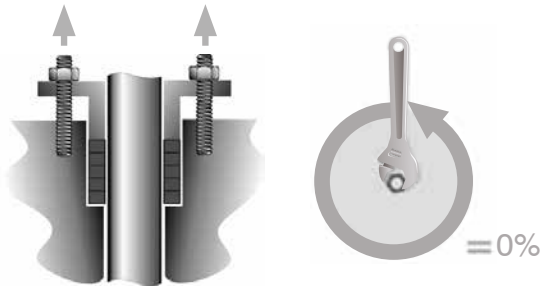


B Compress the packing set with 25% of the predetermined torque.

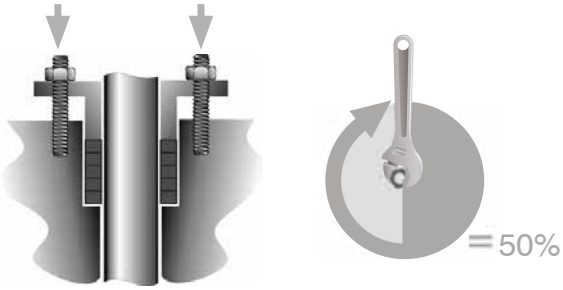


C Cycle the valve (from fully open to closed and returning to fully open) 10 to 20 times with the gland follower bolts at this level of tightness.

D Unload the packing set completely by loosening the gland follower bolts.

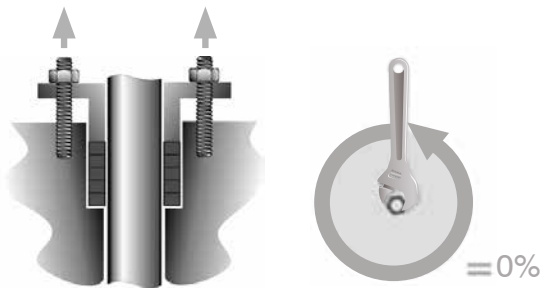


E Compress the packing set with 50% of the predetermined torque.

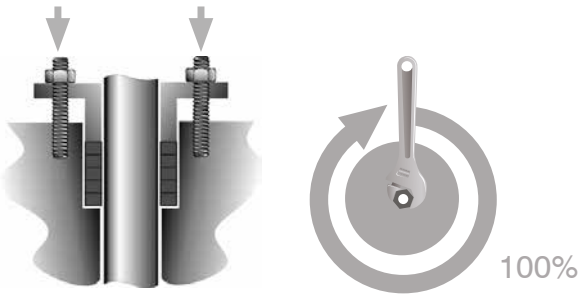


F Cycle the valve (from fully open to closed and returning to fully open) 10 to 20 times with the gland follower bolts at this level of tightness.

G Unload the packing set completely by loosening the gland follower bolts.



H Compress the packing set with 100% of the predetermined torque.



I Cycle the valve (from fully open to closed and returning to fully open) 10 to 20 times with the gland follower bolts at this level of tightness.

James Walker®

Fitting guide for

Supagraf® fugitive emissions control packing for valves

Issue 1

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

If operational thermal cycles below 0°C are anticipated, additional bedding-in cycles under low-temperature conditions should be undertaken **(This will help to consolidate the packing).**

Bolt load calculations

16 To achieve leakage performance to fugitive emission control levels, as required by standards such as ISO 15848-1, it is recommended that a compressive stress of 50MPa to 70MPa is applied to the compression packing. Note that the stress levels up to 100MPa may be required for certain applications.

The following formula calculates the approximate bolt torque required to achieve a stress of 70MPa, assuming lubricated nuts & bolts.

Where: T is the required torque, measured in Nm
N is the number of bolts
D is the bolt diameter, measured in mm
B is the housing bore diameter, measured in mm
C is the valve stem diameter, measured in mm

$$T = \frac{0.011}{N} (B^2 - C^2) \times D$$

Safety Data Sheets are available on request

www.jameswalker.biz

James Walker, Gote Brow, Cockermouth, Cumbria, CA13 0NH, United Kingdom
Tel: +44 (0)1900 823555 Fax: +44 (0)1900 898354 cockermouth@jameswalker.biz