

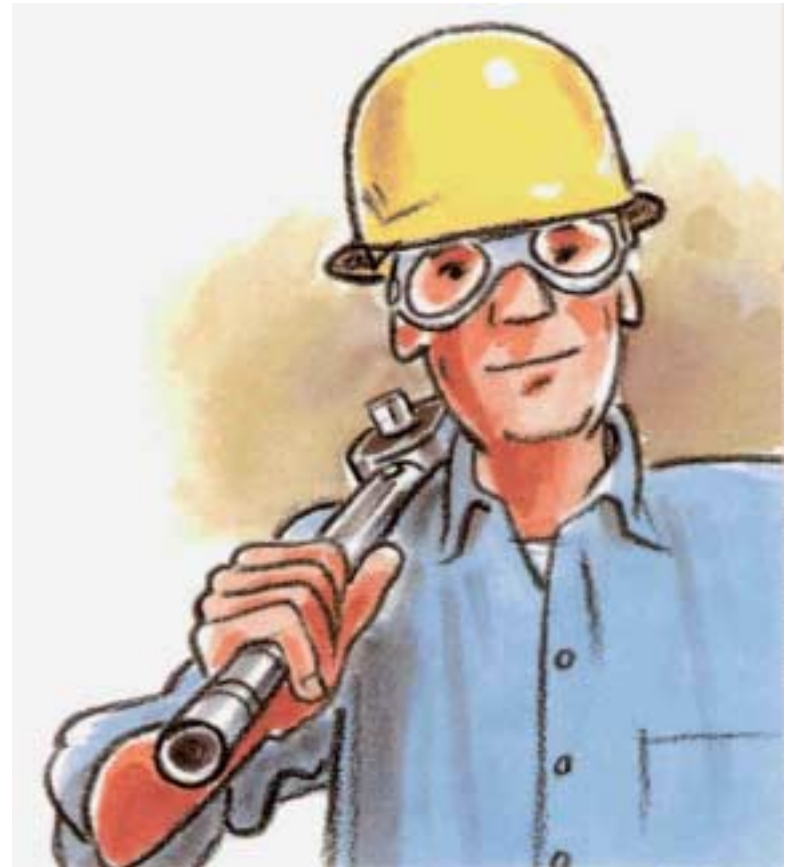
Gasket Installation Procedures

Assuring

✓ joint integrity

and

✓ maximum safety



A guide to successful gasket installation

- ✓ Successfully sealing a flanged connection is dependent upon all components of a well-designed flange system working well together
- ✓ This presentation provides guidance to maintenance operators, engineers and fitters, to ensure successful gasket installation and assembly of bolted flange connections
- ✓ It is intended to complement other plant-approved installation procedures

Tools required

Specific tools are required for cleaning and tensioning the fasteners. Additionally, always use standard safety equipment and follow good safety practices.

- ✓ Calibrated torque wrench, hydraulic or other tensioner
- ✓ Wire brush (brass if possible)
- ✓ Helmet
- ✓ Safety goggles
- ✓ Lubricant
- ✓ Other plant-specified equipment



Clean

Remove all foreign material and debris from:

- ✓ seating surfaces
- ✓ fasteners (bolts or studs)
- ✓ nuts
- ✓ washers

Use plant-specified dust control procedures

Examine



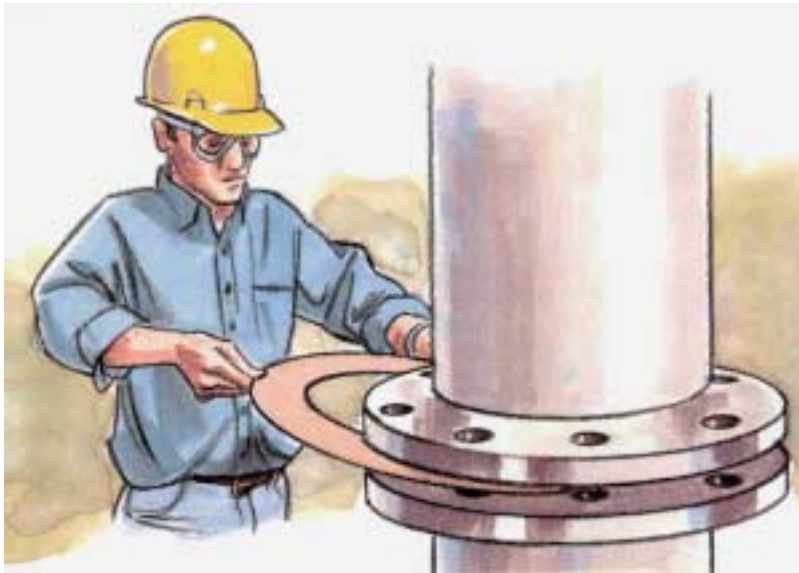
- ✓ **Examine fasteners** (bolts or studs), **nuts** and **washers** for defects such as burrs or cracks
- ✓ **Examine flange surfaces** for warping, radial scores, heavy tool marks, or anything prohibiting proper gasket seating
- ✓ **Replace components** if found to be defective. If in doubt, seek advice

Align flanges

- ✓ Align flange faces and bolt holes without using excessive force
- ✓ Report any misalignment



Install gasket



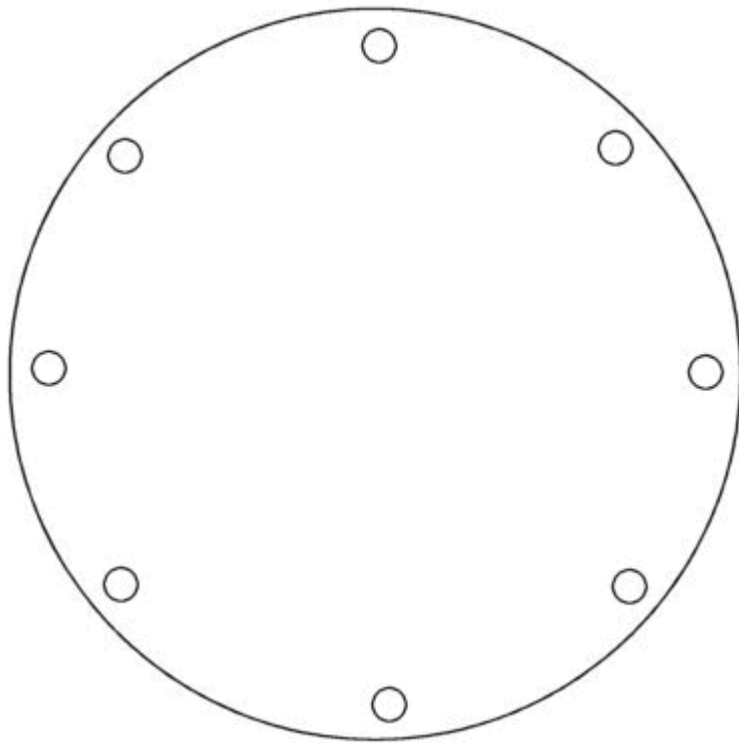
- ✓ Ensure gasket is the specified size and material
- ✓ Examine the gasket to ensure it is free of defects
- ✓ Carefully insert the gasket between the flanges
- ✓ Make sure the gasket is centred between the flanges
- ✓ Do not use jointing compounds or release agents on the gasket or seating surfaces unless specified by the gasket manufacturer
- ✓ Bring flanges together, ensuring the gasket isn't pinched or damaged

Lubricate load-bearing surfaces

- ✓ Use only specified or approved lubricants
- ✓ Liberally apply lubricant uniformly to all thread, nut and washer load-bearing surfaces
- ✓ Ensure lubricant doesn't contaminate either flange or gasket face



Install and tighten fasteners



- ✓ **Always use proper tools:** calibrated torque wrench or other controlled tensioning device
- ✓ **Consult your gasket manufacturer** for guidance on torque specifications
- ✓ **Always torque in a cross bolt tightening pattern**

Tighten the nuts in multiple steps

- ✓ **Step 1** - tighten all nuts initially by hand (larger bolts may require a small hand wrench)
- ✓ **Step 2** - torque each nut to ~30% of full torque
- ✓ **Step 3** - torque each nut to ~60% of full torque
- ✓ **Step 4** - torque each nut to full torque, again still using the cross bolt tightening pattern (larger diameter flanges may require additional tightening passes)
- ✓ **Step 5** - apply at least one final full torque to all nuts in a clockwise direction until all torque is uniform (larger diameter flanges may require additional passes)



Re-tightening



- ✓ **Caution:** consult your gasket manufacturer for guidance and recommendations on re-tightening
- ✓ **Do not** re-torque elastomer-based, asbestos-free gaskets after they have been exposed to elevated temperatures unless otherwise specified
- ✓ Re-torque fasteners exposed to aggressive thermal cycling
- ✓ All re-torquing should be performed at ambient temperature and atmospheric pressure



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For further details on gasket installation, please refer to the
ESA/FSA Guidelines for safe seal usage - Flanges and Gaskets
(Publication N^o. 009/98) available from the FSA and ESA in *Deutsch, English, Español and Italiano*

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