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
For further details on gasket installation, please refer to the **ESA/FSA Guidelines for safe seal usage - Flanges and Gaskets** (Publication No. 009/98) available from the FSA and ESA in **Deutsch, English, Español** and **Italiano**

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