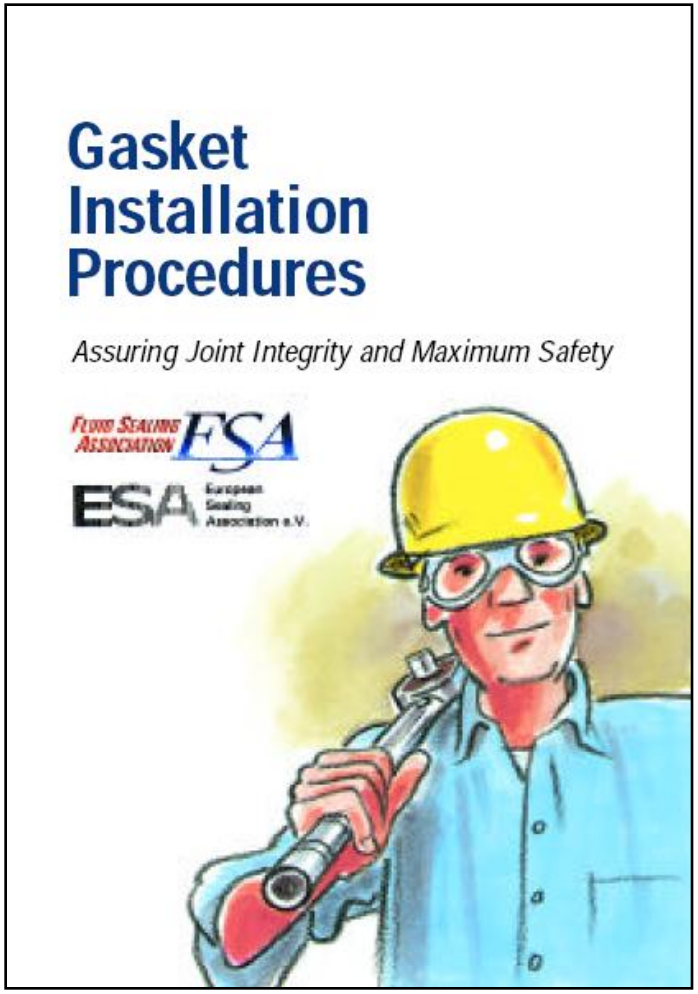
Installation & Assembly



Installation & Assembly

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 installation overview 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

Installation & Assembly

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

Installation & Assembly

1a. Clean

- Remove all foreign material and debris from:
  - Seating surfaces
  - Fasteners (bolts or studs)
  - Nuts
  - Washers

- Use plant-specified dust control procedures

Installation & Assembly

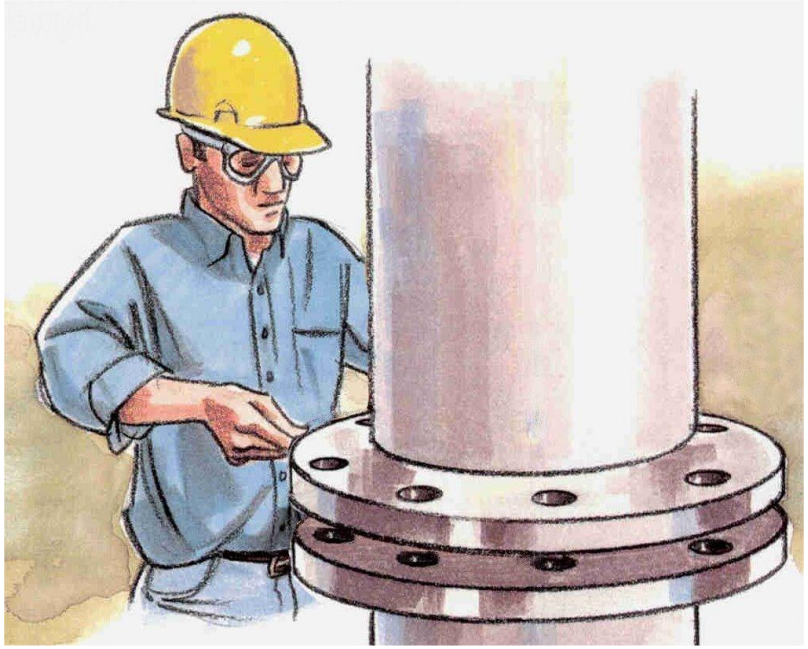
1b. Examine

- 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.

Installation & Assembly

2. Align flanges

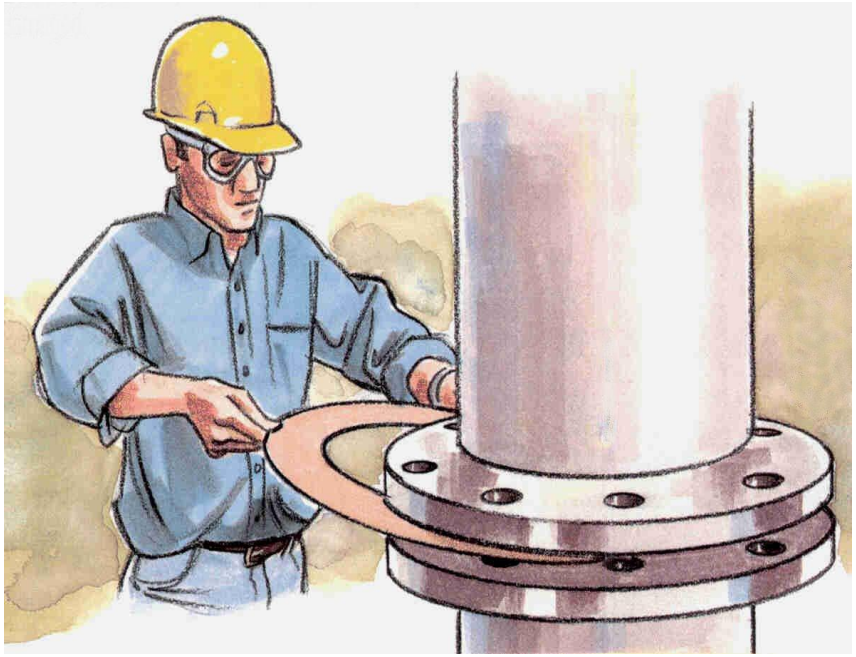
- Align flange faces and bolt holes without using excessive force
- Report any misalignment



Installation & Assembly

3a. Install gasket

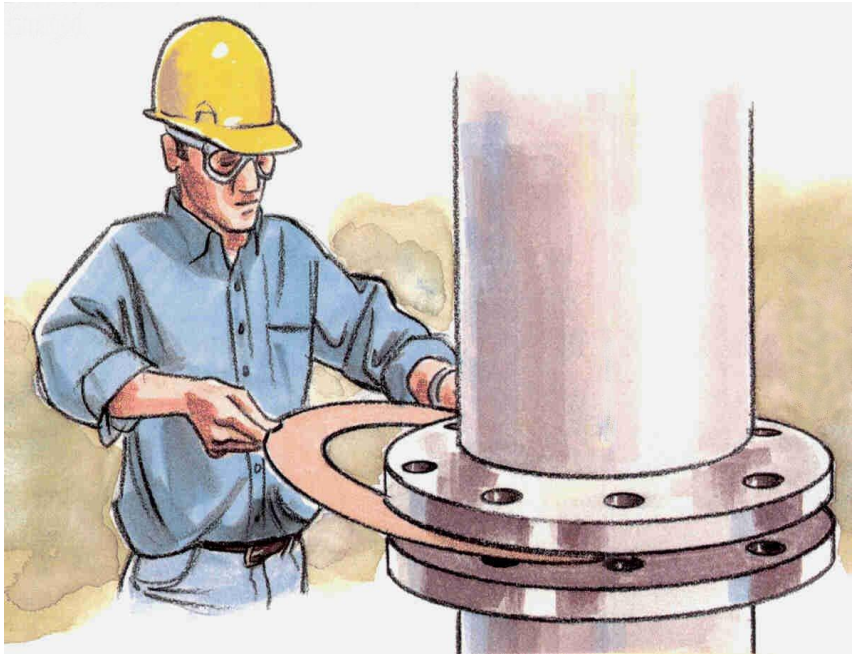
- Ensure gasket is the specified size and material
- Examine the gasket to ensure it is free of defects
- Carefully insert the gasket between the flanges
- Make sure the gasket is centered between the flanges



Installation & Assembly

3b. Install gasket

- 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



Installation & Assembly

4. 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

Installation & Assembly

4a. 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

Installation & Assembly

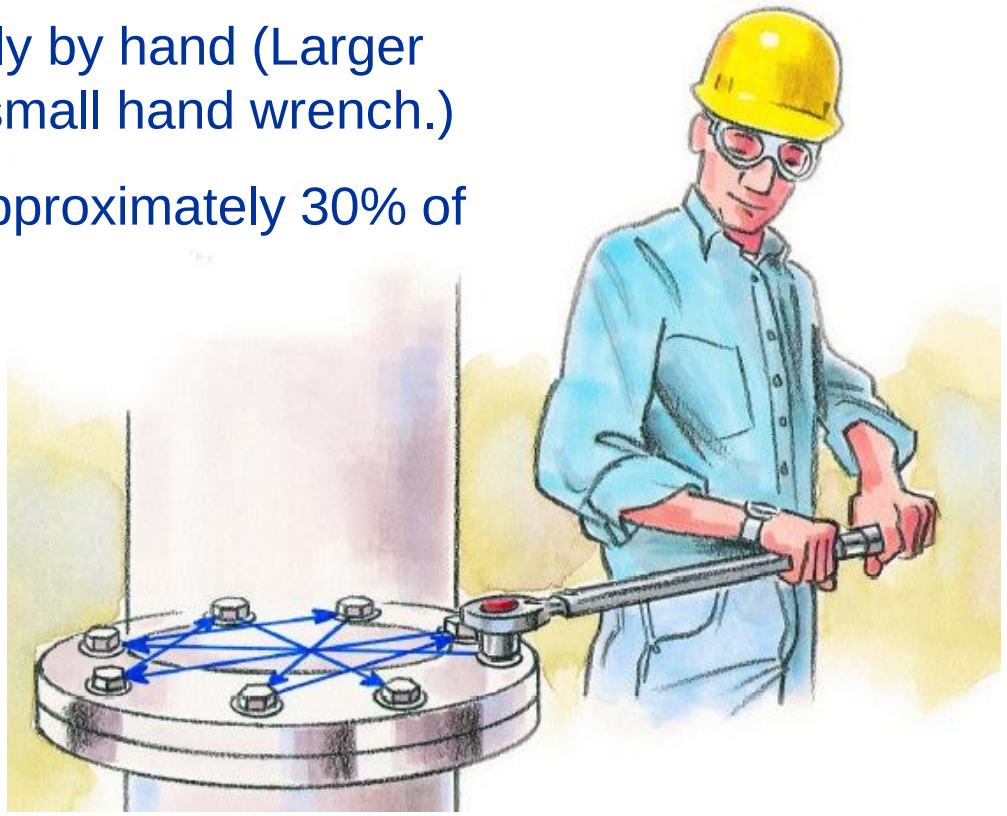
4b. Install and tighten fasteners

- Tighten the nuts in multiple steps in a cross pattern

Step 1: Tighten all nuts initially by hand (Larger bolts may require a small hand wrench.)

Step 2: Torque each nut to approximately 30% of full torque

Step 3: Torque each nut to approximately 60% of full torque



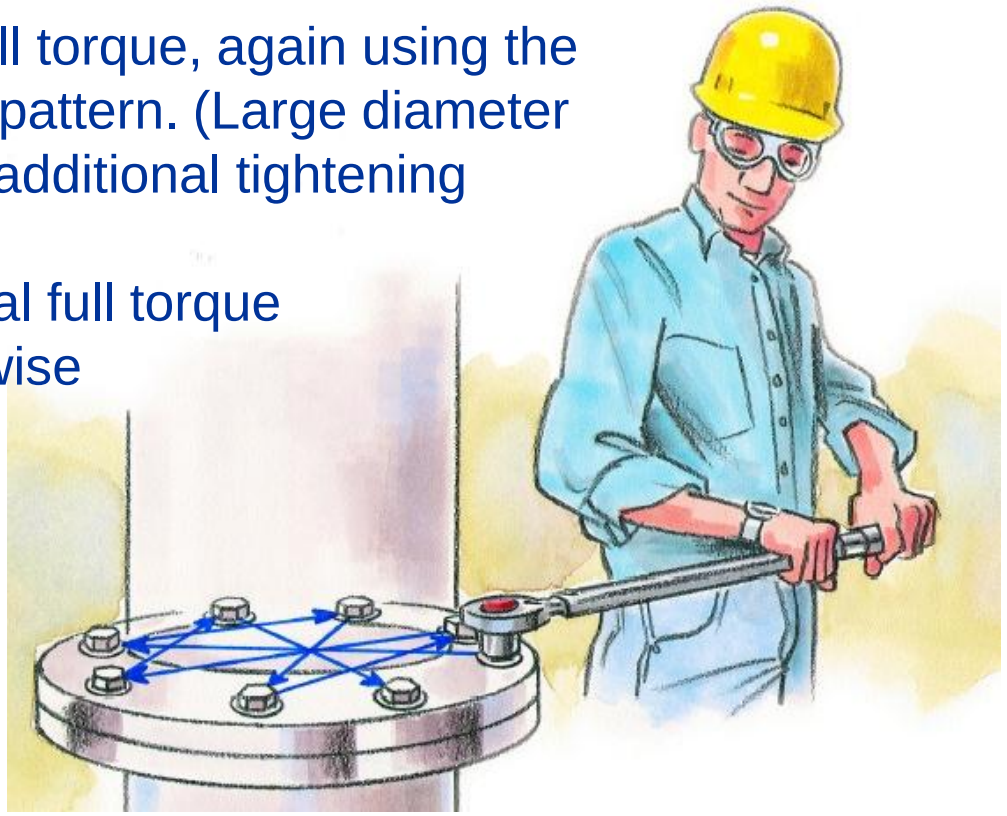
Installation & Assembly

4c. Install and tighten fasteners

- Tighten the nuts in multiple steps in a cross pattern

Step 4: Torque each nut to full torque, again using the cross bolt tightening pattern. (Large diameter flanges may require additional tightening passes.)

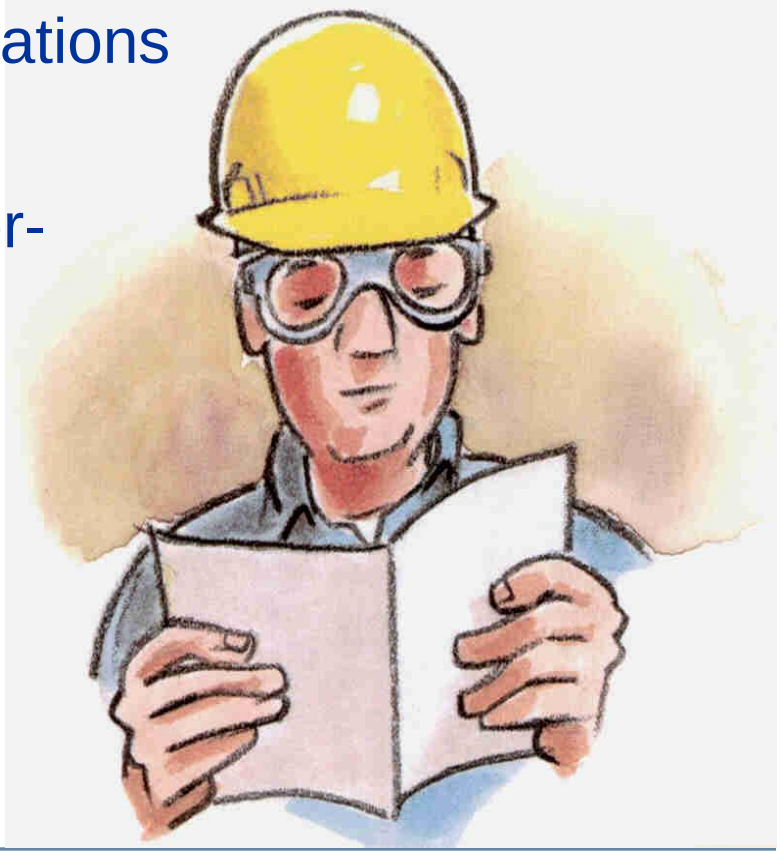
Step 5: Apply at least one final full torque to all nuts in a clockwise direction until all torque is uniform. (Large diameter flanges may require additional tightening passes.)



Installation & Assembly

5a. Retightening

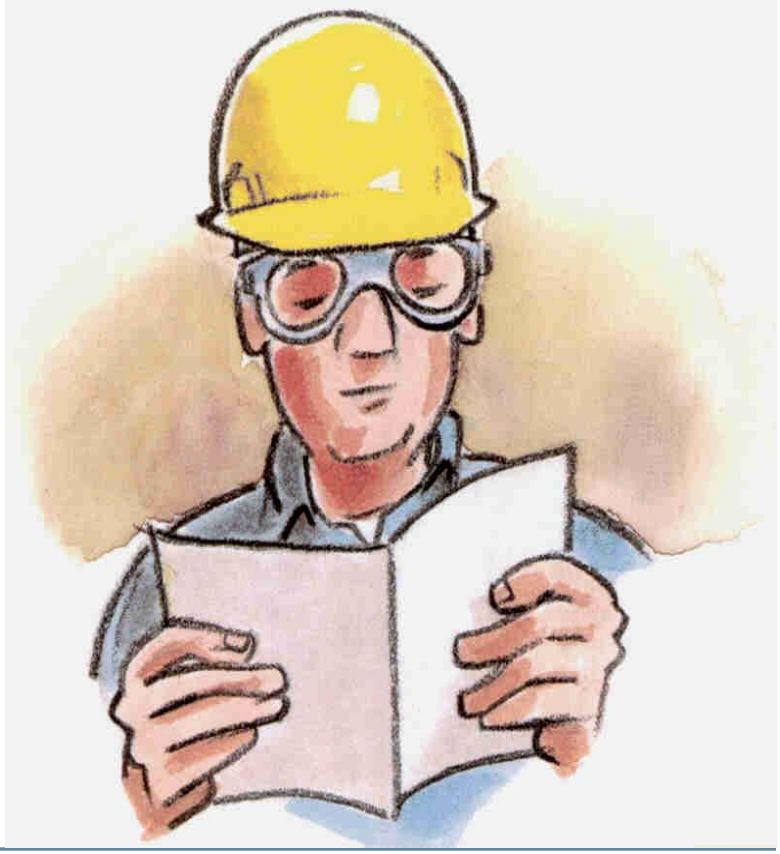
- Caution: consult your gasket manufacturer for guidance and recommendations on re-tightening
- Do not re-torque elastomer-based, asbestos-free gaskets after they have been exposed to elevated temperatures unless otherwise specified



Installation & Assembly

5b. Retightening

- Re-torque fasteners exposed to aggressive thermal cycling
- All retorquing should be performed at ambient temperature and atmospheric pressure
- Consult with the gasket manufacturer for specific recommendations on retightening under “hot” conditions



Installation & Assembly

Summary

- Clean and inspect all load bearing surfaces for defects
- Follow some sort of assembly and torquing procedure (eg. ASME PCC-1)
- Use a cross-pattern torquing procedure
- Consult the gasket manufacturer for material specific recommendations