

# ANSI FLANGE INSTALLATION GUIDE

Proper installation of ANSI flanges is crucial to ensuring a leak-free and secure connection. Follow these steps carefully, referring to the manufacturer's instructions as necessary.

## 1. Preparation & Gasket:

### Cleanliness:

- Ensure the flange faces and gasket are clean and free of debris, oil, rust, or imperfections that could compromise the seal.
- Inspect the flange faces for warping or damage that could prevent proper sealing.

### Gasket Selection & Placement:

- Choose the correct gasket type based on the application's pressure, temperature, and fluid type. Some applications may require spiral-wound, full-face, or ring gaskets.
- Place the gasket between the flange faces, ensuring it's centered and does not overlap the flange bore.
- For assembly below 40°F (4°C), a petroleum-free silicone lubricant may be recommended for the gasket to improve sealing performance.

## 2. Bolt Installation:

### Bolt Insertion:

- Insert bolts into the flange bolt holes, ensuring even spacing around the flange.

### Lubrication:

- Lubricate bolt threads and nut surfaces with an appropriate anti-seize compound (especially for stainless steel fasteners) to reduce friction, prevent galling, and ensure accurate torque readings.

### Hand Tightening:

- Hand-tighten the bolts in a cross-pattern sequence to ensure even pressure distribution before final torquing.

### 3. Torqueing:

#### Initial Tightening:

- Use a properly calibrated torque wrench to tighten the bolts in a cross-pattern sequence to the manufacturer's recommended torque values.
- Refer to the flange manufacturer's specifications for correct torque values, as over-tightening can damage the flange, while under-tightening can cause leaks.

#### Torque Stages:

Many manufacturers recommend tightening in multiple stages to ensure uniform pressure distribution:

- Stage 1: Tighten to 30-50% of the final torque.
- Stage 2: Tighten to 70-80% of the final torque.
- Stage 3: Tighten to 100% of the final torque.
- Stage 4 (Final Check, if needed): Perform a final pass at 100% torque to confirm uniform clamping force.

#### Final Torque Check:

- Once all bolts are tightened to full torque, repeat the sequence to ensure none have loosened due to gasket compression.

#### Re-Torqueing After Pressurization:

- Some manufacturers recommend re-torqueing the bolts after initial pressurization or allowing a waiting period (e.g., 4 to 24 hours) to accommodate gasket relaxation.

## 4. Other Important Considerations:

### Flange Misalignment:

- Ensure the flanges are properly aligned before tightening. Misalignment can lead to uneven stress distribution and potential leaks.

### Proper Support:

- Ensure the flange, attached pipe, fitting, and/or valve are properly supported to eliminate stress on the flange, especially for plastic flanges.

### Bolt Size and Material:

- The bolts used must be strong enough to withstand the system's pressure and stresses. Consider material, size, length, and thread type to match the flange rating and application requirements.

### Environmental Factors:

- Temperature fluctuations and exposure to certain chemicals can affect gasket material properties. Ensure compatibility with the operating environment.

### Torque Wrench Calibration:

- Regularly calibrate your torque wrench to ensure accurate torque application and prevent under/over-tightening.

### Manufacturer's Instructions:

- Always refer to the manufacturer's specific installation guide for the particular flanges you are using, as some may have additional requirements or torque specifications.