

Flanged connections:

Proper flange bolt-up and torque procedures are essential for ensuring leak-tight connections in piping systems. Here's a step-by-step guide:

Procedure for Proper Flange Bolt-Up and Torque

Tools and Equipment Needed:

- Torque wrench
- Flange gaskets (appropriate type for your service)
- Clean cloths for surface preparation
- Lubricant (if required, usually a thread lubricant)
- Bolt alignment tools (if necessary)

Procedure:

- 1. Inspect Components:**
 - Check flanges for damage, corrosion, or any irregularities.
 - Verify that gaskets are compatible with the service conditions and in good condition.
 - Ensure bolts and nuts are of the correct type, size, and length.
- 2. Clean Flange Surfaces:**
 - Clean the flange surfaces and bolt holes to remove any debris, contaminants, or old gasket material. This ensures a proper seal.
- 3. Position the Gasket:**
 - Place the gasket on one flange, ensuring it is centered and seated properly.
- 4. Align Flanges:**
 - Carefully bring the flanges together without damaging the gasket. Make sure the bolt holes align.
- 5. Insert Bolts:**
 - Insert the bolts through the aligned holes, ensuring they pass through the gasket. Use washers as necessary.
 - If applicable, ensure that the bolt threads are lubricated appropriately to reduce friction during torquing.
- 6. Hand Tightening:**
 - Begin by hand-tightening all nuts to ensure that the flanges are in contact and the gasket is compressed evenly. This helps prevent binding during the final torquing process.
- 7. Torque Sequence:**

- Use a star-pattern sequence or crisscross pattern for tightening. This helps to evenly distribute the load and avoid distorting the flanges. Here's a typical sequence for four bolts:
 1. Torque bolt 1
 2. Torque bolt 3
 3. Torque bolt 2
 4. Torque bolt 4
 - Follow this pattern for each pass.
 - Think star pattern when you tighten the lug nuts on the rim of your vehicle.
- 8. Initial Torque Application:**
- Apply torque to each bolt according to the specifications provided in relevant standards (e.g., ASME, ANSI) or by the manufacturer. Typically, this would be a lower percentage of the final torque value.
 - Typically the first pass needs to be tightened to 20% of the final torque value, second pass to 60%, third pass to 80% and final torque value on the fourth pass. This is more of a best practice if not provided with specific instructions.
- 9. Final Torque Application:**
- After the initial pass, follow up with a second pass to reach the final torque specification. This ensures that the bolt load is consistent.
- 10. Re-check Torque:**
- After the system has been pressurized (if applicable), check the torque values on the bolts again to ensure no relaxation has occurred.
- 11. Record Keeping:**
- Document the torque values and any relevant information for future reference.
- 12. Regular Maintenance:**
- Periodically check the torque values and the condition of the flange connections, especially in high-temperature or high-pressure applications.

Important Considerations:

- Always adhere to the specific torque values and procedures provided by the manufacturer or relevant standards.
- Ensure that personnel are trained in proper torque techniques and safety practices.
- Use appropriate personal protective equipment (PPE) during the bolt-up process.

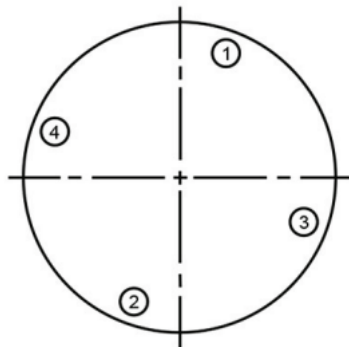
By following these steps, you can ensure a secure and leak-free connection in your piping system.

Standard torque sequence guide

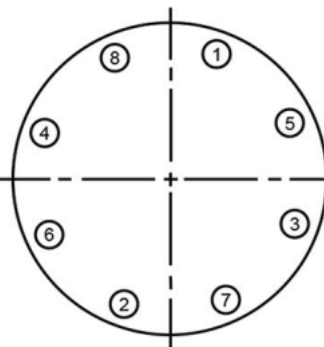


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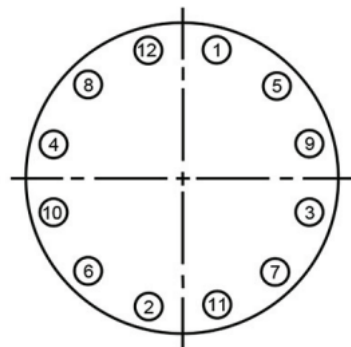
FLANGE BOLT TORQUE SEQUENCE



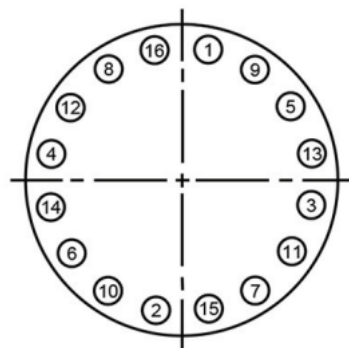
4-bolt



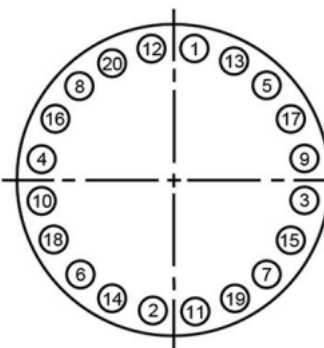
8-bolt



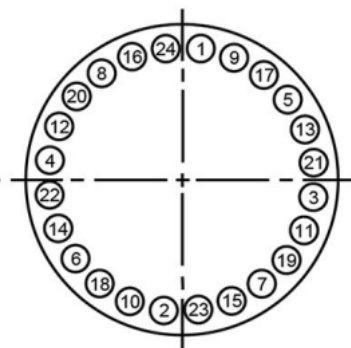
12-bolt



16-bolt



20-bolt



24-bolt



On larger flanges it's best to reference the torque sequence guide and number the studs with a paint marker so you don't lose track (I.E. 1 through 24). Talk to Quality Control for information about final torque value. Once you have the studs numbered, begin tightening stud 1 through 24 in accordance with the torque sequence chart to 20% of final torque value. Start back at stud number 1 and begin tightening the studs/bolts to 60%. Repeat the process to 80%, then repeat the process to 100% of the final torque value.

How to Use a Torque Wrench: A Comprehensive Guide for Beginners

A torque wrench is a specialized tool used to apply a specific amount of torque—a measure of rotational force—to fasteners like nuts and bolts. Using a torque wrench correctly ensures that parts are tightened to the manufacturer's specifications, which is crucial for safety and performance in automotive, construction, and mechanical applications. This guide will walk you through the basic steps of using a torque wrench effectively.

What You Need

- **Torque Wrench:** Various types exist, including beam, click, digital, and hydraulic wrenches. The common types for general use are click and beam wrenches.
- **Socket Set:** Ensure you have the right size socket to fit the fastener you are tightening.
- **Calibrated Torque Values:** These values can usually be found in a service manual or product specifications.

Step-by-Step Instructions

1. **Choose the Right Torque Wrench:**
 - Select a torque wrench that covers the torque range specified for your application. A typical range is between 10 to 150 ft-lbs (foot-pounds) or 1 to 200 Nm (Newton-meters).
2. **Calibrate the Torque Wrench:**
 - **For Click Wrenches:** Before use, it's essential to set the wrench to the lowest value and then reset it before each use. This helps maintain calibration.
 - **For Beam Wrenches:** Ensure the pointer is set to zero when at rest.
3. **Set the Desired Torque:**
 - For a click torque wrench, turn the handle until you reach the desired torque setting. Many wrenches have a scale to help you set the values accurately. Ensure you lock it in place if your model has a locking mechanism.
 - For beam torque wrenches, use the scale on the beam to visually gauge the torque being applied.
4. **Fit the Socket:**
 - Attach the correct size socket for the bolt or nut you are working with. Ensure it fits snugly to avoid stripping the fastener.
5. **Position the Wrench:**
 - Place the socket over the fastener, ensuring the wrench is oriented so that it can be turned in the torque direction (usually clockwise for tightening).
6. **Apply Torque Slowly:**

- Grasp the wrench firmly and apply gradual pressure. Avoid using excessive force, as quick or forceful tightening can lead to inaccurate readings.
- 7. **Listen for the Click:**
 - For click torque wrenches, you will hear a distinct click when the desired torque setting is reached. Stop applying force immediately. If using a beam wrench, stop when the indicator crosses the set value on the scale.
- 8. **Check Your Work:**
 - Double-check the fastener's tightness by rechecking the torque if necessary, allowing you to ensure it's properly secured.
- 9. **Store the Torque Wrench Properly:**
 - Always return the torque setting to the lowest value when finished to relieve tension on the internal components. Store it in a protective case to avoid damage.

Tips for Effective Use

- **Use in the Correct Order:** If you're working with multiple fasteners, it's often wise to tighten them in a specific pattern (like a star pattern for wheel lugs) to ensure even distribution of force.
- **Regular Calibration:** Have your torque wrench calibrated regularly to maintain accuracy, especially if you use it frequently in high-stakes environments.
- **Keep it Clean:** Regularly clean the wrench to prevent debris from interfering with its operation.

Conclusion

Using a torque wrench can seem intimidating at first, but with proper understanding and practice, it becomes a straightforward task. This tool is essential in many fields of work, ensuring safety and reliability in your projects. By following these steps and suggestions, even a complete beginner can effectively use a torque wrench and achieve the desired results. Happy tightening!



Understanding Flexitallic Gaskets: A Comprehensive Guide

Introduction to Flexitallic Gaskets

Flexitallic gaskets are a leading brand of gaskets known for their high-quality sealing solutions in various industries, including oil and gas, chemical processing, and power generation. Founded in the early 20th century, Flexitallic has built its reputation on innovative product design and a commitment to meeting the complex sealing needs of modern industrial applications.

Types of Flexitallic Gaskets

Flexitallic offers a range of gasket types and materials to accommodate different operational requirements. The primary types include:

1. **Spiral Wound Gaskets:**
 - Composed of alternating layers of metal and filler, spiral wound gaskets are designed for high-temperature and high-pressure applications. The flexibility of the metal allows the gasket to compress and conform to the flange surface while the filler material aids in sealing.
2. **RTJ (Ring Type Joint) Gaskets:**
 - RTJ gaskets are precision machined and usually used in high-pressure applications. They are designed to fit tightly into grooves on the flange faces. This type of gasket maintains sealing integrity under fluctuating temperatures.
3. **Flat Gaskets:**
 - Made from various materials like rubber, PTFE, or reinforced paper, flat gaskets are used in a variety of applications. Flexitallic's flat gaskets are particularly noted for their durability and compatibility with a range of chemicals.
4. **Compression Packings:**
 - These are chosen for dynamic sealing applications, where movement can occur. They are typically used in pumps and valves, helping to prevent leakage in equipment that experiences rotational or linear action.

Key Features and Benefits

Flexitallic gaskets stand out due to several distinctive features:

- **Versatile Material Options:** Flexitallic uses a wide range of materials, including graphite, PTFE, and various metals, which provide excellent chemical resistance and thermal stability.

- **High Performance:** Designed for high pressure and high temperature, these gaskets maintain integrity in extreme environments, which is critical for safety and efficiency in industrial operations.
- **Ease of Installation:** Flexitallic gaskets are engineered for straightforward installation, often reducing assembly time and ensuring proper fit and sealing performance.
- **Innovative Design:** The Spiral Wound Gasket, for example, allows optimal compressibility and stress distribution, which prevents over-compression and damage to flange surfaces.
- **Extensive Testing:** Flexitallic gaskets undergo rigorous testing and certification processes to ensure reliability and performance in critical applications.

Applications

Flexitallic gaskets are used in a variety of applications across numerous sectors, including:

- **Oil and Gas:** To seal flanged joints in pipelines and vessels where high pressures and potentially corrosive materials are present.
- **Chemical Processing:** In equipment where inert or aggressive chemicals need to be handled without leakage.
- **Power Generation:** For turbines, heat exchangers, and other critical machinery requiring reliable sealing under variable operating conditions.
- **Food and Beverage:** Flexitallic offers food-grade gaskets that comply with health and safety regulations, suitable for industries requiring sanitary conditions.

Installation and Maintenance

Proper installation and maintenance are essential for ensuring the longevity and effectiveness of Flexitallic gaskets. Here are some key considerations:

- **Surface Preparation:** Ensure that flange faces are clean and free of dirt, oil, or damage. Rough or uneven surfaces can lead to gasket failure.
- **Torque Specifications:** Adhering to the specified torque values is vital. Over-tightening can crush gaskets, while under-tightening can lead to leaks.
- **Inspection:** Regularly inspect gaskets for signs of wear or damage and replace as necessary to prevent leaks.
- **Proper Handling:** Handle gaskets with care to avoid trauma that could affect their performance.

Conclusion

Flexitallic gaskets provide reliable sealing solutions that meet the demands of modern industrial applications. Their innovative designs and diverse material options make

them suitable for an extensive range of applications. By understanding the different types, features, and proper installation techniques, industries can leverage Flexitallic gaskets to enhance safety, improve efficiency, and prevent costly leaks and downtime. Whether in oil and gas, chemical processing, or food and beverage, Flexitallic remains a trusted choice among professionals for robust gasket solutions.

Spiral wound gasket or commonly referred to as a flexitallic gasket. Most common, typically found in higher pressure applications.



Flat gasket or paper gasket, typically found in lower pressure applications.



Best practice to install a gasket: Align the flanges, slip the bottom two studs or bolts through the flange holes. Insert the gasket between the flanges letting the gasket rest on the bottom two flange bolts. Insert the remaining bolts/studs. Follow torque sequence above to properly tighten the bolts/studs.