



# GORE® GASKET TAPE SERIES 1000

This guide is offered to help you achieve a reliable seal when you install GORE® Gasket Tape Series 1000, with or without shims, on glass-lined steel equipment.

To reliably seal joints with two or more gaskets compressed by a single set of bolts or clamps, additional steps and precautions are required.

Sections of this guide marked with a gray bar provide specific guidance for these multi-gasket joints.

## Gasket Selection and Ordering

Gasket width and length can be determined from flange drawings. Gasket thickness and shimming requirements are based on flange deviation measurements which may need to be estimated at time of material ordering.

### 1.1 Select gasket width and length

- As flange dimensions determine gasket width and length, obtain flange inside diameter (ID), outside diameter (OD) and sealing surface width before flange rounding (see Figure 1).
- Minimum gasket width is full coverage of the contacting glass surfaces.
- Ideal gasket width extends from flange ID to OD.
- To determine appropriate gasket tape length: Obtain flange circumference at the OD and add at least 50 mm (2") for the skive cut.

### 1.2 Select gasket (base layer) thickness

- Most applications require a base layer of 6 mm (1/4") tape, which can accommodate deviation up to 1.7 mm (0.07") without shimming.
- Deviations up to 2.5 mm (0.10") can be accommodated by using 9 mm (3/8") tape without the need for shimming.
- Deviations that exceed the above limits can be addressed by adding one or more layers of 3 mm thick GORE® Gasket Tape Series 1000 Shimming Tape.
- To minimize bolt-load loss from creep, choose a thinner base layer plus shims rather than a thicker base layer. For example, a 6 mm base layer plus 3 mm shim (applied only where needed) will minimize bolt-load loss from creep better than a 9 mm base layer alone.

### 1.3 Select shimming (if needed)

To effectively seal flanges with deviations that exceed the maximum for the base layer, shimming material is required. Use 3 mm (1/8") GORE® Gasket Tape Series 1000 Shimming Tape as directed in Section 3.6. Choose Shimming Tape width that matches base layer width.

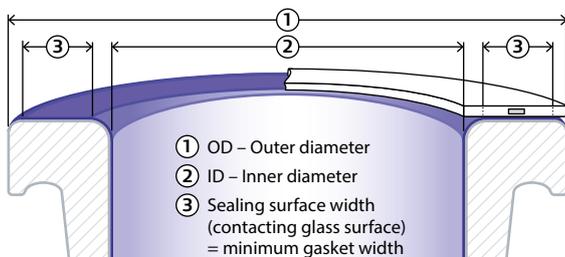


Figure 1: Determining gasket dimensions.

## Preparation

### 2.1 Assemble required materials

- GORE® Gasket Tape Series 1000, selected per this guide
- GORE® Gasket Tape Series 1000 Shimming Tape, if needed per this guide
- Fasteners/ancillary items (e.g., spring washers) specified by flange manufacturer
- Glass cleaning and drying supplies
- Fastener cleaning and lubricating supplies
- Site-required PPE, including cut-resistant gloves and eye protection

### 2.2 Assemble required tools

- For 6 mm base layer and possible shimming: Feeler gauges for 1.7, 3.2, 4.7 mm (0.07, 0.13, 0.19") with  $\pm 0.1$  mm accuracy
- For 9 mm base layer only: Feeler gauge for 2.5 mm (0.10") with  $\pm 0.1$  mm accuracy
- Approved flange-specific installation torque target
- Calibrated torque wrench(es)
- Sharp straight-edge knife
- Knife sharpener
- Optional skive-cutting guide tool
- Measuring tool for flange dimensions
- Fine-tip permanent marker (to mark gasket tape)
- Large-tip permanent marker (to mark flange)

### 2.3 Flange deviations determine gasket thickness

Measure and mark flange surface deviation around full flange circumference to within  $\pm 0.1$  mm, to identify appropriate gasket thickness (Section 1.2) and any areas that will require shimming (Section 1.3).

See Figure 7 for an example of completed flange deviation markings and associated shimming.

## IMPORTANT

Ensure that flanges are clean of all contamination and debris that could cause errors in measuring flange deviation.

When measuring flange dimensions/deviations for joints with a single gasket:

- Place a separator between the flanges to avoid glass-to-glass contact while measuring flange deviation. Separator material must be flat and uniform thickness, non-compressible under the weight of the top flange placement, and thin/flexible enough to conform to bottom flange deviations during measurement (example: thin fiber board).
- Close and align the flanges without compressive load beyond equipment weight.
- Around the entire flange circumference, use feeler gauge(s) to measure the deviation between the top/removable flange and the non-compressible separator, to an accuracy of  $\pm 0.1$  mm ( $\pm 0.01$ "). It may be necessary to shift the separator to the upper or lower flange so that you can measure the entire gap from one side of the separator.
- On the stationary/bottom flange, mark all start- and end-points where the prescribed thickness of feeler gauge could be inserted. (See tool list for feeler gauge requirements.) Refer to Table 2 and Figure 7 for additional detail regarding use of a 6 mm base layer.
- Be sure to place a reference mark on both flanges to enable correct flange realignment at assembly. Remove separator.

For joints with two or more gaskets compressed by a single set of bolts or clamps:

A separate set of deviation measurements must be taken for EACH gasket relative to its adjacent equipment surfaces. This is due to the fact that each gasket only compensates for deviation between the two surfaces that directly adjoin it (see Figure 2).

Clamp configuration

Bolt configuration

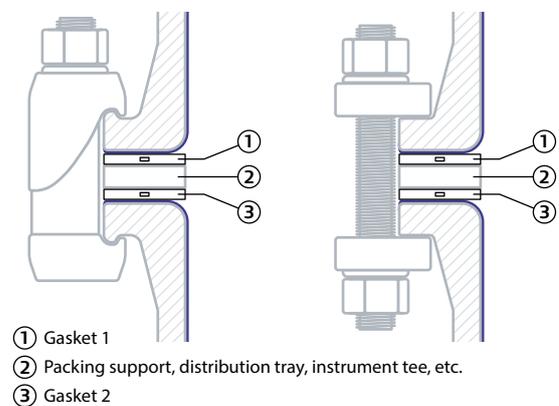


Figure 2: Illustration of joint with multiple gaskets.

## Gasket Installation

### 3.1 Open flanged connection

For ease of installation, open the flanges a minimum of 15 cm (6"). Ensure the flanges are well secured for a safe working environment.

### 3.2 Clean and dry sealing surface thoroughly

To ensure optimal adhesion, remove all oil, graphite, and other residue. Glass flange surface must be completely dry for the gasket adhesive to adhere. The adhesive bonds effectively to glass flanges with surface temperatures ranging from 2–50 °C (36–122 °F).

If your installation surface temperature is outside of this range or you have other challenges preparing the flange surface, please contact Gore.

## IMPORTANT

The adhesive performs best on a glass surface that is clean, and at a temperature that is comfortable to the touch. Glass surface **MUST** be completely dry. If necessary, gently warm flange to remove any condensation.

### 3.3 Perform initial skive cut

Unwind about 50 cm (1.5') of GORE® Gasket Tape Series 1000 onto a clean, firm surface. Do not use the flange surface for this purpose. Cut the end of the tape with a sharp knife using the skiving technique.

**Hint:** Use a fine-tip permanent marker to draw the desired diagonal line on the side of the gasket tape, as a cutting guide.

To achieve the desired angle of approximately 10°, the length of the skive cut ( $L_s$ ), should match the dimension in Table 1. Avoid making it shorter.

Tape thickness (t)	Skive cut length ( $L_s$ )	Thickest skive section (h), at target of ~1.3x (t)
6 mm (1/4")	30–40 mm (1 1/4")	8 mm (1/3")
9 mm (3/8")	45–60 mm (2")	12 mm (1/2")
3 mm (1/8")	15–20 mm (3/4")	N/A

Table 1: Skive dimensions (see Figure 3 and 5 for reference).

## IMPORTANT

When using the skiving technique to cut the gasket tape, the skive-end **MUST** be cut at an angle so it tapers smoothly to a point where it meets the flange. Do not leave a step at the skive-end (See Figure 3).

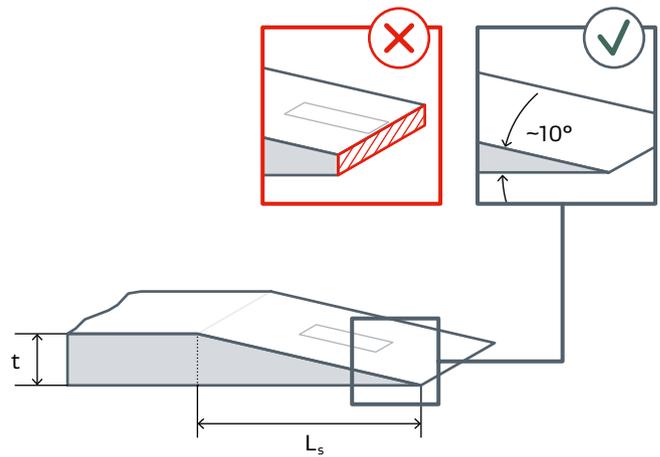


Figure 3: First skive cut. End must not have a step.

### 3.4 Position and apply base layer of gasket tape

- Start applying the base layer by positioning the skived end of the gasket tape at the location of a clamp or bolt where no shimming is needed. Ideally this location would have minimal flange deviation, even less than the allowable deviation for the base layer. Try to avoid locations where obstructions will hinder access for the second skive cut.
- Excess material width should be distributed evenly beyond ID and OD to keep the barrier core roughly centered on the flange-sealing surface. Excess OD must not interfere with clamp or bolt placement.
- To prevent the adhesive from picking up dirt, do not remove the backing-strip until just before installing the gasket tape. Be careful not to dislodge the adhesive from the gasket while peeling off the backing strip.

#### For joints with two or more gaskets:

Offset the skive-joint locations of each gasket. For example, in a joint with two gaskets, position the skive joint at 12 o'clock on one gasket and at 6 o'clock on the other gasket.



### 3.6 Shim flange irregularities

Use Gore's 3 mm (1/8") Series 1000 Shimming Tape to compensate for flange deviations that were previously marked (per Section 2.3). See Figure 7 for examples (I, II and III) of irregularities and associated flange markings. A multiple-shim installation is illustrated in Figure 8.

When shimming flange irregularities:

- Skive-cut the loose end of the shim tape as recommended in Section 3.3.
- Place the skive-cut end atop the base layer of gasket tape, with the skive ramp centered on the beginning deviation mark on the flange. (See Figure 7.)
- Apply the shim tape to the flange deviation area, extending at least 50 mm (2") past the ending deviation mark on the flange. Cut the end of the excess material with a straight (not angled) cut.
- Skive-cut the squared end per Section 3.5, with the skive ramp centered on the ending deviation mark on the flange (See Figure 7). Be sure to remove the excess shim tape beyond the skive cut.

Repeat the four steps above until enough shims have been installed to compensate for the measured flange deviation.

Measured deviation	Shims	Total thickness
0–1.7 mm (0–0.07")	(none)	6 mm (1/4")
>1.7–3.2 mm (>0.07–0.13")	1 x 3 mm (1/8")	9 mm (3/8")
>3.2–4.7 mm (>0.13–0.19")	2 x 3 mm (1/8")	12 mm (1/2")
>4.7–6.2 mm (>0.19–0.25")	3 x 3 mm (1/8")	15 mm (5/8")

Table 2. Shimming guidance for 6 mm (1/4") base layer

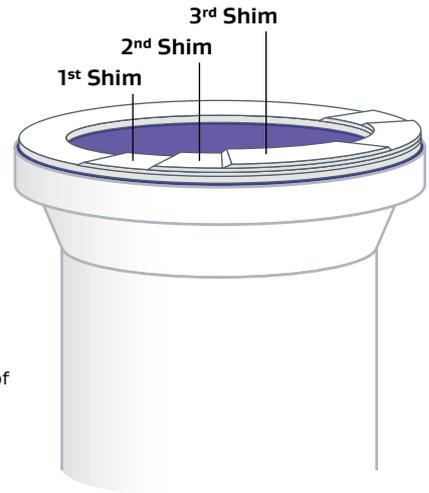


Figure 8: Illustration of multiple shim layers

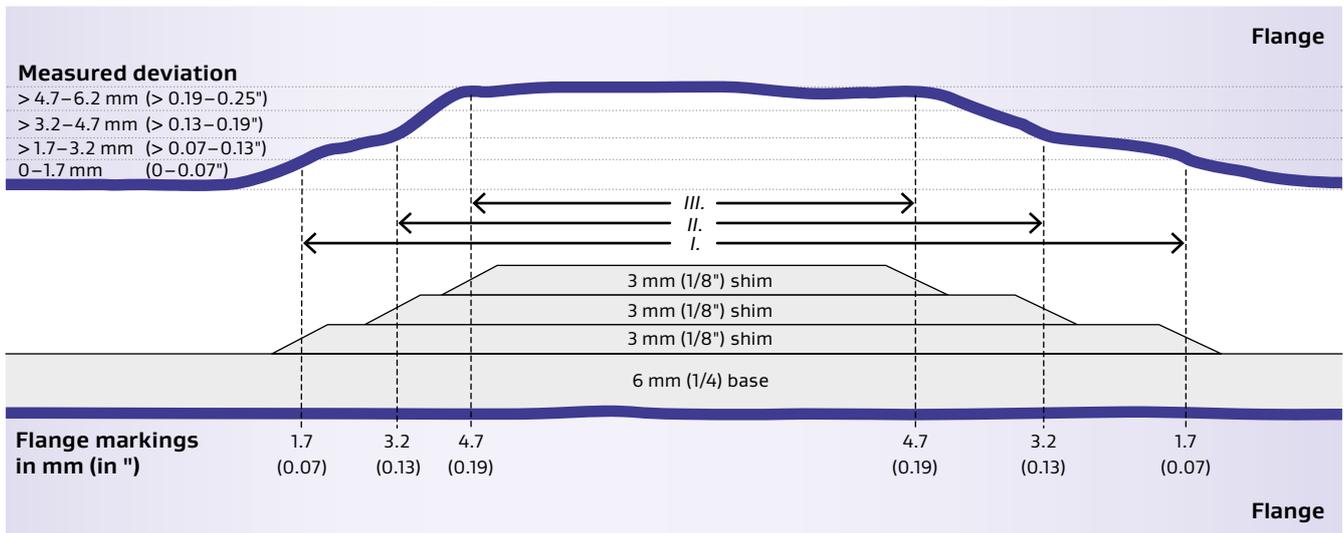


Figure 7: Flange deviation example with 6 mm (1/4") base tape. Note: Figure is not to scale.

## Flange Torquing

### 4.1 Confirm target torque



Follow the equipment manufacturer's torque recommendations at all times. Confirm this meets or exceeds the gasket stress recommended in the GORE® Gasket Tape Series 1000 data sheet →[PDF](#).

### 4.2 Close the flanged connection

Bring the flanges into contact and use reference marks (per Section 2.3) to align. If multiple shim layers are causing uneven contact, pre-compress the shimmed layers by slightly tightening the closest bolts/clamps.

### 4.3 Torque

- Use a calibrated torque wrench to tighten lubricated bolts or clamps, working in a star pattern with three incremental passes: one each at 30%, 60% and 100% of recommended torque.
- Follow with one, or a maximum of two<sup>1</sup>, circular passes at 100% of recommended torque.
- Allow at least 4 hours for flange system relaxation, followed by one, or a maximum of two<sup>1</sup>, circular passes at 100% of recommended torque.

For additional detail, refer to industry-standard best practices such as ESA/FSA "Gasket Installation Procedures" or ASME PCC-1.

### 4.4 Thermal cycle

Thermally cycle the flange connections by bringing the equipment to maximum service temperature for a minimum of one hour. Allow flanges to cool (to approximately ambient temperature) before retorquing.

### 4.5 Retorque

The majority of creep occurs after the first thermal cycle, so this retorque step enables any necessary corrections to be made before the equipment is put back into service. For joints with a single gasket, retorquing is recommended with one, or a maximum of two<sup>1</sup>, circular passes at 100% of torque from Section 4.1.

For joints with two or more gaskets:

Retorquing (as described in Section 4.5) is **REQUIRED** before putting equipment into service.

## IMPORTANT

Flanges **MUST** cool to near ambient temperature before any retorquing.

<sup>1</sup> For tape gasketing of glass-lined steel flanges, a maximum number of circular passes is specified. This differs from industry-standard procedures that were developed primarily for steel flanges.

For further questions about installation, or about our gaskets in general, contact your local GORE representative.

For gasket selection criteria, technical information, and a complete listing of local sales offices, please visit [gore.com/sealants](http://gore.com/sealants).

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