

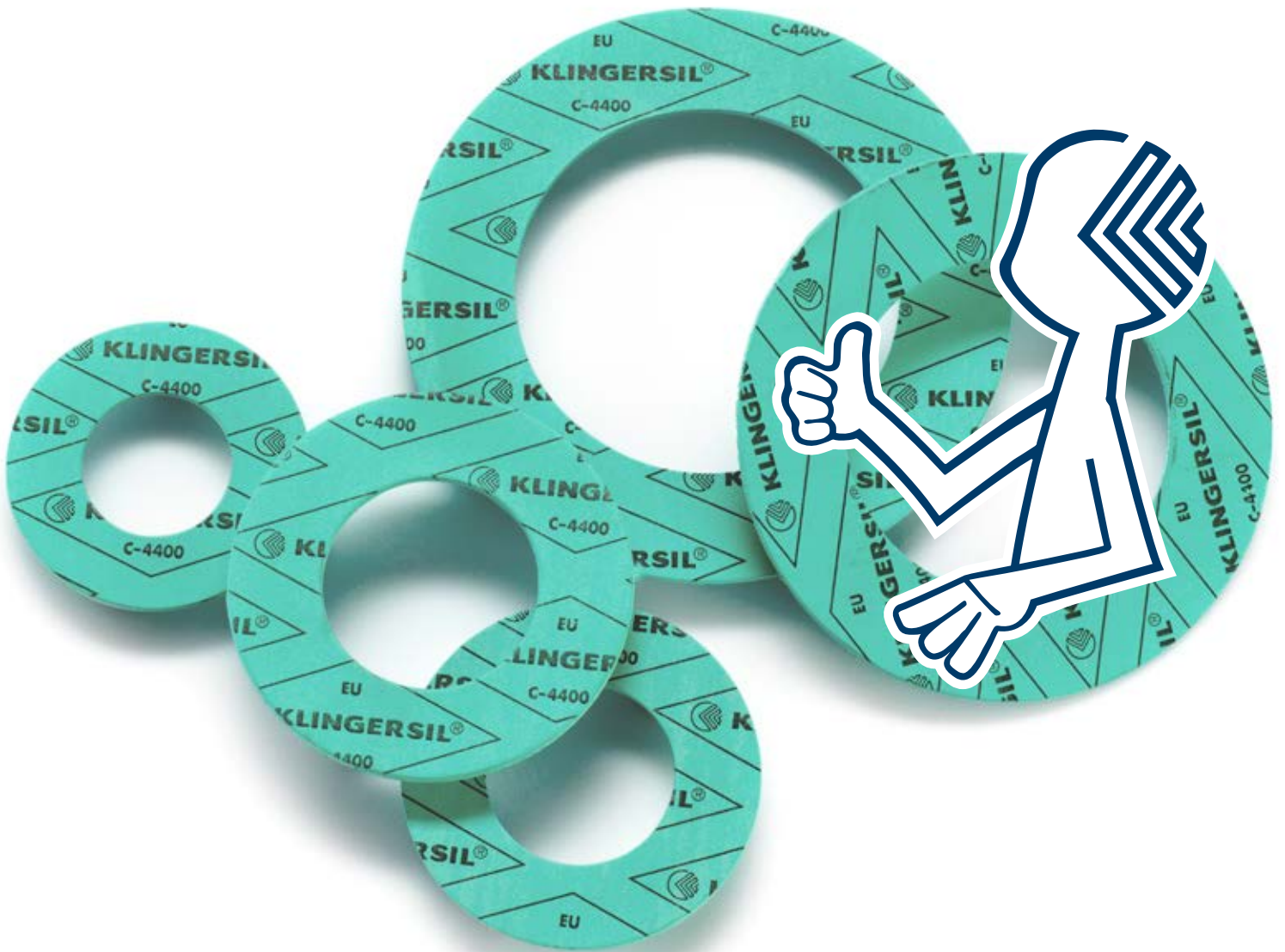


INSTALLATION MANUAL

for KLINGER® gaskets



INSTALLATION TIPS FOR KLINGER® GASKETS



SUITABILITY

Check on chemical resistance



STORAGE

Check on storage conditions



PT-DIAGRAMS

Review the pt-Diagrams

INSTALLATION INSTRUCTIONS FOR KLINGER® GASKETS

1. GASKET DIMENSIONS



1.1 CORRECT SIZE

- ✓ The gasket has to have the correct size.

1.2 BOLT HOLES

- ✓ Cut the bolt holes just a bit larger than the bolts to simplify the centralization of the gasket.

1.3 INNER DIAMETER

- ✓ The inner diameter of the gasket should not be smaller than the inner diameter of the flange.

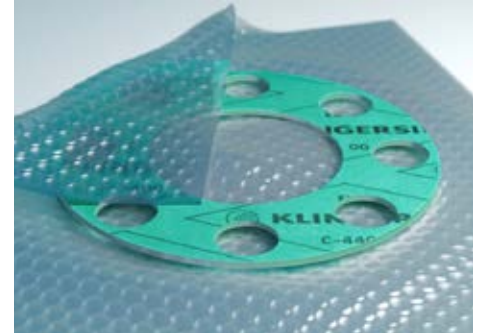
2. STORAGE



2.1 IDEAL STORAGE CONDITIONS

- ✓ The gasket should be stored horizontal to avoid tensions and permanent warpage.
- ✓ Ideal storage conditions are:
 - » temperature < 25°C
 - » air humidity 50 - 60%
 - » darkened storage room
 - » Store the gasket in a clean condition (ideally in a plastic bag).

3. HANDLING



3.1 PROTECT THE GASKET

- ✓ All types of gaskets (metallic gaskets, PTFE gaskets, fibre reinforced gaskets etc.) should be handled with the same care and attention.
- ✓ Avoid carrying small gaskets in a pocket to protect the gasket from damage.
- ✓ Carry ready cutted gaskets carefully, ideally in some form of protective cover.

3.2 PROTECT THE SURFACE

- ✗ Do not bend the gasket and do not damage the surface.

3.3 TAKE CARE

- ✓ Metal reinforced gaskets could cause injuries.

CUT THE BOLT HOLES LARGER THAN THE BOLTS



4. BOLTS / NUTS / WASHERS



4.1 BOLT PROPERTIES

- ✓ Pay attention that all bolts which are designed for the flange are installed.
- ✓ Check if the used bolts are suitable for the given operating temperatures.
- ✓ Tighten the bolts crosswise with the correct torque (calculation with KLINGER®expert).
- ✓ Ensure that there is no corrosion on the bolts because this can effect the function of the bolt.
- ✗ Never re-use bolts.

4.2 NUT PROPERTIES

- ✓ Use a nut which has a specified proof load 20% higher than the ultimate strength of the fastener.
- ✓ Use standard threads, rather than fine.
- ✓ Use the correct lubricant.

4.3 WASHERS

- ✓ Use the same material for the washers and the nuts.
- ✓ Use washers to:
 - » bridge slotted or oversized holes
 - » even interface forces between joint components
 - » reduce problems of fatigue by spreading the load placed by the fastener on the joint.

5. GASKET INSTALLATION



5.1 THE TOOLS

- ✓ At first make sure that the following tools are available and in good condition:
 - » the correct gasket chosen for the specific application
 - » a calibrated torque wrench
 - » a wire brush
 - » lubricants for the bolts

5.2 CLEANING OF ALL FLANGE SURFACES

- ✓ Make sure that the flange surfaces are clean.
- ✓ Check the bolts and the flange surface if they are technically ok and free from any serious defects.
- ✓ Always brush in the direction of the grooves.
- ✓ To avoid damage on the flange surface please use a brass drift.



5.3 FLANGE CONDITIONS

- ✓ Make sure that the flanges are parallel and report all irregularities.

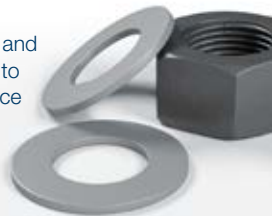


5.4 IMPORTANT FOR THE GASKET

- ✓ Insert the gasket carefully between the flanges.
- ✓ The gasket has to be centralized in the flange.
- ✓ Ensure that the gasket is installed in a dry state.
- ✓ It is important that the gasket is not pinched or otherwise damaged when bringing the flanges together.

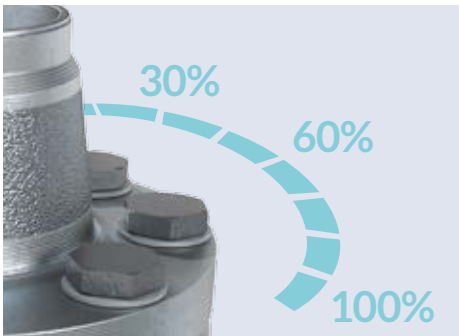
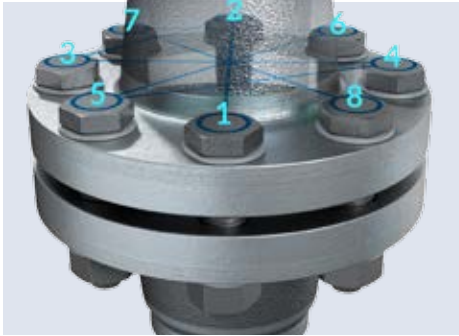
5.5 LUBRICATION OF BOLTS

- ✓ Apply lubricant to the bolt and the nut threads as well as to the face of the nut to reduce friction when tightening.
- ✓ Pay attention that the lubricant does not contaminate the gasket or the flange surfaces.
- ✓ The recommended service temperature of the lubricant has to be within the process service temperature limits.



MAKE SURE THE GASKET IS UNDAMAGED WHEN BRINGING THE FLANGES TOGETHER





5.7 RE-TIGHTENING

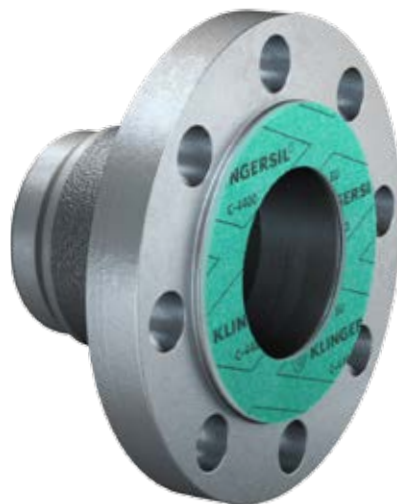
- ✓ If retightening is considered necessary, this should only be done at ambient temperatures before or during the first start-up.
- ✗ Never retighten compressed fibre gaskets at higher operating temperatures and longer operating times.

5.8 RE-USE OF GASKETS

- ✗ For safety reasons never re-use a gasket.
- ✓ The cost of a gasket is minimal compared with the costs which are related to a down time of the plant.

5.6 BOLT TIGHTENING

- ✓ The required torque value can be calculated with KLINGER®expert.
- ✓ The following 5 steps are necessary to achieve an even torque:
 - » finger tighten bolts (cross pattern)
 - » use 30% of the required torque (cross pattern)
 - » use 60% of the required torque (cross pattern)
 - » use 100% of the required torque (cross pattern)
 - » Close the torquing with two final passes in a clockwise sequence.



THE GASKET HAS TO HAVE THE CORRECT SIZE

