

Optimized Gasket Design

VdTÜV MB 100 / FDBR V-DK-009

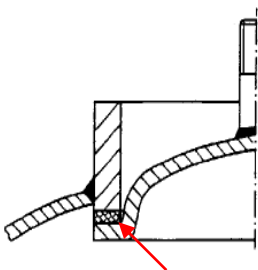
For users of oval closure lid gaskets according to VdTÜV Leaflet “Gasket 100” (previously TRD 401 appendix 1) of novaphit® SSTC^{TRD 401}.

novaphit® SSTC^{TRD 401} is the product name which will be continued despite of the discontinuation of the TRD 401 standard. The printing on the gasket sheets will be extended by VdTÜV Leaflet Gasket 100.

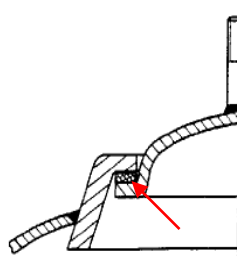
The gasket material novaphit® SSTC^{TRD 401} is approved for several years as manhole, headhole and hand-hole gaskets for steam boilers and pressure vessels. In contrast to products containing rubber, the material novaphit® SSTC^{TRD 401} is resistant to high temperatures and alternating loads and has an extraordinary leakage performance. However, it is mechanically sensitive. Because of that fact, it must be paid attention to the correct geometry of the gasket, which must be optimized for the oval closure lid.

Comparison of different closure systems

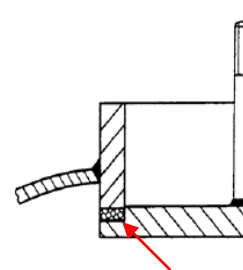
Steam boilers have an upright ring or a conical welding ring, flat or arched closure lids. Due to the combination of this two characteristics different quality levels of the sealing surface arise and affect surface finish and plane parallelism (chart from VdTÜV Leaflet Gasket 100)



upright ring
arched closure lid



conical ring
arched closure lid



edge ring
flat closure lid

Gaskets made from novaphit® SSTC^{TRD 401} are extremely dimensionally stable. This is a quality feature which is required by the instructions of VdTÜV Leaflet Gasket 100 and demanded for a dimension of the gasket that fits exact on the closure lid. Additional geometrical adjustments are not recommended. The unavoidable radius at the arched closure lid (arrow) or a chamfer at the flat closure lid can damage the gasket during assembly or start-up process if the fit is too tightly.

The VdTÜV Leaflet Gasket 100 says: “The dimensions of the radius must allow a proper opening and closing of the lid (no jamming allowed) and an even position of the gasket on the sealing surface

Together with leading manufacturers and users Frenzelit recommends optimizing the dimensions of the oval closure lid gaskets made of novaphit® SSTC^{TRD 401}. Two recommendations:

Optimized Gasket Design

VdTÜV MB 100 / FDBR V-DK-009

1. Standards to keep in mind

Using gaskets for manhole, headhole and handhole applications in steam boilers the current versions of VdTÜV Leaflet Gasket 100 and V-DK-009 must be complied with.

2. Geometry of the gasket

Inside dimension

Deviant from the usual nominal sizes the inner ovals must be enlarged by 2mm in both directions. This avoids a too narrow fit of the gasket and the risk of tearing during tightening. For assembly aid the gasket can be fixed with a usual adhesive spray.

Gasket width

The usual gasket width of headhole and manhole gaskets (nominal size > 200 mm x 300 mm) must be reduced from 25 mm to 20 mm. The width of handhole gaskets can be reduced from 15 mm to 13 mm. This modification achieves a homogeneous compression along the lid circumference and an increase of the surface pressure during installation.

Example: Headhole: nominal size (mm) 220 x 320 x 25 → manufacturing size (mm) 222 x 322 x 20

3. Thickness of the gasket

Generally, headhole and manhole gaskets are used with a thickness of 4,0 mm or 6,0 mm. In most cases 4,00 mm is used for handhole gaskets. For the first use and with plain, almost new sealing surfaces also 2 mm can be used.

4. Structure and manufacturing of the gasket

Gasket thicknesses of 4,0 mm and 6,0 mm are produced by doubling of the 2,0 mm thick novaphit® SSTC^{TRD 401} material. The connection of the different layers is fixed by small amounts of bonding agents (tesa® 60020, tesa® 60021, Scotch Super 77, Teroson SB 2444, Henkel Terokal 2444 or equivalent). It is only recommended to use small amounts of bonding agents which should not exit at the cutting edge.

5. Use of XP-technology for novaphit®

For an easier disassembly of gaskets also the novaphit® SSTC^{TRD 401} with XP technology can be used. Don't spray the bonding agents on the blue printed top of the gasket or expose it to the spray!

6. Maximum pressure

Oval closure lids of novaphit® SSTC^{TRD 401} resist internal pressure levels up to 150 bar or higher, although the scope of the VdTÜV Leaflet Gasket 100 is limited to 40 bar. With high internal pressure levels, the use of thicknesses of 2,0 mm or 4,0 mm is recommended.

Optimized Gasket Design

VdTÜV MB 100 / FDBR V-DK-009

7. Delivery, packing, assembly, and documentation of the gaskets

Each gasket for oval closure lids must be individually wrapped. The TechInfo “fitting instructions” has to be added. This document must be sent with every delivery of the novaphit® SSTC^{TRD401} and has to be duplicated for further deliveries. It contains installation instructions, that must be archived in the respective boiler book of the boiler. The contact details of the retailer can be added, but the manufacturer name (Frenzelit) and the product name (novaphit® SSTC^{TRD401}) must not be changed. Otherwise, the test loses its validity.

8. Shelf life

Details for shelf life of the finished gasket are noted in the TechInfo 2 “Storage Conditions Gaskets” (online in the download area TechInfos) and must be considered.

Do you have any questions about your application? Our gaskets application engineering will help you: gaskets@frenzelit.de,

Phone: +49 9273 72-419

Status: April 2022