

Novaphit® gaskets made from expanded pure graphite are suitable for high chemical, thermal and mechanical stresses. They do their job reliably even when there are extreme fluctuations in conditions. novaphit® gaskets do not contain any binders.

Properties of novaphit® gaskets made from expanded graphite

- Suitable for temperatures between -200 °C and 550 °C
- Insensitive to changing loads
- Maximum adaptability to flange unevenness
- High flexibility when sealing surfaces are unfavourable/faulty
- Practically no hot creep
- Universal chemical resistance
- Maximum sealing performance in the flange
- Use possible at internal pressure levels of up to 250 bar

Environmental protection

High-quality gaskets make a major contribution to protection of the environment. Rules like the German regulations about air pollution (“TA Luft”) specify demanding sealing criteria. It is particularly important that these criteria are met in applications involving media that endanger the environment and are harmful to health.

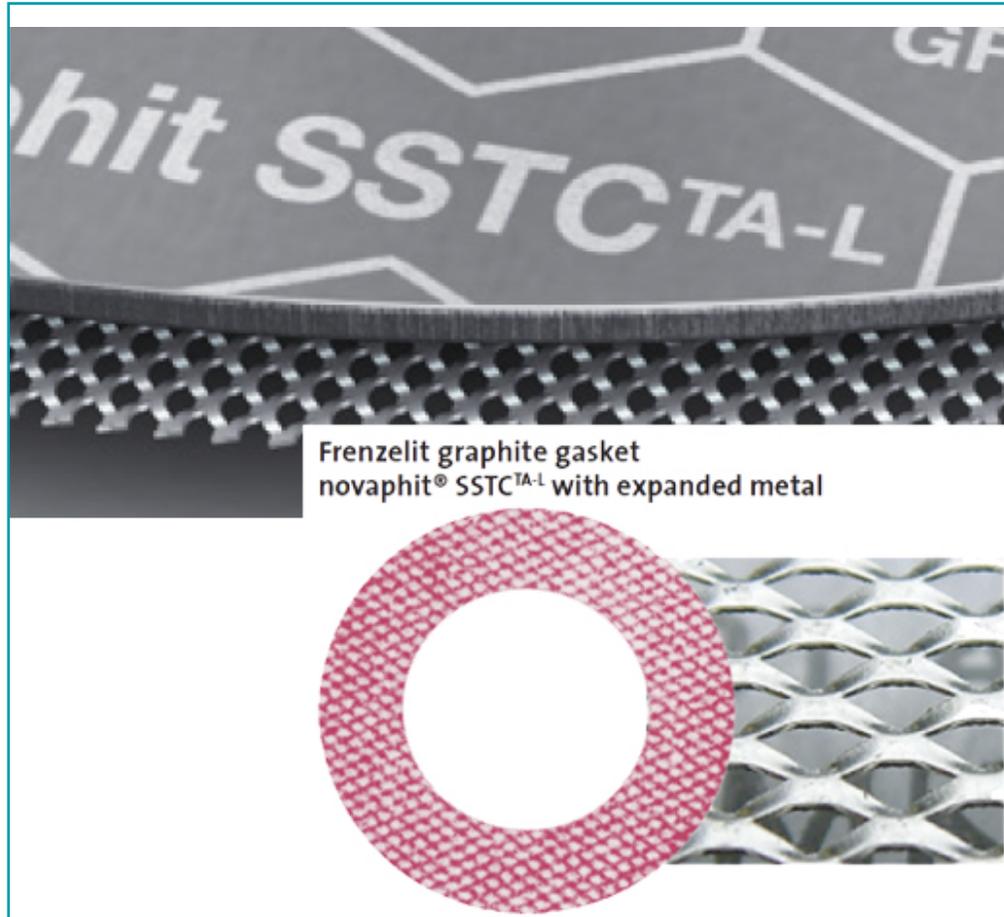
Focus on the entire sealing system: VDI 2290

There are more detailed regulations that are designed to make sure the requirements of TA Luft are satisfied more specifically. The quality of the overall gasket connection is influenced not only by the properties of the gasket material but also by the installation situation. The current VDI directive 2290 is based to a particularly large extent on a comprehensive approach to the creation of a sealing system. The importance of expert installation is stressed just as much as the need for accurate design calculations.

Gasket design in accordance with DIN EN 1591 DIN EN 1591-1 is explicitly recommended for the design and calculation of gasket systems. Attention is also drawn to use of the design sealing class L0,01 in VDI 2290.

Thanks to their optimum performance, novaphit® MST and novaphit® SSTCTA-L enable gasket connections to be established that meet the strict criteria of TA Luft and VDI 2290.

By supplying novaphit® MST and novaphit® SSTCTA-L, Seaco creates the basis for carrying out company-wide standardisation at a maximum quality level.



Material profile of novaphit® SSTC / novaphit® SSTCTA-L

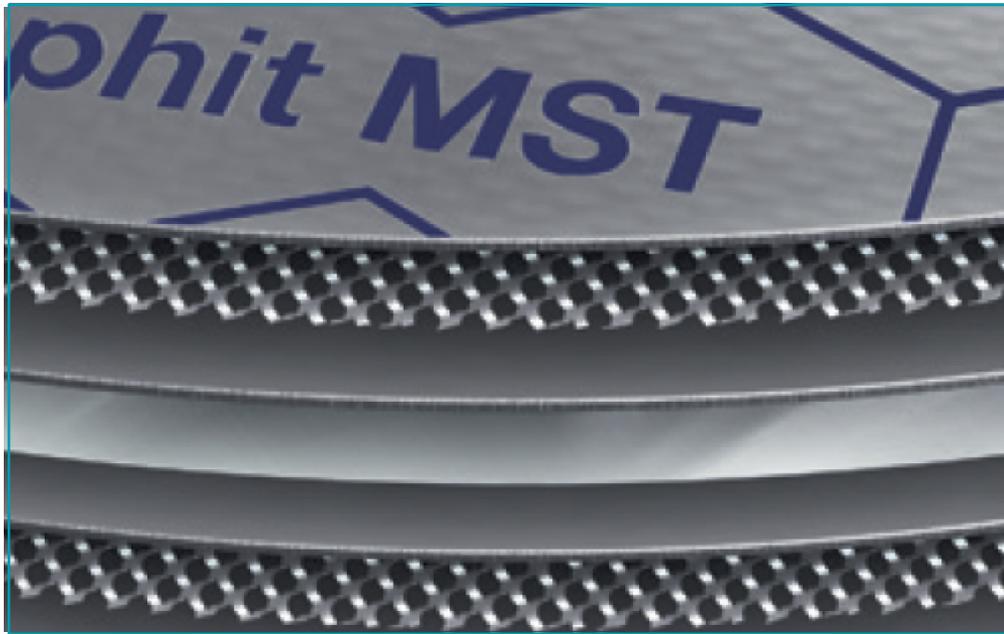
Gasket material made from expanded graphite (purity level > 99 %) with internal impregnation and an acid-resistant expanded metal insert made from chrome-nickel steel (material no. 1.4404 / AISI 316L)

Expanded metal made from acid-resistant stainless steel material (AISI 316L)

Thickness of the expanded metal insert used Stretching the stainless steel film used (original thickness 0.15 mm) leads to a three-dimensional structure with a projected height of about 0.4 mm, as a result of which chambering of the gasket core is achieved.

Geometry of the stainless steel insert

- Better exploitation of the surface pressure available to compact the graphite, because no “crowns” need to be levelled. Installation of the gasket is completed faster.
- No undercutting in the insert material. The graphite film encloses the insert completely.
- Optimised surface pressure distribution by comparison with other insert concepts. This is demonstrated impressively by the self-contained lines of higher surface pressure (see the Fuji Film photo of novaphit® SSTCTA-L with expanded metal).
- Favourable grid geometry (diamond dimension = 3.0 mm) makes it possible to produce gaskets with very narrow widths reliably.
- Easy cuttability. Handling benefits in manual and in-house finishing.
- Considerably lower risk of layer separation when bending occurs. Even in such a case, the graphite film is pressed around the insert again completely when pressure is applied to the gasket during installation in the flange. This results in a greater tolerance in case of incorrect handling.
- Repeated bending of the insert is irreversible because of strain hardening, i.e. the insert recovers and is actively involved in the sealing operation! This guarantees greater security in the gasket connection, particularly at higher surface pressure levels.
- Another advantage of novaphit® SSTC and novaphit® SSTCTA-L in direct comparison with smooth metal inserts is their open insert design principle. This means that not merely the outer graphite layer but rather that a considerably thicker layer is available to compensate for flange damage.



Material profile of novaphit® MST with XP technology

Advantages of the unique combination of expanded metal and smooth metal inserts
Multilayer gasket material made from expanded graphite (purity level 99.5 %*) with several expanded metal and flat metal inserts made from stainless steel (material no. 1.4404 / AISI 316L) and intelligent internal impregnation.
XP technology as standard novaphit® MST, the flagship of the novaphit® product family, features all advantages of the XP technology as standard.

Outstanding adaptability

The logical arrangement of the stainless steel inserts is the special feature of novaphit® MST. Graphite foils of 0.5 mm thickness alternate with stainless steel 316L. Expanded metal is, however, chosen for the outer layers on each side. The open structure of the expanded metal makes the gasket more adaptable, because the two outer graphite layers on each side can be used to compensate for flange unevenness. New dimension in internal impregnation performance

Systematic improvement in the effectiveness of the internal impregnation has made it possible to use graphite films with optimised initial density. The sealing properties are at the same time increased as a result, while adaptability is significantly better. Gasket deformation of about 43 % is achieved with surface pressure of only 20 MPa. Compared with standard multilayer laminates, which reach only about 23%, this means that adaptability is 87% higher.

Excellent handling

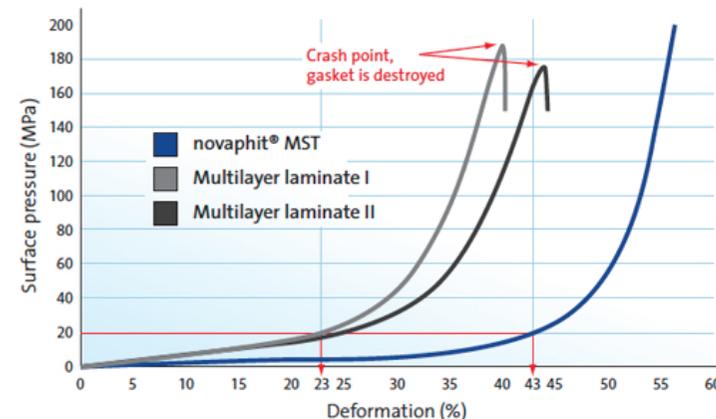
Thanks to the multilayer structure, gaskets made from novaphit® MST have extremely good dimensional stability properties and do not buckle. This can be an advantage over single-layer, reinforced graphite gaskets.

Very simple processing

The thickness of the individual stainless steel inserts (0.05 mm) has been chosen carefully to make sure that extremely reliable and simple processing is possible by all standard methods:

- Punching
- Plotting
- Water jet cutting
- Cutting with circular saws
- Cutting with metal shears
- Cutting with scissor

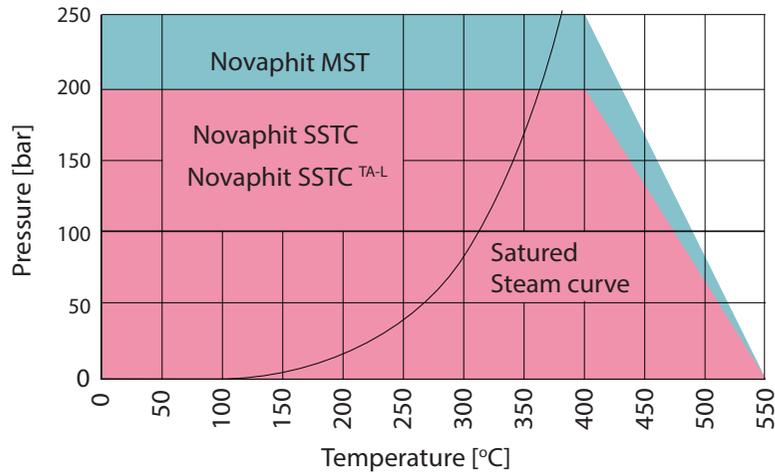
Compression chart according to DIN 28090-1



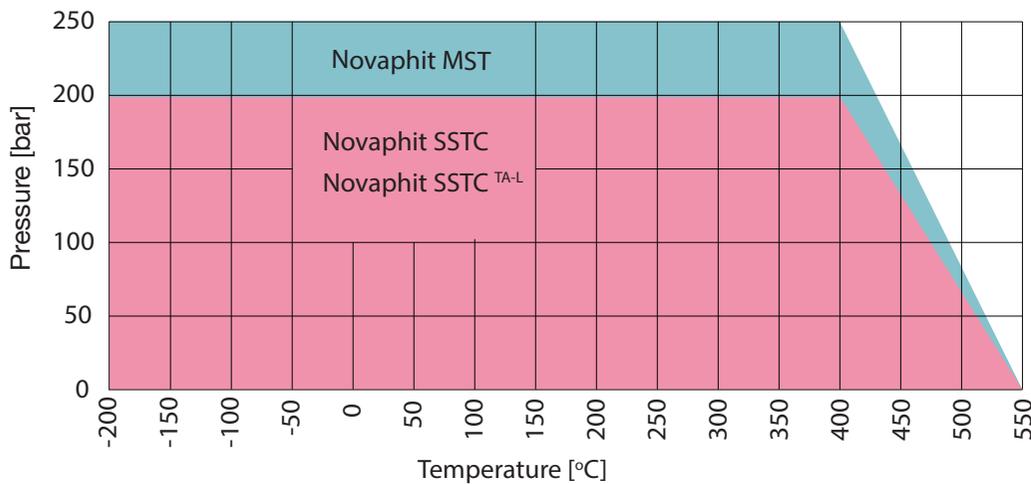
Application recommendations

Depending on the pressure and temperature the application recommendations for different temperature and pressure levels in the graphs apply to a gasket thickness of smooth flanges. Higher limits are possible when thinner gaskets are used!

Application recommendation for water



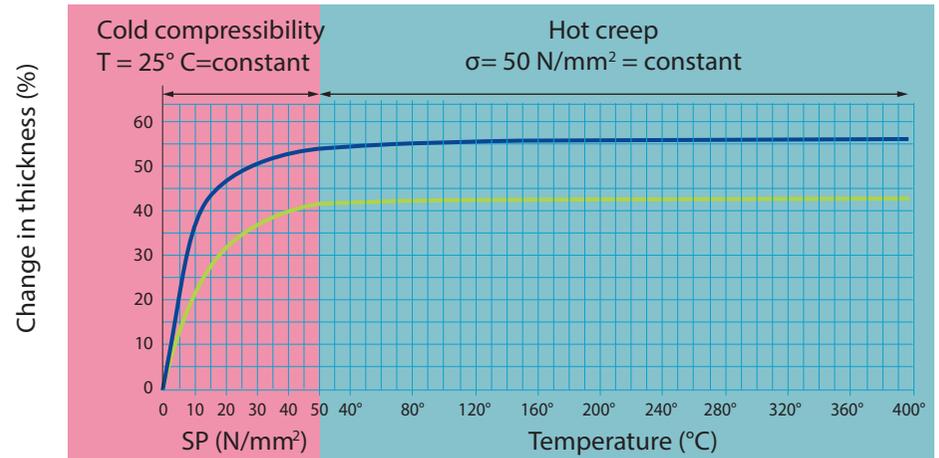
Application recommendation for other media *



* Example for the most common other media.

Compression set - Temp-Test

(up to 50 N/mm² and 400 °C)



■ novaphit®MST

■ novaphit®SSTC / Novaphit® SSTC TA-L

Waranty exclusion

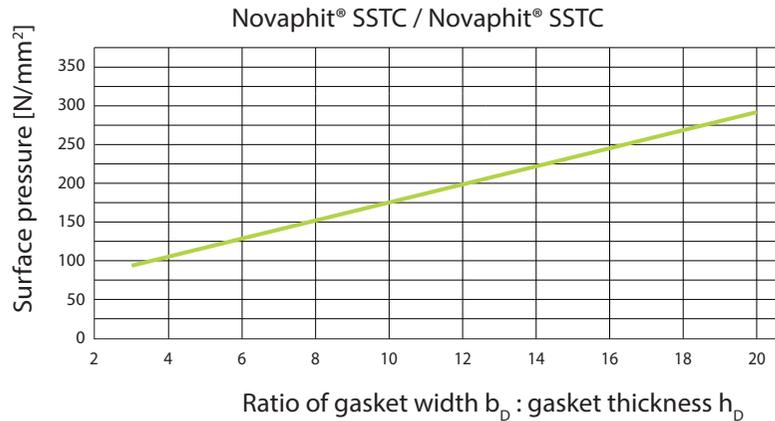
In view of the variety of different installation and operation conditions as well as application and process engineering options, the information given in this datasheet can only provide approximate guidance and cannot be used as basis for warranty claims.

Explanatory notes about the temperature (Temp-Test)

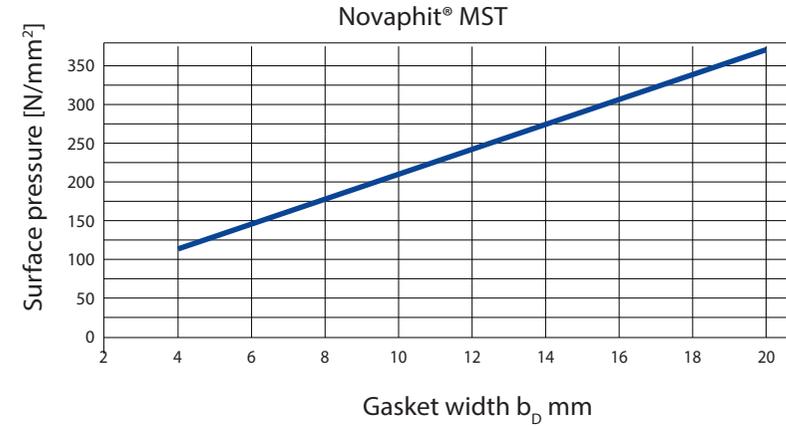
The purpose of the temperature test is to determine how the gasket deforms under certain conditions. It is a special Frenzelit development that represents what is effectively a “fingerprint” of major gasket properties. The compression set of the gasket at room temperature is determined in the first part of the test. This curve indicates the adaptability of the gasket during installation. In the second part of the test, the temperature is increased at a specified speed, while the surface pressure level reached in the first part is maintained consistently. I.e. the system is not allowed to “relax” as a result of gasket compression. This is overly critical – the strain on the gasket would be lower in a real sealing situation – but it unsparingly reveals the character of the gasket.

Application recommendation for water

Maximum surface pressure after installation, with smooth sealing faces



The maximum surface pressure can be increased by a factor 1.5 of approximately in the case of tongue and groove flanges



The multilayer structure of novaphit® MST means that the gasket thickness does not play a role

Material data

General information		novaphit® SSTC	novaphit® SSTC ^{TA-L}	novaphit® MST
Binders		none	none	none
Approvals and tests	DVGW VP401 TA Luft Blow out safety test according to VDI 2200 BAM for gaseous O ₂ (200 °C / 130 bar) and liquid O ₂ Firesafe (DIN EN ISO10497, API 607, BS 6755) ² Germanischer Lloyd (GL)		✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ - ✓ ✓ ✓ ✓ ✓
Colour		graphite grey	graphite grey	graphite grey
Printing colour		black	platinum grey	blue

Physical properties

Gasket thickness	2.0 mm	Test standard	Unit	Value Mode (typical value)		
Graphite purity		DIN51 903	[%]	> 99	> 99	99,5
Density		DIN28 090-2	[g/cm ³]	1.35	1.37	1.20
Residual stress at 300°C		DIN52 913	[N/mm ²]	≥ 45	≥ 45	≥ 45
Compressibility		ASTM B6J	[%]	37	37	50
Recovery		ASTM B6J	[%]	15	17	10
Cold compressibility ϵ_{KSW}		DIN28 090-2	[%]	35	36	45
Cold recovery ϵ_{KRW}		DIN28 090-2	[%]	4	5	4
Hot creep $\epsilon_{WSW/300}$		DIN28 090-2	[%]	2	3	3
Hot recovery $\epsilon_{WRW/300}$		DIN28 090-2	[%]	2	4	3
Specific leakage rate		DIN3535-6	[mg/(s·m)]	0.07	≤0.01	≤ 0.01
Oxidation value with XP technology		DIN28090-2	[%/h]	≤ 3	≤ 3	≤ 3
Oxidation value without XP technology		DIN28090-2	[%/h]	≤ 4	≤ 4	-
Tensile strength transverse		DIN52 910	[N/mm ²]	8	8	16
Total chloride content		DIN28 090-2	[ppm]	≤ 50	≤ 50	≤ 50
Leachable chloride content		PV-001-133	[ppm]	≤ 20	≤ 20	≤ 20
Total fluoride content		PV-001-133	[ppm]	≤ 50	≤ 50	≤ 50

Product data (tolerances acc. to DIN 28091-1)

Dimensions	[mm]	1000 x 1000 1500 x 1500 2000 x 1000	1000 x 1000 1500 x 1500 2000 x 1000	1000 x 1000 1500 x 1500
Thicknesses	[mm]	1.0/1.5/2.0/3.0	1.0/1.6/2.0/3.0	1.0/1.5/2.0/3.0/4.0