Match the European IPPC Directive. Best Available Techniques (BAT) for stringent fugitive emission regulations.

- GASKETS
- TECHNICAL TEXTILES
- EXPANSION JOINTS
- INSULATION
- NEW MATERIALS

Frenzelit

creating
hightech
solutions

IPPC Directive 96/61/EC

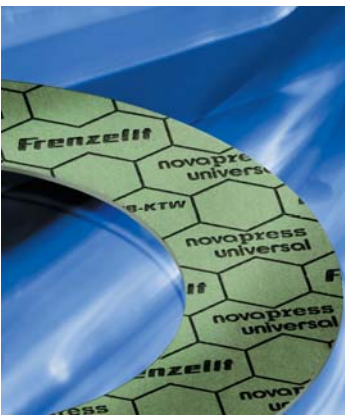
The objective of the European IPPC Directive is to minimize emissions throughout the European Union. Germany has already implemented the Directive in 2002 with the latest amendments due to the TA Luft.

Other European countries have to introduce similar national regulations by October 2007. This regulation apply to several industrial sectors of the process industry especially the chemical industry.

One major task of the directive is the introduction of the BAT (Best Available Technology) idea. As a result plant operators are obliged to use BAT products or processes. In order to inform the industry about these developments the IPPC bureau in Sevilla, Spain is publishing BREF notes. BREF notes are BAT reference documents each applicable for specific sectors e.g. refining operations.

A major part of Volatile Organic Compound emissions (VOC's) of the process industry are caused by flanged connections. Depending on the individual installation the percentage of fugitive emissions caused by flanged joints vary from 5 to almost 30 %. The TA Luft approved gasket range of Frenzelit will help you to minimize these fugitive emissions to a minimum.

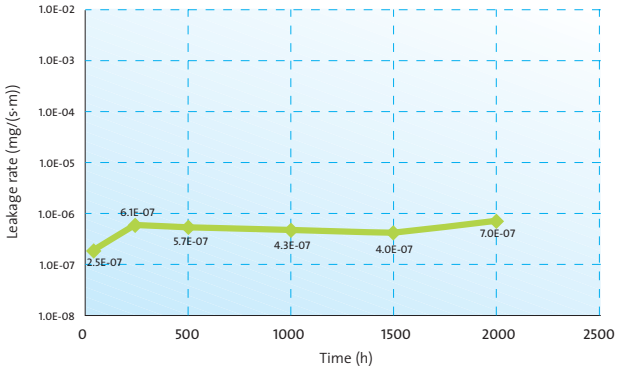
novapress® UNIVERSAL



The all-round material which has set standards. novapress® UNIVERSAL is suitable for all applications with increased temperature and pressure applications, even in gaseous and liquid media.

- **good tensile strength**
- **excellent stress relaxation**
- **very low gas leakage**
- **very good oil resistance**

Leakage rate novapress® UNIVERSAL



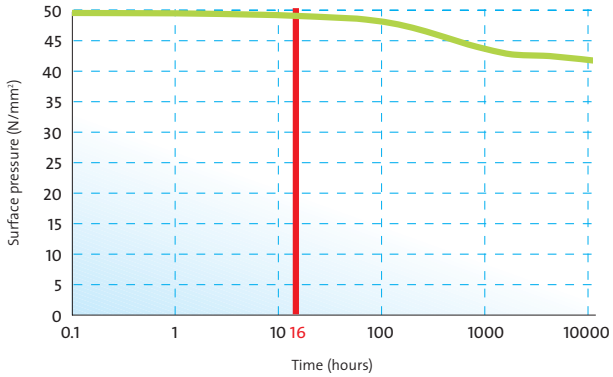
Test method:	VDI 2200 (draft 06/2005)
Temperature of exposure:	150 °C
Test medium:	Helium (1 bar = const.)
Temperature:	Room temperature = const.
Surface roughness:	3.2 µm < Ra < 6.3 µm

novatec® PREMIUM II

novatec® PREMIUM II is the "TA Luft" tested gasket material for the general and chemical industry.

- **media-resistant at high temperatures**
- **excellent pressure resistance**
- **optimised adaptability**
- **unique release properties**
- **tool-friendly processing**
- **better handling properties**
- **single-piece gaskets of all sizes and thicknesses**

Long-term creep relaxation



novatec® PREMIUM II has very high long-term pressure resistance properties and thus provides constant reliability throughout the maintenance cycle.

Gasket dimensions:	75 x 55 x 1.5 mm
Surface pressure:	48 - 50 N/mm²
Test temperature:	300 °C
Stiffness C:	840 kN/mm

Do you have any questions about your application?

The gasket information service will help you:

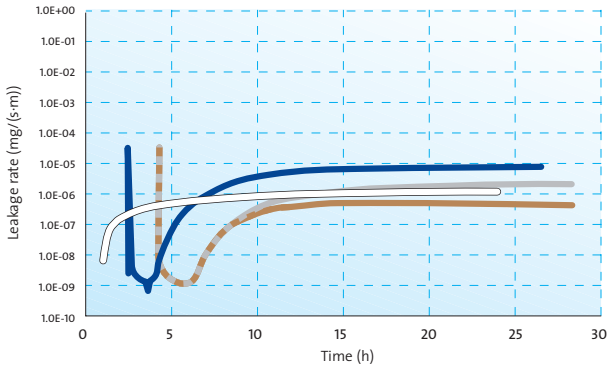
gaskets@frenzelit.de

novaflon®

Product range based on modified and multi-directional expanded PTFE materials.

- **excellent media resistance to most alkalines and acids throughout the pH range (pH levels 0-14)**
- **high residual stress**
- **resistant to creep and cold flow**
- **wide temperature range from -210 °C to +260 °C, novaflon® 500: -240 °C up to +270 °C**
- **unlimited shelf life**
- **FDA approved**

Leakage rate novaflon®



novaflon® 100
Leakage rate λ $5.8 \cdot 10^{-6}$ mbar·l/(s·m)

novaflon® 300
Leakage rate λ $5.4 \cdot 10^{-7}$ mbar·l/(s·m)

novaflon® 200
Leakage rate λ $1.7 \cdot 10^{-6}$ mbar·l/(s·m)

novaflon® 500
Leakage rate λ $1.2 \cdot 10^{-6}$ mbar·l/(s·m)

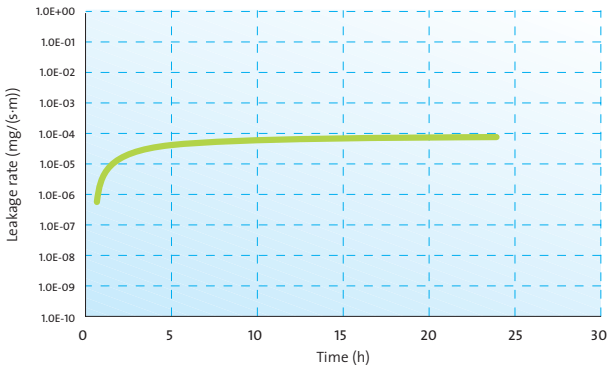
Test method:	VDI 2200 (draft 06/2005)
Temperature of exposure:	150 °C

novaphit® SSTC^{TA-L}

novaphit® SSTC^{TA-L} is a composite gasket material made from multi-layers of expanded graphite with a purity of at least 99 % and a layer of expanded metal from acid-proof chrome-nickel steel.

- **unique material profile for maximum safety requirements**
- **high heat and mechanical resistance**
- **excellent properties**
- **unique media resistance**

Leakage rate novaphit® SSTC^{TA-L}



Test method:	VDI 2200 (draft 06/2005)
Temperature of exposure:	300 °C
Time of exposure:	48 h
Test medium:	Helium (1 bar = const.)
Temperature:	Room temperature = const.
Surface roughness:	3.2 µm < Ra < 6.3 µm

Return on investment

Reducing fugitive emissions not only helps to improve the environment for future generations; it is also a way to exploit remarkable cost-saving potential by means of standardization and less product loss. The product loss caused by fugitive emissions in the USA has been estimated to total more than 300,000 tonnes a year and similar figures can be expected in Europe. The problem: in most instances these losses of valuable media are invisible. Because of this reason the Frenzelit gasket team has developed a Life-Cycle-Cost Analysis software that visualizes the cost saving potential by using novaphit® SSTC^{TA-L} BAT (Best Available Technique) graphite gaskets.

In this example we quantify the costs caused by fugitive emissions at a virtual ethylene plant. 50,000 sealing devices. 50,000 sources of fugitive emissions. 50,000 opportunities to prevent leakage and save money.

Basic assumptions

25,000 flanges, ANSI 6” Class 150

25,000 flanges, ANSI 12” Class 150

Plant maintenance interval:	**4 years**
Average operating pressure:	**25 bar**
Media:	**ethylene**
Production costs:	**0.50 EUR/KG**

Standard graphite gaskets with a tanged insert are in use. It is worth comparing the overall site leakage caused by fugitive emissions with the sealing performance of novaphit® SSTC^{TA-L}.

Leakage rate in comparison

novaphit® SSTC^{TA-L}: $8 \cdot 10^{-5}$ mbar·l/(s·m)

(certified by an independent testing facility)

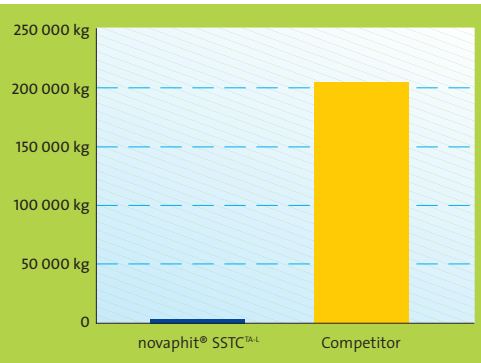
Competitor 1: $5 \cdot 10^{-3}$ mbar·l/(s·m)

Based on a test with a differential pressure of 1 bar helium after heat treatment.

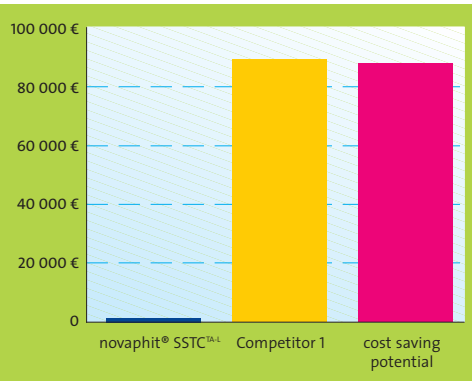
The overall site emissions in 4 years are 222,919 kg with the standard graphite gasket with a tanged metal insert. By comparison, the use of novaphit® SSTC^{TA-L} offers a plant-wide ethylene emission reduction potential of 219,352 kg.

Reducing plant-wide fugitive emissions is not only a step towards an environmentally friendly production site; it is also a way to exploit remarkable cost-saving potential. In a 4-year period, the use of novaphit® SSTC^{TA-L} leads to overall cost benefits of more than € 87,000.

Leakage rate in comparison



Cost-saving potential



Good for people and the environment.

Frenzelit has obtained certification that the company complies with the requirements of both ISO/TS 16949 and ISO 14001. This means complete transparency in all areas and a high degree of security for our customers.

Quality management
ISO/TS 16949

Environmental management
ISO 14001

novaDISC

Every sealed joint is influenced by several factors during operation. Therefore when chosing the right sealing material, three main factors have to be considered:

- **medium**
- **temperature**
- **pressure**

The computer software novaDISC consists of several modules which allow the exact and menu-driven calculation of the following parameters:

- **Choice of suitable gasket material depending on chemical and physical application limits.**
- **Choice of suitable gasket material for any flange.**
- **Flange calculations for DIN-, ANSI-, GOST- and also for non-standard flanged joints.**

The multi-lingual programme guides the user through the various surfaces and based on the entered application conditions, it will then generate a report which can be either printed or sent out by e-mail.
novaDISC is a free of charge service, available by Frenzelit for all gasket specialists working on the design of sealed joints. Please visit our homepage to order your CD-Rom free of charge.

FL/1/05.07/025/FL

GASKETS
TECHNICAL TEXTILES
EXPANSION JOINTS
INSULATION
NEW MATERIALS

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solutions