

The heavy-duty gaskets KLINGER^{top}-chem

KLINGER^{top}-chem	2000	2003	2005	2006
Ref. thickness of measured values, mm	1.5	2	1.5	1.5
Density, g/cm ³	2.5	1.7	2	2.9
Compressibility ASTM F 36 J, %	2	18	7	4
Recovery ASTM F 36 J, %	55	40	35	40

Stress relaxation

DIN 52913, 16h, 50MPa, 300 °C	35	–	–	–
DIN 52913, 16h, 30MPa, 150 °C	30	13	25	18

Klinger cold/hot compression

23°C/ 50MPa, %	2	–	10	10
250°C/ 50MPa, %	5	–	30	40
23°C/ 25MPa, %	–	9	–	–
250°C/ 25MPa, %	–	38	–	–

Tightness

DIN 3535/6, ml/min	0.5	0.1	0.2	0.1
DIN 28090-2, mg/s m	0.05	0.01	0.02	0.01

Thickness/weight increase

H ₂ SO ₄ , 100%: 18h/ 23°C, %	0.5/ 1	– / 1	2/ 2	–
HNO ₃ , 100%: 18h/ 23°C, %	1/ 2	– / 5	2/ 7	2/ 7
NaOH, 33%, 72h/ 110°C, %	5/ 5	– / 2	–	12/ 24

Permits/certifications

BAM certification	yes	u. preparation	–	yes
KTW proposal	yes	yes	yes	yes
DIN-DVGW permit	yes	yes	yes	yes
HTB acc. to VP 401	u. preparation	–	–	–
Fire Safe	yes	–	–	–
FDA conformity	yes	yes	yes	yes
TA-Luft certification	yes	yes	–	–
Germanischer Lloyd	yes	yes	u. preparation	u. preparation
United States Coast Guard	yes	–	–	–
Registro Italiano Navale	yes	–	–	–
Det Norske Veritas AS	yes	–	–	–

Standard sizes (other sizes on request)

Sheet sizes mm	1,500 x 1,500	1,500 x 1,500	1,500 x 1,500	1,500 x 1,500
Thickness mm	1.0/1.5 /2.0 /3.0	1.0/1.5 /2.0 /3.0	1.0/1.5 /2.0 /3.0	1.0/1.5 /2.0 /3.0
Tolerances	thickness ± 10 %, length ± 50 mm, width ± 50 mm			

Typical values

Subject to technical alterations.

Status: March 2003



KLINGERTop-chem offer the advantages of PTFE gaskets without the disadvantages commonly associated with PTFE materials. This allows you to use these materials in applications where traditionally they are unsuitable, saving you maintenance time and improving plant safety.

As an example, a comparison of the load bearing performance of KLINGERTop-chem-2000 with that of rival products is shown in the diagram below. With KLINGERTop-chem-2000, the high relaxation typical of standard PTFE gaskets is not observed. The results demonstrate that at a load of 50 MPa and temperature of 200°C, the relaxation of this material is only 1.6%, ensuring that bolt forces are maintained even under severe conditions.

The two new grades KLINGERTop-chem-2005 and -2006 now offer a solution for PTFE-standard applications. They differ in respect to their chemical resistance:

KLINGERTop-chem-2005 is particularly suited for general chemical and strongly acidic applications.

KLINGERTop-chem-2006 is the better choice for caustic medias.

By way of an introduction to the properties of the KLINGERTop-chem range, the matrix on the following page presents the attributes of the individual grades. The table illustrates that for all PTFE applications a suitable material can be selected from the KLINGERTop-chem range.

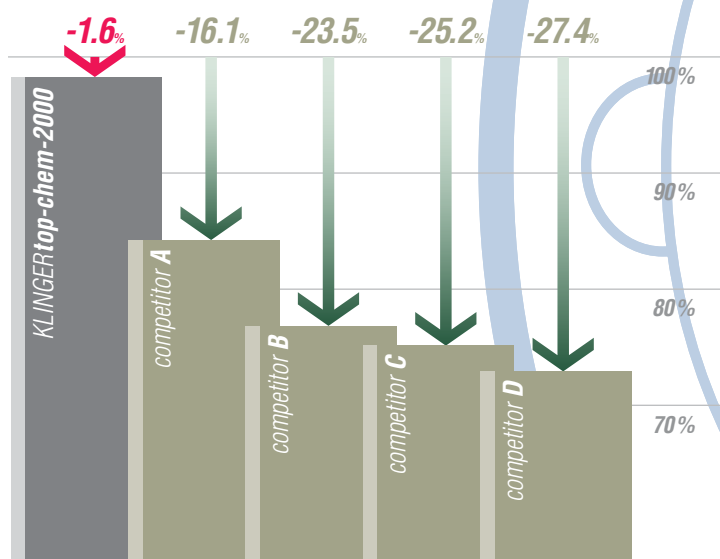
The detailed performance data on the following pages will help you to choose the correct material for your application, ensuring the safe performance of the gasket. The following short description of the four grades provides a general overview of properties and is the first step towards making this choice.

KLINGERTop-chem-2000

The universal heavy-duty gasket for an extremely wide range of applications in the chemical and petrochemical industries as well as in the ship building industry for chemical tanker applications. Due to its unique load bearing properties it is able to withstand high temperatures and pressures and it is the only PTFE gasket with a Fire Safe Certificate.

It is also the first choice in the food sector and in the pharmaceutical industry, for steam applications and in oxygen pipes, and where special requirements are made acc. to TA Luft (German Clean air regulation).

KLINGERTop-chem-2000 has excellent chemical resistance in strongly acidic and alkaline applications and offers exceptional performance in applications with high mechanical requirements at high temperatures.



KLINGERTop-chem: A complete sealing package for safe performance

KLINGERTop-chem-2003

As regards media, the range of applications is comparable to that of KLINGERTop-chem-2000.

However, KLINGERTop-chem 2003 has greater compressibility and is ideal for maintaining a tight seal even at low surface loads and temperatures.

KLINGERTop-chem-2003 has excellent chemical resistance in strongly acidic and alkaline applications and excellent mechanical properties at medium and low temperatures and loads. Special mention should be given to its high gas tightness at even low surface loads (TA-Luft certification).

KLINGERTop-chem-2005

KLINGERTop-chem-2005 has excellent chemical resistance in strongly acidic applications and is suitable for a wide range of applications in the chemical industrie. It has good mechanical properties at medium and low temperatures and loads.

As regards media, the range of applications approaches that of KLINGERTop-chem-2000. The material is an economical alternative where requirements less stringent.

KLINGERTop-chem-2006

KLINGERTop-chem-2006 has good chemical resistance in strongly alkaline conditions and good mechanical properties at medium and low temperatures and loads.

KLINGERTop-chem-2006 is optimised for caustic conditions and also suitable for a wide range of applications in the chemical industry. Because it is free from pigments, this material is especially suited to food and pharmaceutical applications.

KLINGERTop-chem

Strong acids

Strong alkalis

**Mechanical resistance
to high temperature**

Tightness

Adaptability

2000	2003	2005	2006
++	++	++	+
++	++	+	++
++	○	+	+
+	++	+	+
○	++	+	+



The heavy-duty gaskets KLINGER^{top}-chem

Stability according to Klinger

The load bearing capacity of a gasket can be assessed at ambient and high temperature using the hot compression test developed by Klinger.

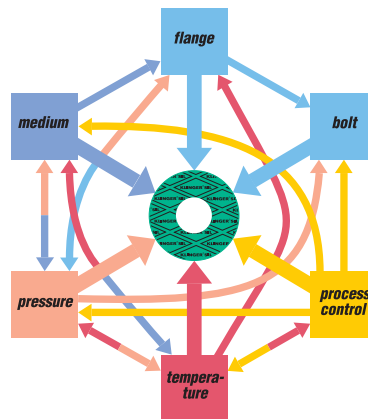
In contrast to the test method according to DIN 52913 and BS 7531, the gasket stress is kept constant throughout the entire test. The gasket is thus exposed to significantly severer conditions.

The thickness decrease as a result of a constant load is measured at a temperature of 23°C and also after heating up to 250°C.

The value of the thickness decrease at 250°C relates to the thickness after compression at 23°C.

The many and varied demands made on gaskets

The successful operation of a gasket depends upon a multiplicity of factors. Many who use static gaskets believe that the values quoted for maximum admissible temperature and maximum operating pressure are inherent properties or characteristics of gaskets and gasket materials.



Unfortunately, this is not the case.

The maximum temperatures and pressures at which gaskets may be used are influenced by a large number of factors.

Therefore a definite statement of these values for gaskets material is not possible.

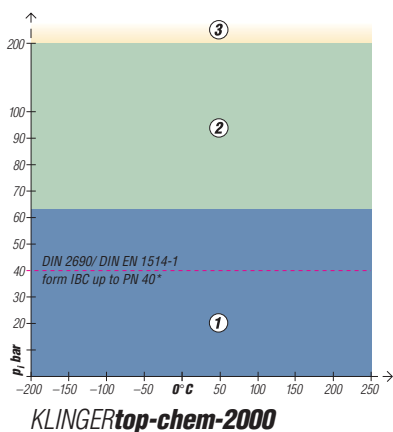
So why does Klinger provide pT diagrams?

For the reasons given the pT diagram is not infallible: it serves as a rough guide for the end user who often has only the operating temperatures and pressures to go on.

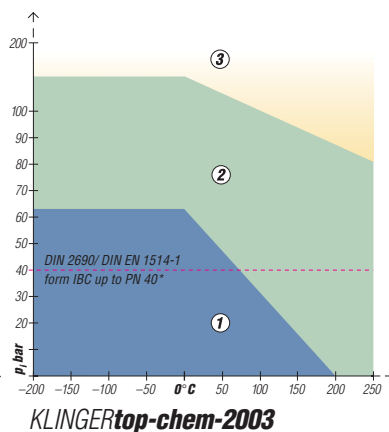
Additional stresses such as greatly fluctuating load may significantly affect whether a gasket is suitable for the application.

Resistance to media must be taken into account in every case.

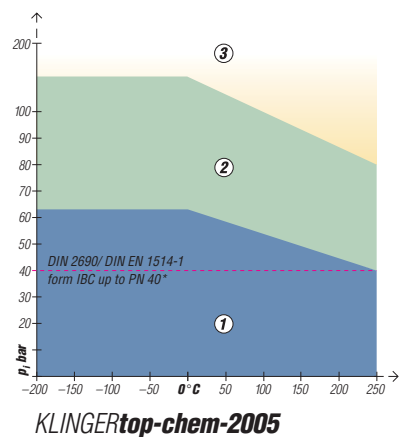
- ① If your operating temperatures and pressures fall within this field, it is not usually necessary to conduct a technical examination.
- ② If your operating temperatures and pressures are within this field we recommend a technical examination.
- ③ If your operating temperatures and pressures are within this blank field, a technical examination should be carried out.



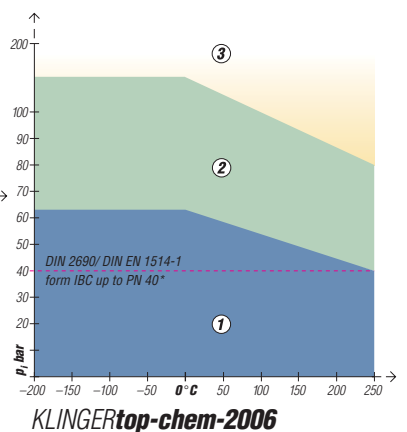
KLINGER^{top}-chem-2000



KLINGER^{top}-chem-2003



KLINGER^{top}-chem-2005



KLINGER^{top}-chem-2006

*Gaskets according to DIN 2690 are only standardised up to PN 40