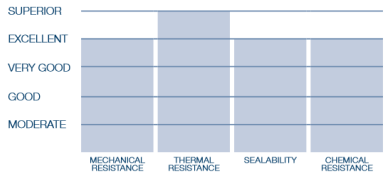
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SCHEDA TECNICA(Revisione 2012)

Klinger Quantum FDA

(Particolari/Guarnizioni realizzate con processo di taglio da lastra con queste caratteristiche)

KLINGER®Quantum is a unique gasket material with the highest flexibility at high temperatures.
High-quality fibre and filler compound bonded in a high temperature resistant HNBR-matrix. This material is suitable for the use in oils, water, steam,
gases, salt solutions, fuels, alcohols, moderate organic and inorganic acids, hydrocarbons, lubricants and refrigerants.

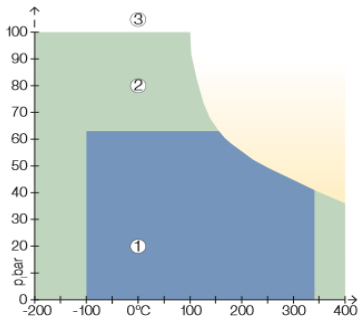
KEY FEATURES	BENEFITS:
- Unique HNBR matrix - Special curing technology - Resistant to creep and cold flow - Dimensionally stable	- Superior long-term flexibility at higher temperatures - Outstanding temperature resistance - FDA conformity
	PROPERTIES: 

(Per tutte le situazioni dove è richiesta la TRACCIABILITA' DEVE ESSERE ESPRESSAMENTE RICHIESTA IN FASE D'ORDINE con maggiorazione di prezzo da concordare)

Industries:



pT diagram for thickness 2.0 mm:



1. In area one, the gasket material is normally suitable subject to chemical compatibility.
2. In area two, the gasket material may be suitable but a technical evaluation is recommended.
3. In area three, do not install the gasket without a technical evaluation.

   Always refer to the chemical resistance of the gasket to the media.

Dimensions of the standard sheets:

Sizes:

1000 x 1500 mm, 2000 x 1500 mm

Thicknesses:

0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm

Tolerances:

Thickness acc. DIN 28091-1
Length ± 50 mm, width ± 50 mm

Other thicknesses, sizes and tolerances on request.

Typical technical data for thickness 2.0 mm:

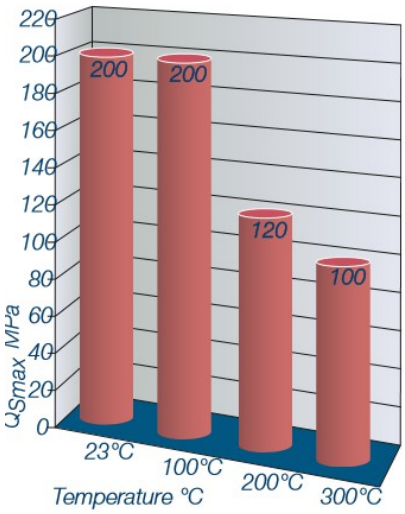
Compressibility ASTM F 36 J		%	10
Recovery ASTM F 36 J		%	50
Stress relaxation DIN 52913	50 MPa, 16 h/175°C	MPa	32
	50 MPa, 16 h/300°C	MPa	30
Stress relaxation BS 7531	40 MPa, 16 h/300°C	MPa	29
KLINGER cold/hot compression	thickness decrease at 23°C	%	10
50 MPa	thickness decrease at 300°C	%	14
	thickness decrease at 400°C	%	20
Tightness	DIN 28090-2	mg/s x m	0.02
Specific leakrate λ	VDI 2440	mbar x l/s x m	4.4E-08
Thickness increase after fluid	oil IRM 903: 5 h/150°C	%	3
immersion ASTM F 146	fuel B: 5 h/23°C	%	5
Density		g/cm³	1.7
Average surface resistance	ρO	Ω	7.7x10E12
Average specific volume resistance	ρD	Ω cm	4.7x10E12
Average dielectric strength	E_d	kV/mm	18.5
Average power factor	50 Hz	tan δ	0.064
Average dielectric coefficient	50 Hz	εr	6.8
Thermal conductivity	λ	W/mK	0.44
Classification acc. to BS 7531:2006	Grade AX		
ASME-Code sealing factors			
for gasket thickness 1.0 mm	tightness class 0.1mg/s x m	MPa	y 15
			m 1.1
for gasket thickness 2.0 mm	tightness class 0.1mg/s x m	MPa	y 15
			m 2.5
for gasket thickness 3.0 mm	tightness class 0.1mg/s x m	MPa	y 15
			m 3.8

ATTENZIONE: Valori ricavati da test eseguiti su normale giunto flangiato dove la superficie di appoggio è molto maggiore dello spessore. Per guarnizioni dalla fascia piccolina (Esempio raccorderia, ...) occorre fare i test sul campo.
Values derived from tests performed on a normal flanged joint where the surface of the support is much greater than the thickness. For small-band gaskets (for example fittings, ...), specific application tests must be performed..

Gasket factor Q_{Smax} according to EN13555

Q_{Smax} is the maximum surface pressure that may be imposed on the gasket at the indicated temperatures without collapse or compressive fai-lure of the gasket.

The determination of Q_{Smax} may for sheet materials result in an overestimation of the capability of the gasket sheet and it is important that all values of Q_{Smax} for sheets are verified by conducting a test for P_{QR} at the same temperature and surface pressure as for the Q_{Smax}-value.

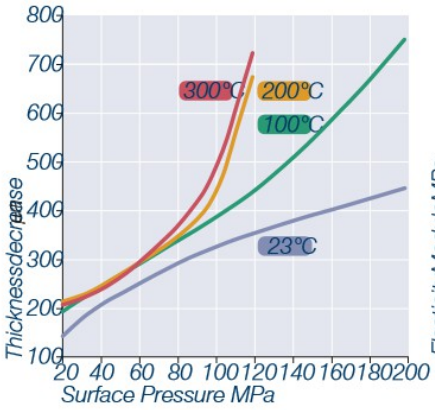


Temp. °C	Q_{Smax}	P_{QR} 500k N/mm² 40 MPa	60 MPa
23	200	0,99	>0,99 >0,99
100	200	0,77	0,85 0,88
200	120	0,72	0,83 0,82
300	100	0,64	0,82 0,72

Thickness Reduction at Q_{Smax}

The specification of the thickness reduction of the tested gasket ma-terial results in a better evaluation of whether the material is suitable for the given application or not.

The thickness reduction of the gasket material is measured at the end of every load cycle of the Q_{Smax} test and results in the following diagram:

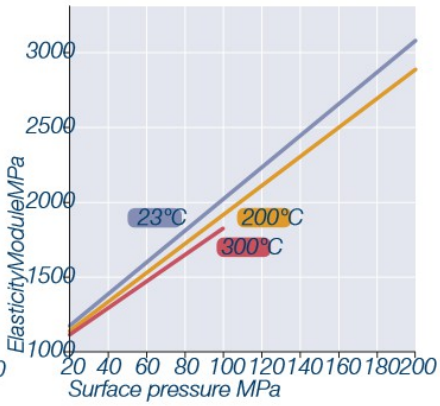


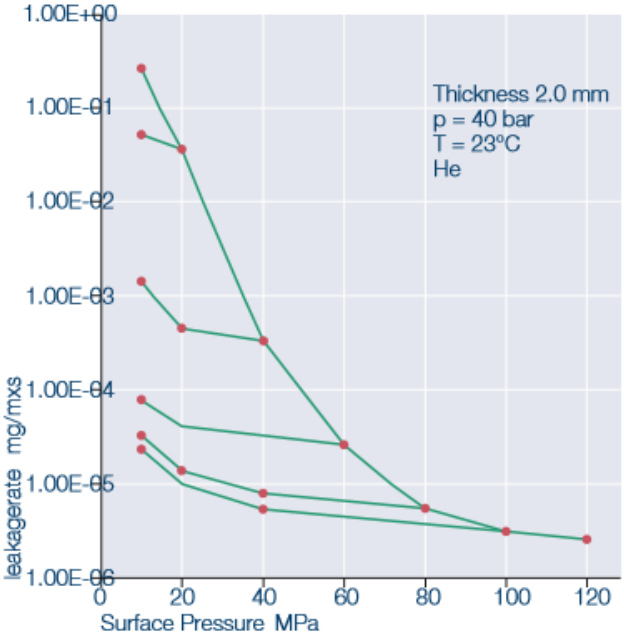
Elasticity Module E_G according to EN 13555

This gasket characteristic is determined from the thickness recovery of the gasket between the initial compression surface pressure and unloading to a third of the initial surface pressure.

The determination is made from the unloading cycles of the Q_{Smax} test. The value for E_G changes with the surface pressure on the gasket.

A high E_G value means a small recovery, and a low E_G value means a higher recovery and is thus an indication of a lesser embrittlement of the material.

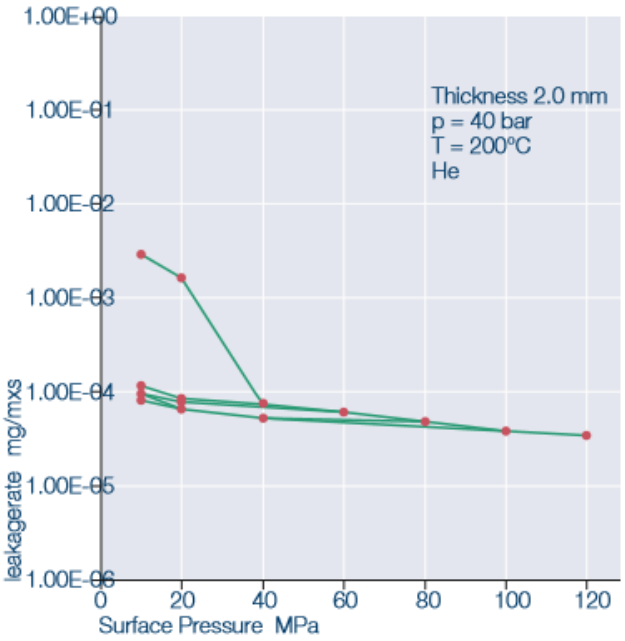




Leakage curve of KLINGER®Quantum at a temperature of 23°C and an internal pressure of 40 bar

A flanged joint will remain tight as long as the surface pressure in service is higher than the minimum surface pressure required to achieve the necessary levels of tightness but is lower than the maximum permissible surface pressure. But increasingly high demands on the tightness requirements for flanged joints (e.g. Tightness class 0.01) necessitate the application of high loads on the gasket material in order to meet these stringent requirements.

If the gasket is to be subjected to non-static loading and stress fluctuations due to temperature and pressure cycling, it is advisable to select a gasket material which is less prone to embrittlement with increasing temperatures (e.g.KLINGER®graphit Laminat, KLINGER®top-chem, KLINGER®top-sil, KLINGER®Quantum).



Leakage curve of KLINGER®Quantum at a temperature of 200°C and an internal pressure of 40 bar

In cyclic loading conditions we recommend a minimum surface stress of 30 MPa and that the gasket should be as thin as is practicable.

For safety reasons never re-use gaskets.

Gasket factor Q_{Smin} according to EN13555 (Tightness at high temperatures)

Q_{Smin} describes the required minimum surface pressure on the gasket under operating conditions, i.e. upon relief during operation at operating temperature, so that the necessary leakage class L is maintained for the given internal pressure.

During the test, the gasket must be cyclically strained and relieved, with the leakage rate being measured at a surface pressure defined in the standard at an internal pressure of 40 bar.

Helium has to be used as testing gas for this test.

Important points to be observed With heightened awareness of safety and environmental issues, reducing leaks from flanged assemblies has become a major priority for industry. It is therefore important for companies who use gaskets to choose the correct material for the job and install and maintain it correctly to ensure optimum performance.

INSTALLATION INSTRUCTIONS

The following guidelines are designed to ensure the optimum performance of our gasket materials:

1. Choosing the gasket

There are many factors which must be taken into account when choosing a gasket material for a given applica-tion including temperature, pressure and chemical compatibility.

Please refer to the information given in our brochure or, for advice to our software program KLINGER® expert.

If you have any questions regar-ding the suitability of material for a given application please contact Klinger Technical Department.

2. Gasket thickness

The gasket should be as thin as technically practical. To ensure optimum performance a minimum thickness/width ratio of 1/5 is required (ideally 1/10).

3. Flange condition

Ensure all remains of old gasket materials are removed and the flanges are clean, in good condition and parallel.

4. Gasket compounds

Ensure all gaskets are installed in a dry state, the use of gasket compounds is not recommended as this has a detrimental effect on the stability and load bearing characte-ristics of the material.

In its uncompressed form the gasket can absorb liquid, and this may lead to failure of the gasket in service.

To aid gasket removal Klinger materials are furnished with a non sticking finish.

In difficult installation conditions, separating agents such as dry sprays based on molybdenum sulphide or PTFE e.g. KLINGER®lon spray, may be used, but only in minimal quanti-ties.

Make sure that the solvents and propellants are completely eva-porated.

5. Gasket Dimensions

Ensure gasket dimensions are correct. The gasket should not intrude into the bore of the pipework and should be installed centrally.

6. Bolting

Wire brush stud/bolts and nuts (if necessary) to remove any dirt on the threads. Ensure that the nuts can run freely down the thread before use. Apply lubricant to the bolt and to the nut threads as well as to the face of the nut to reduce friction when tightening.

We recommend the use of a bolt lubricant which ensures a friction coefficient of between 0.10 to 0.14.

7. Joint Assembly

It is recommended that the bolts are tightened using a controlled method such as torque or tension, this will lead to greater accuracy and con-sistency than using conventional methods of tightening. If using a torque wrench, ensure that it is accurately calibrated.

For torque settings please refer to the KLINGER®expert or contact our Technical Department which will be happy to assist you.

Carefully fit the gasket into position taking care not to damage the gasket surface.

When torquing, tighten bolts in three stages to the required torque as follows:
Finger tighten nuts. Carry out tightening, making at least three complete diagonal tightening se-quences i.e. 30%, 60% and 100%of final torque value. Continue with one final pass – torquing the bolts/studs in a clockwise sequence.

8. Retightening

Provided that the above guidelines are followed retightening of the gasket after joint assembly should not be necessary.

If retightening is considered necessary, then this should only be performed at ambient temperature before or during the first start-up phase of the pipeline or plant. Retightening of compressed fibre gaskets at higher operating tempera-tures and longer operating times may lead to a failure of the gasket connection and possible blow out.

9. Re-use

For safety reasons never re-use a gasket.

Si consiglia di controllare sempre eventuali additivi/sostanze chimoiche presenti anche se in piccole percentuali.

Materiale compatibile con GLICOLE PROPILENICO.
ATTENZIONE: Materiale NON compatibile con Perossido di Idrogeno anche diluito. Con perossido di idrogeno si consiglia l'utilizzo di materiali a base PTFE.

OMOLOGAZIONI

I manufatti da noi realizzati sono ottenuti con processo di taglio a freddo che non altera le proprietà chimico/fisiche del materiale. E' però un processo industriale NON asettico che può lasciare traccia di polveri (Talco, ...) che non ne alterano le proprietà. Si rende quindi necessaria la pulizia/sterilizzaione prima del suo utilizzo dove necessario.

ATTENZIONE: Le guarnizioni ed i nostri manufatti in genere non sono dispositivi di sicurezza. Ove siano presenti pericoli per la sicurezza delle persone (alte pressioni,alte temperature, fluidi pericolosi, ...) prevedere dispositivi aggiuntivi di sicurezza certificati.

E' compito del progettista dell'impianto scegliere il tipo di materiale adeguato e valutare eventuali pericoli di rottura del manufatto (Guarnizione, bandella, paracolpi, ...) e prevenirli.

Seguono le omologazioni disponibili:

DVGW DIN3535-6 Report number:DG-5123BU0146 Date of expiry:8/05/2024
BAM - OXYGEN - NO CERTIFICATEW - only test report BAM Report number:II-611/200E
TA-Luft (clean air) Amtec certificate n°:30179801/FH/25.05.09
FIRE SAFE TUV - Thecnical Report: IS-DDB-MAN-09-05 (20/04/2009)
FDA Klinger (26/11/2015) declaration of conformity regarding the determined limits of extractable substances. - 21 CFR 177.2600 Rubber articles intended for repeated use (e) , (f) - 21 CFR 180.22 Acrylonitrile copolymers (a) (3)(repeated use) Is suitable for the safe usage in direct contact with acquesus or fatty acids and alcoholic food during production storage, processing, preparation, packing and trasportation at temperature up to 260°C. The raw material contained in Quantum are listed in the accordingly regulations of the code of Federal regulation Part.177. **Pulire e sterilizzare il manufatto prima dell'utilizzo**
EU1935/2004 On Request **Pulire e sterilizzare il manufatto prima dell'utilizzo**

NOTE SULLE OMOLOGAZIONI IN GENERE AL SEGUENTE LINK:
https://st.laguarnizione.it/?ID=DOC0003

DICHIARAZIONI GENERICHE (Reach, Rosh,EUDR , BPA free, ...) Al seguente link:
https://st.laguarnizione.it/?ID=DOC0004