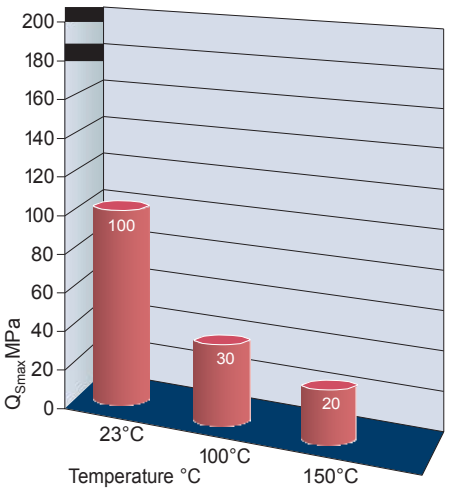
KLINGER® top-chem 2003

Gasket factors acc. to EN 13555

Maximum permissible surface pressure under operating condition Q_{Smax} acc. to EN 13555
The maximum surface pressure in operating condition is the maximum permissible surface pressure the gasket can be loaded at the specified temperatures.

To validate the test result of Q_{Smax}, P_{QR} values are provided. An evaluation of the tested gasket regarding unacceptable extrusion in the bore or damage of the gasket is also required.

The diagram shows these values for the various temperature ratings.



Creep relaxation factor P_{QR} acc. to EN 13555
This factor considers the relaxation influence on the gasket load between the tightening of the bolts and the long-term effect of the service temperature.

P_{QR} values for stiffness 500 kN/mm, gasket thickness 2 mm				
Temperature	Gasket stress 10 MPa	20 MPa	P_{QR} bei Q_{Smax}	Q_{Smax} (MPa)
23°C	0.88	0.90	0.79	100
100°C	0.83	0.75	0.60	30
150°C	0.77		0.76	20

Secant unloading modulus of the gasket E_G and gasket thickness e_G acc. to EN 13555

Secant unloading modulus of the gasket E_G (MPa) and gasket thickness e_G (mm)						
Gasket stress	Ambient temperature		Temperature 100°C		Temperature 150°C	
MPa	E_G MPa	e_G mm	E_G MPa	e_G mm	E_G MPa	e_G mm
1		1.950		1.968		1.969
20	1446	1.789	1245	1.586	1681	1.295
30	2221	1.716	2322	1.230		
40	3653	1.635				
50	8090	1.541				
60	10462	1.448				
80	6523	1.306				

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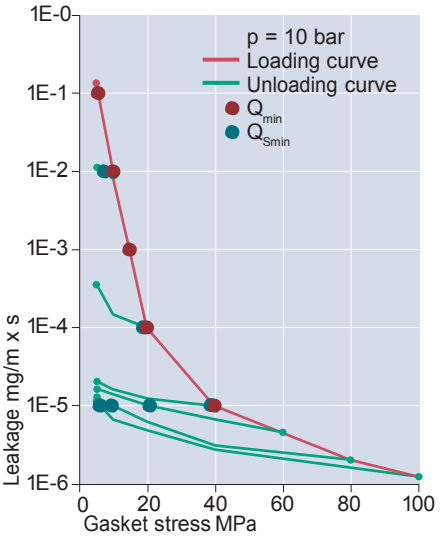
Gasket factors acc. to EN 13555

Minimum surface pressure $Q_{min(L)}$ acc. to EN13555 (Installation)
The minimum surface pressure during installation is the minimum required surface pressure, which has to be applied on the gasket surface during assembly at room temperature.
This is to assure that the gasket can adjust to the roughness of the flange surfaces, that internal leakage paths can be tightened and that the required tightness class L for the specified internal pressure will be achieved.

Minimum surface pressure $Q_{Smin(L)}$ acc. to EN13555 (Operating condition)
The minimum surface pressure in service is the minimum required surface pressure, which has to be applied on the gasket surface under operating conditions, i.e. after unloading during service, in order to keep the required tightness class L for the specified internal pressure.

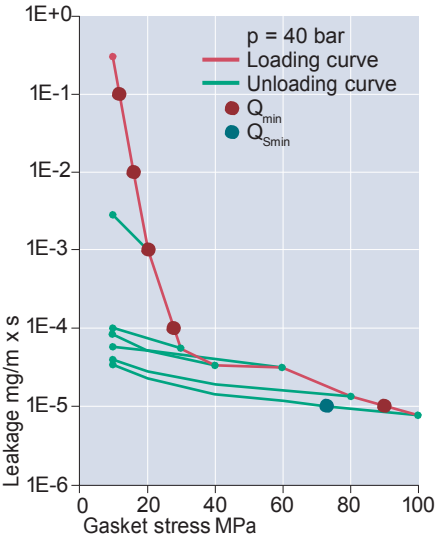
Minimum stress to seal for tightness class L $Q_{min(L)}$ at assembly/ $Q_{Smin(L)}$ after off-loading 10 bar							
L	$Q_{min(L)}$	$Q_{Smin(L)}$ MPa					
mg/ s x m	MPa	Q_A= 10 MPa	Q_A= 20 MPa	Q_A= 40 MPa	Q_A= 60 MPa	Q_A= 80 MPa	Q_A= 100 MPa
10^{-0}	5	5	5	5	5	5	5
10^{-1}	5	5	5	5	5	5	5
10^{-2}	10	7	5	5	5	5	5
10^{-3}	15		5	5	5	5	5
10^{-4}	20		19	5	5	5	5
10^{-5}	40			39	21	9	6

Q_A = Stress on the gasket during installation before unloading



Minimum stress to seal for tightness class L $Q_{min(L)}$ at assembly/ $Q_{Smin(L)}$ after off-loading 40 bar							
L	$Q_{min(L)}$	$Q_{Smin(L)}$ MPa					
mg/ s x m	MPa	Q_A= 20 MPa	Q_A= 30 MPa	Q_A= 40 MPa	Q_A= 60 MPa	Q_A= 80 MPa	Q_A= 100 MPa
10^{-0}	10	10	10	10	10	10	10
10^{-1}	12	10	10	10	10	10	10
10^{-2}	16	10	10	10	10	10	10
10^{-3}	20		10	10	10	10	10
10^{-4}	28		10	10	10	10	10
10^{-5}	90						73

Q_A = Stress on the gasket during installation before unloading



KLINGER® top-chem 2003

Technical values

Excellent chemical resistance in strongly acidic and alkaline applications and excellent mechanical properties at medium temperatures and loads.
High gas tightness even at low surface loads.

Basis

PTFE filled with hollowglass-microspheres.

Dimensions

of the standard sheets
Sizes:
1,500 x 1,500 mm
Thicknesses:
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.

Function and durability

The performance and service life of KLINGER gaskets depend in large measure on proper storage and fitting, factors beyond the manufacturer's control. We can, however, vouch for the excellent quality of our products.

With this in mind, please also observe our installation instructions.

Typical values for thickness 2.0 mm			
Compressibility ASTM F 36 M		%	18
Recovery ASTM F 36 M		%	35
Stress relaxation DIN 52913	30 MPa, 16 h/150°C	MPa	13
KLINGER cold/hot compression	thickness decrease at 23°C	%	9
25 MPa	thickness decrease at 250°C	%	36
Tightness	DIN 28090-2	mg/s x m	0.01
Specific leakrate λ	VDI 2440	mbar x l/s x m	3.29E-06
Thickness/weight increase	H_2SO_4, 100%: 18 h/23°C	%	1/1
	HNO_3, 100%: 18 h/23°C	%	0/5
	NaOH, 33%: 72 h/110°C	%	1/5
Density		g/cm³	1.7
Average surface resistance	ρ_O	Ω	9x10E12
Average specific volume resistance	ρ_D	Ω cm	2.6x10E12
Average dielectric strength	E_d	kV/mm	16.7
Average power factor	50 Hz	tan δ	0.085
Average dielectric coefficient	50 Hz	εr	2.8
Thermal conductivity	λ	W/mK	0.18
ASME-Code sealing factors	Leakage DIN 28090		
for gasket thickness 1.0 mm	tightness class 0.1 mg/s x m	MPa	y 8 m 2.0
for gasket thickness 2.0 mm	tightness class 0.1 mg/s x m	MPa	y 8 m 2.7
for gasket thickness 3.0 mm	tightness class 0.1 mg/s x m	MPa	y 10 m 3.6

Tests and approvals

BAM tested
DIN-DVGW
DIN-DVGW W 270
KTW-Guideline
German Lloyd
TA-Luft (Clean air)
FDA conformity
(components of KLINGER®top-chem 2003 comply with the FDA requirements)

Certified according to
DIN EN ISO 9001:2008

Subject to technical alterations.
Status: June 2017

Klinger Limited Australia
38 McDowell Street, Welshpool,WA6106
Phone 1300 798 279 – in Australia
Phone +61 (0)8 9251 1600
Fax +61 (0)8 9350 9286
e-mail: sales@klinger.com.au
http://www.klinger.com.au