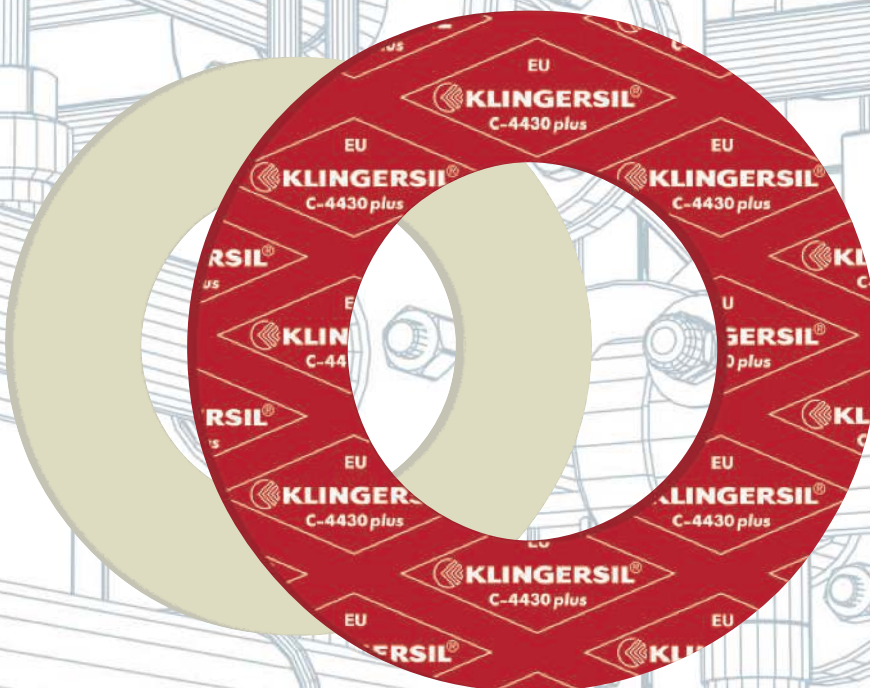


KLINGERSIL® C-4430plus

Superior performance at high
temperature applications



KLINGERSIL® C-4430plus

- + Thermal stability
- + Life time
- + High temperature tightness
- + Safety

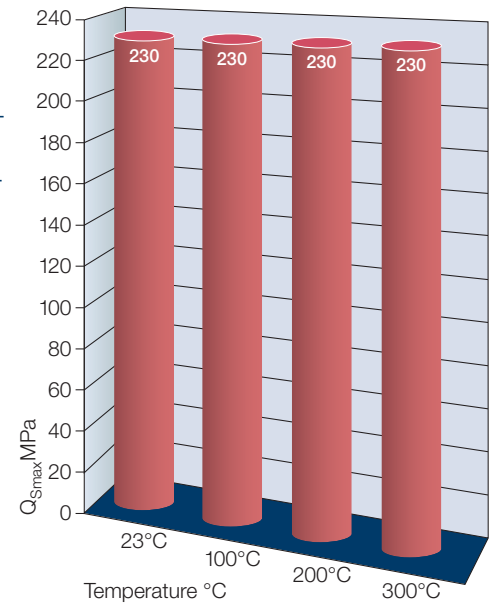
KLINGERSIL® C-4430plus

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		P _{QR} bei Q _{Smax}	Q _{Smax} (MPa)
	30 MPa	50 MPa		
23°C	0.93	0.95	0.98	230
100°C	0.76	0.86	0.93	230
200°C	0.72	0.86	0.87	230
300°C	0.59	0.72	0.82	230

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 200°C		Temperature 300°C	
MPa	E_G MPa	e_G mm	E_G MPa	e_G mm	E_G MPa	e_G mm	E_G MPa	e_G mm
1		2.067		2.087		2.083		2.058
20	1377	1.916	1231	1.868	2399	1.846	2906	1.807
30	1923	1.876	1937	1.838	2513	1.828	4198	1.793
40	2815	1.847	2204	1.810	2715	1.811	3416	1.775
50	2938	1.820	2801	1.788	3279	1.799	4323	1.762
60	3543	1.796	3315	1.772	4706	1.789	6029	1.751
80	7062	1.772	4905	1.752	4935	1.773	7536	1.734
100	6642	1.748	6206	1.731	5351	1.756	6756	1.717
120	6572	1.728	8047	1.712	5866	1.739	8790	1.704
140	8927	1.716	7681	1.690	6526	1.722	9942	1.692
160	11166	1.706	7558	1.666	7915	1.704	9569	1.680
180	10560	1.695	7994	1.641	7348	1.679	8859	1.669
200	9652	1.683	8144	1.617	7523	1.650	9444	1.661
220	8664	1.672	8454	1.593	7320	1.619	9971	1.653
230	8467	1.665	8489	1.578	7398	1.600	10157	1.647

KLINGERSIL® C-4430plus

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)

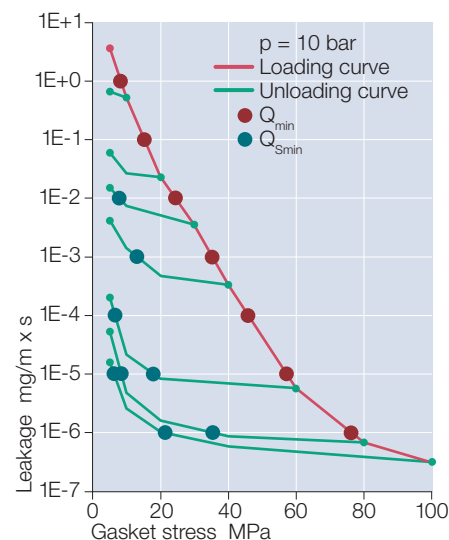
The minimum surface pressure in service is the minimum required surface pressure, which has to be applied on the gasket surface under operating conditions, i.e. after unloading during service, in order to keep the required tightness class L for the specified internal pressure.

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	$Q_A=$ 30 MPa	$Q_A=$ 40 MPa	$Q_A=$ 60 MPa	$Q_A=$ 80 MPa	$Q_A=$ 100 MPa
10^{-0}	8	5	5	5	5	5	5	5
10^{-1}	15		5	5	5	5	5	5
10^{-2}	24			8	5	5	5	5
10^{-3}	35				13	5	5	5
10^{-4}	46					7	5	5
10^{-5}	57					18	9	6
10^{-6}	76						35	21

Q_A = Stress on the gasket during installation before unloading

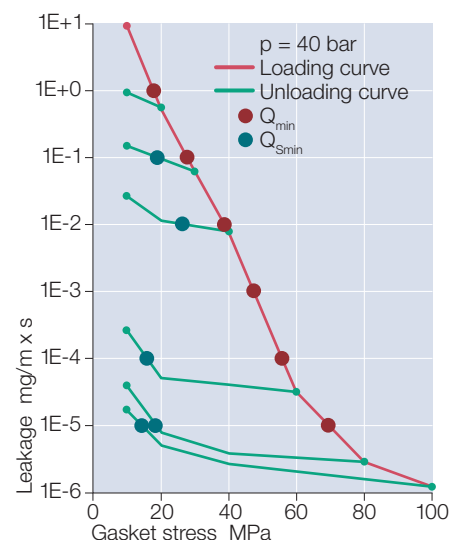


Minimum stress to seal for tightness class L

$Q_{\min(L)}$ 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}	18	10	10	10	10	10	10
10^{-1}	28		19	10	10	10	10
10^{-2}	39			26	10	10	10
10^{-3}	47				10	10	10
10^{-4}	56				16	10	10
10^{-5}	69					19	14

Q_A = Stress on the gasket during installation before unloading



KLINGERSIL® C-4430plus

Technical values

High pressure gasket for universal applications.
Suitable for use with water and steam at higher temperatures as well as to oils, gases, salt solutions, fuels, alcohols, moderate organic and inorganic acids, hydrocarbons, lubricants and refrigerants.
Premium material grade with outstanding stress retention.

■ Basis

Optimum combination of synthetic fibres bonded with NBR.

■ Dimensions of the standard sheets

Sizes:

1,000 x 1,500 mm,
2,000 x 1,500 mm.

Thicknesses:

0.5 mm, 1.0 mm, 1.5 mm,
2.0 mm, 3.0 mm

Tolerances:

Thickness acc. DIN 28091-1,
length $\pm$ 50 mm, width $\pm$ 50 mm.

Other thicknesses, sizes and tolerances on request.

■ Surfaces

KLINGERSIL® gasket materials are generally furnished with surfaces of low adhesion.

■ 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 J		%	9
Recovery ASTM F 36 J		%	55
Stress relaxation DIN 52913	50 MPa, 16 h/175°C	MPa	39
	50 MPa, 16 h/300°C	MPa	35
Stress relaxation BS 7531	40 MPa, 16 h/300°C	MPa	31
KLINGER cold/hot compression 50 MPa	thickness decrease at 23°C	%	8
	thickness decrease at 300°C	%	11
	thickness decrease at 400°C	%	14
Tightness	DIN 28090-2	mg/s x m	0.05
Specific leakrate λ	VDI 2440	mbar x l/s x	2.9E-06
Thickness increase after fluid immersion ASTM F 146	oil IRM 903: 5 h/150°C	%	3
	fuel B: 5 h/23°C	%	5
Density		g/cm ³	1.8
Average surface resistance	ρ_O	Ω	4.1x10E13
Average specific volume resistance	ρ_D	Ω cm	4.5x10E12
Average dielectric strength	E_d	kV/mm	21.3
Average power factor	50 Hz	tan δ	0.03
Average dielectric coefficient	50 Hz	ϵ_r	6.7
Thermal conductivity	λ	W/mK	0.38
ASME-Code sealing factors			
for gasket thickness 1.0 mm	tightness class 0.1 mg/s x m	y	20
		MPa	m 1.1
for gasket thickness 2.0 mm	tightness class 0.1 mg/s x m	y	20
		MPa	m 1.6
for gasket thickness 3.0 mm	tightness class 0.1 mg/s x m	y	20
		MPa	m 2.2

Classification acc. to BS 7531:2006 Grade AX

■ Tests and approvals

BAM-tested
DIN-DVGW
DIN-DVGW W 270
Elastomer-Guideline
WRAS approval
TA-Luft (Clean air)
Fire-Safe acc. to DIN EN ISO 10497