KLINGER®
top-sil ML1

KLINGER Portugal

KLINGER® top-sil ML1 - unique multi-layer material concept - a milestone for fiber-reinforced gaskets.

This gasket material makes use of the effects achieved by combining synthetic fibers and different elastomers into a **special multi-layer sealing matrix. The result: An extend** service life and improved flexibility at higher **temperatures. Highly versatile, it can be utilized for a w range of media and applications, including oils, wat steam, gases, salt solutions, fuels, alcohols, mode organic and inorganic acids, hydrocarbons, lubricants refrigerants.**

Basis composition: Synthetic fibers and elastomers, bonded in a multi-layer structure.
Color: Yellow
Certificates: BAM-tested, DIN-DVGW, DNV GL approval, TA-Luft (Clean air), Fire-safe acc. to DIN EN ISO 10497
Sheet size: 2000 x 1500 mm
Thickness: 1.0mm, 1.5mm, 2.0mm, 3.0mm
Tolerances:
Thickness according to DIN 28091-1
Length: +/- 50 mm
Width: +/- 50 mm

TECHNICAL DATA –Typical values for a thickness of 2.0 mm

Compressibility	ASTM F 36 J	%	9
Recovery	ASTM F 36 J	%	50
Stress relaxation DIN 52913	50 MPa, 16h/175°C	MPa	34
	50 MPa, 16h/300°C	MPa	28
Stress relaxation BS 7531	40 MPa, 16h/300°C	MPa	29
KLINGER cold/hot compression 50MPa	thickness decrease at 23°C	%	8
	thickness decrease at 300°C	%	15
Tightness	DIN 28090-2	mg/(s x m)	0.05
Specific leakrate	VDI 2440	mbar x l/(s x m)	3.51E-06
Thickness increase after fluid immersion ASTM F 146	oil IRM 903: 5 h/150°C	%	4
	fuel B: 5h/23°C	%	8
Density		g/cm³	1.7
Average surface resistance	ρO	Ω	9.3x10E12
Average specific volume resistance	ρD	Ω cm	3.8x10E12
Average dielectric strength	Ed	kV/mm	18.8
Average power factor	50 Hz	tan δ	0.048
Average dielectric coefficient	50 Hz	εr	7.3
Thermal conductivity	λ	W/mK	0.36
Classification acc. to BS 7531:2006	Grade AX		
ASME-Code sealing factors for gasket thickness 2.0 mm	tightness class 0.1 mg/s x m	MPa	y 15
			m 2.2

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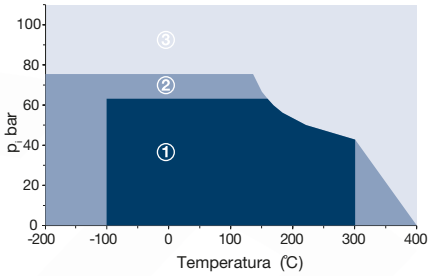
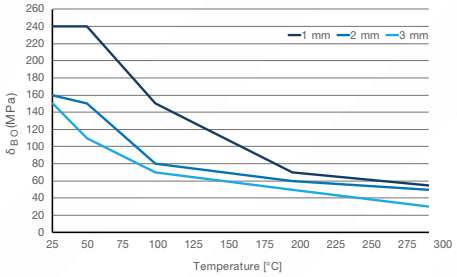
The area of the P-T diagram
1 – In area one, the gasket material is normally suitable subject to chemical compatibility.
2 – In area two, the gasket material may be suitable but a technical evaluation is recommended.
3 – In area three, do not install the gasket without a technical evaluation.
Always refer to the chemical resistance of the gasket to the media.

P-T diagram - thickness 2.0 mm



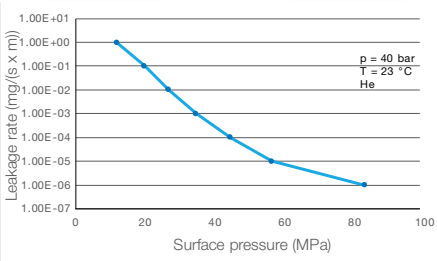
Maximum surface pressure in operating conditions of Sigma BO
This diagram shows the maximum surface pressure in MPa with which the sealing material may be loaded, depending on the operating temperature. The characteristic curves apply to the specified sealing thicknesses. In contrast to Qsmax according to EN 13555, the surface pressures specified here are based on a maximum permissible reduction in thickness.

Sigma BO



The tightness performance graph
The graph shows the required stress at assembling to seal a certain tightness class.
The determination of the graph is based on EN13555 test procedure which applies 40bar Helium at room temperature. The sloping curve indicates the ability of the gasket to increase tightness with raising gasket stress.

Tightness performance



Chemical resistance chart
Simplified overview of the chemical resistance depending on the most important groups of raw materials:

A: small or no attack
B: weak till moderate attack
C: strong attack

Paraffinic hydrocarbon	Motor fuel	Aromates	Chlorinated hydrocarbon fluids	Motor oil	Mineral lubricants	Alcoho	Ketone	Ester	Water	Acid (diluted)	Base (diluted)
A	B	C	C	A	B	A	C	C	A	A	A

For more information on chemical resistance please visit www.klinger.pt

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