KLINGERSIL®	DIN 28090/DIN 28091							DIN 2505		ASTM	
Type	thick-ness	σ_{VO}	$\sigma_{Vu\,0,1}$	σ_{BO} (7.2.2)							
		MPa	MPa	MPa	MPa	MPa	MPa	k_1	$K_0 x K_D$	"m"	"y"Stress
	mm	25°C	25°C	50°C	100°C	200°C	300°C	mm	(N/mm)	factor	MPa
KLINGERSIL® C-4300	1	158	15	120	63	39		1.1 x b_D	22 x b_D	2.7	15.0
	2	120	18	80	52	33		1.1 x b_D	22 x b_D	3.0	15.0
	3	48	20	40	29	18		1.1 x b_D	22 x b_D	3.3	15.0
KLINGERSIL® C-4400	1	240	18	195	95	50	38	1.1 x b_D	22 x b_D	3.2	20.0
	2	240	23	110	80	42	30	1.1 x b_D	22 x b_D	3.5	20.0
	3	63	24	53	41	24		1.1 x b_D	22 x b_D	3.9	20.0
KLINGERSIL® C-4409	1	240	39	215	176	120	80	1.1 x b_D	28 x b_D	3.2	30.0
	2	240	43	110	80	42	30	1.1 x b_D	28 x b_D	3.5	30.0
KLINGERSIL® C-4430	1	>240	22	260	145	81	65	1.1 x b_D	22 x b_D	4.5	25.0
	2	>240	29	240	120	73	56	1.1 x b_D	22 x b_D	5.0	25.0
	3	133	29	97	65	40	31	1.1 x b_D	22 x b_D	5.5	25.0
KLINGERSIL® C-4500	1	220	23	195	120	68	51	1.1 x b_D	22 x b_D	3.5	25.0
	2	180	26	110	110	59	43	1.1 x b_D	22 x b_D	4.0	25.0
	3	100	28	80	55	33	23	1.1 x b_D	22 x b_D	4.5	25.0
KLINGERSIL® C-4509	1	280	24	195	140	120	97	1.1 x b_D	28 x b_D	3.5	30.0
	2	180	28	110	110	59	43	1.1 x b_D	28 x b_D	4.0	30.0
KLINGERSIL® C-8200	1	225	17	160	70	44		1.1 x b_D	22 x b_D	3.5	22.5
	2	150	19	110	53	34		1.1 x b_D	22 x b_D	4.0	22.5
	3	75	21	55	26	17		1.1 x b_D	22 x b_D	4.5	22.5

KLINGERtop-chem and top-graph	DIN 28090/DIN 28091							DIN 2505		ASTM	
Type	thick-ness	σ_{VO}	$\sigma_{Vu\,0,1}$	σ_{BO} (7.2.2)							
		MPa	MPa	MPa	MPa	MPa	MPa	k_1	$K_0 x K_D$	"m"	"y"Stress
	mm	25°C	25°C	50°C	100°C	200°C	250°C	mm	(N/mm)	factor	MPa
KLINGERtop-chem 2000	1	253	21	214	150	125	75	1.1 x b_D	25 x b_D	4.7	10.0
	2	210	21	185	150	125	75	1.1 x b_D	25 x b_D	3.5	10.0
	3	100	21	87	60	50	33	1.1 x b_D	25 x b_D	5.0	12.0
KLINGERtop-chem 2003	2	>110	13	110	28	15	10	1.1 x b_D	22 x b_D	2.8	5.0
KLINGERtop-chem 2005	2	>110	28	50	35	22	15	1.1 x b_v	22 x b_D	3.5	10.0
KLINGERtop-chem 2006	2									5.0	15.0
KLINGERtop-graph 2000	2	>160	25	120	80	70	60 *			4.0	25.0

* 300°C

The evaluation of these characteristic datas are based on the rules of DIN 28090. The use of this values will not guarantee the performance of the gasket. Application conditions not in the control of the gasket material manufacturer can influence the operation of the gasket. A deducation of liability claims of any nature is therefore not possible. As further investigations are continuousely carried out we reserve the right of appropriate updates.

The design factors "m" and "y" according to the ASME Code are based on a maximum leakage rate of 1 ml/min. approx. 0.1 mg/sec x m measured according to DIN 28090 at different gas pressures and different gasket stresses.
The DIN 2505 and the "y" and "m" concept itself now being questioned as a valid design tool.

Gasket Factors according to EN13555

Gasket factor $Q_{min(L)}$
The gasket factor $Q_{min(L)}$ is defined in the EN13555 as the required minimum surface stress on the gasket at installation at room temperature so that the adaptation of the gasket to the flange surface is sufficient to achieve tightness class L for a given internal pressure.

Gasket factor $Q_{Smin(L)}$
The gasket factor $Q_{Smin(L)}$ is defined as the required minimum surface stress under operating conditions, i.e. after release at operating temperature, so that the required tightness class L is achieved for the given internal pressure.

Gasket factor Q_{Smax}
In the EN13555 the gasket factor Q_{Smax} is defined as the maximum surface stress with which the gasket may be loaded at the given temperature without collapsing or failure due to over compression.

Gasket factor P_{QR}
This gasket factor is defined to consider the relaxation of the gasket load after tightening the bolts and the long-term influence of the operating temperature.

Validity of the test result
The validity of the test result for Q_{Smax} is dependant on the factor P_{QR} which is mentioned in the EN 13555 section 8.4.5. This can then be applied to the Q_{Smax} for different gasket materials.

However there is no information in the standard which P_{QR} values confirm a Q_{Smax} value. This means it is not easy for the user to determine which gasket materials will work properly at a given operating temperature and surface pressure or are already overrated as quoted in the standard.

For KLINGER gasket materials KLINGER recommends the use of the values determined with the gasket calculation software KLINGER®expert for the maximum permissible and minimum required surface stress for a given application.

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Gasket factors according EN 13555:2005-02

All values for thickness 2.0 mm

Material	Q_{min} [N/mm²] p_i = 40 bar, RT		Qsmin [N/mm²], p_i = 40 bar Q_A [N/mm²] 20	40	60	80	Qsmax [N/mm²]		P_{QR} Stiffness 500 kN/mm
KLINGERSIL® C-4300	$L_{0.1}$	18.0	< 10.0	< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	28.2		< 10.0	< 10.0	< 10.0	100°C	> 200	0.87
	$L_{0.001}$	36.6		30.1	< 10.0	< 10.0	175°C	> 200	0.80
	$L_{0.0001}$	48.5			< 10.0	< 10.0	200°C	> 200	0.78
KLINGERSIL® C-4324	$L_{0.1}$	17.2	< 10.0	< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	27.0		< 10.0	< 10.0	< 10.0	100°C	> 200	0.84
	$L_{0.001}$	37.7		27.5	< 10.0	< 10.0	175°C	> 200	0.76
	$L_{0.0001}$	51.2			17.4	< 10.0	200°C	> 200	0.75
KLINGERSIL® C-4400	$L_{0.1}$	18.1	< 10.0	< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	29.4		< 10.0	< 10.0	< 10.0	100°C	> 200	0.92
	$L_{0.001}$	41.6			< 10.0	< 10.0	175°C	> 200	0.84
	$L_{0.0001}$	54.8			18.9	< 10.0	200°C	> 200	0.84
	$L_{0.00001}$	71.0				24.9	250°C	> 200	0.83
KLINGERSIL® C-4430	$L_{0.1}$	20.5		< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	32.6		< 10.0	< 10.0	< 10.0	100°C	> 200	0.93
	$L_{0.001}$	44.7			< 10.0	< 10.0	175°C	> 200	0.91
	$L_{0.0001}$	56.8			31.8	< 10.0	200°C	> 200	0.90
	$L_{0.00001}$	73.4				28.0	250°C	> 200	0.88
							300°C	> 200	0.85
KLINGERSIL® C-4500	$L_{0.1}$	17.5	< 10.0	< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	25.6		< 10.0	< 10.0	< 10.0	100°C	> 200	0.87
	$L_{0.001}$	34.0		13.1	< 10.0	< 10.0	175°C	> 200	0.79
	$L_{0.0001}$	43.7			< 10.0	< 10.0	200°C	> 200	0.80
	$L_{0.00001}$	56.4			34.9	15.7	250°C	> 200	0.77
	$L_{0.000001}$	93.7					300°C	> 200	0.74
KLINGERSIL® C-8200	$L_{0.1}$	17.0	< 10.0	< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	26.5		< 10.0	< 10.0	< 10.0	100°C	> 200	0.67
	$L_{0.001}$	36.7		16.7	< 10.0	< 10.0	175°C	> 200	0.60
	$L_{0.0001}$	49.3			12.5	< 10.0	200°C	> 200	0.54
KLINGER®top-graph 2000	$L_{0.1}$	19.3	16.8	< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	32.5		10.6	< 10.0	< 10.0	100°C	> 200	0.92
	$L_{0.001}$	47.1			12.6	< 10.0	175°C	> 200	0.84
	$L_{0.0001}$	63.3				16.0	200°C	> 200	0.83
	$L_{0.00001}$	81.9					250°C	> 200	0.77
							300°C	> 200	0.76
KLINGER®top-sil-ML1	$L_{0.1}$	19.2	16.4	< 10.0	< 10.0	< 10.0	RT	> 160	
	$L_{0.01}$	32.2		11.0	< 10.0	< 10.0	100°C	> 160	0.87
	$L_{0.001}$	45.7			12.1	< 10.0	175°C	140	0.76
	$L_{0.0001}$	59.3			56.8	15.1	200°C	120	0.78
	$L_{0.00001}$	80.4					250°C	100	0.72
							300°C	80	0.70
KLINGER®top-chem 2000	$L_{0.1}$	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	RT	> 200	
	$L_{0.01}$	19.7	19.0	< 10.0	< 10.0	< 10.0	100°C	> 180	0.73
	$L_{0.001}$	51.8			39.5	< 10.0	175°C	> 160	0.77
	$L_{0.0001}$	84.8					200°C	140	0.67
							250°C	50	0.93
KLINGER®top-chem 2003	$L_{0.1}$	< 10.0	< 10.0	< 10.0	< 10.0		RT	80	
	$L_{0.01}$	14.7	< 10.0	< 10.0	< 10.0		100°C	30	0.65
	$L_{0.001}$	23.7		< 10.0	< 10.0		150°C	20	0.70
	$L_{0.0001}$	38.4		23.9	< 10.0				
KLINGER®top-chem 2005	$L_{0.1}$	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	RT	120	
	$L_{0.01}$	12.0	< 10.0	< 10.0	< 10.0	< 10.0	100°C	40	0.90
	$L_{0.001}$	21.0		< 10.0	< 10.0	< 10.0	175°C	20	0.92
	$L_{0.0001}$	36.0		18.0	10.5	< 10.0	200°C	20	0.90
KLINGER®top-chem 2006	$L_{0.1}$	30.0		< 10.0	< 10.0	< 10.0	RT	100	
	$L_{0.01}$	41.0			< 10.0	< 10.0	100°C	40	0.86
	$L_{0.001}$	51.8			< 10.0	< 10.0	175°C	20	0.82
	$L_{0.0001}$	66.0				< 10.0			

Gasket dimensions: DN40/ PN40 according EN 1514-1