

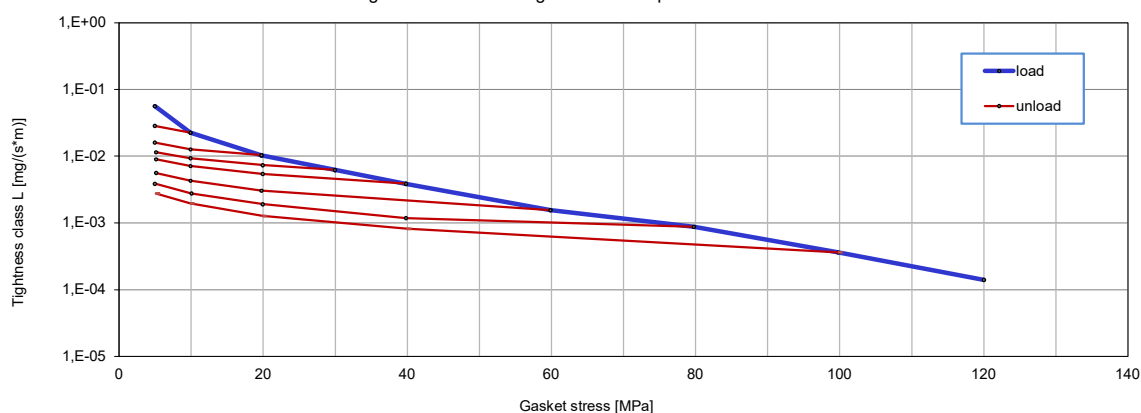
		LABORATORY OF SEALING MATERIALS 43-382 Bielsko-Biała, ul. Szyprów 17 tel. +48 33 8184133 e-mail: lbmu@spetech.com.pl www.laboratory.spetech.eu			 TUV Rheinland CERTIFIED www.tuv.com 210/AL1/5952
Company		SPETECH sp. z o.o.			
Gasket Type		SPETOGRAPH® GUS® 10			 LB – 12402
Dimensions [mm]		92 x 49 x 2 (DN40 PN40)			
Calculation type EN 1591-1		a) flat gasket;		EN 1514-1	
Notes:		Rev.0 (04-03-2021)		IBC	

Factors acc. to EN 13555 to use in calculation standard EN 1591-1:2009/ :2013

Minimum level of surface pressure required for leakage rate class L on assembly $Q_{min/L}$ and after off-loading $Q_{Smin/L}$ at room temperature (RT)

Internal pressure [bar]		10									
L [mg/(s·m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress									
		$Q_A = 10$ [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}	5	5	5	5	5	5	5	5			
10^{-1}	5	5	5	5	5	5	5	5			
10^{-2}	20		20	8	5	5	5	5			
10^{-3}	75						63	30			
10^{-4}											
10^{-5}											
10^{-6}											
10^{-7}											

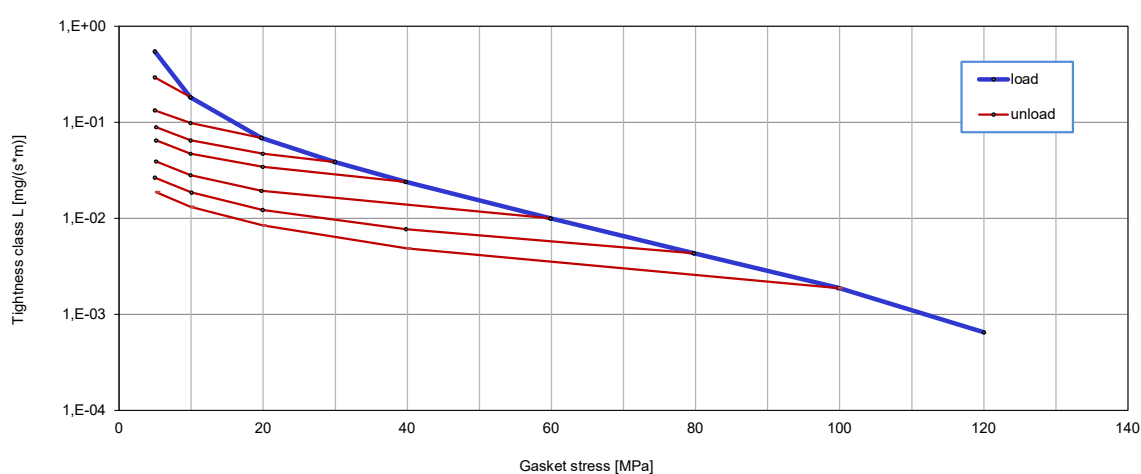
Leakage rate in function of gasket stress - pressure 10 bar / RT



Minimum level of surface pressure required for leakage rate class L on assembly $Q_{min/L}$ and after off-loading $Q_{Smin/L}$ at room temperature (RT)

Internal pressure [bar]		40									
L [mg/(s·m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress									
		$Q_A = 10$ [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}	5	5	5	5	5	5	5	5			
10^{-1}	16		9	5	5	5	5	5			
10^{-2}	59					58	28	16			
10^{-3}	112										
10^{-4}											
10^{-5}											
10^{-6}											
10^{-7}											

Leakage rate in function of gasket stress - pressure 40 bar / RT

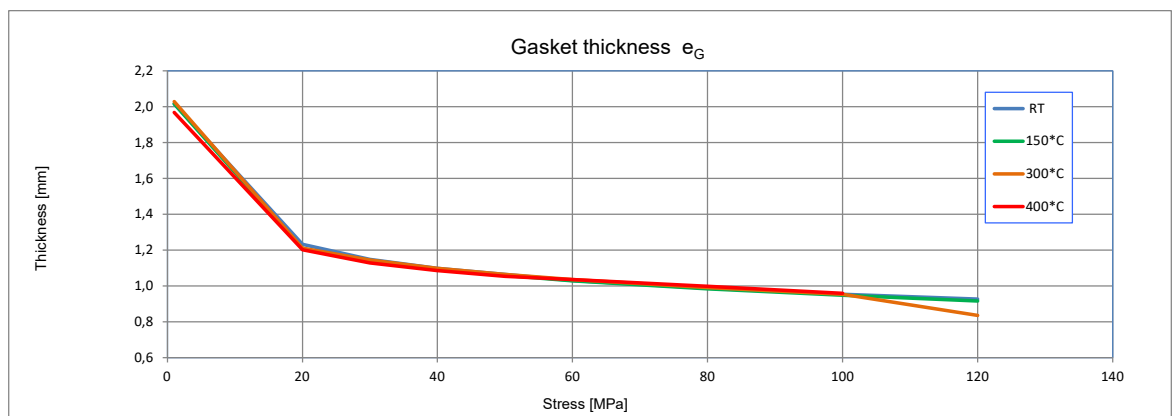


Temperature	RT						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		2,015					120
20	336	1,233					
30	542	1,148	0,97	0,009			
40	743	1,099					
50	983	1,064	0,98	0,008			
60	1022	1,031					
80	1598	0,988					
100	1930	0,954					
120	2507	0,928	0,99	0,010			

Temperature	150°C						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		2,015					120
20	360	1,208					
30	569	1,142	0,92	0,020			
40	822	1,095					
50	980	1,059	0,95	0,021			
60	1164	1,029					
80	1478	0,984					
100	1831	0,948					
120	2081	0,917	0,98	0,020			

Temperature	300°C						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		2,028					120
20	468	1,211					
30	554	1,144	0,88	0,030			
40	877	1,099					
50	1136	1,065	0,94	0,027			
60	1223	1,036					
80	1650	0,991					
100	1932	0,953					
120	1859	0,836	0,97	0,030			

Temperature	400°C						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		1,967					100
20	485	1,202					
30	683	1,128	0,90	0,026			
40	1063	1,085					
50	1684	1,054	0,93	0,031			
60	2353	1,035					
80	2492	0,998					
100	2301	0,959	0,97	0,025			



Description:	E_G	Modulus of elasticity	Q_{smax}	Maximum surface pressure
	e_G	Gasket or sealing element thickness	μ_G	Static friction factor (based on EN1591-1:2014 Annex E)
	P_{QR}	Creep relaxation factor	C	Stiffness
	Δe_{Gc}	Gasket thickness change due to creep		

Factors acc. to EN 13555 to use in calculation standard EN 1591-1:2001

T [°C]	Q _{min} [MPa]	Q _{max, ref} [MPa]	E ₀ [MPa]	K ₁	Q _i /P	g _c	c ₁
20	10	100	1	26	1,3	1,0	
100		100	1	26	1,3	1,0	
200		95	1	26	1,3	1,0	
300		90	1	26	1,3	1,0	
400							
bGref [mm]				eGref [mm]			

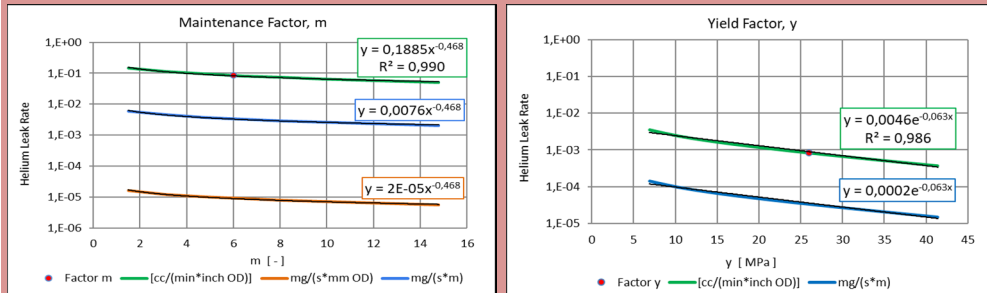
Factors acc. to:

EN 13445-3 : Unfired pressure vessels - Part 3: Design

EN 13480-3:2002 Metallic industrial piping - Part 3: Design and calculation

ASME Code s. VIII Boiler & Pressure Vessel Code

Tightness class	ASTM F3149	PVRC Tightness class	EN 13555
Factor m	[-]	T3	L0,01
		T4	L0,001
Factor y	[MPa]	<1,5	<1,5
	[psi]		



NOTE: Maintenance values [m] less than 2.0 are typically not used in ASME designs except for elastomeric gaskets (Classification D2000).

Gasket dimensions acc. to EN 12560-1 NPS4 Class300.

The given coefficient values are read from the test curves, not from the trend line.

[σ_{max} - see maximal applicable gasket stress Q_{smax} acc. EN 1591-1:2009/2013](#)

Factors acc. to:

AD 2000-Merkblatt B7 August 2007

k ₀ k _D [N/mm]	k1 [mm]	k ₀ k ₉ [N/mm]
10,0*b _D	2,0*b _D	*b _D

[σ_{max} - see maximal applicable gasket stress Q_{smax} acc. EN 1591-1:2009/2013](#)

Factors acc. to:

WUDT-UC-WO-O/19

σ _m [MPa]	σ _r [MPa]	b [1]				
		20°C	100°C	200°C	300°C	400°C
18,3	4,0*p ₀	1,0	1,1	1,1	1,1	1,2

[σ_{max} - see maximal applicable gasket stress Q_{smax} acc. EN 1591-1:2009/2013](#)

Factors acc. to:

ASTM F36-2003 Standard Test Method for Compressibility and Recovery of Gasket Materials
Procedure J

Compressibility [%]	Recovery [%]
41,7	16,3

Factors acc. to:

ASTM F38-00 Standard Test Methods for Creep Relaxation of a Gasket Material (Method B)

Temperature [°C]	Creep Relaxation [%]
20	3,3
100	16,3
200	22,6

Factors acc. to:

EN 61340-2-3 Electrostatics - Part 2-3: Methods of test for determining the resistance and resistivity of solid planar materials used to avoid electrostatic charge accumulation

Surface resistance R _s at U=10V	[Ω]		NDA
Volume resistance R _v at U=10V	[Ω]		NDA
Surface resistivity ρ _s at U=10V	[Ω]		NDA
Volume resistivity ρ _v at U=10V	[Ωm]		NDA