



LABORATORY OF SEALING MATERIALS

43-382 Bielsko-Biala, ul. Szyprów 17

tel. +48 33 8184133 e-mail: lbmu@spetech.com.pl www.laboratory.spetech.eu



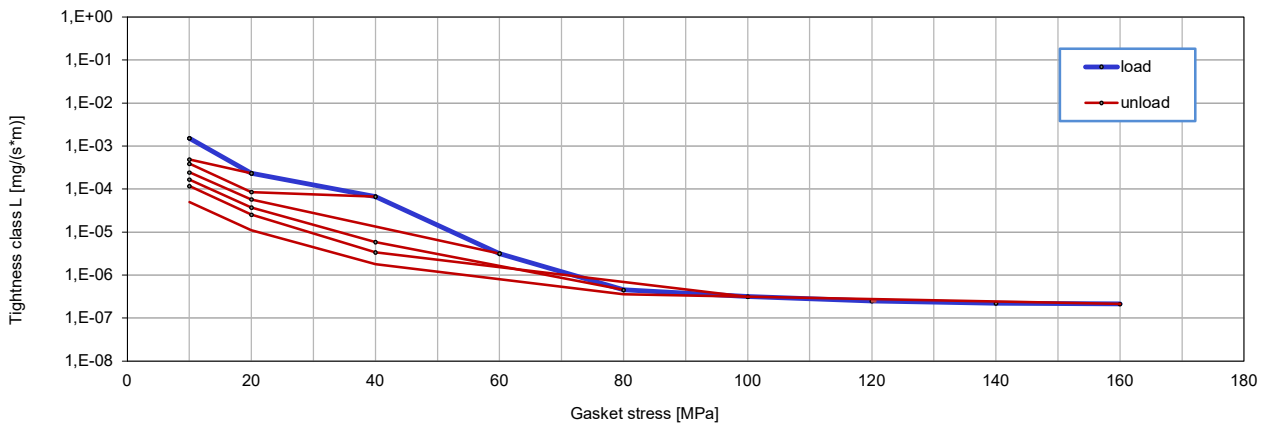
Company	SPETECH sp. z o.o.		
Gasket Type	DRYFLEX® FGC		
Dimensions [mm]	69 x 53 x 4 (DN40 PN40)		
Calculation type EN 1591-1	a) flat gasket;	EN 1514-6	NR
Notes:	Rev.1 (10-02-2021)		

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									
		$Q_A = 20$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]	$Q_A = 160$ [MPa]				
10^{-0}	10	10	10	10	10	10	10				
10^{-1}	10	10	10	10	10	10	10				
10^{-2}	10	10	10	10	10	10	10				
10^{-3}	13	10	10	10	10	10	10				
10^{-4}	33		19	17	13	12	10				
10^{-5}	53			45	35	29	22				
10^{-6}	72				67	71	55				
10^{-7}											

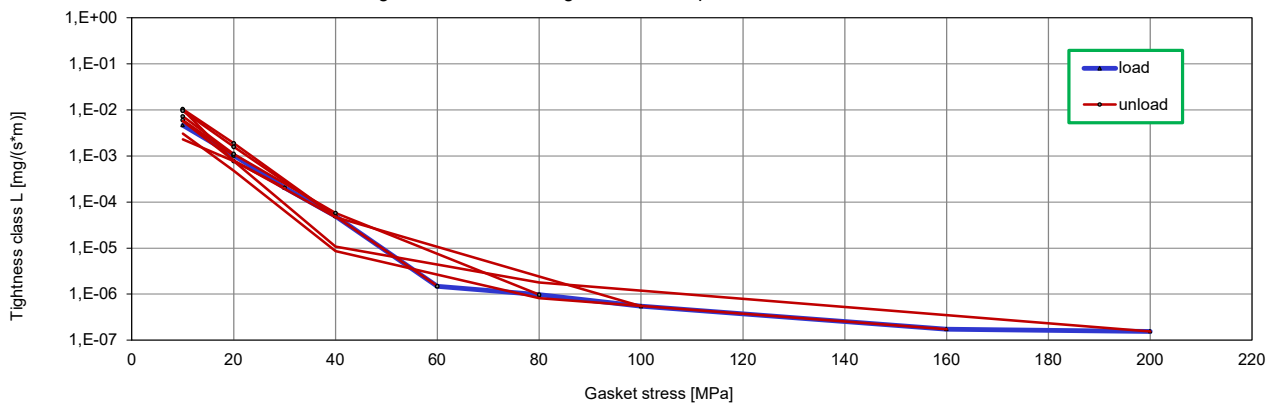
Leakage rate in function of gasket stress - pressure 10 bar / RT



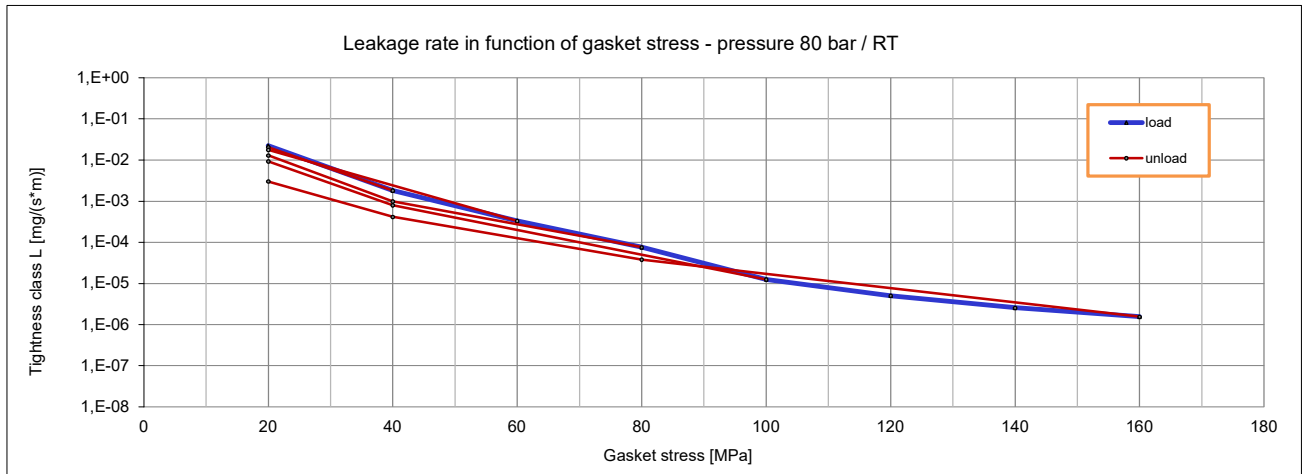
Minimum level of surface pressure required for leakage rate class L on assembly $Q_{min/L}$ and after off-loading $Q_{Smin/L}$ at room temperature (RT)

Internal pressure [bar]		40									
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress									
		$Q_A = 20$ [MPa]	$Q_A = 30$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]	$Q_A = 160$ [MPa]	$Q_A = 200$ [MPa]		
10^{-0}	10	10	10	10	10	10	10	10	10		
10^{-1}	10	10	10	10	10	10	10	10	10		
10^{-2}	10	10	10	10	10	10	10	10	10		
10^{-3}	20		19	23	23	21	19	16	18		
10^{-4}	35			37	36	37	35	28	29		
10^{-5}	49				48	58	61	39	42		
10^{-6}	80						92	77	109		
10^{-7}											
10^{-8}											

Leakage rate in function of gasket stress - pressure 40 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]	80												
L [mg/(s*m)]	Q _{min/L} [MPa]	Q _{Smin/L} [MPa] for effective gasket stress											
		Q _A = 20 [MPa]	Q _A = 30 [MPa]	Q _A = 40 [MPa]	Q _A = 60 [MPa]	Q _A = 80 [MPa]	Q _A = 100 [MPa]	Q _A = 160 [MPa]					
10 ⁻⁰	20			20	20	20	20	20					
10 ⁻¹	20			20	20	20	20	20					
10 ⁻²	27			26	26	22	20	20					
10 ⁻³	47				49	40	38	31					
10 ⁻⁴	77					76	70	64					
10 ⁻⁵	105							114					
10 ⁻⁶													
10 ⁻⁷													
10 ⁻⁸													

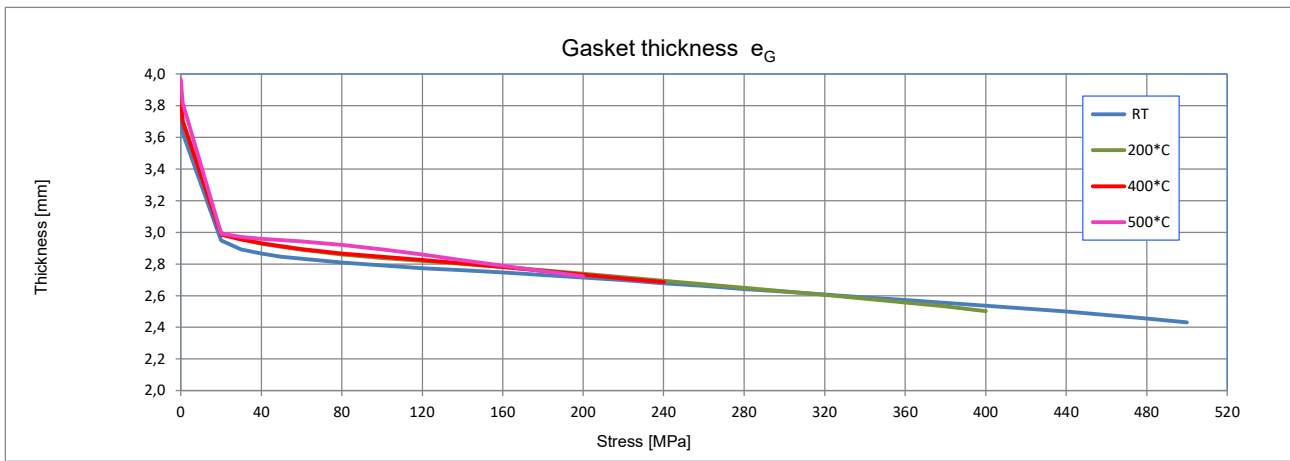


Temperature		RT						Q _{smax} [MPa]	μ _G [-]
Gasket stress [MPa]	E _G [MPa]	e _G [mm]	C=500 kN/mm		C=1500 kN/mm				
			P _{QR} [-]	Δ _{eGc} [mm]	P _{QR} [-]	Δ _{eGc} [mm]			
0		3,800					500	0,08	
1		3,628							
20	2389	2,948							
30	3523	2,893							
40	4404	2,865							
50	5306	2,847	0,98	0,003					
60	6299	2,833							
80	8097	2,810							
100	10342	2,791	0,99	0,003					
120	12839	2,774							
140	15369	2,760							
160	17503	2,746							
180	19178	2,731							
200	19741	2,714							
220	20624	2,697							
240	20972	2,679							
260	21343	2,661							
280	21435	2,643							
300	22172	2,625							
320	22535	2,608							
340	22793	2,590							
360	22831	2,572							
380	23326	2,555							
400	23424	2,536							
420	23798	2,518							
440	23688	2,499							
460	23944	2,478							
480	24136	2,456							
500	24064	2,432	0,99	0,016					

Temperature	200°C							
Gasket stress	E _G	e _G	C=500 kN/mm		C=1500 kN/mm		Q _{smax}	μ _G
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		3,840					400	0,06
1		3,702						
20	2698	2,995						
30	3876	2,958						
40	4737	2,929						
50	5638	2,908	0,84	0,024				
60	6668	2,889						
80	9105	2,859						
100	12241	2,838	0,94	0,020				
120	14954	2,820						
140	16380	2,801						
160	18023	2,782						
180	18573	2,760						
200	18965	2,738						
220	19273	2,716						
240	19548	2,695						
260	19669	2,672						
280	19940	2,650						
300	19900	2,627						
320	20091	2,605						
340	20362	2,581						
360	20401	2,557						
380	20614	2,531						
400	20577	2,502	0,95	0,066				

Temperature	400°C							
Gasket stress	E _G	e _G	C=500 kN/mm		C=1500 kN/mm		Q _{smax}	μ _G
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		3,860					240	0,07
1		3,702						
20	2634	2,986						
30	3803	2,956						
40	4810	2,930						
50	5804	2,911	0,76	0,038				
60	6880	2,894						
80	9678	2,866						
100	12576	2,845	0,93	0,023				
120	15092	2,825						
140	16873	2,804						
160	17795	2,781						
180	18566	2,756						
200	18995	2,732						
220	19806	2,709						
240	20010	2,686	0,94	0,039				

Temperature	500°C							
Gasket stress	E _G	e _G	C=500 kN/mm		C=1500 kN/mm		Q _{smax}	μ _G
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		3,965					200	-
1		3,817						
20	4394	2,992						
30	6616	2,971						
40	8663	2,959						
50	10490	2,950	0,80	0,031				
60	12780	2,941						
80	17575	2,920						
100	21135	2,892	0,87	0,039				
120	25240	2,859						
140	27093	2,824						
160	29315	2,788						
180	30053	2,754						
200	31505	2,721	0,88	0,076				



Description:	E_G	Modulus of elasticity	Q_{smax}	Maximum surface pressure
	e_G	Gasket or sealing element thickness	μ_G	Static friction factor
	P_{QR}	Creep relaxation factor	C	Stiffness
	Δ_{eGc}	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/P	g_c	c_1
20	15	500	16000	-	1,3	1,0	0
100		480	16000	-	1,3	1,0	0
200		450	16000	-	1,3	1,0	0
300		420	16000	-	1,3	1,0	0

b_{Gref} [mm]	8,0	e_{Gref} [mm]	3,8
-----------------	-----	-----------------	-----

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		
		T3	T4	L0,01	L0,001	
Factor m	[-]	4,3	< 2,7	16,0	< 2,7	7,3
Factor y	[MPa]	13,3			9,6	16,5
	[psi]	1930				

Maintenance Factor, m

Yield Factor, y

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 1514-6 PN40 DN40.
 The given coefficient values are read from the test curves, not from the trend line.
[omax - see maximal applicable gasket stress Qsmax acc. EN 1591-1:2009/2013](#)

Factors acc. to:
 AD 2000-Merkblatt B7 August 2007

k_0k_D [N/mm]	k_1 [mm]	k_0k_9 [N/mm]
$15,0 \cdot b_D$	$1,1 \cdot b_D$	$\cdot b_D$

[omax - see maximal applicable gasket stress Qsmax acc. EN 1591-1:2009/2013](#)

Factors acc. to:

WUDT-JC-WO-O/19

σ_m [MPa]	σ_r [MPa]	b [1]				
		20oC	100oC	200oC	300oC	400oC
15,3	5,0*p ₀	1,0	1,1	1,1	1,1	1,1

[dmax](#) - 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 [%]
NDA	NDA

Factors acc. to:

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

Temperature [°C]	Creep Relaxation [%]
20	NDA
100	NDA
200	NDA

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]	<	1,00E+03
Volume resistance R_v at U=10V	[Ω]	<	1,00E+03
Surface resistivity ρ_s at U=10V	[Ω]	<	1,01E+04
Volume resistivity ρ_v at U=10V	[Ω m]	<	3,72E+02