

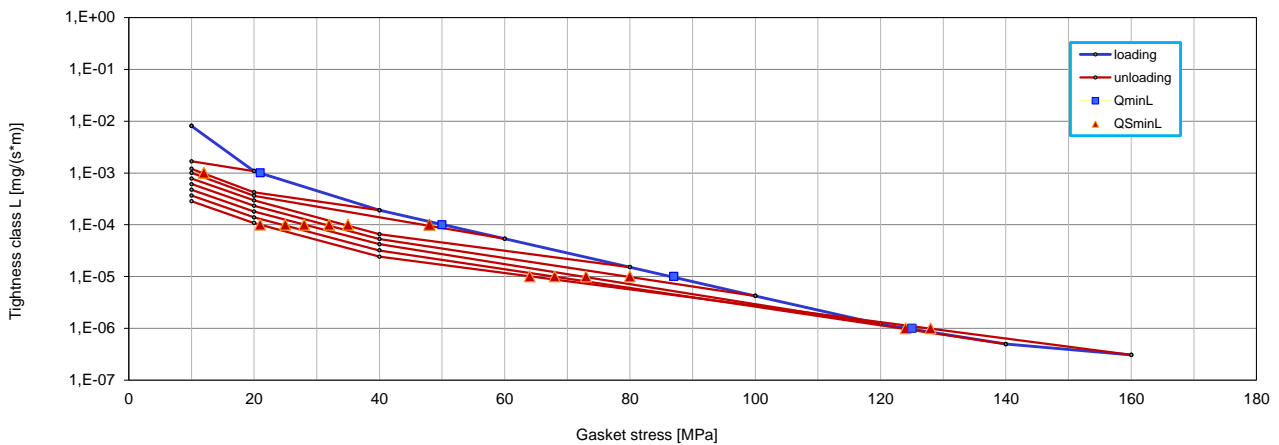
Company	SPETECH sp. z o.o.
Gasket Type	SPETOMET[®] MWK[®]10 FGC
Dimensions [mm]	69 x 53 x 4
Calculation type EN 1591-1	a) flat gasket; EN 1514-6

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)

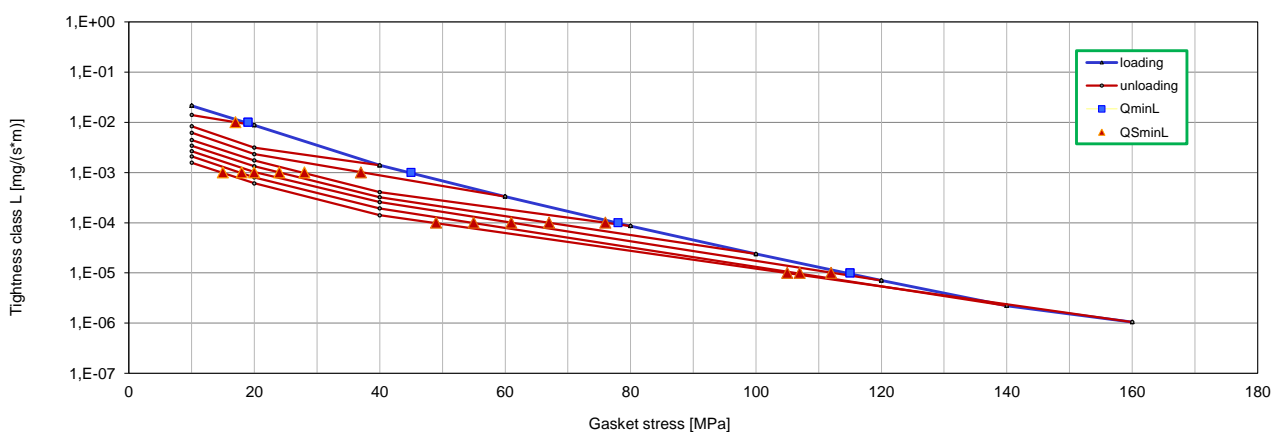
Internal pressure [bar]		10										
L [mg/(s*m)]	Q _{min/L} [MPa]	Q _{Smin/L} [MPa] for effective gasket stress										
		Q _A = 10 [MPa]	Q _A = 20 [MPa]	Q _A = 40 [MPa]	Q _A = 60 [MPa]	Q _A = 80 [MPa]	Q _A = 100 [MPa]	Q _A = 120 [MPa]	Q _A = 140 [MPa]	Q _A = 160 [MPa]		
10 ⁰	10		10	10	10	10	10	10	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	21			12	10	10	10	10	10	10		
10 ⁻⁴	50				48	35	32	28	25	21		
10 ⁻⁵	87						80	73	68	64		
10 ⁻⁶	125								124	128		

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

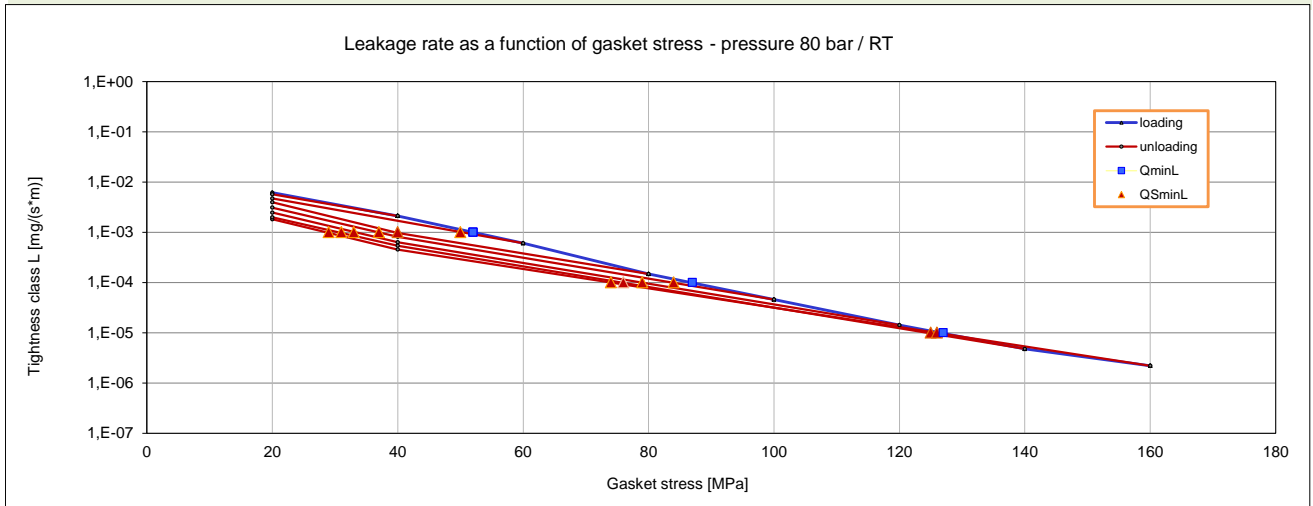

 Minimum level of surface pressure required for leakage rate class L on assembly Q_{min/L} and after off-loading Q_{Smin/L} at room temperature (RT)

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 = 40 [MPa]	Q _A = 60 [MPa]	Q _A = 80 [MPa]	Q _A = 100 [MPa]	Q _A = 120 [MPa]	Q _A = 140 [MPa]	Q _A = 160 [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	19		17	10	10	10	10	10	10	10		
10 ⁻³	45				37	28	24	20	18	15		
10 ⁻⁴	78					76	67	61	55	49		
10 ⁻⁵	115							112	107	105		
10 ⁻⁶												

Leakage rate as a 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 = 10 [MPa]	Q _A = 20 [MPa]	Q _A = 40 [MPa]	Q _A = 60 [MPa]	Q _A = 80 [MPa]	Q _A = 100 [MPa]	Q _A = 120 [MPa]	Q _A = 140 [MPa]	Q _A = 160 [MPa]			
10 ⁻⁰	20			20	20	20	20	20	20	20	20		
10 ⁻¹	20			20	20	20	20	20	20	20	20		
10 ⁻²	20			20	20	20	20	20	20	20	20		
10 ⁻³	52				50	40	37	33	31	29			
10 ⁻⁴	87						84	79	76	74			
10 ⁻⁵	127								125	126			
10 ⁻⁶													



Parameters at RT						
Gasket stress [MPa]	Unloading modulus of elasticity EG [MPa]	Gasket or sealing element thickness e _G [mm]	Creep relaxation factor P _{QR} [-]	Gasket thickness change due to creep Δe _{Gc} [mm]	Maximum surface pressure Q _{Smax} [MPa]	Static friction factor μ _G [-]
1		3,875				
20	3150	3,252				
30	5010	3,184	0,96	0,004		
40	6817	3,153				
50	8349	3,132				
60	9866	3,117				
80	12699	3,096				
100	15080	3,082	0,99	0,003		
120	17588	3,072				
140	19405	3,062				
160	21432	3,054				
180	23125	3,045				
200	24655	3,035	0,99	0,004		
220	25728	3,020			500	0,10
240	26967	3,009				
260	28314	2,996				
280	29529	2,982				
300	31443	2,974				
320	32062	2,952				
340	34881	2,936				
360	35960	2,918				
380	37201	2,899				
400	38377	2,886				
420	39757	2,860				
440	39936	2,839				
460	41736	2,818				
480	41769	2,795				
500	43182	2,780	0,99	0,016		

Parameters at 100°C						
Gasket stress [MPa]	Unloading modulus of elasticity	Gasket or sealing element thickness	Creep relaxation factor	Gasket thickness change due to creep	Maximum surface pressure Q_{smax} [MPa]	Static friction factor μ_G [-]
	EG [MPa]	e_G [mm]	P_{QR} [-]	Δe_{gc} [mm]		
1		3,860			500	0,10
20	3098	3,224				
30	5212	3,185	0,87	0,012		
40	6722	3,154				
50	8021	3,133				
60	9655	3,119				
80	12234	3,099				
100	14614	3,086	0,97	0,009		
120	16758	3,076				
140	18708	3,066				
160	20270	3,055				
180	21534	3,044				
200	23204	3,031	0,98	0,014		
300	30210	2,948				
400	37095	2,840				
500	41733	2,716				

Parameters at 200°C						
Gasket stress [MPa]	Unloading modulus of elasticity	Gasket or sealing element thickness	Creep relaxation factor	Gasket thickness change due to creep	Maximum surface pressure Q_{smax} [MPa]	Static friction factor μ_G [-]
	EG [MPa]	e_G [mm]	P_{QR} [-]	Δe_{gc} [mm]		
1		3,855				
20	3662	3,217				
30	5294	3,176	0,80	0,018		
40	6787	3,144				
50	8319	3,124				
60	9650	3,111				
80	12393	3,092				
100	15046	3,079	0,96	0,011		
120	17307	3,068				
140	19056	3,058				
160	20874	3,046				
180	22255	3,033				
200	23908	3,019	0,96	0,023		
220	25577	3,003				
240	27135	2,985				
260	28919	2,967				
280	30598	2,948				
300	32353	2,928				
320	33560	2,907				
340	34856	2,885				
360	36153	2,861				
380	37305	2,837				
400	37958	2,811				
420	38961	2,784				
440	39759	2,758				
460	40493	2,733				
480	41918	2,708				
500	42875	2,684				

Parameters at 300°C						
Gasket stress [MPa]	Unloading modulus of elasticity EG	Gasket or sealing element thickness e_G	Creep relaxation factor P_{QR}	Gasket thickness change due to creep Δe_{Gc}	Maximum surface pressure Q_{smax}	Static friction factor μ_G
	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
1		3,874			500	0,10
20	3422	3,199				
30	5190	3,166	0,81	0,017		
40	6323	3,134				
50	7570	3,115				
60	8917	3,101				
80	11387	3,082				
100	13353	3,068	0,95	0,014		
120	15603	3,056				
140	17926	3,044				
160	18752	3,030				
180	21073	3,016				
200	22839	3,000	0,95	0,031		
220	24753	2,984				
240	26631	2,966				
260	28882	2,947				
280	30954	2,928				
300	32298	2,907				
320	33526	2,885				
340	35116	2,864				
360	36280	2,842				
380	37547	2,819				
400	38614	2,795				
420	40291	2,772				
440	41294	2,749				
460	42255	2,726				
480	43672	2,704				
500	45276	2,683				

Parameters at 400°C						
Gasket stress [MPa]	Unloading modulus of elasticity EG	Gasket or sealing element thickness e_G	Creep relaxation factor P_{QR}	Gasket thickness change due to creep Δe_{Gc}	Maximum surface pressure Q_{smax}	Static friction factor μ_G
	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
1		3,862			400	0,10
20	3248	3,187				
30	5105	3,151	0,75	0,023		
40	6461	3,120				
50	7852	3,101				
60	9163	3,088				
80	11374	3,068				
100	13215	3,054	0,92	0,024		
120	15926	3,041				
140	16991	3,028				
160	19538	3,014				
180	21203	2,999				
200	22483	2,983	0,94	0,039		
220	23890	2,966				
240	25133	2,948				
260	26503	2,928				
280	28207	2,908				
300	30014	2,887				
320	31513	2,865				
340	32376	2,841				
360	35200	2,817				
380	35702	2,793				
400	37307	2,770				

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
0...20	15	500	16000	-	1,3	1,0	
100		480	16000	-	1,3	1,0	
200		450	16000	-	1,3	1,0	
300		420	16000	-	1,3	1,0	
bGref [mm]		8,0		eGref [mm]		4,0	

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

m	y [psi]	y [MPa]
3,5	2200	15,2

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

Factors acc. to:

AD 2000-Merkblatt B7 August 2007

k ₀ k _D [N/mm]	k ₁ [mm]	k ₀ k _θ [N/mm]
15,0*b _D	1,1*b _D	*b _D

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

Factors acc. to:

WUDT-UC-WO-O/19

σ _m [MPa]	σ _r [MPa]	b [1]				
		20oC	100oC	200oC	300oC	400oC
15,3	7,0*p ₀	1,0	1,1	1,1	1,1	1,1

[Q_{max} - see maximal applicable gasket stress Q_{max} 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	[Ωm]	> 3,72E+02