

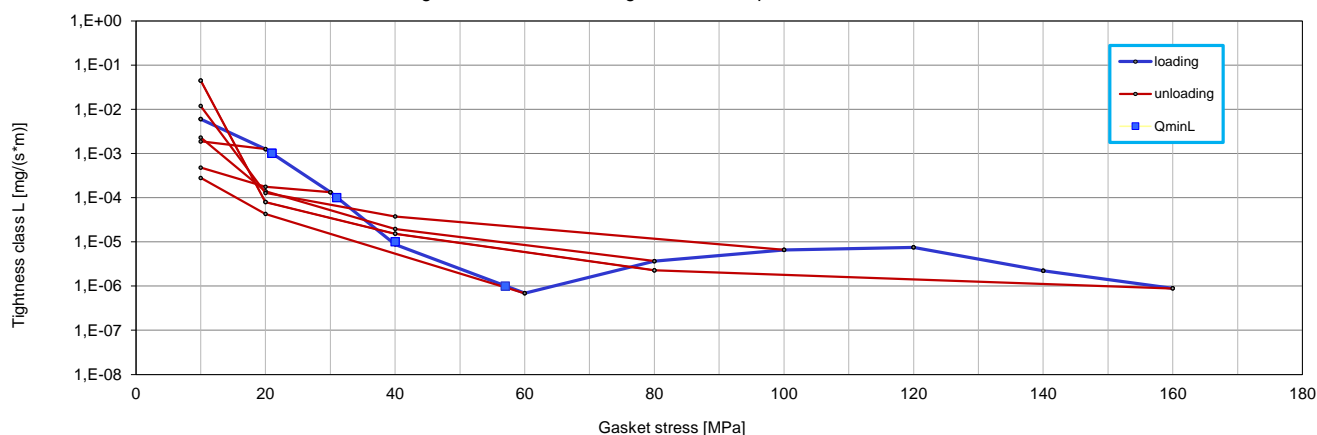
Company	SPETECH sp. z o.o.
Gasket Type	SPETOGRAF® GUS® 41
Dimensions [mm]	92 x 49 x 2
Calculation type EN 1591-1	a) flat gasket; EN 1514-1

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]	$Q_A = 120$ [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				13
10^{-3}	21			10	10	10	13	16					16
10^{-4}	31					13	16	24	24				20
10^{-5}	40					38	34	57	86				49
10^{-6}	57						57						150
10^{-7}													

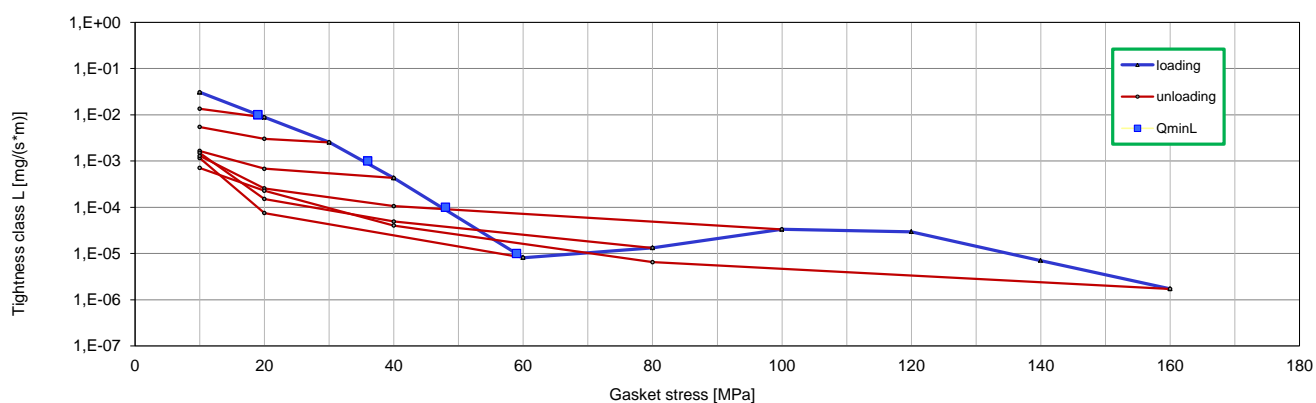
Leakage rate as a function of gasket stress - pressure 10 bar / RT



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)

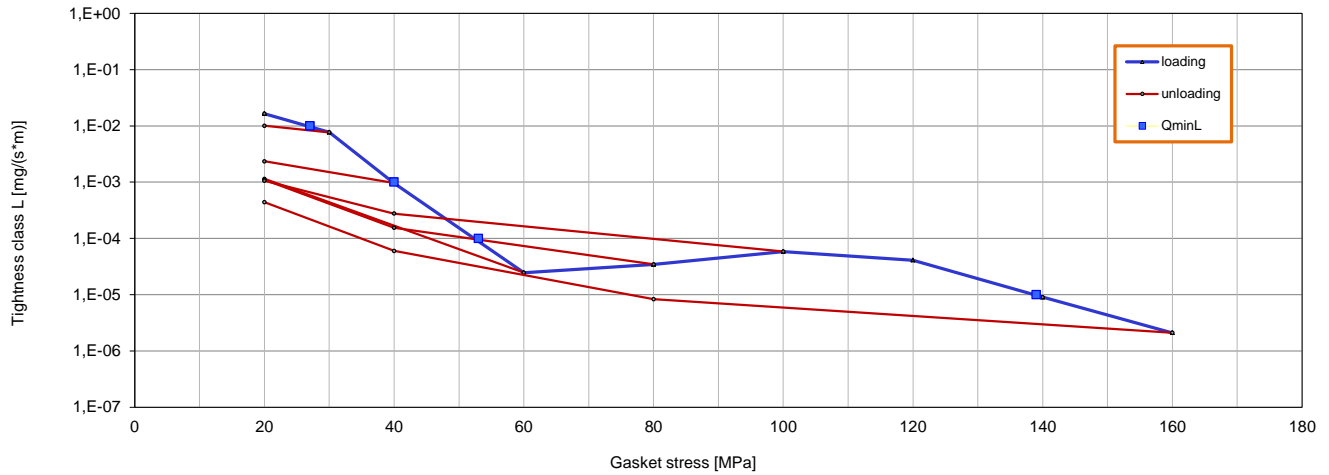
Internal pressure [bar]		40											
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress											
		$Q_A = 10$ [MPa]	$Q_A = 20$ [MPa]	$Q_A = 30$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]	$Q_A = 120$ [MPa]	$Q_A = 140$ [MPa]	$Q_A = 160$ [MPa]		
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}	36					16	11	12	12				10
10^{-4}	48						19	28	43				30
10^{-5}	59						56						71
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 = 30 [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	20
10 ⁻¹	20			20	20	20	20	20	20	20	20	20
10 ⁻²	27			21	20	20	20	20	20	20	20	20
10 ⁻³	40				29	22	21	21				20
10 ⁻⁴	53					46	51	80				35
10 ⁻⁵	139											76
10 ⁻⁶												

Leakage rate as a function of gasket stress - 80 bar / RT



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 [-]
0		2,879			200	0,10
1		2,056				
10	165	1,597				
20	398	1,412				
30	644	1,333	0,99	0,003		
40	918	1,265				
50	1191	1,212	1,00	0,002		
60	1495	1,184				
80	2122	1,142				
100	2851	1,113	1,00	0,004		
120	3554	1,092				
140	4518	1,076				
160	5289	1,062				
180	6148	1,050				
200	6939	1,039	0,99	0,011		

Parameters at 200°C						
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 [-]
0		2,770			200	0,10
1		2,122				
10	184	1,622				
20	418	1,455				
30	685	1,372	0,95	0,014		
40	942	1,297				
50	1239	1,256	0,97	0,014		
60	1548	1,227				
80	2117	1,184				
100	2781	1,155	0,99	0,013		
120	3542	1,133				
140	4334	1,116				
160	5093	1,102				
180	5810	1,090				
200	6575	1,079	0,99	0,014		

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]	[-]
0		2,969			200	0,10
1		2,277				
10	206	1,590				
20	441	1,448				
30	685	1,340	0,92	0,021		
40	973	1,276				
50	1268	1,238	0,96	0,019		
60	1480	1,211				
80	2261	1,174				
100	3025	1,147	0,98	0,015		
120	3724	1,127				
140	4578	1,111				
160	5392	1,098				
180	6230	1,085				
200	6979	1,075	0,99	0,020		

Parameters at 500°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]	[-]
0		3,007			200	0,10
1		2,272				
10	215	1,562				
20	435	1,425				
30	664	1,292	0,87	0,033		
40	932	1,238				
50	1211	1,203	0,96	0,019		
60	1507	1,176				
80	2145	1,136				
100	2836	1,111	0,98	0,016		
120	3580	1,093				
140	4320	1,079				
160	5052	1,065				
180	5955	1,055				
200	6707	1,045	0,98	0,031		

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_y/P	g_c	c_1
0...20	15	270	1	33	1,3	1,0	
100		250	1	33	1,3	1,0	
200		230	1	33	1,3	1,0	
300		210	1	33	1,3	1,0	
bGref [mm]		19,5		eGref [mm]		2,0	

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]
1,78	2300	15,9

q_{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]	k_1 [mm]	$k_0 k \delta$ [N/mm]
$15,0 \cdot b_D$	$2,0 \cdot b_D$	$\cdot b_D$

q_{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]				
		200°C	100°C	200°C	300°C	400°C
16,2	$3,6 \cdot p_0$	1,0	1,1	1,1	1,1	1,2

q_{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 [%]
31	26

Factors acc. to:

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

Temperature [°C]	Creep Relaxation [%]
20	8
100	8
200	14

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]	< 1,0E+3
Volume resistance R_v at U=10V	[Ω]	< 1,0E+3
Surface resistivity ρ_s at U=10V	[Ω]	< 1,01E+4
Volume resistivity ρ_v at U=10V	[Ωm]	< 7,43E+2