

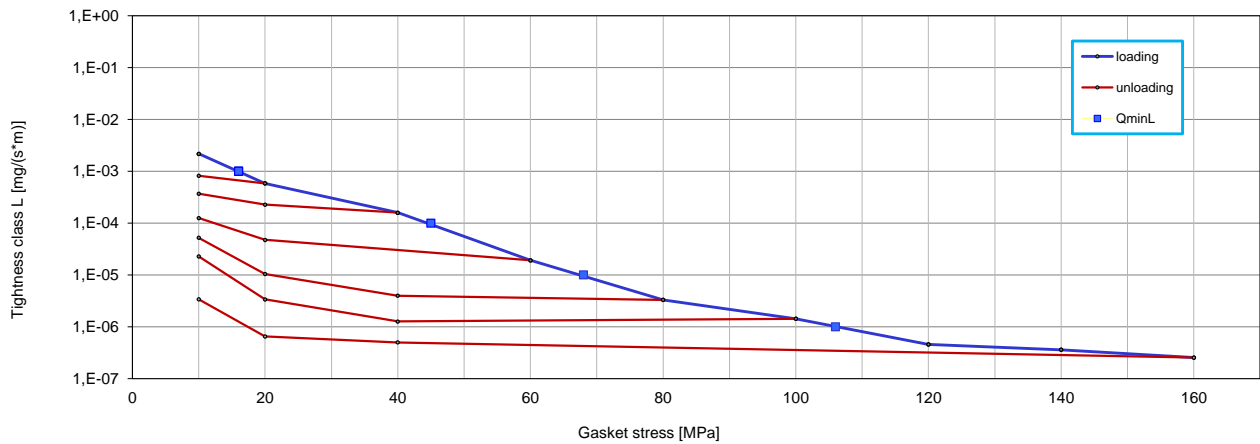
Company	SPETECH sp. z o.o.
Gasket Type	SPETOMET[®] MPL[®] 121 FGC
Dimensions [mm]	92 x 49 x 2
Calculation type EN 1591-1	a) flat gasket; EN 1514-4

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)

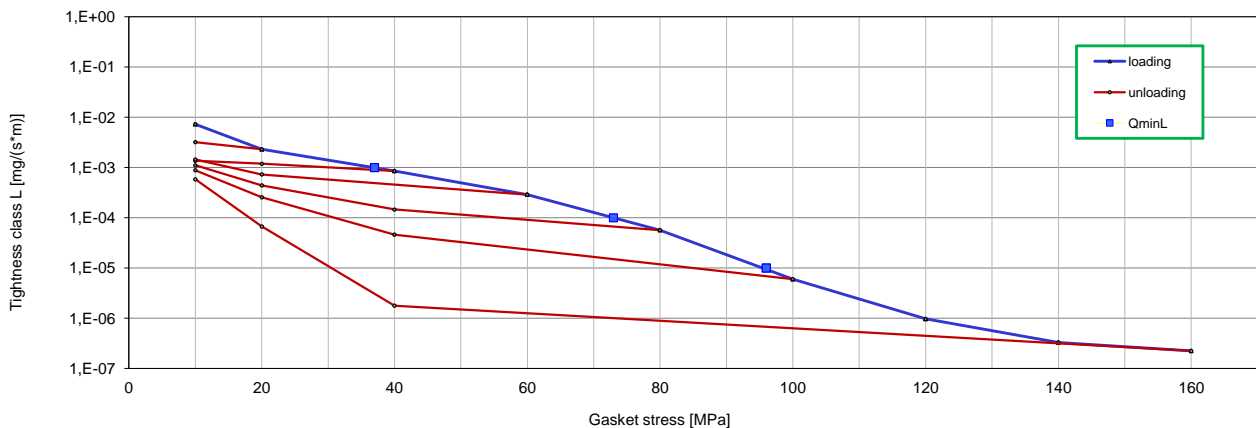
Internal pressure [bar]		10											
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress											
		$Q_A = 10$ [MPa]	$Q_A = 20$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]	$Q_A = 120$ [MPa]	$Q_A = 140$ [MPa]	$Q_A = 160$ [MPa]			
10^{-0}	10		10	10	10	10	10	10			10		
10^{-1}	10		10	10	10	10	10	10			10		
10^{-2}	10		10	10	10	10	10	10			10		
10^{-3}	16		10	10	10	10	10	10			10		
10^{-4}	45					13	10	10			10		
10^{-5}	68						21	15			10		
10^{-6}	106										18		
10^{-7}													

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

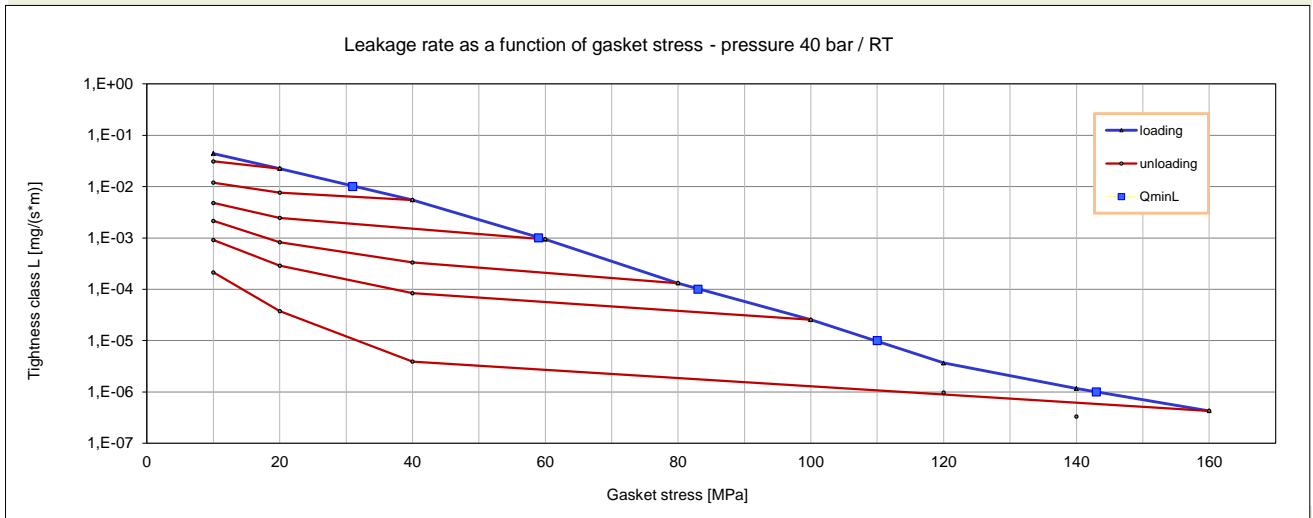

 Minimum level of surface pressure required for leakage rate class L on assembly $Q_{min/L}$ and after off-loading $Q_{Smin/L}$ at room temperature (RT)

Internal pressure [bar]		20											
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^{-1}	10		10	10	10	10	10	10			10		
10^{-2}	10		10	10	10	10	10	10			10		
10^{-3}	37				31	16	11	10			10		
10^{-4}	73						56	31			18		
10^{-5}	96							85			31		
10^{-6}	120										74		

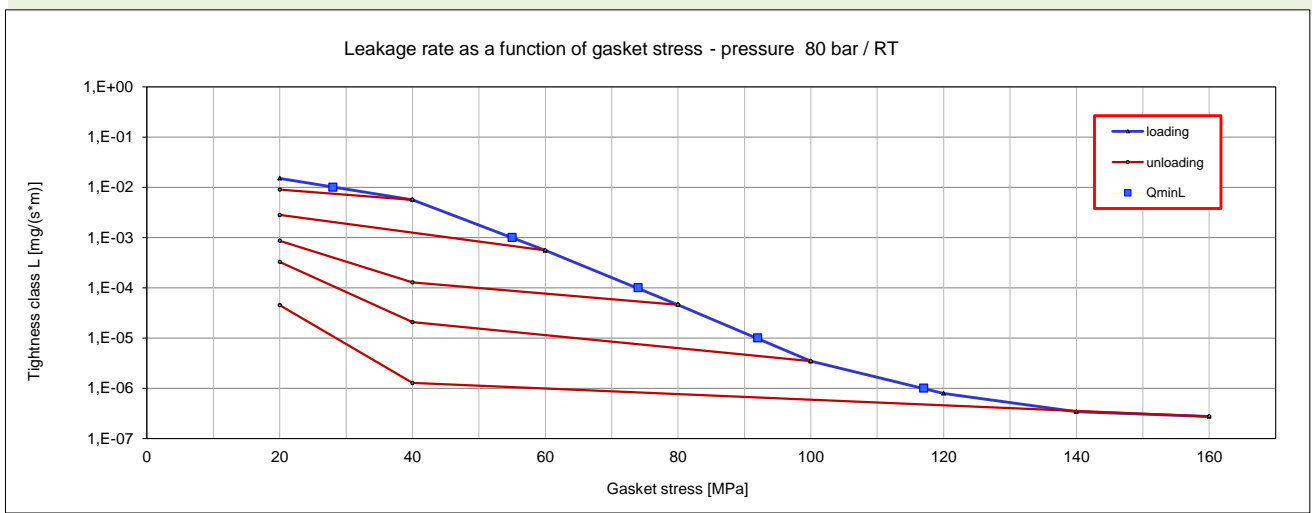
Leakage rate as a function of gasket stress - pressure 20 bar / RT



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 ⁻¹	10		10	10	10	10	10				10	
10 ⁻²	31			14	10	10	10				10	
10 ⁻³	59				57	18	10				10	
10 ⁻⁴	83						37				14	
10 ⁻⁵	110										32	
10 ⁻⁶	143										114	



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	
10 ⁻¹	20			20	20	20	20				20	
10 ⁻²	28			20	20	20	20				20	
10 ⁻³	55				45	20	20				20	
10 ⁻⁴	74					50	29				20	
10 ⁻⁵	92						65				29	
10 ⁻⁶	117										58	



Parameters at RT						
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 _{ec}	Maximum surface pressure Q _{smax}	Static friction factor μ _G
	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
1		1,910			200	0,10
20	605	1,180				
30	1096	1,091	0,97	0,008		
40	1632	1,037				
50	2205	1,004	0,98	0,008		
60	2796	0,981				
80	4069	0,953				
100	5476	0,934				
120	6842	0,921				
140	8553	0,911				
160	9984	0,903				
180	12140	0,896				
200	14336	0,891	1,00	0,004		

Parameters at 150°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 _{ec}	Maximum surface pressure Q _{smax}	Static friction factor μ _G
	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
0		#ADR!			200	0,10
1		1,904				
20	648	1,103				
30	1117	1,029	0,82	0,045		
40	1667	0,992				
50	2217	0,968	0,91	0,038		
60	2842	0,950				
80	4115	0,926				
100	5634	0,910				
120	7010	0,899				
140	8610	0,890				
160	10386	0,884				
180	12271	0,878				
200	14684	0,873	0,99	0,017		

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 _{ec}	Maximum surface pressure Q _{smax}	Static friction factor μ _G
	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
0		#ADR!			200	0,10
1		1,891				
20	636	1,095				
30	1045	1,032	0,77	0,058		
40	1455	0,991				
50	1970	0,965	0,86	0,059		
60	2495	0,946				
80	3690	0,922				
100	5024	0,906				
120	6280	0,895				
140	7996	0,887				
160	9380	0,880				
180	11164	0,875				
200	12347	0,870	0,98	0,034		

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	10	100	1	28	1,3	0,9	0,00
100	--	90	1	28	1,3	0,9	--
200	--	80	1	28	1,3	0,9	--
300	--	70	1	28	1,3	0,9	--
bGref [mm]		19,5		eGref [mm]		1,9	

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]
2,00	2100	14,5

[Qmax - see maximal applicable gasket stress Qmax 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 ₉ [N/mm]
10,0*b _D	1,0*b _D	*b _D

[Qmax - see maximal applicable gasket stress Qmax 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
14,3	4,0*p ₀	1,0	1,1	1,1	1,1	1,2

[Qmax - see maximal applicable gasket stress Qmax 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°C	NDA
100°C	NDA
200°C	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