

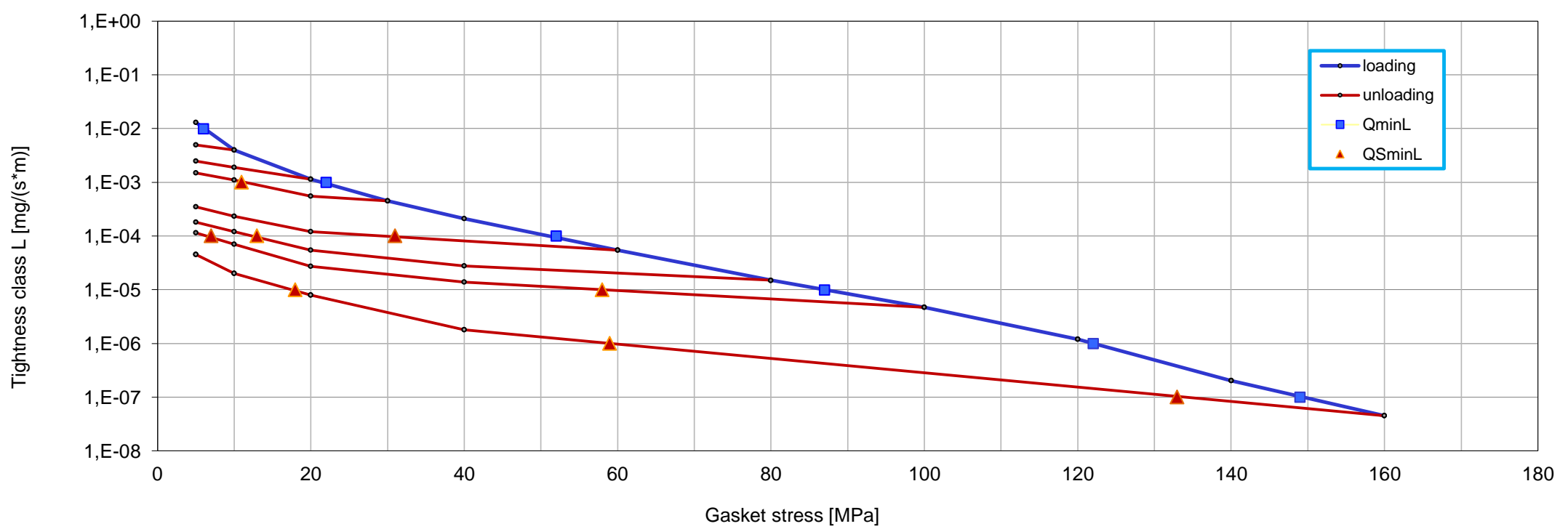
Company	SPETECH sp. z o.o.
Gasket Type	SPETOGRAF® GUS® 40 PRO
Dimensions [mm]	92 x 49 x 2
Calculation type EN 1591-1	a) flat gasket; EN 1514-1

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)

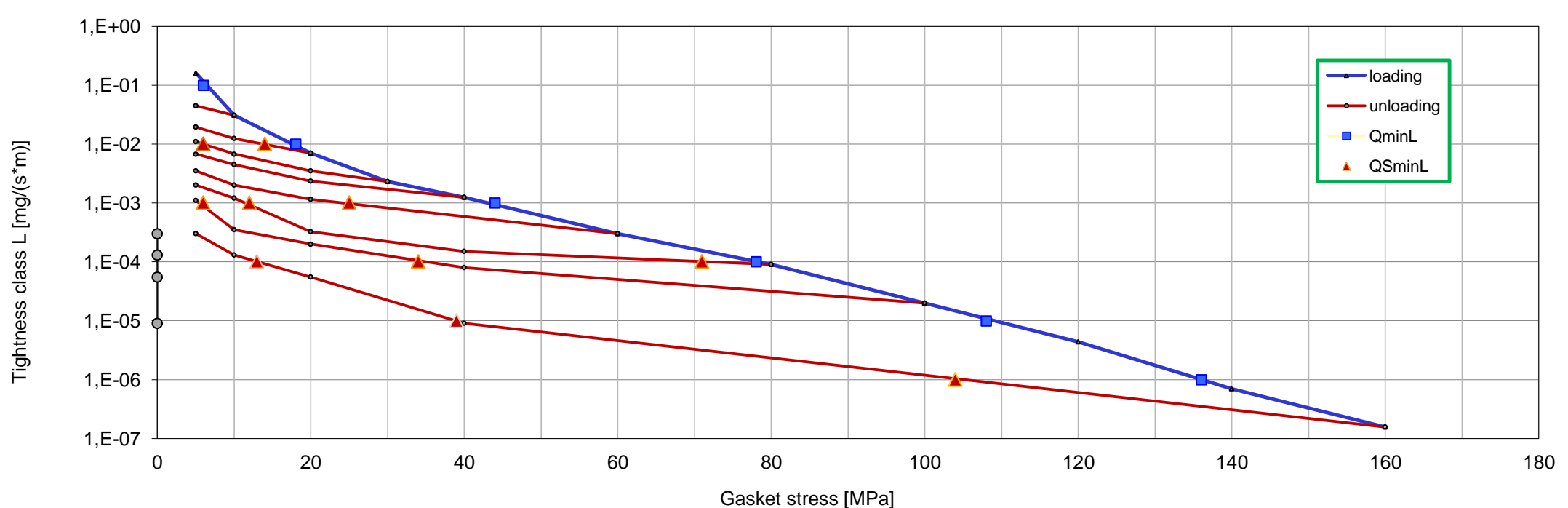
Internal pressure [bar]		10										
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress										
		$Q_A = 10$ [MPa]	$Q_A = 20$ [MPa]	$Q_A = 30$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]	$Q_A = 120$ [MPa]	$Q_A = 140$ [MPa]	$Q_A = 160$ [MPa]	
10^{-0}	5	5	5	5	5	5	5	5	5			5
10^{-1}	5	5	5	5	5	5	5	5	5			5
10^{-2}	6	5	5	5	5	5	5	5	5			5
10^{-3}	22			11	5	5	5	5	5			5
10^{-4}	52					31	13	7				5
10^{-5}	87							58				18
10^{-6}	122											59
10^{-7}	149											133

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

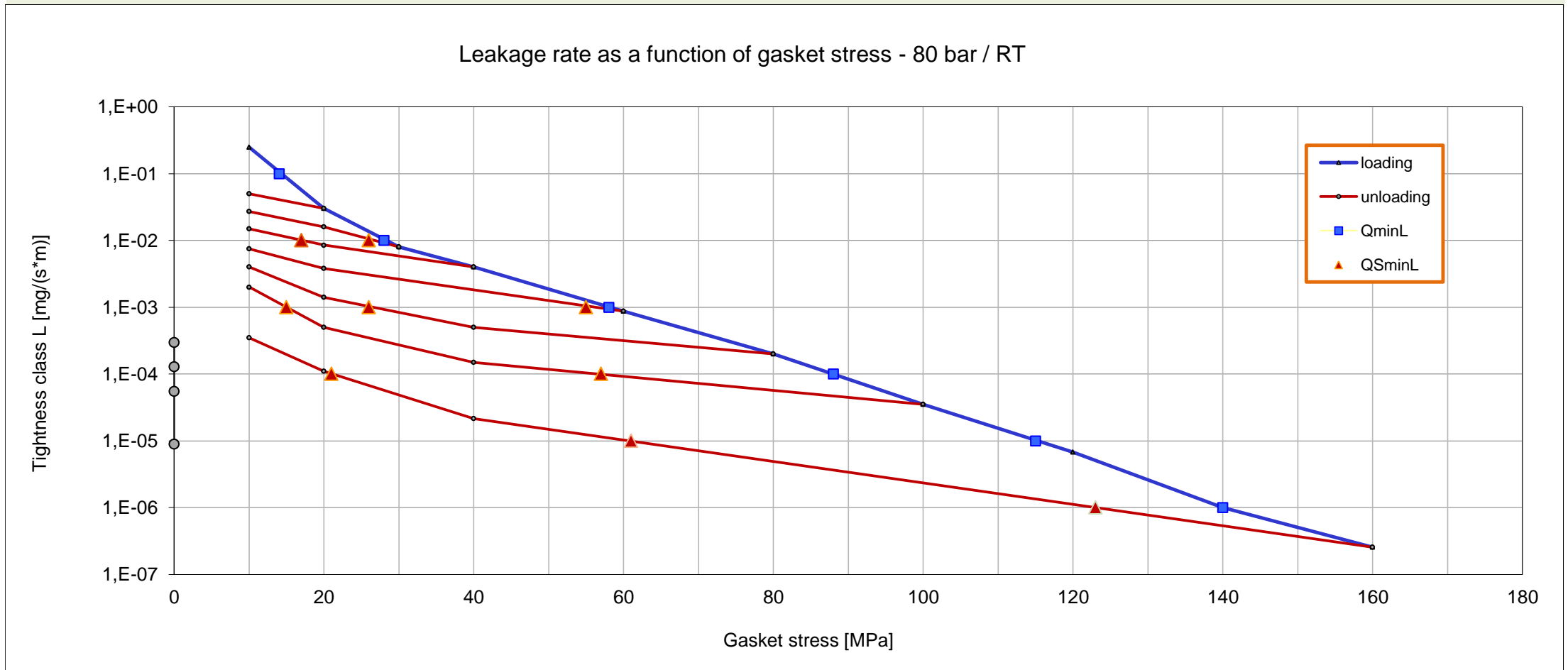

 Minimum level of surface pressure required for leakage rate class L on assembly $Q_{min/L}$ and after off-loading $Q_{Smin/L}$ at room temperature (RT)

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}	5	5	5	5	5	5	5	5	5			5
10^{-1}	6	5	5	5	5	5	5	5	5			5
10^{-2}	18		14	6	5	5	5	5	5			5
10^{-3}	44					25	12	6				5
10^{-4}	78						71	34				13
10^{-5}	108											39
10^{-6}	136											104

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}	10		10	10	10	10	10	10	10			10	
10^{-1}	14		10	10	10	10	10	10	10			10	
10^{-2}	28			26	17	10	10	10	10			10	
10^{-3}	58					55	26	15	10			10	
10^{-4}	88							57				21	
10^{-5}	115											61	
10^{-6}	140											123	



Parameters at RT						
Gasket stress [MPa]	Unloading modulus of elasticity EG [MPa]	Gasket or sealing element thickness eG [mm]	Creep relaxation factor PQR [-]	Gasket thickness change due to creep Δe_{Gc} [mm]	Maximum surface pressure Qsmax [MPa]	Static friction factor μ_G [-]
1		2,086			200	0,10
20	420	1,454				
30	835	1,372	0,97	0,008		
40	1060	1,327				
50	1503	1,295	0,98	0,008		
60	1832	1,268				
80	2609	1,231				
100	3898	1,207				
120	7218	1,189				
140	6025	1,173				
160	10285	1,163				
180	9545	1,149				
200	6978	1,134	1,00	0,000		

Parameters at 150°C						
Gasket stress [MPa]	Unloading modulus of elasticity EG [MPa]	Gasket or sealing element thickness eG [mm]	Creep relaxation factor PQR [-]	Gasket thickness change due to creep Δe_{Gc} [mm]	Maximum surface pressure Qsmax [MPa]	Static friction factor μ_G [-]
1		2,117			200	0,10
20	496	1,456				
30	779	1,390	0,95	0,013		
40	1189	1,348				
50	1432	1,315	0,96	0,017		
60	1857	1,289				
80	2331	1,250				
100	4030	1,227				
120	5187	1,208				
140	7330	1,192				
160	7240	1,179				
180	8702	1,168				
200	11070	1,157	0,99	0,017		

Parameters at 300°C						
Gasket stress [MPa]	Unloading modulus of elasticity E_G	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		2,107			200	0,10
20	502	1,431				
30	797	1,377	0,91	0,023		
40	1077	1,331				
50	1622	1,302	0,96	0,017		
60	1902	1,276				
80	2388	1,235				
100	3451	1,209				
120	5072	1,192				
140	7903	1,178				
160	7876	1,165				
180	7849	1,151				
200	7822	1,131	0,99	0,017		

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
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	

b _{Gref} [mm]	19,5	e _{Gref} [mm]	2,0
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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]
2,0	2900	20

[g_{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 _θ [N/mm]
30,0*b _D	1,5*b _D	*b _D

[g_{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]				
		20oC	100oC	200oC	300oC	400oC
20,4	4,0*p ₀	1,0	1,1	1,1	1,1	1,2

[g_{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