

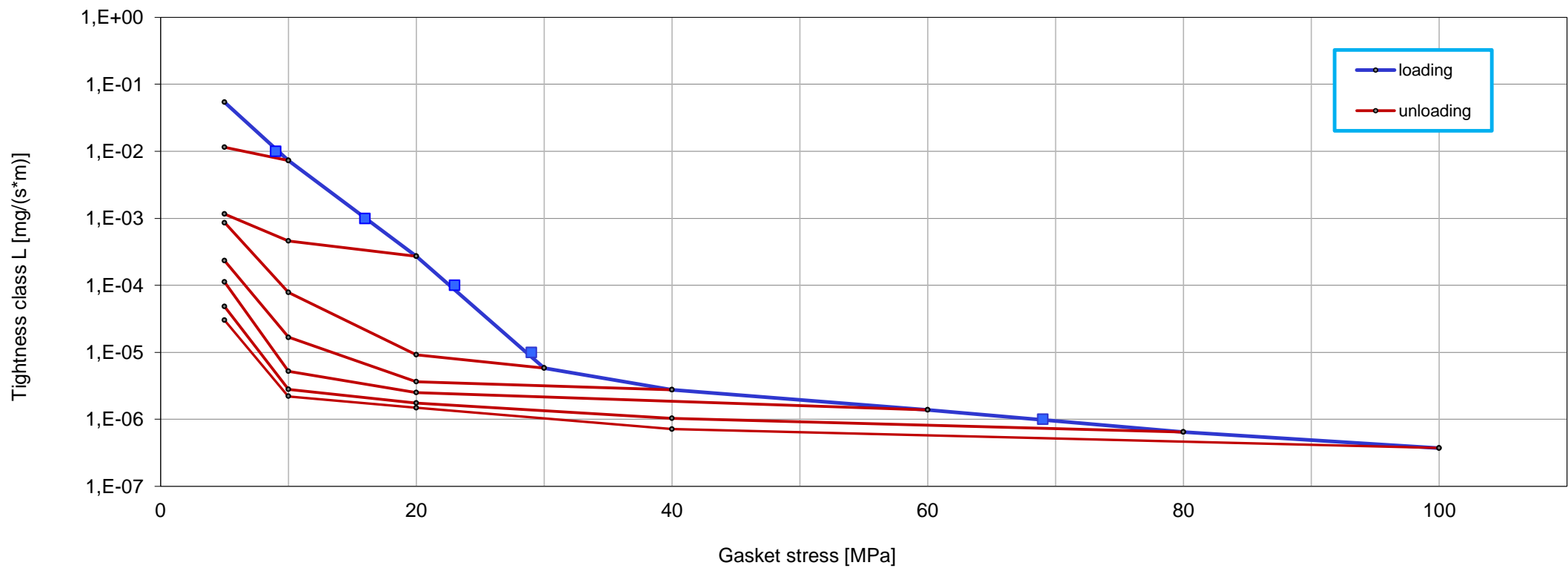
Company	SPETECH sp. z o.o.
Gasket Type	SPETOBAR® BAS 380
Dimensions [mm]	92 x 49 x 3
Calculation type EN 1591-1	a) flat gasket; EN 1514-1

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)

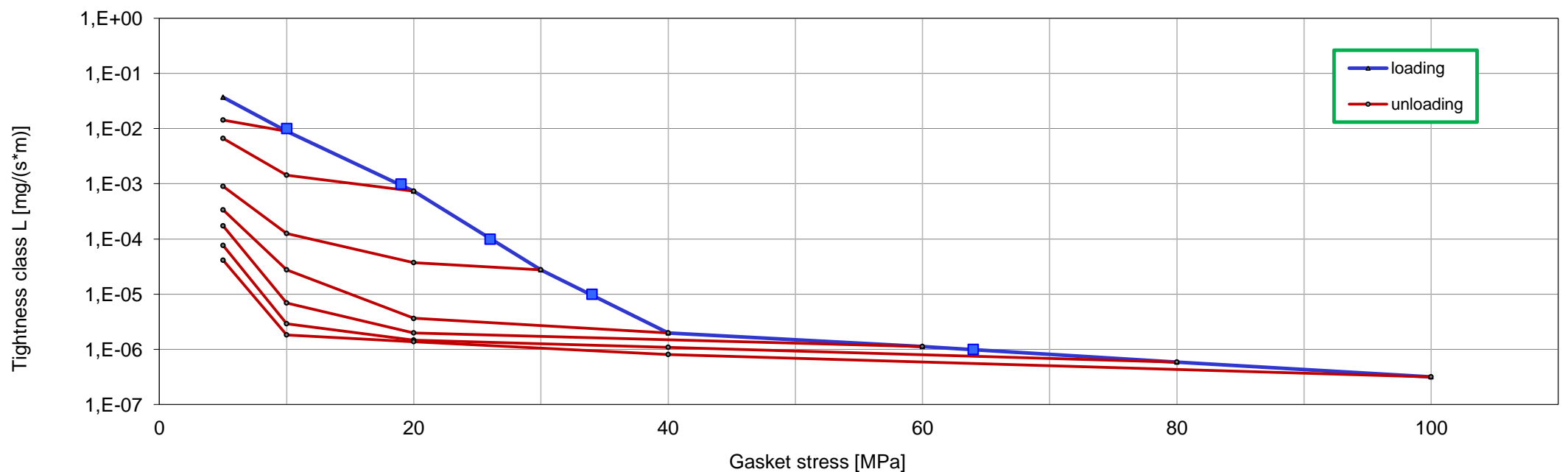
Internal pressure [bar]		10										
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress										
		$Q_A = 10$ [MPa]	$Q_A = 20$ [MPa]	$Q_A = 30$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]	$Q_A = 120$ [MPa]	$Q_A = 140$ [MPa]	$Q_A = 160$ [MPa]	
10^{-0}	5	5	5	5	5	5	5	5				
10^{-1}	5	5	5	5	5	5	5	5				
10^{-2}	9	7	5	5	5	5	5	5				
10^{-3}	16		6	5	5	5	5	5				
10^{-4}	23			10	7	6	5	5				
10^{-5}	29			20	14	9	8	7				
10^{-6}	69						43	31				
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}	5	5	5	5	5	5	5	5				
10^{-1}	5	5	5	5	5	5	5	5				
10^{-2}	10	9	5	5	5	5	5	5				
10^{-3}	19		16	5	5	5	5	5				
10^{-4}	26			12	8	6	5	5				
10^{-5}	34				15	10	8	8				
10^{-6}	64						46	33				
10^{-7}												

Leakage rate as a function of gasket stress - pressure 40 bar / RT



Parameters at RT						
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]	[-]
0		2,818			200	0,25
1		2,759				
10	359	2,543				
20	896	2,469	0,91	0,015		
30	1551	2,420				
40	2052	2,376	0,93	0,025		
50	2389	2,336				
60	2683	2,298	0,93	0,035		
80	3206	2,233				
100	3751	2,171	0,93	0,057		
120	4278	2,112				
140	4750	2,057				
160	5205	2,005				
180	5701	1,958				
200	6114	1,915	0,94	0,096		

Parameters at 100°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]	[-]
0		2,835			60	0,25
1		2,783				
10	607	2,513				
20	1174	2,405	0,62	0,063		
30	1478	2,299				
40	1751	2,180	0,57	0,143		
50	2066	2,050				
60	2417	1,921	0,55	0,228		

Parameters at 150°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]	[-]
0		2,809			50	0,25
1		2,753				
10	935	2,440				
20	1204	2,348	0,50	0,084		
30	1395	2,225				
40	1629	2,070	0,45	0,182		
50	1913	1,892	0,45	0,229		

Parameters at 175°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]	[-]
0		2,836			40	0,25
1		2,777				
10	872	2,463				
20	1073	2,365	0,44	0,094		
30	1262	2,221				
40	1515	2,025	0,42	0,194		

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	35	80	500	20	1,6	-	0,05
100	-	70	500	20	1,6	-	-
200	-	60	500	20	1,6	-	-
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]
2,0	2900	20

σ_{max} - see maximal applicable gasket stress Q_{smax} 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_2 [N/mm]
$15,0 \cdot b_D$	$1,4 \cdot b_D$	$\cdot b_D$

σ_{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
20,4	$4,0 \cdot p_0$	1,0	1,4	1,8

σ_{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 [%]
14	73

Factors acc. to:

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

Temperature [°C]	Creep Relaxation [%]
20	25
100	88
200	98

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=100V	[Ω]	3,33E+09
Volume resistance R_v at U=100V	[Ω]	4,24E+09
Surface resistivity ρ_s at U=100V	[Ω]	3,37E+10
Volume resistivity ρ_v at U=U=100V	[Ωm]	2,10E+09