LABORATORY OF SEALING MATERIALS
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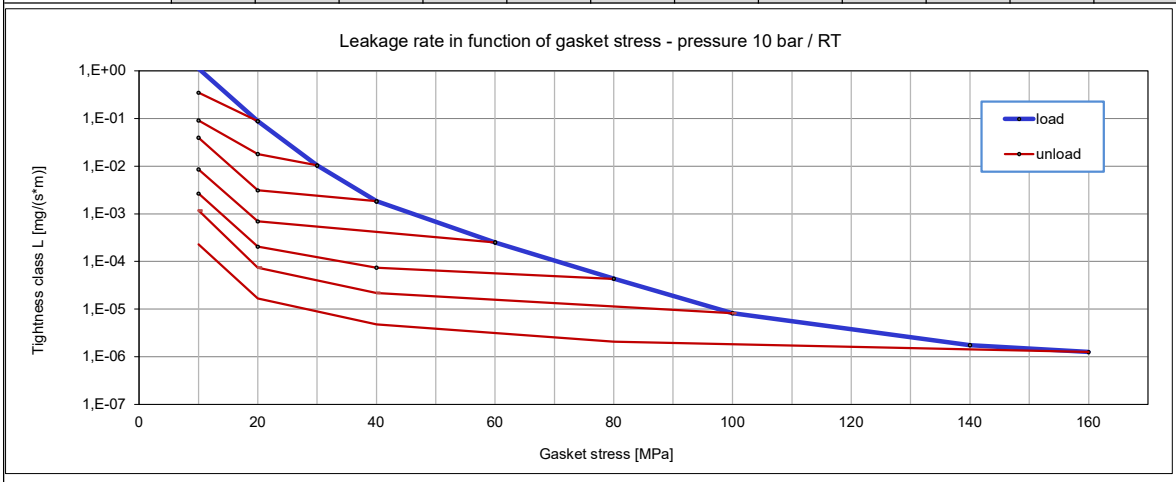
Company	**SPETECH sp. z o.o.**		
Gasket Type	**SPETOBAR® BAS® 340I**		
Dimensions [mm]	**92 x 49 x 2 (DN40 PN40)**		
Calculation type EN 1591-1	**a) flat gasket;**	**EN 1514-1**	**IBC**
Notes:	Rev.1 (11-02-2021)		

Factors acc. to EN 13555 to use in calculation standard EN 1591-1:2009/ :2013

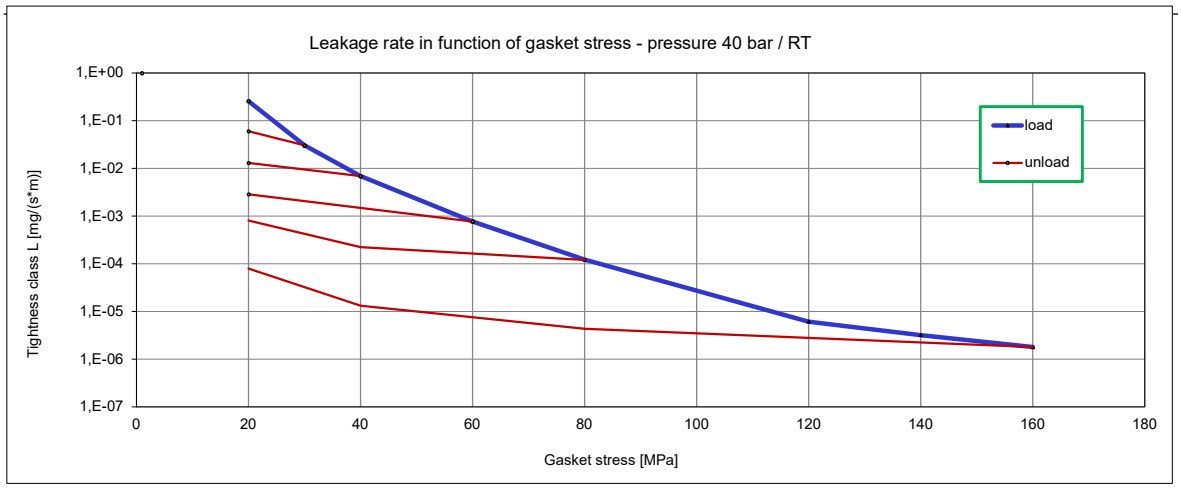
Minimum level of surface pressure required for leakage rate class L on assembly Qmin/L and after off-loading QSmin/L at room temperature (RT)

Internal pressure [bar]	**10**											
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress										
		Q_A = 20 [MPa]	Q_A = 30 [MPa]	Q_A = 40 [MPa]	Q_A = 60 [MPa]	Q_A = 80 [MPa]	Q_A = 100 [MPa]	QA = 160 [MPa]				
10^{-0}	11	10	10	10	10	10	10	10				
10^{-1}	20	19	10	10	10	10	10	10				
10^{-2}	30			16	10	10	10	10				
10^{-3}	46				18	14	11	10				
10^{-4}	70					34	19	13				
10^{-5}	98						88	28				
10^{-6}												
10^{-7}												



Minimum level of surface pressure required for leakage rate class L on assembly Qmin/L and after off-loading QSmin/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 = 20 [MPa]	Q_A = 30 [MPa]	Q_A = 40 [MPa]	Q_A = 60 [MPa]	Q_A = 80 [MPa]	Q_A = 100 [MPa]	Q_A = 160 [MPa]				
10^{-0}	20			20	20	20	20	20				
10^{-1}	20			20	20	20	20	20				
10^{-2}	33			20	20	20	20	20				
10^{-3}	48				20	20	20	20				
10^{-4}	65					24	20	20				
10^{-5}	80					78	40	24				
10^{-6}												
10^{-7}												
10^{-8}												



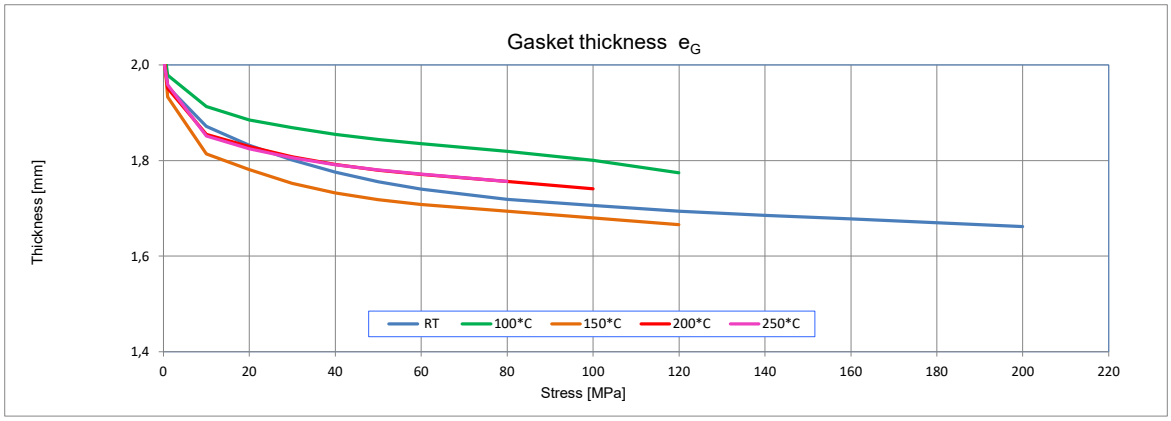
Temperature	RT							
Gasket stress	E_G	eG	C=500 kN/mm		C=1500 kN/mm		Q_{smax}	μ_G
			P_{QR}	Δ_{eGc}	P_{QR}	Δ_{eGc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		2,057						
1		1,954						
10	783	1,872						
20	1164	1,832						
30	1683	1,801	0,97	0,008				
40	2240	1,776						
50	2797	1,755	0,97	0,012				
60	3478	1,740						
80	4853	1,719					**200**	0,31
100	6154	1,706	0,99	0,009				
120	7044	1,694						
140	7852	1,685						
160	8440	1,678						
180	8916	1,670						
200	9289	1,662	0,99	0,011				

Temperature	100*C							
Gasket stress	E_G	eG	C=500 kN/mm		C=1500 kN/mm		Q_{smax}	μ_G
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		2,046						
1		1,979						
10	1183	1,913						
20	1990	1,885						
30	2508	1,868	0,89	0,029				
40	3221	1,855					**120**	0,32
50	3915	1,844	0,92	0,035				
60	4468	1,836						
80	5222	1,819						
100	5810	1,800	0,94	0,051				
120	6292	1,775	0,93	0,075				

Temperature	150*C							
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}	μ_G
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		2,042						
1		1,933						
10	1073	1,814						
20	1431	1,781						
30	1854	1,752	0,85	0,038				
40	2304	1,732					**120**	0,30
50	2890	1,718	0,88	0,047				
60	3431	1,708						
80	4527	1,694						
100	5112	1,680	0,90	0,087				
120	5676	1,666	0,87	0,130				

Temperature	200*C							
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}	μ_G
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		2,022						
1		1,951						
10	1246	1,855						
20	1697	1,830						
30	2108	1,808	0,84	0,040				
40	2581	1,792					**100**	0,24
50	3069	1,780	0,86	0,060				
60	3624	1,771						
80	4364	1,756						
100	4911	1,741	0,88	0,100				

Temperature	250*C							
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}	μ_G
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		2,013						
1		1,958						
10	1631	1,851						
20	1869	1,825						
30	2422	1,805	0,76	0,061			**80**	0,16
40	3027	1,791						
50	3646	1,780	0,79	0,087				
60	4208	1,771						
80	4922	1,756	0,82	0,119				



Description:				
	E_G	Modulus of elasticity	Q_{smax}	Maximum surface pressure
	e_G	Gasket or sealing element thickness	μ_G	Static friction factor
	P_{QR}	Creep relaxation factor	C	Stiffness
	Δ_{eGc}	Gasket thickness change due to creep		

Factors acc. to EN 13555 to use in calculation standard EN 1591-1:2001

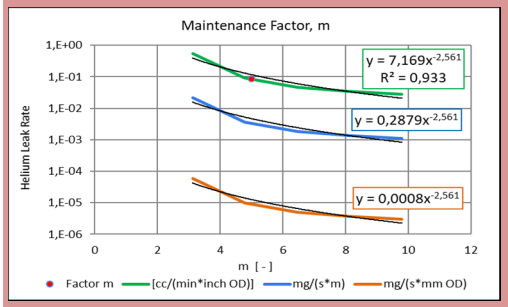
T [°C]	Q_{min} [MPa]	$Q_{max, ref}$ [MPa]	E_0 [MPa]	K_1	Q_l/P	g_c	c_1
20	35	80	500	20	1,6	-	0,05
100	-	70	500	20	1,6	-	-
200	-	60	500	20	1,6	-	-

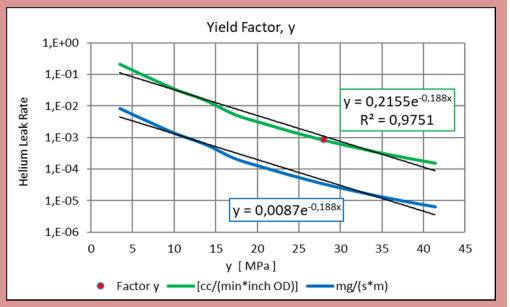
bGref [mm]	19,5	eGref [mm]	2,0

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

Tightness class		ASTM F3149	PVRC Tightness Class		EN 13555	
			T2	T3	L0,01	L0,001
Factor m	[-]	5,0	< 3,1	4,1	3,9	11,2
Factor y	[MPa]	28,0			21,4	37,2
	[psi]	4060				





NOTE: Maintenance values [m] less than 2.0 are typically not used in ASME designs except for elastomeric gaskets (Classification D2000).
Gasket dimensions acc. to EN 12560-1 NPS4 Class 300
The given coefficient values are read from the test curves, not from the trend line.
σmax - see maximal applicable gasket stress Qsmax acc. EN 1591-1:2009/:2013

Factors acc. to:

AD 2000-Merkblatt B7 August 2007

k_0k_D [N/mm]	k1 [mm]	$k_0k\vartheta$ [N/mm]
$20*b_D$	$2*b_D$	$*b_D$

σmax - see maximal applicable gasket stress Qsmax 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
26,5	$4*p_0$	1,0	1,4	1,8		

σmax - see maximal applicable gasket stress Qsmax 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]		NDA
Volume resistance R_v at U=10V	[Ω]		NDA
Surface resistivity ρ_s at U=10V	[Ω]		NDA
Volume resistivity ρ_v at U=10V	[Ωm]		NDA