

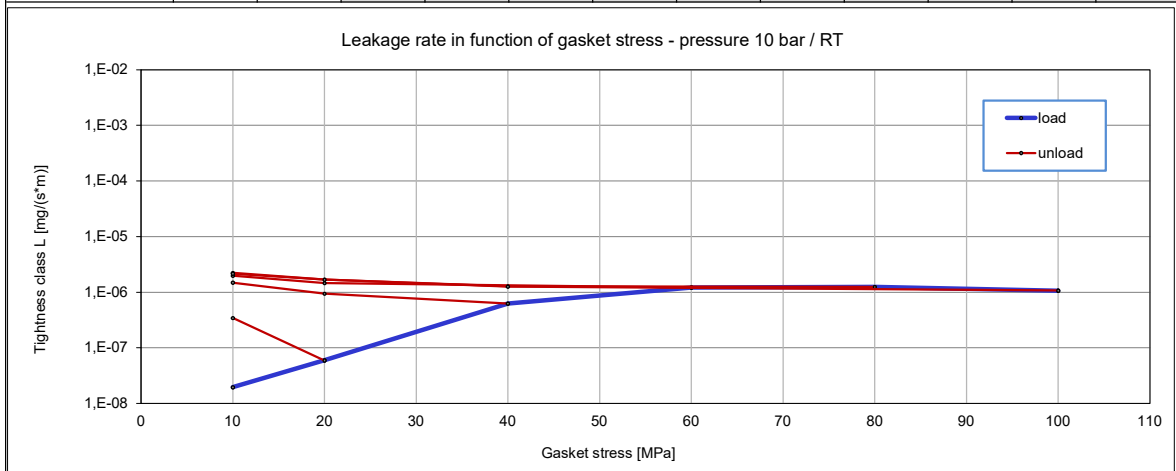
	LABORATORY OF SEALING MATERIALS 43-382 Bielsko-Biala, ul. Szyprów 17 tel. +48 33 8184133 e-mail: lbmu@spetech.com.pl www.laboratory.spetech.eu			  LB - 12402
	Company	SPETECH sp. z o.o.		
Gasket Type	SPETOFLO [®] FU MPL 12			
Dimensions [mm]	92 x 50 x 2 (DN40 PN40)			
Calculation type EN 1591-1	a) flat gasket;		EN 1514-1	IBC
Notes:	Rev.1 (17-02-2021)			

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

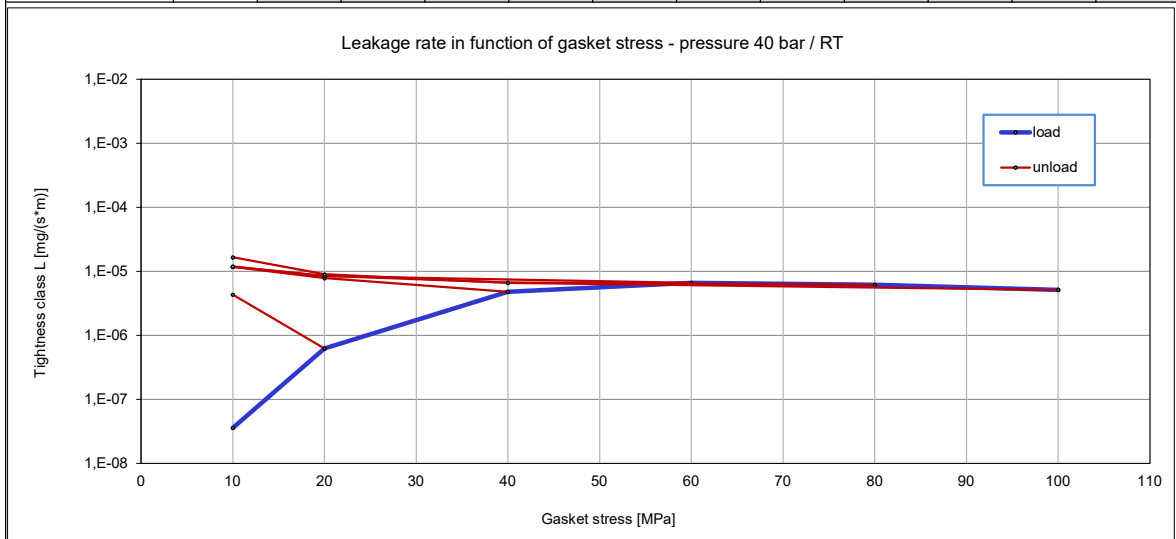
Minimum level of surface pressure required for leakage rate class L on assembly $Q_{min/L}$ and after off-loading $Q_{Smin/L}$ at room temperature (RT)

Internal pressure [bar]		10									
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress									
		$Q_A = 20$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]					
10^0	10	10	10	10	10	10					
10^{-1}	10	10	10	10	10	10					
10^{-2}	10	10	10	10	10	10					
10^{-3}	10	10	10	10	10	10					
10^{-4}	10	10	10	10	10	10					
10^{-5}	10	10	10	10	10	10					
10^{-6}	55	10	18								
10^{-7}	24	17									



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									
		$Q_A = 20$ [MPa]	$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 100$ [MPa]					
10^0	10	10	10	10	10	10					
10^{-1}	10	10	10	10	10	10					
10^{-2}	10	10	10	10	10	10					
10^{-3}	10	10	10	10	10	10					
10^{-4}	10	10	10	10	10	10					
10^{-5}	10	10	14	15	15	18					
10^{-6}	25	18									
10^{-7}	14										

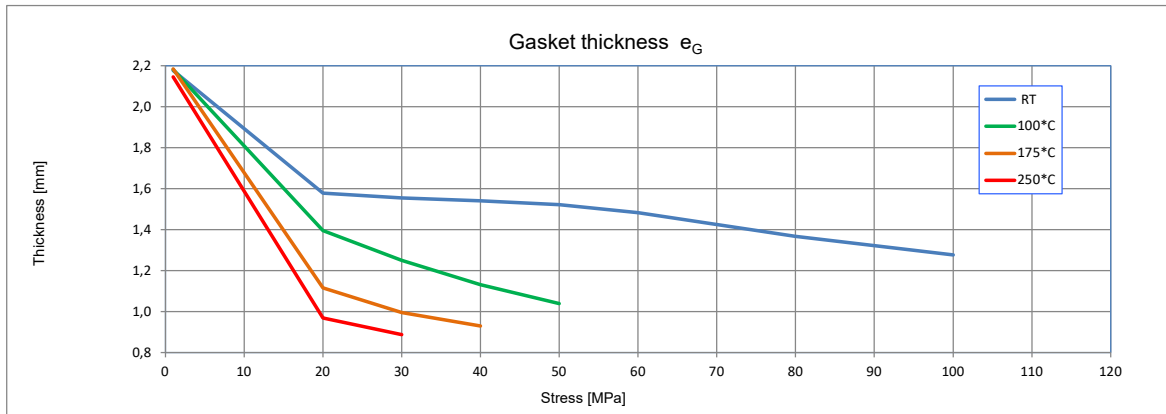


Temperature		RT						Q _{smax}	μ _G
Gasket stress	E _G	e _G	C=500 kN/mm		C=1500 kN/mm				
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}			
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]	
1		2,177					100	0,08	
15			0,89	0,014					
20	881	1,578							
30	1712	1,554	0,97	0,008					
40	2383	1,540							
50	2915	1,522	0,94	0,025					
60	3377	1,483							
80	4352	1,367							
100	4241	1,277	0,90	0,084					

Temperature		100°C						Q _{smax}	μ _G
Gasket stress	E _G	e _G	C=500 kN/mm		C=1500 kN/mm				
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}			
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]	
1		2,182					50	0,06	
15			0,69	0,039					
20	1774	1,396							
30	2454	1,250	0,52	0,121					
40	2856	1,131							
50	3144	1,039	0,43	0,239					

Temperature		175°C						Q _{smax}	μ _G
Gasket stress	E _G	e _G	C=500 kN/mm		C=1500 kN/mm				
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}			
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]	
1		2,185					40	0,04	
15			0,45	0,07					
20	1214	1,115							
30	1528	0,995	0,33	0,17					
40	1796	0,931	0,3	0,24					

Temperature		250°C						Q _{smax}	μ _G
Gasket stress	E _G	e _G	C=500 kN/mm		C=1500 kN/mm				
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}			
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]	
1		2,145					30	0,03	
15			0,31	0,09					
20	813	0,969							
30	1026	0,888	0,23	0,19					



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
	Δe _{Gc}	Gasket thickness change due to creep		

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

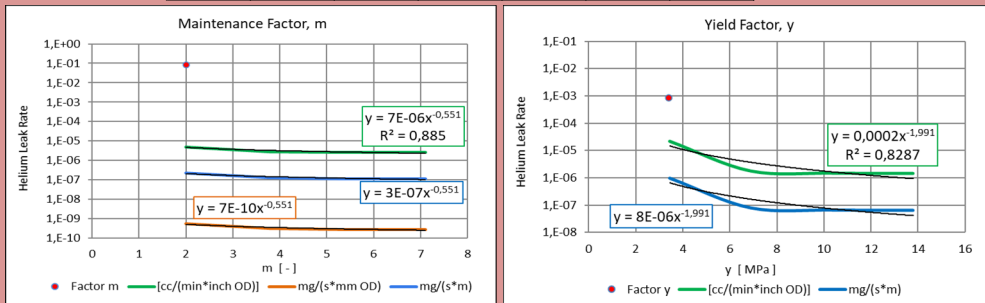
T [°C]	Q _{min} [MPa]	Q _{max, ref} [MPa]	E ₀ [MPa]	K ₁	Q _i /P	g _c	c ₁
20	10	50	600	20	1,3	1,0	
100	-	35	500	20	1,3	0,9	
200	-	20	400	20	1,3	0,8	

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

Tightness class	ASTM F3149	PVRC Tightness Class		EN 13555	
		T3	T4	L0,01	L0,001
Factor m	-	2,0	< 2,0	< 2,0	< 2,0
Factor y	[MPa]	3,4		< 3,4	< 3,4
	[psi]	490			



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 1514-1 DN40 PN40
 The given coefficient values are read from the test curves, not from the trend line.

[omax - see maximal applicable gasket stress Q_{max} 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 ₀ [N/mm]
18*b _D	2*b _D	*b _D

[omax - see maximal applicable gasket stress Q_{max} 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
13,5	5*p ₀	1,1	1,8	2,6

[omax - see maximal applicable gasket stress Q_{max} 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]	>	1,00E+12
Volume resistance R _v at U=10V	[Ω]	>	1,00E+12
Surface resistivity ρ _s at U=10V	[Ω]	>	1,01E+13
Volume resistivity ρ _v at U=10V	[Ωm]	>	4,02E+11