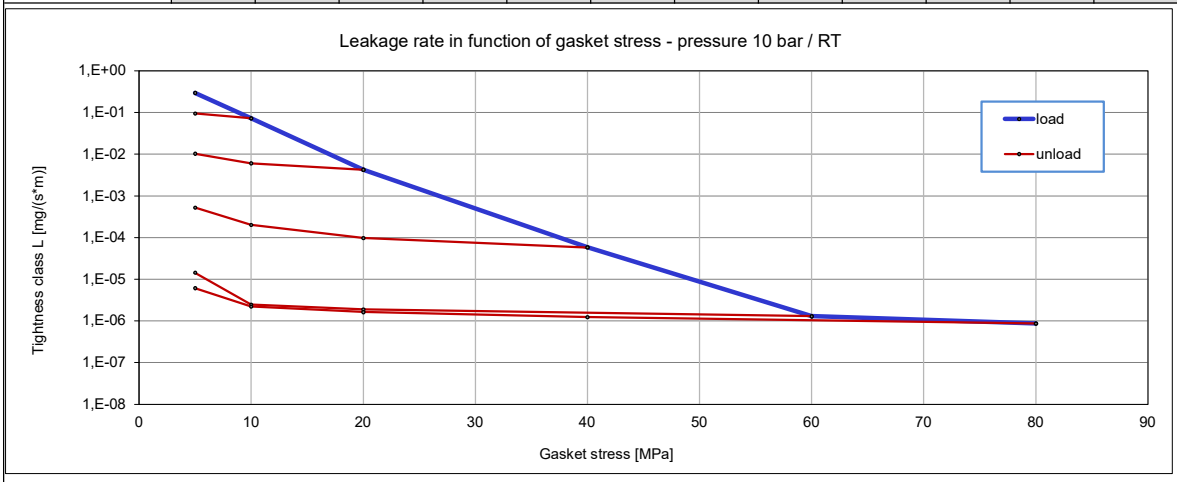
LABORATORY OF SEALING MATERIALS
43-382 Bielsko-Biała, ul. Szyprów 17
tel. +48 33 8184133 e-mail: lbmu@spetech.com.pl www.laboratory.spetech.eu

Company	**SPETECH sp. z o.o.**		
Gasket Type	**SPETOFLON® TEX FGR**		
Dimensions [mm]	**92 x 49 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

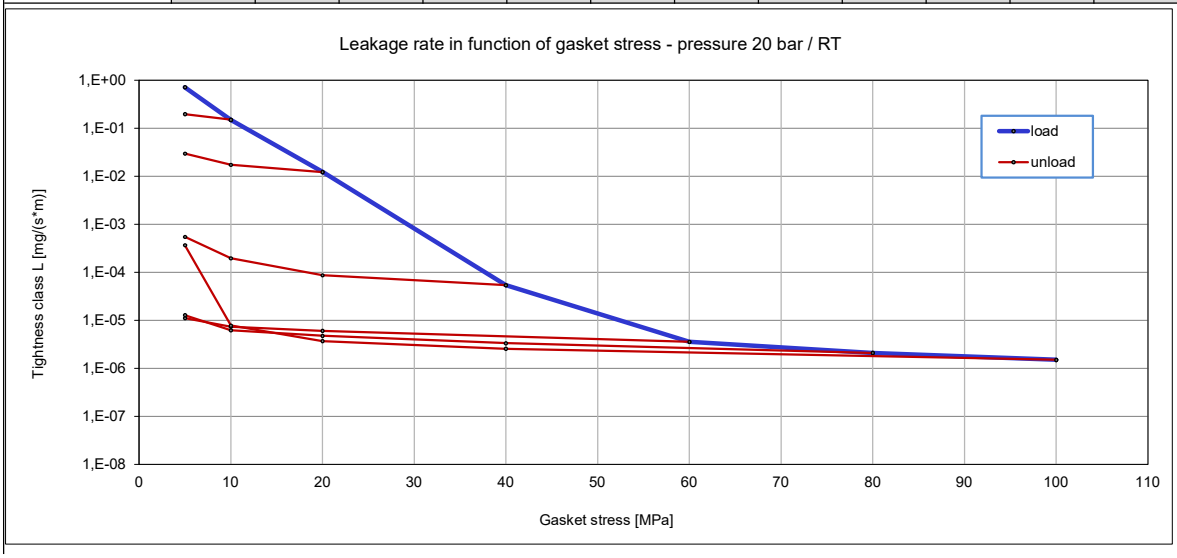
Minimum level of surface pressure required for leakage rate class L on assembly Qmin/L and after off-loading QSmin/L at room temperature (RT)

Internal pressure [bar]	**10**											
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress										
		QA = 10 [MPa]	QA = 20 [MPa]	QA = 40 [MPa]	QA = 60 [MPa]	QA = 80 [MPa]	QA = 100 [MPa]	QA = 120 [MPa]	QA = 140 [MPa]	QA = 160 [MPa]		
10^{-0}	5	5	5	5	5	5						
10^{-1}	**9**	5	5	5	5	5						
10^{-2}	**17**		5	5	5	5						
10^{-3}	**27**			5	5	5						
10^{-4}	**38**			**20**	5	5						
10^{-5}	**50**				**6**	5						
10^{-6}	**75**					**64**						
10^{-7}												

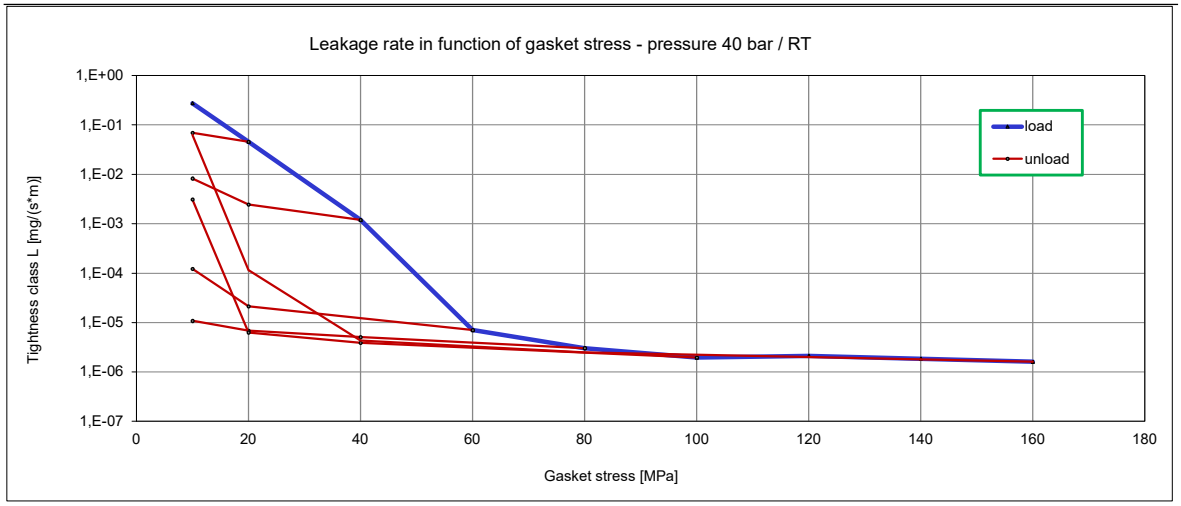


Minimum level of surface pressure required for leakage rate class L on assembly Qmin/L and after off-loading QSmin/L at room temperature (RT)

Internal pressure [bar]	**20**											
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress										
		QA = 10 [MPa]	QA = 20 [MPa]	QA = 40 [MPa]	QA = 60 [MPa]	QA = 80 [MPa]	QA = 100 [MPa]	QA = 120 [MPa]	QA = 140 [MPa]	QA = 160 [MPa]		
10^{-0}	5	5	5	5	5	5	5					
10^{-1}	**12**		5	5	5	5	5					
10^{-2}	**21**			5	5	5	5					
10^{-3}	**29**			5	5	5	5					
10^{-4}	**38**			**19**	5	5	**7**					
10^{-5}	**53**				**6**	**7**	**10**					
10^{-6}												
10^{-7}												



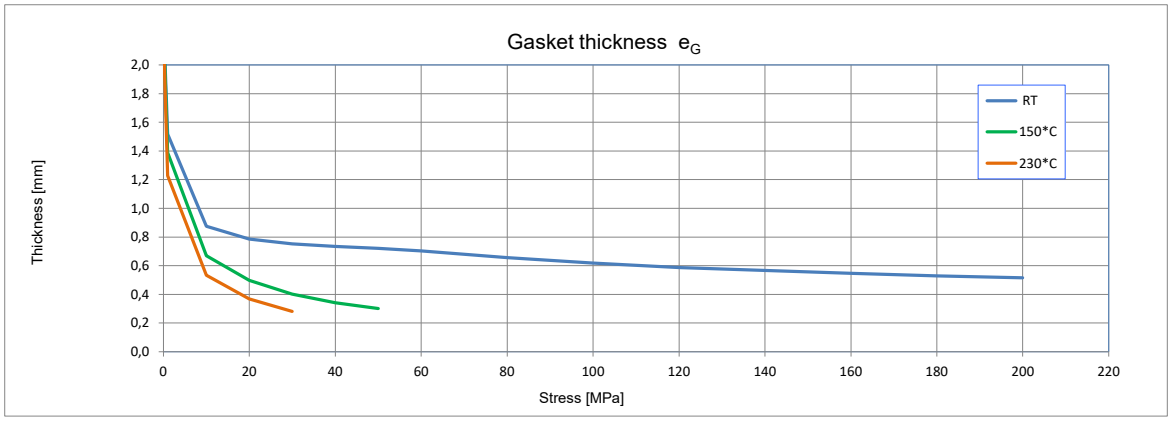
Minimum level of surface pressure required for leakage rate class L on assembly Qmin/L and after off-loading QSmin/L at room temperature (RT)												
Internal pressure [bar]	**40**											
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress										
		Q_A = 10 [MPa]	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}	16		10	10	10	10	10			10		
10^{-2}	29			10	10	10	10			13		
10^{-3}	41				10	10	12			17		
10^{-4}	50				11	10	16			21		
10^{-5}	59				48	13	19			35		
10^{-6}												
10^{-7}												



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		2,315						
1		1,518						
10	223	0,876						
20	553	0,787	0,89	0,019				
30	1016	0,752	0,93	0,018				
40	1541	0,734						
50	2011	0,722	0,94	0,025				
60	2461	0,703					**200**	0,25
80	3200	0,656						
100	3745	0,618						
120	3902	0,588						
140	4481	0,566						
160	4811	0,547						
180	5059	0,531						
200	5274	0,516	0,97	0,049				

Temperature	**150*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		2,280						
1		1,389						
10	389	0,669						
20	889	0,500	0,53	0,080			**50**	0,09
30	1213	0,402	0,46	0,136				
40	1556	0,343						
50	2010	0,303	0,40	0,250				

Temperature	**230*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		2,210						
1		1,228						
10	289	0,533					**30**	0,10
20	639	0,368	0,37	0,106				
30	911	0,283	0,31	0,173				



Description:					
	E_G	Modulus of elasticity	Q_{smax}	Maximum surface pressure	
	e_G	Gasket or sealing element thickness	μ_G	Static friction factor	(based on EN1591-1:2014 Annex E)
	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

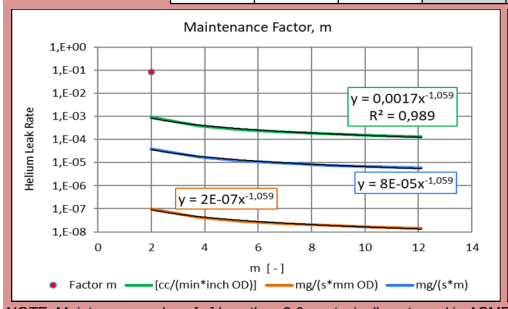
T [°C]	Q_{min} [MPa]	$Q_{max, ref}$ [MPa]	E_0 [MPa]	K_1	Q_l/P	g_c	c_1
20	12	150	500	40	1,3	1,0	0,00
100	-	150	1500	35	1,3	0,9	-
200	-	150	2500	30	1,3	0,8	-

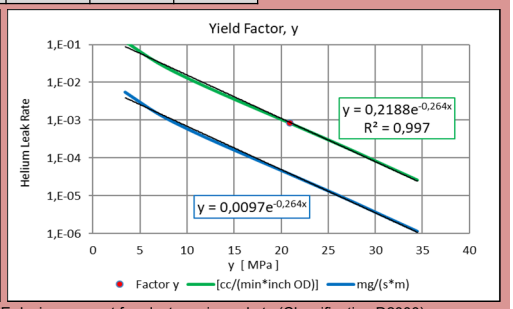
bGref [mm]	19,5	eGref [mm]	2,0

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

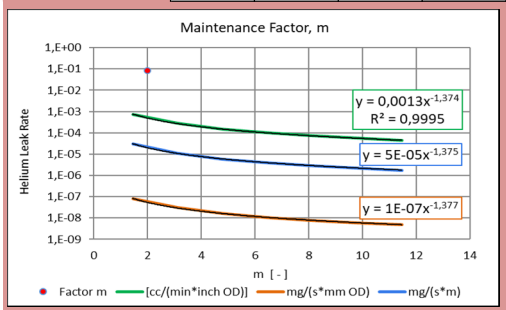
Tightness class		ASTM F3149	PVRC Tightness class		EN 13555	
			T3	T4	L0,01	L0,001
Factor m	[-]	2,0	< 2,0	< 2,0	< 2,0	< 2,0
Factor y	[MPa]	20,9			17,0	26,2
	[psi]	3030				

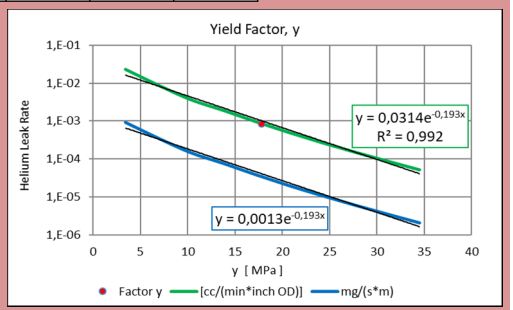




NOTE: Maintenance values [m] less than 2.0 are typically not used in ASME designs except for elastomeric gaskets (Classification D2000).
Gasket dimensions acc. to EN 1514-1 DN40 PN40
The given coefficient values are read from the test curves, not from the trend line.

Tightness class		ASTM F3149	PVRC Tightness Class		EN 13555	
			T3	T4	L0,01	L0,001
Factor m	[-]	2,0	<1,5	<1,5	<1,5	<1,5
Factor y	[MPa]	17,8			12,4	24,6
	[psi]	2580				





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 NPS 4 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^3]	k1 [mm]	$k_0k\vartheta$ [N/mm]
$24,5*b_D$	$2,5*b_D$	$*b_D$

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
19,7	$5,0*p_0$	1,1	1,8	2,6		

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 [%]
53	16

Factors acc. to:

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

Temperature [°C]	Creep Relaxation [%]
20	39
100	68
200	89

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]		6,88E+10
Volume resistance R_v at U=100V	[Ω]		7,68E+11
Surface resistivity ρ_s at U=100V	[Ω]		6,96E+11
Volume resistivity ρ_v at U=100V	[Ωm]		5,71E+11