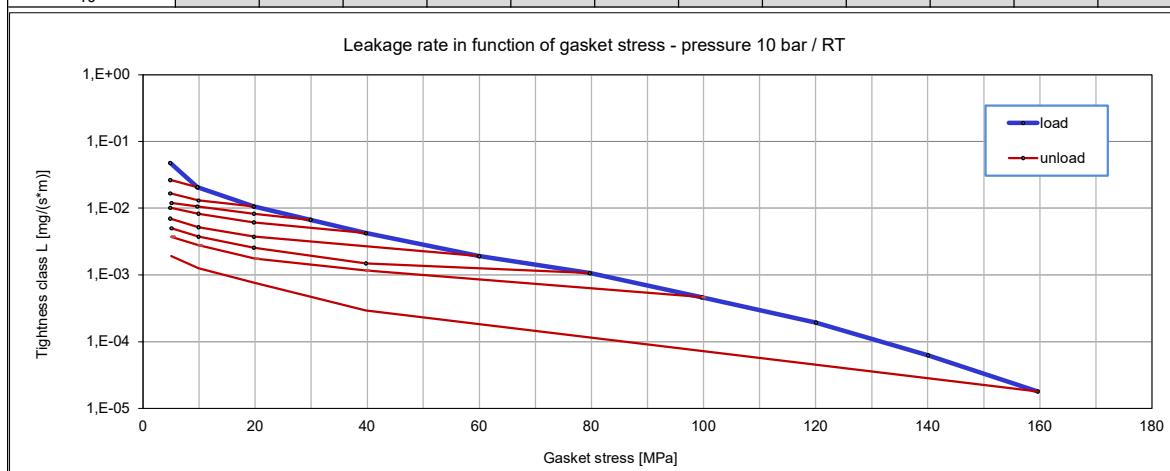
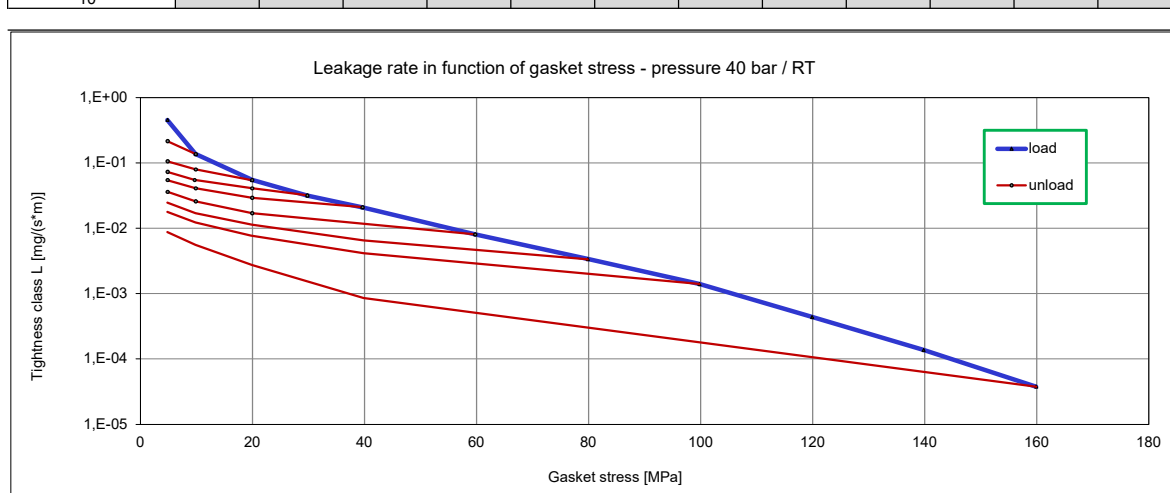


		LABORATORY OF SEALING MATERIALS 43-382 Bielsko-Biała, ul. Szyprów 17 tel. +48 33 8184133 e-mail: lbmu@spetech.com.pl www.laboratory.spetech.eu			 www.tuv.com 210/AL/5952
Company		SPETECH sp. z o.o.			
Gasket Type		SPETOGRAPH® GUS® 20			 LB - 12402
Dimensions [mm]		92 x 49 x 2 (DN40 PN40)			
Calculation type EN 1591-1		a) flat gasket;		EN 1514-1	
Notes:	Rev.0 (04-03-2021)				

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 = 160 [MPa]		
10 ⁻⁰	5	5	5	5	5	5	5	5	5		
10 ⁻¹	5	5	5	5	5	5	5	5	5		
10 ⁻²	21			11	5	5	5	5	5		
10 ⁻³	81							49	15		
10 ⁻⁴	132								85		
10 ⁻⁵											
10 ⁻⁶											
10 ⁻⁷											



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 = 160 [MPa]		
10 ⁻⁰	5	5	5	5	5	5	5	5	5		
10 ⁻¹	13		6	5	5	5	5	5	5		
10 ⁻²	55					48	23	14	5		
10 ⁻³	106								37		
10 ⁻⁴	145								122		
10 ⁻⁵											
10 ⁻⁶											
10 ⁻⁷											
10 ⁻⁸											

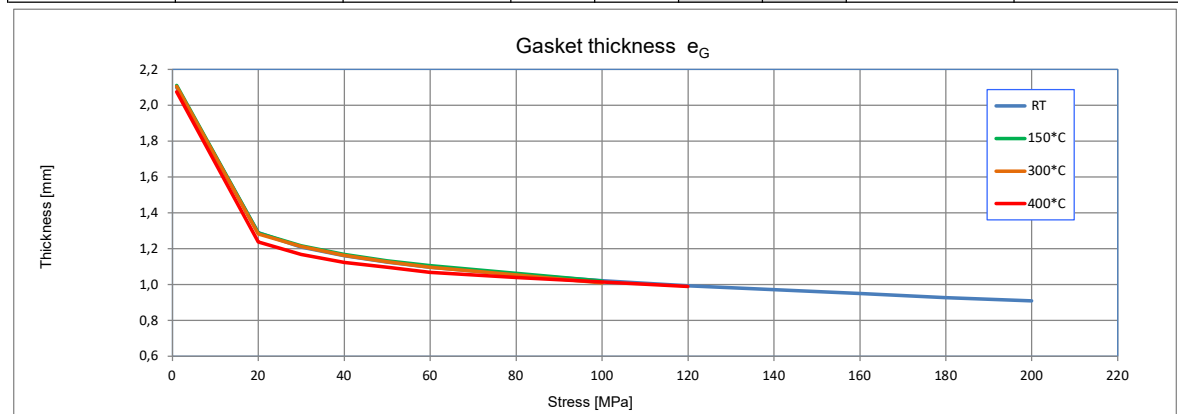


Temperature	RT						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		2,100					200
20	324	1,289					
30	517	1,209	0,97	0,008			
40	710	1,161					
50	937	1,125	0,98	0,008			
60	1129	1,096					
80	1679	1,055					
100	1793	1,021					
120	2072	0,994					
140	2496	0,972					
160	2822	0,951					
180	2694	0,928					
200	3189	0,909	1,00	0,000			

Temperature	150°C						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		2,111					100
20	416	1,287					
30	654	1,217	0,95	0,013			
40	776	1,168					
50	1016	1,132	0,97	0,015			
60	1288	1,105					
80	1667	1,063					
100	1704	1,020	0,98	0,017			

Temperature	300°C						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		2,105					100
20	552	1,283					
30	668	1,213	0,95	0,013			
40	769	1,163					
50	1113	1,127	0,97	0,015			
60	1223	1,097					
80	1677	1,054					
100	1691	1,009	0,98	0,017			

Temperature	400°C						
Gasket stress	E_G	e_G	C=500 kN/mm		C=1500 kN/mm		Q_{smax}
			P_{QR}	Δe_{Gc}	P_{QR}	Δe_{Gc}	
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]
1		2,075					120
20	441	1,238					
30	828	1,169	0,88	0,030			
40	925	1,123					
50	1625	1,096	0,94	0,027			
60	1517	1,069					
80	3324	1,040					
100	3721	1,015					
120	2830	0,989	0,97	0,035			



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
	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	100	1	28	1,3	1,0	
100		90	1	28	1,3	1,0	
200		80	1	28	1,3	1,0	
300		70	1	28	1,3	1,0	
400							
bGref [mm]		19,5		eGref [mm]		2,0	

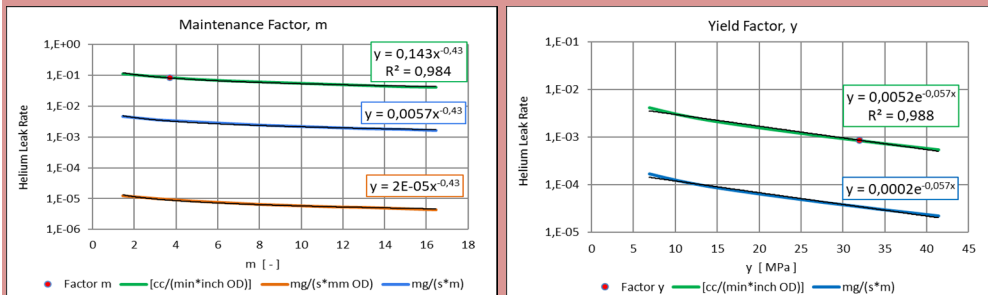
Factors acc. to:

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	[-]	3,7	<1,5	<1,5	<1,5	-
Factor y	[MPa]	32,0			12,7	-
	[psi]	4640				



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 Class 300.

The given coefficient values are read from the test curves, not from the trend line.

σ_{max} - see maximal applicable gasket stress Q_{smax} acc. EN 1591-1:2009/2013

Factors acc. to:

AD 2000-Merkblatt B7 August 2007

$k_0 k_D$ [N/mm]	k1 [mm]	$k_0 k_9$ [N/mm]
$7,0 \cdot b_D$	$2,0 \cdot b_D$	$\cdot b_D$

σ_{max} - see maximal applicable gasket stress Q_{smax} acc. EN 1591-1:2009/2013

Factors acc. to:

WUOT-UC-WO-O/19

σ_m [MPa]	σ_r [MPa]	b [1]				
		20°C	100°C	200°C	300°C	400°C
17,5	$5,0 \cdot p_0$	1,0	1,1	1,1	1,1	1,2

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 [%]
44,2	13,5

Factors acc. to:

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

Temperature [°C]	Creep Relaxation [%]
20	9,3
100	10,8
200	13,9

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