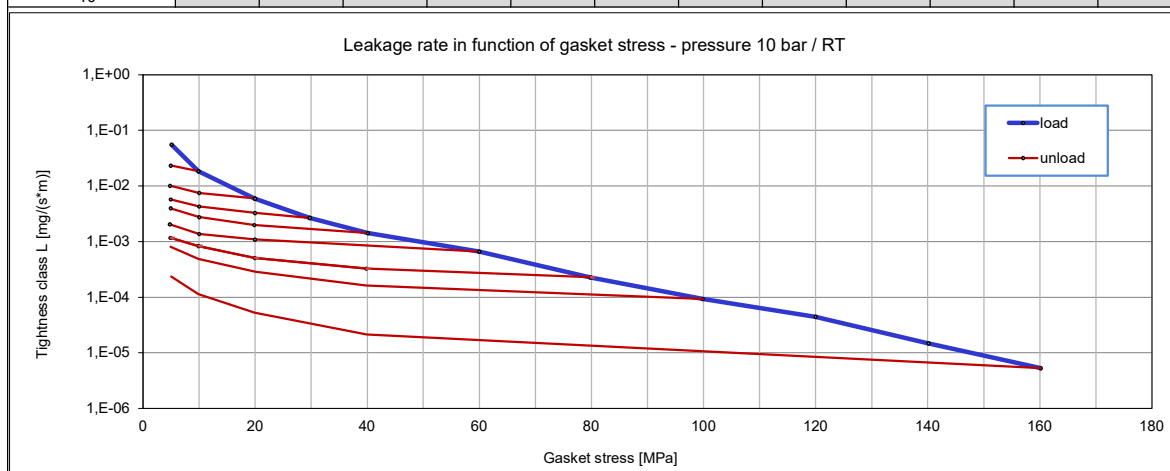
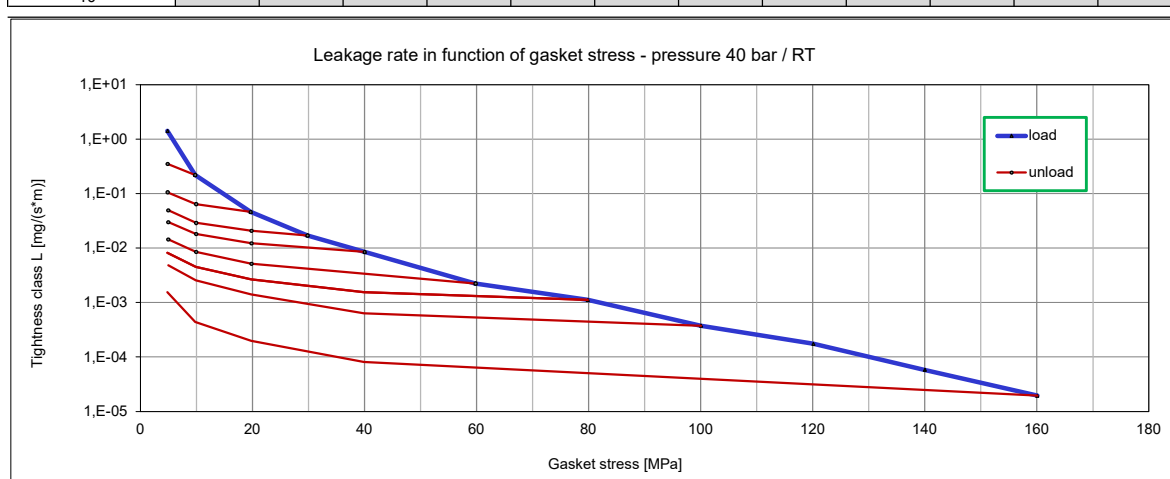


		LABORATORY OF SEALING MATERIALS 43-382 Bielsko-Biała, ul. Szyprów 17 tel. +48 33 8184133 e-mail: lbmu@spetech.com.pl www.laboratory.spetech.eu			 TUV Rheinland CERTIFIED DIN EN ISO 9001 210/AL/5952	
Company		SPETECH sp. z o.o.				
Gasket Type		SPETOGRAPH® GUS® 30			 LB - 12402	
Dimensions [mm]		92 x 49 x 1,5 (DN40 PN40)				
Calculation type EN 1591-1		a) flat gasket;		EN 1514-1		IBC
Notes:	Rev.0 (04-03-2021)					

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}	15		5	5	5	5	5	5	5			
10^{-3}	49					24	7	5	5			
10^{-4}	98							91	12			
10^{-5}	148								104			
10^{-6}												
10^{-7}												



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 = 160 [MPa]					
10 ⁻⁰	6	5	5	5	5	5	5	5	5					
10 ⁻¹	15		5	5	5	5	5	5	5					
10 ⁻²	37				29	8	5	5	5					
10 ⁻³	82							28	7					
10 ⁻⁴	130								35					
10 ⁻⁵														
10 ⁻⁶														
10 ⁻⁷														
10 ⁻⁸														

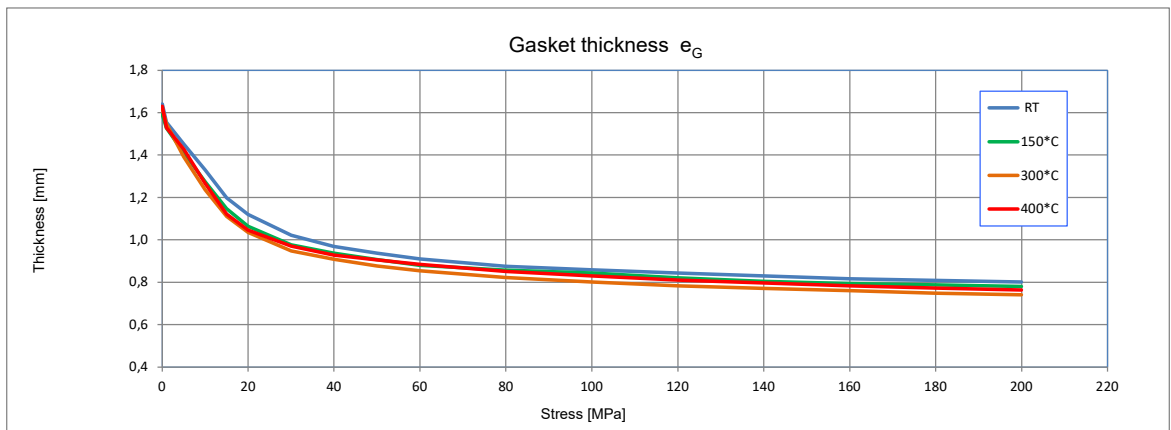


Temperature	RT							
Gasket stress	E _G	eG	C=500 kN/mm		C=1500 kN/mm		Q _{smax}	μ _G
			P _{QR}	Δe _{Gc}	P _{QR}	Δe _{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[-]	[mm]	[MPa]	[-]
0		1,641					200	0,10
1		1,555						
5	146	1,452						
10	230	1,330						
15	310	1,198						
20	482	1,119						
30	944	1,021	0,98	0,007				
40	1060	0,969						
50	1608	0,937	0,99	0,007				
60	1890	0,910						
80	2873	0,875						
100	6332	0,859						
120	6691	0,843						
140	6393	0,829						
160	6889	0,817						
180	8892	0,808						
200	12708	0,801	1,00	0,000				

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		1,591					200	0,10
1		1,527						
5	230	1,411						
10	283	1,274						
15	388	1,147						
20	450	1,064						
30	700	0,976	0,88	0,036				
40	1438	0,937						
50	1259	0,906	0,94	0,029				
60	1496	0,880						
80	4408	0,857						
100	6389	0,843						
120	3224	0,820						
140	3703	0,805						
160	5960	0,794						
180	9254	0,787						
200	13239	0,780	0,98	0,038				

Temperature	300°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		1,619					200	0,10
1		1,547						
5	168	1,392						
10	213	1,236						
15	346	1,110						
20	561	1,035						
30	720	0,948	0,84	0,047				
40	1196	0,908						
50	1379	0,877	0,91	0,045				
60	1942	0,855						
80	2386	0,822						
100	2969	0,801						
120	4247	0,783						
140	10697	0,771						
160	5824	0,760						
180	4765	0,748						
200	5409	0,740	0,98	0,038				

Temperature	400°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		1,631					200	0,10
1		1,529						
5	428	1,427						
10	377	1,267						
15	381	1,121						
20	533	1,046						
30	1002	0,970	0,82	0,053				
40	1253	0,928						
50	2294	0,905	0,91	0,043				
60	2425	0,884						
80	2479	0,851						
100	3083	0,829						
120	3644	0,811						
140	4107	0,796						
160	3913	0,784						
180	5033	0,773						
200	5386	0,764	0,98	0,048				



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	15	150	1	31	1,3	1,0	
100		145	1	31	1,3	1,0	
200		140	1	31	1,3	1,0	
300		130	1	31	1,3	1,0	
400							
bGref [mm]		19,5		eGref [mm]		1,5	

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]
2,54	2600	17,9

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]	k ₁ [mm]	k ₀ k _Δ [N/mm]
16,0*b _D	2,2*b _D	*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]				
		20°C	100°C	200°C	300°C	400°C
18,3	$4,2 \cdot p_0$	1,0	1,1	1,1	1,1	1,2

[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	1,2
100	8,5
200	18,1

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