

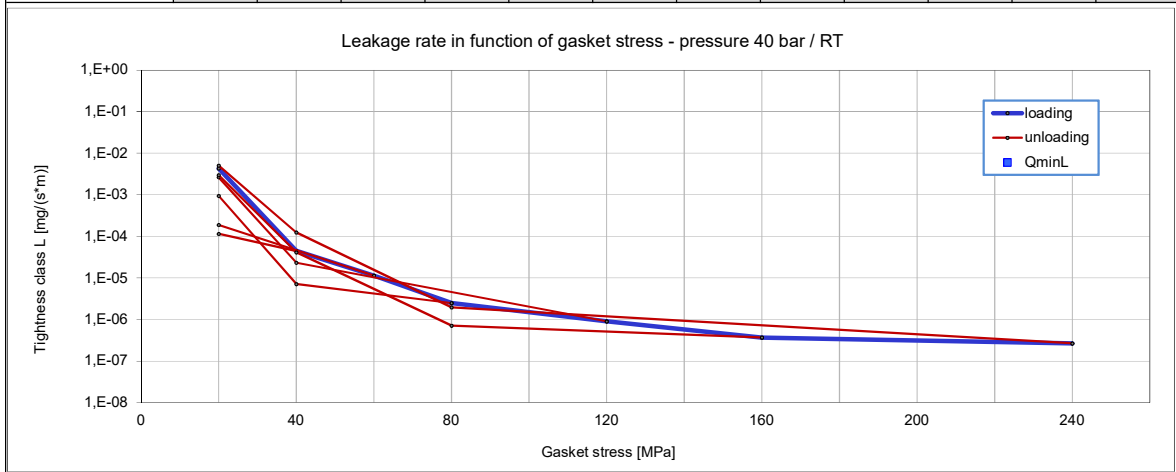
	LABORATORY OF SEALING MATERIALS 43-382 Bielsko-Biala, ul. Szyprów 17 tel. +48 33 8184133 e-mail: lbmu@spetech.com.pl www.laboratory.spetech.eu		  LB - 12402
	Company	SPETECH sp. z o.o.	
Gasket Type	SPETORING RTJ-OR (oval type) 321		
Dimensions [mm]	76,3 x 60,3 x 14,5 (R 20)		
Stiffness (kN/mm)	1500		
Calculation type EN 1591-1	e) RTJ oval;	EN 12560-5	

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

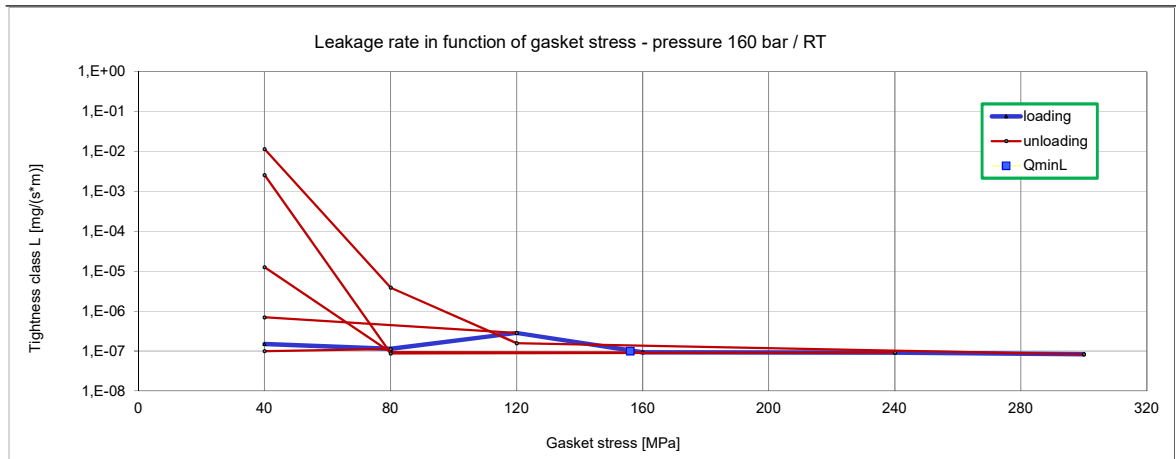
Minimum level of surface pressure required for leakage rate class L on assembly $Q_{min/L}$ and after off-loading $Q_{Smin/L}$ at room temperature (RT)

Internal pressure [bar]	40											
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress										
		$Q_A = 40$ [MPa]	$Q_A = 60$ [MPa]	$Q_A = 80$ [MPa]	$Q_A = 120$ [MPa]	$Q_A = 160$ [MPa]	$Q_A = 240$ [MPa]	$Q_A = 300$ [MPa]				
10^{-0}	20	20	20	20	20	20	20	20				
10^{-1}	20	20	20	20	20	20	20	20				
10^{-2}	20	20	20	20	20	20	20	20				
10^{-3}	27	20	20	20	24	25	29					
10^{-4}	37	22	29	29	34	35	42					
10^{-5}	62			38	60	54	64					
10^{-6}	116				118	77	133					
10^{-7}												
10^{-8}												



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)

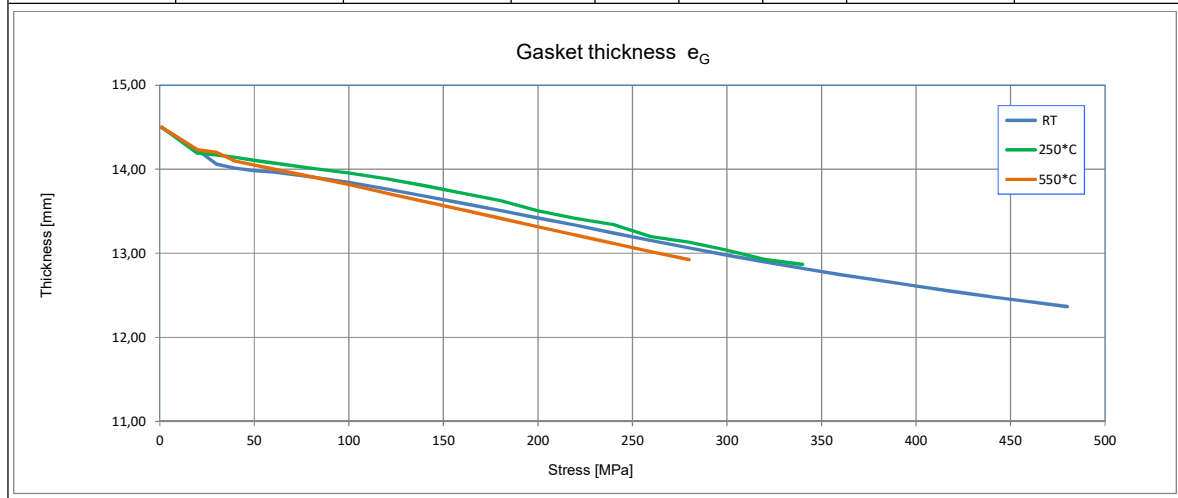
Internal pressure [bar]	160										
L [mg/(s*m)]	$Q_{min/L}$ [MPa]	$Q_{Smin/L}$ [MPa] for effective gasket stress									
		$Q_A = 80$ [MPa]	$Q_A = 120$ [MPa]	$Q_A = 160$ [MPa]	$Q_A = 240$ [MPa]	$Q_A = 300$ [MPa]					
10^{-0}	40	40	40	40	40	40	40				
10^{-1}	40	40	40	40	40	40	40				
10^{-2}	40	40	40	40	40	40	41				
10^{-3}	40	40	40	40	40	43	52				
10^{-4}	40	40	40	40	40	53	63				
10^{-5}	40	40	40	40	42	62	75				
10^{-6}	40	40	40	40	61	71	97				
10^{-7}	156				79	79	250				
10^{-8}											



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]	[-]	
1	200000	14,500					480	NDA	
20		14,229							
30		14,060							
40		14,013							
50		13,984							
60		13,966							
80		13,909							
100		13,844		0,99	0,003	0,98			0,002
120		13,764							
140		13,681							
160		13,596							
180		13,510							
200		13,421		0,99	0,007	0,99			0,004
220		13,336							
240		13,242							
260		13,153							
280		13,065							
300		12,980							
320		12,899							
340		12,821							
360		12,747							
380		12,680							
400		12,611							
420		12,544							
440		12,484							
460		12,424							
480		12,367		0,99	0,011	0,99			0,008

250°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]	[-]	
1	182500	14,500					340	NDA	
20		14,191							
30		14,172							
40		14,142							
50		14,105							
60		14,076							
80		14,015							
100		13,955		0,97	0,010	0,91			0,011
120		13,888							
140		13,805							
160		13,714							
180		13,628							
200		13,507		0,94	0,045	0,88			0,027
220		13,415							
240		13,342							
260		13,197							
280		13,134							
300		13,039							
320		12,927							
340		12,869		0,94	0,076	0,88			0,049

550°C								
Gasket stress [MPa]	E_G [MPa]	e_G [mm]	C= 500 kN/mm		C=1500 kN/mm		Q_{smax} [MPa]	μ_G [-]
			P_{QR} [-]	Δe_{Gc} [mm]	P_{QR} [-]	Δe_{Gc} [mm]		
1	16150	14,500					280	NDA
20		14,232						
30		14,201						
40		14,096						
50		14,050						
60		14,004						
80		13,911						
100		13,817	0,95	0,019	0,83	0,020		
120		13,716						
140		13,617						
160		13,516						
180		13,416						
200		13,316	0,90	0,071	0,83	0,039		
220		13,217						
240		13,118						
260		13,020						
280		12,926	0,89	0,104	0,81	0,060		



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

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
0...20				NDA			
100							
200							
bGref [mm]		NDA		eGref [mm]		NDA	

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]
6,5	26000	179

[omax - see maximal applicable gasket stress Qsmax acc. EN 1591-1:2009/:2013](#)

Factors acc. to:

AD 2000-Merkblatt B7 August 2007

k_0 [mm]	k1 [mm]	K_D [N/mm ²]	K_{D0} [N/mm ²]				
			100 °C	200 °C	300 °C	400 °C	500 °C
2,00	6,00	500,00	480,00	450,00	420,00	390,00	350,00

[omax - 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]		
		20oC	100oC	200oC
NDA	NDA	NDA	NDA	NDA

[sigma_max](#) - 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]	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