

	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	SPETORING LENS Soft Iron			
Dimensions [mm]	DN50 PN63			
Stiffness (kN/mm)	500			
Calculation type EN 1591-1	c) lens gasket;	DIN 2696	lenticular	

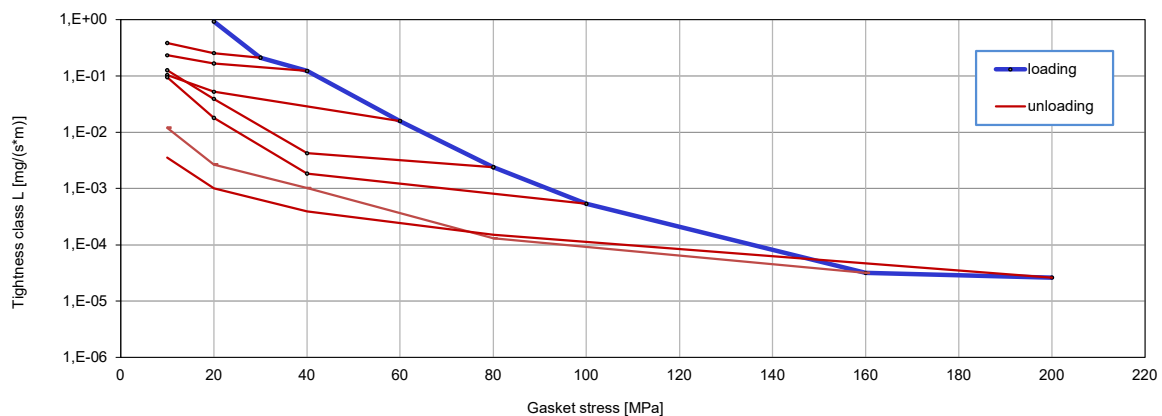
Notes:

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									
		$Q_A = 20$ [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]	$Q_A = 200$ [MPa]		
10^{-0}	19		10	10	10	10	10	10	10		
10^{-1}	42				11	12	10	10	10		
10^{-2}	65					32	25	12	10		
10^{-3}	92						69	40	20		
10^{-4}	136							97	108		
10^{-5}											
10^{-6}											
10^{-7}											

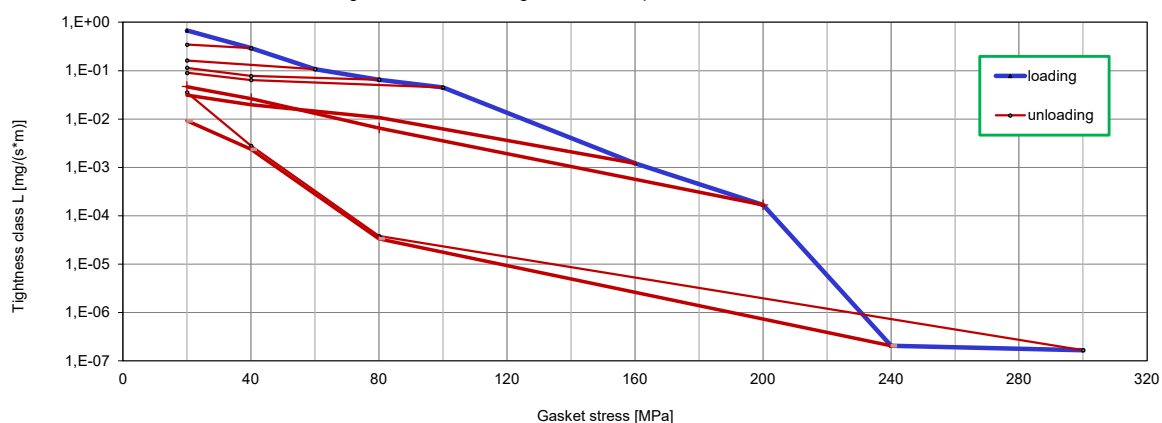
Leakage rate in function of gasket stress - pressure 40 bar / RT



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]	80										
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]	$Q_A = 160$ [MPa]	$Q_A = 200$ [MPa]	$Q_A = 240$ [MPa]	$Q_A = 300$ [MPa]	
10^{-0}	20		20	20	20	20	20	20	20	20	
10^{-1}	62				27	20	20	20	20	20	
10^{-2}	125						83	68	20	30	
10^{-3}	164							142	48	50	
10^{-4}	203								70	71	
10^{-5}	217								118	135	
10^{-6}	231								190	227	
10^{-7}											
10^{-8}											

Leakage rate in function of gasket stress - pressure 80 bar / RT

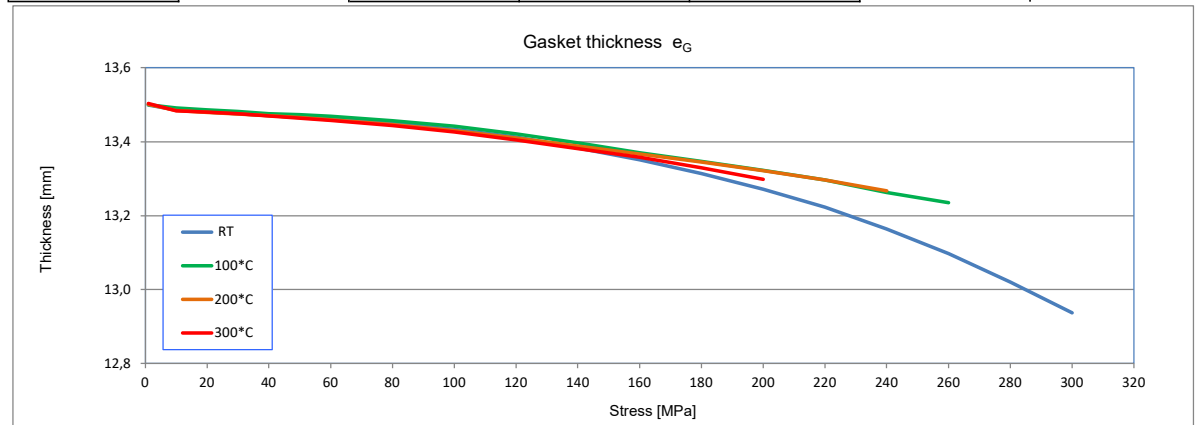


Temperature	RT					
Gasket stress	E _G	eG	C=500 kN/mm		Q _{smax}	μ _G
			P _{QR}	Δe _{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
1	207000	13,499			300	NDA
10		13,486				
20		13,480				
30		13,476				
40		13,470				
50		13,466	1,00	0,000		
60		13,462				
80		13,450				
100		13,433	1,00	0,001		
120		13,413				
140		13,383				
160		13,351				
180		13,313				
200		13,271				
220		13,223				
240		13,164				
260		13,097				
280		13,020				
300		12,937	1,00	0,003		

Temperature	100°C					
Gasket stress	E _G	eG	C= 500 kN/mm		Q _{smax}	μ _G
			P _{QR}	Δe _{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
1	195000	13,500			260	NDA
10		13,492				
20		13,486				
30		13,482				
40		13,475				
50		13,473	0,96	0,006		
60		13,468				
80		13,457				
100		13,442	0,98	0,006		
120		13,421				
140		13,397				
160		13,370				
180		13,346				
200		13,323				
220		13,297				
240		13,263				
260		13,235	0,99	0,007		

Temperature	200°C					
Gasket stress	E _G	e _G	C= 500 kN/mm		Q _{smax}	μ _G
			P _{QR}	Δe _{Gc}		
[MPa]	[MPa]	[mm]	[-]	[mm]	[MPa]	[-]
1	183000	13,500			240	NDA
10		13,484				
20		13,479				
30		13,475				
40		13,470				
50		13,465	0,94	0,008		
60		13,459				
80		13,446				
100		13,430	0,94	0,015		
120		13,410				
140		13,389				
160		13,367				
180		13,345				
200		13,321				
220		13,296				
240		13,267	0,98	0,013		

Temperature	300°C				
Gasket stress	E_G	e_G	C= 500 kN/mm		Q_{smax}
[MPa]	[MPa]	[mm]	P_{QR}	Δe_{Gc}	μ_G
			[-]	[mm]	[-]
1	175000	13,504			200
10		13,483			
20		13,480			
30		13,475			
40		13,469			
50		13,464	0,93	0,009	
60		13,458			
80		13,444			
100		13,426	0,92	0,021	
120		13,405			
140		13,382			
160		13,358			
180		13,330			
200		13,299	0,94	0,029	
					NDA



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		