

TECHNICAL DATA SHEET

fluteck[®] P EX100 (Expanded Polytetrafluoroethylene)

Property	Method	Units	Specification
Specific gravity	EN ISO 13000-2	g/cm ³	0,500 – 0,700
Flamability	UL 94		V-0
Water absorption	ASTM D570	%	0,01

Gasket Sheets are made from 100% pure, multidirectional fluteck[™] P EX100 with higher density. It consists solely of highest grade PTFE resins that offer an almost unlimited chemical resistance. During installation, gaskets made from fluteck[™] P EX100 sheets, adapt perfectly to flange roughness, unevenness and usual irregularities of used flanges.

In service, stressed with temperature cycling and external forces, fluteck[™] P EX100 keeps high gasket stress and forms an optimum thin gasket with high blow-out safety. With fluteck[™] P EX100 sheet gasketing you can cover a wide range of metal flange shapes in demanding aggressive surroundings. For the use in high purity applications fluteck[™] P EX100 sheets with ink- free marking are available on request.

Properties:

- Easy manufacture into all gasket shapes; suitable for high temperatures; higher rigidity and stiffness; highly conformable to the sealing surface; reliably tight and blow-out safe; resistant to ageing reduces service and operating costs

Main applications:

- Large diameter standard flanges, piping systems, apparatus flanges, complex geometries, steel flanges and high grade FRP components. Highly aggressive chemicals, all media in food and pharma applications.

Service Temperature

- Excellent resistance to continuous service temperatures up to 260° C and, for limited periods, even to higher temperatures; the low temperature resistance of the product allows satisfactory performance at as low -200°C.
- **Recommended Operating Range**

Vacuum to 40 bar at -240°C to +260°C, depending on the individual application up to 200 bar.

Chemical resistance

- PTFE possesses a high inertness towards nearly all known chemicals (Ph 0 to 14). It is only attacked by elemental alkali metals, chlorine trifluoride and elemental fluorine at high temperature and pressures.

Solvents resistance:

- PTFE is insoluble in all solvents up to temperatures as high as 300° C (572° F). Certain highly fluorinated oils only swell and dissolve PTFE at temperatures close to the crystalline melting point.

Tests and Certificates

- FDA approved (Code of Federal regulation 21 CFR Ch.1; sections 177.1550 "Perfluorocarbon Resins" of the Food and Drug Administration/ USA
- TA-Luft (VDI 2440) up to 230°C and VDI 2290 @ 40bar He
- Blow-Out-Safety according VDI 2200
- BAM for gaseous and liquid Oxygen
- EC 1935 and relating regulations for extraction limits and GMP

Material Properties flutecTM P EX100 ePTFE Gasketing (2mm)

EN 13555

Minimum stress to seal $Q_{min/L}$ (at assembly) , $Q_{min/L}$ (after off-loading) for $p = 40$ bar										
L [mg/(s*cm)]	$Q_{min/L}$ [MPa]	$Q_{Smax/L}$ [MPa]								
		$Q_A=10$ 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	11		5	5	5	5	5			5
10 ¹	19		16	5	5	5	5			6
10 ²	27			5	5	5	5			10
10 ³	35			17	5	5	5			13
10 ⁴	46				8	5	5			17
10 ⁵	73					76	31			23
10 ⁶										
10 ⁷										
10 ⁸										

Relaxation ratio P_{GR} for stiffness $C = 500$ kN/mm			
Gasket stress [MPa]	ambient temperature	temperature 1 [120 °C]	temperature 2 [230 °C]
Stress level 1 [30 MPa]	0,94	0,90	0,46
Stress level 2 [50 MPa]	0,98	0,67	0,44
PQR at Q_{Smax}	0,96 at 160 MPa	0,65 at 100 MPa	0,53 at 100 MPa

Maximal applicable gasket stress Q_{Smax}				
Q_{Smax} [MPa]	Q_{Smax} [MPa] - temperature 1 [120 °C]	Q_{Smax} [MPa] - temperature 2 [230 °C]	Q_{Smax} [MPa] - temperature 3	Q_{Smax} [MPa] - temperature 4
ambient temperature	160	100	100	

Sekant unloading modulus of the gasket E_G [MPa] and gasket thickness e_G [mm]										
Gasket stress [MPa]	ambient temperature		temperature 1 [120 °C]		temperature 2 [230 °C]					
	E_G [MPa]	e_G [mm]	E_G [MPa]	e_G [mm]	E_G [MPa]	e_G [mm]	E_G [MPa]	e_G [mm]	E_G [MPa]	e_G [mm]
0										
1		1,67		1,66		1,75				
20	385	0,78	845	0,72	521	0,56				
30	721	0,74	1439	0,70	787	0,46				
40	1127	0,72	1901	0,61	864	0,38				
50	1556	0,71	1788	0,55	915	0,33				
60	1994	0,70	2329	0,50	908	0,29				
80	2517	0,69	2387	0,44	1202	0,25				
100	2877	0,68	2465	0,39	1178	0,22				
120	3194	0,67								
140	3359	0,67								
160	3521	0,65								
180										
200										

Design Constants AD -Merkblatt / ASME / ASTM

$R_z \leq 6,3 \mu\text{m}$	$p \leq 10$ bar	$p \leq 16$ bar	$p \leq 40$ bar	$p \leq 60$ bar
$k_0 * k_D$	$10 * b_D$	$15 * b_D$	$25 * b_D$	$35 * b_D$
k_1	$2,5 * b_D$	$2,5 * b_D$	$2,5 * b_D$	$2,5 * b_D$

m-factor:	2,0
y-stress [psi]:	2800

Compressibility:	55 - 60 %
Recovery:	14 %

Creep Relaxation:	15 % @ 23°C (73°F)
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Temperature Resistance of the sealing material:	-250°C - +260°C (-420°F - 500° F)
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Date: 02/2017

