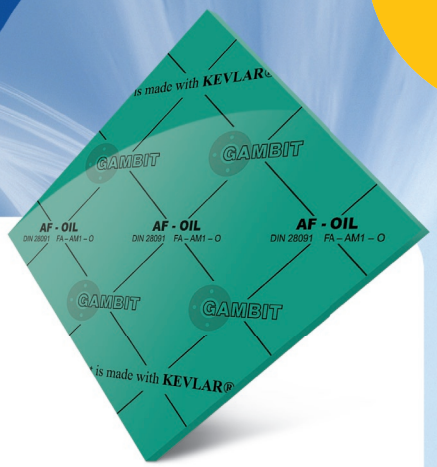
GASKET SHEETS



TECHNICAL SPECIFICATION

Gasket sheet Gambit AF-OIL

Material

Gasket sheet **GAMBIT AF-OIL** is based on Kevlar® aramide fibres, mineral fibres, and fillers bound with NBR rubber-based binder.

Designation according to DIN 28091-2: **FA-AM1-O**

Kevlar® is a registered trademark of E. I. du Pont de Nemours and Company or its affiliates.

General properties and applications

Oil-resistant gasket sheet, recommended for high temperatures and pressures. Designated for application in supervised joints. Suitable for natural gas and drinking water installations. Also recommended for applications with water, steam, kerosene, fuels, oils, brine, natural gas, propane-butane.

Admissions / Certificates

DVGW
Germanischer Lloyd
PZH

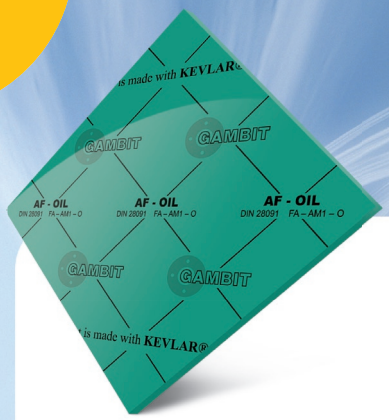
Maximum working conditions

Peak temperature	**°C**	350
Temperature under continuous operation	**°C**	300
Temperature under continuous operation with steam	**°C**	230
Temperatura minimalna	**°C**	-60
Pressure	**MPa**	10

Dimensions

Standard thicknesses of sheets /thicknesses above 5.0 mm are produced by gluing/	**mm**	0,3; 0,5; 0,8 1,0; 1,5; 2,0; 2,5 3,0; 4,0; 5,0; 6,0	± 0,1 ± 10% ± 10%
Standard dimensions of sheets /custom dimensions available within the total range of 1500x3000 mm/	**mm**	1500x1500	± 10,0

Non-standard thicknesses, graphiting of sheet surfaces, and reinforcement with metallic mesh available upon request.



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Physical and chemical properties

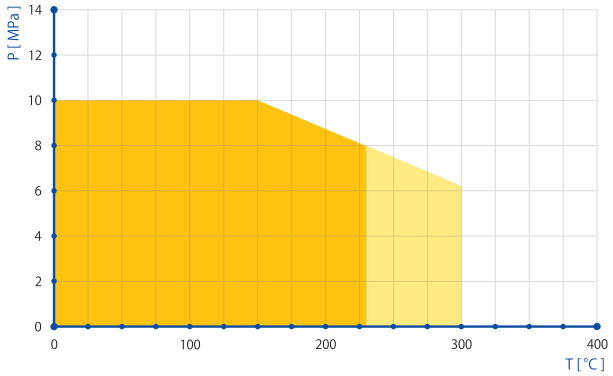
Density	± 5 %	**g/cm³**	2,0	DIN 28090-2
Transverse tensile strength	min.	**MPa**	9	DIN 52910
Compressibility	typical value	**%**	10	ASTM F36
Elastic recovery	min.	**%**	55	ASTM F36
Residual stresses 50 MPa/16 h/300 °C/	min.	**MPa**	29	DIN 52913
Residual stresses 50 MPa/16 h/175 °C/	min.	**MPa**	35	DIN 52913
INCREASE IN THICKNESS				
Oil IRM 903 150 °C/5 h	max.	**%**	6	ASTM F146
Model fuel B 20 °C/5 h	max.	**%**	6	ASTM F146
Kerosene 20 °C/24 h	max.	**%**	5	ASTM F146
Colour		**green**		

(Values as detailed in table refer to 2.0 mm thick gasket sheets)

Calculation coefficients

Coefficients DT – UC – 90/WO-0/19								
σ_m			σ_r			b		
1 mm	2 mm	3 mm	1 mm	2 mm	3 mm	20 °C	200 °C	300 °C
40 MPa	21 MPa	12 MPa	6,4 p_0	5 p_0	4,1 p_0	1,1	1,8	3,0

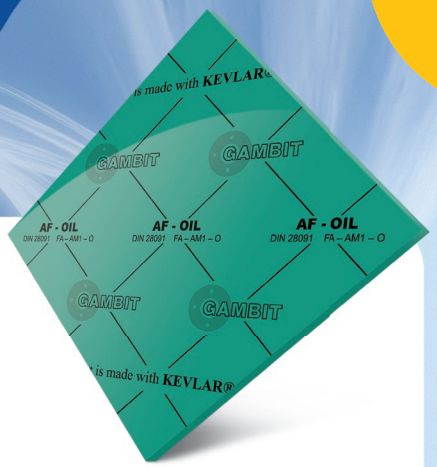
Coefficients ASME			
Tightness class	**Thickness**	**m**	**y**
L0,1	2 mm	4,1	2,7 MPa
L1,0	2 mm	1,8	1,2 MPa



It is not recommended that maximum temperature and pressure are applied simultaneously. Pressure to temperature correlation for sheet thickness 2.0 mm is shown in the diagram.

- There is no requirement for trials.
- Trials should be run if the application involves steam.

All information in this catalogue is based on years of experience in manufacture and use of the discussed products. Since sealing performance in the joint is subject to multiple factors such as mounting method, system parameters, and sealed medium, technical parameters specified herein are of informative nature only and cannot be used as grounds for any claims; any special uses of products are subject to consulting with the manufacturer.



Test Results of Gambit AF-OIL Published on Gasketdata.org

The below tests were run according to EN 13555, the most up-to-date norm in this domain. The results confirm the quality of our products and assist the design of flanges according to norm EN 1591-1+A1:2009/AC:2011.

The results have been approved by Center of Sealing Technologies (CST) at Münster University of Applied Sciences (MUAS) and published on www.gasketdata.org together with the datasheets of the world's leading manufacturers of sealing materials.

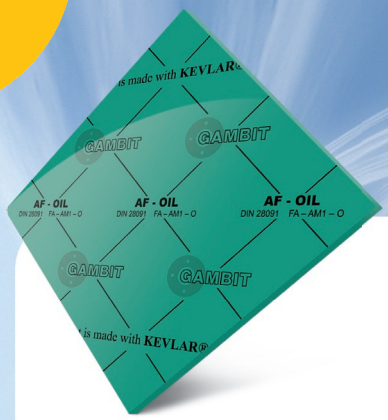
CST is an independent laboratory focused on the research and development in the field of sealing materials in order to assist both the producers and the users.

Gasket characteristics acc. EN 13555 (05/2005) required for design calculations acc. EN 1591-1+A1:2009/AC:2011
Sealing element dimensions [mm] 92 x 49 x 2

Relaxation ratio P_{QR} for stiffness C = 500 kN/mm			
Gasket stress, MPa	**Ambient temperature**	**Temperature 1 (175 °C)**	**Temperature 2 (300 °C)**
Stress level 1 (30 MPa)	0,94	0,82	0,61
Stress level 2 (50 MPa)	0,97	0,90	0,69
P_{QR} at Q_{Smax} (220/220/80 MPa)	0,99	0,86	0,67

Maximal applicable gasket stress Q_{Smax}, MPa		
Q_{Smax}, MPa – ambient temperature	**Q_{Smax}, MPa – temperature 1 (175 °C)**	**Q_{Smax}, MPa – temperature 2 (300 °C)**
220	220	80

Sekant unloading modulus of the gasket E_G, MPa and gasket thickness e_G, mm						
Gasket stress, MPa	**Ambient temperature**		**Temperature 1 (175 °C)**		**Temperature 2 (300 °C)**	
	E_G, MPa	**e_G, mm**	**E_G, MPa**	**e_G, mm**	**E_G, MPa**	**e_G, mm**
0	-	-	-	-	-	-
1	-	2,083	-	2,086	-	2,085
20	1133	1,955	1680	1,922	9216	1,89
30	1766	1,925	2311	1,909	5235	1,873
40	2457	1,903	2660	1,895	4853	1,859
50	3186	1,885	3369	1,883	5285	1,847
60	3982	1,871	3678	1,871	5453	1,834
80	5399	1,851	4440	1,845	6179	1,808
100	6535	1,835	4784	1,815	-	-
120	7345	1,821	5132	1,784	-	-
140	8098	1,808	5521	1,751	-	-
160	8523	1,796	5870	1,72	-	-
180	8926	1,785	6238	1,69	-	-
200	9383	1,774	6468	1,663	-	-
220	9739	1,763	6772	1,638	-	-



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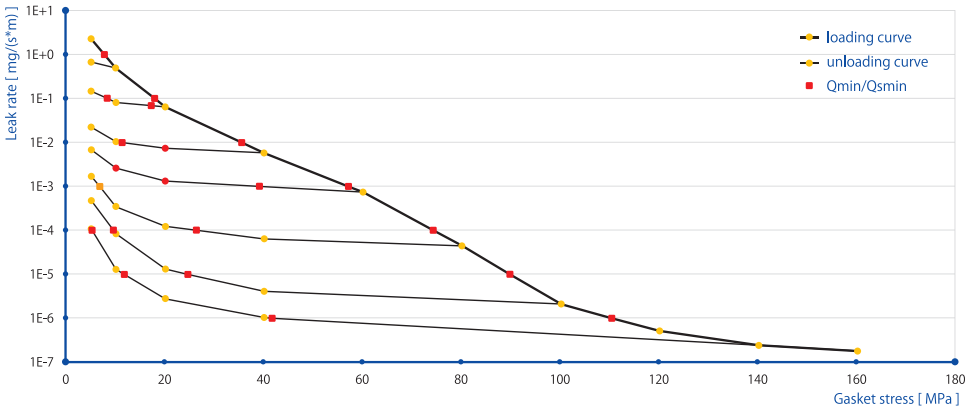
Minimum stress to seal $Q_{min(L)}$ (at assembly), $Q_{Smin(L)}$ (after off-loading) for inner pressure 10 bar										
Tightness class	$Q_{min(L)}$	$Q_{Smin(L)}$, MPa								
mg/(s x m)	MPa	Q_A 10MPa	Q_A 20 MPa	Q_A 40 MPa	Q_A 60 MPa	Q_A 80 MPa	Q_A 100 MPa	Q_A 120 MPa	Q_A 140 MPa	Q_A 160 MPa
10^{0}	8	5	5	5	5	5	5	-	-	5
10^{-1}	18	-	8	5	5	5	5	-	-	5
10^{-2}	36	-	-	11	5	5	5	-	-	5
10^{-3}	57	-	-	-	39	7	5	-	-	5
10^{-4}	74	-	-	-	-	27	10	-	-	5
10^{-5}	90	-	-	-	-	-	25	-	-	12
10^{-6}	111	-	-	-	-	-	-	-	-	42

Minimum stress to seal $Q_{min(L)}$ (at assembly), $Q_{Smin(L)}$ (after off-loading) for inner pressure 40 bar										
Tightness class	$Q_{min(L)}$	$Q_{Smin(L)}$, MPa								
mg/(s x m)	MPa	Q_A 10MPa	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}	19	-	15	5	5	5	5	-	-	5
10^{-1}	39	-	-	23	6	5	5	-	-	5
10^{-2}	62	-	-	-	-	9	6	-	-	5
10^{-3}	84	-	-	-	-	-	11	-	-	7
10^{-4}	96	-	-	-	-	-	35	-	-	10
10^{-5}	115	-	-	-	-	-	-	-	-	28
10^{-6}	159	-	-	-	-	-	-	-	-	158

Leakage - ambient temperature / inner pressure = 10 bar



Leakage - ambient temperature / inner pressure = 40 bar