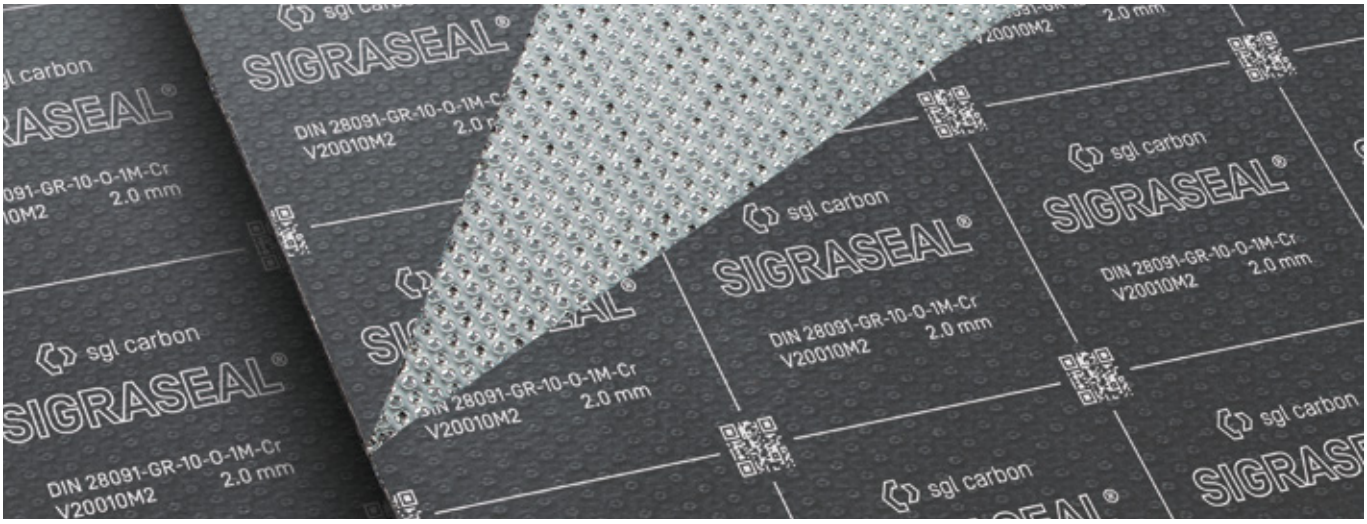
SIGRASEAL®

Flexible graphite foil reinforced with tanged stainless steel



SIGRASEAL is an adhesive-free gasket sheet made of flexible graphite foils reinforced with tanged stainless steel.

Applications

- For all common pipework and vessel flange designs
- For one-piece gasket designs up to an outside diameter of 1500 mm; for diameters above 1500 mm, for example two-layer structures with segmented sections and staggered joints are recommended
- For operating pressures from vacuum up to 100 bar
- For corrosive media
- Operating temperatures range from –269 °C up to 500 °C depending on chemical resistance. Life time might be limited at high temperatures. Consult the manufacturer when application temperatures exceed 400 °C. Please refer to our technical guideline regarding thermal stability.
- Gaskets for the chemical, petrochemical and refinery industries
- Steam pipework in power generation plants and heating equipment
- Existing plants

Properties

- High blow-out resistance and mechanical strength
- High fault tolerance during assembly and operation
- Good chemical resistance
- Long-term stability of compressibility and recovery, even under fluctuating temperatures
- No measurable cold or warm flow characteristics up to the maximum permissible gasket stress
- No aging or embrittlement (no adhesives or binders)
- Asbestos-free (no associated health risks)

Approvals/Test reports

Please see www.sigraflex.com/downloads for details

- BAM oxygen
- FDA and LFGB (SGS Institut Fresenius)

Assembly instructions

Our detailed assembly instructions are available on request.

↑ Cross-section

Material data of SIGRASEAL®

Typical properties		Units	V10010M2	V15010M2	V20010M2	V30010M2
Thickness		mm	1.0	1.5	2.0	3.0
Dimensions		m	1.5 x 1.5	1.5 x 1.5	1.5 x 1.5	1.5 x 1.5
Bulk density of graphite		g/cm³	1.0	1.0	1.0	1.0
Ash content of graphite (DIN 51903)		%	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0
Purity		%	≥ 98	≥ 98	≥ 98	≥ 98
Total chloride content		ppm	≤ 50	≤ 50	≤ 50	≤ 50
Total halogen content (Cl, F, B, I)		ppm	≤ 200	≤ 200	≤ 200	≤ 200
Oxidation rate in air at 670 °C (TGA)		%/h	< 4	< 4	< 4	< 4
Oxidation inhibitor			yes	yes	yes	yes
Passive corrosion inhibitor (ASTM F 2168-13)			yes	yes	yes	yes
Reinforcing steel sheet details				Tanged stainless steel sheet		
	ASTM material number		316L	316L	316L	316L
	Thickness	mm	0.1	0.1	0.1	0.1
	Number of sheets		1	1	1	1
Residual stress (DIN 52913)	$\sigma_{D\ 16\ h,\ 300\,°C,\ 50\ N/mm^2}$	N/mm²	≥ 45	≥ 45	≥ 45	≥ 45
Gasket factors (DIN E 2505 / DIN 28090-1)						
Gasket width	b_D = 20 mm σ_{VU}	N/mm²	20	20	20	20
	m		1.3	1.3	1.3	1.3
	σ_{VO}	N/mm²	200	180	160	120
	$\sigma_{BO\ at\ 300\,°C}$	N/mm²	180	160	140	100
Gasket factors (DIN EN 13555)			see www.esadata.org or www.gasketdata.org			
Compression factors (DIN 28090-2)						
Compressibility	ε_{KSW}	%	35	40	40	40
Recovery at 20 °C	ε_{KRW}	%	4	4	4	4
Hot creep	ε_{WSW}	%	< 4	< 4	< 4	< 4
Recovery at 300 °C	ε_{WRW}	%	4	4	4	4
Young´s modulus at 20 N/mm² (DIN 28090-1)		N/mm²	850	850	850	850
ASTM	„m"-factor		2.5	2.5	2.5	2.5
	„y"-factor	psi	3000	3000	3000	3000
Compressibility (ASTM F36)		%	37	42	42	42
Recovery (ASTM F36)		%	15	14	14	14
The gasket factor conversion formulas as per AD Merkblatt B7 are as follows				$k_0 \times K_D = \sigma_{VU} \times b_D$ $k_1 = m \times b_D$		

Definitions

σ_{VU}	Minimum gasket assembly stress. Recommended gasket assembly stress: ≥ 20 N/mm² bis σ_{BO}
σ_{BU}	Minimum gasket assembly stress in service, where σ_{BU} is the product of internal pressure p_i and gasket factor m for test and in service ($\sigma_{BU} = p_i \times m$)
σ_{VO}	Maximum permissible gasket stress at 20 °C
$\sigma_{BO\ at\ 300\,°C}$	Maximum permissible gasket stress in service
m	$m = \sigma_{BU}/p_i$
„m"-factor	Similar to m, but defined acc. to ASTM, hence different value
„y"-factor	Minimum gasket stress in psi
k_0	in mm, factor for gasket assembly stress
k_1	in mm, factor for gasket stress in service

ε_{KSW}	Compression set under a gasket stress of 35 N/mm²
ε_{KRW}	Gasket recovery after reduction in gasket stress from 35 N/mm² to 1 N/mm²
ε_{WSW}	Gasket creep compression under a gasket stress of 50 N/mm² at 300 °C after 16 h
ε_{WRW}	Recovery after reduction in gasket stress from 50 N/mm² to 1 N/mm²

The percentage changes in thickness of ε_{KSW}, ε_{KRW}, ε_{WSW} und ε_{WRW} are relative to the initial thickness.

Unless stated otherwise, all values are valid at room temperature, typical, non-binding and subject to change. Please note some values correspond to the graphite foil only. For engineering or design purposes please contact our technical sales team.

Additional information on our SIGRAFLEX sealing materials can be found under "Download Center" on our homepage. www.sigraflex.com/downloads

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