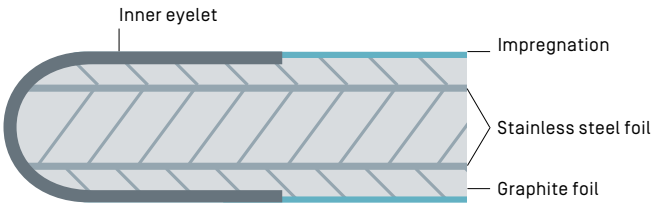
sgl carbon

SIGRAFLEX® SELECT

High-performance gasket with inner eyelet made of SIGRAFLEX flexible graphite foil and flat stainless steel reinforcement

SIGRAFLEX SELECT is a gasket comprised of three SIGRAFLEX flexible graphite foils of various thicknesses reinforced with two 0.05 mm thick stainless steel foils using our proven SIGRAFLEX HOCHDRUCK technology. This gasket has an inner eyelet and is antistick impregnated to reduce leakage and improve handling.



↑ Cross-section

Applications

- For raised-face flanges meeting DIN EN 1514, DIN 2690 and ANSI
- For operating pressures from vacuum up to 100 bar
- For corrosive media
- Operating temperatures range from –269 °C up to 550 °C depending on chemical resistance. Life time might be limited at high temperatures. Consult the manufacturer when application temperatures exceed 450 °C. Please refer to our technical guideline regarding thermal stability.
- Gaskets for the chemical, petrochemical and refinery industries
- Steam pipework in power generation plants
- Heat transfer oils and heating equipment
- Existing plants

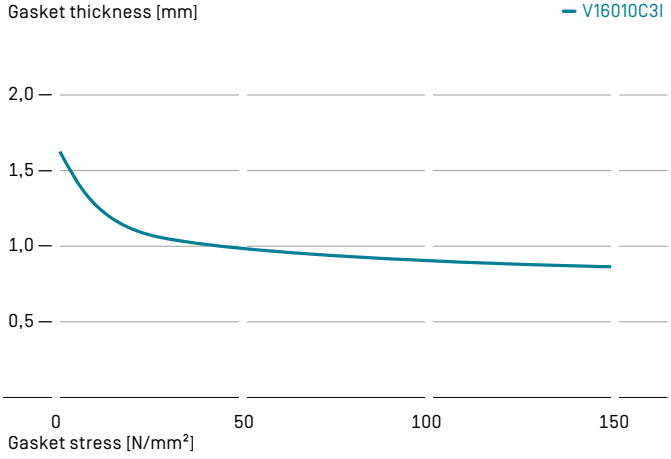
Properties

- Reduction in fugitive emissions due to high leak-tightness
- High operational reliability, increased plant availability
- Excellent oxidation resistance
- 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
- Good scratch resistance and antistick properties due to special impregnation
- 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)

↑ Gaskets made from SIGRAFLEX SELECT

↑ Flange with SIGRAFLEX SELECT gasket

Compressibility of SIGRAFLEX SELECT



Approvals/Test reports

Please see www.sigraflex.com/downloads for details

- TA Luft (VDI 2440/VDI 2200)
- Fire safe according to API 607
- Blow-out safety HOBT (ASTM WK26064)
- BAM oxygen

Assembly instructions

Our detailed assembly instructions are available on request.

Material data of SIGRAFLEX® SELECT

Typical properties		Units	V16010C3I
Thickness		mm	1.6
Bulk density of graphite		g/cm³	1.0
Ash content of graphite (DIN 51903)		%	≤ 2.0
Purity		%	≥ 98
Total chloride content		ppm	≤ 25
Total halogen content (Cl, F, B, I)		ppm	≤ 100
Total sulphur content		ppm	< 300
Oxidation rate in air at 670 °C (TGA)		%/h	< 4
Oxidation inhibitor			yes
Passive corrosion inhibitor (ASTM F 2168-13)			yes
Reinforcing steel sheet details			Smooth stainless steel foil
	ASTM material number		316L
	Thickness	mm	0.05
	Number of sheets		2
Stainless steel inner eyelet, ASTM material number			316 Ti
Residual stress (DIN 52913)	$\sigma_{D\ 16\ h,\ 300\,°C,\ 50\ N/mm^2}$	N/mm²	≥ 47
Gasket factors (DIN E 2505 / DIN 28090-1)			
Gasket width b_D = 20 mm at an internal pressure of			
$\sigma_{VU/0,1}$	10 bar	N/mm²	10
	16 bar	N/mm²	12
	25 bar	N/mm²	15
	40 bar	N/mm²	17
m			1.3
σ_{V0}		N/mm²	160
$\sigma_{B0\ at\ 300\,°C}$		N/mm²	140
Gasket factors (DIN EN 13555)			see www.esadata.org or www.gasketdata.org
Compression factors (DIN 28090-2)			
Compressibility	ε_{KSW}	%	35
Recovery at 20 °C	ε_{KRW}	%	5
Hot creep	ε_{WSW}	%	< 3
Recovery at 300 °C	ε_{WRW}	%	4
Young´s modulus at 20 N/mm² (DIN 28090-1)		N/mm²	750
ASTM	„m"-factor		2
	„y"-factor	psi	2000
Compressibility (ASTM F36)		%	40
Recovery (ASTM F36)		%	15
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

$\sigma_{VU/0,1}$	Minimum gasket assembly stress needed to comply with leakage class L 0.1 (according to DIN 28090-1) Recommended gasket assembly stress: ≥ 20 N/mm² up to σ_{B0}
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_{V0}	Maximum permissible gasket stress at 20 °C
$\sigma_{B0\ at\ 300\,°C}$	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
K_D	in N/mm², max. gasket stress-bearing capacity under assembly conditions
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.

Product overview

Products	Characteristics	Recommended applications
SIGRAFLEX FOIL F.../C/E/Z/APX/APX2®	Flexible, soft, continuous	– 250 °C to approx. 550 °C, for die-formed packing rings, filler material for spiral wound gaskets, facing material for kammprofile and corrugated gaskets
SIGRAFLEX STANDARD L...CI	Unreinforced, impregnated	Raised-face flanges, enamel or glass flanges, highly corrosive media
SIGRAFLEX ECONOMY V...C4	Reinforced with bonded stainless steel foil	Pumps, fittings, gas supply and waste gas pipelines
SIGRAFLEX UNIVERSAL V...C2I	Reinforced with tanged stainless steel, impregnated	Pipework and vessels in the chemical and petrochemical industries and in power generation plants
SIGRAFLEX UNIVERSAL PRO V...C2IP	Reinforced with tanged stainless steel, impregnated	TA Luft applications, for pipework and vessels in the chemical and petrochemical industries and in power generation plants
SIGRAFLEX SELECT V16010C3I	Reinforced with stainless steel foil, adhesive-free, impregnated	TA Luft applications, raised-face flanges, pipework in the chemical and petrochemical industries
SIGRAFLEX HOCHDRUCK V...Z3I	Multilayer material, reinforced with stainless steel foil, adhesive-free, impregnated	Universal sealing sheet, also for solving sealing problems in pipework, process equipment, tongue-and-groove flanges and non-standard joints in the chemical, petrochemical and nuclear industries and in power generation plants
SIGRAFLEX HOCHDRUCK PRO V...Z3IP	Multilayer material, reinforced with stainless steel foil, adhesive-free, impregnated	Universal sealing sheet for TA Luft applications, also for solving sealing problems in pipework, process equipment, tongue-and- groove flanges and non-standard joints in the chemical, petrochemical and nuclear industries and in power generation plants
SIGRAFLEX APX2 HOCHDRUCK V...W3	Multilayer material, reinforced with stainless steel foil, adhesive-free	Universal sealing sheet, also for solving sealing problems in high temperature applications in pipework, process equipment, tongue-and-groove flanges and non-standard joints in the chemical and petrochemical industries and in power generation plants
SIGRAFLEX MF® V...MF	Adhesive-free laminate made of graphite, stainless steel and PTFE	Maximum requirements for sealability (TA Luft), safety and process hygiene; sealed joints in the chemical, petrochemical, pharmaceutical and food industries
SIGRAFLEX EMAIL V...Z3E	Reinforced with stainless steel foil, adhesive-free	PTFE-envelope gaskets for enameled pipework, vessels and stub connections, etc.

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

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