

## SIGRAFLEX® MF®

Three-component gasket made of SIGRAFLEX flexible graphite foil, stainless steel and PTFE for minimum leakage rates, minimum total costs and maximum safety



**SIGRAFLEX MF is a high-quality three-component gasket made of SIGRAFLEX flexible graphite foil, stainless steel and PTFE. SIGRAFLEX MF combines the advantages of the sealing properties of three materials in one product.**

Owing to its SIGRAFLEX flexible graphite foil core, SIGRAFLEX MF displays high long-term stability, and adapts well to uneven flanges.

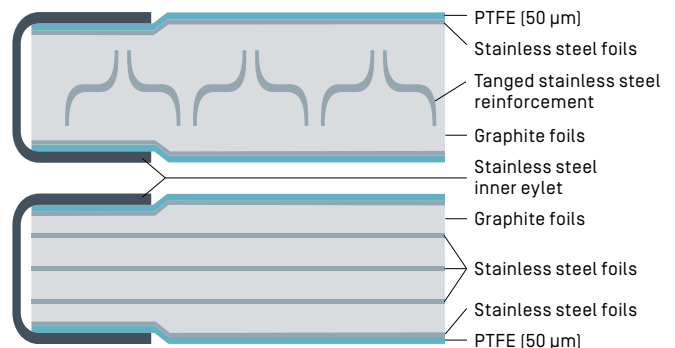
The reinforcing stainless steel sheets ensure the high mechanical strength of the gasket.

Due to the stainless steel/PTFE-foil top layers, SIGRAFLEX MF separates with ease from flanges and leaves no residue. Nothing sticks to the flanges, whether at room temperature or at 300 °C. There is no time-consuming cleaning of the flanges. Maintenance time and the risk of scratching the flange faces reduces significantly. The operator saves time and money with every gasket change.

Moreover, the stainless steel/PTFE-foil top layers together with the inner eyelet, which is applied by various gasket manufacturers for our SIGRAFLEX MF sheet material, provide excellent sealing properties. SIGRAFLEX MF is thus another milestone toward reducing emissions and total costs reliably.

### Applications

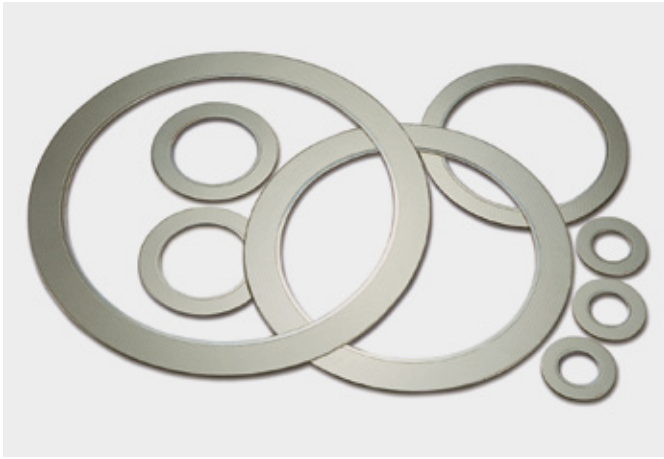
- Maximum requirements in terms of sealability and operational reliability
- In particular for applications involving toxic, inflammable, polluting or high-cost media
- For high demands imposed on process hygiene, e. g. in the pharmaceutical and food industries
- For applications that cannot tolerate sticking of the gasket to the flanges
- Suitable for temperatures ranging from -269 °C (for eyelet material 316 Ti) to 300 °C under consideration of the chemical resistance



↑ Cross-section SIGRAFLEX Z2MF (above) und SIGRAFLEX Z3MF (below)

## Properties

- Excellent sealability, even at low gasket stresses [complies with German Clean Air Act at 10 MPa]
- Savings in cost of ownership [media loss, downtimes, assembly or disassembly cost]
- No sticking to flange surfaces
- Meets high demands on process hygiene/product purity (FDA conformity)
- High blow out resistance and high mechanical strength
- Good chemical resistance
- Long-term stability of compressibility and recovery, even under fluctuating temperatures
- High residual stress even at continuous service temperature of 300 °C
- No aging or embrittlement, owing to absence of adhesives or binders

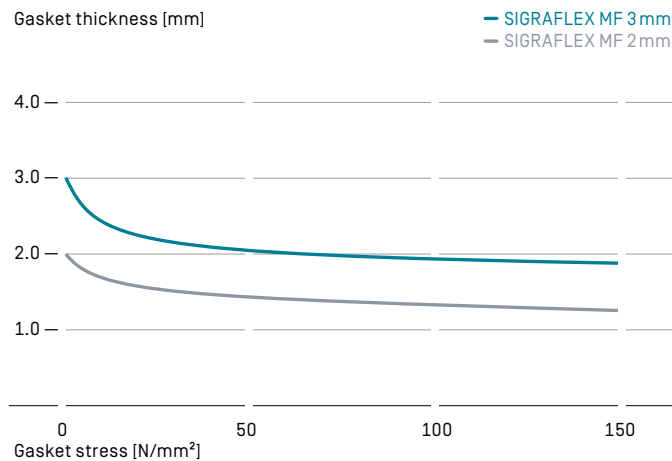


↑ Gaskets made from SIGRAFLEX MF



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## Compressibility of SIGRAFLEX MF



## Approvals/Test reports

Please see [www.sigraflex.com/downloads](http://www.sigraflex.com/downloads) for details

- TA Luft (VDI 2440/VDI 2200) even at 10 MPa
- Fire safety according to BS 6755-2, API 607 or API 6FB
- Blow-out safety HOBt (ASTM WK26064)
- BAM oxygen
- DVGW (DIN 3535-6)
- FDA

## Assembly instructions

Our detailed assembly instructions are available on request.

## Material data of SIGRAFLEX® MF<sup>1)</sup>

Typical properties	Units	SIGRAFLEX Z2MF		SIGRAFLEX Z3MF	
		V20011Z2MF	V30011Z2MF	V20011Z3MF	V30011Z3MF
Thickness	mm	2.0	3.0	2.0	3.0
Bulk density of graphite	g/cm <sup>3</sup>	1.1	1.1	1.1	1.1
Ash content of graphite (DIN 51903)	%	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15
Reinforcing steel		Tanged stainless steel foil		Smooth stainless steel foil	
ASTM material number		316L	316L	316L	316L
Thickness	mm	0.1	0.1	0.05	0.05
Number of steel foils		1	2	3	5
Stainless steel/PTFE top layers		Smooth stainless steel foil		Smooth stainless steel foil	
ASTM material number		316L	316L	316L	316L
Thickness	mm	0.05	0.05	0.05	0.05
Number of steel foils		2	2	2	2
Material		PTFE (DYNEON™ TFM)		PTFE (DYNEON™ TFM)	
Thickness	mm	0.05	0.05	0.05	0.05
Number of PTFE foils		2	2	2	2
Inner eyelet		Choice of gasket manufacturer		Choice of gasket manufacturer	
ASTM material number		e. g. 316 Ti	e. g. 316 Ti	e. g. 316 Ti	e. g. 316 Ti
Residual stress (DIN 52913)	$\sigma_{D 16 h, 300^{\circ} C, 50 N/mm^2}$	N/mm <sup>2</sup>	≥ 48	≥ 48	≥ 48
Gasket factors (DIN EN 13555)		see <a href="http://www.esadata.org">www.esadata.org</a> or <a href="http://www.gasketdata.org">www.gasketdata.org</a>			
Compression factors (DIN 28090-2)					
Compressibility	$\epsilon_{KSW}$	%	30	30	30
Recovery at 20 °C	$\epsilon_{KRW}$	%	5	5	5
Hot creep	$\epsilon_{WSW}$	%	< 3	< 3	< 3
Recovery at 300 °C	$\epsilon_{WRW}$	%	4	4	4
Young's modulus at 20 N/mm <sup>2</sup> (DIN 28090-1)		N/mm <sup>2</sup>	900	900	900
ASTM	„m“-factor		2	2	2
	„y“-factor	psi	1500	1500	1500
Compressibility (ASTM F36)		%	30	30	30
Recovery (ASTM F36)		%	20	20	20

<sup>1)</sup> Material data are typical data for SIGRAFLEX MF gaskets, produced by gasket manufacturers. SGL Carbon is the manufacturer of SIGRAFLEX MF sheet material only.

DYNEON™ pending trademark application of 3M

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](http://www.sigraflex.com/downloads)



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### TDS MF\_Sheet.02

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