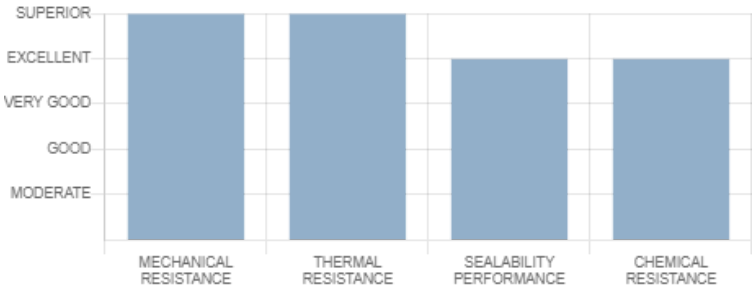
GRAFILIT® EM

GRAFILIT® EM is an expanded graphite-based gasket material endowed with expanded stainless steel reinforcement for high operation pressures, including cycling loading. Uniform surface pressure distribution provides excellent thermomechanical properties and sealing characteristics, and increases blowout resistance. It is particularly suitable for high-temperature applications in the petrochemical industry and steam supply.

PROPERTIES



APPROPRIATE INDUSTRIES & APPLICATIONS

- AUTOMOTIVE AND ENGINE BUILDING INDUSTRIES
- COMPRESSORS & PUMPS
- GENERAL PURPOSE
- HIGH-TEMPERATURE APP.
- PETROCHEMICAL INDUSTRY
- REFRIGERATION & COOLING
- STEAM SUPPLY
- CHEMICAL INDUSTRY
- GAS SUPPLY
- HEATING SYSTEMS
- PAPER & CELLULOSE INDUSTRIES
- POWER PLANT
- SHIPBUILDING
- VALVES

Composition	Expanded natural graphite (>99% purity), expanded stainless steel insert (AISI 316L; 0.15 mm)		
Color	Black		
Approvals and compliances	ABS FIRE SAFE ISO 10497	DNV GL TA Luft (VDI 2440)	DVGW DIN 3535-6
Sheet dimensions	Size (mm): 1000 x 1000 | 1500 x 1500 Thickness (mm): 1.5 | 2.0 | 3.0 Other sizes and thicknesses available on request		

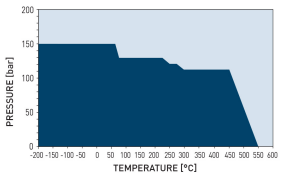
TECHNICAL DATA

Typical values for 1.5 mm thickness

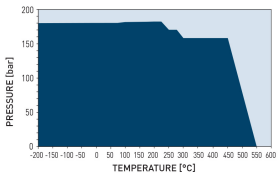
Density	DIN 28090-2	g/cm^3	1.4
Density (plain graphite)	DIN 28090-2	g/cm^3	1.0
Total sulfur content	ASTM D5016	ppm	/
Leachable chloride content	FSA NMG 202	ppm	20
Leachable fluoride content	FSA NMG 203	ppm	20
Leachable halogen content			/
Ash content	DIN 51903	%	≤1
Weight loss (air, 670°C, 4 h)	DIN 28090-2	%/h	<4
Compressibility	ASTM F36A	%	35
Recovery	ASTM F36A	%	20
Tensile strength	ASTM F152		
Longitudinal		MPa	/
Transversal		MPa	/
Residual stress	DIN 52913		
50 MPa, 300°C, 16 h		MPa	49
Specific leak rate	DIN 3535-6	mg/(s·m)	<0.02
Thickness increase	ASTM F146		
Oil IRM 903, 150°C, 5 h		%	/
ASTM Fuel B, 23°C, 5 h		%	/
Compression modulus	DIN 28090-2		
At room temperature: ε_{KSW}		%	32
At elevated temperature: $\varepsilon_{WSW/300°C}$		%	2.5
Creep relaxation	DIN 28090-2		
At room temperature: ε_{KRW}		%	4.5
At elevated temperature: $\varepsilon_{WRW/300°C}$		%	3.5
Operating conditions			
Minimum temperature		°C/°F	-200/-328
Maximum continuous temperature			
– under oxidizing atmosphere		°C/°F	550/1022
– under reducing or inert atmosphere		°C/°F	700/1292
Maximum pressure		bar/psi	150/2175

P-T diagrams EN 1514-1, Type IBC, PN 40, DIN 28091-2 / 3.8, 1.5 mm

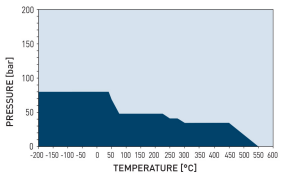
Steam or gasses



Liquids



Aggressive gasses



P-T diagrams indicate the maximum permissible combination of internal pressure and service temperature which can be simultaneously applied to a given gaskets thickness, size and tightness class. Given the wide variety of gasket applications and service conditions, these values should only be regarded as a guidance for the proper gasket assembly. In general, thinner gaskets exhibit better P-T properties.

- General suitability - Under common installation practices and chemical compatibility
- Conditional suitability - Appropriate measures ensure maximum performance for joint design and gasket installation. Technical consultation is recommended
- Limited suitability - Technical consultation is mandatory.

CHEMICAL RESISTANCE CHART

The recommendations made here are intended as a guideline for the selection of a suitable gasket type. As the function and durability of products are dependent upon a number of factors, the data may not be used to support any warranty claims. If there are specific type-approval regulations, these have to be complied with.

Legend: + Recommended ○ Recommendation depends on operating conditions, − Not recommended

Acetamide	○	Calcium chloride	○	Freon-12 (R-12)	+	Motor oil	+	Sodium bisulfite	+
Acetic acid, 100% (Glacial)	+	Calcium hydroxide	+	Freon-134a (R-134a)	+	Naphtha	+	Sodium carbonate	+
Acetic acid, 10%	○	Carbon monoxide (gas)	+	Freon-22 (R-22)	+	Nitric acid, 10%	+	Sodium chloride	+
Acetone	+	Carbon dioxide (gas)	+	Fruit juices	+	Nitric acid, 65%	○	Sodium cyanide	+
Acetonitrile	+	Cellosolve	+	Fuel oil	+	Nitrobenzene	+	Sodium hydroxide	+
Acetylene (gas)	+	Chlorine (gas)	○	Gasoline	+	Nitrogen (Gas)	+	Sodium hypochlorite (Bleach)	−
Acid chlorides	○	Chlorine (in water)	○	Gelatin	+	Nitrous gases (NOx)	○	Sodium silicate (Water glass)	+
Acrylic acid	+	Chlorobenzene	+	Glycerine (Glycerol)	+	Octane	+	Sodium sulfate	+
Acrylonitrile	+	Chloroform	+	Glycols	+	Oils (Essential)	+	Sodium sulfide	○
Adipic acid	+	Chloroprene	+	Helium (gas)	+	Oils (Vegetable)	+	Starch	+
Air (gas)	+	Chlorosilanes	○	Heptane	+	Oleic acid	+	Steam	+
Alcohols	+	Chromic acid	−	Hydraulic oil (Mineral)	+	Oleum (Sulfuric acid, fuming)	−	Stearic acid	+
Aldehydes	+	Citric acid	○	Hydraulic oil (Phosphate ester-based)	+	Oxalic acid	○	Styrene	+
Alum	○	Copper acetate	+	Hydraulic oil (Glycol based)	+	Oxygen (gas)	+	Sugars	+
Aluminium acetate	○	Copper sulfate	+	Hydrazine	+	Palmitic acid	+	Sulfur	○
Aluminium chlorate	○	Creosote	+	Hydrocarbons	+	Paraffin oil	+	Sulfur dioxide (Gas)	○
Aluminium chloride	−	Cresols (Cresylic acid)	+	Hydrochloric acid, 10%	○	Pentane	+	Sulfuric acid, 20%	○
Aluminium sulfate	+	Cyclohexane	+	Hydrochloric acid, 37%	○	Perchloroethylene	+	Sulfuric acid, 98%	−
Amines	+	Cyclohexanol	+	Hydrofluoric acid, 10%	−	Petroleum (Crude oil)	+	Sulfuryl chloride	−
Ammonia (Gas)	+	Cyclohexanone	+	Hydrofluoric acid, 48%	−	Phenol (Carbolic acid)	+	Tar	+
Ammonium bicarbonate	+	Decalin	+	Hydrogen (gas)	+	Phosphoric acid, 40%	−	Tartaric acid	○
Ammonium chloride	○	Dextrin	+	Iron sulfate	+	Phosphoric acid, 85%	−	Tetrahydrofuran (THF)	+
Ammonium hydroxide	+	Dibenzyl ether	+	Isobutane (Gas)	+	Phthalic acid	+	Titanium tetrachloride	−
Amyl acetate	+	Dibutyl phthalate	+	Isooctane	+	Potassium acetate	+	Toluene	+
Anhydrides	+	Dimethylacetamide (DMA)	+	Isoprene	+	Potassium bicarbonate	+	2,4-Toluenediisocyanate	+
Aniline	+	Dimethylformamide (DMF)	+	Isopropyl alcohol (Isopropanol)	+	Potassium carbonate	+	Transformer oil (Mineral type)	+
Anisole	+	Dioxane	+	Kerosene	+	Potassium chloride	+	Trichloroethylene	+
Argon (gas)	+	Diphyl (Dowtherm A)	+	Ketones	+	Potassium cyanide	+	Vinegar	+
Asphalt	+	Esters	+	Lactic acid	○	Potassium dichromate	−	Vinyl chloride (gas)	+
Barium chloride	○	Ethane (Gas)	+	Lead acetate	+	Potassium hydroxide	+	Vinylidene chloride	+
Benzaldehyde	+	Ethers	+	Lead arsenate	+	Potassium iodide	+	Water	+
Benzene	+	Ethyl acetate	+	Magnesium sulfate	+	Potassium nitrate	+	White spirits	+
Benzoic acid	+	Ethyl alcohol (Ethanol)	+	Maleic acid	+	Potassium permanganate	○	Xylenes	+
Bio-diesel	+	Ethyl cellulose	+	Malic acid	○	Propane (gas)	+	Xylenol	+
Bio-ethanol	+	Ethyl chloride (gas)	+	Methane (Gas)	+	Propylene (gas)	+	Zinc sulfate	+
Black liquor	○	Ethylene (gas)	+	Methyl alcohol (Methanol)	+	Pyridine	+		
Borax	+	Ethylene glycol	+	Methyl chloride (Gas)	+	Salicylic acid	+		
Boric acid	+	Formaldehyde (Formalin)	+	Methylene dichloride	+	Seawater/brine	○		
Butadiene (gas)	+	Formamide	+	Methyl ethyl ketone (MEK)	+	Silicones (oil/grease)	+		
Butane (gas)	+	Formic acid, 10%	○	N-Methyl-pyrrolidone (NMP)	+	Soaps	+		
Butyl alcohol (Butanol)	+	Formic acid, 85%	○	Milk	+	Sodium aluminate	+		
Butyric acid	+	Formic acid, 100%	○	Mineral oil type ASTM 1	+	Sodium bicarbonate	+		

All information and data quoted are based upon decades of experience in the production and operation of sealing elements. This data may not be used to support any warranty claims. With its publication this latest edition supersedes all previous issues and is subject to change without further notice.

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