Material – Gasket materials

Description

The products in the portfolio of Badotherm is assembled with the greatest care. Some products have gaskets in them to ensure a leak tight connection between the assembled parts. Some gaskets are seen as a wetted part, a part that comes in contact with the process. This datasheet gives more detail on the materials that are used, and the pro's and con's of the materials. Furthermore there is a short selection on chemical compatibility of the materials.

Flat gaskets

Flat gaskets in the Badotherm products are used in diaphragm seal assemblies such as the US, USL, and USM series, but in other products such as valves as well. Badotherm has a broad selection of gasket materials. The most common gaskets that can be selected are the virgin PTFE, Garfite-N, Graphite gaskets. There are metal gaskets or a combination of materials as well such as the camprofile gasket and copper gaskets.

Virgin PTFE

Virgin PTFE is physiologically inert and may be used in direct contact with food (FDA). The material excels because of its wide temperature range and good resistance. The unique combination of material properties make our PTFE products applicable in the food industry, (petro) chemical industry and machinery and equipment industry.

Typical gaskets: diaphragm seal gasket or valve spindle gasket

Material	Operating temperature
Virgin PTFE	-200 / +260°C

Garfite N

Garfite N contains a unique blend of aramid fibers, fillers and a nitrile binder. It is heat and oxidation resistant and excels in intense heat, high pressure, saturated steam and hot oils. The unique manufacturing process minimizes cold flow and creep relaxation problems. It is ideal in multiple applications in power generation, chemical processing, hydrocarbon processing, and other industries.

Typical gaskets: diaphragm seal gasket

Material	Operating temperature
Garfite N	-75 / +343°C

Camprofile

Camprofil is composed of a grooved metal core with a layer of graphite or other composition sheet material on both sides. They are ideal for standard pipeline and heat exchanger applications. Camprofile gaskets have excellent compression and recovery characteristics, maintaining joint tightness under pressure and temperature fluctuations, temperature differential across the flange face, flange rotation, bolt stress relaxation, and creep. The sealing core is faced with soft material such as flexible graphite and handles pressures from vacuum to Class 2500 and temperatures to 500°C.

Typical gaskets: diaphragm seal gaskets

Material	Operating temperature
Camprofile	-200 / +500°C

Copper gaskets

Copper gaskets are commonly used as a metal gasket for leak tight connection in assemblies. Copper is a soft material so can be deformed easily in a threaded connection and forms itself in the connection. Due to the fact that it is metal it has a high resistance to temperature and pressure.

Typical gaskets: threaded seal assemblies

Stainless steel gaskets

Areas where the gaskets come in contact with the process the use of process compatible gaskets is required. Most assemblies are made in AISI316(L) material. A matching gasket is selected automatically.

Typical gaskets: threaded seal assemblies, valves.

O-ring and molded gaskets

NBR rubber

Nitrile, Buna-N or NBR rubber is a widely used elastomer. It has excellent oil & fuel resistant properties. Nitrile compounds are superior to most elastomers with regard to compression set, tear, and abrasion resistance. Nitrile compounds do not possess good resistance to ozone, sunlight, or weather.

NBR performs well in: Petroleum oils & fuels, Silicon greases & fluids, Ethylene glycol, dilute acids and water (<100°C).

NBR performs not well in: Aromatic hydrocarbons, halogen derivates, ketones, phosphate ester hydraulic fluids, strong acids.

Typical gaskets: window gasket, fill plug, connection gasket, blow out rubber, process flange gaskets.

Material	Operating temperature
NBR rubber	-40 / +108°C

HNBR rubber

Hydrogenated Nitrile is the enhanced version of NBR. HNBR is compared to NBR a rather new developed compound. It is developed to meet higher temperatures than standard NBR while retaining resistance to petroleum based oils. HNBR fills the gap left between NBR, EPDM and FKM elastomers where high temperature conditions require high tensile strength while maintaining excellent resistance.

HNBR performs well in: Automotive applications, oil field applications, sour gas, amine/oil mixtures, oxidized fuels, and lubricating oils.

EPDM performs not well in: Esters, ethers, hydrocarbons (chlorinated) and ketones.

Typical gaskets: fill plug for filled pressure gauges

Material	Operating temperature
HNBR rubber	-30 / +150°C

EPDM rubber

Ethylene Propylene is copolymer of ethylene, propylene and diene monomer. Because of this composition it has an outstanding resistance to phosphate ester type of hydraulic fluids. It has also a good resistance to weathering thanks t the saturation within its chemical backbone.

EPDM performs well in: Alcohols, dilute acids & dilute alkalis, ketones, silicone oils & greases, steam, and water

EPDM performs not well in: aliphatic & aromatic hydrocarbon, di-ester based lubricants, halogenated solvents, and petroleum oils. Aromatic hydrocarbons, halogen derivates, ketones, phosphate ester hydraulic fluids, strong acids.

Typical gaskets: window gasket, fill plug, connection gasket, blow out rubber, process flange gaskets.

Material	Operating temperature
EPDM rubber	-55 / +150°C

FKM rubber

FKM, also known as Viton® is a fluorocarbon type of material. Due to its wide range of chemical compatibility, temperature range, low compression set, and excellent aging characteristics, fluorocarbon rubber is the most significant fluorocarbon elastomers.

FKM performs well in: Acids, Gasoline (alcohol blends), hard vacuum applications, petroleum products, silicone greases and fluids and solvents.

FKM performs not well in: amines, hot chlorosulfonic acid, hot hydrofluoric acid, hydrocarbons, ketones, and low molecular weight esters.

Typical gaskets: process flanges, accessories.

Material	Operating temperature
FKM rubber	-25 / +204°C

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