

What Are the Advantages of Flexible Graphite Gaskets?

There are advantages to using flexible graphite for gaskets over materials like rubber, metal alloys and PTFE(Teflon). Though each listed has its place in industrial applications, flexible graphite is unique in its characteristics thus providing advantages for industrial usage. The origin of flexible graphite goes back to the 1960's when Union Carbide Corporation first developed it. Over the years, this temperature and chemically resistant material has been used to advance industries and make better products and systems. With a strong history of development and applications, the following advantages that flexible graphite brings over other materials are listed for your consideration:

- **Superior Temperature Resistance:** Flexible graphite withstands high temperatures, up to 850°F (454°C) depending on the specific material composition. This makes them ideal for applications involving hot fluids, steam, and combustion processes compared to materials like rubber which have lower temperature tolerances.
- **Great Chemical Compatibility:** Gaskets out of flexible graphite resist chemicals like acids, alkali, solvents, and oils. This versatile characteristic allows them to be used by chemical processing plants, refineries, and industrial settings where gaskets might encounter harsh chemicals.
- **Excellent Sealing Qualities:** Flexible graphite is pliable and conforms to shapes. Flexibility allows it to fill surface irregularities and create a tight seal. It seals areas like flanges with uneven surfaces or applications that require a low bolt torque.
- **Low Creep Relaxation:** Maintaining its shape and sealing properties over extended periods, even under high temperatures and pressures. With minimal creep relaxation, it ensures long-lasting performance and reduces the need for frequent gasket replacements.
- **Fire Resistant:** Where potential conditions of fire hazards exist, flexible graphite is fire-resistant. It is a safer choice compared to materials like rubber or cork in fire hazard conditions.
- **Ease of Use:** These gaskets are relatively easy to install and can be cut into various shapes to fit specific flange configurations.
- **Manufacturability:** There are numerous methods available to manufacture flexible graphite parts and components like laser cutting, CNC machining, waterjet, die-cutting, and digital knife cutting. Each technology will have its own industries and applications that the selected technology is best used for.

Comparison of flexible graphite to other materials used for gaskets:

- **Rubber:** While offering good elasticity, rubber has a lower temperature limit and degrades over time.
- **Metal Gaskets:** Although strong and durable, metal gaskets require higher bolt load torque and are not as conformable.

- **PTFE (Teflon):** PTFE offers excellent chemical resistance but has limited temperature tolerance and can creep under pressure.

Custom graphite gaskets provide a compelling combination of high-temperature resistance, chemical compatibility, excellent sealing capabilities, and long-lasting performance. These advantages make them a preferred choice for various demanding industrial applications, but final determination of what material will be best for any application requires research and communication with professionals in those industries. This can also direct the best manufacturing method to use for the selected material. There are always multiple manufacturing options to choose from and focusing on the application and environment that the graphite seals and gaskets will be subjected to will help guide in the best material choice.

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