



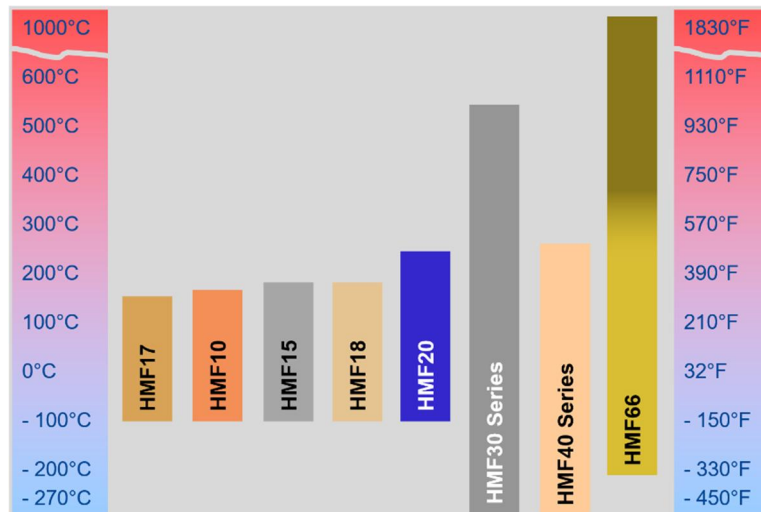
FlatSeal™ Guide 2

Choice of Sealing Material

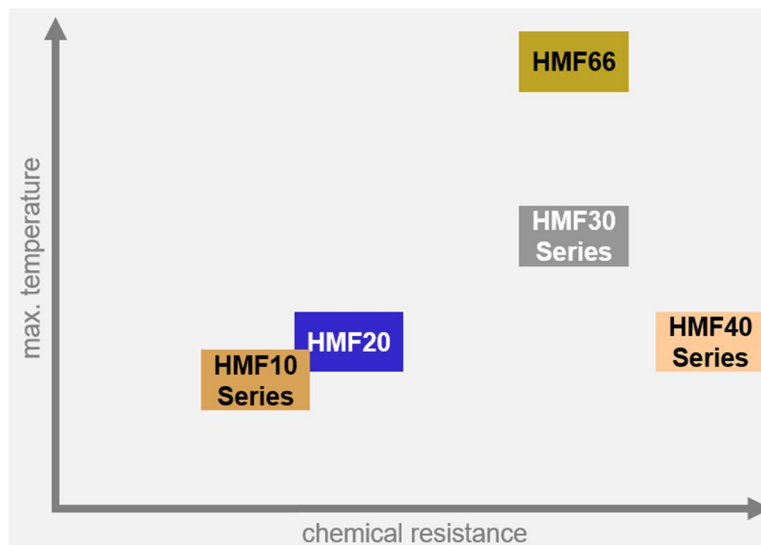
This FlatSeal™ Guide provides simple step-by-step instructions to help choose the correct flat gasket material for different application conditions.

Sealing Materials Overview

- HMF10 Series Elastomer bonded fiber gaskets
- HMF20 Fiber-reinforced graphite gaskets
- HMF30 Series Graphite gaskets reinforced with stainless steel expanded metal inserts
- HMF40 Series Filled or expanded PTFE gaskets
- HMF66 High-temperature gaskets based on high-quality phlogopite mica



Overview of temperature ranges for FlatSeal™ materials



Max application temperature vs. chemical resistance

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Choice of Sealing Material

Step 1: What media need to be sealed against?

The sealing material must be chemically resistant to the media being sealed. As a rough guide:

- For extremely aggressive acids and alkalis:** HMF40 Series.
- For aggressive acids and alkalis:** HMF30 Series. If the housing or pipeline is made of normal steel or stainless steel, seals made from the HMF30 Series can generally be used without any problems. HMF31 and HMF36 are in accordance with TA Luft (German Clean Air Act) and should be preferred. HMF38 is recommended for thin or filigree seal geometries.
- For light acids and alkalis or less aggressive media, e.g., gas, oil, fuel, refrigerants:** HMF10 Series or HMF20. HMF17 and HMF18 are extremely high-performance materials and therefore should be preferred.



Step 2: What is the maximum temperature within the sealing system?

The temperature range of the application must be clarified. For example:

- Up to approx. +150 °C / +300 °F:** All HMF10 Series materials can generally be used.
- For steam or hot oil applications:** The HMF30 Series should generally be used for temperatures above +150 °C / +300 °F. HMF20 can be used up to a maximum temperature of +250 °C / +480 °F.
- For extremely hot applications:** for temperatures up to a maximum of +1000 °C / +1830 °F (e.g., exhaust gas), use HMF66. Ideal application temperatures start from +400 °C / +750 °F. HMF66 requires elevated temperatures to achieve best sealing performance.



Step 3: What pressures need to be sealed against?

The maximum allowable internal pressure depends exclusively on the amount of applied surface pressure. Applied surface pressure largely depends on the flange, bolts and gasket geometry, and less on the gasket material itself. The gasket material only needs to be able to withstand the surface pressure required to maintain internal pressure. Pressure-temperature diagrams show typical pressure ranges and not the physical limits of the gasket materials with regards to maximum permissible internal pressure.



Step 4: Special features of some gasket materials

For applications with low surface pressures, HMF17 is by far the most adaptable fiber gasket material and is suited to seals for applications such as: gearboxes, housings, lids and low bending stiffness constructions. It is suitable for gas, water and food applications, with an unprecedented ratio of adaptability (compression) and (cross-sectional) tightness.

HMF30 Series materials offer excellent adaptability and resist increased temperatures and load cycles, making them ideal for steam, hot water and hot oils (such as heat transfer oils).



Choice of Sealing Material

Gasket Installation

To ensure the best sealing performance, assembly must be carried out correctly. Parallel sealing surfaces being clean and free of sealing residue, grease and oil is just as important as the homogeneous distribution of surface pressure. - e.g., by tightening the bolts in several steps according to the tightening torque specification. Please refer to FlatSeal™ Guide 3 for more information.



FlatSeal™ Selector

The Trelleborg FlatSeal™ Selector helps to find chemically and thermally resistant sealing materials that are compatible with the media within your application. You can perform simple calculations for important properties, such as the expected installation surface pressure or tightening torque, making it easy to estimate the basic suitability of a sealing system.



Further Information

Other FlatSeal™ Guides deal with the following basic topics:

FlatSeal™ Guide 1 – Fundamentals of Flat Gasket Technology

FlatSeal™ Guide 2 – Choice of Sealing Material

FlatSeal™ Guide 3 – Installation Instructions

FlatSeal™ Guide 4 – Optimized Gasket Geometry

FlatSeal™ Guide 5 – Lubrication of Bolts

FlatSeal™ Guide 6 – Roughness of Sealing Surfaces

FlatSeal™ Guide 7 – Service Life of Sealing Systems

FlatSeal™ Guide 8 – Shelf Life of Sealing Materials

FlatSeal™ Guide 9 – Tolerances Cut Parts

FlatSeal™ Guide 10 – Temperature Test

