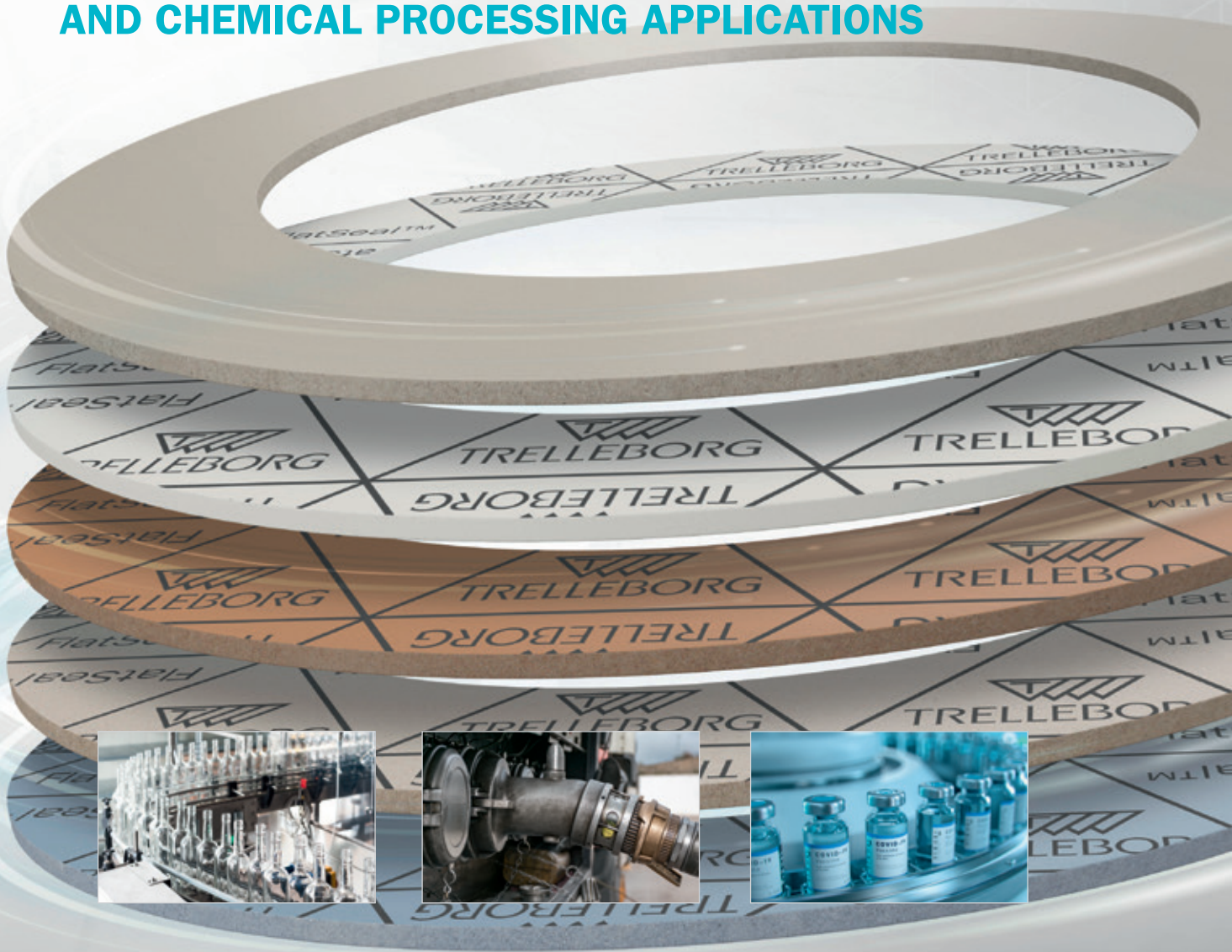




# FlatSeal™ HIVIF40 Series

**SUPERIOR PERFORMANCE IN FOOD  
AND CHEMICAL PROCESSING APPLICATIONS**



# PTFE Based Flat Gaskets

**Demonstrating universal chemical compatibility, the FlatSeal™ HMF40 series of gaskets, offers outstanding sealing performance to ensure safety and optimize the efficiency of processing equipment.**

In a variety of industries and critical applications, flat gaskets provide a static seal between two flat sealing surfaces. In flanges they connect valves, fittings, pipes, and pumps, where they are often subjected to aggressive media. To be effective, gaskets must be able to form a tight seal and have the strength to withstand challenging operating environments.

The FlatSeal™ HMF40 series is a range of polytetrafluoroethylene (PTFE) based flat gaskets, specially engineered for superior sealing performance with the widest range of media. The innovative mix of PTFE and special functional fillers gives each gasket material a unique performance profile. Alongside chemical compatibility, HMF40 materials are suitable for use in operating environments with very low to high temperatures and extreme pressures.

## **Satisfies regulatory requirements for numerous industries**

Compliance with regulatory requirements is paramount in many industries, from aerospace and chemical processing to food and beverage and pharmaceutical equipment. Trelleborg FlatSeal™ HMF40 gaskets are engineered to comply with food contact material regulations and fugitive emissions and blowout requirements.

## **Applications**

- Food and beverage processing
- Pharmaceutical equipment
- Chemical and petrochemical processing
- Chemical transportation applications, such as tank cars
- Low temperature aerospace applications
- Paper manufacturing

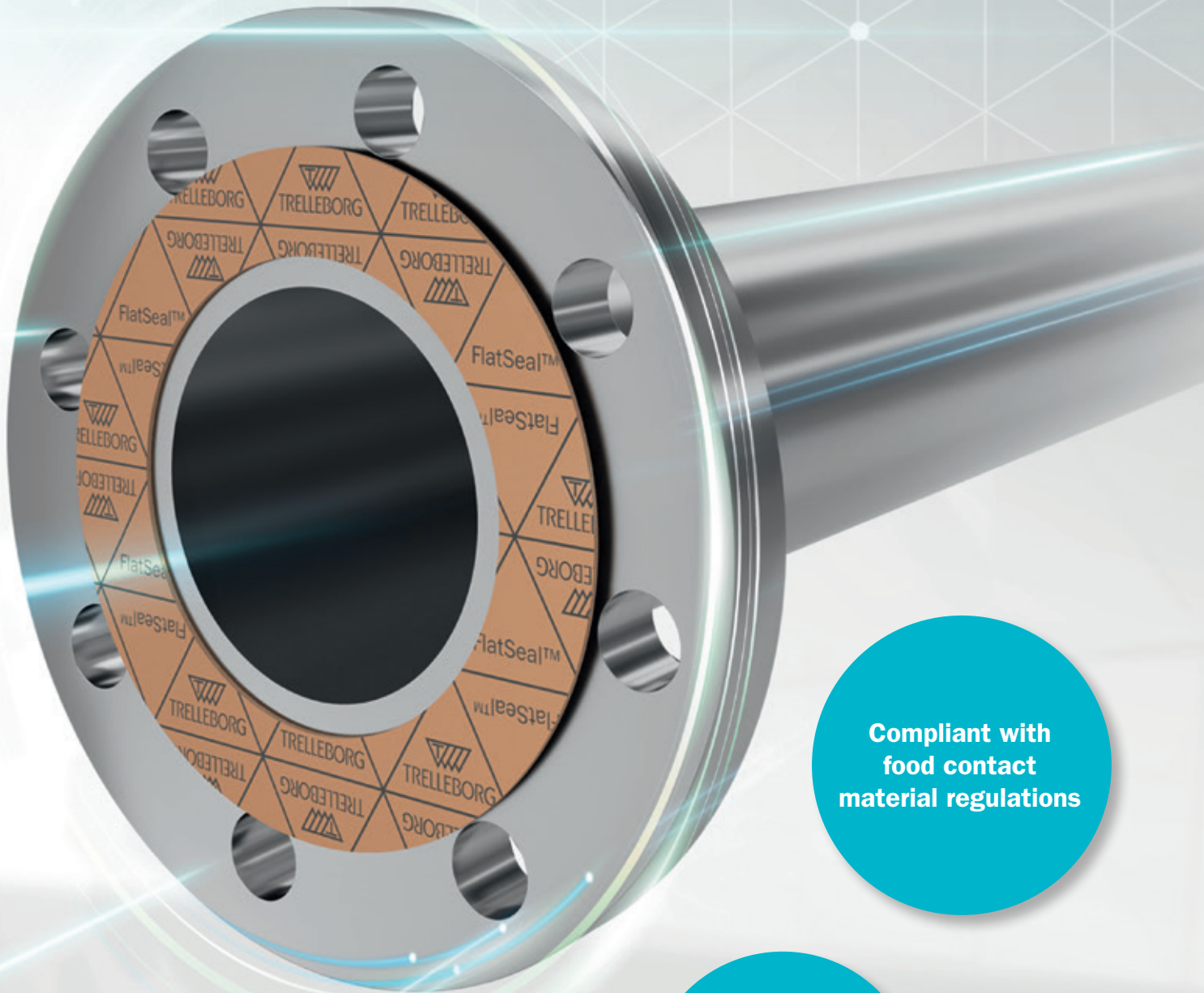
## **Features and benefits**

- Suitable for operating environments with temperatures from -270 °C / -454 °F to +260 °C / +500 °F
- Compatible with the widest range of media including aggressive acids, alkalis and solvents
- Satisfies leakage limits specified in DIN 3535-6
- Blowout resistant
- Excellent low creep properties
- Unlimited shelf life
- Meets TA Luft (Technical Instructions on Air Quality Control) fugitive emissions requirements
- Compliant with food contact material regulations FDA CFR 21 § 177.1550, EC 1935/2004 and Chinese GB

## **Ensuring the highest quality every step of the way**

Using a state-of-the-art process, HMF FlatSeal™ gaskets are manufactured with the highest quality raw materials. Every batch of material must match precise specifications and is subject to rigorous inspection to ensure that only approved materials are used in production.

To guarantee consistent high quality at all steps, a process control system monitors and controls the preparation of formulations, their blending operation, and the process that forms the material sheet from which an HMF FlatSeal™ is formed.



**Compliant with  
food contact  
material regulations**

**Maximum  
sealing  
performance**

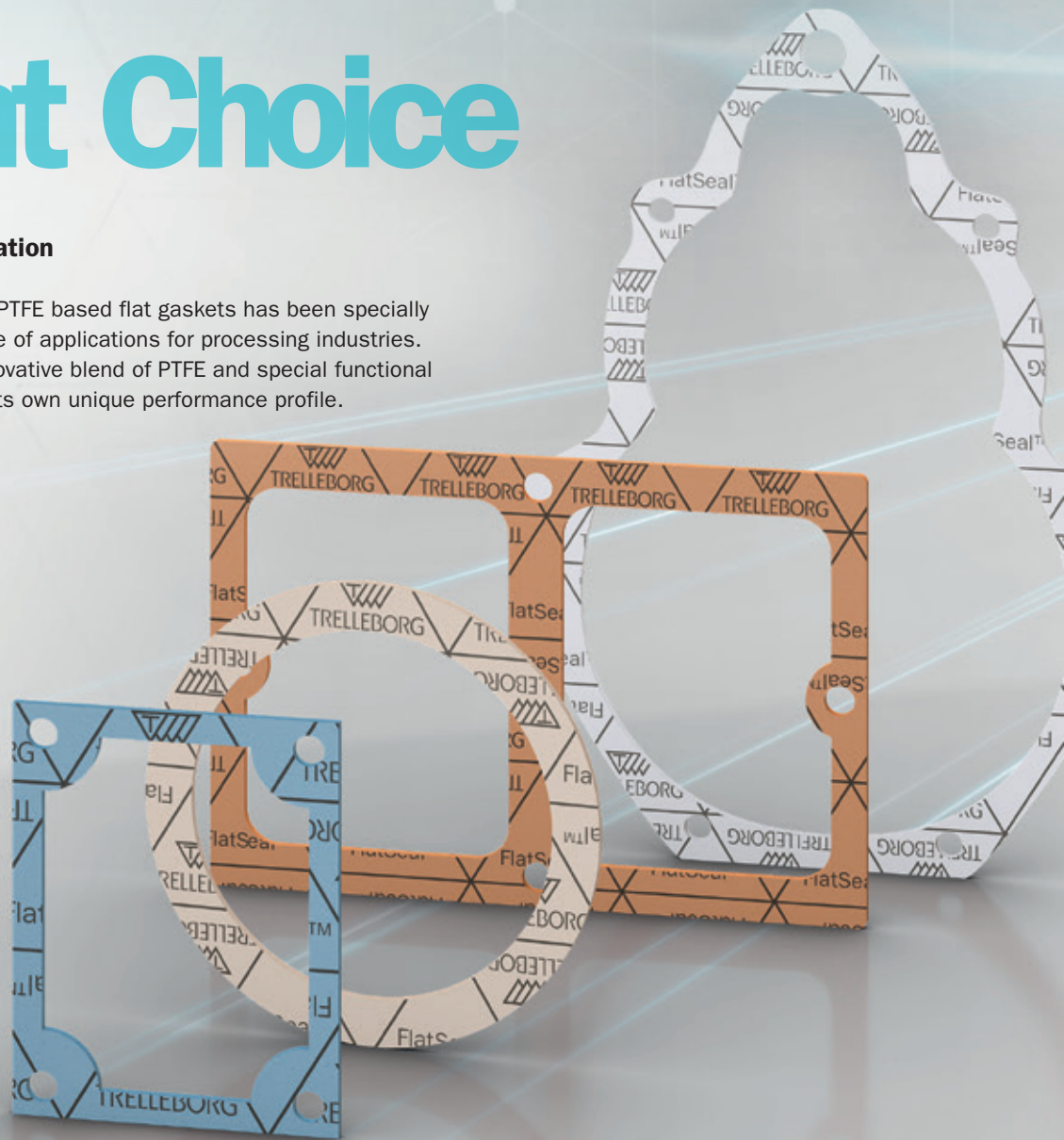
**Excellent  
low creep  
properties**

**Universal  
chemical  
compatibility**

# The Right Choice

## A Solution for Every Application

The FlatSeal™ HMF40 series of PTFE based flat gaskets has been specially engineered for use in a full range of applications for processing industries. Each material is made of an innovative blend of PTFE and special functional fillers, giving each composition its own unique performance profile.



### Contact your Customer Solution Center

Does your application require resistance to aggressive chemicals? Or is the operating environment of your application especially challenging? Reach out to your local Trelleborg Sealing Solutions Customer Solution Center for support with FlatSeal™ selection to meet your specific requirements.

[www.trelleborg.com/seals/csc](http://www.trelleborg.com/seals/csc)



### Operating Environment Recommendations

The temperature and pressure recommendations in the graphs apply to gaskets 2.0 mm / 0.08 inch thick that are used with raised face flanges. Higher stresses are possible when thinner gaskets are used. The recommendations are based on material characteristics and installation conditions.

The information provided should therefore be considered cautious estimates rather than specific operational limits. Please contact your local Customer Solution Center to verify that this material is suitable for the operating environment in your application.

\* Other media refers to other media commonly used in gasket applications that is not chemically critical.

# The FlatSeal™ HMF 40 Series

## FlatSeal™ HMF41



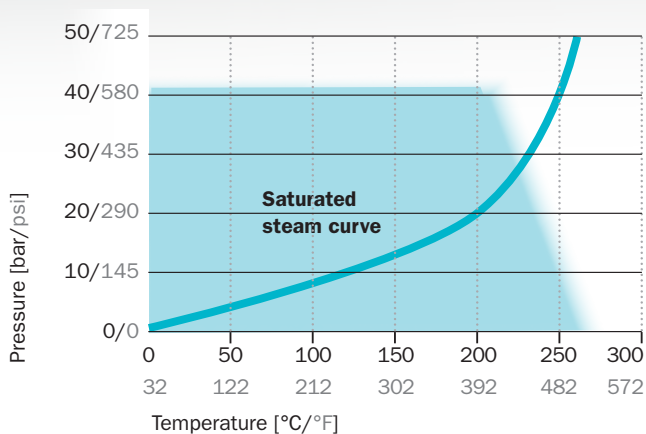
### Enhanced flexibility for stress sensitive flanges

The innovative combination of modified PTFE and hollow glass microspheres, makes FlatSeal™ HMF41 uniquely flexible, giving it the ability to adapt to flange surfaces. This facilitates effective sealing performance on uneven or moderately damaged surfaces and makes it suitable for applications sensitive to stress, such as glass, ceramic and fiber reinforced plastic (FRP) flanges.

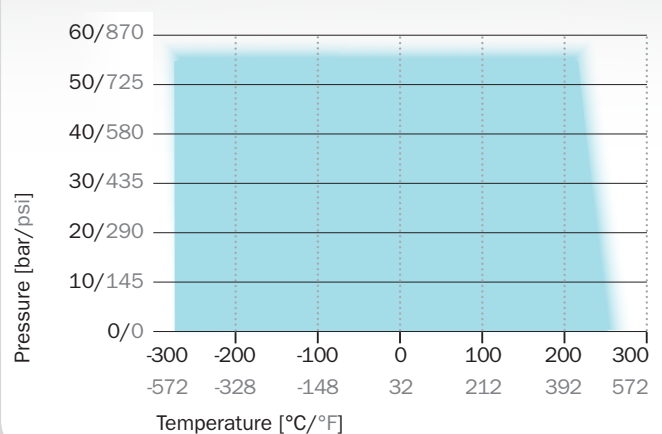
Demonstrating outstanding media resistance, FlatSeal™ HMF41 is ideal for use in the chemical industry, including processing equipment and chemical transportation applications, such as tank cars.

**Advantages:** Flexible material – Ideal for chemical transportation applications

**Water/water vapor**



**Other media\***



**FlatSeal™ HMF42**



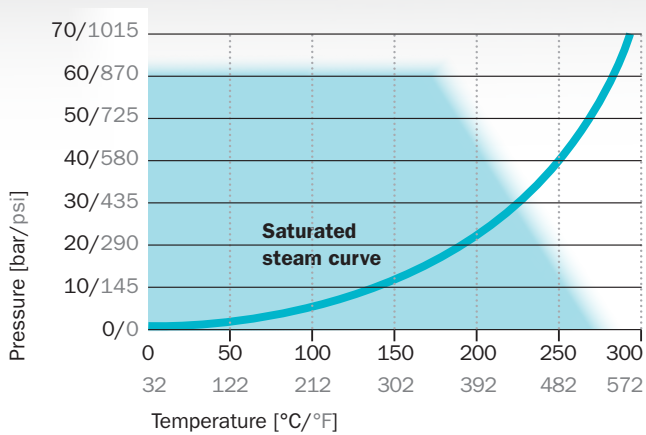
**High mechanical strength for aggressive alkalis**

Due to its special blend of modified PTFE and barium sulphate, FlatSeal™ HMF42 offers superior sealing performance in applications containing harsh alkalis. The high purity material demonstrates excellent low creep properties, high mechanical strength and the ability to withstand pressures, ranging from vacuum to 83 bar / 1204 psi.

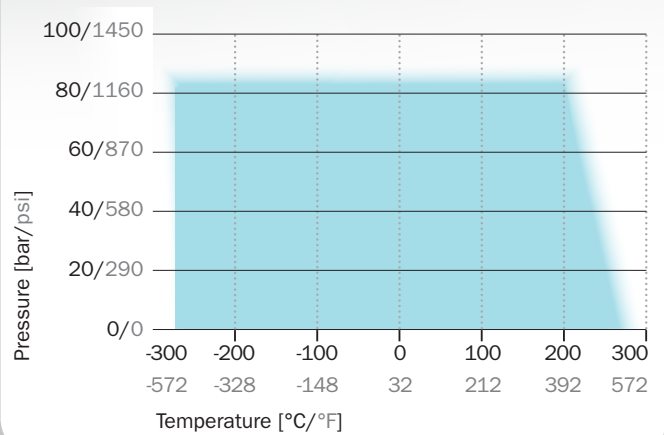
The high purity of the gasket material makes HMF42 the ideal solution for the food processing and pharmaceutical industries.

**Advantages:** Very robust – Compatible with strong alkalis – High purity properties

**Water/water vapor**



**Other media\***



**FlatSeal™ HMF43**



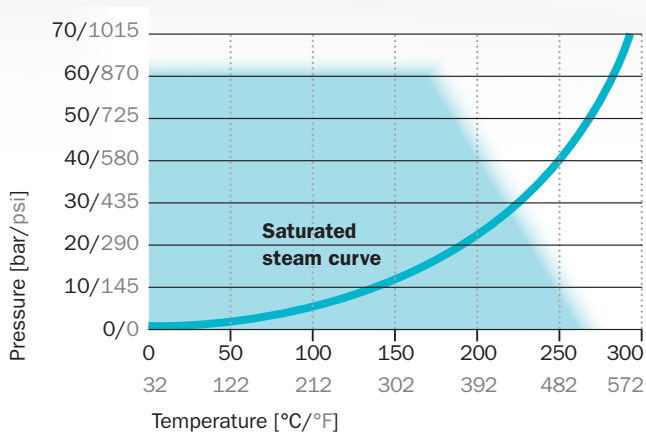
**Robust gasket for high temperature applications**

FlatSeal™ HMF43 combines superior chemical compatibility with excellent low creep properties, making it ideal for use in a wide range of applications in the chemical and petrochemical industries.

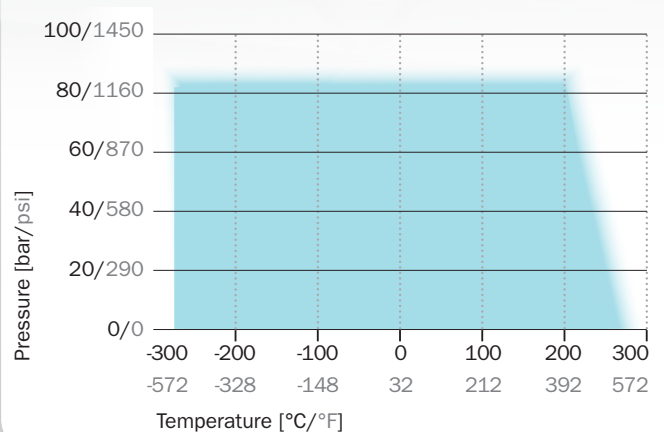
The combination of modified PTFE and silica gives the flat gasket high mechanical strength, making it able to withstand a wide range of temperatures and pressures, from vacuum to 83 bar / 1204 psi. In addition, it is uniquely compatible with concentrated acids, except for hydrofluorides.

**Advantages:** Excellent all-around solution – Withstands high temperatures - Compatible with aggressive acids

**Water/water vapor**



**Other media\***



**FlatSeal™ HMF45**



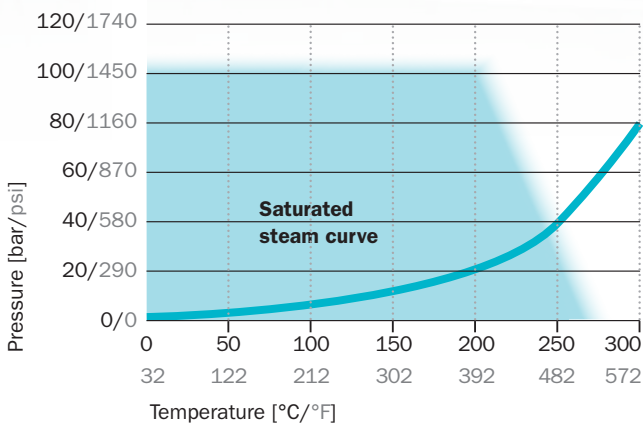
**Expanded PTFE offers unique properties**

Utilizing advanced processing technology, FlatSeal™ HMF45 is made using high purity, multidirectional, expanded PTFE. During the expansion process, the structure of the PTFE material becomes highly cross-linked and oriented in many directions, resulting in a robust material with high compression properties, which provide good adaptability to flange unevenness.

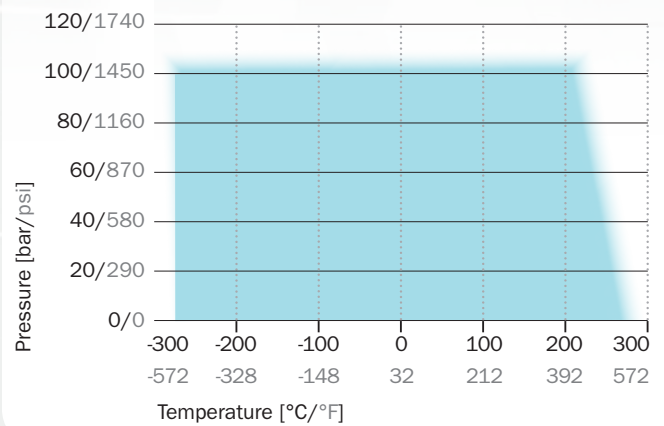
FlatSeal™ HMF45 is suitable for use in with a wide range of chemicals, both acidic and alkaline, and can withstand high pressure environments up to 100 bar / 1450 psi. This makes it suitable for glass lined flanges, FRP equipment and in pipework and reactors in the processing industry.

**Advantages:** Unique, expanded PTFE - Outstanding flexibility – Suitable for high pressure environments

**Water/water vapor**

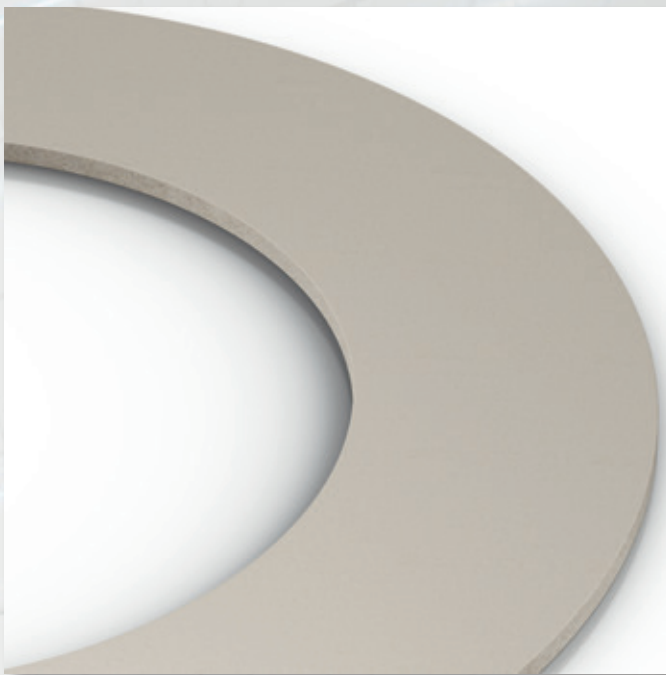


**Other media\***





**FlatSeal™ FoodPro® HMF48**



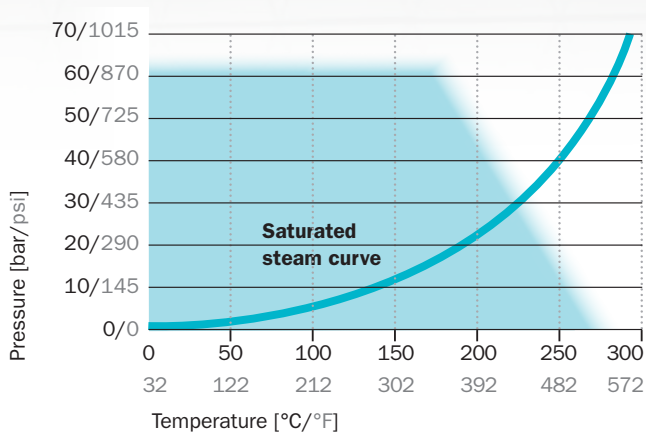
**Suitable for universal use in food contact applications**

Specially engineered to meet the unique requirements of the food and beverage processing industry, FoodPro® HMF48 is formulated from virgin PTFE and enhanced with high-quality, approved silica. This material omits color additives to make it compliant with the most relevant food contact regulations globally, including U.S. Food and Drug Administration (FDA) regulations, European Food Contact Regulations and Chinese food safety standards.

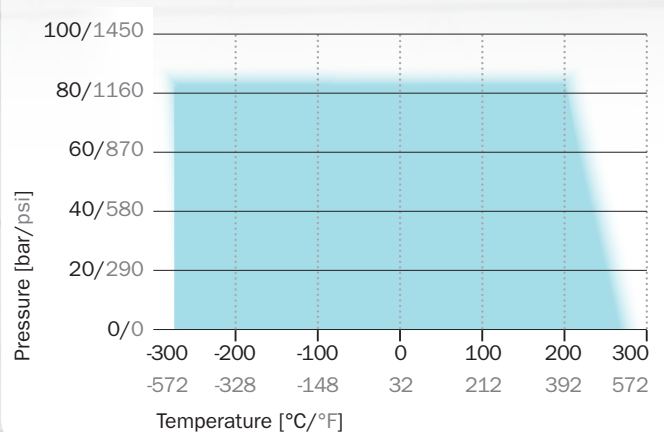
Alongside full compliance, FoodPro® HMF48 is designed for strong performance in all operating conditions, is compatible with a wide range of foods and beverages and can withstand the harsh cleaning processes used in the food processing industry.

**Advantages:** Universal material for food processing –  
 Compatible with food contact regulations – Suitable with all foods and cleaning processes

**Water/water vapor**



**Other media\***



# Material Information

General Data	HMF41	HMF42	HMF43 / 48	HMF45
<b>Approvals and tests</b>	ADI EC 1935/2004 FDA	ADI EC 935/2004 FDA	ADI EC 1935/2004 FDA GB (HMF48) BAM DVGW	ADI EC 1935/2004 FDA BAM
<b>Color</b>	light blue	white	fawn / colorless	white

Physical Properties (typical values)			HMF41	HMF42	HMF43 / 48	HMF45
<b>Thickness</b>		[mm] [inch]	2.0 0.08	2.0 0.08	2.0 0.08	2.0 0.08
<b>Density</b>	<b>DIN 28090-2</b>	[g/cm <sup>3</sup> ]	1.5	2.9	2.1	0.9
<b>Residual stress (+150 °C / +300 °F)</b>	<b>150 °C DIN 52913</b>	[N/mm <sup>2</sup> ]	14	14	16	18
<b>Compressibility</b>	<b>ASTM F 36 M</b>	[%]	35	3	5	50
<b>Recovery</b>	<b>ASTM F 36 M</b>	[%]	30	45	45	10
<b>Cold compressibility <math>\epsilon_{KSW}</math></b>	<b>DIN 28090-2</b>	[%]	24	3	3	40
<b>Cold recovery <math>\epsilon_{KSW}</math></b>	<b>DIN 28090-2</b>	[%]	6	1	1	3
<b>Hot creep <math>\epsilon_{KSW}</math></b>	<b>DIN 28090-2</b>	[%]	35	40	20	15
<b>Hot recovery <math>\epsilon_{KSW}</math></b>	<b>DIN 28090-2</b>	[%]	6	4	3	2
<b>Specific leakage rate</b>	<b>DIN 3535-6</b>	[mg/(s*m)]	< 0.015	< 0.015	< 0.015	< 0.015
<b>Tensile strength</b>	<b>DIN 52910</b>	[N/mm <sup>2</sup> ]	15	18	17	26

## FlatSeal™ Selector

In addition to the FlatSeal™ HMF40 series, Trelleborg Sealing Solutions offers a wide variety of FlatSeal™ options in materials engineered for specific operating conditions.

The screenshot shows the FlatSeal™ Selector web application. At the top, it displays the Trelleborg logo and the title 'FLATSEAL™ SELECTOR'. Below this, there are navigation links for 'HOME' and 'Gasket product / Design', along with language selection buttons for 'DE', 'EN', 'FR', and 'ES'. The main interface is divided into two steps: '1 - Gasket product' (active) and '2 - Design'. There are buttons for 'Save project' and 'Load project'. The 'Medium' field is set to 'hydrochloric acid 10% - 30%' with a dropdown menu showing 'HCl' and a note: 'strong acid, please allow for the concentration'. The 'Temperature from:' field is set to '0' and 'to:' is set to '40' °C. The 'Operational pressure:' field is set to '5' bar. A 'Gasket:' dropdown menu is open, showing a list of products: 'None', 'FlatSeal™ HMF41', 'FlatSeal™ HMF42', 'FlatSeal™ HMF43-4B', and 'FlatSeal™ HMF45'. To the right of the form is a graph showing 'Pressure (bar)' on the y-axis (ranging from 0 to 100) and 'Temperature (°C)' on the x-axis (ranging from -300 to 300). The graph displays a teal shaded area representing the operating range, which is a rectangle from 0 to 5 bar and -200 to 200 °C, with a small extension at 5 bar from 0 to 250 °C. Below the graph, it states 'Modified PTFE gasket material filled with silica' and lists standards: 'ADI, BAM, DVGW, ED 1935/2004, FDA, GB (4B)'. There is a 'Generate PDF' button. At the bottom, there are links for 'Help', 'Contact Us', 'Cookie information', 'Legal Notice', and 'Privacy Notice'.



### Need help specifying a FlatSeal™ for your application?

The new FlatSeal™ Selector helps you select a material based on operating conditions and calculates the surface pressure in your application.

[www.trelleborg.com/seals/tools](http://www.trelleborg.com/seals/tools)



Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way.

Trelleborg Sealing Solutions is a leading developer, manufacturer and supplier of precision seals, bearings and custom-molded polymer components. It focuses on meeting the most demanding needs of aerospace, automotive and general industrial customers with innovative solutions.

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If you'd like to talk to Trelleborg Sealing Solutions, find your local contact at: [www.trelleborg.com/seals/worldwide](http://www.trelleborg.com/seals/worldwide)