

# SEALING SOLUTIONS FOR VALVES



There can be many reasons for a valve failure. Frequent causes are selecting the wrong seal for cost reasons or failing to compare the requirements with the performance limits of the seal. If you look at all the different factors required when selecting the seal, even an O-ring can quickly become an important component. Whether it's a seated, butterfly, diaphragm, sampling, or other valve – we help you to ask the right questions and find the defective components in your processes.

## Prevention of contamination and corrosion

With system components in the food and pharmaceutical industry, hygiene is top priority. It requires certified materials for direct contact with foods and pharmaceuticals. All sealing materials used by Freudenberg in the food and pharmaceutical industry comply with the industry-specific legal provisions. For instance, elastomers and plastics for use in the food industry have to meet the requirements of EU (VO) 1935/2004, FDA, 3-A® Sanitary, and the Chinese GB 4806 and GB 9685. In the pharmaceutical industry, the biocompatibility of the sealing materials is additionally tested to USP Class VI. Dead-space-free solutions in compliance with Hygienic Design Standards play another important role. One example of such solutions is our Hygienic Usit® rings, which prevent accumulation of product residue or liquid.

## Effects of aggressive process media

Valves contain a broad spectrum of different dynamic and static seals. Alongside O-rings, customer-specific parts, profiles and flat gaskets, bellows and wipers are also used. The accompanying sealing materials need to meet diverse requirements. In the food and pharmaceutical industry, systems are cleaned using the CIP/SIP procedure. We have extensively tested our materials in cooperation with cleaning product manufacturers and developed a comprehensive resistance database from the results. You can benefit from this know-how online with our Resistance Guides for testing chemical and CIP/SIP resistance. It's not just aggressive chemicals in the chemical industry that seals need to stand up to; in the food and pharmaceutical industry, seals need to be resistant to numerous flavors. We continuously check our materials for compatibility with known and new flavorings. While our EPDM possesses excellent resistance to CIP/SIP media, it cannot be used in applications with a high fat content or non-polar flavors. For this purpose, Freudenberg specially developed the universal material Fluoroprene® XP, which is resistant to polar and non-polar media and reliably minimizes flavor transfer. VMQ (silicon) and FKM are used for applications with high temperatures and fatty media,

provided that the CIP/SIP conditions allow it. Seals made from Simriz® (FFKM) are used when the temperature and media resistance of the elastomers mentioned are not sufficient.

## Minimizing wear

Low-friction seals are indispensable in the process industry for two reasons. First, no abrasion must get into the process and second, a lower friction coefficient also means longer maintenance cycles. Our seals are low-friction anyway and thanks to our patented RFN surface treatment (Reduced Friction by Nanotechnology), we are able to reduce friction even further. Our seals for butterfly valves are a good example of this. They proved their extraordinarily high switching cycles in numerous bench tests thanks to their extremely low-friction design. So the flap of a butterfly valve closes tightly and can still be opened easily.

## Innovation and design competence

We develop innovative sealing solutions together with you, such as the smart seal. The function of this seal is to prevent both unscheduled downtime and premature replacement of the seal by indicating when it needs to be changed itself. Furthermore, our engineers have developed an improved, application-specific design for rotary seals in which the static and the dynamic sealing function are separated from one another. This gives rise to a longer service life and higher resistance to extremely aggressive media and very high temperatures.

## Benefit from our know-how

Freudenberg Sealing Technologies has developed an extensive material and product portfolio for the special requirements of the process industry. Thanks to many years of experience, research, and work in associations, we possess unique technical knowledge. If there are specific cases in which we do not currently have any empirical values, our test plant is available to you for performing field tests. Your individual valves and process media can be tested here. So we can always find the right sealing solution for your valve systems.

## SINGLE-SEATED VALVE



## DOUBLE-SEATED VALVE



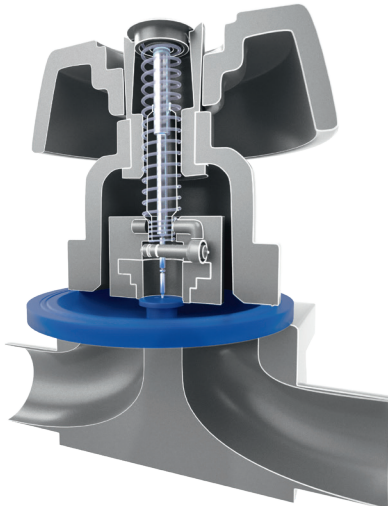
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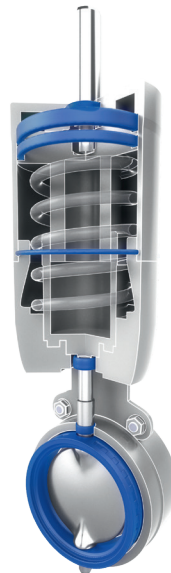
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## DIAPHRAGM VALVE



## BUTTERFLY VALVE



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