

# EXCELLENCE IN ELASTOMERS.

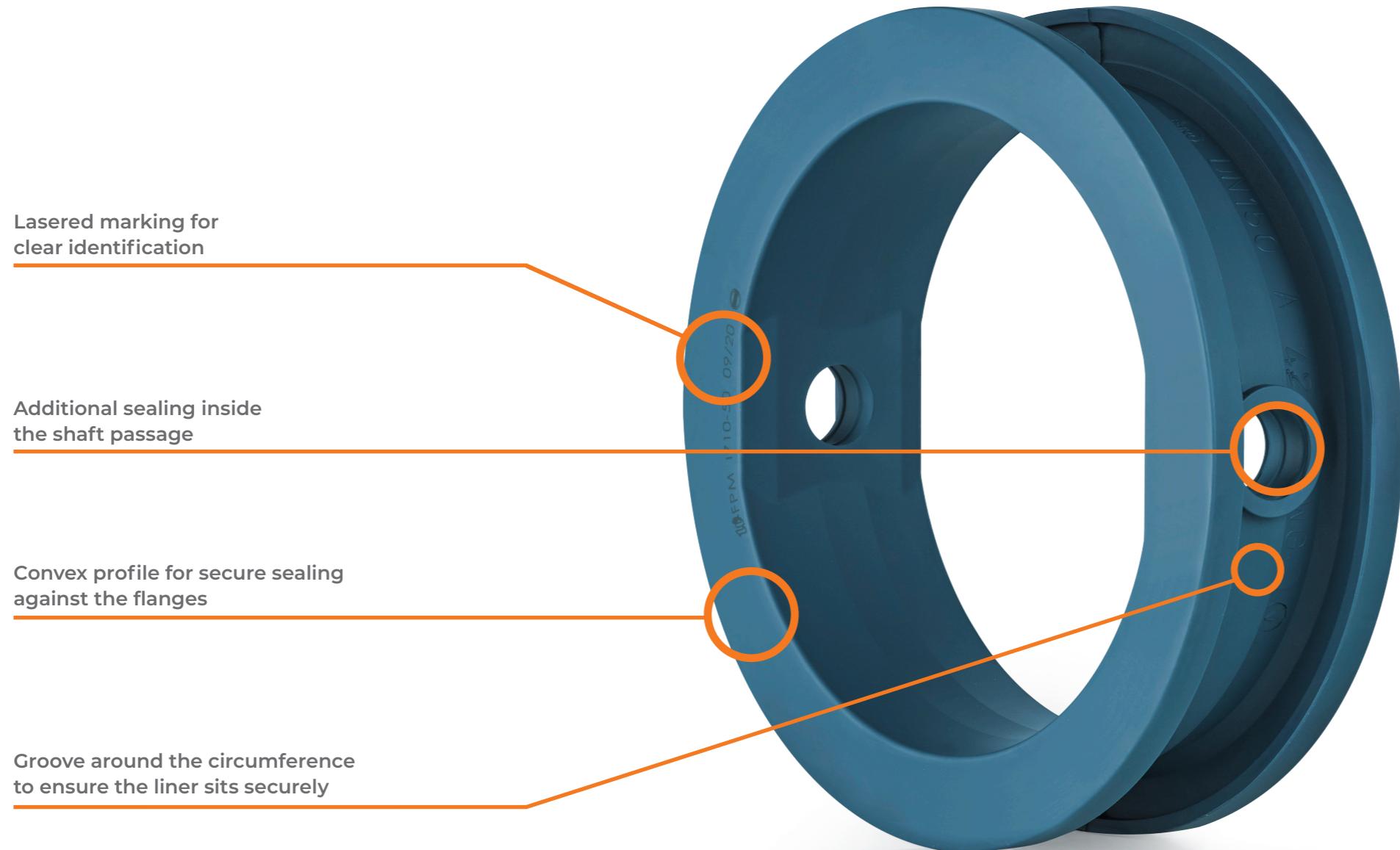
Liners for EBRO shut-off and control valves



# SEAL OF SUCCESS.

EBRO is the only provider to offer liners in this design and manufacture with this degree of performance. This is the result of decades of experience in developing materials and meeting technical requirements for multiple areas of application.

Combined with a precision-engineered body that offers a perfect fit, EBRO's liner design ensures resilience, leak-tightness and durability at the very highest level. This means that we and our customers are now in a position to handle thousands of different media safely and reliably.



# THE LINER: THE HEART OF THE VALVE.

The liner is the crucial component of any shut-off or control valve. When the valve is closed, it ensures reliable sealing; when the valve is open, it guarantees an unobstructed flow for the medium and perfectly sealed shaft and flange connections.

In the process, elastic liners are exposed to a wide range of mechanical, chemical and thermal loads. These include abrasive and aggressive media as well as extreme temperatures and pressures, not to mention the strain put on them by the deformation that occurs whenever valves are opened or closed.

## Our valves hold fast to their promises.

The material, shape and design of the elastomer liners used in our valves have been optimised to suit their conditions of use. Their exemplary functional reliability, resistance and durability are founded on a smart seal design and elastomers that boast specific physical and chemical properties.

## The formulation: it's all in the mix.

We adapt the formulations and mixtures for our elastomers precisely to meet the specific requirements and approval criteria in line with the influences to which the liner is exposed and the media that are being conveyed. Regular quality checks during production ensure that our customers can rely on a high level of functional reliability at all times.

## Clearing things up: colour-coding.

We offer liners in different colours so that the specific material qualities and application classes can be clearly distinguished. For instance, white liners are mainly used in the processing of foodstuffs and in pharmaceutical processes. Our liners for these industries meet all the requirements set by the US Food and Drug Administration (FDA) or the German Federal Institute for Risk Assessment (BfR).

# RESEARCH GIVES US THE EDGE.

Elastomer liners play an important role. Depending on where they are used, they will be exposed to all manner of different stresses, strains and loads that can really take it out of them – literally. To ensure that our valves maintain maximum functional reliability and durability everywhere and at all times, even under the toughest conditions, we are committed to ongoing investment in the high quality of our elastomer liners. By conducting intensive materials research and working closely with end users and manufacturers, therefore, we are able to deliver state-of-the-art solutions.

## Fantastically elastic.

EBRO has its own research and development department in which the elastomers used in its high-performance liners are put through their paces and elastomer formulations are tweaked in line with customers' requests and fine-tuned to suit future applications.

## Keeping out leaks. At all times.

Operating pressure, media, hygiene, cleaning, temperatures, switching frequency – a number of factors need to be taken into account when choosing suitable liners. This is because each system, each process and each medium poses highly specific challenges to a valve's fittings and liners. And the development of new industrial processes and new materials and substances means a steady stream of new requirements.

## Tailored to your applications.

Besides mechanical and thermal loads, our research and development work focuses particularly on chemical interactions between the sealing material and the medium. Our specialists analyse specific application scenarios as required and run test series to determine what elastomer would be the best fit for the medium being conveyed in each case.

With our high-quality liners, therefore, we make sure that our resilient seated valves not only excel when confronted by bulk materials and aggressive media but also meet the toughest hygiene, cleanliness and cleanability requirements in the food and pharmaceutical industries or in paint and varnish manufacture.



Tensile testing



Chemicals testing



Shore A hardness testing



Compression set testing (pressure testing)



IR spectroscopy



Leak-tightness testing



FANTASTIC  
LINERS AND  
WHERE TO  
FIND THEM.



## EPDM (ethylene propylene diene rubber)

is the most commonly used elastomer for non-critical applications. It is resistant to diluted acids, alkalis and alcohols and suitable for temperatures from -10°C to +120°C.

### Potential mixtures:

- Approvals for drinking water (DVGW Wasser, WRAS, ACS, NSF, etc.)
- Approvals for foodstuffs (FDA, EC)
- Colours (black, white)
- Specific properties (ATEX, low-friction, etc.)

### Typical area of application:

- Water
- Steam
- Hot water
- Acids
- Alkalies
- Air



## FKM (fluoro-rubber)

boasts higher chemical resistance as its fluorine content increases. It is recommended for use at temperatures from -10°C to +180°C.

### Potential mixtures:

- Approvals for foodstuffs (FDA)
- Colours (black, white, blue)
- Specific properties (ATEX, ultra-high chemical resistance, etc.)

### Typical area of application:

- Mineral oils
- Petrol
- Fats
- Foodstuffs
- Acids
- Alkalies



## NBR (acrylonitrile butadiene rubber)

is highly resistant to media containing oils and fats. Special versions that are highly resistant to mechanical wear and tear are available for very abrasive applications. NBR can only be used at temperatures up to +90°C. HNBR liners made from hydrogenated nitrile butadiene rubber are used at higher temperatures up to +130°C.

### Potential mixtures:

- Approval for gases
- Approvals for foodstuffs (FDA, EC)
- Colours (black, white, blue)
- Specific properties (ATEX, abrasion-resistant, etc.)

### Typical area of application:

- Oil
- Petrol
- Gas



## PUR (polyurethane)

is a highly resilient plastic that is often used in valves exposed to heavy mechanical loads. It can handle temperatures from around -30°C to +80°C.

### Typical area of application:

- Bulk materials



## CSM (chlorosulphonated polyethylene)

is highly resistant to the effects of the weather, ozone and acids. It is used in swimming pool sanitation.

### Typical area of application:

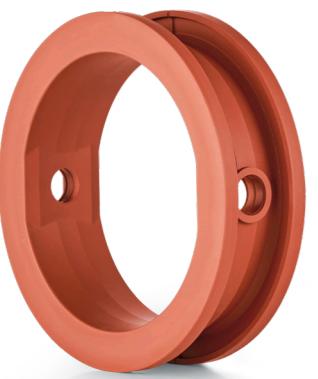
- Swimming pool technology

# OVERVIEW OF LINERS



## SBR (styrene-butadiene rubber)

is the most common form of synthetic elastomer in the world. At +70°C, the maximum temperature at which it can be used is lower than for most other elastomers.



## VMQ (silicone rubber)

can be used at temperatures from -40°C to +200°C, making it highly resistant to hot air and extremely flexible at low temperatures. VMQ also boasts a good degree of resistance to the effects of the weather, ozone and solvents.



## FVMQ (fluorosilicone rubber)

combines silicone's impressive high- and low-temperature properties with FKM's improved chemical resistance to fuels and mineral oils. It can handle temperatures from -50°C to +200°C.

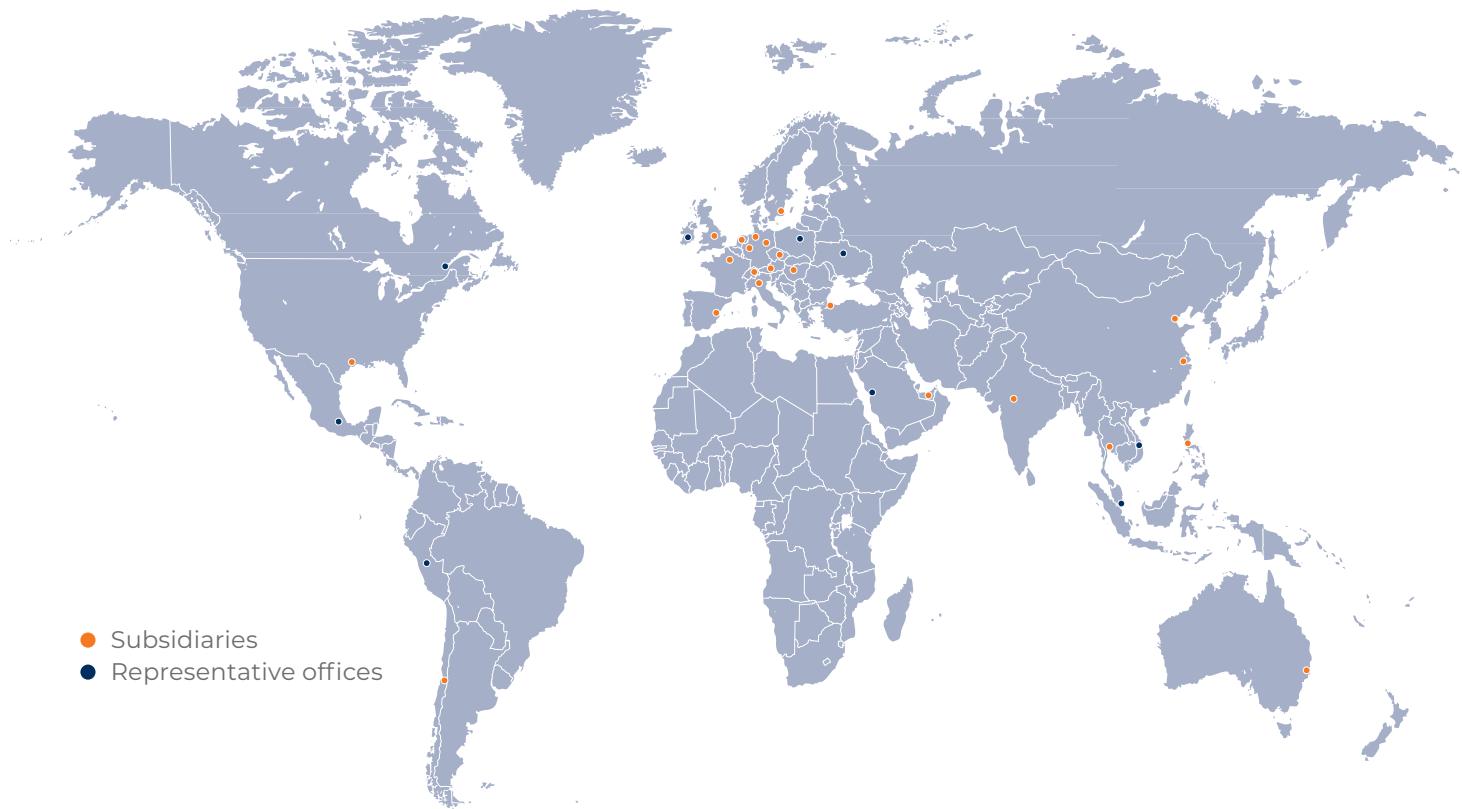
### Typical area of application:

- Bulk materials

Material	Temperature range	Properties	Typical applications
<b>EPDM</b> (ethylene propylene diene rubber)	-10 °C to +120 °C	<ul style="list-style-type: none"> <li>Resistant to diluted acids, alkalis and alcohols</li> <li>Resistant to the effects of the weather and ozone</li> </ul>	Water, steam, hot water, acids, alkalis, air
<b>NBR</b> (acrylonitrile butadiene rubber)	Up to +90 °C	<ul style="list-style-type: none"> <li>Highly resistant to media containing oils and fats</li> </ul>	Oil, petrol, gas
<b>HNBR</b> (hydrogenerated acrylonitrile rubber)	Up to +130 °C		
<b>FKM</b> (fluoroelastomer)	-10 °C to +180 °C	<ul style="list-style-type: none"> <li>Highly resistant to swelling</li> <li>Chemical resistance increases in step with fluorine content</li> </ul>	Mineral oils, petrol, fats, foodstuffs, acids, alkalis
<b>PUR</b> (polyurethane)	-30 °C to +80 °C	<ul style="list-style-type: none"> <li>Highly resistant to abrasion when used with abrasive media thanks to its greater toughness</li> <li>Does not contain softeners</li> </ul>	Bulk materials
<b>CSM</b> (chlorosulphonated polyethylene)	Up to +60 °C	<ul style="list-style-type: none"> <li>Highly resistant to the effects of the weather, ozone and acids</li> </ul>	Chlorinated water, swimming pools
<b>SBR</b> (styrene-butadiene rubber)	Up to +70 °C	<ul style="list-style-type: none"> <li>Most common form of synthetic elastomer in the world</li> </ul>	Abrasive media
<b>VMQ</b> (silicone rubber)	-40 °C to +200 °C	<ul style="list-style-type: none"> <li>Very high resistance at low and high temperatures</li> </ul>	Hot air, foodstuffs and the pharmaceutical industry
<b>FVMQ</b> (floursilicone rubber)	-50 °C to 200 °C	<ul style="list-style-type: none"> <li>High resistance at hot air and excellent low-temperature flexibility</li> <li>Good resistance to weathering and ozone</li> </ul>	Low temperatures, fuels, mineral oils

# THE WORLD OF EBRO VALVES.

## Our international network



Since the company was founded in 1972, EBRO ARMATUREN has been developing, producing and selling shut-off and control valves as well as automation technology for industrial applications. More than 1,000 employees at two domestic and 30+ international subsidiaries ensure that EBRO products are available in over 100 countries worldwide. Within the global network, production takes place at the headquarters in Germany and in Italy, Sweden, China and Thailand with uniformly high manufacturing and quality standards.

In 2005, the Swedish manufacturer Stafsjö Valves AB was acquired and the product range was extended by an extensive portfolio of knife gate valves.

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More information on  
elastomer liners



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