

## Gasket material for sulfuric acid

### General Information

We offer a range of gasket materials for our closures and adapters to meet the different requirements for resistance, purity and mechanical properties.

### Sonderfall Schwefelsäure

Sulfuric acid in higher concentrations tends to discolor polyolefins – the concentration/temperature, the faster the discoloration progresses.

Since components like the closure, adapter and container are usually less affected, the discoloration on the seals is particularly noticeable. Furthermore, discoloration can also occur within the product itself.

It is primarily a superficial carbonization process, which according to our years of experience, has not led to failure or leaks.



With the aim of developing a more suitable seal, we conducted raw material tests back in 2016. Various POE granules were immersed in concentrated sulfuric acid for this purpose on November 18, 2016.

In addition to the granules of various POE types (samples 1-5), a cut-up gasket (POE type 1 – sample 6) and the allegedly sulfuric acid resistance gasket of a competitor (sample 7) were immersed in 96% sulfuric acid.



Discoloration was clearly visible after just 3 weeks. The supposedly sulfuric acid-resistance gasket from the competitor discolored almost as quickly and severely as the POE type 1.

Sample 5 of the granules showed the least discoloration and was therefore used to produce sample gaskets.

On March 1, 2017, this material was immersed in sulfuric acid as part of an injection-molded gasket.



On September 8, 2017 approximately 6 months later, it was noticed that the discoloration in sample 8 was significantly less than that of the other gasket after a similar test duration.

Parallel investigations included mechanical tests during which no noticeable changes were observed.

The gasket was approved for use with sulfuric acid after extensive testing.



In the image on the left from February 24, 2025 (i.e. after 7.5 years), it is clearly visible that our sulfuric acid resistance gasket has also turned black, but the sulfuric acid contamination is significantly lower compared to samples 6 and 7.

The raw material (POE type 2) represents a significant improvement in the use of sulfuric acid.

## Test assessment

### Technical data

	Norm	Unit	Value
Density (23°C)	ASTM D792	g/cm <sup>3</sup>	0,90
MFR (190°C / 2,16 kg)	ISO 1183	g/10 min	3,0
Melting temperature	DIN 51451	°C	96
Extension strain	ASTM D638	%	740
Shore-A hardness	ISO	868	90

### Chemical resistance:

**We recommend using this material exclusively for sulfuric acid!** Tests have shown that this gasket is also resistant to nitric acid, for example, but we have no personal experience with this or its suitability for other chemicals. Suitable gasket materials are available for the listed chemicals.

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