

# SONDERHOFF FERMAPOR K31

Two-component, room temperature cross-linking polyurethane foam for sealing in the FIPFG process





## The tailor-made chemistry for growing requirements.

## SONDERHOFF FERMAPOR K31

The technology



SONDERHOFF FERMAPOR K31 is the two-component polyurethane system to produce soft elastic foam gaskets, which are foamed directly onto the part using FIPFG technology (Formed-In-Place-Foam-Gasket). The system consists of a basic resin (A-component) and a hardener (B-component), which are mixed with each other in a predetermined mixing ratio. When foaming up on the part, a soft foam gasket is formed after a few minutes.

After reaction of the material components, the foam gasket is tack-free and can be installed into mating components. According to experience the seal function is achieved with a compression of approx. 30 – 60 % of the cured foam gasket. The flow behavior, reactivity, degree of hardness and color of the material formulations can be adjusted as required.

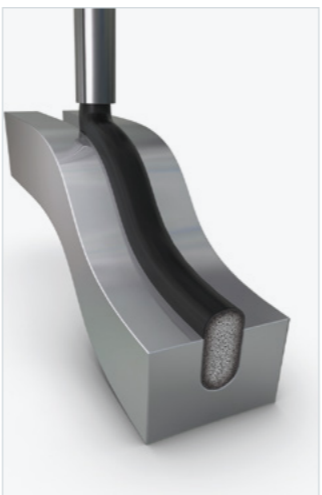
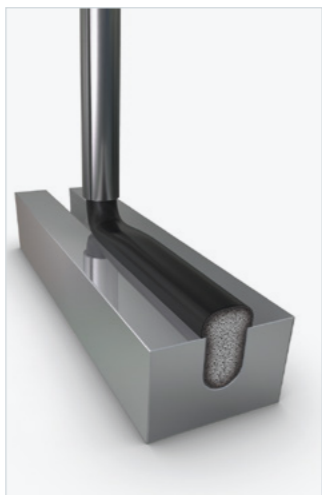
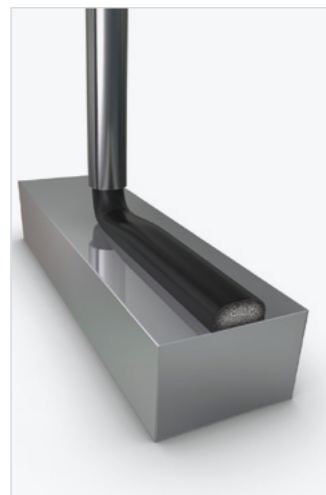
Henkel can draw on the variety of more than 1,000 application-specific formulations of the SONDERHOFF FERMAPOR K31 family.

### SONDERHOFF FERMAPOR K31 – The components

SONDERHOFF FERMAPOR K31 sealing foams consist of a liquid to pasty A-component (polyol) and a hardener, the B-component (MDI isocyanate)

### SONDERHOFF FERMAPOR K31 – The reaction process

The chemical reaction of SONDERHOFF FERMAPOR K31 sealing foams is initiated by mixing the A- and B-components. The applied compound foams up to a uniform gasket under room temperature conditions.



#### 2-dimensional application on flat surface

Thixotropic (pasty) sealing systems are preferably used, which, depending on the degree of viscosity, form a seal body with a height / width ratio of 1 : 3.0 to 1 : 1.5.

#### 2-dimensional application in a groove

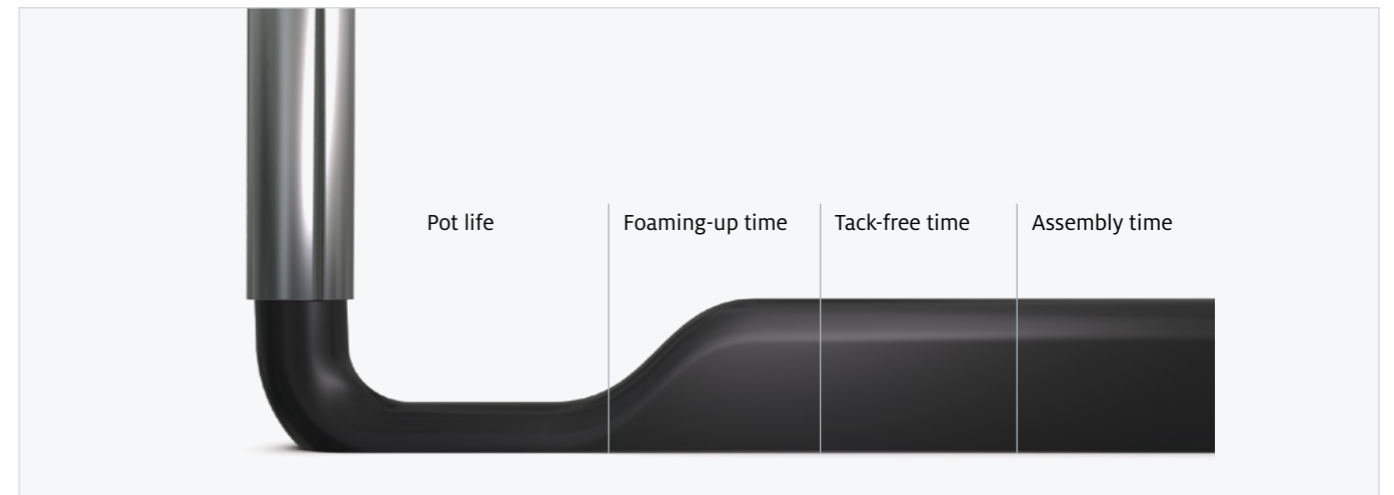
Liquid sealing systems, which are self-levelling over the coupling area, are usually used in this case. This allows seamless foam seals to be created.

#### 3-dimensional application on flat surface

Thixotropic (pasty) sealing systems are preferably used, which, depending on the degree of viscosity, form a seal body with a height / width ratio of 1 : 3.0 to 1 : 1.5. Use is possible even with extreme slopes up to vertical applications.

#### 3-dimensional application in a groove

Thixotropic (pasty) sealing systems are the most often used. It is also possible to apply gaskets on extreme slopes and up to vertical applications.



### SONDERHOFF FERMAPOR K31 – The foaming process

- > **Pot life:** The time span from the mixing of the A- and B-components to the beginning of the foaming time (approx. 5 – 90 sec.). It is also referred to a processability time or service life.
- > **Foaming-up time:** The time span in which the SONDERHOFF FERMAPOR K31 foam system expands to form a seal body (after approx. 30 – 180 sec.).
- > **Tack-free time:** The time from which the sealant surface of SONDERHOFF FERMAPOR K31 foam systems can be touched without causing damage (after approx. 2 – 20 min.).
- > **Assembly time:** The chemical reaction has progressed so far that the SONDERHOFF FERMAPOR K31 foam systems can bear loads or the foamed components can be assembled (after  $\geq$  20 min.).

# SONDERHOFF FERMAPOR K31

Polyurethane foam for sealing in the FIPFG process

## 10 good reasons for SONDERHOFF FERMAPOR K31:

1. ... is ideally suited for sealing industrial components in practically all shapes and geometries.
2. ... often achieves particularly good adhesion onto the component through the chemical reaction of the two material components on the substrate.
3. ... has excellent long-term behavior and shows almost 100 % resetting ability even after years of continuous use.
4. ... is tack-free at room temperature in 2 – 20 minutes. A furnace can significantly shorten the reaction time, but it is not always necessary.
5. ... offers special quick-reacting fast-cure recipes that are tack-free within 120 seconds for higher production cycle times.
6. ... easily compensates for large component tolerances.
7. ... forms a cross-linked structure after the reaction, which is extremely resistant to influences such as moisture, dust and temperature.
8. ... produces foam gaskets with extreme softness.
9. ... is processed with mixing and dosing systems for two components and can be easily and quickly changed over to other components, that need to be sealed at any time.
10. ... can be processed profitably even in small production runs.

**Automotive**  
Door module



**Electrical engineering**  
Switch cabinet door



**Lighting**  
Moisture-proof luminaire



**Filter technology**  
Radial-seal-filter



# SONDERHOFF FERMAPOR K31

Polyurethane foam for sealing in the FIPFG process

## PROCESSING INFORMATION

- SONDERHOFF FERMAPOR K31 systems are processed with mixing and dosing equipment for two components. The recommended processing temperature is +23 °C ±5 °C.

## PHYSICAL AND CHEMICAL PROPERTIES

Property	SONDERHOFF FERMAPOR K31
<b>Appearance</b>	Black or grey, other colors on request
<b>Viscosity</b>	900 to 200,000 mPas
<b>Hardness</b>	From 15 Shore 00 to 40 Shore A achievable
<b>Compression load deflection</b>	From 5 to 200 kPa (at 25 % compression)
<b>Density</b>	From 0.1 to 0.6 g/cm <sup>3</sup>
<b>Temperature resistance</b>	From -40 to +80 °C (temporary up to +160 °C)
<b>Tensile strength</b>	Up to 2 MPa
<b>Elongation at break</b>	Up to 400 %
<b>Resetting ability</b>	≥ 95 % / ≤ 5 % (DVR), (depending on test conditions)
<b>Water absorption</b>	From ≥ 3.5 %, hydrophobic versions available, (depending on test conditions)
<b>Flame retardancy</b>	Up to UL 94 possible
<b>Optional features</b>	E.g. sliding properties, low fogging, suitable for food packaging, protection class up to IP 68 or NEMA 12 (achievable with suitable component design), UL 50E

## THE SONDERHOFF FERMAPOR K31 RANGE (SELECTION)

SONDERHOFF FERMAPOR K31 A-component	Application	Viscosity mPas	Hardness Shore 00	Density g/cm <sup>3</sup>	Special features
A-9675-5-VP	Lighting	1,300 – 1,900	20 – 50	0.13 – 0.24	UL 50 listed, suitable for moisture-proof luminaires, soft
A-9675-2-VP	Lighting	1,000 – 2,500	35 – 75	0.25 – 0.50	UL 50 listed, suitable for moisture-proof luminaires
A-3505-1	Lighting	2,000 – 3,800	30 – 40	0.22 – 0.28	Product for moisture-proof luminaires, especially self-levelling
A-4525-1-B-UL	Enclosures	25,000 – 33,000	40 – 50	0.18 – 0.24	UL 50 listed and good adhesion on lacquer
A-9021-2-VP1	Enclosures	37,000 – 52,000	37 – 52	0.25 – 0.35	UL 94 and UL 50 listed
A-45C2-1-UL-FR	Enclosures	120,000 – 150,000	43 – 53	0.23 – 0.29	UL 94 and UL 50 listed
A-6045-3-B-UL	Enclosures	60,000 – 70,000	50 – 65	0.29 – 0.35	UL 50 listed, hydrophobic, very good resetting ability (DVR), good adhesion on lacquer
A-4545-1	Enclosures	45,000 – 55,000	40 – 50	0.27 – 0.36	High mechanic strength, low friction, optimized against shear stress
A-4530-3-B	Enclosures	33,000 – 40,000	32 – 42	0.19 – 0.23	UL 50 listed, very good resetting ability (DVR), good adhesion on powder coating, fast assembly
A-6060-1-B	Enclosures	55,000 – 65,000	50 – 60	0.23 – 0.29	UL 50 listed, hydrophobic, very good resetting ability (DVR), good adhesion on powder coating, fast assembly
A-9025-2-VP2	Enclosures	35,000 – 50,000	28 – 42	0.15 – 0.30	Extremely soft, UL 50 listed, good adhesion on lacquer
A-6045-2-B-MX	Filters	50,000 – 65,000	50 – 60	0.24 – 0.30	Microbial inert adjustable, suitable for ventilation systems
A-9308-5-VP5-F	Filters	130,000 – 200,000	38 – 62	0.18 – 0.27	For 3D applications, microbial inert adjustable, suitable for ventilation systems
A-3030-1-MX	Filters	28,000 – 38,000	20 – 30	0.17 – 0.23	Extremely soft, microbial inert adjustable, suitable for ventilation systems
A-9675-5-VP	Filters	1,000 – 2,000	35 – 65	0.17 – 0.35	For the smallest 2D groove applications (2 mm), UL50e listed, good resilience
A-6501-3	Automotive	900 – 1,500	56 – 66	0.34 – 0.40	High tightness, hydrophobic, very good resetting ability (DVR)
A-3565-2	Automotive	60,000 – 75,000	30 – 45	0.13 – 0.16	Extremely soft, low assembly forces
A-9308-5-VP5	Automotive	120,000 – 160,000	35 – 55	0.18 – 0.40	Very high mechanic strength, hydrophobic, for 3D applications
A-7060-5-B	Automotive	55,000 – 70,000	55 – 65	0.30 – 0.36	Sealing of E-Mobility batteries, fast assembly
A-9212-3-VP	Automotive	50,000 – 65,000	50 – 60	0.24 – 0.31	High tightness, hydrophobic, very good resetting ability (DVR), 50e listed, 2D/3D can be applied with/without groove
A-9199-29-VP3	Automotive	45,000 – 60,000	20 – 45	0.17 – 0.30	High tightness, low assembly forces and high mechanic strength
A-9308-5-VP4	Automotive	90,000 – 150,000	25 – 50	0.15 – 0.27	Very high mechanic strength, for 3D applications
A-9675-11	Automotive	1,000 – 1,500	28 – 48	0.16 – 0.22	Hydrophobic, suitable for 2D groove applications, low density
A-45C0-1-G-LE	Automotive	90,000 – 130,000	40 – 50	0.18 – 0.24	Low emissions, meets Daimler DBL5452 and BMW TL 8 350 151_6 design 11
A-6501-4-N	Packaging	1,000 – 1,700	62 – 72	0.40 – 0.48	Very elastic, for high tightness requirements, good resetting ability (DVR)
A-9843-8-VP2	Packaging	9,000 – 16,000	60 – 75	0.29 – 0.37	Good price-performance ratio, good resetting ability (DVR)
A-6505-1-N-FD	Packaging	5,000 – 7,500	73 – 83	0.24 – 0.30	Approval for food packaging (EU und FDA)
A-9370-VP5	Appliances	58,000 – 80,000	10 – 30	0.18 – 0.26	Hyper soft for ceramic stovetops

# Customer-specific solutions – worldwide and for many industries

The Henkel specialists for the SONDERHOFF portfolio  
are available globally

Every year, more than 300 million seals are manufactured in more than 50 countries using products from Henkel's Sonderhoff portfolio. At our Centers of Expertise and Regional Hubs, our specialists offer application engineering advice, e.g. selecting a suitable material system and sampling of your components, as well as project management for dosing systems and automation. You will receive training from us on how to use the FIPFG technology and we will support you with the selection of spare parts and a regular service offering. Furthermore, we will be pleased to take over parts of your production for you – from small to large series – at our subcontracting locations.

Sales staff at all other Henkel locations worldwide will also be happy to answer any questions and provide you with further information on our sealing, bonding, and potting solutions. We look forward to hearing from you.

**KOLO, POLAND**  
External Subcontracting Location

**DÜSSELDORF, GERMANY**  
Center of Expertise

**ELGIN, ILLINOIS, USA**  
Regional Hub

**RICHMOND (KANSAS CITY), USA**  
Regional Hub

**DORNBIRN, AUSTRIA**  
Center of Expertise

**BARCELONA, SPAIN**  
External Subcontracting Location

**OGGIONO, ITALY**  
Regional Hub

**INCHEON, KOREA**  
External Subcontracting Location

**SHANGHAI, CHINA**  
Regional Hub

**PUNE, INDIA**  
Regional Hub

**PUNE, INDIA**  
External Subcontracting Location

**SÃO PAULO, BRAZIL**  
External Subcontracting Location

*Global presence*





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