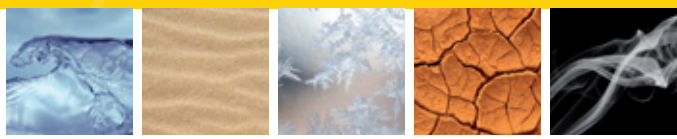
MORE THAN
50
YEARS OF EXPERIENCE IN SEALING SOLUTIONS

chemicals



FERMAPOR® K31

Two-component, room-temperature crosslinking polyurethane foam for sealing according to the FIPFG process

Henkel

sonderhoff
AUTOMATED SEALING SOLUTIONS

Tailor-made chemistry for growing requirements.

FERMAPOR® K31 is the trade name for Sonderhoff's two-component polyurethane systems for the manufacture of flexible foam seals which are foamed directly onto the part by using FIPFG (formed-in-place foam gasket) technology. The systems consist of a resin (A-component) and a hardener (B-component) which are mixed together at a prescribed ratio. This produces a flexible sealing foam within a few minutes.

After curing has finished the sealing foam is tack-free and the part can be assembled. The sealing function is reached with a compression of approximately 30 – 60 % of the cured seal. The flow behaviour, reactivity and colour of the components are freely adjustable depending on the intended use. Sonderhoff can exploit the experience gained from more than 1000 FERMAPOR® K31 formulations.

2D application on a level surface

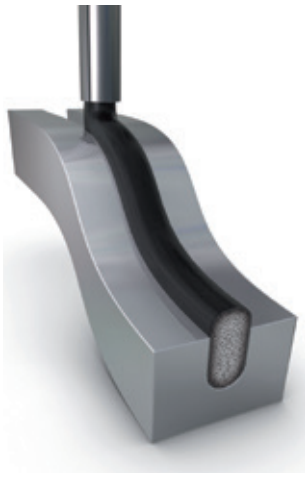
Thixotropic (pasty) sealing systems are preferentially used which, depending on the degree of viscosity, form a seal body with a height/width ratio from 1 : 2,5 to 1 : 1,5.

2D application in a groove

Fluid sealing systems, which are self-levelling over joints, are usually used in this case. This allows smooth seamless seals to be created.

3D application on a surface

Thixotropic (pasty) sealing systems are preferentially used which, depending on the degree of viscosity, form a seal body with a height/width ratio from 1 : 2,5 to 1 : 1,5. Use is possible even with extreme slopes up to vertical application.



3D application in a groove

Thixotropic (pasty) sealing systems are used most often in this case. Seal application is also possible even with extreme slopes.

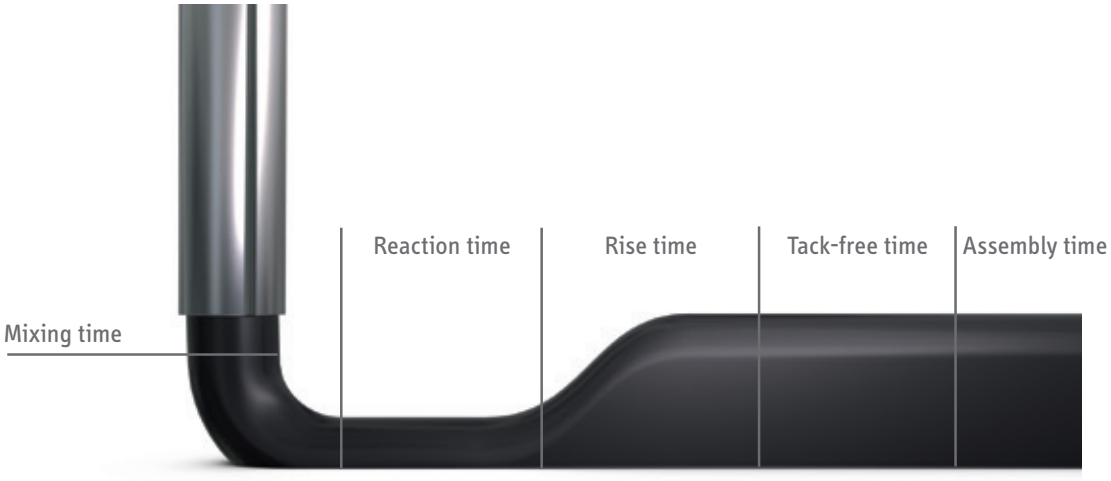
FERMAPOR® K31 – The technology:

FERMAPOR® K31 – The components

FERMAPOR® K31 sealing foams consist of a liquid to paste-like A-component (polyol) and a resin, the B-component (MDI isocyanate).

FERMAPOR® K31 – The reaction process

The reaction of FERMAPOR® K31 sealing foams is initiated by mixing the A and B components. This results in a chemical reaction which proceeds steadily at room temperature. The applied mass foams equally in all dimensions to form the gasket.



FERMAPOR® K31 – The foaming process

- **Mixing time:** is the time period in which the A and B components are mixed.
- **Reaction time:** is the time period in which the FERMAPOR® K31 foam system begins to react (after approx. 15 – 60 seconds*).
- **Rise time:** is the time period in which the FERMAPOR® K31 foam system expands to form the seal body (after approx. 15 – 180 seconds*).
- **Tack-free time:** is the time after which the seal surface of FERMAPOR® K31 foaming systems is tack free at room temperature and can be touched without causing damage (after approx. 2 – 20 minutes*).
- **Assembly time:** is the time point after which FERMAPOR® K31 foaming systems can bear loads or the sealed components can be assembled (after approx. 20 minutes – 12 hours*).

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Polyurethane foam for sealing according to the FIPFG process

PROCESSING INFORMATIONS

FERMAPOR® K31 systems are processed using two component mixing and metering machines. The recommended processing temperature is + 23 ± 5 °C. Most of the FERMAPOR® K31 components can be stored in the original packaging and for at least 6 months at temperatures between + 10 and + 40 °C.

PHYSICAL AND CHEMICAL PROPERTIES*

Property	FERMAPOR® K31
Appearance	black or grey, other colours upon request
Hardness	from 5 Shore 00 to 40 Shore A possible
Compression load deflection	5 kPa to 200 kPa (at 25% compression)
Density	from 0,1 g/cm³ to 0,6 g/cm³
Temperature resistance	from – 40 °C to + 100 °C (short time up to + 160 °C)
Tensile strength	up to 2 MPa [N/cm²]
Elongation at break	up to 400 %
Compression set (DVR)	> 97 % depending on test conditions
Water absorption	from < 3,5 %, hydrophobic versions available
Flame retardancy	flame retardancy up to UL-94 HF-1 possible
Other properties	E.g. antimicrobial finish, lubricated, suitable for food packaging, up to IP68 protection class, up to NEMA 12 protection class, low fogging, special foam systems with outer elastic protective layer possible

THE FERMAPOR® K31 RANGE

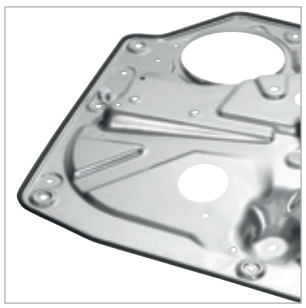
FERMAPOR® K31 A-component	Appication area*	Viskosity mPas	Hardness Shore 00	Density g/cm³	Other properties*
A-9854-7	Lighting	900 - 1.200	30 - 45	0,30 - 0,40	self-levelling, high tightness, very good compression set
A-9652-11-VP2	Lighting	1.000 - 1.600	30 - 45	0,20 - 0,40	spec. product for moisture-proof luminaires, good levelling
A-9020-5	Enclosures	45.000 - 65.000	45 - 55	0,25 - 0,30	UL-50 listed and good adhesion to paint
A-9021-2-VP1	Enclosures	37.000 - 52.000	35 - 50	0,25 - 0,35	UL-50 and UL-94 HBF listed
A-9230-2-VP	Enclosures	40.000 - 50.000	55 - 65	0,30 - 0,40	UL-50 listed, hydrophobic, good compression set / adhesion to paint
A-9160-VP3	Enclosures	18.000 - 22.000	43 - 53	0,20 - 0,30	high mech. strength, low friction, optimized against shear stress
A-9025-2-VP2	Enclosures	38.000 - 50.000	25 - 40	0,20 - 0,30	ultra soft, UL-50 listed, good adhesion to paint
A-9550-VP2	Enclosures	2.000 - 4.000	40 - 50	0,22 - 0,40	special product for high-pressure dispensing machines
A-9020-15-F	Filters	50.000 - 65.000	50 - 60	0,20 - 0,30	antimicrobial, qualified for air conditioning plants
A-9020-VP299-1	Filters	58.000 - 68.000	45 - 57	0,25 - 0,40	for inverse height/width ratio
A-9808	Filters	800 - 2.000	40 - 50	0,20 - 0,35	for smallest groove applications (2 mm)
A-9675-2-VP	Automotive	1.000 - 2.500	35 - 75	0,25 - 0,50	high tightness, hydrophobic, extremly good compression set
A-9260-2	Automotive	40.000 - 60.000	20 - 30	0,15 - 0,30	very soft, low assembly force
A-9308-5-VP5	Automotive	130.000 - 200.000	35 - 45	0,25 - 0,40	product for upside-down application, high mech. strength, hydrophobic
A-9675-20-VP3	Automotive	1.500 - 2.500	45 - 55	0,35 - 0,60	special product for high-pressure dispensing machines
A-9212-3-VP	Automotive	53.000 - 65.000	50 - 65	0,35 - 0,50	high tightness, hydrophobic, extremly good compression set
A-9199-29-VP3	Automotive	45.000 - 60.000	20 - 35	0,20 - 0,30	high tightness, low assembly force and high mechanical strength
A-9199-28-VP4	Automotive	35.000 - 45.000	40 - 70	0,30 - 0,50	good adhesion to galvanized surfaces, hydrophobic
A-9575-3	Automotive	1.000 - 1.500	40 - 70	0,30 - 0,50	special component for automotive lighting products
A-9575-3LE	Automotive	1.000 - 1.500	60 - 70	0,35 - 0,50	low emission, approved according to VW50180, VDA277 / DIN75201-B
A-9828-1	Packaging	1.800 - 2.700	60 - 75	0,30 - 0,40	highly elastic, for highest tightness requirements, good compression set
A-9843-8-VP2	Packaging	7.000 - 15.000	55 - 75	0,30 - 0,40	good cost performance ratio, good compression set
A-9762	Packaging	5.000 - 8.000	60 - 75	0,25 - 0,40	approved for food packaging
A-9370-VP5	Appliances	60.000 - 80.000	7 - 30	0,15 - 0,35	hypersoft, for use at ceramic stove tops

FERMAPOR® K31

Polyurethane foam for sealing according to the FIPFG process

10 good reasons for using FERMAPOR® K31 *

1. FERMAPOR® K31 systems are the most suitable for sealing industrial parts
2. The use of FERMAPOR® K31 systems is possible for almost every shape and seal geometry
3. FERMAPOR® K31 systems achieve particularly good adhesion to parts due to the chemical reaction of the two components on the carrier material
4. FERMAPOR® K31 systems possess exceptional long-term behaviour and display almost 100% resetting ability, even after many years of continual use
5. FERMAPOR® K31 systems will become tack-free at room temperature in 2 – 20 minutes and an oven can reduce the reaction time considerably, but it is not a necessity
6. With FERMAPOR® K31 systems even large part tolerances can easily be compensated for
7. The FERMAPOR® K31 systems develop a cross-linked structure which is extremely resistant to environmental effects such as humidity, dust and temperature*
8. With FERMAPOR® K31 systems also sealing foams with ultra softness are possible
9. FERMAPOR® K31 systems are processed using two component metering units and can be adapted flexibly and quickly to other parts at any time
10. By using FERMAPOR® K31 systems even small product series become profitable



FERMAPOR® K31 in automotive parts

FERMAPOR® K31 in electrical enclosures

FERMAPOR® K31 in lighting products

FERMAPOR® K31 in filters

We supply worldwide to more than 50 countries and our customers produce annually more than 300.000.000 seals with our products.

* The description of the possible fields of use of our products as well as the technical data and values only have a general character and do not mean that a certain product can be used under all conditions in the respective field of use. In this respect, the stated field of use is not a binding specification or usage provision.

Due to the great number of environment variables and their influences (e.g. temperature, test specimens, size, interaction with substrates, influence of machines, or the like) you as our customer must check whether the product is suitable for your specific field of use. We will be pleased to assist and advise you in this respect.

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