

MORE THAN
50
YEARS OF
EXPERIENCE
IN SEALING
SOLUTIONS

chemicals



FERMASIL[®]

Two-component, room-temperature cross-linking silicone systems for sealing, gluing and potting



AUTOMATED SEALING SOLUTIONS



Tailor-made chemistry for your most demanding requirements.

FERMASIL® is the trade name for the two-component silicone system from Sonderhoff Chemicals for manufacturing of flexible silicone elastomers and silicone foam sealings, which are applied directly onto the part by using FIPFG (formed-in-place foam gasket) technology.

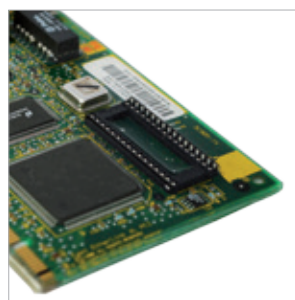
The systems consist of an A-component and a crosslinking B-component, which are processed in a given mixing ratio. After mixing the components most systems react by their own at room temperature and generate a soft and flexible silicone foam sealing or permanently flexible silicone elastomers.

FERMASIL® systems are processed using 2-component low pressure mixing and dosing machines. Suited for silicone sealants are dynamic or static mixing systems. Sonderhoff recommends dynamic mixing systems for material friendly processing.

Sonderhoff FERMASIL® Systems can be used at a constant temperature from -60°C up to +180°C and temporary up to +350°C maintaining their softness and flexibility. Due to their closed cell structure they do not absorb water and are suitable for the use in tropic or damp environment. They are also highly resistant to other chemicals (e.g. commercial cleaning agents, alcohols, diluted acids and lyes, brake fluids, oil and lubricants, cooling agents).



FERMASIL® for enclosures



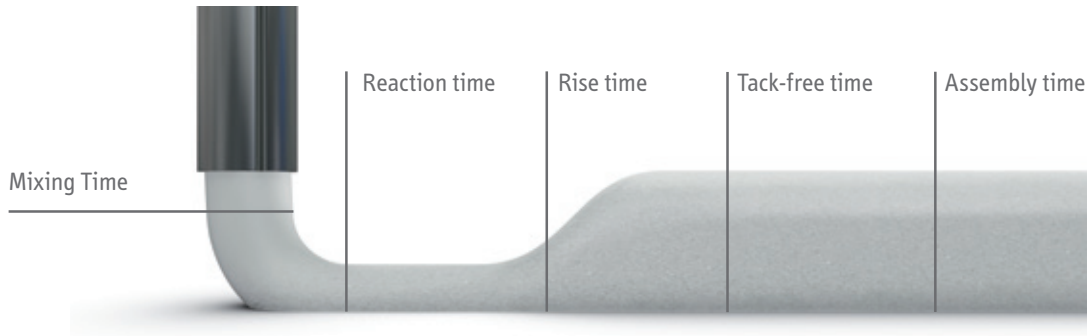
FERMASIL® for electronics



FERMASIL® for lighting

FERMASIL® - The technology

The reaction of FERMASIL® foam sealants 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.



FERMASIL® - 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 FERMASIL® foam system begins to react (after approx. 15 - 60 seconds*).
- **Rise time:** is the time period in which the FERMASIL® foam system expands to form the seal body (after approx. 60 - 180 seconds*).
- **Tack-free time:** is the time after which the seal surface of FERMASIL® foam systems is tack-free at room temperature and can be touched without causing damage (after approx. 2 - 30 minutes*).
- **Assembly time:** is the time point after which FERMASIL® foam systems can bear loads or the sealed parts can be assembled (after approx. 20 minutes - 12 hours*).



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.



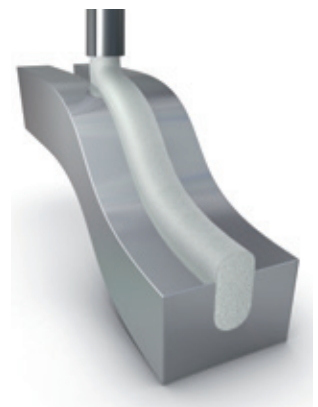
2D application in a groove

Fluid sealing systems, which are self-levelling over joints, are usually used for seal channels. This allows seamless seals.



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 surfaces.



3D application in a groove

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

FERMASIL®

Two-component silicone systems for sealing, gluing and potting

PROCESSING INFORMATION

FERMASIL® silicone systems are processed using 2-component mixing and metering machines. The recommended processing temperature is $+23^{\circ}\text{C} \pm 5^{\circ}\text{C}$. Most of the FERMASIL® components can be stored in the original packaging at temperatures from 0°C up to $+40^{\circ}\text{C}$ for at least 6 months.

PHYSICAL AND CHEMICAL PROPERTIES*

Property	FERMASIL®
Appearance:	white, grey or black, other colours upon request (also transparent)
Hardness:	gel-like up to 80 Shore A possible
Compression load deflection:	20 to 150 kPa (at 25% compression)
Density:	from 0,3 g/cm ³ to 2 g/cm ³
Temperature resistance:	from -60°C to $+180^{\circ}\text{C}$ (short time up to $+350^{\circ}\text{C}$)
Tensile strength:	up to 4,5 MPa [N/cm ²]
Elongation at break:	up to 600 %
Compression set:	> 97 % (depending on test conditions)
Water absorption:	< 1 %
Flame retardancy:	up to UL-94 V-0 possible
Viscosity of the A component:	from 1.000 mPa·s (liquid) to 500.000 mPa·s (highly pasty)
Other properties:	UL50 conformity, UV resistant, low fogging, good chemical resistance, if requested IP 69K ingress protection class and NEMA 4-6p protection class are possible. Customized developments can be agreed any time on request.

THE FERMASIL® RANGE

Designation	Application area*		Viscosity mPa·s	Hardness	Density g/cm ³	Other properties*
2C addition curing						
FERMASIL® 1809-1	Automotive	distance sensors	8.500	70 (Shore 00)	0,70	slightly foamed, liquid silicone system, particularly suitable for ultrasonic sensors – good ratio between resonance and absorption behaviour
FERMASIL® 65C4-1	Automotive	drive belt covers	> 100.000	70 (Shore 00)	0,35	highly viscous, stable, medium hardness, curing possible without heat treatment
FERMASIL® 5020-1	Lighting	luminaires, E-boxes, packaging, electric enclosures	approx. 15.000	50 (Shore 00)	0,30	liquid, good flow, curing possible without heat treatment, for lighting with ATEX approval
FERMASIL® 4010E-1	Electronics	potting of electronics, battery packs, sensors, PC boards	5.000	35 (Shore A)	1,00	very good dielectric properties, good flow rating, color and reactivity are adaptable to costumers' wishes, by changing the mixing ratio also able to process gel-like.
FERMASIL® 2515E-1	Packaging	food boxes, packaging covers in contact with food	> 10.000	20 (Shore A)	1,10	soft elastomer seal with good mechanical properties
FERMASIL® 5515E-1-G	Packaging	food boxes, packaging covers in contact with food	approx. 10.000	25-55 (Shore A)	1,25	use in contact with food is possible, fast curing, good mechanical properties
FERMASIL® 6505-1	Electronics	electric enclosures, E-boxes, ultrasonic sensors	approx. 10.000	60 (Shore 00)	0,40	liquid, PTB approved in electric enclosure applications
FERMASIL® 60C0-1	Electronics	electric enclosures	> 100.000	60 (Shore 00)	0,35	thixotropic, stable, standard material with medium hardness, UL50E listed
FERMASIL® 6590-1-G	Electronics	electric enclosures with ATEX approval	> 100.000	60 (Shore 00)	0,35	UL50E listed, thixotropic, stable, curing possible without heat treatment
2C condensation curing						
FERMASIL® 166	White Goods, Automotive	ceramic stovetop sealings, splash guard in the engine compartment	> 60.000	25 (Shore 00)	0,45	alkoxy cross-linking, no corrosive fission products while curing, very soft foam seal

FERMASIL®

Two-component, room-temperature cross-linking silicone systems

10 good reasons for using FERMASIL® *

1. FERMASIL® systems can be used at a constant temperature up to +180° C, for special types up to +250° C and temporary up to +350° C.
2. FERMASIL® systems are closed-cell and therefore do not absorb water.
3. FERMASIL® systems are highly resistant to many chemicals.
4. FERMASIL® systems are hydrolysis stable and therefore suitable for the use in tropic or damp environment.
5. FERMASIL® systems keep greatest possible flexibility even down to -60° C.
6. FERMASIL® systems are tack-free in 2 - 30 minutes depending on the thermal condition. An oven can reduce the reaction time considerably, but that is not always necessary.
7. FERMASIL® systems are processed using a 2-component mixing and metering machine and can be adapted flexibly and quickly to other parts for sealing application at any time.
8. FERMASIL® systems develop a cross-linked structure which is extremely resistant to environmental effects such as humidity, dust and temperature.
9. FERMASIL® systems possess exceptional long-term behaviour and have almost 100% resetting ability, even after many years of continual use.
10. FERMASIL® systems are in some cases also suitable for direct contact with food.



FERMASIL® for automotives



FERMASIL® for photovoltaics




FERMASIL® for white goods



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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