ELASTOSIL® S 699 A/B

ELASTOSIL®

Thermally Curing Silicone Rubber (RTV-2)

ELASTOSIL® S 699 A/B is a slightly self-levelling, addition-curing, 2-part silicone rubber for molding applications. The product quickly cures at elevated temperature to yield a permanently flexible, but well grindable vulcanizate with low density.

Vulcanized ELASTOSIL® S 699 A/B shows very good long-term stability against weathering, moisture, heat and sunlight. The cured silicone rubber may continuously be exposed to constantly changing climatic conditions, sunlight and temperatures as high as 200 °C (392 °F) without damage.

Properties

Uncured:

- 1 : 1 mixing ratio
- Slightly self-levelling
- Long potlife at room temperature
- Fast curing at moderate temperature levels

Cured:

- Medium to high hardness
- Low density
- Excellent grindability
- Designed for abradable coatings and seals
- Good resistance to fluids, lubricants, cleaning agents, alcohols and aqueous media
- Recommended service temperature range: -50 °C to +200 °C

Technical data

Properties Uncured

Property	Condition	A	B	Method
Color	-	black	white	-
Density	23 °C	0.76 g/cm³	0.75 g/cm³	DIN EN ISO 2811-2
Viscosity, dynamic	25 °C | 0.5 1/s	180000 mPa·s	190000 mPa·s	DIN EN ISO 3219
Viscosity, dynamic	25 °C | 25 1/s	100000 Pa.s	110000 Pa.s	DIN EN ISO 3219
Platinum catalyst in component	-	A	-	-

These figures are only intended as a guide and should not be used in preparing specifications.

Properties Catalyzed A+B

Property	Condition	Value	Method
Viscosity, dynamic	25 °C | 0.5 1/s	150000 mPa·s	DIN EN ISO 3219
Viscosity, dynamic	25 °C | 25 1/s	95000 mPa·s	DIN EN ISO 3219
Mix ratio	-	1 : 1	A : B
Pot Life(1)	25 °C	12 h	-
Kick-off temperature	-	85 - 95 °C	ISO 6502
T90	80 °C	3.5 min	ISO 6502

[1]time to double the initial mixing viscosity

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Properties Cured

Mixing ratio A:B = 1:1 (by weight); curing conditions: 5 min. at 165 °C in a circulating air oven, 2 mm sheet, pressed, no postcuring.

Property	Condition	Value	Method
Color	-	anthracite	-
Density	23 °C	0.76 g/cm^3	DIN EN ISO 1183-1 A
Tear strength	-	8.8 N/mm	ASTM D 624 B
Hardness Shore A	-	55	DIN ISO 48-4
Tensile strength	-	1.8 N/mm^2	ISO 37 type 1
Elongation at break	-	170 %	ISO 37 type 1

These figures are only intended as a guide and should not be used in preparing specifications.

Applications

- Aviation

Application details

- Manufacture of abradable coatings and abradable seals in the compressor section of turbofan aircraft engines or stationary gas turbines
- Typical fields of application: aviation, mechanical engineering.

Processing

Processing

Important!
Only A and B components with the same batch number should be processed together!

Material preparation:
ELASTOSIL® S 699 A/B contains a lightweight filler that might separate during transport or long storage. In order to ensure a homogeneous product composition, and hence an optimal product performance, it is recommended to thoroughly stirr up both component A and component B prior use. Note: since the lightweight filler can collapse when exposed to high shearing, the use of dissolver mixers or mixing devices with strong shear impact should be avoided.

To eliminate any air introduced during re-dispering the filler, it is necessary to de-aerate component A and B prior use. Applying vacuum (25-50 mbar) for some 10-15 min proved useful. Please note, that extended de-aeration under vacuum can alter the curing performance of ELASTOSIL® S 699 A/B; potential effects are a shortened potlife at room temperature, a lowered kick-off temperature and a faster curing under heat, for instance.

Surface preparation:
All surfaces must be clean and free of contaminants that will inhibit the cure of ELASTOSIL® S 699 A/B. Examples of inhibiting contaminants are sulfur containing materials, plasticizers, urethanes, amine containing materials and organometallic compounds – especially organotin compounds. If a substrate's ability to inhibit cure is unknown, a small scale test should be run to determine compatibility.

ELASTOSIL® S 699 A/B is not self-adhesive. In order to make the rubber adhere to other materials (e. g. glass, aluminium, stainless steel, metal alloys and thermoplastics) it is necessary to treat the respective substrates with plasma, corona or a primer (such as WACKER® Primer G 790 TOLUENE FREE) prior to the application of the silicone.

Mixing:

Caution ! Component A of ELASTOSIL® S 699 A/B contains the platinum catalyst, component B comprises the crosslinker. Since even traces of platinum catalyst may cause gelling of component B, all tools (e. g. spatula, stirrers, mixing cups etc.) used for handling either component A or the A/B mix must not come into contact with component B by mistake.

The two components should be thoroughly mixed at a 1 : 1 ratio by weight or volume, preferably by automatic metering lines equipped with static or dynamic mixing devices.

Curing:
The curing time of addition-curing silicone rubber is highly dependent on temperature, size and heat sink properties of the respective substrates or of the assembly parts to be bonded, respectively. In order to secure a quick build-up of adhesion to the substrates, ELASTOSIL® S 699 A/B is vulcanized preferably between 100 °C and 200 °C. Typical curing temperatures and resulting curing times are given in adjacent table.

Temperature	Recommended Curing Time
90 °C	15 min.
120 °C	10 min.
150 °C	5 min.
200 °C	2 min.

Detailed information about processing 2-part addition-curing silicones is given in our brochure “ROOM TEMPERATURE VULCANIZING (RTV) SILICONES - MATERIAL AND PROCESSING GUIDELINES”. We recommend running preliminary tests to optimize conditions for the particular application.

Chemical resistance:
Fully cured ELASTOSIL® S 699 is chemically resistant to most gases and many liquids (fluids, lubricants, cleaning agents, aqueous media, alcohols and other polar solvents). Long-chain esters or aromatic and alipatic hydrocarbons (e. g. fuels, gasoline, kerosene etc.), however, can result in a physical, but reversible swelling of the silicone rubber, which might have a temporary impact on both the dimensional and mechanical stability of the affected silicone article.

Removal:
If removal of the silicone from machines or dispensing equipment is necessary, white spirit or similar nonpolar solvents are recommended. However, cleaning ideally should take place before the silicone is fully vulcanized. Cured silicone rubber needs to be rubbed off or removed mechanically, if necessary in combination with a swelling agent (solvent) or a chemical silicone remover.

Typical Application

Manufacture of Abradable Coatings and Abradable Seals
Due to its excellent grindability ELASTOSIL® S 699 allows the efficient production of highly accurate silicone objects by abrasive finishing. This silicone rubber grade is therefore particularly suitable for the manufacture of abradable coatings and abradable seals, which in the compressor section of turbojets and turbofan engines, for example, minimize the gap between the blade tips and the engine housing and hence increase the jet engine's efficiency.

Typically, ELASTOSIL® S 699 is applied to the interior of the fan casing by a low-pressure injection molding process. However, for the realization of thin layers any other coating technique can be used. After vulcanization and optional post-curing, the circumferential coating can be ground down to the desired thickness.

Packaging and storage

Storage

Store in a dry and cool place.

The 'Best use before end' date of each batch is shown on the product label.

Storage beyond the date specified on the label does not necessarily mean that the product is no longer usable. In this case however, the properties required for the intended use must be checked for quality assurance reasons.

Safety notes

Comprehensive instructions are given in the corresponding Material Safety Data Sheets. They are available on request from WACKER subsidiaries or may be printed via WACKER web site http://www.wacker.com.

QR Code ELASTOSIL® S 699 A/B

For technical, quality or product safety questions, please contact:

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