

ELASTOSIL® SOLAR 3211

Room Temperature Curing Silicone Rubber (RTV-2)

ELASTOSIL® SOLAR 3211 is a pourable addition curing RTV-2 silicone rubber for coating, lamination, encapsulation and molding purposes. The product vulcanizes at room temperature and under heat to yield a crystal clear silicone rubber with very high transmission and of medium hardness.

Cured ELASTOSIL® SOLAR 3211 shows long term stability against weathering, moisture and UV radiation. The silicone elastomer may continuously be exposed to constantly changing climatic conditions, UV radiation and temperatures as high as 180 °C (356 °F) without damage.

Properties

Uncured:

- Very low viscosity
- To be cured with ELASTOSIL® CAT PT, ELASTOSIL® CAT PT-F or ELASTOSIL® CAT UV as curing agent
- 9:1 or 10:1 mixing ratio
- Fast curing at room temperature
- Rapid heat cure possible

Cured:

- Medium hardness
- Crystal clear vulcanisate
- Excellent resistance to UV light
- Very high light transmission in the range of 250 nm to 1100 nm
- Recommended service temperature range: -50 °C to +180 °C

Specific features

- Electrically insulating
- Highly transparent
- Low viscosity
- Optically clear
- Two-component
- UV & weathering-resistant
- UV stable

Technical data

Properties Uncured

Property	Condition	Value	Method
Colour	-	colourless	-
Density	25 °C	1.02 g/cm ³	ISO 2811
Viscosity, dynamic	25 °C	2700 mPa·s	ISO 3219

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

Catalyzed

All values given for a mixing ratio of A:B = 10:1 by weight.

Property	Condition	Value	Method
Viscosity of mix	25 °C	approx. 2500 mPa·s	DIN EN ISO 3219
Pot Life (gelling) with ELASTOSIL® CAT PT	23 °C	40 - 50 min	DIN EN ISO 2555
Pot Life (gelling) with ELASTOSIL® CAT PT-F	23 °C	5 - 8 min	DIN EN ISO 2555
Pot Life (gelling) with ELASTOSIL® CAT UV ⁽¹⁾	23 °C	1 - 2 min	DIN EN ISO 2555
Curing time with ELASTOSIL® CAT PT	23 °C	2 - 3 h	-
Curing time with ELASTOSIL® CAT PT	50 °C	20 - 30 min	-
Curing time with ELASTOSIL® CAT PT	100 °C	5 - 10 min	-
Curing time with ELASTOSIL® CAT PT-F	23 °C	1 - 2 h	-
Curing time with ELASTOSIL® CAT UV ⁽²⁾	23 °C	5 - 10 min	-

¹after UV activation; irradiance: 6 W/cm², 60 s

²after UV activation; irradiance: 6 W/cm², 60 s

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Properties Cured

Cured with ELASTOSIL® CAT PT in a mixing ratio of 10:1 by weight. Curing conditions: 30 min at 150 °C in a circulating air oven. 2 mm sheet, no post-curing.

Property	Condition	Value	Method
Color	-	crystal clear	-
Density	23 °C	1.03 g/cm ³	DIN EN ISO 1183-1 A
Tear strength	-	2.6 N/mm	ASTM D 624 B
Hardness Shore A	-	54	DIN ISO 48-4
Tensile strength	-	7.4 N/mm ²	ISO 37 type 1
Elongation at break	-	80 %	ISO 37 type 1
Refractive index	23 °C 589 nm	1.4096	-
Transmission (10 mm layer), 380-1100 nm	-	> 90 %	-

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All the information provided is in accordance with the present state of our knowledge. Nonetheless, we disclaim any warranty or liability whatsoever and reserve the right, at any time, to effect technical alterations. The information provided, as well as the product's fitness for an intended application, should be checked by the buyer in preliminary trials. Contractual terms and conditions always take precedence. This disclaimer of warranty and liability also applies particularly in foreign countries with respect to third parties' rights.

Applications

- Production of CPV Modules

Application details

- Multi-purpose potting agent for the PV industry
- Encapsulation of solar cells
- Lamination of solar modules
- Bonding of optical devices
- Manufacture of molded articles by casting, e.g. Fresnel lenses and other optical devices

Processing

Surface preparation:

All surfaces must be clean and free of contaminants that will inhibit the cure of ELASTOSIL® SOLAR 3211. 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.

Mixing:

ELASTOSIL® SOLAR 3211 is processed with ELASTOSIL® CAT PT, ELASTOSIL® CAT PT-F or ELASTOSIL® CAT UV as curing agent. The two components need to be thoroughly mixed at a 9:1 or 10:1 ratio by weight or volume. Mixing can happen either manually or by automatic metering lines equipped with static or dynamic mixing devices.

Caution! ELASTOSIL® SOLAR 3211 contains the crosslinker, while the curing agents of the ELASTOSIL® CAT series contain the platinum catalyst. Since even traces of platinum catalyst may cause gelling of ELASTOSIL® SOLAR 3211, all tools (e.g. spatula, stirrers, mixing cups etc.) used for handling either the curing agents or the catalyzed mix must not come into contact with ELASTOSIL® SOLAR 3211 by mistake.

Material application:

To eliminate any air introduced during mixing and dispensing or trapped under components and devices, a vacuum encapsulation is recommended. Alternatively, ELASTOSIL® SOLAR 3211 and the respective curing agent can be deaerated individually prior to use in order to remove absorbed air; applying a vacuum of 25-50 mbar for 10-15 min is recommended.

Curing:

Though curing by heat is possible, ELASTOSIL® SOLAR 3211 typically is processed at room temperature. Preferred curing agents are ELASTOSIL® CAT PT and ELASTOSIL® CAT PT-F. Besides, ELASTOSIL® CAT UV allows a UV-activated curing of ELASTOSIL® SOLAR 3211.

Please note: the curing time is highly dependent on the type of curing agent used, processing temperature and both the size and the heat sink properties of the components being potted, encapsulated or coated. For catalyzed mixtures containing ELASTOSIL® CAT UV as curing agent, the curing speed additionally depends on irradiance and irradiation time. General information about the respective pot life and curing time is given in the table "Catalyzed".

At room temperature the level of Sh hardness typically reaches 75 % of the final value within 1 to 3 hours or even within minutes, depending on the type of curing agent used. It is therefore possible to demould casted articles much earlier than indicated by the curing time values given in the table "Catalyzed".

Besides, the curing speed of ELASTOSIL® SOLAR 3211 can be adjusted within wide limits by WACKER® Catalyst EP or WACKER® Inhibitor PT 88 to suit the processing requirements of the particular application. Adding WACKER® Catalyst EP to the respective curing agent increases reactivity, i. e. pot life and curing time are reduced. WACKER® Inhibitor PT 88 is a pot life extender and thus prolongs pot life or curing time, when added to ELASTOSIL® SOLAR 3211.

Pigmentation:

ELASTOSIL® SOLAR 3211 is colourless, transparent and crystal clear. If necessary, the product can be pigmented by adding up to 2 wt. % of ELASTOSIL® COLOR PASTE FL.

Detailed information about processing, modifying curing speed and pigmentation 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.

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 can be rubbed off and removed mechanically, if necessary in combination with a swelling agent (solvent).

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

According to latest findings, addition-curing silicone rubber ELASTOSIL® SOLAR 3211 does not contain toxic or aggressive substances which would require special handling precautions.

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® SOLAR 3211



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

Wacker Chemie AG, Gisela-Stein-Strasse 1, 81671 Munich, Germany
productinformation@wacker.com, www.wacker.com

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