

Application Information

SurACer® 4450 - Light-curing and Isocyanate-free Doming Resin

Application Guide



The following instructions are a guide to the proper processing and application of **SurACer® 4450**.

1. General

This instruction guide will ensure the proper use of the **SurACer® 4450** and prevent eventual mistakes, which can lead to quality insufficiencies or adverse effects.

The criteria to be complied when working with **SurACer® 4450** fall under the following headings:

- Storage
- Mixing ratio
- Mixing process of components 1 and 2
- Pot life
- Curing



2. Storage

Each component of **SurACer® 4450** (components 1 and 2) can be safely stored for at least 6 months at a maximum temperature of 20° C with light excluded. Before the mixture of component 1 (yellow plastic bottle) with component 2 (blue plastic bottle), the temperature of both should be between 20 °C and 40 °C. After the components 1 and 2 have been homogeneously mixed, the mixture must be stored at room temperature (20 °C) in the dark.

Warning

The viscosity of the components may alter during storage and transport of **SurACer® 4450** at low temperatures (below 20 °C). Component 1 may crystallize out without affecting the quality. For this reason, both components require gentle heating up to maximum 40 °C before use (i.e. on a heating plate, radiator or in a bain-marie) to homogenize them. Only then should they be mixed together.



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3. Mixing ratio

To obtain the optimum **SurACer® 4450** properties, both components must be weighed in the right proportions,

Component 1: 1.0 g / Component 2: 2.0 g

and then thoroughly mixed. The more accurate the weighing and the more homogeneous the mixing, the better the quality of the doming surface and the properties of the material. Accurate weighing of the components (with a tolerance of +/- 0.1 g) is the safest way to ensure the right mixing ratio. The weighing should preferably take place in the special weighing and mixing container (Order no. 5388, 5389, 5390, 5395).

The components of a single kilogram of mixture have been prepared in advance as component 1 (in the yellow bottle) and component 2 (in the blue bottle), so that by simply emptying the entire content of the yellow bottle into the blue bottle, the correct mixing ratio is achieved.

It is absolutely necessary to ensure, by flushing the yellow bottle with some of the mixture several times, that the entire content of the yellow bottle has been used. The 5 kg and 15 kg sets consist of a white container (component 1) and a blue container (component 2). For these mixture weights, it is absolutely necessary that the weighing and mixing of the components take place in an appropriate special weighing and mixing container.

The accurate mixing ratio of the two components is crucial for the achievement of the product specifications. Eventual tolerances will negatively affect the material surface and quality, ranging from stickiness to incomplete hardening.

4. Mixing process of components 1 and 2

The successful mixing of component 1 and 2 is completed when a clear and homogeneous mass is formed. Eventual air bubbles imported during the mixing process will escape once the mixture has rest for some time; how long depends on the quantity of the components blended and might last up to 24 hours, with minimum rest time of two hours. During the rest time, the mixture should be kept in the dark and in room temperature (20 °C). The time necessary for all the visible air bubbles to escape can be shortened by brief heating of the mixture, to no more than 40 °C.

Warning

SurACer® 4450 must never be heated or degassed on a direct flame. Suitable stirring implements, such as plastic rods, glass rods (Order no. 5382), anchor-shaped stirrers (Order no. 8215) or propeller-type stirrers (Order no. 8216), as also a suitable mixing container (see above) should be used for the mixing process.

For weighing and mixing containers with a capacity of 500 or 1,000 ml, a propeller-type stirrer shall be used, the same if the mixing process is performed in the blue bottle (where initially component 2 was). For weighing and mixing containers with a capacity of 1,000 ml and especially 5,000 ml an anchor-shaped stirrer is appropriate. Both stirrer-types can be operated with a suitable battery-driven screwdriver. The SurAChem 5380 special cleaner can be used for the cleaning of stirrers, mixing cups and surfaces.



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In the case of inadequate blending and/or air inclusion in the mixture in form of air bubbles, the end-product will show a loss of quality. This is recognizable as pockmarks, circles, rods or swirls, still visible after the curing process.

5. Pot life

Pot life is defined under the DIN 55945 standard as the maximum period for which a coating material, initially supplied as a separate component, is usable once the component has been combined. In the case of **SurACer® 4450**, once components 1 and 2 have been mixed in the prescribed proportions, their pot life will be 5 days under refrigerated storage. This means that, after the blending of the two components, the mixture will remain workable for 5 days (as long as the storage conditions are observed).

Even after the end of its pot life, **SurACer® 4450** can be used for the production of domed surfaces in case it is still modifiable and curable. In that case, experimental runs must be first carried out. The successful use of **SurACer® 4450** after the expiration of its pot-life is not guaranteed.

6. Curing

The curing of **SurACer® 4450** domes is performed in the specially-developed SurALux light curing boxes (product-line: 8202-V, 8204-LC, 8205-LC). The hardening takes place between 5 and 10 minutes under UVA-light illumination. This time-period depends on the surface area and height of the dome and must be determined experimentally before proceeding to mass production. The curing parameters are listed in the product information sheets supplied with the SurALux light curing boxes.

Warning

For the achievement of the material properties specified by the manufacturer, it is absolutely necessary to use the SurALux technology, developed exclusively for this purpose.

A fingernail test will reveal whether the hardening process is completed (no depression possible) or not. If there is still liquid present in the interior of the dome, **SurACer® 4450** is not fully cured and needs to be further exposed. This exposure time should be extended in gradual stages, each of which will afterwards be once more inspected. Eventual overexposure after the hardening process is completed is not critical.

Factors that affect the necessary exposure time are,

- the thickness of the layer used
- the size of the curing area
- the type of film used
- the temperature of **SurACer® 4450**



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Test the curing of **SurACer® 4450** on a label with: diameter 2.5 - 3 cm, thickness 1.4 – 1.5mm.

The following guideline presents some of the common exposure times:

Type	Layer thickness	Surface	Approximate time
Label	1.0 – 2.0 mm	1 - 10 cm ²	6 - 8 min
Label	1.5 – 2.0 mm	10 - 100 cm ²	1 + 1 + 6 min curing with pauses
Script	1.5 – 2.5 mm	up to 60 mm length	7 min
Script	1.5 – 2.5 mm	> 60 mm length	1 + 1 + 5 min curing with pauses
Area	1.0 – 2.0 mm	d = / <60 mm	7 min
Area	1.5 – 2.5 mm	d > 60 <150 mm	1 + 1 + 1 + 6 min curing with pauses

The above application examples shall be always verified with individual tests.

Note: For large areas, the curing time should be divided (curing with pauses) to avoid damage caused by shrinkage on the surface (i.e. 7 minutes = 1 + 1 + 1 + 4 minutes).

For eventual questions or doubts concerning your product, we encourage you to get in touch with SurA Chemicals GmbH.

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