



DOMING RESIN SurACer[®] 4450

Product- and application
Information



3D Sticker

SurACer® 4450

Doming-resin



Doming resin SurACer® 4450

in several container-sizes available

Compliant in accordance to
RoHS & REACH
regulations

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

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1 What is Doming

3D-Doming is the production process of a decorative, three-dimensional and highly transparent surface coating deposited on printed or unprinted foil or solid shapes. It is possible to use this technology to raise the effectiveness and the functionality of prints, scripts and corporate gifts. Doming is, thus, outstandingly suitable for assisting in meet-

ing advertising targets and boosting sales. 3D UV doming resins can be applied on articles with manual or automatic dispensing techniques. While doming, the resin flows up to the edge of the article and is then ready to be cured with UVA-light within few minutes.

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Isocyanate- and solvent-free

2 SurADoming

SurADoming is the innovative technology for the production of doming articles with the SurACer® doming resins. The SurACer® 4450 doming material, the innovative SurACer® 4460 doming resin, the new SurACer® 4460c

colorful doming resin and the SurACer 4497-1 scratch-resistant coating have been developed and produced by SurA Chemicals GmbH and are distributed worldwide.

3 SurACer® 4450 doming resin

SurACer® 4450 is a two-component, isocyanate- and solvent-free, low viscosity doming resin based on an SH/En system. The SurACer® 4450 doming resin impressively enhances the decorative effect of printed motives on polyester, PVC and metallic foils as well as on aluminum or plastics. SurACer® 4450 doming resin is compliant in accordance with the EU directive 2011/65/EC. All starting substances have been preregistered according to the REACH regulations (EC) No. 1907/2006. SurA Chemicals is certified with DIN EN ISO 9001:2015.

SurACer® 4450 contains no isocyanate- and solvent-containing components. Thus, the exposure to hazardous substances, such as skin and eyes irritations, complex and costly disposals as also other ecological burdens can be completely avoided. This is a huge advantage compared to other resins, such as polyurethane and epoxy resin systems. SurACer® 4450 doming resin consists of two components, component 1 and component 2. After the two components have been successfully mixed, SurACer® 4450 doming resin has a pot-life of at least five days, if stored in the refrigerator.

Very long Pot-life of at least 5 days

This pot-life is significantly longer than that of conventional doming resins and guarantees easy handling as also leads to significant material savings.

The short curing time (within 8 - 12 minutes) of SurACer® 4450 by means of UVA-light guarantees the shortening of manufacturing processes up to product shipment. By curing SurACer® 4450 doming resin with the SurALux light-curing boxes, one can achieve transparent, flexible decorative domes for screen, digital, sublimation and transfer prints with great brilliance.

SurACer® 4450 doming resin is UV and climate stable and therefore shows neither yellowing nor loss of flexibility in outdoor use.

The doming resin is also characterized by its high bond strength with many substrate materials thanks to its very good adhesive strength. Due to its high transparency, the doming resin SurACer® 4450 achieves an effective three-dimensional optic.

The application of SurACer® 4450 can be done in a continuous or discontinuous process with the help of suitable dispensing and curing technology.

Isocyanate- and solvent-free

Reduction of skin irritations & ecological load

UV-Light curing

Very fast curing process within minutes

Very long pot-life

Easy handling
Material saving

Stable towards UV and climate

Absolutely suitable for outdoors

High adhesion

Longer lifespan

High transparency

Great 3D-optic

Doming Technology

SurA Chemicals has several years of experience and extensive know-how in the field of doming technology and provides you with complete solutions for the production of doming articles for decorative and advertising purposes. Our manual and automatic as well as upgradeable workstations allow for a professional and individual production of doming articles. The company's portfolio also extends to light-curing boxes, dispensing devices, compressors, pressure tanks, surface pretreatment systems and devices, as also doming accessories and consumables.

4 Application

The following instructions are a guideline for the correct processing and use of SurACer® 4450. When working with the SurACer® 4450 doming resin, following criteria must be considered:

- ✓ Storage
- ✓ Mixing ration
- ✓ Mixing process
- ✓ Pot-life
- ✓ Curing process

4.1 Storage

Each component of SurACer® 4450 (component 1 and component 2) can be safely stored for at least 6 months at a maximum temperature of 20° C with light excluded. Before mixing 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.

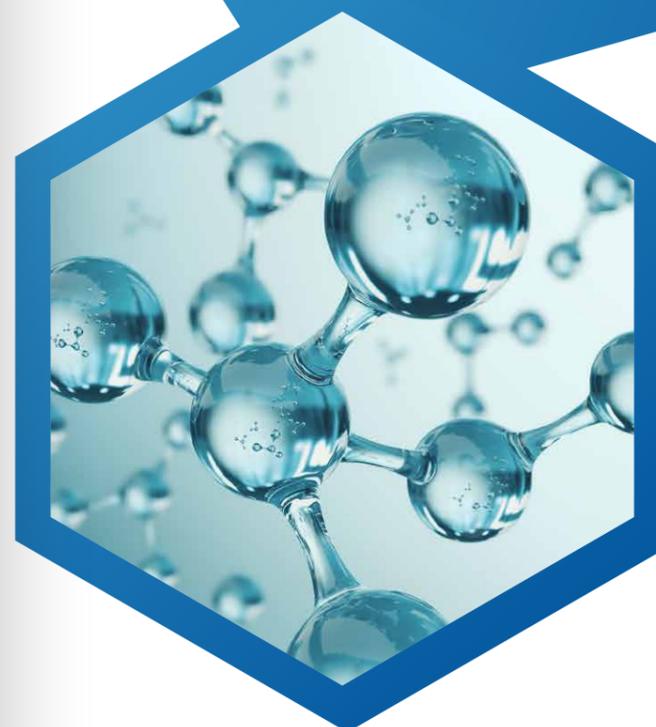
Warning! The viscosity of the components may alter during storage and transport of SurACer® 4450 at low temperatures (below 20 °C). Component 1 may crystallize out without affecting the quality. For this reason,

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.

4.2 Mixing ratio

In order to obtain the optimum SurACer® 4450 properties, both components must be weighed in the right proportions, compo-

nent 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 special weighing and mixing containers. 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.

The doming material SurACer® 4450 is available in different container sizes for easier handling. These are 1 kg containers, consisting of component 1 (yellow bottle) and component 2 (blue bottle), as well as 5 kg containers and 15 kg containers, each consisting of a white canister (component 1) and a blue canister (component 2). For all available con-

tainer types, the weighing and mixing of the components should be carried out in a separate weighing and mixing container.

4.3 Mixing process

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 mixed and might last up to 24 hours, with minimum rest time of 2 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, anchor-shaped stirrers or propeller-type stirrers, as also a suitable mixing container should be used for the mixing process.

UV-light-curing
quick material curing

For weighing and mixing containers with a capacity of 500 or 1000 ml, a propeller-type stirrer shall be used. For weighing and mixing containers with a capacity of above 1000 ml and especially 5000 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. **Warning!** In the case of inadequate stirring and/or air inclusion in the mixture in form of air bubbles, the endproduct will show a loss of quality. This is recognizable as pockmarks, circles, rods or swirls, still visible after the curing process.

High Adhesion
longer lifespan

**SurACer®
4450**

Doming resin

Ideal for higher domes higher layer-thicknesses

4.4 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 component 1 and component 2 have been mixed in the prescribed proportions, their pot-life will be 5 days under refrigerated storage. This means that, after the stirring of the two components, the mixture will remain workable for 5 days (as

long as the correct storage conditions are applied).

Even after the end of its pot life, SurACer® 4450 can be used for the production of domes 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.

4.5 Curing process

The curing of SurACer® 4450 doming resin is performed in the specially-developed SurALux light curing boxes of the series 1000,

2000 and 3000. The curing process takes place between 8 and 12 minutes under UVA-light. This time-period depends on the



High Transparency great 3D optic

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 curing 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 foil used
- the temperature of SurACer® 4450

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

The following guideline presents some of the common exposure times:

Comparison of common doming resins



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	bis 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 divi-

ded (curing with pauses) to avoid damage caused by shrinkage on the surface (i.e. 7 minutes = 1 + 1 + 1 + 4 minutes).

Information on hazards, labeling, protective measures and transport are given in the product specific safety data sheet.

respect of the protected rights of third parties. The company's technical consultation does not release the customer from own examination concerning the suitability and usability of the company's product. The manufacturer's liability extends solely to the value of the products supplied by SurA Chemicals GmbH and applied by the customer.

For eventual questions or doubts concerning your product, we encourage you to get in touch with SurA Chemicals GmbH. The technical consultation given by SurA Chemicals GmbH, verbally or written, is based on the company's best knowledge and shall only be considered as non-binding advice, also in

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Doming resins comparisons

SurACer® 4450	Polyurethane	Epoxy resins
Health and safety during process		
<ul style="list-style-type: none"> ▸ Non-toxic constituents, such as isocyanates and solvents ▸ No dangerous goods, can be safely stored and transported 	<ul style="list-style-type: none"> ▸ Toxic constituents, main constituents are isocyanates of acute toxicity ▸ May cause skin and eyes irritation ▸ Hazardous material, special precautions by storage and transport 	<ul style="list-style-type: none"> ▸ Toxic and corrosive constituents, main constituents are epoxies with properties hazardous to health ▸ May cause skin and eyes irritation
Disposal		
<ul style="list-style-type: none"> ▸ Reduced ecological pollution ▸ Standard commercial waste disposal 	<ul style="list-style-type: none"> ▸ Heavy environmental pollution ▸ Hazardous waste disposal at additional costs 	<ul style="list-style-type: none"> ▸ Environmental pollution ▸ Hazardous waste disposal at additional costs
Curing process		
<ul style="list-style-type: none"> ▸ UVA-curable within minutes ▸ Curing process not affected by humidity 	<ul style="list-style-type: none"> ▸ Air-drying, slowly up to several hours ▸ At room temperature in a ventilated area, place of work is absolutely necessary ▸ Curing process affected by humidity 	<ul style="list-style-type: none"> ▸ Air-drying, slowly up to several hours ▸ At room temperature in a ventilated area, place of work is absolutely necessary ▸ Curing process affected by humidity

SurACer® 4460

Polyurethane

Epoxy resins

Handling

- Very long pot-life (days or weeks)
- Material is available as two components
- Low technology requirements for mixing and application processes
- Very short pot-life (minutes)
- Material is available as two components
- Costly in technology, investment and expenditure
- Very short pot-life (minutes)
- Material is available as two components
- Costly in technology, investment and expenditure

Flexibility

- High flexibility
- High flexibility
- Hard elastic, no flexibility

Outdoors use

- Suitable for outdoor use
- Doming resin is resistant to weather and UV-light
- Suitable for outdoor use
- Doming resin is resistant to weather and UV-light
- Not suitable for outdoor use
- Doming resin is not resistant to weather and UV-light, prone to discolouring

Profitability

- Low investment costs for both manual and industrial scale doming
- Low costs for manual doming
- High investment costs for industrial manufacture
- Additional costs for storage of hazardous materials and cleanup
- Low costs for manual doming
- High investment costs for industrial manufacture
- Additional costs for storage of hazardous materials and cleanup

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