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Colorful

new
colorful
doming resin
SurACer® 4460c

SurACer® 4460c
DOMING RESIN

Product- and Application Information

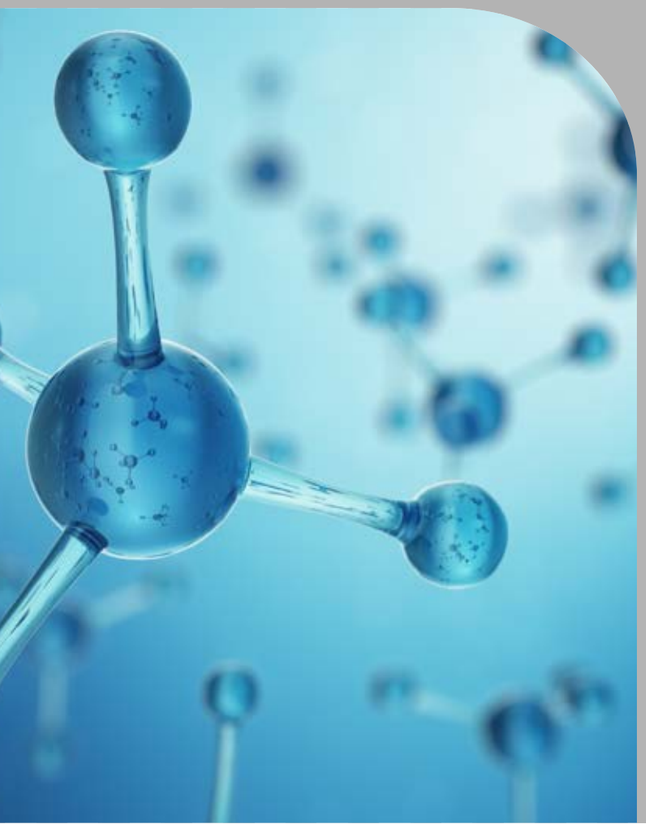
The new colorful-transparent, isocyanate- and solvent-free, low-viscosity, 2-components and UV-cured doming resin based on an SH/En system. In several colors available. With glitter combined. Pre-confectioned for immediate application.

Colorful

domin resin

SurACer® 4460c

The new colorful-transparent, isocyanate- and solvent-free, low-viscosity, 2-kompo-nents and UV-cured doming resin based on an SH/En system.



Welcome to SurA Chemicals GmbH. The company has a long experience and an extensive know-how in the fields of protective and decorative coatings, adhesives, special chemicals such as hydrophobic agents and adhesion promoters, systems and equipment for surface pretreatment, as well as contract manufacturing for the development and production of customer-specific products.

The company is TÜV certified according to DIN EN ISO 9001: 2015. Our products comply with the RoHS directive and are registered according to the REACH regulation. The devices manufactured in our house are CE-marked.
Furthermore, we are partners in international and national research projects and cooperate with large companies and institutes from various countries.

Content

Compliant in accordance to

RoHS & REACH regulations

SurACer® 4460c doming resin is compliant in accordance with the EU directive 2011/65/EC. All starting substances have been pre-registered according to the REACH regulations (EC) No. 1907/2006. SurA Chemicals is certified with DIN EN ISO 9001:2015.

This instruction guide will ensure the proper use of the SurACer® 4460c doming resin and prevent eventual mistakes, which can lead to quality insufficiencies or adverse effects.

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 meeting 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 minutes.

Colorful
doming resin
SurACer® 4460c

Isocyanate- and solvent-free

Reduction of skin irritations and ecological loads

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® 4460c doming resin

SurACer® 4460c is a colorful-transparent, two-component, isocyanate- and solvent-free, low viscosity doming resin based on an SH/En system. The SurACer® 4460c doming resin impressively enhances the decorative effect of printed motives on polyester, PVC and metallic foils as well as on aluminum or plastics. SurACer® 4460c doming resin is compliant in accordance with the EU directive 2011/65/EC. All starting substances have been pre-registered according to the REACH regulations (EC) No. 1907/2006. SurA Chemicals is certified with DIN EN ISO 9001:2015.

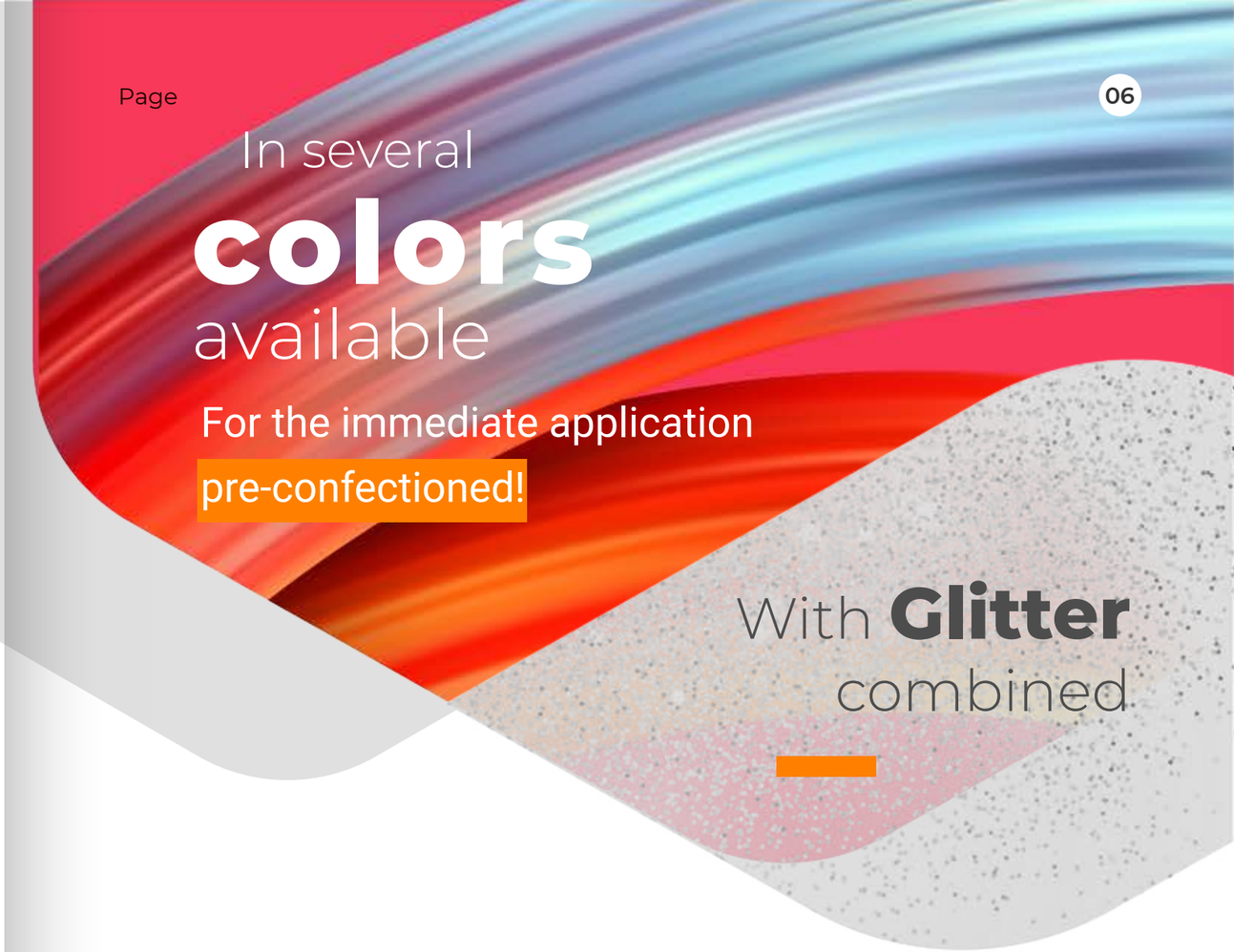
3.1 Colorful doming layers

The SurACer® 4460c doming resin is a further development of the successful doming resin SurACer® 4460. The new material is colorful confectioned and is available in the brilliant colors red, blue, yellow and green. The decorative effect of printed motives can be enhanced in a particular way by applying colorful (instead of colorless) 3D doming layers. Either on polyester, PVC and metallic foils or on aluminum and plastic moldings, the colored doming coatings of the SurACer® 4460c can be used almost anywhere and can be impressively combined with colorful or colorless printed motives.

Furthermore, the creation of individual color-tones and thus the production of unique domes is possible by freely mixing two or more basic colors of the SurACer® 4460c doming resin.

Although colorful, the new doming resin SurACer® 4460c retains the characteristic high transparency of the SurACer® doming resins and thus enhances the decorative 3D effect of doming articles such as stickers, labels or badges in an impressive way.

The colorful doming resin SurACer® 4460c is pre-confectioned in numreous variations (see *3.10 Product overview*). This eliminates additional complicated and time consuming preparation steps (i.e. mixing), it enables easy handling, as also keeps the consumption of consumables to a minimum.



3.2 Glitter doming layers

Another brilliant feature of the SurACer® 4460c doming resin is its combination with glitter. Glitter give colorful as also colorless domes a higher decorative effect and an aditional feeling of luxury. These are available in silver and gold and are pre-confectioned for the immediate use, just like the color variations.

The glitter can be offered in combination with one of the four basic colors of the SurACer® 4460c or for highlighting the glitter effect with the colorless doming resin SurACer® 4460.

SurACer® 4460c

Colorful&
Glitter doming resin

For the immediate application

pre-confectioned!

3.3 Material properties SurACer®

SurACer® 4460c 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® 4460c doming resin consists of two components, component 1 and component 2. After the two components have been successfully mixed, SurACer® 4460c doming resin has a pot-life of at least five days, if stored in the refrigerator. 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® 4460c by means of UVA-light guarantees the shortening of manufacturing processes up to product shipment. By curing SurACer® 4460c 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® 4460c doming resin is UV and climate stable and therefore shows neither yellowing nor loss of flexibility in outdoor use.

Very long pot-life of at least 5 days

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.

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® 4460c achieves an effective three-dimensional optic. The application of SurACer® 4460c can be done in a continuous or discontinuous process with the help of suitable dispensing and curing technology. Thanks to the significant reduction of the viscosity of SurACer® 4460c compared to SurACer® 4450, the processing and application of the material on stickers, labels or badges is faster and easier. The reduced viscosity leads to a lower layer thickness, which gives the end-product an increased, unique flexibility. For this reason, the SurACer® 4460c doming resin is excellent for the production of more flexible domes. The lower doming layers result in a reduction of material consumption and thus in an additional financial advantage.

UV-Light cured
very fast curing process

Material curing within 8 -12 minutes under UVA-light. For best curing results use the light curing boxes SurALux

Material advantages
at a glance

SurACer® 4460c guarantees the production of domes with outständing properties:

Colorful and glitter doming
Brilliant colorful domes in four basic colors
With glitter combined

UV-Licht curing
Very fast curing process within minutes

Isocyanate- and solvent-free
Reduction of skin irritations & ecological load

Low viscosity
Quicker application and processability
Easier dispensing
Greater product flexibility
Material saving

Pre-confectioned
Pre-confectioned for the immediate application

Very long pot-life
Easy handling
Material saving

Stable towards UV and climate
Absolutely suitable for outdoors

High Adhesion
Longer lifespan

The following instructions are a guideline for the correct processing and use of SurACer® 4460c. When working with SurACer® 4460c doming resin, the proper handling by storage, mixind ratio, mixing process, pot-life and curing process of the material is to be considered.

3.4 Storage

Each component of SurACer® 4460c (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 (blue plastic bottle) with component 2 (braun 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 (see P. 12).

Warning! The viscosity of the components may alter during storage and transport of SurACer® 4460c 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.

3.5 Mixing ratio

In order to obtain the optimum SurACer® 4460c 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 special weighing and mixing containers.

The SurACer® 4460c doming material is available in different container-sizes for easier handling. These are 1 kg containers, consisting of component 1 (blue bottle) and component 2 (brown 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 container types, the weighing and mixing of the components should be carried out in a separate 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.

In several container-sizes available

High adhesion
Longer lifespan

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

3.6 Mixing process

The different color-pigments, responsible for the coloration of the SurACer® 4460c , are located in component 1 of the doming resin. Thus, the mixing process can take place with any component 2 of the colorless SurACer® 4460 doming resin. On the other hand, the glitter variations SurACer® 4460gl/s and SurACer® 4460gl/g are located in component 2 of the SurACer® 4460c doming resin. Component 2 of the SurACer® 4460c doming resin is called SurACer® 4460gl. The mixing process can, thus, take place with any component 1 of the colorless SurACer® 4460 doming resin. This results in easier use of both materials.

For the creation of colorful and glitter doming resin one can mix a colorful component 1 of the SurACer® 4460c with a glitter component 2 of the SurACer® 4460gl. This ensures a great variability in the use of the colorful doming resin SurACer® 4460c and the glitter variations of the SurACer® 4460gl.

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® 4460 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. For weighing and mixing containers with a capacity of 500 or 1,000 ml, a propeller-type stirrer shall be used. For weighing and mixing containers with a capacity of above 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.

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.

Achtung! Bei der Glitzervariante des Domingharzes SurACer® 4460c (in farbiger oder farbloser Ausführung) ist die Komponente 2 bedingt durch ihre chemische Zusammensetzung thixotrop. Die Komponente 2 hat demnach eine wesentlich höhere Viskosität, welche durch mechanische Beanspruchung (z.B. Rühren oder Druckbelastung) verringert wird. Erst dann ist ein erfolgreicher Mischungsvorgang der Komponenten 1 und 2 möglich.

The SurAChem® 5380 special cleaner can be used for the cleaning of stirrers, mixing cups and surfaces.

3.7 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® 4460c, once component 1 and component 2 have been mixed in the prescribed proportions, their pot-life will be 5 days under refrigerated storage.

In several **colors** available

For the immediate application pre-confectioned!

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® 4460c 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® 4460c after the expiration of its pot-life is not guarantied.

3.9 Curing process

The curing of SurACer® 4460c doming resin is performed in the specially-developed SurA-Lux 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 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® 4460c 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 curing 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® 4460c

Test the curing of SurACer® 4460c 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:

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

Very long pot-life of at least 5 days

SurACer® 4460c

With **Glitter** combined

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).

3.10 Product overview

Product	Description	Container-sets
SurACer® 4460cr	doming resin in color red	1kg, 5kg, 15kg
SurACer® 4460cb	doming resin in color blue	1kg, 5kg, 15kg
SurACer® 4460cy	doming resin in color yellow	1kg, 5kg, 15kg
SurACer® 4460cg	doming resin in color green	1kg, 5kg, 15kg
SurACer® 4460cr-gl/s	doming resin in color red with silver-glitter	1kg, 5kg, 15kg
SurACer® 4460cb-gl/s	doming resin in color blue with silver-glitter	1kg, 5kg, 15kg
SurACer® 4460cy-gl/s	doming resin in color yellow with silver-glitter	1kg, 5kg, 15kg
SurACer® 4460cg-gl/s	doming resin in color green with silver-glitter	1kg, 5kg, 15kg

Product	Description	Container-sets
SurACer® 4460cr-gl/g	doming resin in color red with gold-glitter	1kg, 5kg, 15kg
SurACer® 4460cb-gl/g	doming resin in color blue with gold-glitter	1kg, 5kg, 15kg
SurACer® 4460cy-gl/g	doming resin in color yellow with gold-glitter	1kg, 5kg, 15kg
SurACer® 4460cg-gl/g	doming resin in color green with gold-glitter	1kg, 5kg, 15kg
SurACer® 4460gl/s	colorless doming resin with silver-glitter	1kg, 5kg, 15kg
SurACer® 4460gl/g	colorless doming resin with gold-glitter	1kg, 5kg, 15kg

4. Doming resins comparison

SurACer® 4460c	Polyurethane	Epoxy resins
Health and safety during process		
▹ Non-toxic constituents, such as isocyanates and solvents	▹ Toxic constituents, main constituents are isocyanates of acute toxicity	▹ Toxic and corrosive constituents, main constituents are epoxies with properties hazardous to health
▹ No dangerous goods, can be safely stored and transported	▹ May cause skin and eyes irritation	▹ May cause skin and eyes irritation
	▹ Hazardous material, special precautions by storage and transport	
Disposal		
▹ Reduced ecological pollution	▹ Heavy environmental pollution	▹ Environmental pollution
▹ Standard commercial waste disposal	▹ Hazardous waste disposal at additional costs	▹ Hazardous waste disposal at additional costs

SurACer® 4460c	Polyurethane	Epoxy resins
Curing process		
▹ UVA-curale within minutes	▹ Air-drying, slowly up to several hours	▹ Air-drying, slowly up to several hours
▹ Curing process not affected by humidity	▹ At room temperature in a ventilated area, place of work is absolutely necessary	▹ At room temperature in a ventilated area, place of work is absolutely necessary
	▹ Curing process affected by humidity	▹ Curing process affected by humidity
Handling		
▹ Very long pot-life (days or weeks)	▹ Very short pot-life (minutes)	▹ Very short pot-life (minutes)
▹ Material is available as two components	▹ Material is available as two components	▹ Material is available as two components
▹ Low technology requirements for mixing and application processes	▹ Costly in technology, investment and expenditure	▹ Costly in technology, investment and expenditure
Flexibility		
▹ High flexibility	▹ High flexibility	▹ Hard elastic, no flexibility
Outdoors use		
▹ Suitable for outdoor use	▹ Suitable for outdoor use	▹ Not suitable for outdoor use
▹ Doming resin is resistant to weather and UV-light	▹ Doming resin is resistant to weather and UV-light	▹ 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	▹ Low costs for manual doming
	▹ High investment costs for industrial manufacture	▹ High investment costs for industrial manufacture
	▹ Additional costs for storage of hazardous materials and cleanup	▹ Additional costs for storage of hazardous materials and cleanup

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