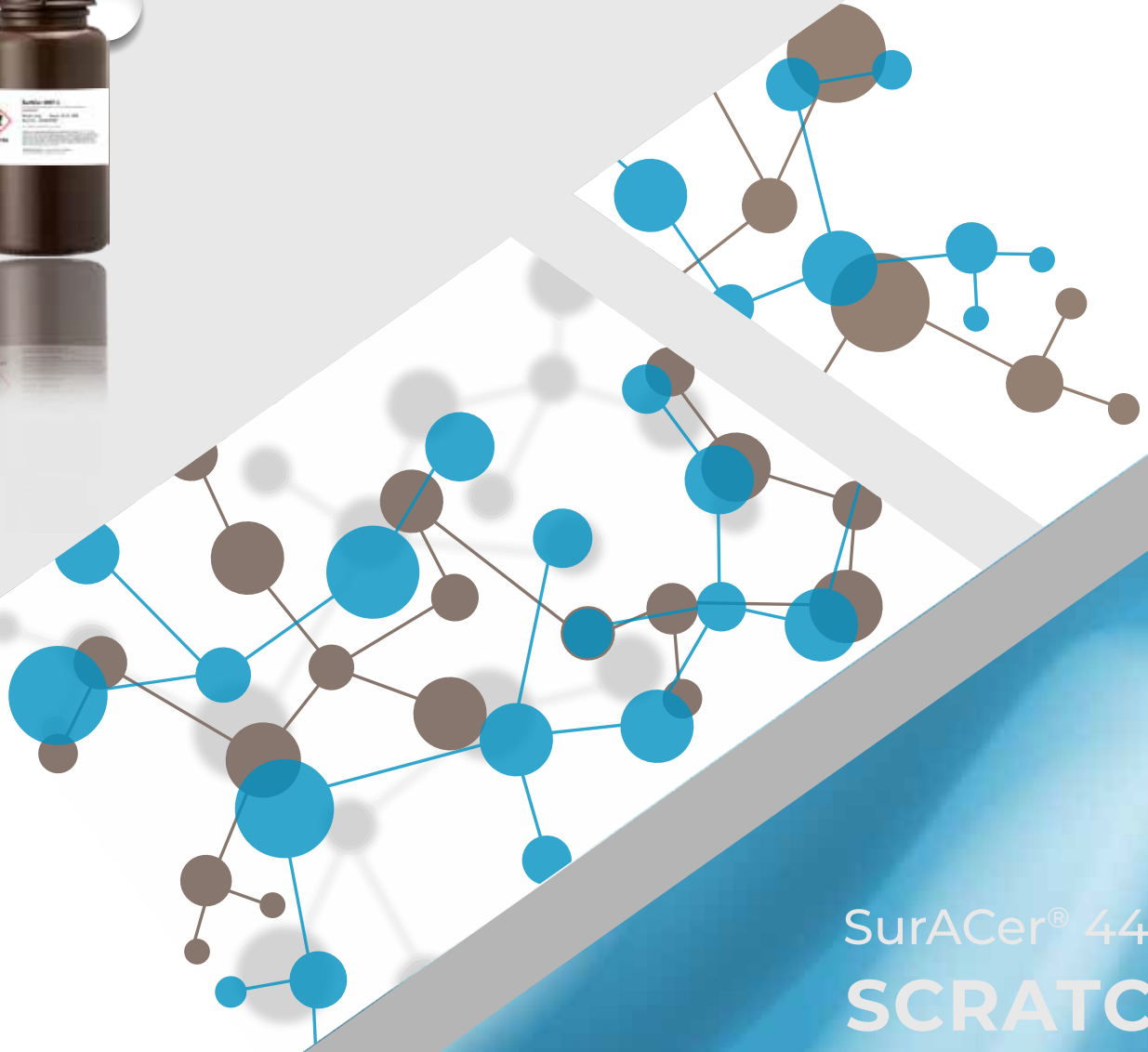
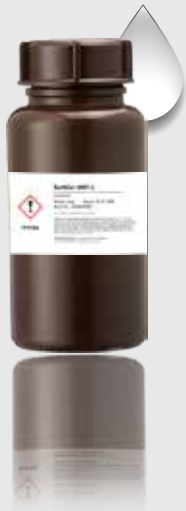


# SURA CHEMICALS

Passion for chemistry

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## SurACer® 4497-1 SCRATCH- RESISTANT COATING

Product and Application Information

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The isocyanate- & solvent-free, 1-component, UV-curing epoxy-based scratch-resistant coating. Excellent for thin transparent coatings of extremely high scratch resistance on various surfaces!

# Scratch-resistant coating

SurACer<sup>®</sup> 4497-1

The isocyanate- & solvent-free,  
**1-component**, UV-curing  
 epoxy-based scratch-resistant  
 coating!



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 focus of our technologies and innovative products is on the sectors of chemical industry, automotive, micro/-electronics, electrical engineering, healthcare, optics, glass & metal industry, plastics processing, printing and graphics industry, as also solar technology.

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. Besides manufacturing our own products, we cooperate in various national and EU-wide projects with leading companies and institutions from numerous countries.

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## Compliant according to RoHS & REACH directive

SurACer® 4497-1 scratch-resistant coating is registered according to REACH regulations (EC) No. 1907/2006 and is compliant in accordance with the EU directive 2011/65/EC (RoHS). SurA Chemicals is TÜV certified with DIN EN ISO 9001:2015.



## SurACer® 4497-1 Scratch-resistant coating

## Isocyanate- and solvent-free

Reduction of skin irritation  
and ecological load

## 1. Introduction

This instruction for use is intended to ensure the correct use of SurACer® 4497-1 scratch-resistant coating and prevent possible errors that can lead to quality restrictions or undesirable effects. When using SurACer® 4497-1

scratch-resistant coating, proper handling during processing, application, curing, storage and, if necessary, surface pretreatment is required.

## 2. SurACer® 4497-1 scratch-resistant coating

SurACer® 4497-1 is an isocyanate- and solvent-free, 1-component epoxy-based scratch-resistant coating for interior use. SurACer® 4497-1 enables transparent protective coatings for screen printing, pad printing as well as inkjet and transfer printing on materials, such as plastics, metals, glass and ceramics. The SurACer® 4497-1 scratch-resistant coating can also be used to effectively enhance the aesthetic effect of print motives in a wide range of applications, such as on polyester, PVC and metallic foils as well as on moldings. The scratch-resistant coating can

also be used for the individual manufacture of jewelry and accessories. In that way, it can be applied as a thin layer, e.g. on printed templates for insertion in jewelry blanks / bezel cups. Thicker coatings can be used for sealing or similar, such as cabochons or relief-like structures. SurACer® 4497-1 can also be used as resin for the production of brilliant moldings. With small, incorporated details such as pearls, glitter or flowers can be designed fancy unique pieces. SurACer® 4497-1 offers versatility and can be processed very easily and individually.

## Advantages

at a glance



### Isocyanate- and solvent-free

Reduction of skin irritation  
and ecological load



### UV-light curing

Very fast curing process  
within minutes



### Extremely high scratch resistance

Excellent for protecting a wide  
variety of material surface  
High scratch resistance up to 14 N



### Thin or thick layers

Applicable in different  
layer thicknesses



### High adhesion

Longer lifespan



### High transparency

Brillante effect optics



### 1-component coating

Easy handling

## 2.1 Processing

The SurACer® 4497-1 scratch-resistant coating can be applied by means of suitable coating techniques such as spraying, brushing, dip coating, spin coating as well as manual or automatic dispensing. It can also be applied with fine brushes or fiber pens. To achieve a better material flow, the SurACer®

4497-1 scratch-resistant coating or the surface to be coated can be kindly warmed. Avoid direct sunlight during application. To achieve the required application parameters layers of 0.5 to 1.0 mm thicknesses should be preferably produced .

## 2.2 Curing process

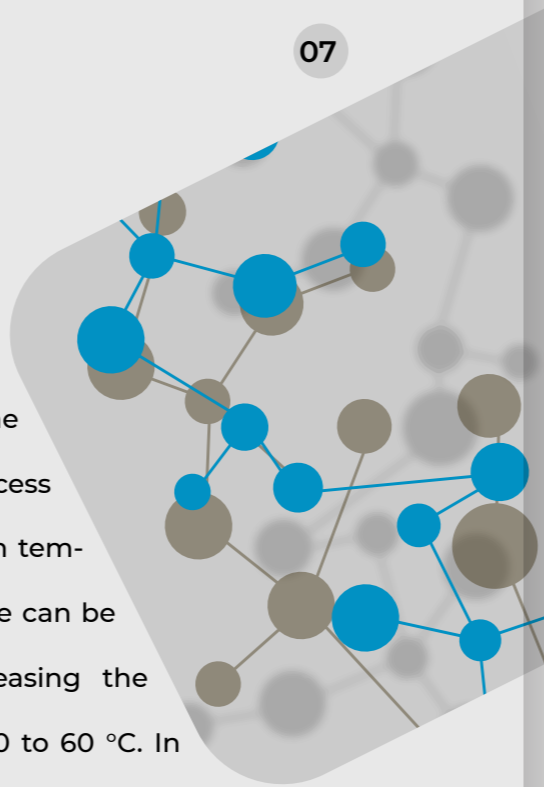
The curing of SurACer® 4497-1 is performed using UV-light irradiation. The curing process for layers of 0.5 to 1.0 mm thickness takes between 8 to 12 min. with an energy between 3 and 6 J / cm<sup>2</sup>. For thicker layers a

longer curing time is required. In general, the curing time depends on the coating area and height and must be determined in preliminary tests.



In the case of thick layers in casting molds, a step-by-step hardening process (layers) and the use of UV-permeable casting molds may be necessary for a perfect hardening process. The UVA irradiation is followed by a post-curing process at room temperature for at least 24 hours. Then the final hardness of the SurACer® 4497-1 scratch-resistant coating is achieved. In order to avoid ripple phenomena on the surface of the SurACer® 4497-1 scratch-resistant coating after curing, the light curing box should be warmed up by an initial irradiation cycle including the baking sheet but without material for 2 to 3 minutes. After UV curing the product is

stackable and can be either transported or used. The post-curing process can occur at room temperature. This time can be reduced by increasing the temperature to 40 to 60 °C. In order to achieve the material properties specified by the manufacturer, it is necessary to use the series of SurALux light curing boxes, which has been developed exclusively for this purpose.



## Dispensing & curing technology



SurA Chemicals has a long experience in the field of dispensing and curing technology and provides complete solutions for the dispensing of liquid media and the UV curing thereof. The company's portfolio comprises light-curing boxes, dispensing devices, compressors, pressure tanks and surface pretreatment technologies, as also dispensing and curing accessories and consumables.

**High adhesion**  
Longer lifespan

**High scratch resistance**  
up to 14 N

## 2.3 Stability and storage

The SurACer® 4497-1 scratch-resistant coating is stable for at least 6 months if stored under dark conditions and in the refrigerator. This means that under the specified storage conditions the SurACer® 4497-1 can be processed for at least 6 months. Before use

the product must obtain room temperature. After the expiration date applications are possible, however, in this case without guarantee. Information on hazards, labeling, protective measures and transport are given in the product specific safety data sheet.

## 2.4 Surface pretreatment

For the best adhesion results, the surfaces to be coated should be free of contamination and organic residues. Before applying the SurACer® 4497-1 scratch-resistant coating, cleaning can be done using suitable cleaning agents such as ethanol or isopropanol.

Due to their molecular structure materials such as polymers have low surface energies. The lack of reactive groups on the material surface can impair adhesion. Such materials

require additional pretreatment of their surface in order to enable high adhesive strengths between the substrate and the coating. This can be done according to the principle of surface silication using the SurASil® process:



## Surface silication

with the SurASil® Process



By the SurASil® process, a gaseous, silicon-containing precursor is fed into the fuel gas mixture of a burner. The combustion energy of the flame creates highly reactive compounds that are deposited on the surface of the material. As a result, very dense and firmly bonded silicate layers (layer thickness approx. 20 – 100 nm) with high surface energy are formed on various material surfaces, such as metals, glass, ceramics, plastics and composite materials.



To further increase the adhesive strength between the SurACer® 4497-1 scratch-resistant coating and the substrate to be coated, the silicon-organic SurAChem® GE 141 adhesion promoter can be applied. The SurAChem® GE 141 adhesion promoter is excellent for increasing the adhesion of epoxy-based coatings and, therefore, for the SurACer® 4497-1 scratch-resistant coating. The adhesion promoter can be applied by spraying, brushing, dipping, roll coating and dispensing as well as, in the case of small substrate areas, using a brush, cotton pad or similar.

The molecules of the SurAChem® GE 141 adhesion promoter are structured in such a way that they form a bridge via functional groups between the SurACer® 4497-1 scratch-resistant coating and the substrate used or rather the silicon-containing layer deposited by means of surface silication on the substrate used. The SurAChem® GE 141 adhesion promoter is suitable for metal, glass, ceramic and plastic surfaces.

## UV-light curing

very fast curing process

Curing of thin layers by means of UVA irradiation within 8 bis 12 minutes. For the best curing results use the series of SurALux curing boxes.

Available in various container sizes

### 2.5 Packaging

The SurACer® 4497-1 scratch-resistant coating is available in containers of 100 g, 250 g, 500 g and 1000 g as well as in 5 kg and 10 kg.

### 2.6 Technical data

#### Technical data of SurACer® 4497-1 scratch-resistant coating

Appearance	viskous, colorless to light yellow, transparent liquid
Density	1,16 g/cm <sup>3</sup>
Odor	odorless
Viskosity according to DIN 53019	135 mPas (20 °C)
Solubility	in all common organic solvents



### Technical data of the coating


Appearance	colorless, hard decorative protective layer
Cross cutt rating (DIN 53151)	Gt. 0
Adhesion according to DIN 53283	40 - 50 MPa
Hardness after post curing (hardness testing model 318)	13 - 14 N
Environment test (VDA test, 160 h)	no infiltration, detachment or discoloration of the coating layer

Information on hazards, labeling, protective measures and transport are given in the

product specific safety data sheet.


For eventual questions or doubts concerning your product, we encourage you to get in touch with SurA Chemicals GmbH. Our verbal and written application-technical consultation is the best to our knowledge and belief and is a non-binding notice, also with regard to any third-party proper-

ty rights. However, this advice does not release the user of our products from carrying out their own testing for the intended purpose. Any liability only relates to the value of the products supplied by us and used by the user. Of course, we guarantee the perfect quality of our products in accordance with our sales and delivery conditions.

 Am Poesener Weg 2  
07751 Bucha  
Germany

 [info@surachemicals.de](mailto:info@surachemicals.de)

 [www.surachemicals.com](http://www.surachemicals.com)

 Tel.: +49 (0) 3641 352920  
Fax: +49 (0) 3641 352929

# SURA CHEMICALS GMBH



Am Poesener Weg 2  
07751 Bucha  
Germany



[info@surachemicals.de](mailto:info@surachemicals.de)



[www.surachemicals.com](http://www.surachemicals.com)



Tel.: +49 (0) 3641 352920

Fax: +49 (0) 3641 352929

