



# 3

## GLUING

Swarovski products can be glued to a wide range of materials in a variety of application areas. The greatest quality is ensured by following the entire application process.

<b>44</b>	Product Overview
<b>44</b>	Machines and Tools
<b>48</b>	Suppliers
<b>50</b>	Application
<b>78</b>	Useful Information
<b>82</b>	Quick Assistance

# PRODUCT OVERVIEW

The following products are suitable for gluing:

	GLUING WITH ADDITIONAL ADHESIVE SYSTEM
Round Stones	✓
Fancy Stones	✓
Settings	✓
Cabochon Pavé	✓
Crystal Pearls	✓
Pendants	✓
Flat Backs No Hotfix	✓
Self-adhesive Elements	— *
Synthetics	✓
Plastic Trimmings: Basic Bandings	✓ **
Metal Trimmings: Flat Back Bandings/Motifs	✓
Crystal Mesh	✓

\* See separate chapter Self-adhesive Elements  
\*\* Plastic Trimmings made of PE or PP are not suitable for gluing.

# MACHINES AND TOOLS

The following machines, tools and aids can be used for the various processes involved in gluing Swarovski products:



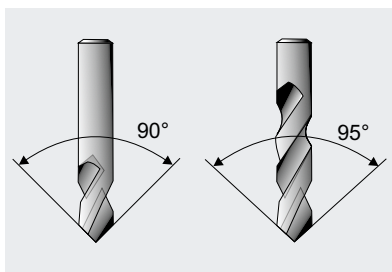
CNC milling machine



Box column drill

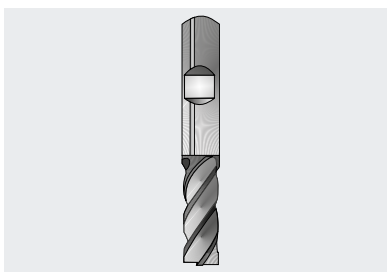


Hand drill



Twist drill 90°/  
NC drill 90°  
for  
XILION Chatons

Twist drill 95°/  
NC drill 95°  
for  
XIRIUS Chatons



Milling cutter



Test Pen (art. 9030/000)



Isopropyl alcohol/Acetone



Blow torch



Corona treater



Plasma cleaner



Precision balance



Plastic gloves



Protective eyewear



Dispensing robot



Fluid dispenser

Courtesy of I&J Fisnar, Inc.



Dispensing gun



Dispensing syringes with dispensing tips



Mixing Nozzle (art. 9030/126)



**CG 80 1C**  
One-component epoxy resin glue: 10 ml and 310 ml cartridge



**CG 500 (A+B)**  
Two-component epoxy resin glue: 50 ml cartridge (25 ml resin + 25 ml hardener)



**CG 500 (A+B)**  
Two-component epoxy resin glue: 100 ml tube (50 ml resin + 50 ml hardener)



**CG 500 (A+B)**  
Two-component epoxy resin glue: 2 l box (1 l resin + 1 l hardener)



**CG 610 (A+B)**  
Two-component epoxy resin glue: 50 ml cartridge (33.3 ml resin + 16.7 ml hardener)



**CG 610 (A+B)**  
Two-component epoxy resin glue: 750 ml box (500 ml resin + 250 ml hardener)



Different glues



**Chaton Sieve** for Chatons size PP 0 - PP 1  
(art. 9030/003)



**Chaton Sieve** for Chatons size PP 2 -  
PP 20 (art. 9030/001)



**Chaton Sieve** for Chatons size PP 21 -  
SS 34 (art. 9030/002)



**Vacuum pump** with silicone hose  
(art. 9040/022), can be adapted to a  
pick-up system by attaching a dispensing tip  
(to be ordered separately).



**Tweezers**



**Wax stick**



**UV light**



**Drying oven**

# SUPPLIERS

This list provides an overview of selected suppliers worldwide.

MACHINES & TOOLS	SUPPLIER	CONTACT
90°/95° NC drill/milling cutter	Dixi Holding SA Hahn & Kolb GmbH Hoffmann GmbH Reich Präzisionswerkzeuge Wedco	www.dixi.ch www.hahn-kolb.de www.hoffmann-group.com www.reich.at www.wedco.at
Test Pen	Swarovski: art. 9030/000	www.swarovski-professional.com
Fluid dispenser (with/without vacuum suction)	Epoxy & Equipment Technology Pte Ltd Hottemp (M) Sdn. Bhd. I & J Fisnar, Inc. Vieweg GmbH Musashi Engineering Europe GmbH	www.eet.com.sg www.hottemp.com.my www.fisnar.com www.dosieren.de www.musashi-engineering.co.jp
Mixing Nozzle for CG 500 (A+B) and CG 610 (A+B) (10 pcs.)	Swarovski: art. 9030/126	www.swarovski-professional.com
CG 80 1C One-component epoxy resin glue	Swarovski: art. 9030, CG 80 1C 10 ml cartridge, Asia, Europe/America art. 9030, CG 80 1C 310 ml cartridge, Asia, Europe/America	www.swarovski-professional.com
CG 500 (A+B) Two-component epoxy resin glue	Swarovski: art. 9030, CG 500 (A+B) 50 ml cartridge, Asia, Europe/America art. 9030, CG 500 (A+B) 100 ml tube, Asia, Europe/America art. 9030, CG 500 (A+B) 2 l box, Asia, Europe/America	www.swarovski-professional.com
CG 610 (A+B) Two-component epoxy resin glue	Swarovski: art. 9030, CG 610 (A+B) 50 ml cartridge, Asia, Europe/America art. 9030, CG 610 (A+B) 750 ml box, Asia, Europe/America	www.swarovski-professional.com
Araldite® adhesives	Bodo Möller Chemie GmbH	www.bm-chemie.com
3M™ Scotch-Weld™ adhesives	3M	www.3m.com
DELO adhesives	DELO Industrial Adhesives	www.delo.de
Elastosil® adhesives / MS Clear HS	Wacker Chemie AG	www.wacker.com
Loctite® adhesives	Henkel Ltd.	www.loctite.com
C. Kreul Hobby Line Schmuckstein Kleber	C. KREUL GmbH & Co KG	www.c-kreul.com
CHRISANNE CLOVER Crystal Glue	Chrisanne Ltd	www.chrisanne.com

MACHINES & TOOLS	SUPPLIER	CONTACT
Tile glues / joint sealers	PCI Augsburg GmbH KERAKOLL Spa ARDEX GmbH	<a href="http://www.pci-augsburg.de">www.pci-augsburg.de</a> <a href="http://www.kerakoll.com">www.kerakoll.com</a> <a href="http://www.ardex.com">www.ardex.com</a>
RBC adhesive 2K	RBC Industries, Inc.	<a href="http://www.rbcepoxy.com">www.rbcepoxy.com</a>
HS 34 S 233 and HS 34 S 77	Adhesive Products GmbH	<a href="http://www.ap-adhesives.com">www.ap-adhesives.com</a>
Chaton Sieve	Swarovski: For Chatons size PP 0 - PP 1: art. 9030/003 For Chatons size PP 2 - PP 20: art. 9030/001 For Chatons size PP 21 - SS 34: art. 9030/002	<a href="http://www.swarovski-professional.com">www.swarovski-professional.com</a>
Vacuum pump with silicone hose, can be adapted to a pick-up system by attaching a dispensing tip	Swarovski: art. 9040/022	<a href="http://www.swarovski-professional.com">www.swarovski-professional.com</a>
Vacuum pick-up system	Epoxy & Equipment Technology Pte Ltd I & J Fisnar, Inc. Musashi Engineering Europe GmbH	<a href="http://www.eet.com.sg">www.eet.com.sg</a> <a href="http://www.fisnar.com">www.fisnar.com</a> <a href="http://www.musashi-engineering.co.jp">www.musashi-engineering.co.jp</a>
Pick-up stick	Crystal Ninja	<a href="http://www.crystalkatana.com">www.crystalkatana.com</a>
Dispensing gun	Vieweg GmbH Perigee Direct	<a href="http://www.dosieren.de">www.dosieren.de</a> <a href="http://www.epoxysupply.com">www.epoxysupply.com</a>
Dispensing tip for adapting a vacuum pump	Gonano Dosiertechnik GmbH Vieweg GmbH	<a href="http://www.dosieren.net">www.dosieren.net</a> <a href="http://www.dosieren.de">www.dosieren.de</a>
UV light	DELO Industrial Adhesives Dr. Hönle AG Heraeus Holding GmbH Herbert Waldmann GmbH & Co. KG	<a href="http://www.delo.de">www.delo.de</a> <a href="http://www.hoenle.de">www.hoenle.de</a> <a href="http://www.heraeus.com">www.heraeus.com</a> <a href="http://www.waldmann.com">www.waldmann.com</a>
Drying oven	Heraeus Holding GmbH VWR International, LLC.	<a href="http://www.heraeus.com">www.heraeus.com</a> <a href="http://www.vwr.com">www.vwr.com</a>



# APPLICATION

When gluing Swarovski crystals, optimal results are obtained by **coordinating the entire application process**. Following the application steps in the right order is very

important. Experience has shown that the most common reasons for crystals becoming detached are inappropriate areas of application, poorly produced cavities, unsuitable gluing systems, and

insufficient quantities of glue. **Product-specific application instructions** are detailed later in this section.

## CAVITY PRODUCTION

Many Swarovski crystals require cavities in order to be applied to materials. A properly produced cavity in combination with a suitable gluing system ensures a stylish, long-lasting application. The cavity

makes it easy to glue properly and ensures higher **protection of the crystal against mechanical and chemical stress**. There are several different production methods and cavity types. Always take

into consideration the requirements and base material of the finished product when choosing the appropriate cavity, pre-treatment method, and kind of glue.

## PRODUCTION METHODS

- **Casting:** To reproduce cavities, particularly in the jewelry sector, the cavities can be made when the metal component is cast. When following this process, the cavities must be cut into the original model. To prevent the bottom of the cavity being rounded off, which would result in the crystal sitting too high, it is recommended that an additional indentation is made when producing the original model.
  - Lost wax in jewelry manufacturing
  - Rubber mold process in jewelry manufacturing
- **Injection molding:** Is the most commonly used manufacturing process for the fabrication of plastic and metal parts. A wide variety of products

are manufactured using injection molding, which vary greatly in their size, complexity, and application. The injection molding process requires the use of an injection molding machine, raw plastic or metal material, and a mold. The plastic or metal is melted in the injection molding machine and then injected into the mold, where it cools and solidifies into the final part.

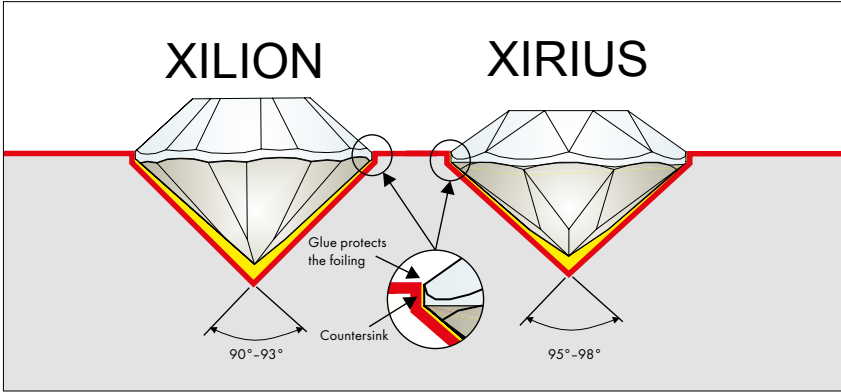
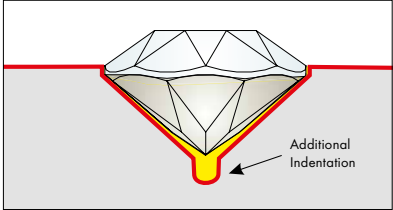
- **Milling** is when materials are machined using a milling machine and milling cutter. Milling machines can be fitted with appropriate tools depending on the materials, e.g. for working with metal and plastic, wood, or natural stone. Modern CNC machining centers offer the greatest precision and

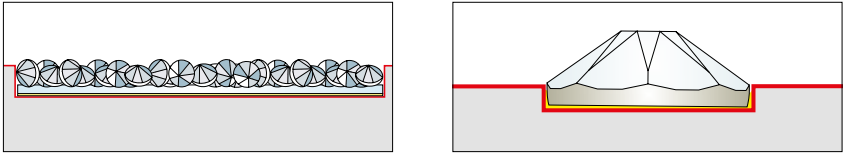
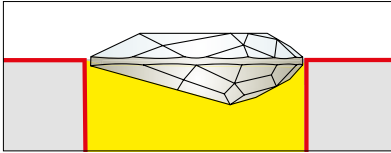
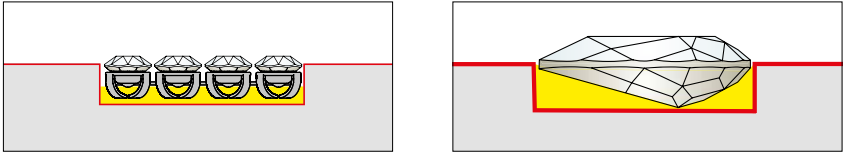
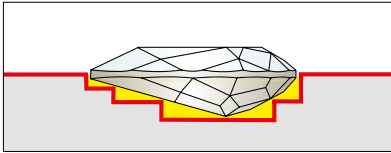
can be used to produce **cavities of every shape** necessary. Please note that when machining natural stone, ceramic, or glass, for example, special diamond-tipped tools must be used.

- **Drilling** is when materials are machined using a power drill and drilling tool.
- **Water jet cutting** allows materials to be separated via a high-pressure jet of water. Economic reasons make water jet cutting machines ideal for certain crystal shapes that are integrated into flat materials. Please note that only **end-to-end cavities** can be produced in this way. In addition, materials that swell through water cannot be worked with. Absorbent materials must be fully dried before gluing the crystal.

CAVITY TYPES

Depending on the Swarovski products used, various cavity types can be made using the different production methods.

SWAROVSKI PRODUCTS	PRODUCTION METHOD	CAVITY TYPE
Round Stones	Milling Drilling	<p><b>Chaton cavity</b></p>  <p>The optimal cavity for a XIRIUS Chaton is produced at an <b>angle of 95° – 98°</b>, for a XILION Chaton at <b>90° – 93°</b>. The cavity should have the same maximum diameter as the crystal plus at least 0.1 mm. The stone sizes available for Swarovski crystals can be found on page 21. For particularly large crystals with a prominent girdle, it is advisable to use an additional countersinking process. Please find a cavity calculator on <a href="http://SWAROVSKI-PROFESSIONAL.COM">SWAROVSKI-PROFESSIONAL.COM</a>.</p>
Round Stones	Casting	<p><b>Chaton casting cavity</b></p>  <p>For jewelry manufactured by casting, an <b>additional indentation</b> at the bottom of the cavity can be drilled to avoid a rounded tip, therefore preventing the crystal from being raised out of the cavity.</p>

CAVITY PRODUCTION	CHECKING SURFACE TENSION AND PRE-TREATMENT	CHOICE OF GLUE	DOSAGE AND SETTING	POST-CLEANING AND CURING
SWAROVSKI PRODUCTS	PRODUCTION METHOD	CAVITY TYPE		
Flat Backs No Hotfix Synthetics*	Casting Milling	<b>Indentation</b> 		
<p>When gluing an article with a <b>flat back</b> it is also advisable to create a cavity as shown here. This cavity ensures that the crystal is better protected against mechanical and chemical stress. The depth of the cavity depends on the height of the girdle (Flat Back) or the height of the Synthetics and the thickness of the base material.</p>				
Round Stones Flat Backs No Hotfix Fancy Stones	Milling Drilling Water jet cutting	<b>End-to-end cavity</b> 		
<p>An end-to-end cavity is the <b>simplest option</b> when producing cavities. When selecting the glue (page 59), please note the additional instructions regarding the gluing gap.</p>				
Plastic Trimmings Crystal Mesh Fancy Stones	Casting Milling	<b>Blind hole</b> 		
<p>A blind hole is another option when producing cavities. It allows Swarovski crystals in a variety of heights to be set and protected in the material. When selecting the depth of the cavity, ensure that there is still a <b>gap</b> between the lowest point of the crystal and the base material. When selecting the glue (page 59), please note the additional instructions regarding the gluing gap.</p>				
Fancy Stones	Casting Milling	<b>Step milling</b> 		
<p>Compared to a simple blind hole, step milling offers <b>better hold</b> of the crystal with less glue. When selecting the depth of the cavity, ensure that there is still a gap between the lowest point of the crystal and the base material. When selecting the glue (page 59), please note the additional instructions regarding the gluing gap.</p>				

APPLICATION

\* except Coldfix

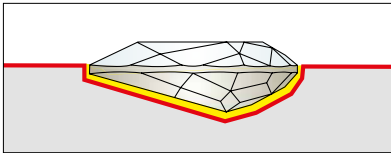
## CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

CHOICE OF GLUE

DOSAGE AND SETTING

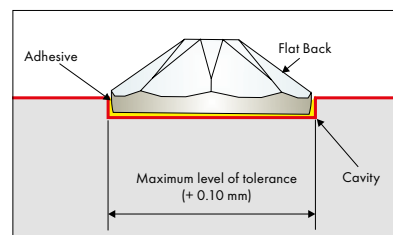
POST-CLEANING  
AND CURING

SWAROVSKI PRODUCTS	PRODUCTION METHOD	CAVITY TYPE
Fancy Stones	Casting Milling	<b>3D milling</b>  <p>3D milling offers an <b>optimum fit</b> with the smallest gluing gap. Due to the fact that the cavity is adapted to the contours of the crystal, CNC milling machines are required.</p>

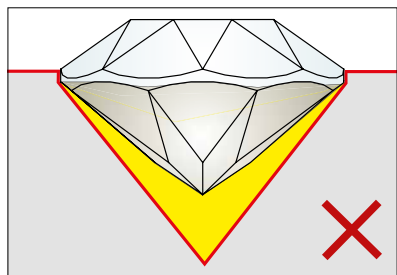
## PRODUCTION TOLERANCES FOR CAVITIES

When producing cavities, the dimensions should be based on the main dimensions, including the maximum tolerance for the crystal components used, and the

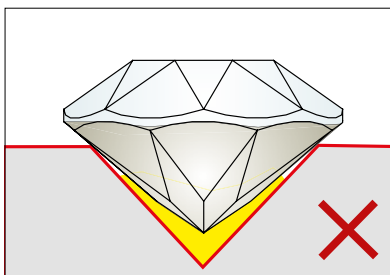
production tolerance. These dimensions can be requested from your Swarovski sales organization.



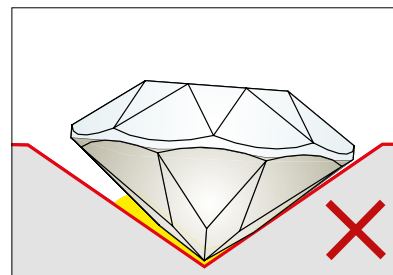
## INCORRECT CAVITIES



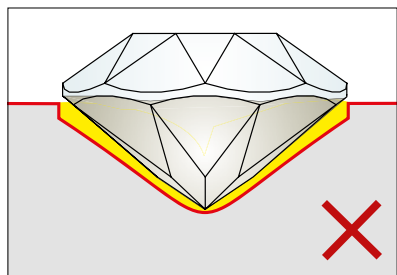
Angle too sharp



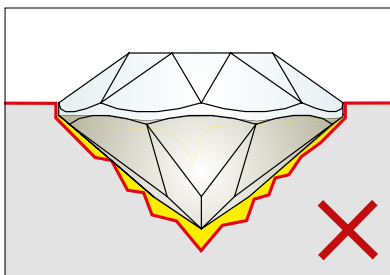
Crystal too large/cavity too small



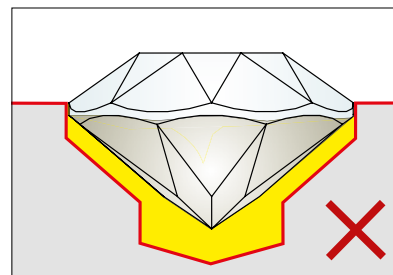
Angle too large



Rounded tip of the cavity



Cavity with uneven surface



Gap too big

CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

CHOICE OF GLUE

DOSAGE AND SETTING

POST-CLEANING  
AND CURING

This section offers a brief overview of the ways in which Swarovski products can be integrated into jewelry design software,

and a summary of the two most important production techniques for jewelry: rubber mold and lost wax.

JEWELRY DESIGN SOFTWARE

Leading software manufacturers offer special programs with three-dimensional display possibilities for the design of jewelry and accessories. These 3D-design programs feature a whole range of functions that simplify and support the design process

and therefore also the entire production process. Special software solutions that have integrated a range of digitally processed Swarovski crystals in their programs are already available ([www.3design.com](http://www.3design.com)).

These can be simply and quickly integrated into any design, thus allowing the designer to work with Swarovski crystals right from the beginning of the design phase.

RUBBER MOLD PROCESS IN JEWELRY MANUFACTURING

This process is widely used in the production of fashion jewelry. Tin alloys are mostly used here, and the biggest

advantage of this procedure is the favorable price of the required tools.

APPLICATION



1 Several original models are shaped out of metal, which must already exhibit an excellent surface quality. The expected shrinkage during casting must be taken into account.



2 These original models are pressed into a rubber mold. The rubber mold gets vulcanized to create a rubber casting model.



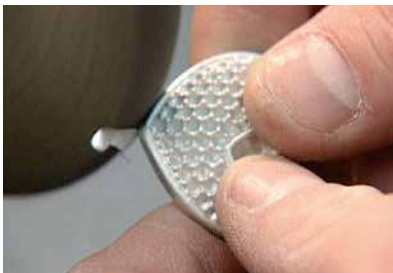
3 Channels are cut in the rubber plate for the casting process.



4 The completed rubber molds are pressed together and filled with the molten metal alloy during rotation (centrifugal casting procedure).



5 After cooling and removing from the mold, the casting channels are cut off.



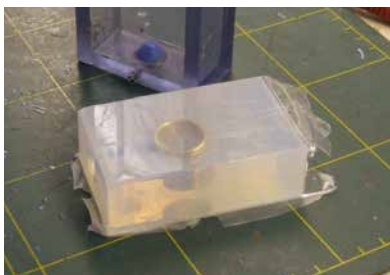
6 The cast model achieved by this process is ground and polished in preparation for the plating process.

## LOST WAX PROCESS IN JEWELRY MANUFACTURING

The lost wax process is used for metals with a higher melting point, for example brass, silver, and gold.



- 1 Production of a prototype, e.g. through rapid prototyping; the better the surface quality is here, the better the casing will be later. The expected shrinkage during casting must be taken into account.



- 2 The prototype is either formed with silicone or vulcanized between raw rubber plates.



- 3 The already produced mold is injected with molten wax by a wax injector to create a wax model.



- 4 The wax forms created this way are each melted onto a wax tree format with a wax welding device. The trunk of the wax tree later serves as the casting channel.



- 5 The tree is now placed into a cuvette, the holes are glued up and it is embedded in implantation paste under vacuum and vibration.



- 6 The wax is melted out after the implantation paste has hardened. Remaining wax is burnt out in a kiln. The wax must be completely burnt out, leaving only the clean cavities.



- 7 While it is still hot, the cuvette is filled, under vacuum, with the molten metal. Because of the porosity of the form, the molten metal fills every part of it.



- 8 After casting, the hot cuvette is plunged into cold water. The casting tree is then cleaned.



- 9 After the jewelry pieces are removed from the casting tree, they are finished by grinding and polishing and pre-treated for the galvanization process.

## CHECKING SURFACE TENSION AND PRE-TREATMENT

### CHECKING THE SURFACE TENSION

The surface tension is an indicator for the wetting properties of the surface to be glued. A surface tension of **at least**

**38 mN/m** is recommended for gluing Swarovski crystals. It should also be randomly tested during production.

It is best to use the Test Pen (art. 9030/000) to measure the surface tension.



**1** Before gluing, mark the surface.



**2** If the ink remains visible for 2 seconds, the surface is suitable for gluing.



**3** If the ink disappears or forms bubbles, the surface is not suitable for gluing. In this case, the pre-treatment cleaning methods should be checked.

**Note:** On porous or absorbent materials, the surface tension cannot be checked with the Test Pen. If the Test Pen is used on highly polluted surfaces (e.g. grease, oil) or on material like wood, the Test Pen might be polluted as well and cannot be used anymore.

### CRYSTAL APPLICATION INSTRUCTION MOVIE

#### Checking surface tension

Watch instruction movie on proper Test Pen usage online at <http://swarovski.gluingapplication>



### PRE-TREATMENT

If the surface tension is below 38 mN/m, the following pre-treatment cleaning methods, applied in the correct order,

can be effective in reaching the right level. After each cleaning process, the surface tension has to be checked again.

CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

CHOICE OF GLUE

DOSAGE AND SETTING

POST-CLEANING  
AND CURING

## TYPES OF CLEANING

## PRE-TREATMENT CLEANING METHODS

## 1 Mechanical cleaning

This involves sanding, blasting, or brushing but is usually not necessary for jewelry.

- Removal of dirt, rust, scale, and residues of varnish
- Roughening the surface

## 2 Washing and degreasing

It is important to ascertain that the tensides do not contain silicone, as this would impair adhesion.

When using solvents it is advisable to test the durability of the surface to be cleaned beforehand to avoid any damage.

**Solvents containing substances with a high boiling point should not be used** due to the risk of residue. If using cleaning solvents, wait a few minutes to allow them to evaporate.

- Cleaning with tenside solutions, rinsing with de-ionized water
- Cleaning with isopropyl alcohol/ethanol
- Cleaning with acetone (MEK/ethyl acetate)
- Cleaning with a cleaning solvent: should not contain high boiling point substances (risk of residue)

## 3 Physical cleaning and activation

These cleaning methods can be applied if mechanical cleaning or washing and degreasing are either not possible or have not resulted in a surface tension of  $>38$  mN/m. Therefore the pre-treatment cleaning method used should be done on a case-by-case basis.

- **Flame treatment via a blow torch**  
The surface to be treated is exposed to the flame of a torch very briefly. When using special gas mixtures, surface silication can also be carried out, so as to apply a more adhesive coating.
- **Corona treatment**  
An electric corona discharge is briefly applied to the surface.
- **Plasma treatment**  
Plasma treatment offers precise cleaning and activates the surface via an ionized gas.

## 4 Chemical cleaning and primers

Applying a primer improves adhesion and helps to prevent corrosion.

- Applying small amounts of solvent and activating the surface.
- Applying a primer.

CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

CHOICE OF GLUE

DOSAGE AND SETTING

POST-CLEANING  
AND CURING

## CHOICE OF GLUE

The selection of the best gluing system is the next stage in ensuring a long-lasting application.

When selecting the most suitable glue, the following factors should be considered:

- The type of cavities/the resulting gluing gap
- The size of the crystals/gluing surface
- The gluing properties and finish required
- The type of base material

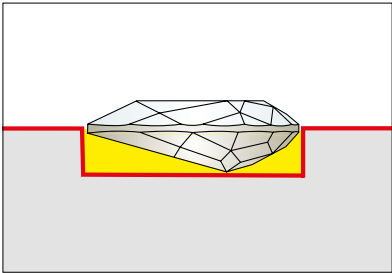


THE TYPE OF CAVITIES/THE RESULTING GLUING GAP

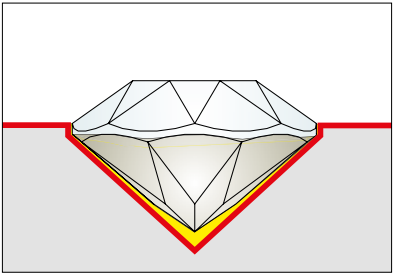
When selecting an adhesive, it is also important to consider the gluing gap that results from the type of cavity chosen. For cavities offering a **large gluing gap, soft**

**and gap-filling** glues such as silicone glue are recommended to avoid tension in the glue joint.

Epoxyethane/polyurethane glues offer **greater strength** and can be used for cavities with a **small gluing gap**.



Large gluing gap



Small gluing gap

THE SIZE OF THE CRYSTALS/GLUING SURFACE

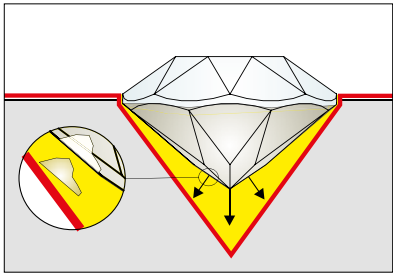
Please note that when gluing small crystals, glues with higher shearing strengths (e.g. CG 500 (A+B) two-component epoxy glue)

should be used. Further information can be found in the manufacturer's technical data sheets.

THE GLUING PROPERTIES AND FINISH REQUIRED

When selecting glues, it is important to consider properties such as **pot life, viscosity, color, curing time, ease of dosing, and shrinkage**. Further information can be found in the manufacturer's technical data sheets. Adhesives tend to shrink during curing. There will be a greater amount of **shrinkage** if the

wrong glue has been chosen, it is hardened under the wrong conditions, or if there is an incorrectly sized cavity (too much space around the crystal). The tension thus created can damage the foiling and the crystals may even detach. Glues that are very hard after curing and shrink considerably are not suitable for Swarovski crystals with foiling.



The foiling is torn from the crystal because of excessive glue shrinkage (shown in yellow).

THE TYPE OF BASE MATERIAL

The following table provides a selection of commonly known and globally available adhesives that are suitable for different

uses and materials. Application tests are advisable to make sure the chosen glue fulfills the specific needs of your application.

## CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

## CHOICE OF GLUE

## DOSAGE AND SETTING

POST-CLEANING  
AND CURING

**Viscosity:** Measure of a fluid's resistance to gradual deformation by shear/tensile stress. It corresponds to the informal notion of 'thickness'.

**Viscosity types**

low	thin fluid
med	medium
high	pasty

**Color:** Description of the glue's color type after curing.

**Bonding:** Depending on the carrier material, the bonding of the glues can vary.

**Bonding types**

+	sufficient or excellent bonding can be reached
o	sufficient bonding is possible
-	sufficient bonding is nearly impossible

	ONE-COMPONENT EPOXY RESIN GLUE	TWO-COMPONENT EPOXY RESIN GLUES						POLYURETHANE GLUES			CYANOACRYLATE GLUES	UV GLUES			SILICONE GLUES	DOUBLE SIDED TAPES	DISPERSIONS & CONTACT GLUES	
	CG 80 1C	CG 500 (A+B)	CG 610 (A+B)	Araldite® 2011	RBC adhesive #118 A/B	DELO-DUOPOX® CR8021	3M™ Scotch-Weld™ DP 190	Araldite® 2028-1	3M™ Scotch-Weld™ DP 610	DELO-PUR 9895	LOCTITE® 401™	DELO-PHOTOBOND GB368	HS 34 S 233	HS 34 S 77	ELASTOSIL® N 2199	3M™	C. Kreul Hobby Line Schmuckstein Kleber	CHRISANNE CLOVER Crystal Glue
Color	transparent	translucent	translucent	beige	translucent	translucent	white/gray	transparent	transparent	beige	transparent	transparent	transparent	transparent	transparent	transparent	transparent	white
Viscosity	med	med	low	high	med	med	high	low	high	high	low	med	med	med	high	.	med	high
Glass	+	+	+	+	+	+	+	○	○	○	-	+	+	+	-	○		
Ceramics	+	+	+	○	+	+	+	+	+	+	-	-	+	+	○	○		
Stone	+	+	+	○	+	+	+	+	+	+	-	-	+	+	○	○		
Aluminum	+	+	+	+	+	+	+	+	+	+	○	+	+	+	○	○		
Brass	+	+	+	+	+	+	+	+	+	+	○	+	+	+	○	○		
Silver	+	+	+	+	+	+	+	+	+	+	○	+	+	+	○	○		
Steel	+	+	+	+	+	+	+	+	+	+	○	+	+	+	○	○		
PC	-	+	+	○	+	+	+	○	○	○	+	○	○	○	○	○		
PS	-	+	+	○	○	+	+	○	○	○	+	○	○	○	○	○		
PVC/ABS	-	+	○	○	+	+	+	○	○	○	+	○	○	○	○	○		
PMMA	○	+	○	○	○	+	+	○	○	○	+	+	+	+	○	○		
Paper	○	○	○	○	+	○	○	○	○	○	○	-	+	+	○	○	○	○
Cork	○	○	○	○	+	○	○	○	○	○	-	-	+	+	○	○		
Wood	○	○	○	○	+	○	○	○	○	○	-	-	+	+	○	○		○
Textiles <sup>2</sup>	-	-	-	-	-	-	-	-	○	-	-	-	+	+	-	-	○	○

<sup>1</sup> The second gluing part has to be UV transparent.

<sup>2</sup> For permanent (wash-resistant) application a Hotfix application is suggested.

APPLICATIONS ON PLASTICS

There are many types of synthetic materials.  
The following table contains information  
regarding the adhesive qualities of a  
selection of plastics.

APPLICATION

PLASTICS	ADHESIVE QUALITIES
ABS	good
ASA	good
CA	good
EP	good
PA	very difficult
PC	good
PE	difficult
PET	difficult
PF	good
PIB	good
PMMA	good
POM	difficult
PP	difficult
PS	good
PTFE	very difficult
PVC-U	good
PVC-P	very difficult
SAN	good
SILICONE	very difficult
UP	good

## CG 80 1C ONE-COMPONENT EPOXY RESIN GLUE

CG 80 1C is a one-component gluing system distributed by Swarovski. Due to its characteristics and high-performance, it is the ideal adhesive for the application of

foiled and unfoiled Round Stones, Fancy Stones and Flat Backs No Hotfix on metal surfaces for customers working in the jewelry, watch and/or accessories industry

where a strong, resistant, colorless and transparent gluing connection is required.

### Key Features / Benefits

- **One-component epoxy glue**  
In comparison to two-component epoxy gluing systems, a one-component system brings the advantage of excluding the process risk coming along with the mixing of the two-components. According to our experience this has a positive impact on crystal fall off! Mistakes/failures which can come along with the mixing process of two-components:
  - **Incorrect mixing ratio of the two-components!**  
To achieve highest bonding performance, it is essential to keep precisely on given mixing ratio. In general, you need to keep on a mixing ratio tolerance of max. 2 - 3%!
  - **Inadequate mixing of the two-components:** A not proper mixed adhesive could be problematic especially for tiny crystal sizes where only little amounts of glue are required! These small amounts of glue raise the risk for the gluing connection to be affected by parts of glue not well mixed.
  - **Air bubbles:** A not proper mixing of the glue can cause air bubbles inside the glue, which lead to an insufficient bonding!
- **High chemical resistant** against perfume, cream and UV-light  
Our latest learnings and experiences showed that a high chemical resistance of the glue is key against crystal falling off!
- **High impact resistant** and therefore perfectly suitable for the jewelry and watch segment, where mechanical stress can cause to the falling off crystals.
- **High bonding performance** on metal and glass surfaces.
- **Transparent and colourless!** The cured glue is totally transparent which amplifies the application possibilities.
- **Low curing temperature** compared to standard 1-component epoxy glues (> 80°C/176 °F).
- **Optimized formula** for the use of Swarovski foiled and unfoiled crystals and therefore **perfectly matching the configurations** of the **Swarovski foiling**.
- **Long pot life**  
A long pot life allows a long process window for the gluing process and this saves time and money!
- **Easy and stable glue dosing**  
At room temperature CG 80 1C changes viscosity only slightly and this allows the use of compressed air dosing devices. Therefore it's easy to achieve process stability in terms of dosing the same glue amount.
- **CLEAR conform**  
CG 80 1C is fully **CLEAR conform** to the newest CLEAR lists to meet our high demands on the quality of our products.

### Technical Data CG 80 1C

Color	transparent
Viscosity at room temperature 23°C (73.4°F)	18,000 +/- 5,000 mPa*s
Viscosity at 30°C (86°F)	10,000 +/- 3,000 mPa*s
Storage stability at ≤ 6°C (42.8°F)	6 months
Storage stability at 23°C (73.4°F)	5 days
Storage stability at 30°C (86°F)	10 hours
Curing temperature	≥80°C (176°F)
Complete curing time in oven ≥80°C (176°F)	1h
Maximum curing temperature in oven	120°C (248°F)
Pot life at room temperature 23°C (73.4°F), 10ml cartridge	5 days
Pot life at 30°C (86°F), 10ml cartridge	10 hours
Pot life at room temperature 23°C (73.4°F), 310ml cartridge	5 days
Pot life at 30°C (86°F), 310ml cartridge	10 hours
Range of temperature in the application area	-40°C to +100°C (-40°F to +212°F)

## CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

## CHOICE OF GLUE

## DOSAGE AND SETTING

POST-CLEANING  
AND CURING**Important information on transportation and storage**

As one-component epoxy gluing systems start to cure when exposed to temperatures above 6°C (42.8 °F) it is essential that the glue is cooled during transportation and storage.

The CG 80 1C will **be delivered to the customer in a package including cool**

**packs, to keep the temperature during transport below 6°C (42.8°F).**

**After delivery, the customer needs to remove the package and store the adhesive in a dry and cold (< 6°C (42.8°F)) or frozen (- 18°C (-50°F)) place.**

For information on storage life and the proper storage conditions, please check the Technical Data Sheet.

**Application**

When gluing Swarovski crystals, optimal results are obtained by coordinating the **entire application process**. Experience has shown, that the most common reasons for crystals becoming detached are inappropriate areas of application, and not

properly cleaned and pretreated surfaces, poorly produces cavities, unsuitable gluing systems and insufficient quantities of glue. For more detailed information on gluing and product-specific application instructions please check the instruction leaflet in the

glues packaging, the glues Technical Data Sheet and the Application Manual, chapter Gluing. An oven is required to harden out the glue!

**Preparation of the carrier material**

The surface to be glued must be clean, dry and free from oil or grease. Before gluing, we recommend testing the surface to be glued with the Test Pen (available from Swarovski; art. 9030/000).

CG 80 1C can easily be dosed using a common dosing gun or dispensing system. Suppliers are listed in the Application Manual, chapter Gluing (page 49). Please find detailed information in the respective Technical Data Sheet.

**Preparation of the adhesive**

The adhesive is delivered in a cartridge (10 ml or 310 ml) and is supplied ready to use. In case of cooled or refrigerated storage, it must be ensured that the adhesive is conditioned to room temperature before use (to ensure proper viscosity).

Process steps:

- 1** Preparation and pretreatment of the carrier material
- 2** Dosing of the adhesive onto the carrier material
- 3** Setting the Crystal product

- 4** Curing
- 5** Cleaning

**Please note**

Once the glue is at room temperature (23 °C/73.4 °F), it can be used for 5 days! In case the glue will be frozen again after usage, the pot life will shorten for the period the glue was in use. E.g. the glue was used

for 2 days at 23 °C/73.4 °F temperature and afterwards frozen. As the freezing process won't bring back the glue to the original status, only 3 days of pot life will be left when using the glue again.

Please note that the CG 80 1C is not available in every region. For further information, please contact your local Swarovski office.

## CG 500 (A+B) TWO-COMPONENT EPOXY RESIN GLUE

CG 500 (A+B) is a high-performance gluing system for both foiled and unfoiled Swarovski crystals, exclusively distributed by Swarovski for professional use within the jewelry segment and other industries such as accessories, interiors, and electronics.

Key features:

- Ideal mechanical resistance
- Ideal chemical resistance
- Future-oriented solution
- Diverse areas of application

### Ideal mechanical resistance

CG 500 (A+B) **absorbs impacts and withstands distortion**. In addition, maximum elasticity protects the crystal foiling.



XILION Chatons that have been glued with CG 500 (A+B) remain in the cavities after extreme mechanical stress due to **optimal shock absorbance** (up to 500%).



XILION Chatons that have been glued with a **standard epoxy resin** fall out of their cavities after extreme mechanical stress due to its **poor shock absorbance** (around 10%).

### Ideal chemical resistance

#### CG 500 (A+B) OFFERS EXCELLENT CHEMICAL RESISTANCE AGAINST:

Humidity	CG 500 (A+B) prevents infiltration of humidity into the glue and thus any corrosion. Jewelry pieces can be stored and worn in places with high humidity.
Perspiration	CG 500 (A+B) prevents infiltration of perspiration into the glue and thus avoids corrosion. The glued Swarovski products are not damaged by perspiration.
Salt and chlorinated water	CG 500 (A+B) protects Swarovski crystals when they are exposed to salt or chlorinated water. The glued Swarovski products are not damaged during swimming.

### Diverse areas of application

#### CG 500 (A+B) OFFERS IDEAL ADHESION FEATURES ON:

Metals	E.g. application of Swarovski products on plated surfaces, brass, stainless steel, titanium, gold, rhodium, and silver within the jewelry industry
Gluable synthetics and rubber	E.g. application of Swarovski crystals on ABS, PMMA, PVC etc. within the accessories and electronics industries
Glass, crystal, wood, stone, cork, and porcelain	E.g. application of Swarovski products in the interior and home décor industries

Technical data of CG 500 (A+B)

Mixture ratio (A : B), by volume	100 : 100 (resin : hardener)
Mixture ratio (A : B), by weight	100 : 86 (resin : hardener)
Pot life at room temperature (23 °C/73.4 °F), quantity applied: 1g	15 min.
Complete curing time at room temperature (23° C/73.4 °F)	24h
Complete curing time in oven (40° C/104 °F)	12h
Complete curing time in oven (80° C/176 °F)	2h
Complete curing time in oven (100° C/212 °F)	1h
Handling time at room temperature (23 °C/73.4 °F)	3h
Viscosity (mixed)	20,000 +/- 5,000 mPa*s

Mixing CG 500 (A+B) two-component glue

The exact mixing of the two-component glue is especially important. Only a fully homogenous mixture leads to the desired results. Care must be taken to follow the manufacturer's instructions.

APPLICATION



1 Use an electric scale to weight out the two components at a ratio of 100:86 (resin : hardener).



2 Both components come in different color shades so that it is easy to see if they are thoroughly mixed.



3 Mix the two components until a homogenous result is achieved.



4 Put the glue in a dispenser.



5 Attach the dispensing tip to the syringe.

CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

CHOICE OF GLUE

DOSAGE AND SETTING

POST-CLEANING  
AND CURING

## CRYSTAL APPLICATION INSTRUCTION MOVIE

### Mixing two-component adhesive

Watch instruction movie how to mix the tube version of Swarovski Crystal Glue CG 500 online at <http://swarovski.gluingmixingtocomponents>



## CG 610 (A+B) TWO-COMPONENT EPOXY RESIN GLUE

The CG 610 (A+B) two-component epoxy resin glue was specially developed for gluing Swarovski crystals of very small sizes, starting with PP 0. Depending on the area of application the adhesive can be used for crystals up to the size of PP 14.

### Key Features:

- Suitable for gluing very small crystals (starting with size PP 0)
- Low viscosity allows an easier dosing of small glue quantities
- Cost saving due to long pot life (140 min.)

### Technical data of CG 610 (A+B)

Mixture ratio (A : B), by volume

Mixture ratio (A : B), by weight

Pot life at room temperature (23 °C/73.4 °F), quantity applied: 1g

Complete curing time at room temperature (23° C/73.4 °F)

Complete curing time in oven (40 °C/104 °F)

Complete curing time in oven (80 °C/176 °F)

Complete curing time in oven (100 °C/212 °F)

Handling time at room temperature (23 °C/73.4 °F)

Viscosity (mixed)

100 : 50 (resin : hardener)

100 : 48 (resin : hardener)

140 min.

72h

18h

4h

1.5h

24h

1,750 +/- 250 mPa\*s



Mixing CG 610 (A+B)  
two-component glue

The **50 ml cartridge** of CG 610 (A+B) is designed in a way that the containing resin and hardener do not have to be mixed together by the user. Just attach a dispensing gun and the mixing nozzle (delivered with the 50 ml adhesive package) to the cartridge and start gluing.



When using glue of the **750 ml box**, resin and hardener have to be mixed in a different way. First, weigh the two glue components at a ratio of 100 : 48 (resin : hardener). It is very important to keep an exact mixing ratio

of the two components to achieve maximum adhesion. Mix the two components well for at least one minute. Only a fully homogenous mixture leads to the desired results.

When a homogenous mixture is achieved, put the glue into a dispenser/syringe and attach a dispensing tip.



## DOSAGE AND SETTING

### DOSAGE

The glue can be precisely dispensed via a variety of dosage systems. Dispensers with a vacuum connection prevent the glue from

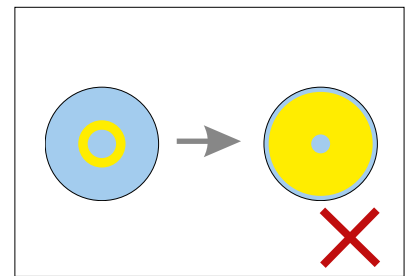
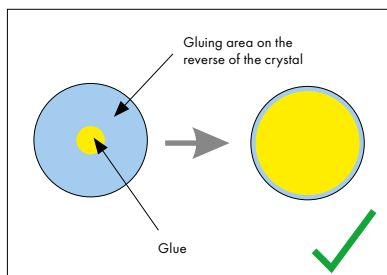
dripping and reduce the amount of cleaning needed. The correct amount of glue will additionally protect the foiling from external

influences. Attention must be paid to the application and quantity of the glue.

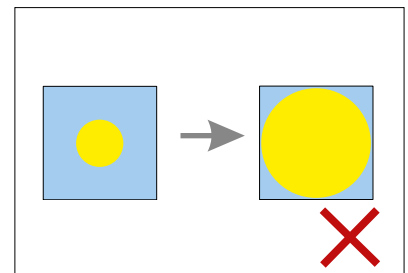
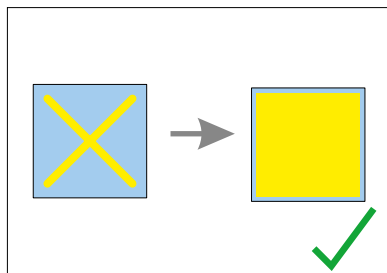
### Glue application

Irrespective of the shape of the gluing area, the glue should be applied as follows:

With a **round** gluing area, a dot of glue in the centre is sufficient. When the crystal is applied, the glue will be evenly distributed in the gluing gap. To glue a single spot, aim the dispensing needle just above the spot to be glued and lift it slowly upward to avoid any glue spreading out sideways.



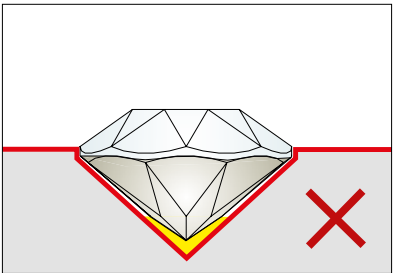
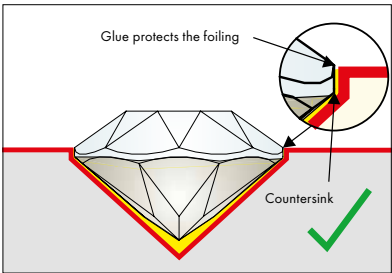
With a **square or rectangular** gluing area, apply a cross of glue to ensure it is evenly spread into the corners.



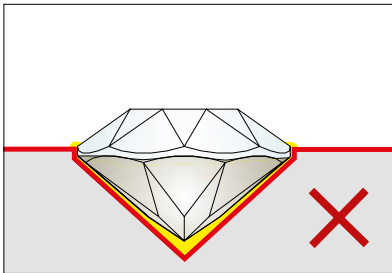
Glue quantity

When selecting the amount of glue to dispense, ensure that when setting and pressing down on the crystal, the glue spreads to the edges, thus offering additional protection for the foiling.

Round Stone

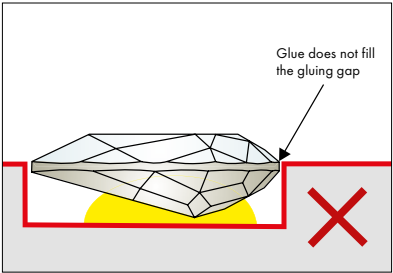
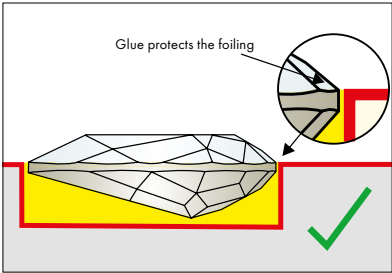


Too little glue

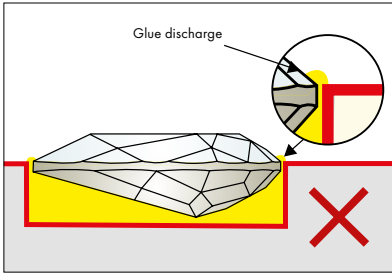


Too much glue

Fancy Stone



Too little glue



Too much glue

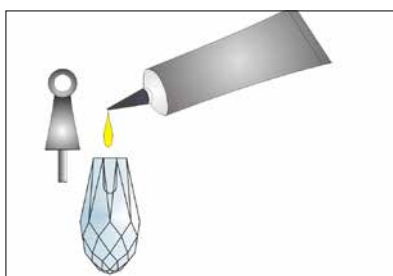
### Half Hole Pendant

Two different types of adhesive can be used to affix the single Half Hole Pendant to the metal cap: UV glue and two-component epoxy resin glue.

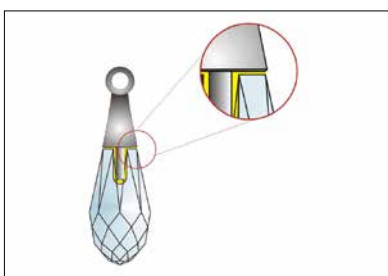
If using UV glue, the crystal must be permeable to UV light. Please note that some crystal colors absorb UV light and are

thus unsuitable for use with UV glues. Best results in internal tests were achieved using the UV glue DELO-PHOTOBOND GB 368. If the crystal color is not suitable for using UV glue, using epoxy resin glue is suggested. In internal tests, the best bond was achieved using CG 500 (A+B).

For further information about commonly known and globally available glues and their adhesion on metal, please check the overview of glues at the beginning of the chapter "Choice of Glue".



- 1 To achieve precise and consistent results, it is suggested to use a dosage system. Choose a dispensing tip with a diameter smaller than 1 mm and put a dot of glue into the pendant's hole. The amount of glue used depends on the type of adhesive and its curing behavior; performing application tests is therefore recommended.



- 2 After setting the metal cap into the hole, the glue should be evenly distributed in the gluing gap and spread over the edges to also affix the metal part on top of the crystal. Remove excess glue before it is hardening, e.g. with a cotton wipe soaked in isopropyl alcohol.

### Crystal Pearl Metal Part

This metal cap can be glued to Crystal Pearls (art. 5810, art. 5818) or Beads (art. 5003, art. 5028) using an adhesive such as the Swarovski crystal glue CG 500 (A+B).

Please follow the whole gluing process (i.e., cleaning, mixing, dosing, setting, curing) carefully. When the glue is dispensed onto the metal part, make sure that the entire

surface of the pin and the base part is covered with the adhesive.

CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

CHOICE OF GLUE

DOSAGE AND SETTING

POST-CLEANING  
AND CURING

SETTING

Once the glue has been dispensed the Swarovski product can be positioned. Pick up the crystals, for example with a wax stick or tweezers, apply them to the gluing position, and press down gently.

For preparing **Chatons** for the positioning process, a **Chaton Sieve** can be helpful.

Take the black sieve (for size PP 0 – PP 1, art. 9030/003), the gray sieve (for size PP 2 – PP 20, art. 9030/001) or the blue sieve (for size PP 21 – SS 34, art. 9030/002) according to the Chatons' sizes. As the gray and the blue sieves provide two sides with different cavity sizes, make sure to choose the sieve type and side that

perfectly matches the Chatons to be set. Place some crystals onto the sieve. By slightly shaking the tool and wiping over it with glove-covered fingers, the majority of Chatons automatically turn into the suitable position for gluing (table pointing upwards).



**Chaton Sieve** for Chatons size PP 0 – PP 1 (art. 9030/003)



**Chaton Sieve** for Chatons size PP 2 – PP 20 (art. 9030/001)



**Chaton Sieve** for Chatons size PP 21 – SS 34 (art. 9030/002)

As a next step the Chatons can easily be picked up from the Chaton Sieve using a tool like the

wax stick, tweezers, or a vacuum pick-up system. The use of a silicone pick up tool is not recommended

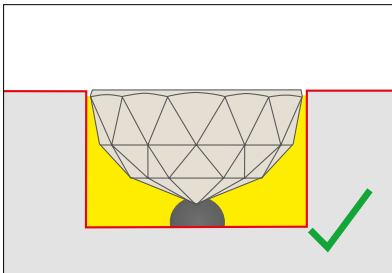
as this can impair the adhesion and the brilliance of the crystals.

Apply the crystals to the gluing position and press down gently. When working with cavities with large gluing gaps, the

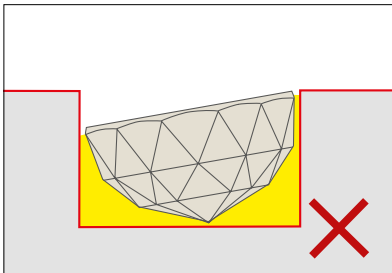
following tools assist in ensuring the optimum positioning:



A cross (or a similar tool) prevents the crystal from tipping over. Press the crystal down flat on the material using the chosen tool.



To prevent the crystal from sinking or tipping during the hardening process, a small **plasticine ball** can be used to fix it in place.



CAVITY PRODUCTION

CHECKING SURFACE  
TENSION AND  
PRE-TREATMENT

CHOICE OF GLUE

DOSAGE AND SETTING

POST-CLEANING  
AND CURING

## POST-CLEANING AND CURING

### POST-CLEANING

Excess glue that escapes during setting can be carefully removed using a cotton wipe that has been soaked in a solvent,

e.g. isopropyl alcohol. It must be removed **while the glue is hardening**, as dried glue cannot be fully removed. Remember to

follow the glue manufacturer's instructions, as well as considering the resistance of the base material.

### CURING

The curing time of the glue depends mainly on the **temperature**, or on the **humidity** in the case of silicone glues. Please note the glue manufacturer's instructions.

To minimize shrinking and tension during hardening, we recommend for standard

two-component epoxy resin glues a **maximum curing temperature of 50 °C (122 °F)**, with the exception of CG 500 (A+B) and CG 610 (A+B).

Both adhesives can be cured at a maximum temperature of **100 °C (212 °F)**, without

any changes to its properties. Please note that CG 80 1C requires a **minimum temperature of >80 °C (>176 °F)** for curing, the maximum temperature is **120 °C (248 °F)**.

## OVERVIEW OF THE SIMPLIFIED GLUING PROCESS



**1** Make sure that the surface on which you want to apply a crystal is suitable for gluing. Use the Test Pen (art. 9030/000) to check the material's surface tension.



**2** The surface must be correctly pre-treated before gluing (e.g. cleaning, degreasing).



**3** The glue should be applied with a dispenser.



**4** Pick up the crystal, using e.g. a tweezer, a plasticine stick or a vacuum pick up system. Carefully place the crystal and press it down gently.



**5** Remove excess glue with a cotton stick soaked in a solvent eg. Isopropyl alcohol. Let the glue cure according to the manufacturer's guidelines.

APPLICATION

## CRYSTAL APPLICATION INSTRUCTION MOVIE

### Gluing

Watch an example of an gluing process online at <http://swarovski.com/gluingfinishedproduct>



## PRODUCT-SPECIFIC APPLICATION INSTRUCTIONS

### APPLICATION ADVICE FOR SYNTHETIC FOIL OVERLAY

Synthetic Foil Overlay is a quick and easy way of applying products from the Synthetic assortment. In addition to Hotfix, the foil overlay has now made these products suitable for including in designs using the sewing or gluing technique.

This makes these products the perfect solution for customers working with carrier materials that are not suitable for Hotfix application. Examples include materials that are pressure- or heat-sensitive, such as smooth leather or technical fabrics that do not absorb Hotfix glue.

#### Gluing technique

Using an additional gluing system, e.g., CG 500 or Araldite 2028, a Synthetic Foil Overlay motif can easily be included in designs:

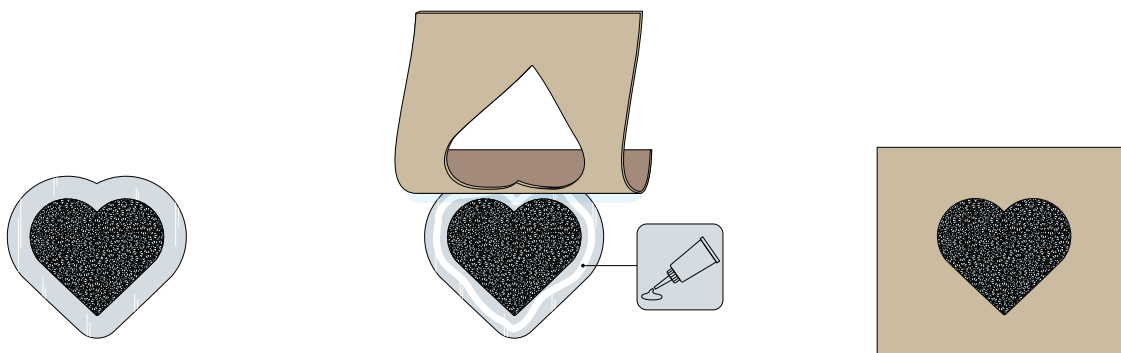
The glue is applied to the reverse side of the motif or to the upper surface of the overlay foil. Solvent-based polyurethane adhesives can also be used, although we do not

advise using a water-based polyurethane adhesive!

Using a glue to add the Synthetic Foil Overlay to designs is recommended for industries that are not exclusively working with textiles. For instance, in the shoe industry, where mainly PU materials are

processed, Synthetic Foil Overlay can be applied to the side of a midsole.

For all gluing methods, we strongly recommend carrying out tests in accordance with customers' needs and specifications.





## APPLYING UV-TRANSPARENT MATERIALS

When using UV glue, **at least one part** of the materials must be translucent for **UV light**. On a metal surface for example, only crystals without foiling can be applied. Similarly, foiled crystals can only be glued

to UV-transparent materials.

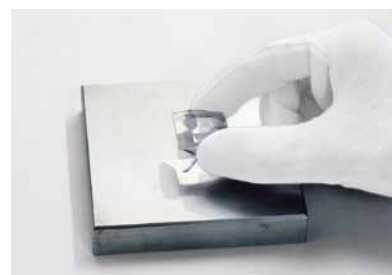
Please note that some crystal and glass colors as well as UV-stabilized plastics absorb UV light and are thus unsuitable for UV glues.



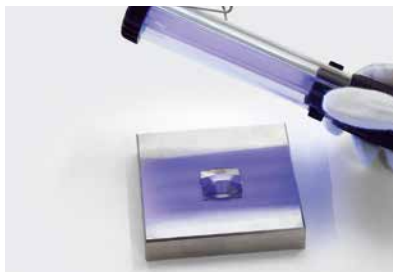
- 1 The surfaces to be glued must be properly pre-treated to achieve a sufficient surface tension. This can be tested via a Test Pen (art. 9030/000).



- 2 Dispense the UV glue.



- 3 Press down on the crystal, until the glue completely covers the gluing area.



- 4 Cure the glue for a few seconds using a UV light (following the manufacturer's instructions), and remove any excess glue using a cleaning agent. The curing process can then be continued, according to the manufacturer's instructions.

**Note:** It is recommended that UV-protective eyewear is worn during curing, to prevent injury. Please follow the manufacturer's instructions.

## CRYSTAL APPLICATION INSTRUCTION MOVIE

### UV gluing with pointed Chatons

Watch UV Gluing instruction movie online at <http://swarovski.com/uvgluing>



## APPLYING SYNTHETICS ON SOLID SURFACES (WITH ADDITIONAL GLUING SYSTEM)



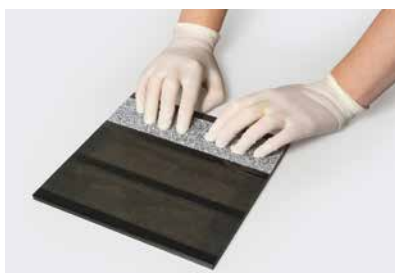
- 1** The surfaces to be glued must be properly pre-treated, so as to achieve sufficient surface tension.



- 2** Apply the correct amount of glue onto the carrier material.



- 3** Elapse the glue equally on the material.



- 4** Position the motif in the desired location and press down firmly for a few minutes.



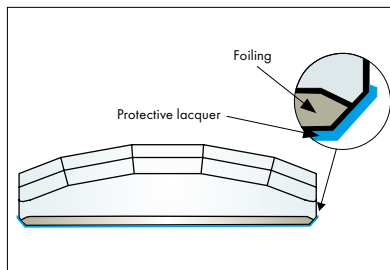
- 5** Glue that escapes during positioning can be carefully removed using a cotton wipe.



- 6** During curing it is suggested to put some weight on the motif.

## APPLYING FLAT BACKS NO HOTFIX FOR MOSAIC TILES

Due to their dimensions (outer dimensions and height) and coating (protective lacquer), selected Flat Backs No Hotfix have been tailored specially for use in tiles and mosaics.



Protective lacquer is applied to the foiling of all crystals, and fully covers the reflective surface. Protective lacquer prevents moisture, cleaning agents, etc. from coming into direct contact with the reflective layer, which can lead to corrosion and damage the crystal.

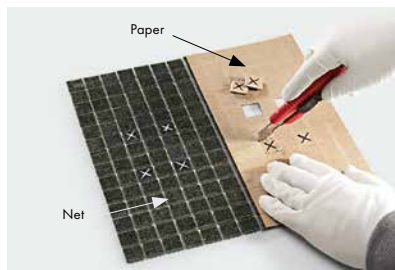
Long-term, satisfactory solutions can only be achieved with **paper-glued** mosaic tiles and the use of recommended tile glues and joint sealers. When working with **net-glued** mosaics, their absorption and storage of moisture means the **support net** must be **completely removed** in the areas where

the crystals are to be applied.

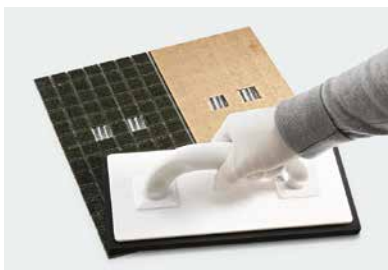
Find suppliers for tile glues and joint sealers on the supplier list on page 48. Solvent-resistant and alkaline tile glues and joint sealers are not recommended.

### Unsuitable areas of application

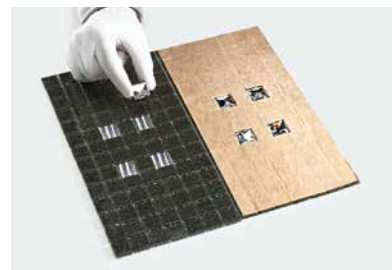
- In swimming baths and steam rooms
- In contact with chlorine and other aggressive cleaning agents
- In saunas, due to the high temperatures and moisture
- Outside



- 1** Cut out the marked tile area and remove it from the mosaic.



- 2** Apply the tile glue to the prepared base according to the manufacturer's instructions, then carefully position the mosaic tile and press down.



- 3** Place the individual crystals in the gaps and lightly press down.



- 4** Before curing, remove any excess glue with a damp sponge; follow the manufacturer's information regarding curing.



- 5** After curing, remove the paper support. Following this, the mosaic can be grouted with a soft rubber scraper.



- 6** Excess joint sealer can be removed with a wet sponge during curing.

**Note:** Please be aware that many tile glues and joint sealers can contain abrasive materials, which can lead to scratching of the crystal. To avoid damaging the crystal, these parts should be carefully cleaned with mild, pH-neutral cleaning agents and cleaning sponges.

USEFUL INFORMATION

APPLICATIONS ON SILVER JEWELRY

Without protection, silver jewelry can turn yellow or black with time due to chemical reactions. To slow or stop these reactions

the surface of silver jewelry is often covered with a temporary (wax-based) or permanent protective coat (varnish-based). Tarnishing

on the surface of the metal often results in a decline in the surface tension under the recommended 38 mN/m.

TARNISHING PREVENTION SYSTEMS	
<b>Temporary protection against tarnishing:</b>	<b>Permanent protection against tarnishing:</b>
<ul style="list-style-type: none"><li>– Wax-based</li><li>– Low surface tension</li></ul>	<ul style="list-style-type: none"><li>– Varnish-based</li><li>– Surface tension depends on varnish</li></ul>
<b>Recommendation:</b> Protect the rest of the piece after gluing	<b>Recommendation:</b> Use a tarnishing protection system with sufficient surface tension

PROTECTIVE FILM

A self-adhesive film can protect against dirt during the application process and aid in positioning.

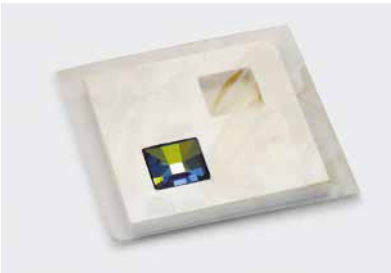
Blind hole



1 To protect the surface of the material used (e.g. metal, tiles, etc.) from dirt, a self-adhesive film can be applied.



2 It is then cut out along the previously produced cavities.



3 The crystal can now be glued into the cavity. Once any excess glue has been removed, the adhesive film can be removed following curing.

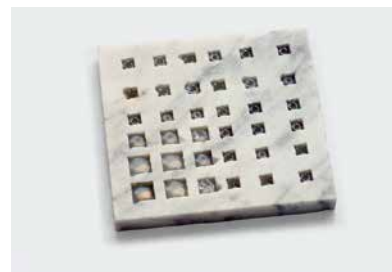
## End-to-end cavities



- 1 Apply a self-adhesive film to the front of the material.



- 2 Place the Flat Backs No Hotfix elements into the end-to-end cavity from the back.



- 3 Now fill the cavity with glue. The glue should cover the entire foiling of the crystal, so as to avoid corrosion. The self-adhesive film prevents the glue spreading onto the front.



- 4 Once the glue has cured, the film can be removed.

**Note:** Highly viscous glues are best suited for end-to-end cavities, as they do not spread through the cracks at the front.

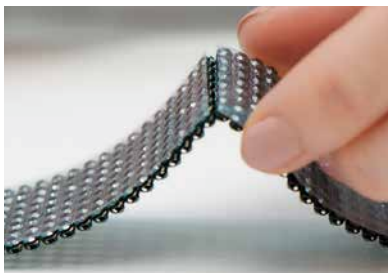
## CUTTING AND GLUING CRYSTAL MESH

The transparent film should not be removed before gluing. The film allows the individual crystals to be aligned perfectly, and

provides Crystal Mesh with the stability necessary for flawless application.



- 1 Cut the transparent film between the rows of crystals with a knife, but do not pull them apart, otherwise the stability of the crystals will be lost.

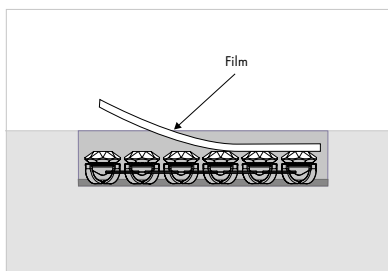


- 2 After cutting the film, there is some space between the crystal rows which allows you further processing.



- 3 Cut the metal mesh with a scissor along the scored line, and remove the excess link rings. The Crystal Mesh is now ready for gluing.

When gluing flexible Crystal Mesh products, do not remove the transparent film until the glue has cured to ensure the proper alignment of the mesh.



## CRYSTAL APPLICATION INSTRUCTION MOVIE

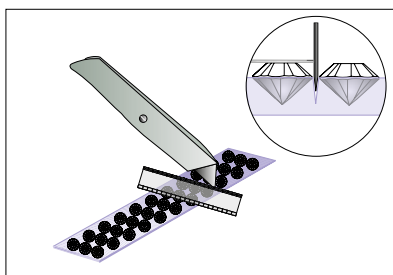
### Cutting Crystal Mesh

Learn how to cut Crystal Mesh properly by watching our instruction movie online at <http://swarovski.com/cuttingcrystalmesh>

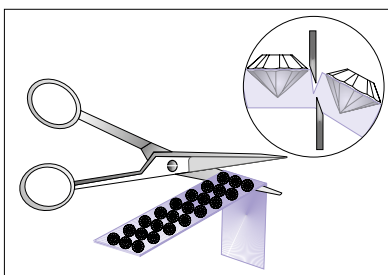


## CUTTING CRYSTALTEX CHATON BANDINGS

When working with Crystaltex Chaton Bandings, the lack of space between crystals means great care must be taken during cutting, so as to avoid damaging the crystal.



- 1** Cut into the support film between the crystal rows with a Stanley knife.



- 2** Snap and cut off the Crystaltex Chaton Banding along the scored edge.



# QUICK ASSISTANCE

The following table outlines typical gluing problems, along with possible causes and recommendations on avoiding them.

PROBLEM	CAUSE
<b>The crystal has become discolored:</b>	
The crystal is matt or yellowed.	1, 2
The crystal seems black and dull compared to the surrounding crystals.	3
The crystal has been plated.	4
<b>The crystal has detached from the cavity without the foiling:</b>	
The crystal has become discolored.	5, 6
The crystal has detached with the mirror coating but without the platinum foiling or the glue.	7, 8, 9
<b>The crystal has detached from the cavity with the foiling:</b>	
Glue is attached to the crystal.	10, 11, 12, 13, 14
No glue is attached to the crystal anymore.	15, 16
<b>Excess glue:</b>	
Before hardening.	2
After hardening.	17

CAUSE	RECOMMENDATION
<b>1</b> Glue residues have not been completely removed and have been smeared over the crystal.	Use a suitable dispenser to apply exactly the right amount of glue. Dispensers with a vacuum connection prevent the glue from dripping and reduce the amount of cleaning needed.
<b>2</b> Too much glue was used.	Be sure to use the exact recommended dosage and to carefully remove any excess glue, e.g. using acetone or isopropyl alcohol.
<b>3</b> The axis of the cavity was already off-center in the original model or the cavity was not drilled straight in the unfinished casting.	Use a special bit when drilling the original model. This offers more precise control of the direction and depth of the drilling.
<b>4</b> The jewelry was only plated after the crystals had been glued to it.	It is recommended to complete the plating before gluing the crystals.
<b>5</b> A gluing gap that has not been completely filled is causing corrosion.	Make sure the exact dosage of glue is used.
<b>6</b> Tensile stresses are reducing the adhesion of the mirror coating. Oxygen is penetrating between the stones and the mirroring and causing oxidization.	Use glue that is more elastic and that does not shrink as much.
<b>7</b> An incorrect glue system was used.	Carry out tests with other glue systems.

CAUSE	RECOMMENDATION
<b>8</b> Incorrect proportions of resin and hardener were used.	Follow the glue manufacturer's mixing instructions.
<b>9</b> Cleaning agents have affected the glue and/or the protective coating.	Use less solvent or a different type of solvent.
<b>10</b> Residues of polishing agent were not completely removed before plating.	Double check the type of cleaning process used.
<b>11</b> A varnished piece of jewelry has not been correctly pre-treated before gluing.	Improve the adhesion of the glue, e.g. with low-pressure plasma treatment or flame treatment if necessary.
<b>12</b> Too little glue was used.	Make sure the exact dosage of glue is used.
<b>13</b> The cavity has the wrong shape after plating.	Re-work the original model to improve the cavity shape.
<b>14</b> Electrolyte residues have not been completely removed.	Double check the type of cleaning process used.
<b>15</b> The specified processing time was exceeded and as a result the glue has already hardened.	Reduce the processing time.
<b>16</b> General glue problems.	Follow the manufacturer's instructions. Check the conditions under which the glue is stored. Excess solvent could have corroded the glue and/or the foiling.
<b>17</b> The jewelry piece was put under stress before the glue had hardened.	Make sure the glue has hardened, for example before transporting the jewelry.