gluing

When gluing jewellery stones from the CRYSTALLIZED™ – *Swarovski Elements* range, optimal results are obtained by coordinating design and materials, by preparing the crystal elements and the glue and by following the application steps in the correct order.

PRODUCT OVERVIEW

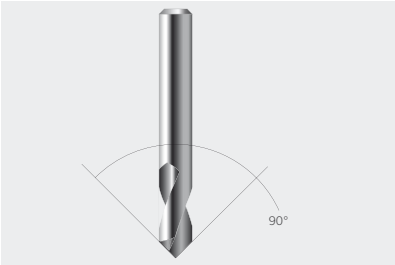
The following product groups can be applied by gluing:

- Round Stones
- Flat Backs No Hotfix
- Fancy Stones
- Transfers No Hotfix
- Crystal Tattoos
- Crystal-it
- Crystal Fabric
- Crystal Transfabric
- Crystal Glaze
- Crystaltex
- Plastic Trimmings
- Metal Trimmings
- Crystal Mesh

MACHINES, TOOLS AND AIDS

The following machines, tools and aids are necessary for gluing of CRYSTALLIZED™ – *Swarovski Elements.*

Tools



Twist drill 90°/ NC drill 90°

CG 500-35 (A+B)
Two-component epoxy resin glue, 2x50 g tube
(Art. 9030/150, /250, /350,
Sys.No. 919330, 919338, 919342)

CG 500-35 (A+B)
Two-component epoxy resin glue, 2x1 kg box
(Art. 9030/110, /210, /310,
Sys.No. 919333, 919341, 919345)

Aids

Vacuum pickup system

Fluid dispenser

Acetone/Isopropanol

Test Pen (Art. 9030/000, Sys.No. 919346)

Tweezers

Wax stick

Dosing syringes

APPLICATION <<<

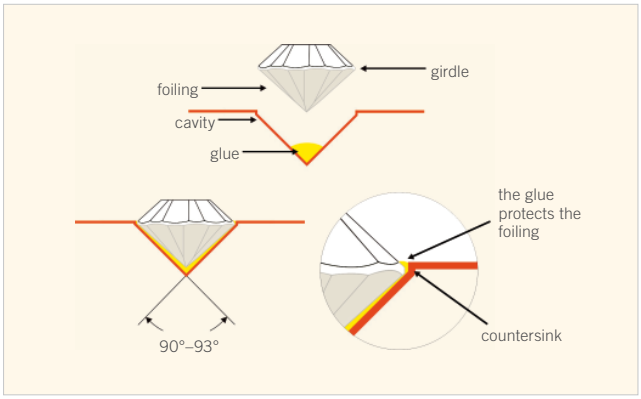
When applying the crystals, optimal results and maximum adhesion can only be achieved if the surface to be glued is properly prepared. The points below contain valuable instructions for pre-treating and gluing of all listed products in the product overview, and therefore should be followed exactly. Always take into consideration each of the layers of the finished product as well as the required profile and substrate of the finished product when choosing the appropriate cavity, pre-treatment method and the right kind of glue.

Cavities for Round Stones

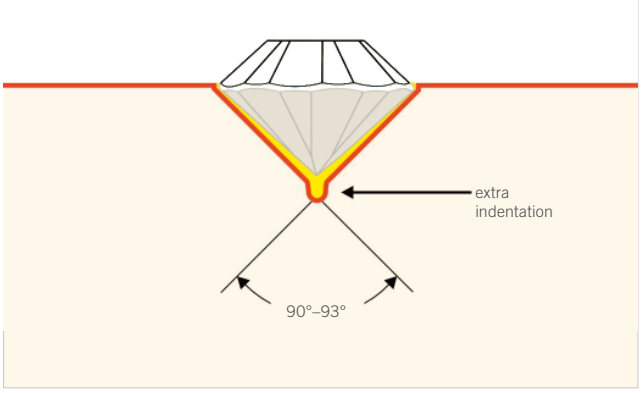
A correctly shaped cavity is essential for gluing Round Stones onto any carrier surface. Experience has shown that the most common reason for crystals becoming detached is that the cavity was drilled with the wrong angle.

The optimal cavity for the XILION Chaton has an angle of 90°-93°. The optimal amount of glue covers the whole foiling up to the girdle of the crystal. This protects the crystal from environmental influences and from chemicals. The cavity should have the same maximum diameter and size as the crystal plus 0.1 mm. The cavities should be bored or milled with a Twist drill or NC drill to an angle of 90°-93°. The sizes available for CRYSTALLIZED™ – *Swarovski Elements* can be found in the chapter Table of Sizes.

With particularly large crystals with a prominent girdle, it is advisable to use an additional countersinking process.



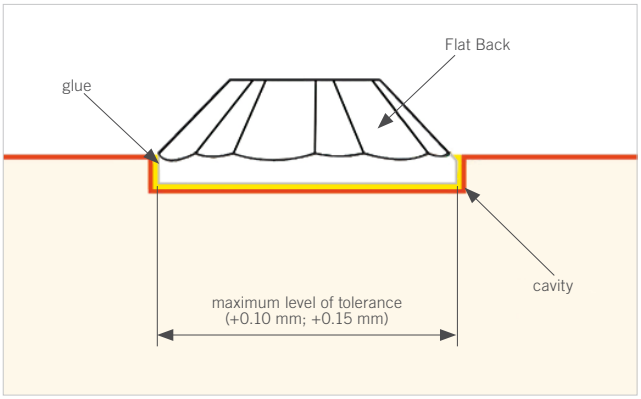
For jewellery manufactured by casting an extra indentation at the bottom of the cavity can be drilled to avoid a rounded tip and therefore preventing the tip of the crystal from touching the bottom of the cavity.



There is an interactive calculator to determine the correct cavities for XILION Chatons on the Swarovski business website: WWW.SWAROVSKI.COM/CRYSTALLIZED.

Cavities for Flat Backs No Hotfix

When gluing Flat Backs No Hotfix onto a solid surface it is also advisable to create a cavity as shown below. The cavity makes it easy to glue properly and ensures a higher protection of the crystal against mechanical and chemical stress.



Cavities for Fancy Stones

In principle, the cavities are matched to suit the geometry of the Fancy Stone. For questions concerning the necessary cavities or for the receipt of technical drawings that indicate measurements and tolerances, please contact the regional Swarovski representative.

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 or more is recommended for gluing CRYSTALLIZED™ – *Swarovski Elements*. It should also be randomly tested during production.

It is best to use the Test Pen (Art. 9030/000, Sys.No. 919346) to measure the surface tension.

1 Before gluing, mark the representative surface sample

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.

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.

	TYPES OF CLEANING	PRE-TREATMENT CLEANING METHODS
1	**Mechanical Cleaning** This involves sanding, blasting or brushing but is not usually necessary for jewellery.	▪ Removal of dirt, residues of varnish, rust, scale ▪ Roughening the surface
2	**Washing & Degreasing** Here it is important to ascertain that the tensides contain no 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 high risk of residue.	▪ Cleaning with tenside solutions, rinsing with de-ionised water ▪ Cleaning with isopropanol/ethanol ▪ Cleaning with acetone (MEK/ethyl acetate) ▪ Cleaning with a cleaning solvent that does not contain high boiling point substances (risk of residue)
3	**Physical Cleaning and Activation** These cleaning methods can be applied if the 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 ▪ Corona treatment ▪ Low pressure plasma treatment
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

Choice of Glue

This table provides a selection of commonly known and worldwide available adhesives that are suitable for different uses and materials. It also should serve as a guide to find the optimal glue for the chosen application.

		Two-Component Epoxy Resin Glues			Polyurethane Glues		Cyanacrylate Glues		UV Glues		Silicone Glues	Dispersion- & Contact Glues		
		CG 500-35	Uhu Plus endfest 300	Araldite 2011	Araldite 2026	Scotch Weld DP 610	UHU Instant Adhesive	Cyberbond 2999	Photobond GB 368	Photobond GB 345	Elastosil N2199	Konstruvit	Chrisanne	Bostik 1475
Inorganic Materials	Crystal	▪			▪	▪			▪	▪	▪			
	Glass	▪			▪	▪			▪	▪	▪			
	Ceramics	▪	▪	▪							▪			
	Stone	▪	▪	▪	▪						▪			
Metals	Aluminium	▪	▪	▪							▪			
	Brass	▪	▪	▪							▪			
	Silver	▪	▪	▪							▪			
	Steel	▪	▪	▪							▪			
Gluable Synthetic Materials	PC	▪	▪	▪	▪	▪	▪	▪						
	PS	▪			▪		▪							
	PVC/ABS	▪	▪	▪	▪	▪	▪	▪			▪			
	Rubber	▪			▪		▪	▪						
Organic Materials	Paper	▪					▪	▪			▪	▪	▪	▪
	Cork	▪									▪	▪	▪	▪
	Wood	▪	▪	▪							▪	▪	▪	▪
	Textiles					▪						▪	▪	▪

Glue Descriptions

CG 500-35 (A+B)
Two-Component Epoxy Resin Glue

Curing

Curing and final strength are dependent on temperature. Curing can be accelerated by application of heat (to a max 100°C/180°F).

Technical Data

Mixture ratio of components A + B	1:1
Pot life at room temperature (23°C/73.4°F)	60 min.
Complete curing time at room temperature (23°/73.4°F)	24 h
Complete curing time in oven (40°C/104°F)	12 h
Complete curing time in oven (70°C/158°F)	2 h
Complete curing time in oven (100°C/212°F)	1 h
Time to handle at room temperature (23°C/73.4°F)	3 h
Elasticity	500%
Viscosity	12000 mPa*s

For all the latest information and comprehensive details (e.g. safety data sheets) for CG 500-35, please go to:
WWW.SWAROVSKI.COM/CRYSTALLIZED/CG500-35

Uhu Plus endfest 300

Two-component epoxy resin glue
www.uhu.de

Araldite 2011

Two-component epoxy resin glue
www.huntsman.com/structural-adhesives

Araldite 2026

Two-component polyurethane glue
www.huntsman.com/structural-adhesives

Scotch Weld DP610

Two-component polyurethane glue
www.3m.com

Uhu Instant Adhesive

Cyanacrylate glue
www.uhu.de

Cyberbond 2999

Cyanacrylate glue
www.cyberbond.eu.com

Photobond GB 368

UV glue
www.delo.de

Photobond GB 345

UV glue
www.delo.de

Elastosil N2199

Silicone glue
www.wacker.com

Konstruvit

Dispersions glue
www.geistlich.com

Chrisanne

Dispersions glue
www.chrisanne.com

Bostik 1475

Contact glue
www.bostik.com

Innovative and future-oriented Crystal Jewellery Glue by Swarovski
CG 500-35 (A+B) Two-Component Epoxy Resin Glue

High performance gluing system for both foiled and unfoiled CRYSTALLIZED™ – *Swarovski Elements* (mainly Round Stones, Flat Backs No Hot Fix and Fancy Stones), exclusively distributed by Swarovski for professional use within the jewellery segment and other industries such as accessories, interior, electronics, etc.

CG 500-35 (A+B) 2x50 g tube

CG 500-35 (A+B) 2x1 kg box

Key Features

- **Future-oriented Solution**
  CG 500-35 is in line with Swarovski's corporate social responsibility, respecting the environment and supporting the community. It is a sustainable gluing system that fulfils high claims regarding environmental- and health protection for both the consumer and the manufacturer.
- **Hgh-grade Ingredients**
  CG 500-35 contains only high grade ingredients. It offers significant advantages for transportation purposes (e.g. air freight shipping) because it is not classified as hazardous material according to IATA transport regulations.
- **Ideal Mechanical and Chemical Resistances**
  CG 500-35 is highly resistant against mechanical stress (e.g. hits and deformations), humidity, perspiration, salt- and chlorine water and UV light. For example, CRYSTALLIZED™ – *Swarovski Elements* glued with CG 500-35 remain in the cavities after extreme mechanical stress due to optimal shock absorbance (up to 500% compared to 10% of standard epoxy glues).
- **Multiple Fields of Application**
  CG 500-35 has ideal adhesion features on many materials like metals (e.g. plated surfaces, stainless steel, titanium, gold and silver in the jewellery industry), glue-able synthetics (e.g. ABS, PMMA, PVC etc. within the accessories and electronics industry) and rubbers, glass, crystal, wood, cork and porcelain (e.g. in the interior and home décor industry).
- **Exclusive Distribution**
  CG 500-35 is exclusively distributed by Swarovski, available worldwide, without minimum order quantities.
- **Perfect Match for CRYSTALLIZED™ – *Swarovski Elements***
  CG 500-35 perfectly matches the configuration of the Swarovski Foiling and is optimised for the use of CRYSTALLIZED™ – *Swarovski Elements.*
- **High Production Efficiency**
  CG 500-35 allows curing at very high temperatures (up to 100°C/212°F) without loosing any resistance features. Significantly shorter production times are possible.

→ **The number of considerable advantages makes CG 500-35 the ideal gluing solution for most applications of CRYSTALLIZED™ – *Swarovski Elements.***

Future-oriented Solution

CG 500-35 contains only high-grade ingredients. Compared to standard gluing systems the following warning notices do not apply for CG 500-35. It is only evaluated as Xi irritant and not Xn harmful.

Standard Epoxy Resin Glues

E Explosive	F Highly Flammable	T Toxic	Xn Harmful	C Corrosive	N Dangerous for the environment	UN 3082 Environmentally hazardous substance, liquid, n.o.s.

These warning notices do not apply for CG 500-35

Ideal Mechanical and Chemical Resistances

CG 500-35 offers ideal Mechanical and Chemical Resistance against:	
Mechanical stress	CG 500-35 absorbs hits and withstands deformations; in addition, maximum elasticity protects the mirror coating of foiled crystals. E.g. CRYSTALLIZED™ – *Swarovski Elements* remain in the cavities when the jewellery piece falls down.
Humidity	CG 500-35 prevents infiltration of humidity into the glue and thus any corrosion. E.g. the jewellery piece can be stored and worn in places with high humidity.
Perspiration	CG 500-35 prevents infiltration of perspiration into the glue and thus avoids corrosion. E.g. the glued CRYSTALLIZED™ – *Swarovski Elements* will not be damaged by perspiration.
Salt- & chlorinated water	CG 500-35 protects CRYSTALLIZED™ – *Swarovski Elements* when they are exposed to salt- or chlorinated water. E.g. the glued CRYSTALLIZED™ – *Swarovski Elements* will not be damaged during swimming.
UV light	CG 500-35 hardly discolours when exposed to sunlight. E.g. glue residues stay transparent and the glue can also be used for applications on glass.

Results of Extreme Mechanical Stress Tests

XILION Chatons that have been glued with **CG 500-35** remain in the cavities after extreme mechanical stress due to optimal shock absorbance (up to 500%)

Glued with CG 500-35

Ring with XILION Chatons

Glued with standard epoxy resin glue

XILION Chatons glued with **standard epoxy resin glue** fall out of the cavities after extreme mechanical stress due to little shock absorbance

Multiple Fields of Application

CG 500-35 offers ideal Adhesion Features on:	
Metals	E.g. applications of CRYSTALLIZED™ – *Swarovski Elements* on plated surfaces, stainless steel, titanium, gold and silver within the jewellery industry
Glue-able synthetics & rubbers	E.g. applications of CRYSTALLIZED™ – *Swarovski Elements* on ABS, PMMA, PVC etc. within the accessories and electronics industry
Glass, crystal, wood, stone, cork & porcelain	E.g. applications of CRYSTALLIZED™ – *Swarovski Elements* in the interior and home décor industry

Mixing Glue Components

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!

1 Mix both of the glue components according to the instructions in the product description

2 Mix the two components well for at least one minute

3 Put the glue in a dispenser

4 Fix the dosing syringe on the dispenser

Dosage

The glue can be applied for example with a dosing syringe or fluid dispenser. The correct amount of glue will additionally protect the foiling from external influences.

Dosing syringes

Courtesy of I&J Fisnar Inc.

Fluid dispenser

Setting the Crystals

Pick up the crystals e.g. with a wax stick, tweezers or a vacuum pick-up system, apply it to the gluing position and press down gently.

The use of a silicone wax stick is not recommended as this can impair the adhesion and the brilliance of the crystals.

Wax stick

Tweezers

Vacuum pick-up system

Application of Round Stones and Fancy Stones

1 The surface must be correctly pre-treated before gluing (e.g. cleaning, degreasing, sanding). If using solvents, wait a few minutes to let it evaporate.

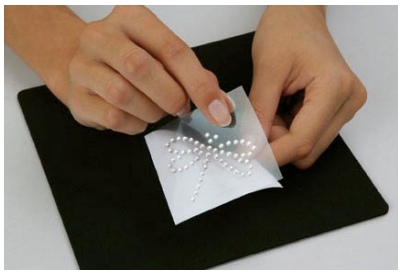
2 The glue should be applied with a dispenser. To glue a single spot, aim the needle just above the spot to be glued and lift it slowly upward to avoid any glue spreading out sideways.

3 Pick up the crystal with the wax stick

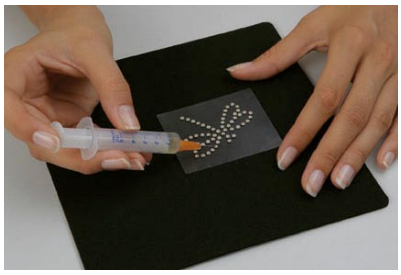
4 Carefully place the crystal in the cavity and press it down gently

Application of Flat Backs No Hotfix and Transfers No Hotfix

Flat Backs No Hotfix can be applied in the same way as Transfers No Hotfix. Both products can be applied to a multitude of flexible and rigid materials.



1 Peel off the white protective film



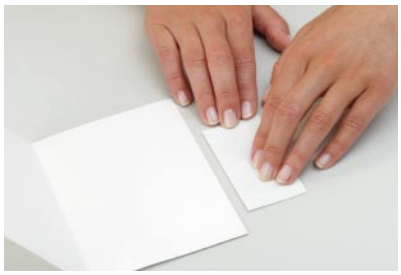
2 Apply the correct amount of glue

3 Position the motif on the pre-treated surface

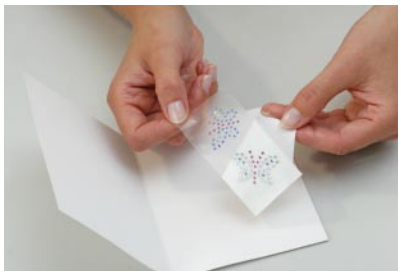
4 Use soft foam rubber to compensate different size of crystals or an uneven surface. The foam rubber should cover the surface of the Transfer and be weighed down while the glue is hardening.

5 After the glue has hardened, remove the transparent film (taking into account the technical data of the glue)

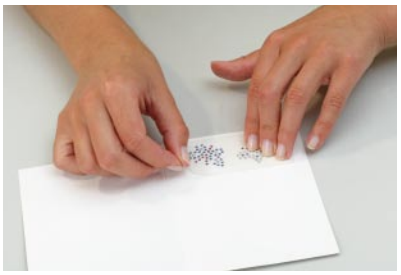
Application of Crystal-it



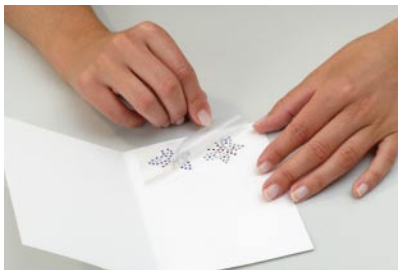
1 Press the crystals onto the carrier foil



2 Peel off the white protective film at an acute angle



3 Press the Crystal-it Motif firmly into place for 10 seconds



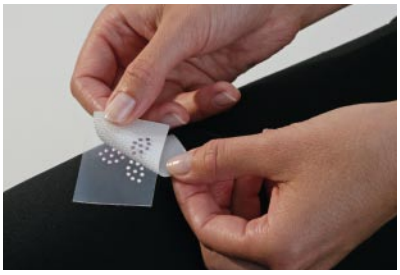
4 Carefully peel off the foil at an acute angle and press down firmly again

Please note: further information is available in chapter “Important Information & Application Support”.

Application of Crystal Tattoos

Crystal Tattoos are coated with a dermatologically tested glue that poses no threat to health and can therefore be applied directly to the skin.

1 Cleanse the skin with soap



2 Peel off the white protective film at an acute angle

3 Press the Crystal Tattoo firmly into place for 10 seconds

4 Carefully peel off the foil and then press down firmly again

Please note: further information is available in chapter “Important Information & Application Support”.

USEFUL INFORMATION <<<

Applications on Silver Jewellery

Without protection, silver jewellery can turn yellow or black with time due to chemical reactions. To slow or stop these reactions the surface of silver jewellery 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 to under the recommended 38 mN/m.

TARNISHING PREVENTION SYSTEMS	
Temporary protection against tarnishing	**Permanent protection against tarnishing**
▪ Wax-based	▪ Varnish-based
▪ Low surface tension	▪ Surface tension depends on varnish
▪ Remove with flame treatment or alkaline solution	
Advice: Protect the rest of the piece after gluing.	Advice: Use a tarnishing protection with sufficient surface tension.

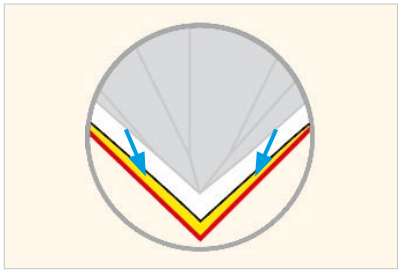
Application on Synthetics

The following table contains information regarding the adhesive qualities of a selection of synthetic materials.

PLASTICS	USUAL COMMERCIAL NAME	ADHESIVE QUALITIES
ABS	Abselex, Lacqran, Tynrene	good
ASA	Luran S, Geloy	good
CA	Ultraphan, Saxetat, Thodialite	good
EP	Araldite, Ferropox, Duroxyn	good
PA	Degamid, Nylon, Perlon	very difficult
PC	Polycarbafil, Lexan, Andoran	good
PE	Geberit, Hostalen G, Ferrozell	bad
PET	Cardura, Atlas, Eralyt	difficult
PF	Formanyl, Holoplast, Kerit	good
PIB	Parapol, Oppanol, Vistanex	good
PMMA	Plexiglass, Resartglass	good
POM	Delrin, Kematal, Ertacetal	difficult
PP	Moplefan, Proplex, Verelite	bad
PS	Hostyrene, Styropor, Noblen	good
PTFE	Teflon, Gaflon, Ferrotron	very bad
PVC	Marcoproplat, Ravinil, Sumilit	good
SAN	Litac, Tuf-Flex, Vestoran	good
SILICONE	Silopren, Contiduct, Corotex	bad
UP	Celipal, Sirester, Vestopal	good

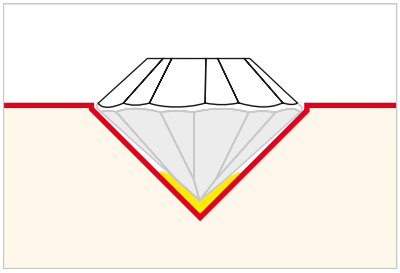
Shrinkage

Adhesives tend to shrink as they harden. There will be a greater amount of shrinkage if the wrong glue has been chosen, it hardened under the wrong conditions or if there is a wrong sized cavity (too much space around the crystal). The tension thus created can damage the foiling and the crystals may even detach.

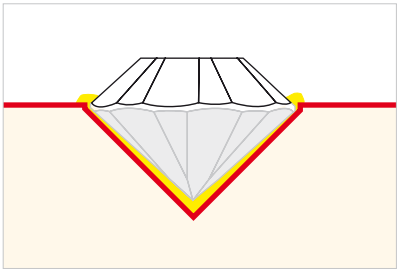


The foiling (shown in black) is torn from the crystal because of excessive glue shrinkage (shown in yellow).

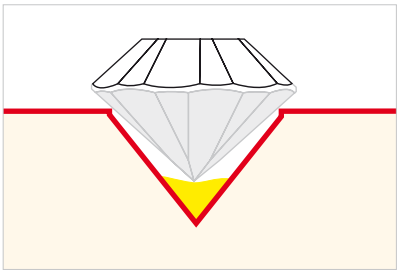
Incorrect Cavities



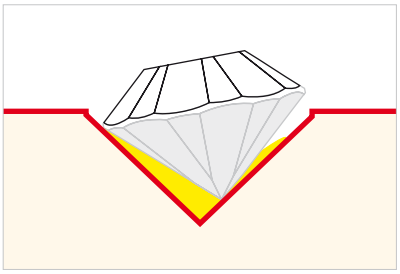
Too little glue



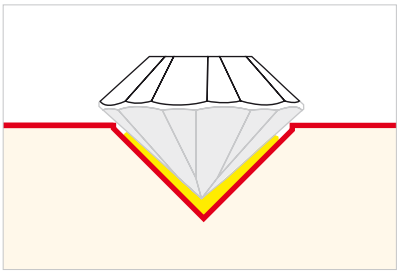
Too much glue



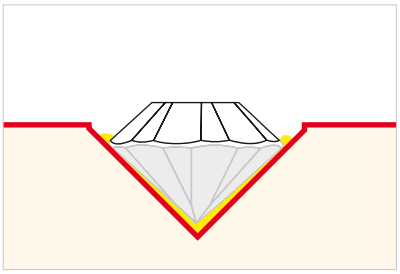
Angle too small



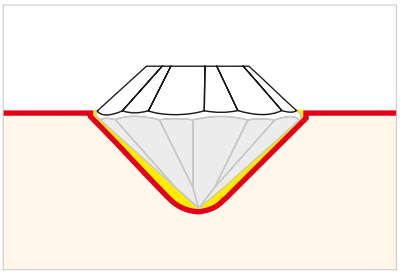
Angle too large



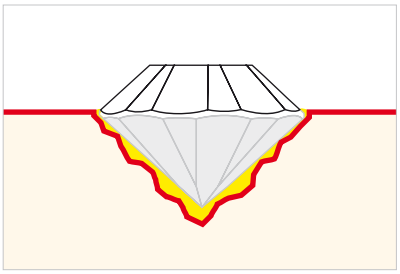
Crystal too large/cavity too small



Crystal too small/cavity too large



Rounded cavity



Cavity with uneven surface

Troubleshooting

PROBLEM	ERROR
The crystal has become discoloured	
▪ The crystal is matt or yellowed	**1, 2**
▪ The crystal seems black and dull compared to the surrounding the crystals	**3**
▪ The crystal has been electroplated	**4**
The crystal has come away from the cavity	
The crystal has detached without the foiling.	
▪ The crystal has become discoloured.	**5, 6**
▪ The crystal has not become discoloured.	**6**
▪ The crystal has detached with the mirror coating but without the Platinum foiling or the glue.	**7, 8, 9**
The crystal has detached with the foiling.	
▪ Glue is attached to the crystal.	**10, 11, 12, 13, 14**
▪ There is no glue is attached to the crystal anymore.	**15, 16, 17**
Too much glue	
Before hardening	**18**
After hardening	**19**

ERROR	CAUSE	RECOMMENDATION
1	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.
2	Too much glue was used	Use less glue. Be sure to use the exact recommended dosage and to carefully remove any excess glue using acetone or isopropanol.
3	The axis of the cavity was already off-centre in the original model or the cavity was not drilled straight in the unfinished casting	When drilling cavities in the original model, use a drill with a special bit, which will allow you to control the direction and depth of the cavity more exactly.
4	The jewellery was only electroplated after the crystals had been glued to it.	It is recommended to complete the electroplating before gluing the crystals.
5	A glue cavity that has not been completely filled is causing corrosion.	Make sure the exact recommended dosage of glue is used.
6	Tensile stresses are reducing the adhesion of the mirror coating. Oxygen is penetrating between the stones and the mirroring and causing oxidisation	Use glue that is more elastic and that does not shrink as much
7	An incorrect adhesive system was used	Carry out tests with other adhesive systems
8	Incorrect proportions of resin and hardener were used.	Follow the glue manufacturer's mixing instructions
9	Cleaning agents have affected the glue and/or the protective coating.	Use less solvent or a different type of solvent
10	Residues of polishing agent were not completely removed before electroplating.	Double check the type of cleaning process used
11	A varnished piece of jewellery 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
12	Too little glue was used	Make sure the exact recommended dosage of glue is used
13	The cavity is the wrong shape after electroplating	Re-work the original model to improve the cavity shape
14	Electrolyte residues have not been completely removed	Double check the type of cleaning process used
15	The specified processing time was exceeded and as a result the glue has already hardened.	Reduce the processing time

ERROR	CAUSE	RECOMMENDATION
16	Too little glue was used	Make sure the exact dosage of glue is used!
17	General glue problems	Follow the manufacturer's instructions. Check the conditions under which the glue is stored. Excess solvent could have attacked the glue and/or the foiling.
18	Too much glue was used	Use sufficient glue. A dispenser system is used to ensure the exact dosage. Excess glue may be carefully removed using a cotton bud that has been soaked in either acetone or isopropanol.
19	The jewellery piece was put under stress before the glue had hardened.	Make sure the glue has hardened before e.g. transporting the jewellery.

SUPPLIERS <<<

This list provides an overview of chosen recommended suppliers worldwide and should serve as a guide to locate the optimal supplies.

MACHINES / TOOLS / AIDS	SUPPLIER	CONTACT
CG 500-35 Two-component epoxy resin glue	Swarovski 2x50 g Tube: European version: Art. 9030/150, Sys.No. 919330 American version: Art. 9030/250, Sys.No. 919338 Asian version: Art. 9030/350, Sys.No. 919342 2x1 kg Box: European version: Art. 9030/110, Sys.No. 919333 American version: Art. 9030/210, Sys.No. 919341 Asian version: Art. 9030/310, Sys.No. 919345	www.swarovski.com/crystallized/CG500-35
Test Pen	Swarovski Art. 9030/000, Sys.No. 919346	www.swarovski.com/crystallized/CG500-35
Twist drill/NC drill	Hahn & Kolb Hoffmann Group	www.hahn-kolb.de www.hoffmanngroup.de
Fluid dispenser (with/without vacuum suction)	I & J Fisnar, Inc.	www.ijfisnar.com
Dosage syringes	I & J Fisnar, Inc.	www.ijfisnar.com
Vacuum pick-up system	I & J Fisnar, Inc.	www.ijfisnar.com