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CERALUN

Ceralun is a high-performance, two-component ceramic epoxy composite especially developed for the application of Swarovski products.

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PRODUCT OVERVIEW

The following products are suitable for application with Ceralun:

	CERALUN
Round Stones	✓
Fancy Stones	✓
Crystal Pearls	✓
Flat Backs No Hoflix	✓

Ceralun is a versatile and strong two-component, high-performance ceramic epoxy composite. This clay has been specifically developed and tailored to

embed foiled and unfoiled crystals. It is an absolutely essential material for innovative design. Ceralun has a high level of hardness, rigidity, and shock absorbance.

It is resistant to sweat, humidity, or climatic changes, and shows no aging.

PRODUCT OVERVIEW & MACHINES AND TOOLS

AVAILABLE BASIC COLORS



AVAILABLE SHINING COLORS



MACHINES AND TOOLS

The following machines and tools can be used for the various processes involved in the application of Swarovski products with Ceralun:



Test Pen (art. 9030/000)



Isopropyl alcohol/Acetone



Blow torch



Corona



Plasma cleaner



Precision balance



Gloves



Protective eyewear



Ceralun (A + B)

Two-component ceramic epoxy composite
(5 x 20 g)



Ceralun (A + B)
Two-component ceramic epoxy composite
(100 g)



Ceralun (A + B)
Two-component ceramic epoxy composite
(10 x 100 g)



Ceralun (A + B)
Two-component ceramic epoxy composite
(1 kg)



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 pick-up system such as the
Swarovski vacuum pump with silicone
hose (art. 9040/022), adapted with
a dispensing tip



Tweezers



Wax stick



Ceralun Release Agent
Contains high molecular liquid wax (100 ml)



Drying oven



Freezer

SUPPLIERS

This list provides an overview of selected suppliers worldwide.

MACHINES & TOOLS	SUPPLIER	CONTACT
Test Pen	Swarovski: art. 9030/000	www.swarovski-professional.com
Ceralun Basic Colors	Swarovski: art. 9020, 5 x 20 g, Asia, Europe/America art. 9020, 100 g, Asia, Europe/America art. 9020, 10 x 100 g, Asia, Europe/America art. 9020, 1 kg, Asia, Europe/America Black (A+B), Burgundy (A+B), Dark Sapphire (A+B), Indicolite (A+B), Malachite (A+B), Red (A+B), Rose (A+B), Walnut (A+B), White (A+B), Yellow (A+B)	www.swarovski-professional.com
Ceralun Shining Colors	Swarovski: art. 9020, 5 x 20 g, Asia, Europe/America art. 9020, 100 g, Asia, Europe/America art. 9020, 10 x 100 g, Asia, Europe/America art. 9020, 1 kg, Asia, Europe/America Anthracite (A+B), Gold (A+B), Pearl Silk (A+B), Shining Green (A+B), Shining Lilac (A+B), Shining Red (A+B), Silver (A+B)	www.swarovski-professional.com
Ceralun Release Agent	Swarovski: art. 9020 (100 ml)	www.swarovski-professional.com
Vacuum pump with silicone hose, can be adapted to a pick-up system by attaching a dispensing tip	Swarovski: art. 9040/022	www.swarovski-professional.com
Vacuum pick-up system	I & J Fisnar, Inc. Epoxy & Equipment Technology PTE., Ltd. Hottemp (M) Sdn. Bhd. PT. SKT International	www.fisnar.com www.eetdispensing.com www.hottemp.com.my www.sktisolution.com
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	www.swarovski-professional.com
Pick-up stick	Crystal Ninja, LLC	www.crystalkatana.com
Drying oven	Heraeus Holding GmbH VWR International, LLC	www.heraeus.com www.vwr.com

APPLICATION

When working with Ceralun, 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, the wrong mixing ratio of the two components, or not mixing them together long enough until a homogenous appearance is achieved.

CERALUN TWO-COMPONENT CERAMIC EPOXY COMPOSITE

Ceralun was especially developed for the application of 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

- Specifically developed and tailored to embed foiled and unfoiled Swarovski crystals.
- High level of hardness, rigidity, and shock absorbance.
- Resistant to perspiration, humidity, or climatic changes and shows no aging.

- Allows new design possibilities.
- Perfect material to generate a large variety of surfaces and structures.
- Applicable on 3D-shaped surfaces.
- Alternative solution to gluing.

Technical data of Ceralun

Mixture ratio (A : B), by weight	1 : 1 (resin : hardener)
Pot life at room temperature (23 °C/73.4 °F)	max. 3 h
Complete curing time at room temperature (23 °C/73.4 °F)	72 h
Complete curing time in oven (40 °C/104 °F)	12 h
Complete curing time in oven (80 °C/176 °F)	2 h
Handling time at room temperature (23 °C/73.4 °F)	12 h
Humidity during curing	30 - 70%
Density	2.5 g/cm ³
Hardness (according to DIN 53505)	D82
Storage time at room temperature (23 °C/73.4 °F, 55% rel. hum.)	12 months
Lowest storage temperature	2 °C/35.6 °F

CHECKING SURFACE TENSION AND PRE-TREATMENT

Ceralun has optimal adhesive characteristics for applications on metal, glass, crystal, gluable plastic surfaces, rubber, wood, cork,

and porcelain, unless the materials do not have the right surface tension.

CHECKING THE SURFACE TENSION

The surface tension is an indicator for the wetting properties of the surface the Ceralun should be applied to. A surface tension of at least 38 mN/m is recommended for working

with Ceralun. 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 Mark the surface.



2 If the ink remains visible for 2 seconds, the surface is suitable for working with Ceralun.



3 If the ink disappears or forms bubbles, the surface is not suitable for applying Ceralun. 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.

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
<p>1 Mechanical cleaning</p> <p>This involves sanding, blasting, or brushing but is not usually necessary for jewelry.</p>	<ul style="list-style-type: none"> - Removal of dirt, residues of varnish, rust and/or scale - Roughening the surface
<p>2 Washing and degreasing</p> <p>Here it is important to ascertain that the tensides contain no silicone, as this would impair adhesion.</p> <p>When using solvents it is advisable to test the durability of the surface to be cleaned beforehand to avoid any damage.</p> <p>Solvents containing substances with a high boiling point should not be used due to the high risk of residue. If using cleaning agents, wait a few minutes to allow them to evaporate.</p>	<ul style="list-style-type: none"> - 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)
<p>3 Physical cleaning and activation</p> <p>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.</p>	<ul style="list-style-type: none"> - Flame treatment with 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.
<p>4 Chemical cleaning and primers</p> <p>Applying a primer improves adhesion and helps to prevent corrosion.</p>	<ul style="list-style-type: none"> - Applying small amounts of solvent and activating the surface. - Applying a primer.

DOSAGE, MIXTURE AND SETTING

Please pay high attention to not deviate from the recommended mixing ratio of 1:1 of the components (resin and hardener) and to

mix the two components until a homogenous appearance is achieved.

MIXING CERALUN TWO-COMPONENT CERAMIC EPOXY COMPOSITE



1 Cut off resin and hardener with a knife.



2 Weigh the two components. The mixing ratio for Ceralun is 1 : 1 by weight.



3 Mix resin and hardener until a homogenous appearance is achieved.

PROPER SETTING OF CRYSTALS

After mixing the two components together, the crystals can be set. To prepare 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' size. Place some Chatons onto the sieve. By slightly shaking the tool and wiping over the crystals with glove-covered fingers, the majority of Chatons automatically get turned into the suitable position for gluing (table pointing upwards).



Using a Chaton Sieve can facilitate the setting of Chatons

As a next step the Chatons can easily be picked up from the sieve using a tool like the wax stick, tweezers, or a vacuum pick-up system. The use of a silicone wax stick is not recommended as this can impair the adhesion and the brilliance of the crystals. Apply the Chatons to the desired position and press down gently.

We recommend a maximum working time of three hours at a temperature of 23 °C/73.4 °F to set the Swarovski products. It is not possible to set crystals at room temperature after a period of

three hours because the required level of adhesion can no longer be achieved.

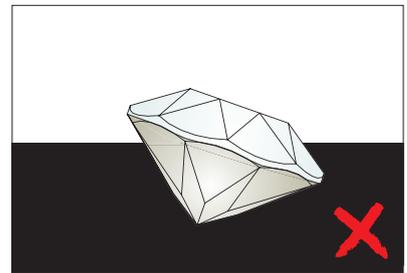
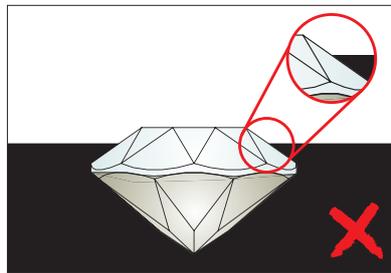
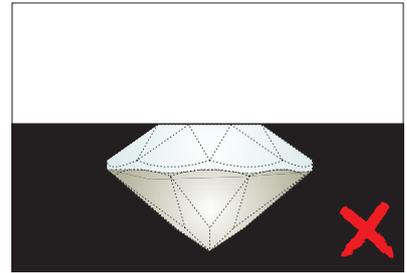
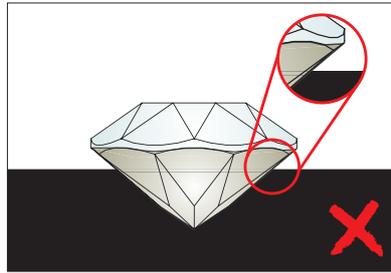
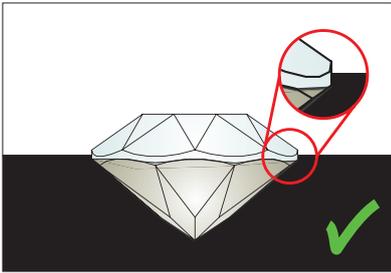
Please take care that the pavilion of the crystal is surrounded by Ceralun right up to the level of the stone's girdle. It is not necessary to leave any particular space between the crystals when setting them.

CHECKING SURFACE TENSION AND PRE-TREATMENT

DOSAGE, MIXTURE AND SETTING

PROCESSING METHODS

CURING



CHECKING SURFACE TENSION AND PRE-TREATMENT

DOSAGE, MIXTURE AND SETTING

PROCESSING METHODS

CURING

PROCESSING METHODS

DIFFERENT PROCESSING METHODS

Ceralun is the perfect material for generating a variety of surfaces and structures. Possible ways of processing

are the free forming method, the stamping technique and the 3D silicone molds.

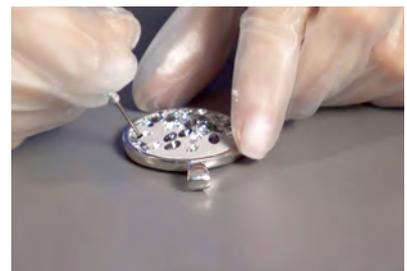
Free forming



1 Place and press the clay onto the relevant area. Be careful not to trap air between Ceralun and the base material.



2 Mold the surface into the required shape and smooth the surface with the recommended Release Agent.



3 Pick up the crystal with a vacuum pick-up system - or with a pair of tweezers or a wax stick. Carefully place the crystal and press it down gently.

Generating shiny surfaces with the free forming method

When a piece of jewelry is created where parts of Ceralun are visible, a smooth and shiny clay surface might be desired. In order to create a shiny surface,

gently wipe and polish the clay with your silicone glove-covered finger using the recommended Release Agent or some water drops. The Ceralun surface can be

polished up to 2 hours after the crystals have been set.

Stamping technique

The stamping technique is suitable to produce structured surfaces.



1 Pre-treat the pattern cautiously with the recommended Release Agent.



2 Gently press the pattern onto the surface.



3 After removing the pattern from the clay, the crystals can be set.

Generating shiny surfaces with the stamping technique

If a larger surface of shiny Ceralun is needed, the following tools are required: transfer foil, a pasta machine or rolling pin, and a freezer. Knead the clay and put it between two layers of foil. Smoothen it

with the help of a pasta machine or with a rolling pin. Using the pasta machine is the recommended option, as a consistent height of the Ceralun is achieved easier than with the rolling pin. When the clay inside the foil

is as flat as desired, put it into the freezer for approx. 15 minutes. The cold reduces the bonding between Ceralun and foil, so that the foil can easily be detached from the flat and shiny clay.

3D silicone molds

The work and cost saving method of using 3D silicone molds is recommended for larger production units.

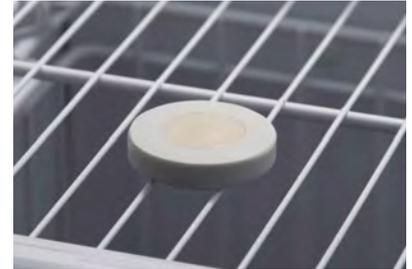
A 3D silicone mold is produced based on a master model. This can be re-used for several times.



1 First press the Ceralun into the 3D silicone mold to form the required shape.



2 Any overlapping material can be trimmed off with a knife.



3 In order to make it easier for you to remove the Ceralun from the mold, it should first be stored in the freezer. The length of time the filled mold should remain in the freezer depends on the thickness and amount of the Ceralun used.



4 After taking the mold out of the freezer, the Ceralun can be removed from it and gently pressed into place on the chosen object.



5 Please be sure to remove any condensed water.



6 Once the Ceralun reaches a lukewarm temperature, you can proceed with setting the crystals.

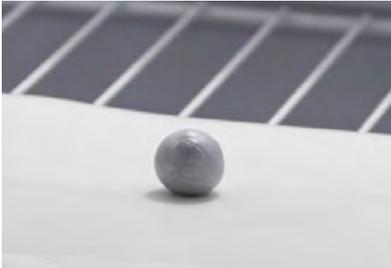
CURING

The hardening time and final adhesion strength of Ceralun are dependent on the temperature. The total hardening time at

room temperature of 23 °C (73.4 °F) takes 72 hours. This can be accelerated using heat of max. 80 °C (176 °F).

USEFUL INFORMATION

EXTENSION OF POT LIFE



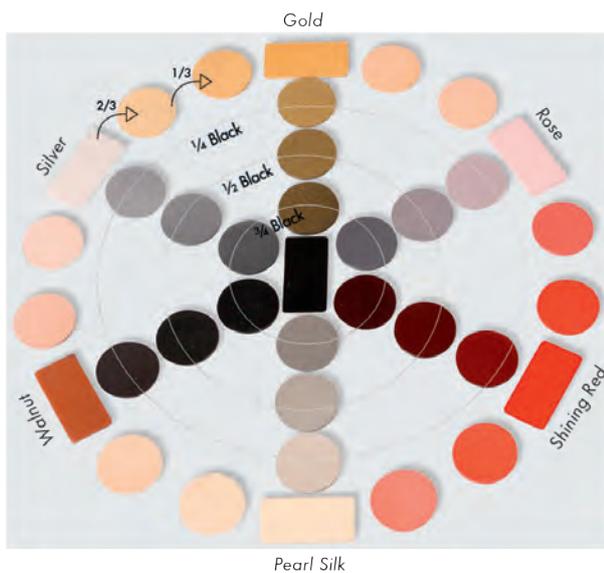
- 1 Store already mixed Ceralun in a freezer to extend the pot life. Ceralun can be stored in a freezer for up to 24 hours at a temperature of around $-20\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$).
- 2 This makes it possible to interrupt the setting process and continue again later without losing the adhesion force.
- 3 It is necessary to gently remove any condensed water that occurs during the defrosting process.

MIXING DIFFERENT COLORS OF CERALUN

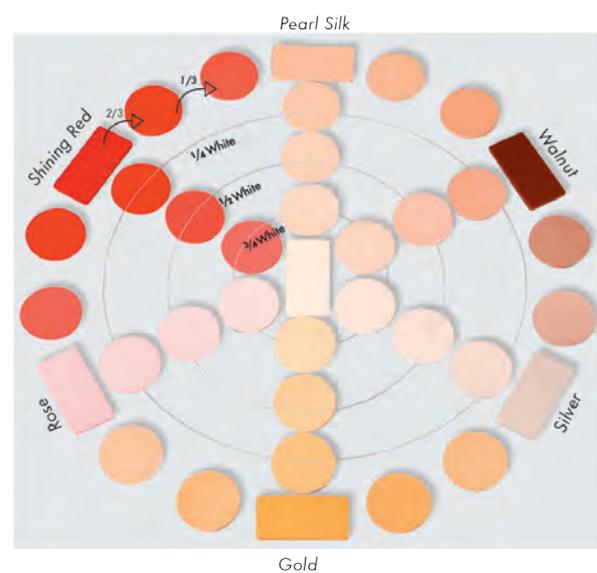
You can mix different colors together as you wish. Please consider that you have to

separately mix the epoxy resin and hardener of each color before you mix them together.

Below you find some examples of mixed colors and the corresponding mixing ratio.



Based on Black



Based on White

QUICK ASSISTANCE

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

PROBLEM	CAUSE
Ceralun does not cure.	1, 2, 6
Ceralun is not bonding with the base material.	1, 2, 3, 6
Crystals fall off.	1, 2, 4, 5, 6
Ceralun cannot be removed from the silicone mold.	7, 8
Using the stamping technique, Ceralun cannot be removed from the surface pattern.	7
Ceralun appears foggy/cloudy after curing.	5, 6, 7

CAUSE	RECOMMENDATION
1 An error has occurred during the calculation of the right mixing ratio between the two components (resin/hardener).	Do not deviate from the recommended mixing ratio of the components (resin/hardener), 1 : 1.
2 Resin and hardener have not been mixed until a homogenous appearance was achieved.	Be sure to use the exact recommended dosage and mix both components until a homogenous mixture is achieved.
3 The base material is not suitable for using Ceralun or it has been incorrectly pre-cleaned.	Check the surface tension. If the surface tension is below 38 mN/m, carry out pre-treatment cleaning methods.
4 The specified processing time was exceeded and as a result Ceralun has already hardened.	Reduce the processing time to a maximum of two hours at a temperature of 23 °C (73.4 °F).
5 If stored in the freezer, condensed water can occur during the defrosting process.	Take care to gently remove any condensed water that occurs during the defrosting process.
6 Ceralun has been stored for too much time in the freezer.	Make sure not to exceed the recommended time of 24 hours when Ceralun is stored in a freezer at a temperature of around - 20 °C (- 4 °F).
7 No or not enough Release Agent has been used.	The Release Agent is a useful tool to be able to remove Ceralun from any surface. Carefully dose the used amount of Release Agent.
8 Ceralun has not been stored in a freezer or has been stored for too little time.	Storing Ceralun in a freezer makes it easier for you to remove it from the mold.

