Soldering

APPLICATION MANUAL

PRECIOSA

Contents

Introduction

Soldering is a process of joining two metal surfaces together using a filler metal called solder. The soldering process involves heating the surfaces to be joined and melting the solder, which is then allowed to cool and solidify, creating a strong and durable joint. For a clean, uniform appearance of the metal, components should be soldered before they are plated.

I. COMPONENTS SUITABLE FOR SOLDERING

COMPONENT		SOLDERING
	**Stones in Settings**	✓
	**Cupchain**	✓

Before You Begin

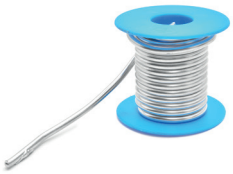
Make sure you have assembled the necessary tools and properly cleaned and treated the metal settings before soldering. Make sure the workspace is adequately ventilated. The use of protective eyewear is strongly recommended.

I. TOOLS AND EQUIPMENT

Impression paste

Tweezers

Wire cutters



Solder wire

Smoother

Oxygen/hydrogen soldering kit

Ultrasound

Protective gloves

Protective eyewear

II. SURFACE PRE-TREATMENT

The material and all tools should be clean and without any grease in particular. Use organic solvents or aqueous solutions of suitable detergents. If you want to get a galvanic layer of the highest quality the decreasing procedure can be also done by bright pickling.

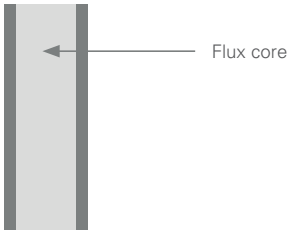
III. BASIC PRINCIPLES OF SOLDERING

Solder wire

Working temperatures and flow characteristics are of particular importance when selecting a solder. Solders are available from various manufacturers in a wire form with or without a flux core, as a paste or in pellets. We recommend solder wire with an integrated flux core. When using solder pellets or wire without a flux core, it is necessary to adapt the flux according to the instructions of the solder manufacturer. Corrosive effects on the foiling should be tested in advance.

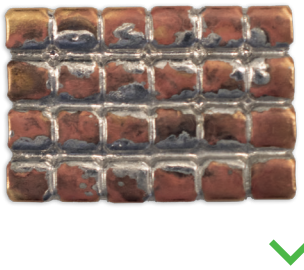
Note that lead-free solders require a higher working temperature.

Adjust the solder diameter according to the product thickness and dimensions.

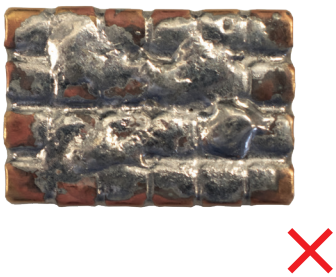


Solder amount

The amount of solder used to join the parts should be in accordance with the size of the soldered parts. Too much solder, as well as too little solder, can negatively influence the quality of the product.

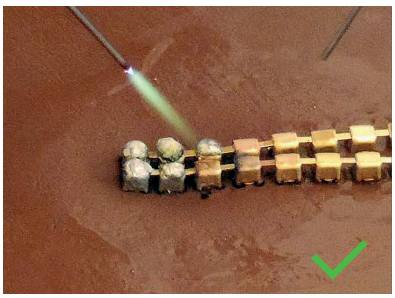


Optimal quantity of solder

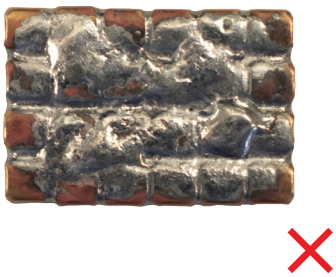


Too much solder
(the solder flows over the cups)

Only that part of the jewellery piece should be heated, where the solder is being used to join the parts. It is not recommended to apply the solder on the entire surface and heat it afterwards.



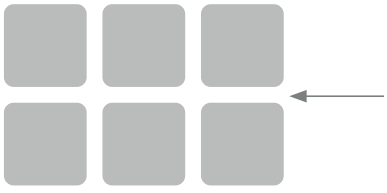
Only soldered spots should be heated



Solder has been applied to the entire surface before heating

Width of the joint

The joint between the soldered parts should be 0.1 – 0.3 mm. A strong and reliable joint can only be achieved when parts around the joint are thoroughly warmed. The heat, however, should be applied only for a necessary time (exceeding the optimal time can result in a damage of the stones).



Impression paste

Impression paste is a material in which a jewelry piece is impressed. The original design (finished product with the stones, called the "sample"), is pressed into the paste, stones side down. An impression of the sample remains in the paste after the "sample" is removed. The new product is placed by tweezers into the impression paste and is ready to be soldered. The back side of the components has to be directed upwards with stones facing the paste.

Impression paste should be elastic and should not dry out. It has to effectively remove the heat from the product.

Always consider the best layout so that a maximal number of samples can be impressed.

Temperature

Even though the melting point of the solder is 190° C, the real temperature affecting the stones can be much higher. When using the oxygen / hydrogen flame, the temperature of the flame core can reach 3,000 °C.

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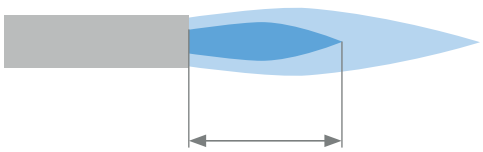
The recommended melting temperature of the solder should be 190 °C / 375 °F.

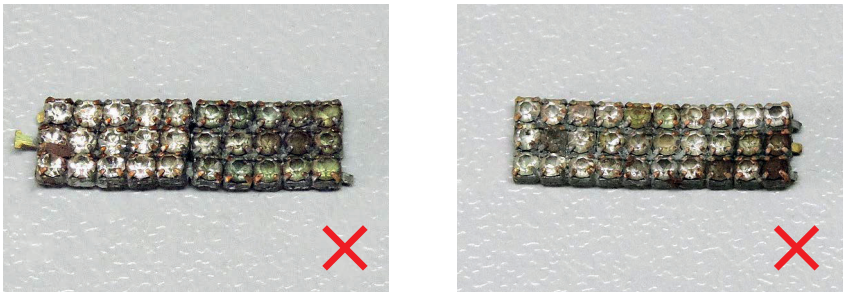
Flame

The optimal length of the flame core should be 5 – 10 mm. The soldering kit should be set accordingly. Using a proper soldering technique with precise oxygen / hydrogen flame provides the highest labour efficiency. Respect also the product thickness and dimensions.



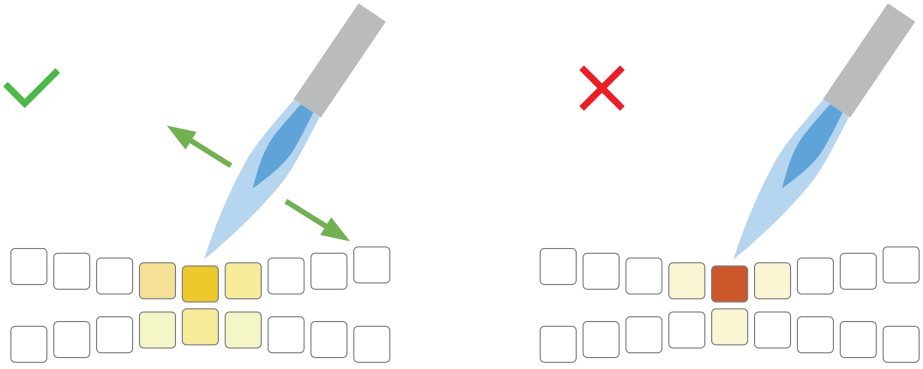
The optimal length of the flame core is 5 –10 mm.

The right flame size and time of its application are important criteria for a successful soldering. If the flame is focused on the jewellery piece too long, the stone and the article may become overheated and therefore damaged and destroyed.



Stones damaged by long soldering and high tempertature.

Do not focus the flame on one spot but move it slightly to and from during soldering.



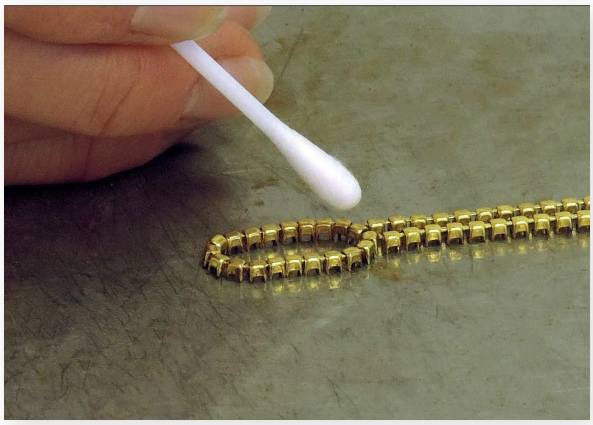
Moving the flame slightly to and fro during soldering provides an even warming of the joint and does not damage the stones.

Focusing the flame on one spot causes stone damage – loss of optical-aesthetic qualities (brilliance,fire).

Damage usually becomes visible after post-soldering surface treatments, e.g. after degreasing or plating. Foiling damage by soldering has a negative influence on the results of the subsequent plating process (deterioration of optical-aesthetic qualities).

Application

SOLDERING

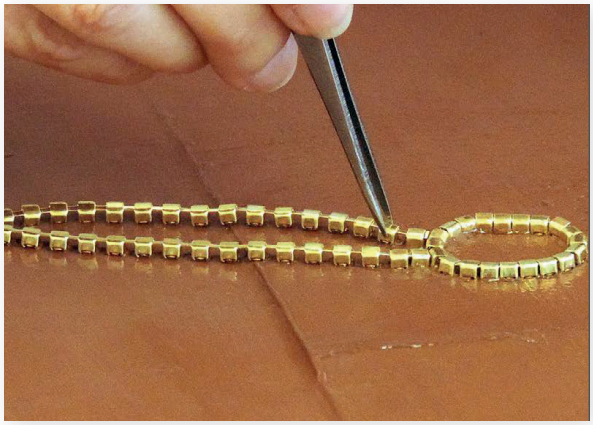


1. Degrease and dry the underside of the metal setting(s).

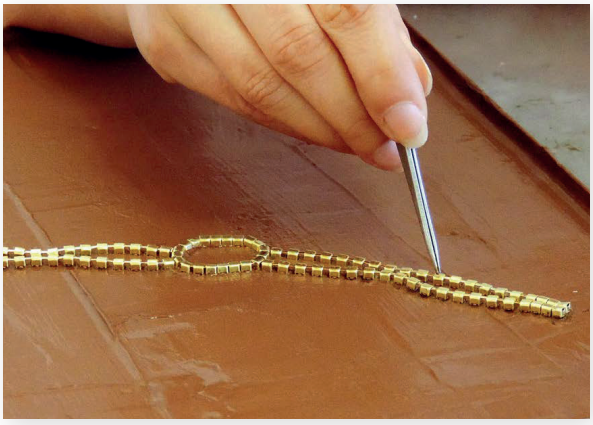
2. Spread the impression paste in the plate; smooth into an even and compact layer.

3. Place the plate with the impression paste on a surface.

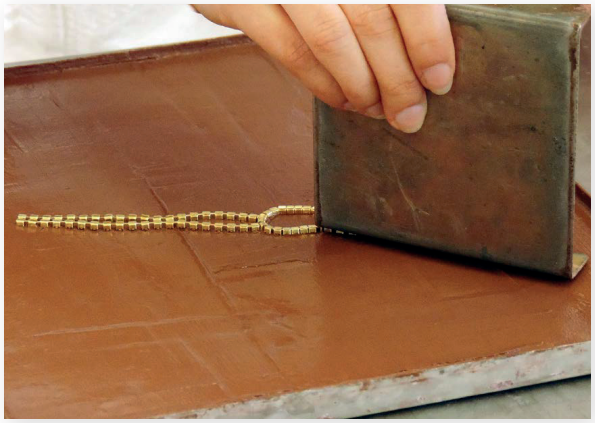
4. Press the the design into the impression paste, stone side down.



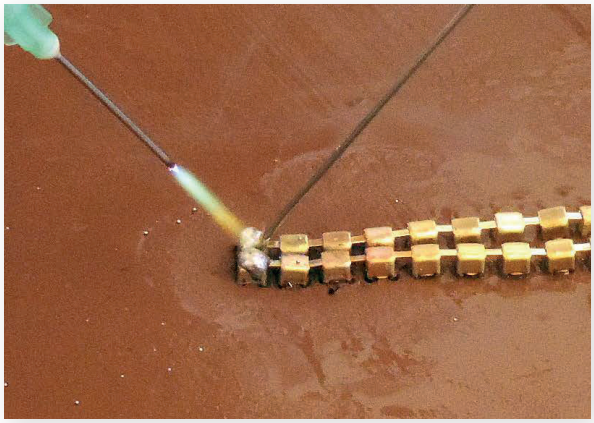
5. Place the set components into the impression of the design in the desired arrangement.



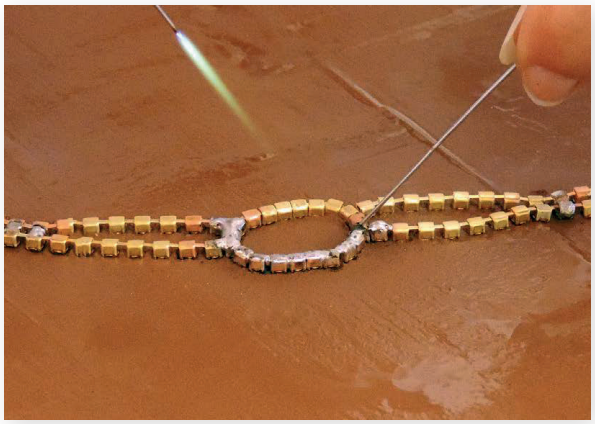
6. Check that the set stones are placed according to the sample design.



7. Press down on the design gentle using a small plate to secure the stones in place.



8. Place the solder wire on the warmed joint and heat the solder until the solder melts and fills the space between the joints.



9. Repeat the soldering process on all desired joints.

10. Let the solder cool down until it is no longer hot to the touch.

AFTER SOLDERING

Let the product cool down and then remove it from the impression paste. Clean the product by immersing it into a mild alkali bath. Use ultrasound to remove solder remainders. To remove a slight colouring caused by oxidation use a mild acid bath with ultrasound. Natural cleaning agents or identical cleaning substances (turpentine, limonene) can be used in a solution with alcohol and water. Let the product dry at an ambient temperature or dry it in warm air.

Troubleshooting and Diagnostics

PROBLEM	RECOMMENDATION
Incorrect impression.	Compare the impression with the sample. The jewelry was laid down in the impression paste incorrectly or the **wrong sample** was used.
The **solder does not flow** properly.	**Check the solder** and change it if necessary. **Increase the temperature.**
Solder and material are **heated insufficiently.**	**Increase the temperature** or **prolong the time of heating** the material.
Too much solder due to repeated soldering or improper solder.	Clean the joint mechanically, e.g. by grinding and solder again.
Solder flows over the stones due to overheating.	Do not solder one spot for a very long time. Remove the solder. Replace the damaged stones and set new ones.
Yellow, discoloured or cracked stones.	Cracking or changing colour can be caused by **overheating**. Try to **cut the** soldering **time**. Do not focus the **flame** on one spot for a long time but **move** it slightly. Use the **solder that melts at a lower temperature**. The solder could have flown into the cup and damaged the foiling. Remove the crystal and check it. **Reduce the amount of solder**. Take care not to use the ultrasound for cleaning the soldered part too intensively. **Avoid extreme temperature differences** during and after soldering. **Replace the** damaged **stones** and set new ones.
The solder **joint cracks.**	Solder again and **use more solder**. Too much solder can also cause cracking as the flexibility of the parts is restricted. **Use less solder**. **Clean** the metal surface sufficiently **before soldering**.
The metal **surface is eneven.**	**Polish** the product. For example by mechanical polishing devices. It is also ideal for preventing corrosion.

Care Instructions

		STONES IN SETTINGS	CRYSTAL CUPCHAIN
Stones with coatings – use only gentle wash cycle (30 °C).	 Turn inside out, choose a gentle wash cycle and use mild laundry detergent. To protect the crystals as much as possible, the use of a soft wash bag is recommended.		
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	 Turn inside out and use mild laundry detergent.	●	●
	 Do not wash!		
	 Do not use chlorine bleach!	●	●
	 Turn inside out and dry at reduced temperature.		
	 Do not tumble dry!	●	●
	 Iron inside out using a silk/polyester viscose setting and pressing cloth.	●	●
	 Iron inside out using a wool setting.		
	 Do not iron!		
To protect the crystals as much as possible, the use of a soft wash bag is recommended.	 May be gently dry-cleaned using perchlorethylene. Turn inside out.		
	 May be gently dry-cleaned using hydrocarbon.		
	 Can withstand professional wet cleaning. Turn inside out.		
	 Do not dry clean!	●	●

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