



## Ten Steps to Successful Soldering (Gold and Silver)

- 1. Inspect–Clean–Inspect**—inspect the jewelry to determine what needs to be done before it is cleaned (magnification is recommended). If gemstone(s) are present, identify them and determine if they can be cleaned using standard methods (ultrasonic and/or steamer). Clean the item(s) and inspect again.
- 2. Prepare**—Prepare the bench keeping all needed equipment and supplies within reach. In preparing the jewelry for soldering, saw/file the area to insure a tight, gap-free fit. Good fit assists the solder to flow properly through the joint. Determine if extra precautions should be taken for any gemstones in the jewelry.
- 3. Firecoat**—Items should be dipped in a solution of boric acid powder and denatured alcohol to help prevent oxidation. Gemstones will also need to be protected from heat. Consult a gemstone durability chart.
- 4. Flux and Preheat**—Flux the solder joint(s) and preheat the piece. Heat the jewelry until the flux turns to liquid.
- 5. Flux the Solder and Place**—Dip the solder piece into flux and place it onto the jewelry while still warm from preheating. This should allow the solder to stick where needed.
- 6. Apply Heat**—Apply heat evenly to the jewelry. The mass of the jewelry item and the thermal conductivity properties of the metal will determine the torch size, the type of flame used, and the amount of heat needed to flow the solder.
- 7. Pickling**—Use a pickling pot with copper tongs and pickling compound (acid) mixed with water. Air-cool the jewelry to avoid splashing before you place the item in the pickle pot. Thoroughly rinse the item, first in a baking soda and water solution, then in clean water.
- 8. Prepare for Polish**—Inspect, be sure all flux and oxidation is removed. Check the solder joint(s) for flow and coverage. Remove any excess solder. Then sand with fine emery.
- 9. Polishing**—Polish across solder joints to avoid “pulling” out the solder with polishing compounds. Thoroughly clean to remove all traces of polishing compounds before buffing to a high polish.
- 10. Inspect–Clean–Inspect**—Inspect the jewelry. Thoroughly clean to remove all traces of buffing compounds. Inspect again.

## Platinum Soldering Steps to Brazing/Welding (Soldering)

**Prepare:** Prepare your work area and equipment for brazing. Platinum should be free of any possible contaminants. Remove any residual metals from the workbench. Your equipment should include: clean ceramic pad, tungsten solder pick, and ultraviolet protective glasses.

**Clean:** The Platinum piece should be cleaned in an ultrasonic cleaning solution to remove oil and grime.

**Align:** Align your work as level as possible. This helps the solder to melt and flow evenly over the area, reducing the possibility of gaps between the pieces being joined.

**Flux:** Flux is not needed, but you may use it to keep the solder held in its place.

**Heat:** Platinum heats at high temperatures. Place the flame directly over the joint to be welded. This will heat the joint quickly and the heat will be transmitted throughout the area to be welded.

**Inspect:** Check the welded joint for flow and coverage. If the area is not completely welded, use another piece of solder instead of reheating the previously soldered joint.

## Soldering Gold and Platinum Together (with gemstones)

- Use Cadmium-Free Karat Gold brazing-filler materials when joining Platinum to Karat Gold products.
- Remove any gemstones within at least a half-inch of the joint to be brazed or the weld area. Never re-tip prongs with a stone in place.
- Be sure to polish the Platinum component completely prior to joining it to Karat Gold. This will allow only the Karat Gold to be polished after brazing.

## Flame Characteristics

**Carbonizing**—Used for annealing.  
High gas. Low oxygen. Tint of yellow.



**Reducing**—Used for soldering.  
More gas than oxygen. Soft cone.  
Hottest, cleanest part of flame (working area).\*



**Oxidizing**—Low gas. High oxygen.  
Hissing sound.



## Common Soldering Questions and Problems: Gold, Silver, and Platinum Solder

**Why doesn't the solder flow?** There are two common reasons why solder will not flow. The first reason is the surface of the areas to be joined are dirty and the second reason is there was not an adequate amount of flux used

**Why does solder pit?** When solder pits, it is usually because the joint has been overheated. If your torch has a finely tipped flame and your solder has a low melting temperature then the solder will pit. Make sure you use a lower flame for easy, medium, and repair solders.

**The joint I soldered looked joined, but it's not?** When a joint can look soldered but it isn't, you had cold solder joints. Cold solder joints are caused by not heating the solder area to the correct temperature. Make sure the piece is heated first then place the solder over the joint. It should flow into the joint by itself if the area has been pre-heated.

**What is the cause of this black layer on my piece when I solder?** When soldering on metal that is alloyed with copper (Gold and Silver) and you are using an oxygenated flame, a black layer may appear. This is called Firescale. It is created and enlarged by high temperatures for a protracted time, particularly in the presence of free oxygen. To prevent Firescale, use borax or a mixture of boric acid and alcohol. Both of these will coat the area and protect the metal from oxidation.

### Solder Forms and Their Uses

**Sheet Solder:** This form of solder can be used for any application needed. It is supplied in various lengths and widths. Simply cut off the desired amount from the sheet, heat the area to be soldered, heat the solder into a ball, place on the area to be joined, and heat to flow the solder into the joint.

**Chip Solder:** This form of solder can be used for any application needed. It is the same as a piece cut off from the sheet solder. Place on the area to be joined, heat the area to be soldered, and heat to flow the solder into the joint.

**Wire Solder:** This form of solder can be used for any application needed. Place the end of the wire in the joint to be soldered and heat. The solder will melt and flow into the joint.

**Paste Solder:** This form of solder can be used for any application but it works especially well for manufacturing chains. It is supplied in a syringe of various Karats and flow temperatures.

\*When using Sheet, Chip, or Wire solder, be sure to coat the solder area with flux.

### Soldering Hints

- DHF Co. offers cadmium-free solder.
- Jagged or porous ends will leave a weak and pitted solder joint if not filed smooth.
- When placing items into or removing from the pickle pot be sure to use the correct type of tweezers for the metal you are using. Use copper tweezers for Gold and tungsten tweezers for Platinum.
- When removing items from the pickle pot be sure to rinse in a mixture of baking soda and water to neutralize the acid, then rinse with fresh water.
- Step soldering involves soldering a single piece more than once in steps. Examine what needs to be done then begin with the hard solder, then medium, then soft.
- Avoid breathing soldering fumes. Proper ventilation (minimum 6 changes of air per hour)\* is necessary, and use of a ventilation hood is recommended.

\*Ventilation rules and regulations vary by location. Check with your local OSHA office to meet the requirements.

NOTICE: All information and procedures are for reference only, and may vary according to desired results and skill levels.