

FUNDAMENTAL PRINCIPLES OF SILVER SOLDERING

1. **All joint areas to be soldered must fit well (good physical contact), solder cannot be used as a filler.**
2. **All solder joint areas and areas adjacent to solder joint must be cleaned and remain clean throughout the soldering process. Oxides in the solder joint area will prevent the solder from migrating into the joint area.**
3. **Make appropriate decisions to jig or hold pieces together in the proper position during the soldering process. (black iron binding wire, wire clips, third hand soldering tweezers etc.**
4. **Use soldering flux liberally to prevent the pieces being soldered from oxidizing. Flux can be in either a liquid or paste form.**
5. **Apply solder pallions or clippings to the fluxed joint area.**
6. **Gently apply heat to the metal being soldered. The heat generated by the metal being soldered should cause the solder to flow, not the direct flame. DO NOT try to heat the solder directly with the torch. When solder flows it will be pulled into joint by capillary action. The solder will displace the flux. If the metal is not hot enough the solder will not flow and will not be pulled into the joint.**
7. **When the soldered joint is completed allow the piece to cool enough to loose heat redness. When all redness is gone quench piece in pickling acid, 5 to 10% sulfuric acid and water or sodium bisulfate crystals and water. Note: remove all jiggging wires or devices before inserting piece in pickling solution. Any iron or steel inserted into pickle will cause copper in solution to plate on any metal objects in the solution and contaminate the solution.**

When silver soldering always use a very high silver content commercial solder or a jewelry grade silver solder. Do not use a lead or tin base solder. Jewelers grade silver solder can be purchased locally at Gemco Jewelers Supply, located on hwy 59 access road just south of Gessner st.

The silver solder that I prefer using is a medium grade solder, I also use an easy flow grade when needed.

Medium solder: 1390° F. melting point, medium to high temp., good silver content and color.

Easy solder: 1325 F. melting point, lower than medium, lower silver content and fair silver color. If a lower flow point solder is needed there is an Easy Flow grade with a melting point of 1270 .

SOME IMPORTANT CHARACTERISTICS ABOUT SILVER SOLDERING

- 1. Solder flows to the source of heat.**
- 2. Solder will not flow into oxidized areas or joints.**
- 3. Oxides in the form of Iron oxide, Yellow ochre pigment etc. can be used to ones advantage in intentionally preventing solder from flowing in specific areas. The oxide is mixed with water to make a fluid paste and applied to desired area with a small brush.**
- 4. A slightly higher temperature is required to re-flow a previously soldered joint.**
- 5. When soldering small pieces to larger pieces the larger piece must be heated proportionately more than the small piece. This is done to prevent the small piece from getting too hot and the solder flowing only to the small.**
- 6. Solder cannot be used effectively as a filler. There is no substitute for a well fit joint.**
- 7. Silver soldering is referred to as low temperature brazing or high temperature soldering. It seems to fall in the middle of the two joining methods.**
- 8. Silver soldering is a molecular joining process. As the metal is heated the metal expands leaving small gaps between the metal crystals. When the solder flows it penetrates the small gaps between the crystals creating an extremely strong joint. In many instances the soldered joint is stronger than the base metal it joined.**