

Silver Soldering Demonstration

Model Shipwrights of Niagara

October 2019 meeting presentation by Ray Peacock

Ray discussed the use of Propane (blue cylinder; heats to approximately 1300°C or 2400°F) with soft solder (a tin/lead or lead free alloy mix normally used for plumbing), MAP/Pro (yellow cylinder; heats to 1500°F or 2700°), and Butane (heats to approximately 1400°C or 2600°F) and is hot enough for silver soldering.

Soft solder hasn't adequate strength in the joint if there will be any stress on the work and it does not chemically blacken. Ray will use soft solder where possible as it is less expensive and he will blacken any remaining visible solder after cleaning the joint with files etc. with a permanent felt tip marker (which is normally glossy) or an art pen filled with matt finish acrylic paint that might be purchased at most art supply stores.

Silver solder is used on those joints that will experience strain, such as taught wire rigging lines. Ray normally uses a small hand held refillable butane torch for hobby soldering. Very little silver solder is used in the process. If the work is composed of larger heat sink pieces Ray would consider using MAO/Pro.

Soldering must be done on a suitable surface that can withstand the temperatures. Ray uses a double "third hand" station that has a ceramic tile base. The third hand(s) keeps his other hand free and away from the heat.

Use tweezers or pliers to handle any hot pieces to protect yourself from burns.

Silver solder is available in several temperature ranges, described as "extra-easy", "easy", "medium" and "hard", according to the silver content. These are used progressively when soldering without de-soldering previously soldered joints. Thus the hard grade would be used for the first joint, followed by medium for a second joint on the same piece, and so on. Hard solder is composed of 75 percent silver and has a melting temperature of 740°C (1365 °F). Easy solder is composed of 45 percent silver and has a melting temperature of 618°C (1145°F).

Below is the process for silver soldering with photos.

STEPS

1. Clean the work – sandpaper, or 1500 grit emery cloth for small pieces where minimum scratching of the piece is necessary – minimize touching the cleaned area or use clean tweezers to handle the work
2. Hammer flat one end of the silver solder wire and cut off a couple small pieces
3. Apply flux to the work. Ray has a container of HANDY FLUX that is used for silver soldering but revealed the main ingredient is Boracic Acid and you can save some money by purchasing Borax. Mix a small amount with water to make a paste and brush this onto the work.
4. Place the work pieces together assuring they are in full contact as the silver solder is not a gap filler.
5. Place the snips of silver solder on each side of the work so it will flow in the joint when heated.

Silver Soldering Demonstration

6. Apply heat with a suitable torch. Ray uses a refillable Butane torch for small work pieces. The moisture in the flux will bubble away and the solder will flash when melted.

7. Pickle the work when cool enough to handle. The pickling process is acid cleaning that will remove the discolouring oxide layer created when heating the work. Ray uses the purchased pickling agent SPARAX No.2 but he says vinegar will work as well. Place the work into a bath of the pickling chemical and allow it to rest for a few minutes. The part can be rinsed with clean water afterwards.

Photos follow...



Figures 1 & 2 - Soldering Station and Butane Torch



Figures 3 & 4 - Cleaning the Work and Hammering the Silver Solder Flat

Silver Soldering Demonstration



Figures 5 & 6 - Cutting Pieces of flattened Solder



Figure 7 & 8 - Soldering Paste (Borax dissolved in water works just as well)



Figures 9 & 10 - Assembling and Heating

Silver Soldering Demonstration



Figures 11 & 12 - Pickling Agent (powder mixed with water) - Vinegar works as well

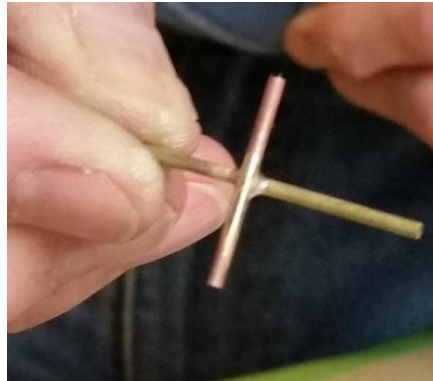


Figure 13 - Silver Soldering Completed

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