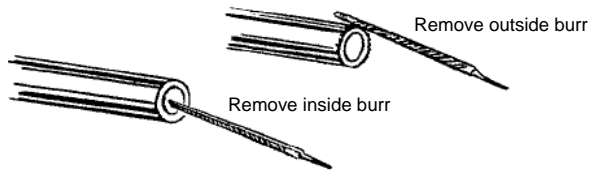


SILVER BRAZING – HOW TO

Brazing is a metal joining process utilizing a filler metal which melts above 840°F and below the melting point of the base metals. The filler metal is drawn into the joint by capillary attraction producing a sound, leak-proof connection. These sentences briefly describe a process which is an integral part of manufacturing, installing and repairing refrigeration and air conditioning systems. This information is designed to assist the serviceman or contractor in making sound brazed joints and selecting the correct filler metal for each application.

PROCEDURES FOR BRAZING PIPE & TUBE

Cut pipe square. Cut to the exact length required using a tube cutter or hacksaw. If a hacksaw is used, a sawing fixture should also be used to ensure square cuts. Remove all inside and outside burrs with a reamer, file or other sharp edge scraping tool. If tube is out of round it should be brought to true dimension and roundness with a sizing tool.

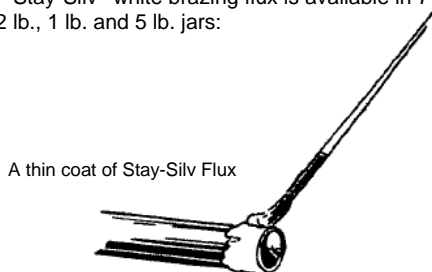


Clean tube end and inside surface of fitting. The joint surface areas should be clean and free from oil, grease, or oxide contamination. Surfaces may be properly cleaned for brazing by brushing with a stainless steel wire brush, or by a stiff rubbing with emery cloth. If oil or grease is present, clean with a commercial solvent. Remember to remove small foreign particles, such as emery dust, by wiping with a clean dry cloth. The joint surfaces **MUST** be clean.



Select brazing alloy. When brazing COPPER to COPPER, low cost Dynaflow® is recommended or Stay-Silv® 15 may be used. These alloys contain phosphorus and are self-fluxing on copper. When brazing BRASS or BRONZE fittings, Stay-Silv white flux is required with these alloys. When brazing IRON, STEEL or other FERROUS metals, select one of the Safety-Silv brazing alloys such as Safety-Silv® 45 or Safety-Silv® 56 with Stay-Silv® white brazing flux. Do not use phosphorus-bearing alloys as the joint may be brittle. To estimate the amount of brazing alloys needed, see the chart on next page.

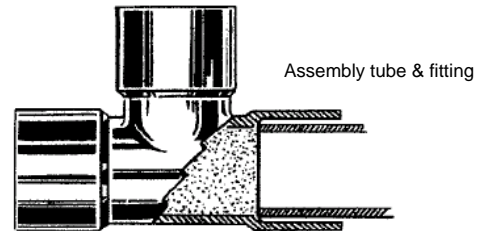
Proper fluxing is important because the flux absorbs oxides formed during heating and promotes the flow of filler metal. When using Stay-Silv® white flux, apply it only with a brush. To prevent excess flux residue inside refrigeration lines, apply a thin layer of flux to only the male tubing. Insert the tube into the fitting and, if possible, revolve the fitting once or twice on the tube to ensure uniform coverage. Stay-Silv® white brazing flux is available in 7 oz., 1/4 lb., 1/2 lb., 1 lb. and 5 lb. jars:



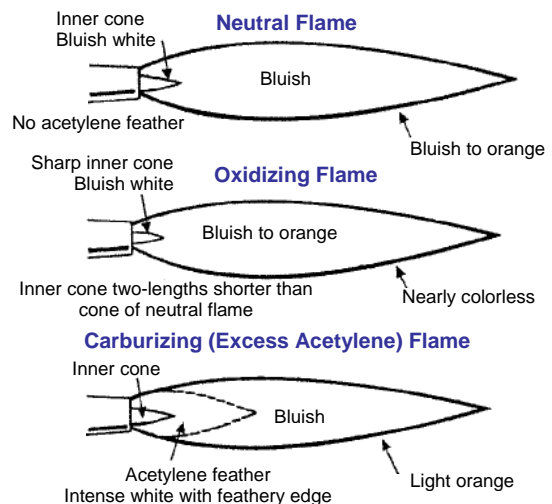
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Assemble tube and fittings. Insert the fluxed tube end into the fitting. Maintain support to ensure the proper alignment until the brazing alloy solidifies ... maintain for a few seconds (or more) depending upon the size of the joint area.

The assembly is now ready to braze, using brazing alloy in rod, wire or in coil form manually fed into the joint.



Adjust torch flame. For most brazing jobs using oxygen-acetylene gases, a "neutral" flame should be used. The neutral flame has a well defined inner cone. See diagram. Avoid an oxidizing flame.



Heating the joint area. Always keep the torch in short motion, Then...

1. Start heating the tube first applying flame at a point just adjacent to the fitting. Work the flame alternately around the tube and fitting until both reach brazing temperature before applying the brazing filler metal.
2. When a flux is used, it will be a good temperature guide. Continue heating the tube until the flux passes the "bubbling" temperature range and becomes quiet, completely fluid and transparent and has the appearance of clear water.
3. Direct the flame from the tube to the flange-base of the fitting and heat until the flux that may remain in the fitting is also completely fluid,
4. Sweep the flame back and forth along the axis of assembled joint ... tube and fitting...to get and then maintain uniform heat in both parts.

Apply the brazing alloy. Feed the alloy into the joint between the tube and the fitting. Only after the base metals have been heated to brazing temperatures should the filler metal be added. At that time, the flame may be directed momentarily to the tip of the filler metal to begin the melting process. Always keep both the fitting and the tube heated by playing the flame over the tube and the fitting as the brazing alloy is drawn into the joint. The brazing alloy will diffuse into and completely fill all joint areas. Do not continue feeding brazing alloy after the joint area is filled. Excess fillets do not improve the quality or the dependability of the braze and are a waste of material.