

Revere Copper Products, Inc.



Soldering *FreedomGray*™

The “keys” to successful soldering of Revere *FreedomGray* are the same as those for soldering plain copper – adhesion of solder to the metal’s surface and “draw” of the solder into the seam. Both of these are affected by the surface condition of the metal to be soldered, “wetting agent’s” (flux’s) ability to draw the molten solder, solder used, and application of heat.

- **Metal surface** – it is imperative that metal to receive solder be dry, clean, and free of oxides, dirt, oils, etc. Solder will not adhere to such foreign materials.

The pre-weathered wash-coat (paint) on *FreedomGray* must be removed from all surfaces to receive solder. Wash-coat may be removed by wiping with lacquer thinner or similar solvent.

CAUTION: Lacquer thinner is extremely flammable – do not use near open flame or heat source.

Unless an oxide coating has displaced the pre-weather wash-coat, it is not necessary to mechanically clean (sand, wire-brush, etc.) *FreedomGray*. If *FreedomGray* is mechanically cleaned, **DO NOT** remove the tin/zinc alloy! It is not required that the alloy coating be removed. Removal of the alloy coating may result in aesthetic and/or corrosion problems and will void Revere’s warranty.

- **Wetting agent** – flux serves two (2) purposes: a) removal of thin oxide films and b) assists in “drawing” the solder into the seam. (Fluxing will not a remove the pre-weather wash-coat from *FreedomGray*.)

In addition to the conventional zinc-chloride fluxes that are used to solder plain copper, “tin-loaded” fluxes such as Johnson’s E-127 Flux-‘N-Solder with Pure Tin may be used to solder architectural coppers. It is not necessary to use a flux that contains tin with *FreedomGray* but most mechanics find that lead-free solders “draw” quicker and easier when such fluxes are used.

- **Solder alloy** – to insure a “lead-free” installation Revere suggests using a lead-free alloy solder such as Johnson #497 *SuperFlo*™ by Johnson Manufacturing Company, Princeton, Iowa with *FreedomGray*.

Joints or seams made with this product are stronger joints than similar joints or seams made with traditional tin-lead solders. In addition, when this product is used with Johnson E-127 flux, it draws better than “pure tin” solders.

- **Heat source** – must be sufficient to raise the temperature of the *entire* seam to the point at which solder flows freely (above its melting point). Coppers (irons) heated in charcoal or gas fired pots or continuously heated coppers (torches) are the preferred heat source.

Size and weight of the coppers must be sufficient so that all thicknesses of metal in the lock or seam are heated to a temperature above the melting point of the solder. Revere suggests acetylene be used with continuously heated coppers (acetylene “burns hotter” than propane and makes soldering quicker and easier).

As noted above, soldering **FreedomGray** is *essentially* the same as soldering plain copper. However, the properties of lead-free solders are different from those of tin-lead solders. Therefore, Revere suggests that the integrity of the seams – not necessarily the flux or heat source be the determining factor in judging and accepting finished work. Likewise, while Revere strongly suggests all plain copper be pre-tinned prior to soldering, pre-tinning is not normally required with **FreedomGray**.

The above is based on tests and field experience of Revere Copper Products, Inc. and others. It is presented for reference only. While it represents our best suggestions for soldering **FreedomGray**, it is recommended that all parties consult the appropriate manufacturer's MSDS for proper procedures, safety, and care when handling and/or working with any chemical (including flux), metal (including solders), or heat source.

In the event of a difference between the above and a manufacturer's MSDS, information in the MSDS must be followed.

Further, all aspects of soldering should be done in a manner in accordance with local health, safety, and building codes.

For other technical questions or more information regarding any of Revere's architectural coppers please contact the Architectural Services Department at (800) 448-1776, extension 2474 or 2707 or e-mail archcopper@reverecopper.com.

For information regarding Johnson's fluxes and solders contact Johnson Manufacturing Company, 114 Lost Grove Road, Princeton, IA 52768; phone – (563) 289-5123, fax (563) 289-3825, or e-mail johnsonmfg@aol.com.