Soldering causes the metal surface of the workpiece to actually fuse or melt, but it will not adhere to the workpiece. The high melting point allows assembled parts to be Oxynate No. 7 hot salts blued or Nitre-Blue™ blued. Hi-Temp Hi-Force 44 Solder is not affected by Oxynate No. 7 hot salts bluing.

When two pieces are to be joined, it is best to “tin” each of the pieces. Tinning is a procedure where a thin coat of solder is applied to the workpieces where they will join. The procedure is simple; first clean, heat and flux the bottom surface of the first part and apply a very thin coat of solder to the joining surface. Remove any excess solder while it is still molten, with a clean cotton patch or a felt cloth.

Follow the same procedure on the joining surface of the second part. After both have cooled to where they can be handled, position them as needed for final assembly, put a small amount of flux between the two parts and clamp together. Apply heat carefully to both parts so both come up to the desired soldering temperature, 640° F. - 650° F., simultaneously. At this point the parts to be joined should be fitted as closely as possible. The smaller pieces. If two workpieces of different sizes are to be soldered together, the smaller piece will normally require less heating than the larger piece in order to have them achieve the same temperature level simultaneously. Again, practice and experience are required to master the “art” of soldering.

Any two parts to be joined should be fitted as closely as possible. The tighter or closer the fit, the stronger the solder bond. If the radius on the bottom of a sight ramp, for example, is too small for the barrel, there will be a gap in the center of the bottom of the ramp. Take the time necessary to carefully and precisely fit the ramp to the barrel for as perfect a fit as possible. Failure to do so will lead to a solder joint that has less than maximum strength.

**HOW TO USE - THEORY**

**NOTE**: For best results we strongly recommend the use of Copper-Bond Flux with Brownells Hi-Temp Hi-Force 44 Solder. The stock number for a 6 ounce bottle is #478-100-100.

When soldering, cleanliness is very important. All grease, oil and dirt must be cleaned from the surface of the workpiece. Make certain the fumes from any solvents used to clean the parts have dispersed before lighting your torch! Any material or substance that inhibits the contact and fusing of the solder with the metal of the workpiece must be removed. This includes rust, scale, bluing, paint, etc. The surface of the workpiece must be cleaned down to the bare metal. If the metal of the workpiece is exposed to the atmosphere, the process of oxidation begins immediately! Even if you cannot see the oxidation, it’s there. One of the major functions of a flux is to remove this layer of oxidized metal so the solder can bond with the surface of the workpiece.

When applying heat, either from a propane or oxyacetylene torch, direct the heat onto the workpiece. Do not heat the solder! If heat is applied to the solder, the solder will melt, but it will not adhere to the workpiece. The solder should be melted by the transference of heat from the workpiece. Heat the workpieces and let them melt the solder. If the workpieces are overheated the solder will melt, but it will “bead” and will not adhere. You must control the temperature of the workpiece to within a few degrees of the melting point of the solder, 640° F. If it is too high, the solder will bead up and run off the workpiece; if too low, the solder will not melt. There is no substitute for practice soldering to develop a “feel” for proper heat application. With experience, it becomes easier to judge how much heat should be applied for the best result.

“Mass” also complicates the heating process. Larger workpieces require more heat or a longer time to come up to the proper temperature than do smaller pieces. If two workpieces of different sizes are to be soldered together, the smaller piece will normally require less heating than the larger piece in order to have them achieve the same temperature level simultaneously. Again, practice and experience are required to master the “art” of soldering.

Any two parts to be joined should be fitted as closely as possible. The tighter or closer the fit, the stronger the solder bond. If the radius on the bottom of a sight ramp, for example, is too small for the barrel, there will be a gap in the center of the bottom of the ramp. Take the time necessary to carefully and precisely fit the ramp to the barrel for as perfect a fit as possible. Failure to do so will lead to a solder joint that has less than maximum strength.

**USING HI-TEMP HI-FORCE 44 SOLDER**

After cleaning the area of the workpiece to be soldered, heat it to the appropriate temperature and apply the flux to the workpiece (we recommend Copper-Bond Flux). Be very careful with the flux; use it sparingly. It can remove bluing from the parts! A cotton-tipped swab is ideal for applying small, controlled amounts of flux.

When two pieces are to be joined, it is best to “tin” each of the pieces. Tinning is a procedure where a thin coat of solder is applied to the workpieces where they will join. The procedure is simple; first clean, heat and flux the bottom surface of the first part and apply a very thin coat of solder to the joining surface. Remove any excess solder while it is still molten, with a clean cotton patch or a felt cloth.

Follow the same procedure on the joining surface of the second part. After both have cooled to where they can be handled, position them as needed for final assembly, put a small amount of flux between the two parts and clamp together. Apply heat carefully to both parts so both come up to the desired soldering temperature, 640° F. - 650° F., simultaneously. At this point the solder will flow.

To help “pull” solder to the edge of the seam and give the joint a more finished appearance, apply just a drop or so of flux with a small, pointed, metal
rod to the seam, or joint, between the two parts just after the solder melts.
Removal of the heat source and removal of the solder and adjustment metal to
cool. After the solder has hardened, do not attempt to speed up the cooling
of the parts by quenching in water or other liquid. Always allow the parts to
air cool. If a quench is used, you may cause the solder to crystallize which
will weaken the solder joint.

Hi-Temp Hi-Force 44 is an excellent solder for use with stainless steel.
However, the heat necessary to cause the solder to flow may cause the sili-
cone present in the stainless steel to come to the surface of the steel. This
silicone may prevent the solder from adhering.

NOTES ON
DETAILING OUT THE FINISHED SOLDER JOB
Hi-Temp Hi-Force 44 will not color well with either silver solder black or
soft solder black chemicals. Fitting the joint as tightly as possible will leave
the smallest line of solder showing. Any excess solder may be scraped, filed
or sanded off. Be sure you are down to bare steel before using any touch-up
blue or bluing parts. By being very careful when laying out the job, tinning
and soldering, you will have little or no excess solder to clean up, and touch-
ing up or bluing will not be necessary.

Wash any soldering flux residue completely off the parts after the job is
finished. Many fluxes will attract moisture. This requires cleanup and oiling
after the job is finished.

If you have any questions about the use of this or any other Brownells
product, do not hesitate to call, or write, for technical assistance.