



UNITED ALLOY # 014

Be insured in quality, Be insured in service, Be insured in "United Alloys."

UNITED ALLOY is uniquely different from other available alloys. Combining the highest purity metals available, stringent quality control, special de-oxidizers and grain refiners, produce trouble-free, superior quality castings and fabrication or rolling (hand-made).

UNITED ALLOY # 014 is a spring / super hardness silver alloy for adding to fine silver to make Maximum Hardness Sterling Silver for spring, sheet, wire or special high hardness products which has been formulated to give highest hardness and may also be used to make 900 Coin Silver casting, sheet or wire products. This master silver alloy can be used for regular casting, hand-made and also continuous casting.

1.) **MELTING** : The # 014 Alloy, and fine silver should be melted together in a clean crucible. Put alloy in the bottom of the crucible and fine silver on top. The melting temperature for alloying should be 1,000 - 1,040 °C. Boric acid flux may be used to keep the metal clean during the melting process for open melting operation. The metal should be mixed well with a stirring rod before pouring to assure a good mix.

Crucible Temperature for Continuous Casting : 990 - 1,040 °C

Die Temperature for Continuous Casting : 750 - 850 °C

2.) **POURING** : Metal should be poured into a preheated, vertical graphite or lightly lubricated iron mold. A steady even pouring motion should be used slowing down at the end of the pour to prevent shrinkage in the top of the ingot. Use a round rod mold for wire and a 2 piece L shaped mold for plate and sheet.

3.) **QUENCHING** : The metal ingot should be removed from the mold and quenched immediately in pickle solution or water. For heavy ingots a one-minute cool down before quenching prevents quench cracking.

4.) **FABRICATION** : The ingot should be cleaned of all adhering oxide or fluxes before rolling. The ingot should be rolled or drawn to a 50% reduction in size before annealing. After annealing continue the reduction at 50% before annealing again. Clean the ingot after each anneals. Keep rolls, dies and metal clean to prevent defects in the finished stock.

5.) **ANNEALING** : Annealing temperature 650 - 700 °C for 20 minutes. Quench immediately in water or pickle solution. A boric acid fire coat should be applied before annealing in open atmosphere ovens to protect the metal from heavy oxidation. Avoid over-annealing wire or plate stock as this can cause excessive grain growth creating orange peel effect on the surface of finished goods.

6.) **HARDENING** : Place in a pre-heated oven set at 300 °C for 2 hour and air cool.

7.) **PICKLING** : United's Brite-Cast™ (Ammonium Bi-fluoride), Sparex # 2 (sodium bisulfate), 10% - 20% Sulfuric Acid.

Rubber gloves and safety glasses are recommended when using acid pickle.

8.) **RE-USING** : New alloy and fine silver 50% and Old silver 50%, Cleans Old silver well before re-melting.

9.) **SOLDERING** : United Silver Solder Alloy # SSA or already mixed silver solder sheet.

10.) **NOTES** : Melt temperature may vary with type of unit.

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