A quick guide for using Argentium™ Sterling Silver

BENEFITS

Argentium™ Sterling Silver has many advantages in comparison to standard sterling silver:

- Firescale-free alloy.
- Highly tarnish-resistant.
- Lower heat and electrical conductivity, enabling the alloy to be resistance, plasma and laser welded.
- Annealed hardness is equal to standard sterling silver. Further hardening can be achieved by simple heat treatment (even after soldering).
- Increased ductility, to assist forming processes including spinning and stamping.
- Environmental advantages of a firescale-free alloy – cyanide and other hazardous chemicals used for stripping or plating over firescale, are eliminated.
- Production/finishing time is reduced.

PRODUCTS

Argentium™ Sterling Silver is available in casting grain, sheet, wire and tube.

ANNEALING

Argentium™ Sterling Silver displays a paler colour when heated. To avoid overheating the alloy, annealing and soldering operations should be carried out in a darkened area. Furnace annealing should be carried out at 1050°F/565°C for approximately 30 minutes. During furnace annealing without a protective atmosphere, there may be some oxidation of the copper – any surface oxides can be easily removed with pickle.

SOLDERING

Lower-temperature solders are recommended – medium, easy and extra-easy solders work best using standard soldering fluxes (Argentium™ Silver solder will soon be available).

QUENCHING

Argentium™ Sterling Silver will retain heat for longer than standard sterling silver. It is important to wait for any visible red heat to disappear from the alloy before quenching (this is best judged in a darkened area).

INVESTMENT CASTING

Casting temperature range: 1750-1800°F/955-980°C. Argentium™ Sterling Silver displays a paler colour when heated/molten, therefore do not judge casting temperature by eye.

Flask temperature: Lower flask temperatures are recommended. For guidance, drop by a minimum of 85°F/30°C below regular temperatures used for standard sterling silver.

Crucibles: To avoid contamination from other alloys, it is important to use separate crucibles for Argentium™ Sterling Silver. Do not use silicon carbide crucibles.

Protective atmosphere/fluxing: A protective atmosphere is recommended when melting Argentium™ Sterling Silver. If a protective atmosphere is not available, flux can be used (boric acid is recommended). Skim any oxides off the surface before stirring.

Hardness – wet investment removal: Leave flasks to cool for 20-25 minutes before quenching. This will give castings approximately the same hardness as standard sterling silver (70HV). To raise the hardness to approximately 95HV, heat castings at 580°F/300°C for 30-45 minutes and air cool to room temperature.

Hardness – dry investment removal: Leave flasks to cool to room temperature before removing castings from the investment. This will give Argentium™ Sterling Silver a hardness of approximately 100HV.

Precipitation hardening: For hardness above 100HV, follow precipitation hardening instructions.

Remelting: Use at least a 50% fresh/50% scrap mix. For high-quality pieces, using more fresh metal will yield superior results. It is important that used trees and buttons are free from investment powder residue, to avoid contamination.

PRECIPITATION HARDENING

The following steps will achieve a hardness of approximately 120HV:

1. Heat the alloy to a pale-red annealing temperature (approximately 1050°F/565°C, wait until any visible red heat has disappeared and then water quench.
2. Precipitation harden by heating the alloy at 580°F/300°C for approximately 30-45 minutes and air cool to room temperature.

A new simpler precipitation hardening technique is now available achieving a hardness of approximately 110HV, for further details please contact us at **info@argentiumsilver.com**.

FINISHING PROCESSES

Polishing: It is important to use separate polishing wheels for Argentium™ Sterling Silver, to avoid contamination from other alloys. If this is not possible, thoroughly rake wheels before use.

Degreasing/cleaning solutions: It is important to use neutral pH degreasing/cleaning solutions (pH6-pH8) with Argentium™ Sterling Silver. Thoroughly rinse degreased articles with water and carefully dry to avoid water spotting.

Tumble finishing: Successful tumble finishing has been achieved using rough cut with epoxy cones and triangles in a vibratory tumbler and steel-shot mixture in a rotary tumbler. It is very important to maintain clean shot and solution.

Chemical treatment: Treatment processes, such as blackening with liver of sulphur, will take longer.

For more information, or for specific technical help of any kind, please write to **argentiuminfo@sternleach.com**

ARGENTIUM™
STERLING SILVER
How silver was meant to be