

TECHNICAL INFORMATION & INSTRUCTIONS

ARGENTIUM 940S SILVER CASTING ALLOY



Product Code: AG-A940S-CAST
Document updated: Sept 2026

GENERAL INFORMATION

COMMERCIAL COMPOSITION

Silver: 94.2%
Copper
Germanium
Silicon

MELTING TEMPERATURES

Liquidus: 900°C | 1652°F
Solidus: 870°C | 1598°F
Melting range: 30°C | 86°F

FULL CHARACTERISATION DATA

COLOUR COORDINATES

L* 95.4
A* -0.3
B* 3.9
C* 3.9
Yellow Index 7.2

MECHANICAL CHARACTERISTICS

As cast hardness [HV 0.2]: 65
Hardness after annealing [HV 0.2]: 65
Hardness - single-step heat hardening process [HV 0.2]: 120
Hardness - double-step heat hardening process [HV 0.2]: 140
Tensile strength (Rm) [MPa]: 250
Yield strength: (Rp0.2) [MPa]: 91
Elongation at rupture: (A) [%] 30

PRODUCT APPLICATIONS

Casting in open systems
Casting in closed systems
Casting without stones
Stone-in-place casting

AS CAST GRAIN SIZE [µm]: 185

DENSITY [g/cm³]: 10.38

i IMPORTANT: Maximising Argentium Silver’s Hardness and Tarnish Resistance

The following processes are mandatory:

- **Low-temperature heat hardening process** (see Page 2, Step 2).
Must be applied to increase strength and durability, and optimise the surface for finishing.
- **Pickle castings** after heat hardening and before finishing to ensure a bright, polished finish (see Page 3, Step 3).
- **A grease-free surface MUST be achieved** as a final finishing process (see Page 3, Step 5).

i IMPORTANT: Heat/Colour Recognition & Cooling Argentium Silver

Argentium Silver glows a paler colour than standard Sterling silver at red-hot temperatures.
Take care not to overheat the metal. Temperature/metal colour recognition is easier to judge working in a shaded area.

Argentium Silver retains its heat for longer than standard Sterling silver.
Following heating processes, always wait until the red colour glow has completely disappeared before touching or quenching Argentium Silver - this is easier to see in a shaded area.

PRODUCTION PROCESS FOR ARGENTIUM SILVER CASTINGS**1. Cast > 2. Heat Harden > 3. Pickle > 4. Polish > 5. Degrease/Clean & Rinse > 6. Surface Passivation****1. CASTING****CASTING SIZE**

Less than 0.5mm:
0.5 - 1.2mm:
More than 1.2mm:

Flask Temp. Range (°C | °F)

600 - 640°C		1112 - 1184°F
560 - 600°C		1040 - 1112°F
540 - 580°C		1004 - 1076°F

Metal Temp. Range (°C | °F)

1010 - 1040°C		1850 - 1904°F
990 - 1010°C		1814 - 1850°F
960 - 990°C		1760 - 1814°F

CASTING ATMOSPHERE:

Melt under an inert atmosphere (nitrogen or argon).

CASTING TREES WITHOUT STONES: Remove the flask from the casting machine within one minute of the alloy being poured. Set the flask down gently and allow to cool for approx. 13 minutes before quenching (ensuring any red glow has disappeared).

STONE-IN-PLACE CASTING TREES: Remove the flask from the casting machine within one minute of the alloy being poured. Allow the flask to cool down to room temperature before removing investment.

RE MELTING / RECYCLING:

50:50 old/new material. Ensure previously cast Argentium Silver is clean and free of investment residues.

2. HEAT HARDEN CASTINGS

i Heat hardening is a **MANDATORY** process that optimises strength, durability and tarnish resistance, whilst making it easier and quicker to polish Argentium Silver to a bright, lustrous finish.

✓ Either of the following single-step **or** double-step heat hardening processes **must be carried out before finishing**.

NB. The single-step heat hardening process will significantly increase the hardness of Argentium Silver and is sufficient for most applications, providing excellent strength, durability and performance. For applications where an even greater level of hardness is required, the double-step process can be used.

SINGLE-STEP HEAT HARDENING PROCESS

Heat harden in air atmosphere:

Temp.

300°C / 572°F

Time

60 mins

Cooling

Slow cool in air or furnace

DOUBLE-STEP HEAT HARDENING PROCESS

Step 1) Heat in a protective atmosphere:

THEN

Step 2) Heat harden in air atmosphere:

Temp.

700°C / 1292°F

Time

10 mins

Cooling

Ensure red glow has disappeared then quench in water

300°C / 572°F

60-90 mins

Slow cool in air or furnace

3. PICKLE CASTINGS AFTER HEAT HARDENING

i Items **MUST** be pickled after heat hardening and before finishing to ensure a bright, polished finish.

✓ **Recommended pickle solutions:** Sodium Bisulphate | Sparex | Citric Acid | Sulphuric Acid (max. 10% solution)
Dilute as per supplier's instructions and keep pickling time to a minimum.

⊘ **DO NOT** use Hydrofluoric Acid.

4. POLISH

✓ Use **traditional polishing wheels** or **mass finishing techniques**.

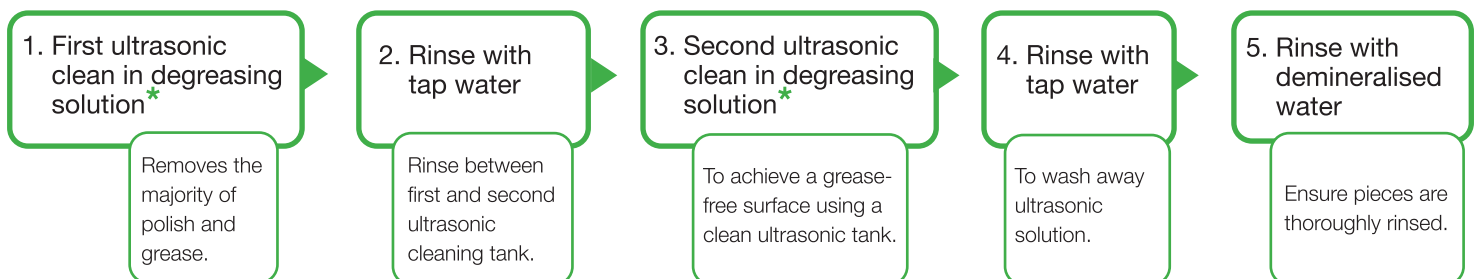
NB. It is preferable to use **dedicated polishing wheels** for Argentium Silver to prevent cross-contamination from other metals, which may reduce tarnish resistance. Pre-used polishing wheels must be raked clean before use.

For mass finishing, clean and maintain the media regularly in accordance with the media manufacturer's best-practice recommendations to ensure consistent finishing results.

5. DEGREASE/CLEAN & RINSE

i A grease-free surface is essential for maximising tarnish resistance.

The following **Ultrasonic Degreasing/Cleaning 5-Step Process** is recommended.



✓ * Clean using a **near-neutral pH** ultrasonic degreasing solution. Dilution and cleaning time as advised by the manufacturer, working temperature **no more than 40°C**. (*'Andy Gold' liquid detergent is recommended.*)

✓ A thorough final rinse in **demineralised water** is important to remove any remaining residues deposited from the cleaning solution.

✓ After the final rinse, dry pieces using an air gun, followed by a final dry in a fan oven.

⊘ **DO NOT USE** electrolytic cleaning or steam cleaning - these processes can reduce tarnish resistance.

6. SURFACE PASSIVATION

✓ It is recommended to heat finished pieces in a **clean oven** for **1 hour at 100°C**.

This process assists tarnish resistance by promoting the formation of Argentium Silver's protective oxide layer.