TECHNICAL INFORMATION & INSTRUCTIONS

ARGENTIUM 940S SILVER CASTING ALLOY

Document updated: January 2026

ARGENTIUM®
THE FINEST SILVER

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

AS CAST GRAIN SIZE [µm]: 185

DENSITY [g/cm³]: 10.38

MECHANICAL CHARACTERISTICS

As cast hardness [HV 0.2]:	65
Hardness after 70% area reduction [HV 0.2]:	170
Hardness after annealing [HV 0.2]:	65
Single step precipitation hardening hardness [HV 0.2]:	120
Double step precipitation hardening hardness [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

IMPORTANT: Maximising Argentium Silver's Tarnish Resistance

To initiate and optimise tarnish resistance the following processes are manadatory...

i A low-temperature heat treatment must be applied to increase hardness and optimise the surface for finishing - see '**HEAT HARDENING INSTRUCTIONS**', Page 2.

i A grease-free surface must be achieved as a final finishing process - see '**FINISHING & DEGREASING/ CLEANING INSTRUCTIONS**', Page 3.

IMPORTANT: Heat/Colour Recognition & Cooling Argentium Silver

i **Argentium Silver glows a paler colour than standard Stering 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).

i **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).

CASTING PROCESSING PARAMETERS

CASTING TEMPERATURES	Flask Temp. Range (°C / °F)		Metal Temp. Range (°C / °F)	
Less than 0.5mm:	600 - 640°C	1112 - 1184°F	1010 - 1040°C	1850 - 1904°F
0.5 - 1.2mm:	560 - 600°C	1040 - 1112°F	990 - 1010°C	1814 - 1850°F
More than 1.2mm:	540 - 580°C	1004 - 1076°F	960 - 990°C	1760 - 1814°F

CASTING ATMOSPHERE: Melt under an inert atmosphere (nitrogen or argon).

CASTING TREES WITHOUT STONES: It is important to remove the flask from the casting machine within one minute of the alloy being poured. The flask should be set down gently and allowed to cool for 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.

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

PICKLING: 10% Sulphuric Acid Solution | Sodium Bisulphate | Weak Sparex | Phosphoric Acid. Dilute as per supplier's instructions.
Keep pickling time to a minimum. **DO NOT** use Hydrofluoric Acid.

HEAT HARDENING INSTRUCTIONS **Mandatory process - carry out before final finishing processes.**

Either of the following single-step **or** double-step heat hardening treatments **must** be carried out before finishing.
NB. The double-step process will acheive a greater finished hardness.

SINGLE-STEP HEAT HARDENING TREATMENT	Temp.	Time	Cooling
Heat harden in air atmosphere:	300°C / 572°F	60-90 mins	Slow cool in air or furnace

DOUBLE-STEP HEAT HARDENING TREATMENT	Temp.	Time	Cooling
Step 1) Heat in a protective atmosphere:	700°C / 1292°F	40 mins	Ensure red glow has disappeared then quench in water
Step 2) Heat harden in air atmosphere:	300°C / 572°F	60-90 mins	Slow cool in air or furnace

✅ **Items MUST be pickled after heat hardening and before finishing to ensure a brighter polished finish.**

FINISHING PROCESSES

Follow **'FINISHING & DEGREASING/CLEANING INSTRUCTIONS'** on Page 3.

STEPS FOR MAXIMISING ARGENTIUM SILVER'S TARNISH RESISTANCE

1. Preparation: Heat Hardening

- Pieces **must** be heat hardened before polishing.
  Heat hardening makes it quicker to polish Argentium Silver to a bright, lustrous finish, and improves tarnish resistance.
- **Items MUST be pickled after heat hardening and before finishing to ensure a brighter polished finish.**

Refer to Page 2 for heat hardening and pickling instructions.

2. Polishing

- Use **traditional polishing wheels** or **mass finishing techniques**.
- It is preferable to use **dedicated polishing wheels/media** 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.)

3. Degreasing/Cleaning & Rinsing

- A **grease-free surface** is essential for **maximising tarnish resistance.**
- The following **Ultrasonic Degreasing/Cleaning 5-Step Process** is recommended.

1. First ultrasonic clean in degreasing solution*	2. Rinse with tap water	3. Second ultrasonic clean in degreasing solution*	4. Rinse with tap water	5. Rinse with demineralised water
Removes the majority of polish and grease.	Rinse between first and second ultrasonic cleaning tank.	To achieve a grease-free surface using a clean ultrasonic tank.	To wash away ultrasonic solution.	Ensure pieces are thoroughly rinsed.

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

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

- After the final rinse, dry pieces using an air gun and/or fan oven.

🚫 **DO NOT** USE

X Electrolytic cleaning

X Steam cleaning

The above can cause a surface reaction with Argentium Silver.

4. Surface Passivation

- 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.