

# TECHNICAL INFORMATION SHEET

## ARGENTIUM 940 CASTING SILVER



Dated: May 2024

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### GENERAL INFORMATION

#### COMMERCIAL COMPOSITION

Silver: 94.2%  
Copper  
Germanium

#### MELTING TEMPERATURES

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

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### 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 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

AS CAST GRAIN SIZE [ $\mu\text{m}$ ]: 185

DENSITY [ $\text{g}/\text{cm}^3$ ]: 10.3

#### PRODUCT APPLICATIONS

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

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### IMPORTANT: MAXIMISING ARGENTIUM SILVER'S TARNISH RESISTANCE

To initiate and optimise tarnish resistance, a grease-free surface must be achieved as a final finishing process - see 'CLEANING & RINSING' instructions, page 2.

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### CASTING PROCESSING PARAMETERS

CASTING TEMPERATURES	Flask from [°C / °F]	Flask to [°C / °F]	Metal from [°C / °F]	Metal to [°C / °F]
Less than 0.5mm:	600 / 1112	640 / 1184	1010 / 1850	1040 / 1904
0.5 - 1.2mm:	560 / 1040	600 / 1112	990 / 1814	1010 / 1850
More than 1.2mm:	540 / 1004	580 / 1076	960 / 1760	990 / 1814

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

**CASTING INSTRUCTIONS:** 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 down for the following times...

- Castings without stones: cool for 20 minutes, then quench in water.
- Stone-in-place castings: cool for 30-45 minutes, then quench in water.

**RE MELTING / RECYCLING:** 50:50 old/new material. Ensure previously cast Argentium is clean and free of investment residues.

**PICKLING:** 10% Sulphuric Acid solution or Sodium Bisulphate, weak Sparex, Phosphoric Acid (diluted as per supplier's instructions). Keep pickling time to a minimum. Do **NOT** use Hydrofluoric Acid.

### HEAT HARDENING PARAMETERS (to be carried out before final finishing processes)

SINGLE STEP PRECIPITATION HARDENING TREATMENT	Temp. [°C / °F]	Time	Cooling
Heat harden in air atmosphere:	300 / 572	90 mins	Slow cool in air or in furnace
DOUBLE STEP PRECIPITATION HARDENING TREATMENT	Temp. [°C / °F]	Time	Cooling
Step 1: Heat in a protective atmosphere:	700 / 1292	40 mins	Quench in water *
Step 2: Heat harden in air atmosphere:	300 / 572	60 mins	Slow cool in air or in furnace

### 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 - allowances for a slower cool must be made when quenching.

### FINISHING PROCESSES

#### POLISHING

Argentium Silver can be polished using traditional wheels or mass finishing processes. The use of separate polishing wheels for Argentium Silver items is advised - this prevents cross-contamination of another metal/alloy onto the surface of Argentium pieces, which can compromise tarnish resistance.

#### CLEANING & RINSING

To maximise Argentium Silver's tarnish resistance, a grease-free surface must be achieved using ultrasonic cleaning. We do **NOT** recommend electrolytic cleaning or steam cleaning.

Use of distilled water for cleaning / rinsing is recommended to prevent water marks. Please do **NOT** use deionised / reverse osmosis water with Argentium Silver.

**NB.** For high volume production, please refer to 'Argentium Cleaning Guidelines' document by Legor Group.

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