

# TECHNICAL INFORMATION SHEET

## ARGENTIUM 960 CASTING SILVER



Dated: August 2023

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### GENERAL INFORMATION

#### COMMERCIAL COMPOSITION

Silver: 96.2%  
Copper  
Germanium

#### MELTING TEMPERATURES

Liquidus: 920°C / 1688°F  
Solidus: 890°C / 1634°F  
Melting range: 30°C / 86°F

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### FULL CHARACTERISATION DATA

#### COLOUR COORDINATES

L\* 95.7  
A\* -0.3  
B\* 3.5  
C\* 3.5  
Yellow Index 6.3

#### MECHANICAL CHARACTERISTICS

As cast hardness [HV 0.2]: 55  
Hardness after 70% area reduction [HV 0.2]: 155  
Hardness after annealing [HV 0.2]: 55  
Single step precipitation/heat hardening hardness [HV 0.2]: 100  
Double step precipitation/heat hardening hardness [HV 0.2]: 120  
Tensile strength (Rm) [MPa]: 227  
Yield strength: (Rp0.2) [MPa]: 147  
Elongation at rupture: (A) [%] 36

AS CAST GRAIN SIZE [µm]: 190

DENSITY [g/cm<sup>3</sup>]: 10.4

#### 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 the following processes are mandatory...

- 1) A simple, low-temperature heat treatment must be applied to increase hardness and optimise the surface for finishing - see 'PRECIPITATION/HEAT HARDENING PARAMETERS' instructions, page 2.
- 2) 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	1020 / 1868	1050 / 1922
0.5 - 1.2mm:	560 / 1040	600 / 1112	1000 / 1832	1020 / 1868
More than 1.2mm:	540 / 1004	580 / 1076	980 / 1796	1000 / 1832

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

**CASTING TREES WITHOUT STONES:** Let the flask cool down in the chamber for 1 minute after pouring. Take the flask out of the machine without shaking it, let it cool for 20 minutes in air, then quench in water.

**STONE-IN-PLACE CASTING TREES:** Let the flask cool down 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.

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

SINGLE STEP HEAT 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 HEAT 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

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### 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.

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### 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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