

TECHNICAL INFORMATION SHEET

ARGENTIUM 940 SILVER - MILLFORM



Updated: March 2025

GENERAL INFORMATION

COMMERCIAL COMPOSITION

Silver:	94.2%
Copper	
Germanium	

MELTING TEMPERATURES

Liquidus:	895°C / 1643°F
Solidus:	860°C / 1580°F
Melting range:	35°C / 95°F

FULL CHARACTERISATION DATA

COLOUR COORDINATES

L*	95.3
A*	-0.3
B*	3.9
C*	4.0
Yellow Index	7.2

AS CAST GRAIN SIZE [µm]: 200

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]:	110
Double step precipitation hardening hardness [HV 0.2]:	140
Tensile strength (Rm) [MPa]:	255
Yield strength: (Rp0.2) [MPa]:	101
Elongation at rupture: (A) [%]	31

PRODUCT APPLICATIONS

CNC and lathe production	Solid wire chain production
Hand production	Laser welded chain production
Continuous casting	Hollow chain production
Sheet production	Bi-metal cladding
Wire production	TIG tube production
Torch and furnace fusible	Ingot casting
Precipitation hardening	Stamping production

IMPORTANT: MAXIMISING ARGENTIUM SILVER'S TARNISH RESISTANCE

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

- 1) A low-temperature heat treatment must be applied to increase hardness and optimise the surface for finishing - see '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.

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).

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MECHANICAL WORKING PARAMETERS

REDUCTIONS:	Sheet - area or thickness	70%
	Wire - diameter	45%
POURING TEMPERATURE - CONTINUOUS:	1000°C - 1080°C / 1832°F - 1976°F	
POURING TEMPERATURE - INGOT:	980°C - 1020°C / 1796°F - 1868°F	
ANNEALING TEMPERATURES:	less than 1mm:	560°C - 620°C / 1040°F - 1148°F for 20 minutes
	1mm - 5mm:	560°C - 620°C / 1040°F - 1148°F for 25 minutes
	more than 5mm:	560°C - 620°C / 1040°F - 1148°F for 30 minutes

CONTROLLED FURNACE ATMOSPHERE FOR ANNEALING: Ratio 95:5 or 90:10 nitrogen:hydrogen

QUENCHING: Quench in water (see HEAT/COLOUR RECOGNITION & COOLING ARGENTIUM SILVER', page 1).

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

NB. Argentium Silver must be pickled after heat hardening and before finishing.

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 the 'Argentium Finishing & Cleaning Guide' on our website:
<https://www.argentiumsilver.com/user-guides-downloads>