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**PRODUCT DATA
SHEET**

12% Nickel Silver

Copper Alloys

UNS C75700

Also known as Nickel Silver 65 - 12

Composition, AS2738-2000

Copper		Lead	Iron	Nickel (inc Cobalt)		Zinc
Min	Max	Max	Max	Min	Max	
60.0	65.0	0.04	0.25	11.0	13.0	Remainder

**Equivalent Alloy
Specifications**

Specification	Designation
UNS	C75700
ISO	Cu Ni12 Zn24
BSI	NS104
JIS	NSP 3

Specification	Product Form
AS1566	Rolled flat products

**Australian
Product
Specifications**

**Mechanical
Properties**

AS1566,
Rolled flat
Products.

Product	Temper	(Tensile Strength, MPa, typical)	(Elongation, %, typical)	Hardness, HV
Coil & Flats	(Annealed)	400	48	(< 100)
	½ Hard	500	20	140 – 170
	Hard	650	10	170 – 190
	EH	750	4	195 – 220

Available Forms Austral Wright Metals can supply this alloy as coil or sheet. See the Austral Wright Metals Product Catalogue for standard stock sizes.

General Description 12% nickel silver takes a brilliant polish and has good resistance to corrosion in rural, industrial and marine atmospheres and in fresh water. Since it has good cold formability and an attractive soft ivory-white colour, it is often used for decorative applications.

The alloy is often silver plated, when it may be stamped EPNS (electro plated nickel silver). Alloy C75700 itself does not contain silver. It takes its name from the similarity of its appearance when polished to silver, although it does not have the corrosion resistance of the latter.

C75700 is a copper nickel zinc alloy. The crystal structure is the face centred cubic alpha phase, and hence the alloy has a good combination of strength, hardness and ductility.

Typical applications:

Decorative. Holloware, spoons and forks, watch cases, jewellery, medallions, "objets d'art", pressed, spun or deep drawn items, usually silver plated.

Electrical. Relay & contact springs, wiper blades, resistance wire & strip for moderately elevated temperatures, contacts, connector pins & terminals.

Mechanical. Springs & clips, rivets, Bourdon tubing.

Miscellaneous. Instrument & camera parts, slide fasteners, etching stock, nameplates, musical instruments, fishing tackle, spectacle parts, latch keys, shop fittings.

PHYSICAL PROPERTIES

<u>Property</u>	<u>Metric Units</u>	<u>Imperial Units</u>
Melting Point (Liquidus)	1060°C	1940°F
Melting Point (Solidus)	1000°C	1830°F
Density	8.65 gm/cm ³ @ 20°C	0.315 lb/in ³ @ 68°F
Specific Gravity	8.65	8.65
Coefficient of Thermal Expansion	16.0 x 10 ⁻⁶ /°K (20 - 300°C)	9.0 x 10 ⁻⁵ /°F (68 - 572°F)
Thermal Conductivity	80 W/m.°K @ 20°C	19 BTU/ft ³ /ft/hr/°F @ 68°F
Thermal Capacity (Specific Heat)	0.418 4 J/kg/°K @ 20°C	0.10 BTU/lb/°F @ 68°F
Electrical Resistivity (Annealed)	22 microhm.cm @ 20°C	130 ohms (circ mil/ft) @ 68°F
Electrical Conductivity (Annealed)	0.046 4 microhm ⁻¹ .cm ⁻¹ @ 20°C	8% IACS
Temperature Coefficient of Electrical Resistance (Annealed)	0.000 4 / °C @ 0 - 100°C	0.000 2 / °F @ 32 - 212 °F
Modulus of Elasticity (tension)	128.5 GPa @ 20°C	18.6 x 10 ⁶ psi @ 68°F
Modulus of Rigidity (torsion)	48 GPa @ 20°C	6.9 x 10 ⁶ psi @ 68°F

FABRICATING PROPERTIES

Cold Working Capacity	Excellent
Hot Working Capacity	Very limited
Hot Working Temperature	850 - 925°C
Annealing Temperature	600 - 750°C
Stress Relieving Temperature	250 - 350°C
Machinability Rating	25% of free cutting brass (C36000)
Polishing/Electroplating Finish	Excellent

JOINING PROPERTIES

Soldering	Excellent
Brazing	Excellent
Oxy-Acetylene Welding	Good
Gas Shielded Arc Welding (GTAW/TIG, GMAW/MIG)	Fair
Coated Metal Arc Welding (Manual electrodes)	Not recommended
Resistance Welding	Spot Good Seam Good

Corrosion Resistance

C75700 has good corrosion resistance to weathering. It is frequently used in decorative applications, where it undergoes little tarnishing in service. If atmospheric corrosion does occur after prolonged exposure without cleaning in an aggressive marine environment, the corrosion products are likely to be green to brown in colour. Exposure tests 25 metres from a surf beach have indicated a likely thickness loss due to corrosion of about 1 mm per year

C75700 should not be used in contact with ammonia or ammonia compounds, as it may suffer stress corrosion cracking. Beware of corrosion inhibitors in piping systems containing carbon steels, which should be checked for compatibility with alloy C75700.

Please consult Austral Wright Metals for advice on your specific application.

Phase Diagram of C75700 (isothermal section at 20°C)

