

AMS 4597-C72900 (Hardiall®)

Standard-stocked product	Extruded and drawn
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Product description	Copper nickel-tin bronze
Tempers	TX TS solution annealed, cold finished and spinodal hardened
Solids	0.75" to 3.54" (19.05 mm to 89.92 mm) O.D.* *Consult mill for other shapes/sizes

Typical uses

Aerospace

Brakes, compression fit airframe fasteners, control surface and actuator bushings and bearings, door hardware, electronic system connectors, helicopter controls, hydraulic actuators, landing gear bushings and bearings, steering joints, valves, wheel bearings, wing flap bearings

Electrical

Connectors, contacts, controls, miniaturized sockets, relay elements, switches

Industrial

Springs, wire

Marine

Marine components

Oil and gas

Bearings, bushings, drilling components, sucker rod, valve guide bushing couplings

Chemical composition

Ni + Co (%)	Sn (%)	Fe (%)	Zn (%)	Mn (%)	Cb (%)	Mg (%)	Pb (%)	Cu (%)
14.50-15.50	7.50-8.50	0.50	0.50	0.30	0.10	0.15	0.02	Remain

Chemical composition according to AMS 4597

Note: Copper + sum of named elements, 99.5% min. Single values represent maximums.

Machinability

AMS	Machinability rating	Density (lb/in ³)	Density (g/cm ³)
AMS 4597-C72900		0.323	8.94

AMS 4597-C72900 continued

Mechanical properties

Mechanical properties according to AMS 4597

TX TS solution annealed, cold finished and spinodal hardened

Size range up to 1.60" (40 mm) exclusive nominal thickness between parallel sides (bars, rods); nominal wall thickness (tubing)

Ultimate tensile strength, min		Yield strength, at 0.2% offset, min		Elongation, in 4D, min	Rockwell "C" hardness	Remarks
ksi	MPa	ksi	MPa	%	min HRC	
165	1137	155	1069	6	34	

Size range 1.60" to 3.25" (40 to 83 mm) inclusive nominal thickness between parallel sides (bars, rods); nominal wall thickness (tubing)

Ultimate tensile strength, min		Yield strength, at 0.2% offset, min		Elongation, in 4D, min	Rockwell "C" hardness	Remarks
ksi	MPa	ksi	MPa	%	min HRC	
156	1075	148	1020	3	34	

Physical properties

	US customary	Metric
Melting point – liquidus	2039 °F	1115 °C
Melting point – solidus	1742 °F	950 °C
Density	0.323 lb/in ³ at 68 °F	8.94 gm/cm ³ at 20 °C
Specific gravity	8.94	8.94
Electrical conductivity	7.8% IACS at 68 °F	0.045 MegaSiemens/cm at 20 °C
Thermal conductivity	17 Btu/sq ft/ft hr/°F at 68 °F	29.4 W/m at 20 °C
Coefficient of thermal expansion 68-572	9.1 · 10 ⁻⁶ per °F (68-572 °F)	15.8 · 10 ⁻⁶ per °C (20-300 °C)
Specific heat capacity	0.09 Btu/lb/°F at 68 °F	377.1 J/kg at 293 °C
Modulus of elasticity in tension	18500 ksi	127554 MPa
Modulus of rigidity	7500 ksi	51711 MPa

Physical properties provided by CDA

Fabrication properties

Technique	Suitability
Soldering	Excellent
Brazing	Excellent
Oxyacetylene welding	Good
Gas shielded arc welding	Excellent
Coated metal arc welding	Excellent
Spot weld	Excellent
Seam weld	Excellent
Butt weld	Excellent
Capacity for being cold worked	Excellent
Capacity for being hot formed	Good

Fabrication properties provided by CDA

Thermal properties

Treatment	Minimum*	Maximum*
Annealing	1515	
Hot treatment	1200	1600

Thermal properties provided by CDA

**Temperature is measured in Fahrenheit.*