TECHNICAL DATA SHEET

PRODUCT: COPPER ALLOY UNS-C52100

PRODUCT BASIC INFORMATION:

Alloy:	**UNS-C52100**	**Phospher Bronze**
Form:	--	
Temper:		--
Dimension:	--	
Surface Finish:	--	
Similar Alloys	--	
Application:	General Use	

CHEMICAL COMPOSITION:

Element		**Percentage (%)**
Aluminum	**(Al)**	--
Nickel	**(Ni)**	9.0 to 11
Iron	**(Fe)**	1.0 to 1.8
Copper	**(Cu)**	84.7 to 90
Manganese	**(Mn)**	0 to 1.0
Magnesium	**(Mg)**	--
Lead	**(Pb)**	0 to 0.050
Zinc	**(Zn)**	0 to 1.0
Tin	**(Sn)**	--
Cadmium	**(Cd)**	--
Remainder Total		0 to 0.5

MECHANICAL PROPERTIES:

Properties	Metric	Imperial
Tensile strength	303 - 414 MPa	43900 - 60000 psi
Tensile Strength, Yield	110 - 393 MPa	16000 - 57000 psi
Elongation	42 %	42 %
Elastic modulus	140 GPa	20300 ksi
Shear Modulus	--	--
Fatigue Strength	52 GPa	7540 ksi

PHYSICAL DATA :	Metric Units	Imperial Unit
Melting Point (Liquidus)	1150 °C	2100 °F
Melting Point (Solidus)	1100 °C	2010 °F
Density	8.94 g/cc @ 20°C	0.323 lb/in^3 @ 68°F
Specific Gravity	8.94	8.94
Coefficient of Thermal Expansion	10 to -6 power per °F (68 – 572°F)	9.5
Thermal Conductivity	40.0 W/mK @ 20°C	278 BTU-in/hr-ft^2-°F
Thermal Capacity (Specific Heat):	390 J/kg-K - °C	0.094 BTU/lb-°F
Electrical Conductivity	9.8%	IACS
Electrical Resistivity:	0.0000190 Ω.cm @ 20°C	--
Modulus of Elasticity (tension)	140 GPa @ 20°C	20300 ksi
Modulus of Rigidity (torsion)	--	6800 ksi
Poisson's Ratio	--	--

PROCESSING PROPERTIES:	METRIC	ENGLISH
Annealing Temperature:	600 - 825 °C	1110 - 1520 °F
Hot-Working Temperature:	850 - 950	1560 - 1740
Recrystallization Temperature:	--	--

DESCRIPTIVE PROPERTIESD:	METRIC	ENGLISH
Velocity of Sound:	--	--

OTHER PROPERTIES:	
Typical Applications	UNS C70600 has many applications, including seawater pipelines, heat exchangers, condensers, valves, fittings, and pumps. It is also used in power plants, desalination plants, and offshore structures. The material's excellent resistance to biofouling and corrosion in seawater makes it ideal for marine applications such as shipbuilding, underwater engineering, and desalination equipment.
Machinability	The machinability rate of UNS C70600 copper-nickel alloy is 20.
Weldability	Soldering, brazing, oxyacetylene welding, gas shielded arc welding, coated metal arc welding, spot welding, seam welding, and butt welding are considered as suitable for UNS C70600 alloy.
Heat Treatment	UNS C70600 does not require heat treatment. The material can be annealed at 650°C for an hour to improve its machinability and formability. However, if heated above 800°C, the material can form a brittle phase that reduces its mechanical properties.
Hot Working	The hot working capacity of UNS C70600 copper-nickel alloy is good with the recommended hot working temperature ranging between 760 and 816°C (1550 and 1750°F).
Cold Working	The cold working capacity of UNS C70600 is good.
Annealing	The annealing temperature of UNS C70600 copper nickel alloy is between 593 and 816°C (1100 and 1500°F).
Forging	--
Hardening	UNS C70600 has a Rockwell hardness of B75. Its softness allows easy fabrication and machining, making it a popular choice for complex components and structures.

Applicable Specifications

Form	Specific Sub-Form	Application	System	Standard	Description
Bar			ASTM	B122/B122M	COPPER-NICKEL-ZINC ALLOY (NICKEL-SILVER) AND COPPER-NICKEL PLATE, SHEET, STRIP, AND ROLLED BAR
			ASTM	B151/B151M	COPPER-NICKEL-ZINC ALLOY (NICKEL-SILVER) AND COPPER-NICKEL ROD AND BAR
			MILITARY	MIL-C-15726	COPPER-NICKEL ALLOY ROD, FLAT PRODUCTS (FLAT WIRE, STRIP, SHEET, BAR, AND PLATE) AND FORGINGS
Condenser & Heat Exchanger			ASTM	B956/B956M	WELDED COPPER AND COPPER-ALLOY CONDENSER

Applicable Specifications					
Form	**Specific Sub-Form**	**Application**	**System**	**Standard**	**Description**
Tube with Integral Fins					AND HEAT EXCHANGER TUBES WITH INTEGRAL FINS
Forgings	Forgings				
Pipe			ASTM	B466/B466M	SEAMLESS COPPER-NICKEL PIPE AND TUBE
			ASTM	B467	WELDED COPPER-NICKEL PIPE
			ASME	SB467	WELDED COPPER-NICKEL PIPE
			ASME	SB466	SEAMLESS COPPER-NICKEL PIPE AND TUBE
Plate			ASTM	B432	COPPER AND COPPER ALLOY CLAD STEEL PLATE
		Condenser Tube	ASME	SB171	COPPER ALLOY CONDENSER TUBE PLATES
			MILITARY	MIL-C-15726	COPPER-NICKEL ALLOY ROD, FLAT PRODUCTS (FLAT WIRE, STRIP, SHEET, BAR, AND PLATE) AND FORGINGS
			ASTM	B122/B122M	COPPER-NICKEL-ZINC ALLOY (NICKEL-SILVER) AND COPPER-NICKEL PLATE, SHEET, STRIP, AND ROLLED BAR
		Condenser Tube	SAE	J463	WROUGHT COPPER AND COPPER ALLOYS
		Condenser Tube	SAE	J461	WROUGHT AND CAST COPPER ALLOYS
		Condenser Tube	ASTM	B171/B171M	COPPER ALLOY CONDENSER TUBE PLATES
Rod		Welding	AWS	A5.15	WELDING RODS FOR WELDING CAST IRON
			ASTM	B151/B151M	COPPER-NICKEL-ZINC ALLOY (NICKEL-SILVER) AND COPPER-NICKEL ROD AND BAR
			MILITARY	MIL-C-15726	COPPER-NICKEL ALLOY ROD, FLAT PRODUCTS (FLAT WIRE, STRIP, SHEET, BAR, AND PLATE) AND FORGINGS
Sheet			SAE	J461	WROUGHT AND CAST COPPER ALLOYS
			MILITARY	MIL-C-15726	COPPER-NICKEL ALLOY ROD, FLAT PRODUCTS (FLAT WIRE, STRIP, SHEET, BAR, AND PLATE) AND FORGINGS
			SAE	J463	WROUGHT COPPER AND COPPER ALLOYS
			ASTM	B122/B122M	COPPER-NICKEL-ZINC ALLOY

Applicable Specifications					
Form	**Specific Sub-Form**	**Application**	**System**	**Standard**	**Description**
					(NICKEL-SILVER) AND COPPER-NICKEL PLATE, SHEET, STRIP, AND ROLLED BAR
Strip			ASTM	B122/B122M	COPPER-NICKEL-ZINC ALLOY (NICKEL-SILVER) AND COPPER-NICKEL PLATE, SHEET, STRIP, AND ROLLED BAR
			MILITARY	MIL-C-15726	COPPER-NICKEL ALLOY ROD, FLAT PRODUCTS (FLAT WIRE, STRIP, SHEET, BAR, AND PLATE) AND FORGINGS
Tube		Condenser Tube	ASTM	B552	SEAMLESS AND WELDED COPPER-NICKEL TUBES FOR WATER DESALTING PLANTS
		Condenser Tube	SAE	J463	WROUGHT COPPER AND COPPER ALLOYS
		Condenser Tube	ASME	SB111	COPPER AND COPPER ALLOY SEAMLESS CONDENSER TUBES & FERRULE STOCK
			MILITARY	MIL-T22214	TUBE, CONDENSER AND HEAT EXCHANGER WITH INTEGRAL FINS
		Condenser Tube	MILITARY	MIL-T15005	TUBES, COPPER-NICKEL ALLOY CONDENSER AND HEAT EXCHANGER
		Condenser Tube	ASTM	B111/B111M	COPPER AND COPPER ALLOY SEAMLESS CONDENSER TUBES AND FERRULE STOCK
			ASTM	B543/B543M	WELDED COPPER AND COPPER ALLOY HEAT EXCHANGER TUBE
			MILITARY	MIL-T16420	TUBE, COPPER-NICKEL ALLOY, SEAMLESS AND WELDED
			ASME	SB543	WELDED COPPER AND COPPER ALLOY TUBE
			MILITARY	MIL-T16420	TUBE, COPPER-NICKEL ALLOY, SEAMLESS AND WELDED
			ASME	SB395	U-BEND SEAMLESS COPPER & COPPER ALLOY HEAT EXCHANGER & CONDENSER TUBE
		Condenser Tube	SAE	J461	WROUGHT AND CAST COPPER ALLOYS
			ASTM	B359/B359M	COPPER AND COPPER-ALLOY

Applicable Specifications					
Form	**Specific Sub-Form**	**Application**	**System**	**Standard**	**Description**
					SEAMLESS CONDENSER AND HEAT EXCHANGER TUBES WITH INTEGRAL FINS
			ASTM	B469	SEAMLESS COPPER ALLOY TUBES FOR PRESSURE APPLICATION
			ASME	SB466	SEAMLESS COPPER-NICKEL PIPE AND TUBE
			ASTM	B466/B466M	SEAMLESS COPPER-NICKEL PIPE AND TUBE
			ASME	SB359	COPPER & COPPER ALLOY SEAMLESS CONDENSER & HEAT EXCHANGER TUBES WITH INTEGRAL FINS
			ASTM	B395/B395M	U-BEND SEAMLESS COPPER AND COPPER ALLOY HEAT EXCHANGER AND CONDENSER TUBES
Wire			MILITARY	MIL-C15726	COPPER-NICKEL ALLOY ROD, FLAT PRODUCTS (FLAT WIRE, STRIP, SHEET, BAR, AND PLATE) AND FORGINGS

APPLICATIONS

Principal Design Features	UNS C70600 is a versatile material with various applications in various industries. Its excellent resistance to corrosion, high ductility, and good thermal conductivity makes it an ideal choice for marine, chemical, and power generation applications. With proper welding techniques and maintenance, the material can offer reliable service in harsh environments for many years.

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PACKAGING, HANDING & STORAGE:

Package:	Packed in waterproof Kraft, fastened by steel straps on wood pallets, suitable for handling, loading and unloading from the trunks or containers, suitable for export ocean forwarding.
Handling:	Prevent the goods hurting the people who are moving, loading, unloading, especially pay attention to the rolling and dropping for the coils.
Storage:	Stored in indoor area on plain floor, free away from moisture, water, snow, animal oils and dye wastes, avoid storing with acid or basic chemical goods.