C72200 Chromium-Bearing Copper Nickel

AMERITUBE

Developed by the International Nickel Company, C72200, a chromium modified copper nickel alloy, has exhibited significantly superior resistance to inlet end erosion and blockage erosion as compared to C70600 90/10 Copper Nickel. This alloy can serve as a lower cost substitute for titanium and C71640 (a modified C71500 70/30 copper nickel) to avoid erosion-corrosion problems. Available under the ASTM B111 / ASME SB111 specification, Ameritube has experience provided very thin wall, hard drawn and annealed C72200 for heat transfer applications. Where higher flow velocities cause faster corrosion of copper alloys, particularly in marine and saltwater applications, higher nickel content is required, C72200 avoids the higher cost of C71500 and titanium by limiting nickel content with the introduction of chromium. While all copper nickel alloys are famed for their heat transfer allowing for less use of chlorine due to their natural biofouling resistance, C72200 has a higher heat transfer than titanium, C71500 and C71640, making it a superior choice. Being a cost effective alternative to C71640 and offering a lower cost to titanium where its level of performance is not required, C72200 is an interesting alloy that should achieve larger acceptance among various applications including steam surface condensers in the air removal section and the main body as well as desalination plants.

CHEMICAL COMPOSITION

	Cu	Fe	Pb	Ni	Cr	Zn	Mn	Si	Ti
MIN/MAX	Rem	0 .5-1.0	.05	15.0-18.0	0.3-0.7	1.0	1.0	.03	.03

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APPLICABLE SPECIFICATIONS

Pipe, Seamless	ASTM B466/ B466M	Plate, Condenser Tube	ASTM B171/ B171M	Tube, Finned	ASTM B359/ B359M	Tube, Condenser	ASTM B111
Plate	ASTM B122	Tube, Welded	ASTM B543/ B543M	Strip	ASTM B122	Tube, U-bend	ASTM B395/B395M

FABRICATION PROPERTIES

Soldering	Brazing	Oxyacetylene Welding	Gas Shielded Arc Welding	Coated Metal Arc Welding	Spot Weld	Seam Weld	Butt Weld	Capacity for being Cold Worked	Capacity for being Hot Formed
Good	Good	Fair	Excellent	Good	Good	Good	Good	Good	Good

PHYSICAL PROPERTIES

Melting Point - Liquidus	Density	Specific Gravity	Electrical Conductivity	Thermal Conductivity	Specific Heat Capacity	Modulas of Elasticity	Modulus of Rigidity
2148 F	0.323lb/in^3 @ 68 F	8.94	6.53 %IACS @ 68 F	239 BTU-in/hr-ft^2-°F @68°F	0.0946 BTU/lb-°F	19600 ksi	6000 ksi
1175 C	8.94 gm/cm^3 @ 20 C	8.94		34.5 W/m-K @20°C	0.396 J/g-°C	135 GPa	41370 MPa

MAXIUM PRESSURE WORK

P = Maxium work pressure(psi)
S = Minimum tensile strength of material for a specific temper(It is the value of the tensile strength in psi in Mechanica properties table)
D = Exterior diameter of tube
T = Wall thickness of tube

$$P = \frac{2T \times S}{5D}$$

NON DESTRUCTIVE TESTS

Eddy Current Testing
Hydrostatic Testing
Air Underwater Testing
Ultrasonic Testing
(PMI) Positive Material Identification

DESTRUCTIVE TESTS

Microstructure Test
Tensile Test
Flattening Test
Expansion Test
Optical Test
Ammonia Vapor Test
Spectrometry Test

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