PNA 203

Cu-OFE / C10100 Release 01_2009_E

PNA 203 is a high-purity, oxygen-free copper with high electrical conductivity. It is not susceptible to hydrogen disease (embrittlement) when heated in hydogenous atmosphere.

For industrial applications, oxygen-free copper is valued more for its chemical purity than its electrical conductivity.

This copper is finished to a final form in a carefully regulated, oxygen-free environment and it achieves a minimum 101% IACS conductivity rating. For this reason PNA 203 is normally more expensive than other grades of copper.

Chemical Composition (wt. %)	
Cu	Minimum 99.99

Physical Properties		
Density	g/cm³	8.94
Coefficient of Thermal Expansion	10^{-6}/K	17.7
Electrical Conductivity	MS/m	58
	%IACS	101
Thermal Conductivity	W/(mK)	394
Modulus of Elasticity	kN/mm²	127

Material Designation	
Aurubis	PNA 203
EN	CW009A
UNS*	C10100
ISO	Cu-OFE
BS	C110

* Unified Numbering System

Mechanical Properties					
		R 220 H 040	R 240 H 065	R 290 H 090	R 360 H 110
Tensile Strength *Rm*	N/mm²	220 – 260	240 – 300	290 – 360	> 360
Yield Strength $Rp_{0.2}$	N/mm²	< 140	> 180	> 250	> 320
Elongation A_{50}	%	> 33	> 8	> 4	> 2
Hardness *Hv*	-	40 – 65	65 – 95	90 – 110	> 110

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Bendability

		R 220	R 240	R 290	R 360
r = x·t (t ≤ 0.5mm)	90° GW**	0	0	0	0
	90° BW	0	0	0	0

** GW: bending edge ⊥ rolling direction, BW: bending edge ∥ rolling direction.

Fabrication Properties

Cold Formability	Excellent
Hot Formability	Excellent
Soldering	Excellent
Brazing	Excellent
Oxyacetylene Welding	Fair
Gas Shield Arc Welding	Good
Resistance Welding	Poor

Typical Applications

Electrical Engineering

Busbars, Super Conductors

Transistor Components

Connectors, Coaxial Cables

Particle Accelerators

Other Properties

Corrosion Resistance	Resistant to corrosion in most atmospheres including marine and industrial environments. Material corroded by oxidising acids, halogens, sulphides and ammonia based solutions.
Work Hardening	Work hardens relatively slowly during cold working and can be annealed in neutral or oxidising atmospheres. Annealing can be achieved by rapid cooling after heating (370°C to 650°C).

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