

PNA 221

CuZn5 / C21000

Release 03_2009_E



PNA 221 is solid solution strengthened copper alloy (brass) with 5% zinc. As the zinc content increases in the alloy, the strength improves, but is accompanied by losses in conductivity and ductility.

Moreover, it should be noted that as the zinc content rises, the inclination to stress corrosion cracking increases in the event of exposure to an ammoniacal atmosphere. This type of corrosion can, however, be combated in many cases by the removal of thermal stress.

As the zinc content rises, the user may under certain circumstances have an economic advantage due to the different metal values.

Chemical Composition (wt. %)

Cu	94 – 96
Fe	Maximum 0.05
Pb	Maximum 0.05
Zn	Remainder

Physical Properties

Density	g/cm ³	8.9
Coefficient of Thermal Expansion	10 ⁻⁶ /K	18
Electrical Conductivity	MS/m	32.8
	%IACS	56
Thermal Conductivity	W/(mK)	243
Modulus of Elasticity	kN/mm ²	127

Material Designation

Aurubis	PNA 221
EN	CW500L
UNS*	C21000
ISO	CuZn5
BS	CZ125

* Unified Numbering System

Mechanical Properties

		R 230 H 045	R 270 H 075	R340 H110
Tensile Strength <i>R_m</i>	N/mm ²	230 – 280	270 – 350	> 340
Yield Strength <i>R_{p0.2}</i>	N/mm ²	< 130	> 200	> 280
Elongation <i>A₅₀</i>	%	> 38	> 12	> 4
Hardness <i>H_v</i>	-	45 – 75	75 – 110	> 110

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Bendability

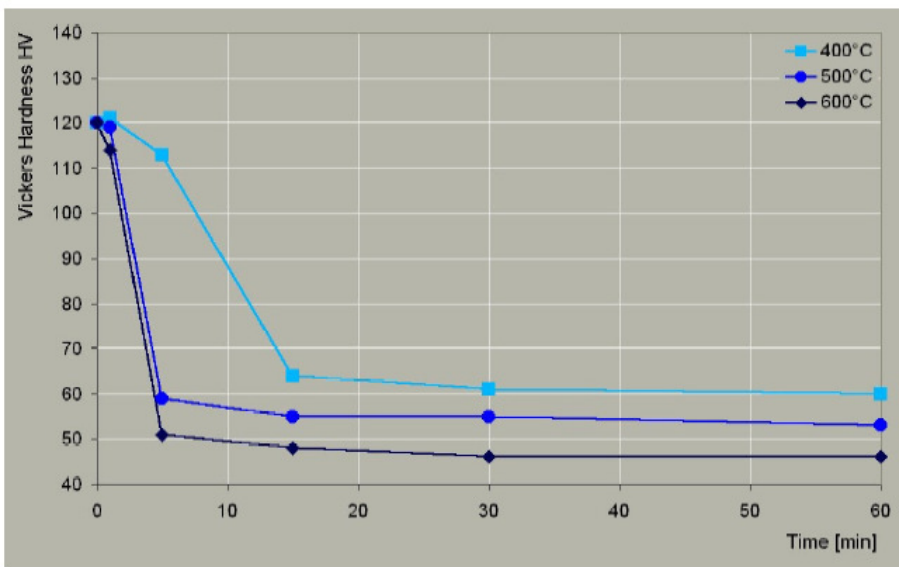
	R 230	R 270	R 340
90° GW**	0	0	0.5
90° BW	0	0	1
180° GW	0	0	1
180° BW	0	1	2

$r = x \cdot t$ ($t \leq 0.5\text{mm}$)

** GW: bending edge \perp rolling direction, BW: bending edge \parallel rolling direction.

Softening Stability

Vickers hardness after heat treatment (typical values)
(Temper R 340)



Fabrication Properties

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

Typical Applications

Components for Electrical Engineering
Ordnance, Connectors
Contacts, Shell casings
Detonator Caps

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