PNA 221

CuZn5 / C21000

Release 06_10_E

EIP Metals
Norddeutsche Affinerie AG

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	max 0.05
Pb	max 0.05
Zn	Rem.

Physical properties

Density	g/cm³	8.9
Coefficient of thermal expansion	10^{-6}/K	18.0
Electrical conductivity	MS/m	32.8
	%IACS	56
Thermal conductivity	W/(mK)	243
Modulus of elasticity	kN/mm²	127

Material designation

Prymetall	PNA 221
EN	CuZn5 CW500L
UNS*	C 21000

*Unified Numbering System

Mechanical properties

		R 230 H 045	R 270 H 075	R 340 H 110
Tensile strength *Rm*	N/mm²	230 – 280	270 – 350	> 340
Yield strength $Rp_{0.2}$	N/mm²	< 130	> 200	> 280
Elongation A_{50}	%	> 36	> 12	> 4
Hardness *HV*	-	45 – 75	75 – 110	> 110

Bendability

		R 230	R 270	R 340
r = x·t (t ≤ 0.5mm)	90° GW**	0	0	0.5
	90° BW	0	0	1
	180° GW	0	0	1
	180° BW	0	1	2

** GW: bending edge ⊥ rolling direction, BW: bending edge || rolling direction

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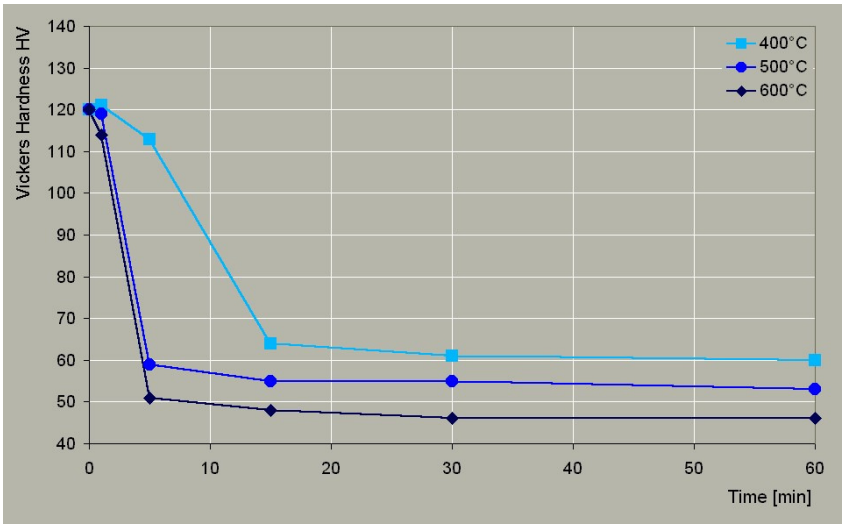
Softening stability



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

Fabrication properties

Cold formability	excellent
Hot formability	good
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	good
Gas shielded arc welding	good
Resistance welding	good

Typical uses

Components of electrical engineering,

Ordnance, Connectors,

Contacts, Shell casings,

Detonator caps

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