PNA 224

CuZn20 / C24000 Release 03_2009_E

PNA 224 is solid solution strengthened copper alloy (brass) with 20% 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	79 – 81
Fe	Maximum 0.05
Pb	Maximum 0.05
Zn	Remainder

Physical Properties		
Density	g/cm³	8.67
Coefficient of Thermal Expansion	10^{-6}/K	18.8
Electrical Conductivity	MS/m	19
	%IACS	32.8
Thermal Conductivity	W/(mK)	142
Modulus of Elasticity	kN/mm²	119

Material Designation	
Aurubis	PNA 224
EN	CW503L
UNS*	C24000
ISO	CuZn20
BS	CZ103

* Unified Numbering System

Mechanical Properties								
		R 270 H 055	R 320 H 085	R 400 H 120	R 480 H 155	G 010	G 020	G 035
Tensile Strength *Rm*	N/mm²	270 – 320	320 – 400	400 – 480	> 480	340	300	290
Yield Strength *Rp0.2*	N/mm²	< 150	> 200	> 320	> 440	190	125	110
Elongation *A50*	%	38	20	5	-	50	50	50
Hardness *Hv*	-	55 – 85	85 – 120	120 - 155	> 155	< 105	< 85	< 75
Grain size *DK*	µm	-	-	-	-	< 15	15-30	25-50

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Bendability

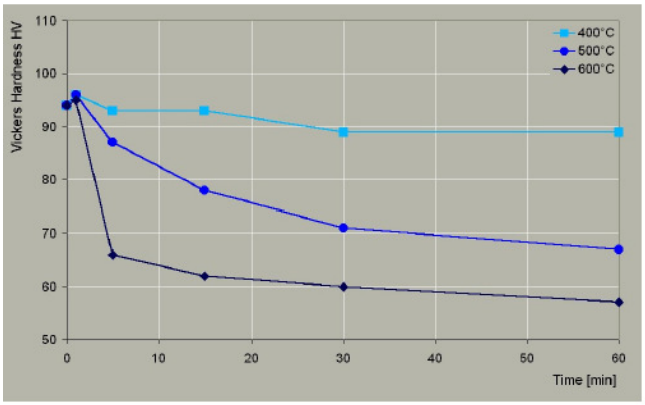
		R 270	R 320	R 400	R 480
r = x·t (t ≤ 0.5mm)	90° GW**	0	0	0	0.5
	90° BW	0	0	0	1
	180° GW	0	0	0	1
	180° BW	0	0	0	1.5

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

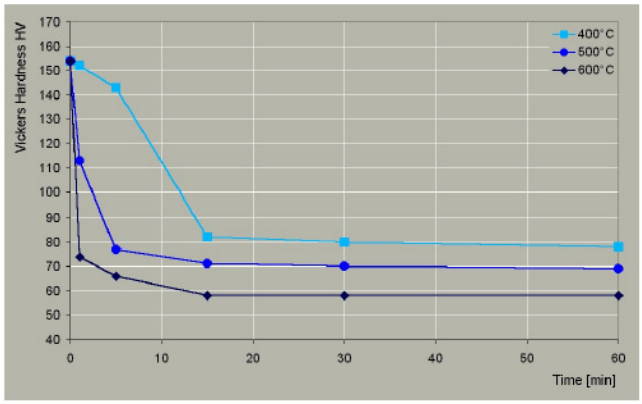
Softening Stability

Vickers hardness after heat treatment (typical values)

(Temper R 410)



(Temper R 480)



Fabrication Properties

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

Typical Applications

Components for Electrical Engineering
Architecture, Musical Instruments
Contacts, Battery Caps
Conduits, Costume Jewellery
Hardware, Deep drawn components
Welding wire

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