

PNA 284

CuSn₄ / C51100

Release 03_2009_E



PNA 284 is a solid solution strengthened copper alloy (bronze) with 4% tin. It combines very good cold workability and high strength, is corrosion resistant, can be very well soft and hard soldered and, in addition, still has good electrical conductivity.

It is used in applications where great importance is attached to the combinations of conductivity and strength.

Chemical Composition (wt. %)

Cu	Remainder
Zn	Max 0.1
P	0.03 – 0.18
Sn	3.5 – 4.5

Physical Properties

Density	g/cm ³	8.85
Coefficient of Thermal Expansion	10 ⁻⁶ /K	18
Electrical Conductivity	MS/m	12
	%IACS	21
Thermal Conductivity	W/(mK)	100
Modulus of Elasticity	kN/mm ²	120

Material Designation

Aurubis	PNA 284
EN	CW450K
UNS*	C51100
ISO	CuSn ₄
BS	PB101

* Unified Numbering System

Mechanical Properties

		R 290 H 070	R 390 H 115	R 480 H 150	R 540 H 170	R 610 H 190
Tensile Strength <i>R_m</i>	N/mm ²	290 – 390	390 – 490	480 – 570	540 – 630	> 610
Yield Strength <i>R_{p0.2}</i>	N/mm ²	< 190	> 210	> 420	> 490	> 610
Elongation <i>A₅₀</i>	%	> 40	> 11	> 4	> 3	-
Hardness <i>Hv</i>	-	70 – 100	115 – 155	150 – 180	170 – 200	> 190

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Bendability

	R 290	R 390	R 480	R 540	R 610	
r = x · t (t ≤ 0.5mm)	90° GW**	0	0	0	1	
	90° BW	0	0	0	4	2
	180° GW	0	0	0	5	3
	180° BW	0	0	2	3	4

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

Fabrication Properties

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

Typical Applications

Automotive, Components of
Electrical engineering, Connectors,
Clamp ports, Clamp-connections,
Leadframes, Relays and conductor
Springs, Spring rings, Pressure gauge
Springs, Retaining clips

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