

PNA 294

CuSn₄ Adv. / C51180

Release 03_2009_E



PNA 294 is a precipitation and solid solution strengthened alloy with 4% Tin. It provides higher strength and improved bend-ability while maintaining good conductivity.

Therefore it is a good choice for applications in electronic and automotive connector market.

Chemical Composition (wt. %)

| | |
|----|-------------|
| Cu | Remainder |
| Sn | 3.50 – 4.90 |
| Fe | 0.05 – 0.20 |
| Ni | 0.05 – 0.20 |
| P | 0.01 – 0.35 |

Physical Properties

| | | |
|----------------------------------|---------------------|------|
| Density | g/cm ³ | 8.85 |
| Coefficient of Thermal Expansion | 10 ⁻⁶ /K | 17.8 |
| Electrical Conductivity | MS/m | 11.6 |
| | %IACS | 20 |
| Thermal Conductivity | W/(mK) | 90.6 |
| Modulus of Elasticity | kN/mm ² | 110 |

Material Designation

| | |
|---------|------------------------|
| Aurubis | PNA 294 |
| EN | Not Standardized |
| UNS* | C51180 |
| ISO | CuSn ₄ Adv. |
| BS | N/a |

* Unified Numbering System

Mechanical Properties

| | | R 480 | R 550 | R 590 | R 670 | R 730 | R 760 |
|--|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength <i>R_m</i> | N/mm ² | 480 – 580 | 550 – 640 | 590 – 690 | 670 – 770 | 730 – 820 | 760 – 840 |
| Yield Strength <i>R_{p0.2}</i> | N/mm ² | 480 | 570 | 600 | 700 | 740 | 770 |
| Elongation <i>A₅₀</i> | % | 22 | 18 | 10 | 8 | 5 | 3 |
| Hardness <i>H_v</i> | - | 130 | 160 | 180 | 190 | 200 | 210 |

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Bendability

| | R 480 | R 550 | R 590 | R 670 | R 730 | R 760 |
|---|-------|-------|-------|-------|-------|-------|
| $r = x \cdot t$ ($t \leq 0.5\text{mm}$) | | | | | | |
| 90° GW** | 0 | 0 | 0 | 0.5 | 1 | - |
| 90° BW | 0 | 0 | 0 | 3 | 4 | - |

** GW: bending edge \perp rolling direction, BW: bending edge \parallel 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, Electrical,
Electronical and Electrical Connectors,
Springs

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