

PNA 210

Cu-HCP / C10300

Release 01_2009_E



PNA 210 is a deoxidised, oxygen-free copper with a low residual phosphorus content.

It is used for semis with special requirements as to formability, weld-ability and brazability, e.g. in electronics, process equipment manufacture or in the cable industry.

Chemical Composition (wt. %)

| | |
|----|---------------|
| Cu | Minimum 99.95 |
| P | 0.002 – 0.007 |

Physical Properties

| | | |
|----------------------------------|---------------------|------|
| Density | g/cm ³ | 8.94 |
| Coefficient of Thermal Expansion | 10 ⁻⁶ /K | 17.7 |
| Electrical Conductivity | MS/m | 57 |
| | %IACS | 98 |
| Thermal Conductivity | W/(mK) | 385 |
| Modulus of Elasticity | kN/mm ² | 127 |

Material Designation

| | |
|---------|---------|
| Aurubis | PNA 210 |
| EN | CW021A |
| UNS* | C10300 |
| ISO | Cu-HCP |
| BS | C102 |

* Unified Numbering System

Mechanical Properties

| | | R 220 | R 240 | R 290 | R 360 |
|--|-------------------|-----------|-----------|-----------|-------|
| | | H 040 | H 065 | H 090 | H 110 |
| Tensile Strength <i>R_m</i> | N/mm ² | 220 – 260 | 240 – 300 | 290 – 360 | > 360 |
| Yield Strength <i>R_{p0.2}</i> | N/mm ² | < 140 | > 180 | > 250 | > 320 |
| Elongation <i>A₅₀</i> | % | > 33 | > 8 | > 4 | > 2 |
| Hardness <i>Hv</i> | - | 40 – 65 | 65 – 95 | 90 – 110 | > 110 |

Bendability

| | | R 220 | R 240 | R 290 | R 360 |
|---|----------|-------|-------|-------|-------|
| $r = x \cdot t$ ($t \leq 0.5\text{mm}$) | 90° GW** | 0 | 0 | 0 | 0 |
| | 90° BW | 0 | 0 | 0 | 0.5 |

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

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Fabrication Properties

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

Typical Applications

Electrical Engineering
Contacts, Pressure Vessels
Commutators

Other Properties

| | |
|----------------------|--|
| Corrosion Resistance | Resistant to corrosion in most atmospheres including marine and industrial environments. Material corroded by oxidising acids, halogens, sulphides and ammonia based solutions. |
| Work Hardening | Work hardens relatively slowly during cold working and can be annealed in neutral or oxidising atmospheres. Annealing can be achieved by rapid cooling after heating (370°C to 650°C). |

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