



# Technical Data Sheet

## AMPCOLOY® 91

AMPCOLOY® 91 is a premium high copper alloy designed with slightly higher mechanical strength than its counterparts. It offers excellent wear and corrosion resistance, making it the ideal choice for critical applications. With this alloy, you can expect superior performance and durability, making it a preferred choice for various applications where high thermal conductivity is critical.

### Key Features:

- ▶ Increased mechanical properties
- ▶ High thermal & electrical conductivity
- ▶ Performance under heavy loads
- ▶ Corrosion & wear resistant
- ▶ Good machinability & coatability
- ▶ RWMA Class 3
- ▶ Remarkable properties up to 842°F
- ▶ Forged or extruded to achieve best physical properties
- ▶ Increasing conductivity at higher temperatures

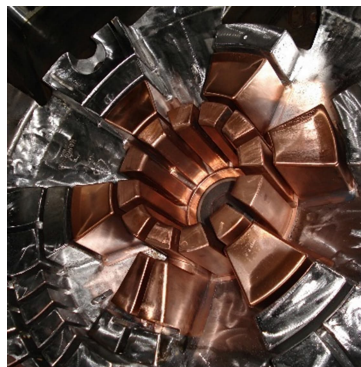


### Nominal Composition:

| Copper<br>(Cu) | Cobalt<br>(Co) | Beryllium<br>(Be) | Others    |
|----------------|----------------|-------------------|-----------|
| Balance        | 2.4%           | 0.5%              | max. 0.5% |

### Applications:

- ▶ Used where both high mechanical strength & conductivity are essential
- ▶ For injection molding, die casting & welding industries
- ▶ Various resistance welding electrodes
- ▶ Cooling inserts for injection molding
- ▶ Plunger tips for aluminum high pressure die casting machines
- ▶ Molds for low pressure die casting



AMPCOLOY® 91 has a wide range of applications in various industries due to its impressive properties. This high-performance bronze alloy is the preferred choice for welding electrodes especially when working with stainless steel, MoneI®, nickel alloys, and other challenging materials. Whether it's increasing productivity in welding processes or ensuring precision in casting, this high copper alloy excels in applications where superior thermal conductivity and durability are paramount.



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| Mechanical Properties<br>(Nominal values) | Forged | Extruded |        |
|---|--------|----------|--------|
|   |        | Ø ≤ 2"   | Ø > 2" |
| Tensile Strength R <sub>m</sub> (ksi)     | 102    | 130      | 105    |
| Yield Strength R <sub>p0.5</sub> (ksi)    | 72     | 80       | 75     |
| Elongation 2" (%)                         | 17     | 10       | 17     |
| Brinell Hardness (10/3000)                | 217    | 240      | 217    |
| Rockwell Hardness (HRB)                   | 96     | 100      | 96     |
| Modulus of Elasticity E (ksi)             | 18850  | 18850    | 18850  |

### Physical Properties:

| Density<br>ρ<br>(lbs/in³) | Coefficient of<br>Expansion α<br>(in/in/°F) | Thermal Conductivity λ<br>(W/m·K) |              |              |              | Electrical<br>Conductivity<br>(% I.A.C.S.) | Specific Heat<br>C <sub>p</sub><br>(BTU/lb·°F) |
|---------------------------|---|-----------------------------------|--------------|--------------|--------------|--|--|
| 0.315                     | 9.44·10 <sup>-6</sup>                       | 68°F<br>208                       | 212°F<br>226 | 392°F<br>243 | 572°F<br>256 | 52   | 0.1  |

### Machining Parameters:

| Operation           | Cutting Speed v <sub>c</sub><br>(m/min) | Feed f<br>(mm/rev) | Depth a<br>(mm) | Tool Specification |
|---------------------|---|--------------------|-----------------|--------------------|
| Milling – Roughing  | 110 - 160                               | 0.1 - 0.4          | up to 4         | K10 - K20          |
| Milling – Finishing | 90 - 115                                | 0.05 - 0.1         | 0.1 - 0.5       | K10 - K20          |
| Turning – Roughing  | 150 - 225                               | 0.1 - 0.2          | up to 2         | K10 - K20          |
| Turning – Finishing | 170 - 250                               | 0.05 - 0.1         | 0.1 - 0.2       | K10 - K20          |

Scan the QR Code to view our machining recommendations:



### Health & Safety:

Since the alloy contains Beryllium, it is recommended that during any operation which is liable to create dust or fumes (for example dry grinding, polishing or welding) precautions should be taken to ensure there is no inhalation or exposure to eyes or skin. Conventional machining (for example milling and turning) is not generally considered hazardous.

Contact us

