# TECHNICAL DATA SHEET

## PRODUCT: COPPER ALLOY UNS-C86500

### PRODUCT BASIC INFORMATION:

| | | |
|---|---|---|
| **Alloy:** | **UNS-C86500** | **Manganese Bronze** |
| **Form:** | -- | |
| **Temper:** | | -- |
| **Dimension:** | -- | |
| **Surface Finish:** | -- | |
| **Similar Alloys** | UNS C86400 - UNS C68100 - UNS C67600 - UNS C68000 - UNS C67500 - UNS C38000 | |
| **Application:** | General Use | |

### CHEMICAL COMPOSITION:

| **Element** | | **Percentage (%)** |
|---|---|---|
| **Aluminum** | **(Al)** | 0.5 to 1.5 |
| **Nickel** | **(Ni)** | 0 to 1.0 |
| **Iron** | **(Fe)** | 0.4 to 2.0 |
| **Copper** | **(Cu)** | 55 to 60 |
| **Manganese** | **(Mn)** | 0.1 to 1.5 |
| **Magnesium** | **(Mg)** | -- |
| **Lead** | **(Pb)** | 0 to 0.4 |
| **Zinc** | **(Zn)** | 36 to 42 |
| **Tin** | **(Sn)** | 0 to 1.0 |
| **Cadmium** | **(Cd)** | -- |
| **Remainder Total** | | 0 to 1.0 |

| MECHANICAL PROPERTIES: | | |
|---|---|---|
| **Properties** | **Metric** | **Imperial** |
| **Tensile strength** | 483 MPa | 70000 psi |
| **Tensile Strength, Yield** | 172 MPa | 25000 psi |
| **Elongation** | 25 % | 25 % |
| **Elastic modulus** | 105 GPa | 15200 ksi |
| **Shear Modulus** | -- | -- |
| **Fatigue Strength** | 130 – 150MPa | 18900 - 21800 psi |

| PHYSICAL DATA : | Metric Units | Imperial Unit |
|---|---|---|
| **Melting Point (Liquidus)** | 880 °C | 1620 °F |
| **Melting Point (Solidus)** | 862 °C | 1580 °F |
| **Density** | 8.30 g/cc @ 20°C | 0.300 lb/in³ @ 68°F |
| **Specific Gravity** | -- | -- |
| **Coefficient of Thermal Expansion** | -- | -- |
| **Thermal Conductivity** | 87.0 W/mK @ 20°C | 604 BTU-in/hr-ft²-°F |
| **Thermal Capacity (Specific Heat):** | 0.373 J/g-°C | 0.0891 BTU/lb-°F |
| **Electrical Conductivity** | 22% | IACS |
| **Electrical Resistivity:** | 0.00000840 Ω.cm @ 20°C | -- |
| **Modulus of Elasticity (tension)** | 105 GPa @ 20°C | 15200 ksi |
| **Modulus of Rigidity (torsion)** | -- | -- |
| **Poisson's Ratio** | -- | -- |

| PROCESSING PROPERTIES: | METRIC | ENGLISH |
|---|---|---|
| **Annealing Temperature:** | 260 °C | 500 °F |
| **Hot-Working Temperature:** | -- | -- |
| **Recrystallization Temperature:** | -- | -- |

| DESCRIPTIVE PROPERTIESD: | METRIC | ENGLISH |
|---|---|---|
| **Velocity of Sound:** | -- | -- |

## OTHER PROPERTIES:

| | |
|---|---|
| **Typical Applications** | **Automotive**: weld guns Builders **Hardware**: brackets Electrical: electrical hardware Industrial: compressors, forming dies for wood pulp industry, frames, gears, hooks, lever arms, machinery, machinery parts (substituted for steel and malleable iron), machinery parts requiring high strength, pressing dies for wood pulp, struts, wear rings for pressing dies for wood pulp industry **Marine**: boat parts, clamps, covers for marine hardware, propellers for salt and fresh water, rudders |
| **Machinability** | Copper casting alloy UNS C86500 has a machinability rating of 26. |
| **Weldability** | The preferred welding techniques for UNS C86500 are soldering and brazing. Carbon arc welding, oxyacetylene welding, gas-shielded arc welding and coated metal arc welding are not recommended for this alloy. |
| **Heat Treatment** | The stress relieving temperature of this alloy is 500 F or 260 C. The time at temperature is one hour per inch of section thickness. This alloy does not respond to heat treatment. |
| **Hot Working** | -- |
| **Cold Working** | -- |
| **Annealing** | -- |
| **Forging** | -- |
| **Hardening** | -- |

| Product | Specification |
|---|---|
| **As Centrifugal Cast (Castings)** | **ASTM -** B271/B271M - COPPER BASE ALLOY CENTRIFUGAL CASTINGS |
| | **AMS –** 4860 - MANGANESE BRONZE CASTINGS, SAND AND CENTRIFUGAL, AS CAST |
| | **SAE -** J462 - CAST COPPER ALLOYS |
| | **SAE -** J461 - WROUGHT AND CAST COPPER ALLOYS |
| **As Continuous Cast (Castings)** | **ASTM -** B505/B505M - COPPER BASE ALLOY CONTINUOUS CASTINGS |
| **As Sand Cast (Castings)** | **AMS –** 4860 - MANGANESE BRONZE CASTINGS, SAND AND CENTRIFUGAL, AS CAST |
| | **SAE -** J462 - CAST COPPER ALLOYS |
| | **ASTM –** B584- COPPER ALLOY SAND CASTINGS FOR GENERAL APPLICATIONS |
| | **ASTM –** B763/B763M - COPPER ALLOY SAND CASTINGS FOR VALVE APPLICATIONS |
| **Ingot** | **ASTM –** B30 - COPPER BASE ALLOYS IN INGOT FORM |
| | **FEDERAL -** QQ-C-523 - COPPER ALLOY INGOTS: BRASS (YELLOW HIGH STRENGTH) MANGANESE AND MANGANESE-ALUMINUM BRONZE |
| **Valve** | -- |

## APPLICATIONS

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|---|---|
| **Principal Design Features** | C86300 grade of manganese bronze is an alloy that consists of copper, zinc, manganese and aluminum. Alloy C86300 has a chocolate brown colour due to the presence of manganese in the composition. Copper European alloy C86300 is exceedingly resistant to corrosion and durable. It is often used in architecture |

## PACKAGING, HANDING & STORAGE:

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|---|---|
| **Package:** | Packed in waterproof Kraft, fastened by steel straps on wood pallets, suitable for handling, loading and unloading from the trunks or containers, suitable for export ocean forwarding. |
| **Handling:** | Prevent the goods hurting the people who are moving, loading, unloading, especially pay attention to the rolling and dropping for the coils. |
| **Storage:** | Stored in indoor area on plain floor, free away from moisture, water, snow, animal oils and dye wastes, avoid storing with acid or basic chemical goods. |