

COPPER ALLOY Nos. C26000, C26100, C26130 and C26200 (CARTRIDGE BRASS, 70%)

Composition — percent

| | No. C26000 | | | No. C26100 | | | No. C26130 | | | No. C26200 | | |
|------------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|---------|---------|
| | Nominal | Minimum | Maximum | Nominal | Minimum | Maximum | Nominal | Minimum | Maximum | Nominal | Minimum | Maximum |
| Copper | 70 | 68.5 | 71.5 | 70 | 68.5 | 71.5 | 70 | 68.5 | 71.5 | 67.0 | 70.0 | |
| Lead | ..... | ..... | .07 | ..... | ..... | .05 | ..... | ..... | .05 | ..... | .07 | |
| Iron | ..... | .05 | ..... | ..... | .05 | ..... | ..... | .05 | ..... | ..... | .05 | |
| Zinc | 30 | ..... | 30 | 30 | ..... | 30 | ..... | 31.5 | ..... | ..... | ..... |  |
| Phosphorus | ..... | ..... | .03 | ..... | .02 | ..... | ..... | ..... | .02 | ..... | ..... |  |
| Arsenic | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .02 | ..... | ..... | ..... |  |

Nearest Applicable A S T M Specifications *

| Flat Products | B19, B36, B134, B569 |
|---------------|----------------------|
| Pipe | |
| Rod | |
| Shapes | B129 |
| Tube | B135, B587 |
| Wire | B134 |

*Refer to specific ASTM specifications for alloys covered

Physical Properties

| | English Units | C. G. S. Units |
|-------------------------------------|------------------------------------|------------------------------------|
| Melting Point (Liquidus) | 1750 F | 955 C |
| Melting Point (Solidus) | 1680 F | 915 C |
| Density | .308 lb/cu in @ 68 F | 8.53 gm/cu cm @ 20 C. |
| Specific Gravity | 8.53 | 8.53 |
| Coefficient of Thermal Expansion | per °F from 68 F to 212 F | per °C from 20 C to 100 C |
| Coefficient of Thermal Expansion | per °F from 68 F to 392 F | per °C from 20 C to 200 C |
| Coefficient of Thermal Expansion | .0000111 per °F from 68 F to 572 F | .0000199 per °C from 20 C to 300 C |
| Thermal Conductivity | 70 Btu/sq ft/ft/hr/°F @ 68 F | .29 cal/sq cm/cm/sec/°C @ 20 C |
| Electrical Resistivity (Annealed) | 37.0 Ohms (circ mil/ft) @ 68 F | 6.16 Microhm-cm @ 20 C |
| Electrical Conductivity* (Annealed) | 28 % IACS @ 68 F | .162 Megmho-cm @ 20 C |
| Thermal Capacity (Specific Heat) | .09 Btu/lb °F @ 68 F | .09 cal/gm °C @ 20 C |
| Modulus of Elasticity (Tension) | 16,000 psi | 11,200 Kg/sq mm |
| Modulus of Rigidity | 6,000 psi | 4,200 Kg/sq mm |

Typical Uses

- ARCHITECTURAL: grillwork
- AUTOMOTIVE: radiator and heater cored and tanks
- ELECTRICAL: flashlight shells, lamp fixtures, reflectors, screw shells, socket shells
- HARDWARE: bead chain, chain, eyelets, fasteners, grommets, finish hardware articles (binges, kick plates, locks, push plates, etc.), stencils
- INDUSTRIAL: pump and power cylinders and liners
- MUNITIONS: ammunition components
- PLUMBING: plumbing accessories, plumbing brass goods
- WIRE: fasteners, pins, rivets, screws, springs

Common Fabrication Processes

Fabrication Properties

| | | |
|---|--------------------------------|-----------------|
| Capacity for Being Cold Worked | ..... | Excellent |
| Capacity for Being Hot Formed | ..... | Fair |
| Hot Forgeability Rating (Forging Brass = 100) | ..... | ..... |
| Hot Working Temperature | 1350-1550 F or 725-850 C | ..... |
| Annealing Temperature | 800-1400 F or 425-750 C | ..... |
| Machinability Rating (Free Cutting Brass = 100) | ..... | ..... |
| Suitability for being joined by: | | |
| Soldering | ..... | Excellent |
| Brazing | ..... | Excellent |
| Oxyacetylene welding | ..... | Good |
| Gas Shielded Arc Welding | ..... | Fair |
| Coated Metal Arc Welding | ..... | Not Recommended |
| Resistance Welding | | |
| Spot | ..... | Good |
| Seam | ..... | Not Recommended |
| Butt | ..... | Good |

Forms and Tempers Most Commonly Used

| | Annealed Tempers | | | | | Rolled or Drawn Tempers | | | | | Hot Finished Tempers | | | | | | | | | | |
|---------------|-----------------------|-------|-------|-------|-------|-------------------------|--------------|-------------|--------------|-----------|----------------------|------------|--------|--------------|-----------------------------|----------------|---------------------------|---------------|-------------|-----------------|-------|
| | Nominal Grain Size mm | | | | | | | | | | | | | | | | | | | | |
| | .100 | .070 | .050 | .035 | .025 | Soft Anneal | Light Anneal | Eighth Hard | Quarter Hard | Half Hard | Three Quarter Hard | Extra Hard | Spring | Extra Spring | Drawn — General Purpose (1) | Hard Drawn (2) | Light Drawn — Bending (3) | As Hot Rolled | As Extruded | Special Tempers | |
| FLAT PRODUCTS | Strip, Rolled | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Strip, Drawn | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Flat Wire, Rolled | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Flat Wire, Drawn | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Bar, Rolled | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Bar, Drawn | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Sheet | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | ROD | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | WIRE | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | TUBE | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | PIPE | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | SHAPES | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

DRAWN—GENERAL PURPOSE (H58) temper is used for general purpose tube only, usually where there is no real requirement for high strength or hardness on the one hand or for bending qualities on the other.

HARD DRAWN (H80) temper is used only where there is need for a tube as hard or as strong as is commercially feasible for the size in question.

LIGHT DRAWN—BENDING (H55) temper is used only where a tube of some stiffness, but yet capable of readily being bent (or otherwise moderately cold worked) is needed.

Mechanical Properties

| Form | Size Section in. | Temper | Tensile Strength ksi | Yield Strength | | Elongation in 2 in. % | Rockwell Hardness F \| B \| 30T | Shear Strength ksi | Fatigue Strength | | | |
|---------------|--------------------------|------------------|----------------------|---------------------------|------------------|-----------------------|-------------------------------|--------------------|------------------|----------------|-------|-------|
| | | | | (.5% Ext. under Load) ksi | (.2% Offset) ksi | | | | ksi | Million Cycles | | |
| FLAT PRODUCTS | .040 in. | .100 mm | 44.0 | 11.0 | ..... | 66 | 54 -- 11 | ..... | 13.0 | 100 | | |
| | | .070 mm | 46.0 | 14.0 | ..... | 65 | 58 -- 15 | 32.0 | 13.0 | 100 | | |
| | | .050 mm | 47.0 | 15.0 | ..... | 62 | 64 -- 26 | ..... | ..... | ..... |  |  |
| | | .035 mm | 49.0 | 17.0 | ..... | 57 | 68 -- 31 | 34.0 | 14.0 | 100 | | |
| | | .025 mm | 51.0 | 19.0 | ..... | 55 | 72 -- 36 | ..... | ..... | ..... |  |  |
| | | .015 mm | 53.0 | 22.0 | ..... | 54 | 78 -- 43 | 35.0 | 14.0 | 100 | | |
| | | Quarter Hard | 54.0 | 40.0 | ..... | 43 | 55 54 | 36.0 | ..... | ..... |  |  |
| | | Half Hard | 62.0 | 52.0 | ..... | 25 | 70 65 | 40.0 | 18.0 | 100 | | |
| | | Hard | 76.0 | 63.0 | ..... | 8 | 82 73 | 44.0 | 21.0 | 100 | | |
| | | Extra Hard | 86.0 | 65.0 | ..... | 5 | 88 76 | 46.0 | ..... | ..... |  |  |
| | | Spring | 94.0 | 65.0 | ..... | 3 | 91 77 | 48.0 | 23.0 | 100 | | |
| | | Extra Spring | 99.0 | 65.0 | ..... | 3 | 93 78 | ..... | ..... | ..... |  |  |
| | | WIRE | | .050 mm | 48.0 | | | 64 | -- -- | | | |
| | | | | .035 mm | 50.0 | | | 60 | -- -- | 34.0 | | |
| | | | | .025 mm | 52.0 | | | 58 | -- -- | | | |
| .015 mm | 54.0 |  |  | ..... | ..... | 56 | -- -- | ..... | ..... | ..... |  |  |
| Eighth Hard | 58.0 |  |  | ..... | ..... | 35 | -- -- | 38.0 | ..... | ..... |  |  |
| Quarter Hard | 70.0 |  |  | ..... | ..... | 20 | -- -- | ..... | ..... | ..... |  |  |
| TUBE | 1.0 in. OD X .065 in. | .050 mm | 47.0 | 15.0 | ..... | 65 | 64 -- 26 | ..... | ..... | ..... |  |  |
| | | .025 mm | 52.0 | 20.0 | ..... | 55 | 75 -- 40 | ..... | ..... | ..... |  |  |
| | | Hard Drawn (35%) | 78.0 | 64.0 | ..... | 8 | 82 73 | ..... | ..... | ..... |  |  |
| ROD | 1.0 in. | .050 mm | 48.0 | 16.0 | ..... | 65 | 65 -- -- | 34.0 | ..... | ..... |  |  |
| | | Eighth Hard (6%) | 55.0 | 40.0 | ..... | 48 | -- 60 -- | 36.0 | ..... | ..... |  |  |
| | | Half Hard (20%) | 70.0 | 52.0 | ..... | 30 | -- 80 -- | 42.0 | 22.0 | 50 | | |

The values listed above represent reasonable approximations suitable for general engineering use. Due to commercial variations in composition and to manufacturing limitations, they should not be used for specification purposes. See applicable A.S.T.M. specification references.