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PRODUCT DATA
SHEET

Free Cutting Brass
Alloy 385

Copper Alloys

UNS C38500

Also known as Architectural Bronze

Composition, AS2738.2 - 1984, Compositions & designations

Copper		Lead		Zinc
Min	Max	Min	Max	Max
56.0	60.0	2.5	4.5	Remainder

Equivalent Alloy
Specifications

Specification	Designation
UNS	C38510
ISO	CuZn39Pb3
BSI	CZ121

Specification	Product Form
AS1567	Wrought rods, bars & sections
AS2738	Compositions & designations

Australian
Product
Specifications

Mechanical
Properties

AS1567, Wrought rods,
bars & sections

	Units	Temper
		M
Tensile Strength minimum	MPa	380
Elongation minimum	%	12
Hardness maximum	HV	(90)

() – for information only

Available Forms Austral Wright Metals are able to supply this alloy as extruded rods.

General Description Free cutting brass is a significantly improved form of 60/40 brass, with excellent free cutting characteristics. It is used in the mass production of brass components on high speed lathes where maximum output and longest tool life are required, and where no further cold forming after machining is needed.

The superior machining characteristics of alloy 385 are due to the rapid chill effect of continuous casting, which gives a fine uniform lead distribution without segregation, and suppresses the formation of brittle phases which cause tool wear.

The alloy gives:

- ?? Superior surface finish without tooling modification
- ?? Improved tool life and reduced tool sharpening
- ?? Cleaner threads with no build-up and no breakage
- ?? Cutting tools previously used with a negative rake can be modified to zero top rake

Typical applications are nuts, bolts, screw threads.

PHYSICAL PROPERTIES

Property	Metric Units	Imperial Units
Melting Point (Liquidus)	890°C	1635°F
Melting Point (Solidus)	875°C	1610°F
Density	8.47 gm/cm ³ @ 20°C	0.306 lb/in ³ @ 68°F
Specific Gravity	8.47	8.47
Coefficient of Thermal Expansion	20.9 x 10 ⁻⁶ /°K (20 - 300°C)	11.0 x 10 ⁻⁵ /°F (68 - 572°F)
Thermal Conductivity	121 W/m.°K @ 20°C	70 BTU/ft ² /ft/hr/°F @ 68°F
Thermal Capacity (Specific Heat)	377 J/kg.°K @ 20°C	0.09 BTU/lb/°F @ 68°F
Electrical Resistivity (Annealed)	6.16 microhm.cm @ 20°C	38 ohms (circ mil/ft) @ 68°F
Electrical Conductivity (Annealed)	0.162 microhm ⁻¹ .cm ⁻¹ @ 20°C	28% IACS
Modulus of Elasticity (tension)	97 GPa @ 20°C	14.0 x 10 ⁶ psi @ 68°F
Modulus of Rigidity (torsion)	37 GPa @ 20°C	5.3 x 10 ⁶ psi @ 68°F
Poisson's Ratio	0.32	0.32

FABRICATING PROPERTIES

Cold Working Capacity	Poor
Hot Working Capacity	Fair
Hot Working Temperature	700 - 800°C
Annealing Temperature	425 - 600°C
Stress Relieving Temperature	250 - 300°C
Machinability Rating	90% of free cutting brass (C36000)
Polishing/Electroplating Finish	Good

JOINING PROPERTIES

Soft Soldering	Good
Silver Soldering	Fair - Good
Brazing	Good
Oxy-Acetylene Welding	Fair
Gas Shielded Arc Welding (GTAW/TIG, GMAW/MIG)	Not recommended
Coated Metal Arc Welding (Manual electrodes)	Not recommended
Resistance Welding	Not recommended

Corrosion Resistance

Alloy 385 has good corrosion resistance to weathering and fair resistance to many waters.

Alloy 385 should not be used in contact with ammonia, ammonia compounds or amines, as it may suffer stress corrosion cracking.

Please consult Austral Wright Metals for specific advice on your application.

Phase Diagram & Mechanical Properties of the Brasses

