

C46400

NAVAL BRASS

DESCRIPTION

Brass is a 60:40 copper zinc alloy to which about 1% of tin has been added to improve the corrosion resistance, particularly to dezincification. The alloy is a two phase alpha-beta brass, hence has reasonably high strength with lower ductility than the single phase 70:30 or alpha brass. It is used for structural applications and for forgings, especially where contact with sea water is likely to induce corrosion. The mechanical properties are almost indistinguishable from those of 60:40 brass C28000, although the tin addition tends to give slightly higher strength. C46400 can be readily hot worked, and can also be cold worked, but not as easily as the single phase alpha brasses.

CHEMICAL COMPOSITION

Elements	Min (%)	Max (%)
Cu	59.00	62.00
Pb	-	0.20
Sn	0.50	1.00
Fe	-	0.10
Total Others	-	0.50
Zn	Remainder	

MECHANICAL PROPERTIES (AS PER TEMPER H02)

Range (Inch)	From	To	UTS Min (ksi)	PS Min (ksi)	Elongation Min (%)	Hardness Min (HRB)	Hardness Max (HRB)
Round (Dia)	0.059	0.500	60.00	27.00	22.00	-	-
	0.500	1.000	60.00	27.00	25.00	60.00	80.00
	1.000	2.000	58.00	26.00	25.00	55.00	80.00
	2.000	2.953	54.00	25.00	25.00	55.00	80.00
Hex (A/F)	0.118	0.500	60.00	27.00	22.00	-	-
	0.500	1.000	60.00	27.00	25.00	60.00	80.00
	1.000	2.000	58.00	26.00	25.00	55.00	80.00
	2.000	2.756	54.00	25.00	25.00	55.00	80.00
Square (A/F)	0.118	0.500	60.00	27.00	22.00	-	-
	0.500	1.000	60.00	27.00	25.00	60.00	80.00
	1.000	2.362	58.00	26.00	25.00	55.00	80.00
Rectangle (Thickness)	0.1181	0.500	60.00	27.00	22.00	-	-
	0.500	1.000	60.00	27.00	25.00	50.00	80.00
	1.000	1.968	58.00	26.00	25.00	55.00	80.00

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MECHANICAL PROPERTIES (AS PER TEMPER HO2)

Range (mm)	From	To	UTS Min (MPa)	PS Min (MPa)	Elongation Min (%)	Hardness Min (HRB)	Hardness Max (HRB)
Round (Dia)	3.00	12.00	415.00	185.00	22.00	-	-
	12.00	25.00	415.00	185.00	25.00	60.00	80.00
	25.00	50.00	400.00	180.00	25.00	55.00	80.00
	50.00	75.00	370.00	170.00	25.00	55.00	80.00
Hex (A/F)	3.00	12.00	415.00	185.00	22.00	-	-
	12.00	25.00	415.00	185.00	25.00	60.00	80.00
	25.00	50.00	400.00	180.00	25.00	55.00	80.00
	50.00	70.00	370.00	170.00	25.00	55.00	80.00
Square (A/F)	3.00	12.00	415.00	185.00	22.00	-	-
	12.00	25.00	415.00	185.00	25.00	60.00	80.00
	25.00	50.00	400.00	180.00	25.00	55.00	80.00
	50.00	60.00	370.00	170.00	25.00	55.00	80.00
Rectangle (Thickness)	3.00	12.00	415.00	185.00	22.00	-	-
	12.00	25.00	415.00	185.00	25.00	60.00	80.00
	25.00	50.00	400.00	180.00	25.00	55.00	80.00

PHYSICAL PROPERTIES

Melting Point - Liquidus°F	1650
Melting Point - Solidus°F	1630
Densitylb/cu in. at 68°F	0.304
Specific Gravity	8.41
Electrical Conductivity% IACS at 68°F	26
Thermal ConductivityBtu/ sq ft/ ft hr/ °F at 68°F	67
Coefficient of Thermal Expansion 68-57210- ⁶ per °F (68 – 572°F)	11.8
Specific Heat CapacityBtu/ lb /°F at 68°F	0.09
Modulus of Elasticity in Tensionksi	15000
Modulus of Rigidityksi	5600

FABRICATION PROPERTIES

Technique	Suitability
Soldering	Excellent
Brazing	Excellent
Oxyacetylene Welding	Good
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Not Recommended
Spot Weld	Good
Seam Weld	Fair
Butt Weld	Good
Capacity for Being Cold Worked	Fair
Capacity for Being Hot Formed	Excellent
Forgeability Rating	90
Machinability Rating	30

TYPICAL USES

➤ Fasteners ➤ Industrial ➤ Marine