C83600

Material Notes: Casting methods recommended for this alloy: Centrifugal, Continuous, Investment, and Sand.

Applications: Valves, flanges, pipe fittings, plumbing goods, pump castings, water pump impellers and housings, ornamental fixtures small gears.

Classified under: Red Brasses and leaded red brasses. ASTM B62, ASTM B584; formerly ASTM B145-4A

As cast values below are for sand casting. Alloy does not respond to heat treating. Casting shrinkage allowance is 5.7%

Key Words: Leaded Red Brass, composition metal, ounce metal, 85-5-5-5, CA 836, AMS 4855, ASTM B30, ASTM B62, ASTM B271, ASTM B505, ASTM B584, ASTM B145-4A, SAE J462 (CA836), Ingot code number 115, FED QQ-C-390 (CA836), MIL-C-15345 (Alloy 1)

Physical Properties	Metric	English	Comments
Density	8.83 g/cc	0.319 lb/in³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	60	60	Typical
Tensile Strength, Ultimate	255 MPa	37000 psi	
Tensile Strength, Yield	117 MPa @Strain 0.500 %	17000 psi @Strain 0.500 %	
Elongation at Break	30 %	30 %	In 50 mm
Creep Strength	48.0 MPa	6960 psi	for 0.1% creep in 10,000 h, at 290°C
	77.0 MPa	11200 psi	for 0.1% creep in 10,000 h, at 230°C
	86.0 MPa	12500 psi	for 0.1% creep in 10,000 h, at 180°C
Rupture Strength	35.0 MPa @Temperature 230 °C, Time 3.60e+8 sec	5080 psi @Temperature 446 °F, Time 100000 hour	
	85.0 MPa @Temperature 230 °C, Time 1.08e+7 sec	12300 psi @Temperature 446 °F, Time 3000 hour	
	120 MPa @Temperature 230 °C, Time 1.08e+6 sec	17400 psi @Temperature 446 °F, Time 300 hour	
	130 MPa @Temperature 175 °C, Time 3.60e+8 sec	18900 psi @Temperature 347 °F, Time 100000 hour	
	200 MPa @Temperature 230 °C, Time 108000 sec	29000 psi @Temperature 446 °F, Time 30.0 hour	
	220 MPa @Temperature 175 °C,	31900 psi @Temperature 347 °F,	

	Time 9.00e+6 sec	Time 2500 hour	
	350 MPa @Temperature 230 °C, Time 7200 sec	50800 psi @Temperature 446 °F, Time 2.00 hour	
	370 MPa @Temperature 175 °C, Time 2.16e+6 sec	53700 psi @Temperature 347 °F, Time 600 hour	
	400 MPa @Temperature 175 °C, Time 720000 sec	58000 psi @Temperature 347 °F, Time 200 hour	
	430 MPa @Temperature 175 °C, Time 108000 sec	62400 psi @Temperature 347 °F, Time 30.0 hour	
Modulus of Elasticity	83.0 GPa	12000 ksi	
	50.0 GPa @Temperature 225 °C	7250 ksi @Temperature 437 °F	
	74.0 GPa @Temperature 115 °C	10700 ksi @Temperature 239 °F	
	82.0 GPa @Temperature 20.0 °C	11900 ksi @Temperature 68.0 °F	
	108 GPa @Temperature -40.0 °C	15700 ksi @Temperature -40.0 °F	
Compressive Strength	97.0 MPa	14100 psi	at permanent set of 0.1%, room temperature
	120 MPa	17400 psi	at permanent set of 1%, room temperature
	258 MPa	37400 psi	at permanent set of 10%, room temperature
	80.0 MPa @Temperature 115 °C	11600 psi @Temperature 239 °F	0.1% set
	80.0 MPa @Temperature 225 °C	11600 psi @Temperature 437 °F	0.1% set
	100 MPa @Temperature 20.0 °C	14500 psi @Temperature 68.0 °F	0.1% set
	100 MPa @Temperature 225 °C	14500 psi @Temperature 437 °F	1% set
	110 MPa @Temperature 115 °C	16000 psi @Temperature 239 °F	1% set
	120 MPa @Temperature -40.0 °C	17400 psi @Temperature -40.0 °F	0.1% set
	125 MPa @Temperature 20.0 °C	18100 psi @Temperature 68.0 °F	1% set
	135 MPa @Temperature -40.0 °C	19600 psi @Temperature -40.0 °F	1% set
	220 MPa @Temperature 225 °C	31900 psi @Temperature 437 °F	10% set
	230 MPa @Temperature 115 °C	33400 psi @Temperature 239 °F	10% set
	260 MPa @Temperature 20.0 °C	37700 psi @Temperature 68.0 °F	10% set
	325 MPa @Temperature -40.0 °C	47100 psi @Temperature -40.0 °F	10% set
Fatigue Strength	76.0 MPa @# of Cycles 1.00e+8	11000 psi @# of Cycles 1.00e+8	
	76.0 - 83.0 MPa @# of Cycles 1.00e+8	11000 - 12000 psi @# of Cycles 1.00e+8	

	85.0 - 99.0 MPa @# of Cycles 1.00e+7	12300 - 14400 psi @# of Cycles 1.00e+7	
	106 - 120 MPa @# of Cycles 1.00e+6	15400 - 17400 psi @# of Cycles 1.00e+6	
	140 - 155 MPa @# of Cycles 100000	20300 - 22500 psi @# of Cycles 100000	
Machinability	84 %	84 %	UNS C36000 (free-cutting brass) = 100%
Izod Impact	14.0 J	10.3 ft-lb	
Charpy Impact	15.0 J	11.1 ft-lb	V-notch

Electrical Properties	**Metric**	**English**	**Comments**
Electrical Resistivity	0.000011494 ohm-cm @Temperature 20.0 °C	0.000011494 ohm-cm @Temperature 68.0 °F	Calculated from 15% IACS
Magnetic Permeability	1.0	1.0	

Thermal Properties	**Metric**	**English**	**Comments**
CTE, linear	18.0 µm/m-°C @Temperature 20.0 - 205 °C	10.0 µin/in-°F @Temperature 68.0 - 401 °F	
Specific Heat Capacity	0.380 J/g-°C	0.0908 BTU/lb-°F	
Thermal Conductivity	72.0 W/m-K @Temperature 20.0 °C	500 BTU-in/hr-ft²-°F @Temperature 68.0 °F	
Melting Point	855 - 1010 °C	1570 - 1850 °F	
Solidus	855 °C	1570 °F	
Liquidus	1010 °C	1850 °F	

Component Elements Properties	**Metric**	**English**	**Comments**
Aluminum, Al	<= 0.0050 %	<= 0.0050 %	
Antimony, Sb	<= 0.25 %	<= 0.25 %	
Copper, Cu	84 - 86 %	84 - 86 %	
Iron, Fe	<= 0.30 %	<= 0.30 %	
Lead, Pb	4.0 - 6.0 %	4.0 - 6.0 %	
Nickel, Ni	<= 1.0 %	<= 1.0 %	
Phosphorous, P	<= 0.050 %	<= 0.050 %	
Silicon, Si	<= 0.0050 %	<= 0.0050 %	
Sulfur, S	<= 0.080 %	<= 0.080 %	
Tin, Sn	4.0 - 6.0 %	4.0 - 6.0 %	
Zinc, Zn	4.0 - 6.0 %	4.0 - 6.0 %	