Overview of materials for Brass

Categories: Metal; Nonferrous Metal; Copper Alloy; Brass

Material Notes: This property data is a summary of similar materials in the MatWeb database for the category "Brass". Each property range of values reported is minimum and maximum values of appropriate MatWeb entries. The comments report the average value, and number of data points used to calculate the average. The values are not necessarily typical of any specific grade, especially less common values and those that can be most affected by additives or processing methods.

Vendors: No vendors are listed for this material. Please click here if you are a supplier and would like information on how to add your listing to this material.

Physical Properties	Metric	English	Comments
Density	0.969 - 8.89 g/cc	0.0350 - 0.321 lb/in³	Average value: 8.48 g/cc Grade Count:604

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	37.0 - 155	37.0 - 155	Average value: 81.3 Grade Count:29
Hardness, Rockwell B	12.0 - 215	12.0 - 215	Average value: 69.6 Grade Count:274
Hardness, Rockwell F	54.0 - 100	54.0 - 100	Average value: 68.9 Grade Count:94
Hardness, Rockwell 30T	8.00 - 240	8.00 - 240	Average value: 55.1 Grade Count:213
Hardness, Rockwell H	46.0 - 90.0	46.0 - 90.0	Average value: 68.7 Grade Count:13
Hardness, Vickers	80.0 - 140	80.0 - 140	Average value: 105 Grade Count:4
Tensile Strength, Ultimate	20.7 - 1030 MPa	3000 - 150000 psi	Average value: 411 MPa Grade Count:606
Tensile Strength, Yield	34.5 - 683 MPa	5000 - 99100 psi	Average value: 253 MPa Grade Count:546
Elongation at Break	1.00 - 68.0 %	1.00 - 68.0 %	Average value: 28.8 % Grade Count:598
Reduction of Area	40.0 - 60.0 %	40.0 - 60.0 %	Average value: 52.4 % Grade Count:59
Modulus of Elasticity	75.8 - 121 GPa	11000 - 17600 ksi	Average value: 105 GPa Grade Count:555
Compressive Yield Strength	62.1 - 2580 MPa	9000 - 375000 psi	Average value: 384 MPa Grade Count:11
Poissons Ratio	0.260 - 0.460	0.260 - 0.460	Average value: 0.325 Grade Count:375
Fatigue Strength	22.0 - 360 MPa	3190 - 52200 psi	Average value: 110 MPa Grade Count:107
Machinability	20.0 - 106 %	20.0 - 106 %	Average value: 50.0 % Grade Count:521
Shear Modulus	26.9 - 44.1 GPa	3900 - 6400 ksi	Average value: 38.9 GPa Grade Count:421
Shear Strength	205 - 531 MPa	29700 - 77000 psi	Average value: 274 MPa Grade Count:281
Izod Impact	10.8 - 45.0 J	8.00 - 33.2 ft-lb	Average value: 38.7 J Grade Count:12
Charpy Impact	15.0 - 102 J	11.1 - 75.0 ft-lb	Average value: 47.1 J Grade Count:52

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00000318 - 0.0000860 ohm-cm	0.00000318 - 0.0000860 ohm-cm	Average value: 0.00000818 ohm-cm Grade Count:542
Magnetic Permeability	1.00 - 4.95	1.00 - 4.95	Average value: 1.33 Grade Count:25
Magnetic Susceptibility	-1.00e-6	-1.00e-6	Average value: -1.00e-6 Grade Count:40

Thermal Properties	Metric	English	Comments
CTE, linear	18.0 - 26.0 µm/m-°C	10.0 - 14.4 µin/in-°F	Average value: 20.1 µm/m-°C Grade Count:334
Specific Heat Capacity	0.375 - 0.510 J/g-°C	0.0896 - 0.122 BTU/lb-°F	Average value: 0.379 J/g-°C Grade Count:472
Thermal Conductivity	2.31 - 233 W/m-K	16.0 - 1620 BTU-in/hr-ft²-°F	Average value: 85.1 W/m-K Grade Count:552
Melting Point	178 - 1090 °C	353 - 2000 °F	Average value: 927 °C Grade Count:514
Solidus	178 - 1050 °C	353 - 1920 °F	Average value: 911 °C Grade Count:509
Liquidus	843 - 1090 °C	1550 - 2000 °F	Average value: 942 °C Grade Count:514
Annealing Point	427 - 760 °C	800 - 1400 °F	Average value: 546 °C Grade Count:361

Processing Properties	Metric	English	Comments
Processing Temperature	260 - 371 °C	500 - 700 °F	Average value: 275 °C Grade Count:38
Annealing Temperature	425 - 750 °C	797 - 1380 °F	Average value: 540 °C Grade Count:278
Hot-Working Temperature	625 - 950 °C	1160 - 1740 °F	Average value: 769 °C Grade Count:376
Recrystallization Temperature	288 - 400 °C	550 - 752 °F	Average value: 334 °C Grade Count:219

Component Elements Properties	Metric	English	Comments
Aluminum, Al	0.00500 - 3.00 %	0.00500 - 3.00 %	Average value: 0.542 % Grade Count:44
Antimony, Sb	0.0150 - 1.50 %	0.0150 - 1.50 %	Average value: 0.188 % Grade Count:49
Arsenic, As	0.0150 - 0.250 %	0.0150 - 0.250 %	Average value: 0.0756 % Grade Count:17
Bismuth, Bi	0.150 - 2.50 %	0.150 - 2.50 %	Average value: 1.14 % Grade Count:17
Boron, B	0.00200 - 0.200 %	0.00200 - 0.200 %	Average value: 0.143 % Grade Count:14
Cadmium, Cd	0.00100 - 0.0100 %	0.00100 - 0.0100 %	Average value: 0.00200 % Grade Count:9
Carbon, C	0.100 %	0.100 %	Average value: 0.100 % Grade Count:7
Copper, Cu	53.0 - 95.0 %	53.0 - 95.0 %	Average value: 69.4 % Grade Count:618
Iron, Fe	0.0500 - 3.00 %	0.0500 - 3.00 %	Average value: 0.193 % Grade Count:541

Lead, Pb	0.0200 - 11.0 %	0.0200 - 11.0 %	Average value: 0.811 % Grade Count:564
Manganese, Mn	0.0100 - 23.0 %	0.0100 - 23.0 %	Average value: 3.06 % Grade Count:59
Nickel, Ni	0.100 - 14.0 %	0.100 - 14.0 %	Average value: 1.79 % Grade Count:52
Phosphorus, P	0.0100 - 0.200 %	0.0100 - 0.200 %	Average value: 0.0659 % Grade Count:64
Selenium, Se	0.0100 - 1.10 %	0.0100 - 1.10 %	Average value: 0.518 % Grade Count:6
Silicon, Si	0.00500 - 5.50 %	0.00500 - 5.50 %	Average value: 1.21 % Grade Count:52
Sulfur, S	0.0500 - 0.650 %	0.0500 - 0.650 %	Average value: 0.201 % Grade Count:29
Tin, Sn	0.000 - 6.00 %	0.000 - 6.00 %	Average value: 1.10 % Grade Count:241
Titanium, Ti	0.100 - 0.300 %	0.100 - 0.300 %	Average value: 0.186 % Grade Count:7
Zinc, Zn	4.00 - 43.5 %	4.00 - 43.5 %	Average value: 28.8 % Grade Count:618
Zirconium, Zr	0.100 - 0.200 %	0.100 - 0.200 %	Average value: 0.154 % Grade Count:13