



C22000

Commercial Bronze, 90%

Chemical Composition

(%max., unless shown as range or min.)

	Cu	Fe	Pb	Zn
Min./Max.	89.0-91.0	0.05	0.05	Rem.
Nominal	90	-	-	10

Note: Cu + Sum of Named Elements, 99.8% min.

Applicable Specifications

Product	Specification
Bands, Projectile Rotating	MILITARY MIL-B-20292, MIL-B-18907
Bar	ASTM B36 SAE J461, J463
Cups, Bullet Jacket	ASTM B131 MILITARY MIL-C-3383
Plate	ASTM B36
Sheet	ASTM B36, B694 SAE J463, J461
Strip	ASTM B694, B36, B130 SAE J461, J463
Tube	ASTM B135 SAE J461, J463
Tube, Rectangular Waveguide	ASTM B372 MILITARY MIL-W-85
Tube, Welded	ASTM B587
Wire	ASTM B134
Wire, Metallizing	MILITARY MIL-W-6712

Common Fabrication Processes

Blanking, Coining, Drawing, Etching, Forming and Bending, Heading and Upsetting, Hot Forging and Pressing, Piercing and Punching, Roll Threading and Knurling, Shearing, Spinning, Squeezing and Swaging, Stamping

Millard Wire & Specialty Strip Co.

449 Warwick Industrial Drive • Warwick, RI 02886
Phone: (401) 737-9330 • Fax: (401) 737-9340



Fabrication Properties

Joining Technique	Suitability
Soldering	Excellent
Brazing	Excellent
Oxyacetylene Welding	Good
Gas Shielded Arc Welding	Good
Coated Metal Arc Welding	Not Recommended
Spot Weld	Not Recommended
Seam Weld	Not Recommended
Butt Weld	Good
Capacity for Being Cold Worked	Excellent
Capacity for Being Hot Formed	Good
Machinability Rating	20

Thermal Properties

Treatment	Temp./Time – US	Temp./Time – SI
Stress Temperature		
Solution Minimum		
Solution Maximum		
Solution Time		
Solution Medium	None	
Precipitation Value		
Precipitation Time		
Precipitation Medium	None	
Annealing Minimum	800	427
Annealing Maximum	1400	761
Annealing Time		
Hot Works Minimum	1400	761
Hot Works Maximum	1600	872



C22000 Specification Sheet

Mechanical Properties

(Measured at Room Temperature, 68°F (20°C))

Temper	Section Size	Cold Work	Typ/Mi n	Temp	Tensile Strength	Yield Strength (0.5% ext. under load)	Yield Strength (0.2% offset)	Yield Strength (0.05% offset)	EI	Rockwell Hardness				Vickers Hardness	Brinell Hardness			Shear Strength	Fatigue Strength	Izod Impact Strength
										B	C	F	30T		500	500	3000			
	in.	%		F	ksi	ksi	ksi	ksi	%					500	500	3000	ksi	ksi	ksi	
	mm.			C	MPa	MPa	MPa	MPa									MPa	MPa	MPa	ft-lb
Wire																				
H06	0.08	0	TYP	68	83	-	-	-	3	-	-	-	-	-	-	-	-	-	0	
	2			20	572	-	-	-	3	-	-	-	-	-	-	-	-	-	0	
Tube																				
H80	0	35	TYP	68	60	53	-	-	6	69	-	-	62	-	-	-	-	-	0	
	0			20	414	365	-	-	6	69	-	-	62	-	-	-	-	-	0	
Flat Products																				
M20	0.25	0	TYP	68	37	10	-	-	45	-	-	53	28	-	-	-	-	-	0	
	6.35			20	255	69	-	-	45	-	-	53	28	-	-	-	-	-	0	
H02	0.25	0	TYP	68	52	45	-	-	15	58	-	-	-	-	-	-	35	-	0	
	6.35			20	359	310	-	-	15	58	-	-	-	-	-	-	241	-	0	
OS015	0.04	0	TYP	68	41	15	-	-	42	-	-	65	26	-	-	-	32	-	0	
	1			20	283	103	-	-	42	-	-	65	26	-	-	-	221	-	0	
H02	0.04	0	TYP	68	52	45	-	-	11	58	-	-	56	-	-	-	35	-	0	
	1			20	359	310	-	-	11	58	-	-	56	-	-	-	241	-	0	
Rod																				
H00	0.5	0	TYP	68	45	-	-	-	25	42	-	-	-	-	-	-	33	-	0	
	12.7			20	310	-	-	-	25	42	-	-	-	-	-	-	228	-	0	
Wire																				
H01	0.08	0	TYP	68	50	-	-	-	13	-	-	-	-	-	-	-	34	-	0	
	2			20	345	-	-	-	13	-	-	-	-	-	-	-	234	-	0	
H00	0.08	0	TYP	68	44	-	-	-	27	-	-	-	-	-	-	-	33	-	0	
	2			20	303	-	-	-	27	-	-	-	-	-	-	-	228	-	0	
Flat Products																				
OS035	0.25	0	TYP	68	38	12	-	-	50	-	-	57	-	-	-	-	30	-	0	
	6.35			20	262	83	-	-	50	-	-	57	-	-	-	-	207	-	0	
OS035	0.04	0	TYP	68	38	12	-	-	45	-	-	57	12	-	-	-	30	-	0	
	1			20	262	83	-	-	45	-	-	57	12	-	-	-	207	-	0	
H06	0.04	0	TYP	68	67	58	-	-	4	75	-	-	67	-	-	-	40	-	0	
	1			20	462	400	-	-	4	75	-	-	67	-	-	-	276	-	0	
Tube																				
OS035	0	0	TYP	68	38	12	-	-	50	-	-	57	12	-	-	-	-	-	0	
	0			20	262	83	-	-	50	-	-	57	12	-	-	-	-	-	0	
Flat Products																				
H08	0.04	0	TYP	68	72	62	-	-	3	78	-	-	69	-	-	-	42	21	0	
	1			20	496	427	-	-	3	78	-	-	69	-	-	-	290	145	0	
Wire																				
H08	0.08	0	TYP	68	90	-	-	-	3	-	-	-	-	-	-	-	-	-	0	
	2			20	621	-	-	-	3	-	-	-	-	-	-	-	-	-	0	
Rod																				
OS035	0.5	0	TYP	68	40	-	-	-	50	-	-	55	-	-	-	-	32	-	0	
	12.7			20	276	-	-	-	50	-	-	55	-	-	-	-	221	-	0	
Flat Products																				
M20	0.04	0	TYP	68	39	14	-	-	44	-	-	60	-	-	-	-	31	-	0	
	1			20	269	97	-	-	44	-	-	60	-	-	-	-	214	-	0	
Wire																				
H04	0.08	0	TYP	68	74	-	-	-	4	-	-	-	-	-	-	-	42	23	0	
	2			20	510	-	-	-	4	-	-	-	-	-	-	-	290	159	0	
OS035	0.08	0	TYP	68	40	-	-	-	50	-	-	-	-	-	-	-	30	-	0	
	2			20	276	-	-	-	50	-	-	-	-	-	-	-	207	-	0	
Flat Products																				
OS050	0.04	0	TYP	68	37	10	-	-	45	-	-	53	6	-	-	-	28	-	0	
	1			20	255	69	-	-	45	-	-	53	6	-	-	-	193	-	0	

*Fatigue Strength: 100×10^6 cycles, unless indicated as [N]X 10^6 .



Mechanical Properties (cont'd)

Temper	Section Size	Cold Work	Typ/Min	Temp	Tensile Strength	Yield Strength	Yield Strength	Yield Strength	El	Rockwell Hardness				Vickers Hardness	Brinell Hardness			Shear Strength	Fatigue Strength	Izod Impact Strength
						(0.5% ext. under load)	(0.2% offset)	(0.05% offset)		B	C	F	30T	500	500	3000	ksi			
	in.	%		F	ksi	ksi	ksi	ksi	%								ksi	ksi	ft-lb	
	mm.			C	MPa	MPa	MPa	MPa									MPa	MPa	J	
Wire																				
H02	0.08	0	TYP	68	60	-	-	-	6	-	-	-	-	-	-	-	37	-	0	
	2			20	414	-	-	-	6	-	-	-	-	-	-	-	255	-	0	
Flat Products																				
OS025	0.04	0	TYP	68	39	14	-	-	44	-	-	60	16	-	-	-	31	-	0	
	1			20	269	97	-	-	44	-	-	60	16	-	-	-	214	-	0	
H01	0.04	0	TYP	68	45	35	-	-	25	42	-	-	44	-	-	-	33	-	0	
	1			20	310	241	-	-	25	42	-	-	44	-	-	-	228	-	0	

Physical Properties

Property	US Customary	Metric
Melting Point - Liquidus	1910° F	1043° C
Melting Point - Solidus	1870° F	1021° C
Density	0.318 lb/in ³ at 68° F	8.8 gm/cm ³ @ 20° C
Specific Gravity	8.8	8.8
Electrical Resistivity	23.60 ohms-cmil/ft @ 68° F	3.92 microhm-cm @ 20° C
Electrical Conductivity	44 %IACS @ 68° F	0.257 MegaSiemens/cm @ 20° C
Thermal Conductivity	109 Btu·ft/(hr·ft ² ·°F) at 68F	188.7 W/m·°K at 20° C
Coefficient of Thermal Expansion	10.20·10 ⁻⁶ per °F (68-572° F)	18.4·10 ⁻⁶ per °C (20-300° C)
Specific Heat Capacity	0.090 Btu/lb/°F at 68° F	377.1 J/kg·°K at 293° K
Modulus of Elasticity in Tension	17000 ksi	117000 MPa
Modulus of Rigidity	6400 ksi	44130 MPa

Tempers Most Commonly Used

Flat Products	
PLATE	H02, M20, OS035
SHEET	H02, M20, OS035
STRIP, ROLLED	H01, H02, H04, H06, H08, OS015, OS025, OS035, OS050

Other	
ROD	H00, OS035
TUBE	H55, H58, H80, O50, O60, OS035
WIRE	H00, H01, H02, H04, H06, H08, OS015, OS035



Typical Uses

Architecture

Weather Stripping, Screen Cloth, Ornamental Trim, Etching Bronze, Grill Work

Builders Hardware

Kick Plates, Hardware

Consumer

Housing for Lipstick Compacts, Compacts, Costume Jewelry, Caskets, Lipstick Cases, Ball Point Pens, Chain Links

Electrical

Wave Guides, Rotor Bar – AC Motors, Cable Wrap

Fasteners

Screw Shells, Bolts, Line Clamps, Rivets, Screws

Industrial

Base for Vitreous Enamel, Escutcheons, Flexible Tube, Studs, Screen Wire

Marine

Marine Hardware

Ordnance

Small Arms Cartridges, Artillery Projectile Rotating Bands, Press Fit, Primer Caps, Rotating Bands

Plumbing

Plumbers' Brass Goods

Casting Characteristics

No casting characteristics available for this alloy.