TECHNICAL DATA SHEET

PRODUCT: COPPER ALLOY UNS-C22000

PRODUCT BASIC INFORMATION:

Alloy:	**UNS-C22000**	**Commercial Bronze**
Form:	Plate	
Temper:		
Dimension:		
Surface Finish:	Mill Finish	
Similar Alloys:	UNS C83400 - UNS C41300 - UNS C22600 - UNS C66200 - UNS C31400 - UNS C42200	
Application:	General Use	

CHEMICAL COMPOSITION:

Element		**Percentage (%)**
Aluminum	**(Al)**	--
Silicon	**(Si)**	--
Iron	**(Fe)**	0.05 max
Copper	**(Cu)**	89.0 – 91
Manganese	**(Mn)**	--
Magnesium	**(Mg)**	--
Lead	**(Pb)**	0.02 max
Zinc	**(Zn)**	balance 10%
Titanium	**(Ti)**	--
Remainder Each		--
Remainder Total		--

MECHANICAL PROPERTIES:		
Properties	**Metric**	**Imperial**
Tensile strength	255 MPa	37000 psi
Tensile Strength, Yield	69 MPa	10000 psi
Elongation	45%	45%
Elastic modulus	115 GPa	16700 ksi
Shear strength	44 MPa	6380ksi
Fatigue Strength	--	--

PHYSICAL DATA :	Metric Units	Imperial Unit
Melting Point (Liquidus)	1045°C	1910°F
Melting Point (Solidus)	1020°C	1870°F
Density	8.80 gm/cm³ @ 20°C	0.318 lb/in³ @ 68°F
Specific Gravity	8.80	8.80
Coefficient of Thermal Expansion	18.4 x 10 $^{-6}$ / °C (20-300°C)	10.2 x 10 $^{-6}$ / °F (68-392°F)
Thermal Conductivity	189 W/m. °K @ 20°C	109 BTU/ft³/ft/hr/°F @ 68°F
Thermal Capacity (Specific Heat):	376 J/kg. °K @ 20°C	0.09 BTU/lb/°F @ 68°F
Electrical Conductivity	44%	IACS
Electrical Resistivity:	3.92 microhm.cm @ 20°C	10.3 Ω (circ mil/ft) @ 68°F
Modulus of Elasticity (tension)	115 GPa @ 20°C	17 x 10 ^{6} psi @ 68°F
Modulus of Rigidity (torsion)	44 GPa @ 20°C	6.4 x 10 ^{6} psi @ 68°F
Poisson's Ratio	0.33	0.33

PROCESSING PROPERTIES:	METRIC	ENGLISH
Annealing Temperature:	425 - 800 °C	797 - 1470 °F
Hot-Working Temperature:	750 - 875 °C	1380 - 1610 °F
Recrystallization Temperature:	370 °C	698 °F

DESCRIPTIVE PROPERTIESD:	METRIC	ENGLISH
Velocity of Sound:	3720 m/s	--

OTHER PROPERTIES:

Principal Design Features	Brasses (Copper-Zinc Alloy), Commercial Bronze, 90%. Better suited to cold forming than machining.
Machinability	220 Bronze machining creates parts from bronze material through cutting, drilling, grinding and other operations. This type of machining requires understanding metal properties to use the correct tools and strategies to create complex shapes and designs. C22000 requires precise planning, accuracy in measurements, and skillful handing that helps produce aesthetically pleasing components with great strength. With this knowledge, machinists can produce high-quality parts without sacrificing precision or speed while keeping production costs low.
Weldability	220 Bronze is an aluminum bronze alloy known for its weldability and excellent resistance to corrosion. The alloy is composed primarily of copper, aluminum, and iron with trace amounts of manganese, nickel, and silicon. Alloy 220 has a low melt temperature allows it to be easily joined by welding processes such as gas metal arc welding (GMAW). Bronze 220 provides high strength even in harsh environments due to its high corrosion resistance. Heat treatment processes like quenching or tempering can also further improve its strength. Bronze 220 is ideal for projects requiring strong weldable materials in corrosive applications.
Heat Treatment	--
Hot Working	This alloy's capacity for being hot formed is rated as "good".
Cold Working	The capacity for cold working this alloy is rated as "excellent".
Annealing	The capacity for cold working this alloy is rated as "excellent".
Forging	The hot forgeability rating of this alloy is not given. (Forging Brass=100). The recommended hot working temperature for this alloy is between 1400 and 1600 F.
Hardening	--

Product	Specification
Bands, Projectile Rotating	MILITARY MIL-B-20292, MIL-B-18907
Bronze 220 Bar	ASTM B36 - SAE J461, J463
Bronze 220 Cups, Bronze 220 Bullet, Bronze 220, Jacket	ASTM B131 - MILITARY MIL-C-3383
Bronze 220 Plate	ASTM B36
Bronze 220 Sheet	ASTM B36, B694 - SAE J463, J461
Bronze 220 Strip	ASTM B694, B36, B130 - SAE J461, J463
Bronze 220 Tube	ASTM B135 - SAE J461, J463
Bronze 220 Tube, Bronze 220 Rectangular Waveguide	ASTM B372 - MILITARY MIL-W-85
Bronze 220 Tube, Bronze 220 Welded	ASTM B587

APPLICATIONS

Typical Applications	Overall, Bronze material is an excellent choice for many applications thanks to its durability and ability to resist corrosion from most acids at room temperature and good thermal stability, allowing it to be used in high-temperature applications without compromising quality or integrity over time. Its combination of physical properties makes it perfect for valve stems, lock bodies, piston rings, bearings, bushings, and electrical fittings. To ensure maximum corrosion resistance when using bronze220, heat treatment should be applied before application to maximize the beneficial effects of the alloy's chemical composition, including increased hardness and improved tensile strength.

PACKAGING, HANDING & STORAGE:

Package:	Packed in waterproof Kraft, fastened by steel straps on wood pallets, suitable for handling, loading and unloading from the trunks or containers, suitable for export ocean forwarding.
Handling:	Prevent the goods hurting the people who are moving, loading, unloading, especially pay attention to the rolling and dropping for the coils.
Storage:	Stored in indoor area on plain floor, free away from moisture, water, snow, animal oils and dye wastes, avoid storing with acid or basic chemical goods.