Summary of Cast Bronze Characteristics

Alloy	Characteristics and Uses
Leaded Red Brass	Reasonable strength, excellent thermal conductivity, reasonable corrosion resistance to sea-water and brine, and good machining and casting properties. Lead content ensures pressure tightness. Leaded Red Brass is used as a low-cost bearing material when low loads and low speeds are encountered. Requires good, reliable lubrication and a moderately hard shaft.
Tin Bronzes	Hard, strong alloys with good corrosion resistance, especially against seawater. Moderately machinable. As bearing materials, they are wear resistant and resist pounding well. Best for high loads, low speeds. Require good, reliable lubrication and a moderately hard shaft. Higher tin concentrations improve strength, but at the expense of conformability and embeddability.
Leaded Tin Bronze	Lead improves machinability in these tin bronzes but does not materially affect mechanical properties. The alloys are essentially free-cutting versions of the tin bronzes, above, and have similar properties and uses.
High-Lead Tin Bronze	Most commonly used bearing alloys, found in bearings operating at moderate loads and moderate-to-high speeds. Excellent for boundary-lubricated situations or where lubrication is uncertain. Since lead is insoluble in the solid phases, it is dispersed in the matrix as small isolated globules, acting as small reservoirs of lubricant. Increasing lead concentrations increase conformability and scoring resistance, but at the expense of reduced strength and pounding resistance. Alloy C93200 is considered the workhorse alloy of the series. Alloy C93600 has improved machining and anti-seizing properties. C93800 is noted for its good corrosion resistance against concentrations of sulfuric acid below 78%. Alloy C94100 is especially good under boundarylubricated conditions. Alloys with high mechanical strength, good corrosion resistance and favorable castability, and of low relative cost. Can be machined but, with the exception of C86400 and C86700, are less readily machined than leaded compositions.
High Strength Brass	Brasses have typically poor tribological properties, and hence as a bearing material tend to be used

	in non-critical applications. When used for high-strength bearings, alloys C86300 and C86400 require hardened shafts and reliable lubricant supplies.
Aluminum Bronze	The aluminum bronzes are characterized by high strength and excellent corrosion resistance. Some can be heat treated ("HT"). Physical properties remain good at elevated temperatures. Excellent heavy duty bearing alloys with very good abrasion resistance and excellent resistance to repeated, severe impacts. Poor anti-seizure properties, relatively poor conformability and embeddability, hence require good reliable lubrication, hard shafts and proper shaft alignment, with both shaft and bearing machined to fine surface finishes.
Silicon Brass	Moderate-to-high strength alloys with good corrosion resistance and favorable casting properties. Used for mechanical products and pump components where combination of strength and corrosion resistance is important.
Copper Beryllium Alloys	Relatively high-strength materials with good electrical and thermal conductivity. Used where bearings and bushings with a good combination of strength and conductivity are needed. Excellent heavy duty bearing alloys, but do not tolerate misalignment or dirty lubricants and generally should be used against hardened steel shafts, with both shaft and bearing machined to fine surface finish.
Leaded Copper	Ultrahigh-lead alloys for special purpose bearings. Alloys have relatively low strength and poor impact properties and generally require reinforcement. Excellent for boundary-lubricated situations, or where lubrication is uncertain.
Lead Free Bronzes	Formulated to mimic the properties of the leaded alloys but without the safety concerns of lead. Friction, yield and tensile strength and corrosion resistance are all comparable to leaded bearing bronzes.