

Copper, Brass & Bronze

	Alloying Elements	Properties	Popular Uses
High Copper Alloys	<p>96% - 99.3% Copper</p> <p>Alloying Elements: Cadmium Beryllium Chromium Zirconium</p>	<p>High thermal and electrical conductivity. Lower strength and hardness than brasses and bronzes. More often casted than machined.</p>	<p>Wires, electrical components, roofing, screens, medical/dental</p>
Brasses	<p>55% - 95% Copper</p> <p>Main alloying element is Zinc (5% - 40%). Lead is often added to increase machinability</p>	<p>High strength, conductive, machinable and corrosion resistant. Zinc typically kept under 15% to maintain corrosion resistance.</p>	<p>Electrical components, radiators, hardware, cases, marine applications, valves, screws, nuts, keys</p>
Bronzes	<p>60% - 92% Copper (typically ~88%)</p> <p>Main alloying element is Tin, Aluminum or Silicon.</p>	<p>High strength, thermal conductivity, hardness, corrosion resistance and low friction properties.</p>	<p>Bearings, tools, coins, sculptures, musical instruments, marine applications, forgings</p>

Machining Copper, Brass and Bronze:

When referring to metals that are often used in machining, the term free machining or free cutting is often used. Free machining materials contain certain elements that add efficiencies such as higher machining speed, improved surface finish, smaller chips and longer tool life.

Lead has been historically added to alloys to improve machinability and can act as a lubricant and assists in chip breaking. However with recent developments in the negative health implications of lead, free machining coppers, brasses and bronzes are being transitioned to contain sulfur or tellurium instead of lead.

