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Metals Tidbits:

- The chemical symbol for silver is Ag, which comes from the Latin word for silver, argentum.
- Aluminum is the most common metal found in the Earth's crust. However, the most common metal found on Earth is iron, mostly because it makes up such a large part of the Earth's core.
- Compared to other metals, gold is less chemically reactive.
- The word copper and its symbol Cu come from the Latin word for Cyprus "Cuprum", where the Ancient Romans mined much of their copper.

Have a Metals Problem?
Call Us 1-262-544-7700
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Aluminum Bronze Alloys

In Metallurgy, as in most of the major spectator sports, it's easy to understand the big picture, but the nuances can be more difficult to grasp. Get the ball through the basket. Touch home plate. Cross the goal line. Add some zinc to copper and you get brass. Add some tin and you are moving toward bronze. Then it gets more complex. Adding seemingly minor percentages of other metals as alloying materials can dramatically change the properties and performance of that bronze.

Take Aluminum Bronze as an example.

Aluminum Bronzes are a family of copper-based alloys that use iron and nickel in their chemistry - but rely on aluminum as the principle alloying element. Aluminum significantly adds to alloy properties to the point that its strength is similar to that of a medium carbon steel. The additional advantage is that aluminum bronze also possesses excellent corrosion resistance. It is that strength and corrosion resistance that gave rise to the early use of aluminum bronze.

That is where the metallurgical nuance and understanding of other properties of Aluminum Bronze takes over.

A small adjustment in metallurgy causes significant changes in performance. This recognition of other properties has led to the use of Aluminum Bronzes for a variety of parts requiring hardness, resistance to wear and galling, low magnetic permeability, resistance to cavitation, erosion, softening and oxidation at elevated temperatures. These properties,

together with ease of weldability, have greatly extended the fields of application for Aluminum Bronze.

There are some major groups in the Aluminum Bronze family: Aluminum Bronze and Nickel Aluminum Bronze (and also versions that utilize more manganese and silicon). Aluminum Bronze contains approximately 9-14% aluminum and 4% iron while Nickel Aluminum Bronze contains approximately 9-11% aluminum, 4% iron and 5% nickel. That addition of nickel in the latter further improves the corrosion resistance of a material that is already strong in this area.

Common Aluminum Bronze alloys and some typical applications:

- C95200 is a highly ductile material with good corrosion resistance. This is ideally suited for bushings, bearings, light duty gears, wear plates, low pressure piping, pump columns, and containers.
- C95400 offers high yield and tensile strength, extraordinary toughness and exceptional resistance to wear, fatigue, and deformation. This all-purpose alloy is widely used in chemical, marine, aircraft, and machine tools as gears, bushings and bearings, pumps, and valves.
- C95500 is one of the toughest of the non-ferrous alloys. It serves the same industries as C95400 with higher strength, hardness and corrosion resistance, though it has slightly lower impact toughness.

- As a special Nickel Aluminum Bronze, C95800 is especially suited for marine applications with optimum resistance to seawater corrosion. Those may include propeller system parts, bushings, bearings, piping, including desalination, and other corrosive marine applications.

- C95900 provides higher hardness and compressive strength, and is used for wear plates, forming rolls, draw dies, gears, valve guides, seats, and die inserts.

- MTEK 375 is an extremely hard, superior material often used for forming, drawing, and bending of stainless steel.

When watching that major spectator sport, it is easy to think that because we understand the big picture, we understand the nuances. Isn't it more fun to watch because we think we are smarter than the coaches on the field? The good news is that we are connected to the Metallurgists that do understand the nuances and can help in the selection of materials like one from the Aluminum Bronze family that will perform best in our most challenging environments.