

AMPCO METAL Microstructure

Key to Superiority

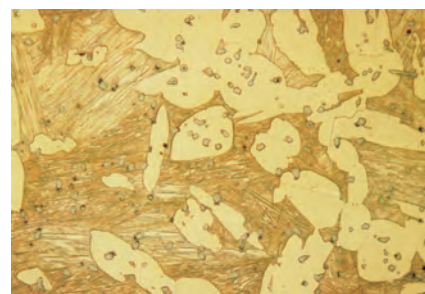
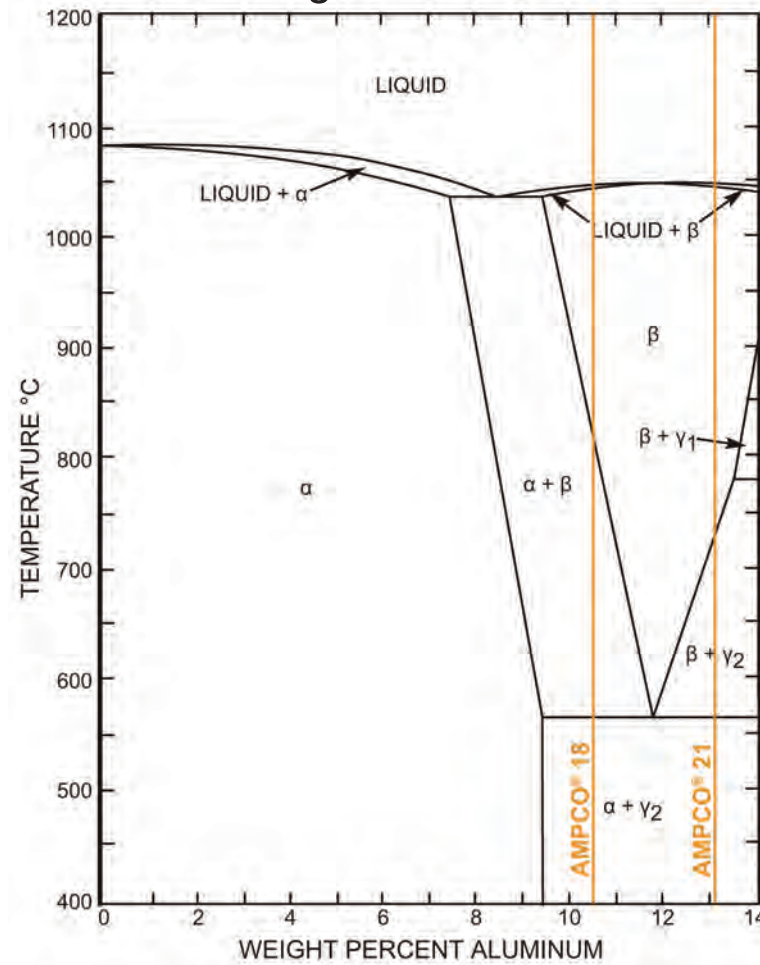
Through a combination of consistent metallurgical control and melting know-how, our proprietary AMPCO® specification is produced with unique microstructure, largely attributable to the phases in the alloys. The desirable phases in cast aluminum bronzes are identified as alpha, beta, and intermetallic compound. The configuration, retention, and distribution of the phases determines whether the alloy is a premium AMPCO® product or a generic substitute.

The alpha phase contributes to the ductility and softens the alloy reducing its strength. The alpha phase in AMPCO® alloys is broken up and uniformly distributed which, in effect, provides ductility while maintaining high strength; the alpha phase in generic substitutes tends to be massive contributing to the lower mechanical properties.

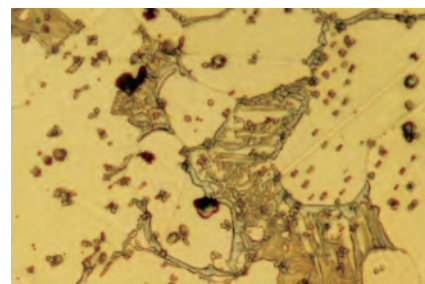
The beta phase creates strength and hardness in aluminum bronze, but it is susceptible to embrittlement (beta break down to eutectoid) when improper foundry techniques are employed. The beta phase in AMPCO® alloys is retained and, therefore, alloy embrittlement does not occur in our alloys; the presence of uncontrolled eutectoid from beta transformation is widespread in generic substitutes.

Another key to obtaining a good microstructure and premium physical properties is the type of intermetallic compound found in the alloy, The intermetallic compound in AMPCO® alloys, as well as its distribution, is unique and differs from that found in commercial aluminum bronzes. The distinctiveness of the intermetallic compound in AMPCO® alloys is readily recognized and has come to be known as AMPCO-PHASE® totally distinct from the large and segregated compound in generic bronzes which tends to contribute to weak alloy properties.

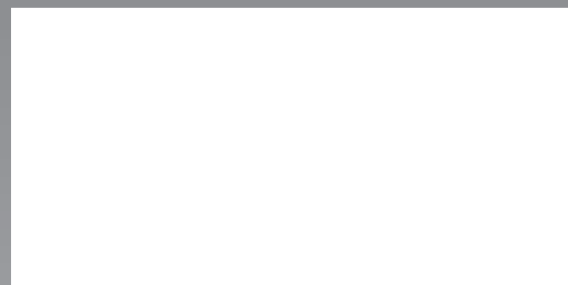
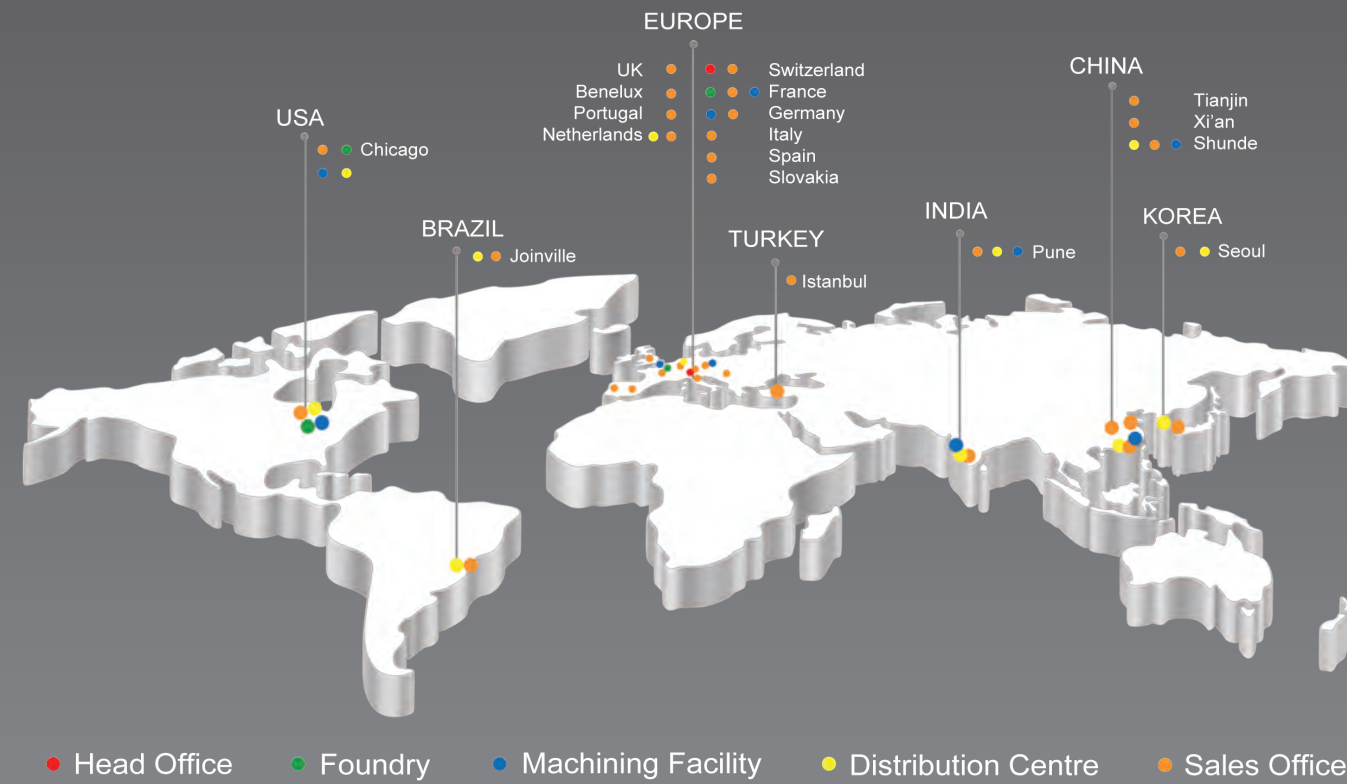
Copper-Aluminum-Iron Phase Diagram



AMPCO® 18
CAST



COMMERCIAL
ALUMINUM
BRONZE



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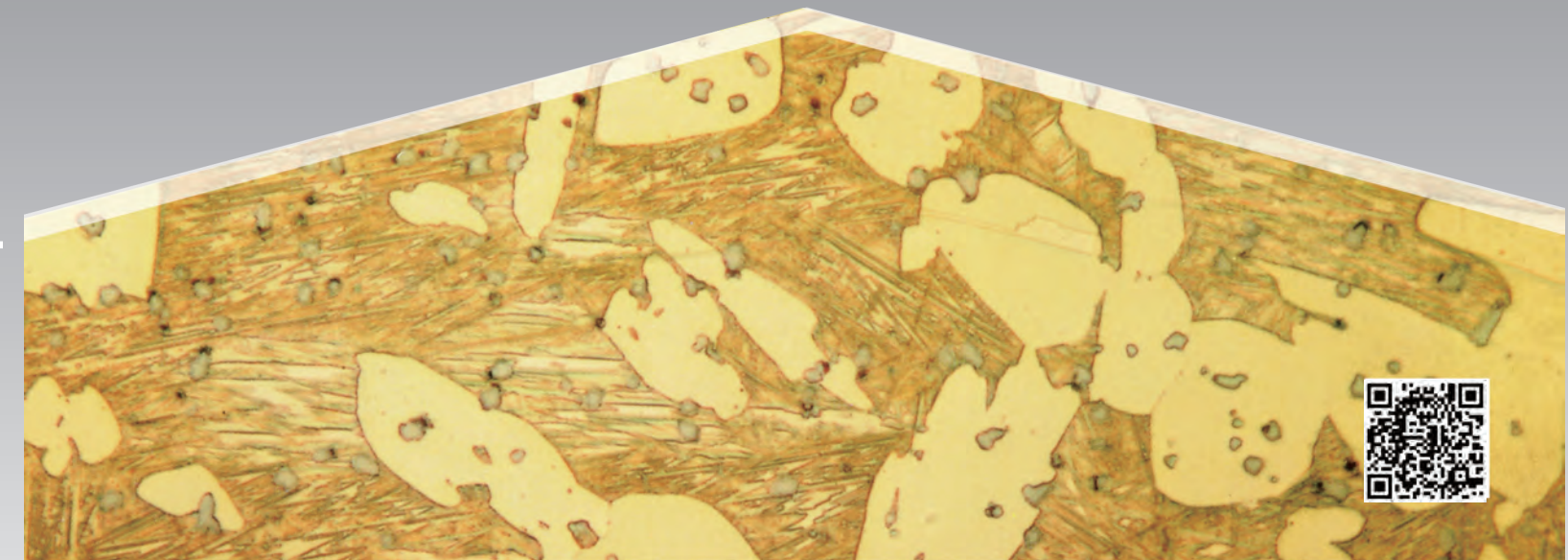
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A Second Century of Innovation

microcast® PROCESS
 Key to Superiority



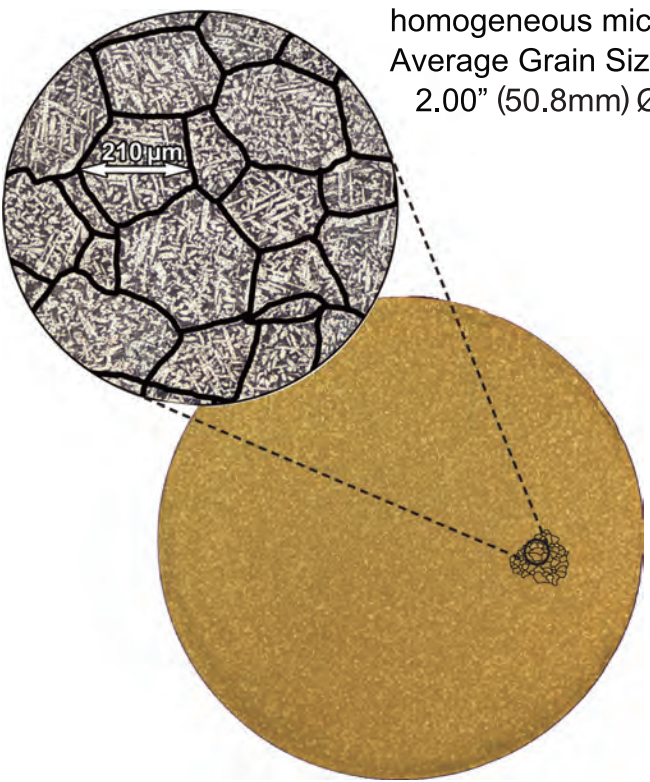
AMPCO METAL EXCELLENCE IN ENGINEERED ALLOYS

microcast® Key to Superiority



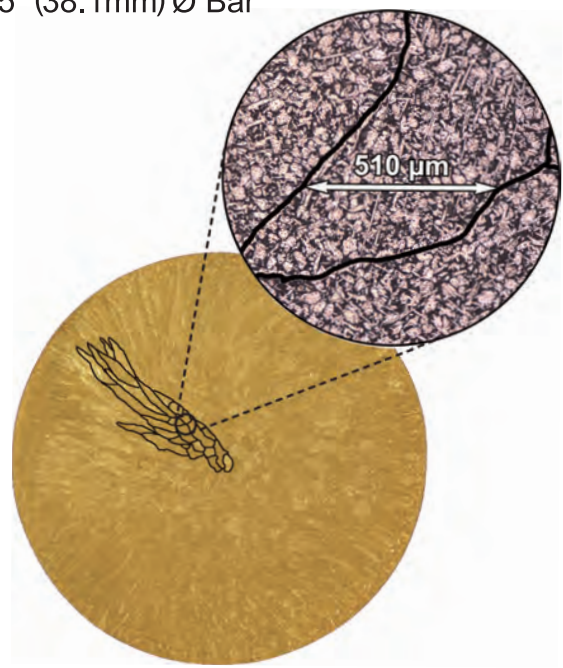
AMPCO® 18

Characterized by small equiaxed grains in a homogeneous microstructure
Average Grain Size: 210 µm
2.00" (50.8mm) Ø Bar



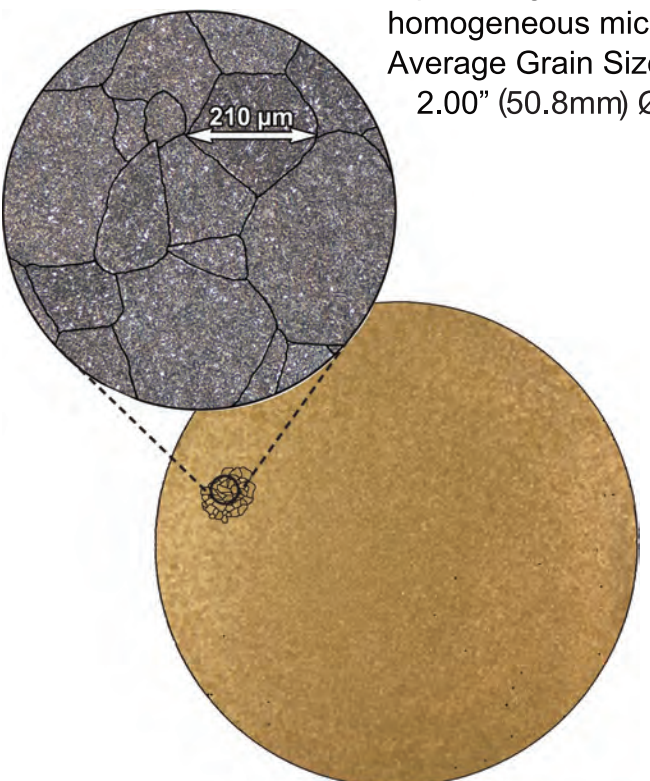
Competitor

Characterized by large columnar grains in a non-homogeneous microstructure.
Average Grain Size: 510 µm
1.5" (38.1mm) Ø Bar



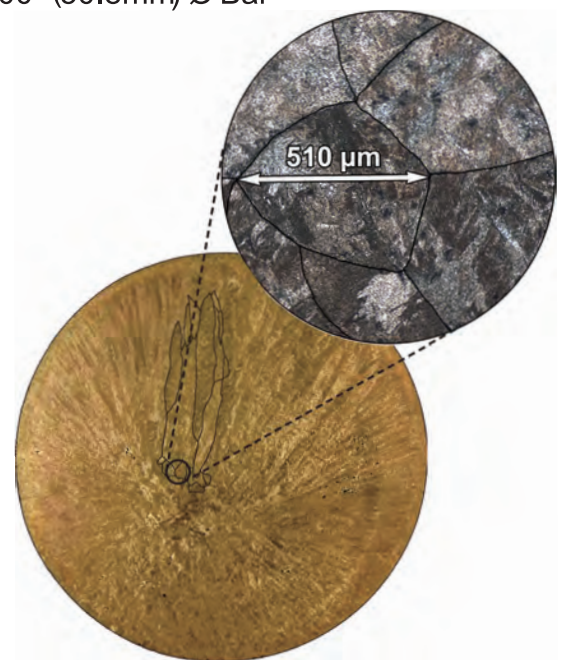
AMPCO® 21

Characterized by small equiaxed grains in a homogeneous microstructure
Average Grain Size: 210 µm
2.00" (50.8mm) Ø Bar



Competitor

Characterized by large, columnar grains in a non-homogeneous microstructure.
Average Grain Size: 510 µm
2.00" (50.8mm) Ø Bar



Wear - Resistant Bronzes Corrosion - Resistant Bronzes

SPECIFY AMPCO® High - Conductivity Alloys



● Deep Drawing AMPCO® 21/22/25/26

● Tube Bending AMPCO® 18/21/22/25/M4

● Tube Forming AMPCO® 18/21/22/25

● Rollercoasters AMPCO® 18/M4

● General Engineering AMPCO® 18/21/M4

● Steel Mill AMPCO® 18



CORPORATE MISSION STATEMENT:
"Provide customers around the world with innovative engineered metal products and services, delivering exceptional value to their business."

● AMPCO - TRODE® Welding Materials ● AMPCO® SAFETY TOOLS

● Plastics Industries AMPCOLOY® 940/944/83/95

● Aerospace & Offshore AMS 4640/4590/4880/4881

● Die Casting AMPCOLOY® 940/95

● Soap mould AMPCOLOY® 940

● Resistance Welding & Plunger Tips AMPCOLOY® 972/940/83/95