COINING

AMETEK®
ELECTRONIC COMPONENTS
AND PACKAGING

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56 Silver - 42 Copper-2 Nickel

Physical Properties of Bulk Solder

Solder Alloy Composition	56Ag42Cu2Ni (weight per cent)
Solidus temperature	770°C (1418°F)
Liquidus temperature	895°C (1643°F)
Density	9.75 kg/l
Yield strength	339 MPa
Tensile strength	366 MPa
Thermal conductivity	237 W/(m.K)
Thermal Coefficient of Expansion	17 x 10^{-6} K^{-1} (estimate)
Electrical Conductivity	52% IACS
Electrical Resistivity	3.2 μΩ cm

Typical impurity levels for electronic grade/ vacuum tube grade are less then:
Pb: 0.002 Zn: 0.002 P : 0.020
Cd: 0.002 C : 0.005
Volatile elements each 0.002 % max.
Other elements each 0.005% max.
Total other elements 0.010% max.

AgCu-alloys are generally used to join, silver, copper and nickel base alloys in reducing or inert atmospheres or vacuum. They are also widely used to join metalized ceramics to metals in vacuum. This assumes reasonably-clean brazing surfaces or controlled atmosphere during the brazing cycle. If and when the components are slightly oxidized, a combination with higher temperatures and/or longer brazing temperatures is required.
Joint clearance is recommended at 0.002” - .005” (50-127μm).

During remelting joints on either copper- or silver-base alloys, the braze exhibits decreased fluidity and an increased remelt temperature, due to the solution of either silver or copper in the eutectic. Brazing time and temperature should be minimized to prevent excessive diffusion and erosion of the base metal. AgCu-based filler materials have limited wetting ability on iron and/or nickel base alloys. The wetting it does have is derived primarily from its copper content. Both nickel and iron have practically no solubility in silver, while nickel is readily soluble in copper and the solubility of iron in copper is sufficient to provide wetting. The addition of nickel to the AgCu-alloy enables good wetting to Ni and Ni-alloys, Kovar, (low-) alloyed steels, tool steels and Stainless steels.