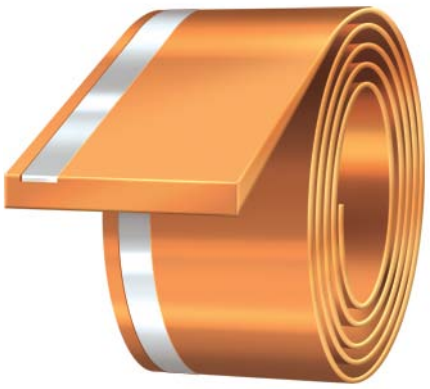
MATERION

TECH BRIEFS

Aluminum Inlay Advantages for Wire Bonding Applications

Aluminum bonded to aluminum is one of the easiest and most reliable wire bonding solutions for automotive electronic applications. When also considering manufacturability and reliability issues, this proven material features the lowest "Total System" cost.



Advantages Include:

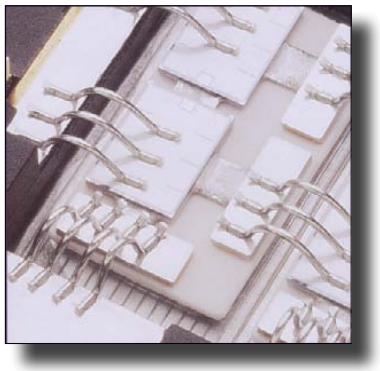
- Superior reliability
- High temperature stability
- High vibration stability
- Long shelf life
- Larger process window compared to Ni Phos

Additional Key Points:

Repeatability The aluminum layer for wire/ribbon bonding will be at a consistent thickness providing for optimum wire bondability. There will be little, if any, need to alter wire bonder parameter settings.

Process Implementation Al Inlay will grant you the largest process window with the highest bond shear, wire pull, and visual results since it is a mono-metallic system.

Sustainability Al Inlay has been the preferred wire bond system since the late 1980s. A quarter century later, it is still being implemented into new programs due to its high reliability and ease of production over other solutions such as Ni Phos.



With 40 years of experience, Materion Technical Materials has produced millions of pounds of Aluminum clad materials for high reliability automotive leadframe applications.

Please contact our Technical Design Team today to discuss the many benefits of Aluminum Inlay Wire Bonding Technology offered by Materion.

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MATERION TECHNICAL MATERIALS
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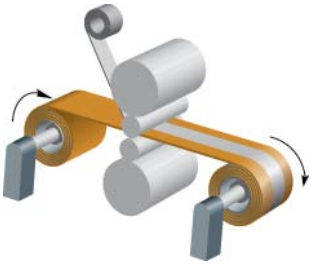
Specification Considerations:

Base materials: C10200, C19400, C51900, C70250, C14415, C18080 and other high performance alloys available.
Aluminum Inlays: A1 A91145, Al Si1
Tensile (UTS): 53-63 KPSI
Hardness: HV 100-125 (base), HV 20-40 (Aluminum)
Surface Roughness: 15 microinch (RMS) max
Inlay Thickness: 50μμ minimum recommended (thinner inlays available)

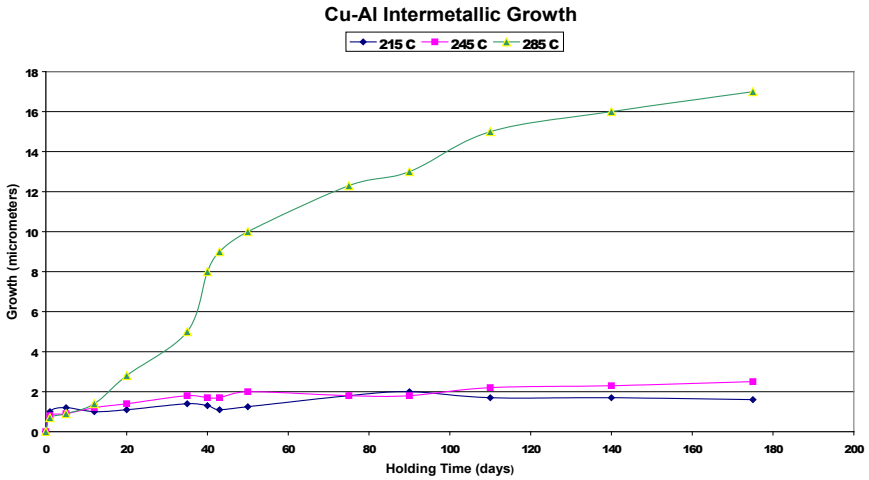
Roll Bonding and Diffusion Process:



Materion Technical Materials' continuous clad process ensures stability and consistency throughout the coil. Cladding is done with a high percentage of cold reduction, and subsequent annealing steps ensure a true metallurgical bond between the Aluminum and the Copper alloy.

Technical Materials' side-by-side cladding process achieves an excellent metallurgical bond through the controlled formation of a thin intermetallic compound layer as shown to the left. The intermetallic bond layer between the aluminum and copper is thermally developed via solid state diffusion.

The effect of elevated operating temperatures on the intermetallic bond layer between aluminum and copper has been extensively studied by the automotive industry. The intermetallic bond layer is extremely stable at temperatures below 250° C.



Wire Bond Papers from Materion Technical Materials:

Wire Bond Comparison
Evaluation of Wire Bond Systems
Evaluation of Aluminum Wire Bondable Surfaces
The Influence of Surface Defect Size on the Wire Bond Pull Strength for Automotive Lead Frame Materials

For a complete list of all technical papers available, please click here: *TECHNICAL PAPERS*

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