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Electrically conductive adhesives are commonly used for bonding electronic components and sealing applications that require a combination of good mechanical and electrical properties. They can be used as a cold solder for heat-sensitive components where hot soldering is impractical, provide a continuous EMR seal, the assembly and repair of electrical modules, printed circuits, wave guides, flat cables and high frequency shields. The adhesive must retain its mechanical strength, adhesion, and characteristic conductivity properties throughout the lifetime of the component in which they are used. For some applications, these conductive adhesives can be in use for decades. Oxidation and surface coatings of the conductive fillers in addition to degradation or oxidation of the polymer binder can lead to loss of electrical conductivity and/or mechanical properties. To ensure that these prerequisites are being met, accelerated aging studies are in progress with representative adhesives.

In this work, three representative conductive adhesives – Loctite Ablestik KS0004, Parker Chomerics Tecknit 72-00035 Con/RTV-Ni, and Loctite Ablestik 2902 - were chosen for the accelerated aging study. Single overlap shear, volume resistivity, and dynamic mechanical test samples were prepared to monitor changes in adhesion, conductivity, glass transition temperature, and modulus of the bulk material. These samples are monitored over a period of 6 months at an elevated temperature (80 °C) in air and will be compared to control samples aged at room temperature. The information gained from this study will provide us the technical basis evidence that operational life and service requirements are being met.

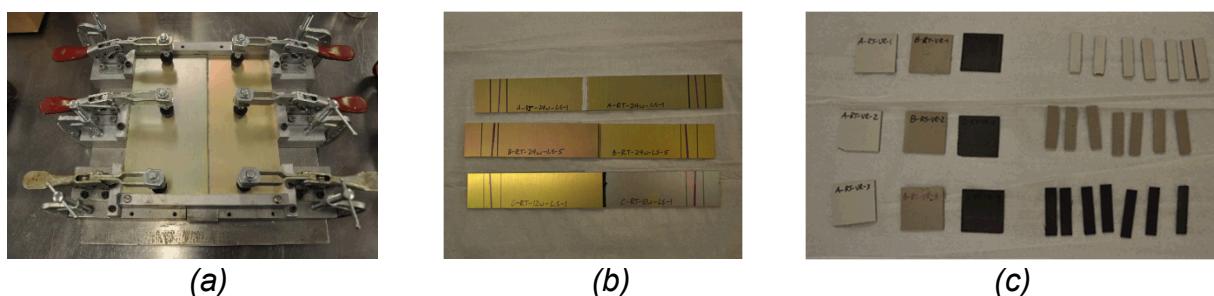


Figure 1. Preparation of samples (a) overlap shear samples being prepared using Loctite Ablestik 2902 and Alodine-coated aluminum 6061, (b) cured overlap shear panel cut into lap shear samples that will be aged at elevated or room temperature, (c) Loctite Ablestik 2902, Hysol KS0004, and Tecknit 72-00035 Con/RTV-Ni samples for volume resistivity and dynamic mechanical testing.