

Solderability of Aavid Thermalloy Standard Catalog Products with RoHS Compliant Plating

Background

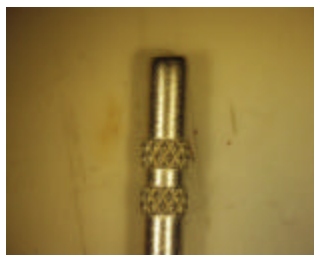
Aavid Thermalloy is in the process of converting all standard heat sink products to make them RoHS compliant. Although two-thirds of our most popular standard products have always been compliant, heat sinks that have solderable mounting features such as tabs or pins have traditionally been plated with tin-lead to maintain solderability until use. Due to the RoHS limitations on lead content in electrical and electric products, we are releasing new versions of our products that specify lead free solderable platings. Changing the plating requires testing to insure that solderability shelf life of the mounting features is maintained relative to the non-compliant plating and that the new plating is both forward and backward compatible with both tin/lead and lead-free solders.

Approach

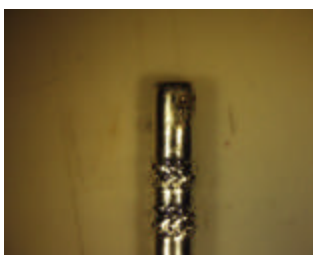
Based on reviews of research and testing performed by leading electronic industry corporations, Aavid Thermalloy has selected 100% matte tin with nickel underplating as the standard specification for lead free solderable components. The Aavid Thermalloy specification calls for 75 to 150 micro inches (1.8 to 3.8 microns) nickel underplating followed by 160 to 350 micro inches (4 to 8.9 microns) 100% matte tin. 100% matte tin was chosen in part for its compatibility with both tin-lead and lead free (tin/silver/copper) solders.

Test Method/Observations

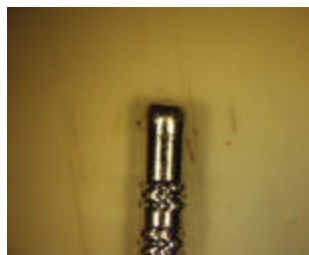
Solderability testing of the compliant plating has been conducted in Aavid Thermalloy's thermal lab to IPC/EIA/JEDEC J-STD-002 (category 1, dip-and-look) for both eutectic tin-lead (63/37) and tin/silver/copper (96.5/3/0.5) solder. To make the testing more representative of current soldering practices, a mild no-clean liquid flux (Kester 959) was used instead of the rosin flux specified in J-STD-002. All samples tested, including the latest at approximately 11.5 months after plating, pass the visual accept/reject criteria of J-STD-002. See photos below.



Bare test pin



Test pin dipped in
Sn/Pb 63/37



Test pin dipped in
Sn/Ag/Cu (96.5/3/0.5)

Conclusions

After nearly one year of storage, Aavid Thermalloy standard parts with RoHS-compliant plating continue to show acceptable solderability when tested with tin/lead (backward compatible) and tin/silver/copper (forward compatible) solders. As always, Aavid recommends that our customers test for acceptability in their process.

Reference

Elmgren, et al, "Pure Tin-The Finish of Choice for Connectors", Proceedings of IPC/JEDEC Conference, Frankfurt, Germany, Oct., 2003.