RoHS COMPLIANT ~ ISO 9001 CERTIFIED

KEYSTONE ELECTRONICS CORP.

11-10-2009

Technical Bulletin

Solderability testing and successful assembly of Gold plated battery holders and silver plated test points listed below.

“Keystone battery holders will solder under a variety of peak temperatures and time above 235C. Unlike temperature sensitive active components, our battery terminals are not sensitive to variation in profiles provided they do not exceed the maximum conditions as defined in the J-STD-020 document’s profiles”.

Part Numbers

498, 498TR, 1015, 1015TR, 1016, 1016TR, 1018, 1018TR, 1020, 1020TR, 1022, 1022TR, 1024, 1024TR, 1054, 1054TR, 1056, 1056TR, 1060, 1060TR, 1081,1081TR, 1082, 1082TR,1083, 1083TR, 1091, 1091TR, 1093, 1093TR, 1094, 1094TR, 2994, 2994TR, 5015, 5016, 5017, 5018

Introduction:

With the introduction of RoHS requirements, it has become necessary to implement plating strategies that have a narrower process window or present reliability challenges or even assembly challenges compared to the traditional SnPb plating used for many decades.

Solderability Testing:

Testing of devices such as Keystone Battery Terminals falls under the requirements of the ANSI-J-STD-002 document – Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires.

This document details specifically the type of flux to be used as a function of the solder alloy
ANSI-J-STD-002 Test Flux #1 (0.2% activation level) for SnPb alloy @ 245ºC
ANSI-J-STD-002 Test Flux #2 (0.5% activation level) for SAC 305 alloy @ 255ºC

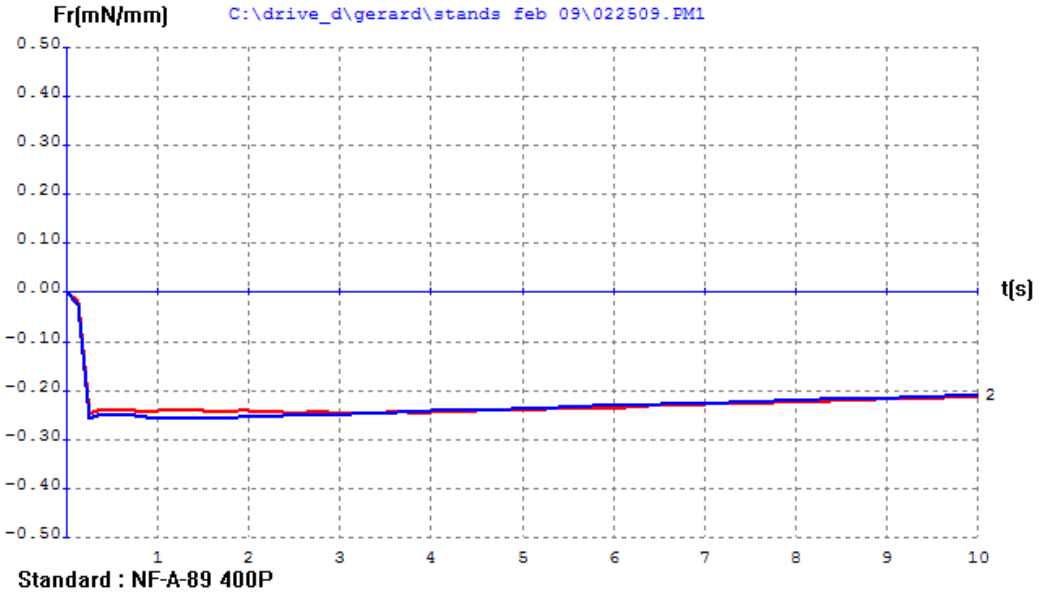
The choice of the specified fluxes was to ensure that NO False Positives would result from solderability testing where the part “passed” the test but failed to solder during assembly.

As such the activation levels of these fluxes as defined by the ANSI J-STD-004 are very low and the activator used, Diethylammonium Hydrochloride, is considered a weak non active component typically not found in assembly flux constituents.

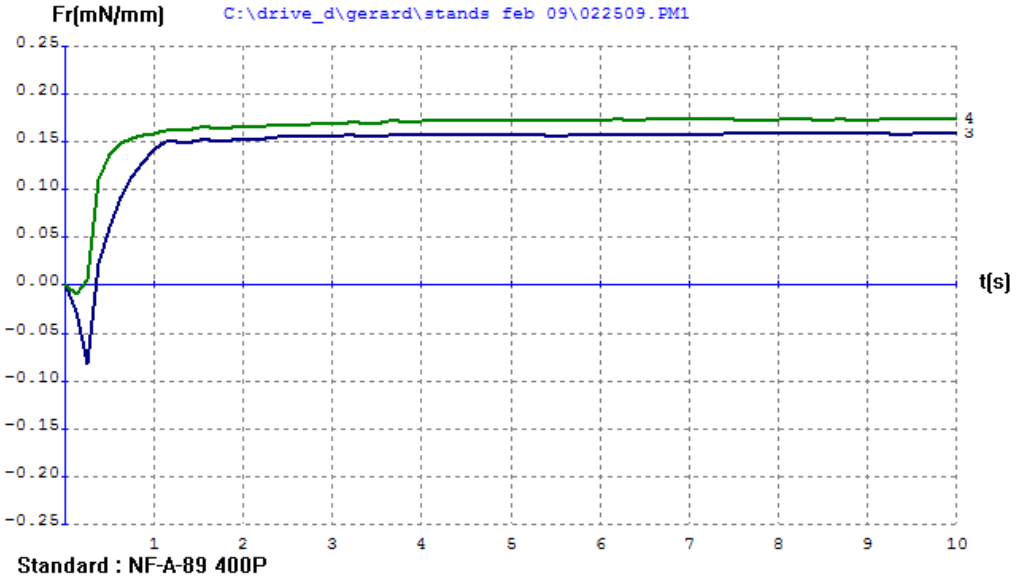
It should be noted that the two above specified fluxes are classified as ROL1 fluxes per the ANSI JSTD-004

Testing of Gold plate to the parameters detailed in the ANSI-J-STD-002 document using the specified protocols results in excellent wetting by the assembly solder with a well defined intermetallic compound visible by cross section.

Pb-Free testing using SAC305 Alloy at 255°C

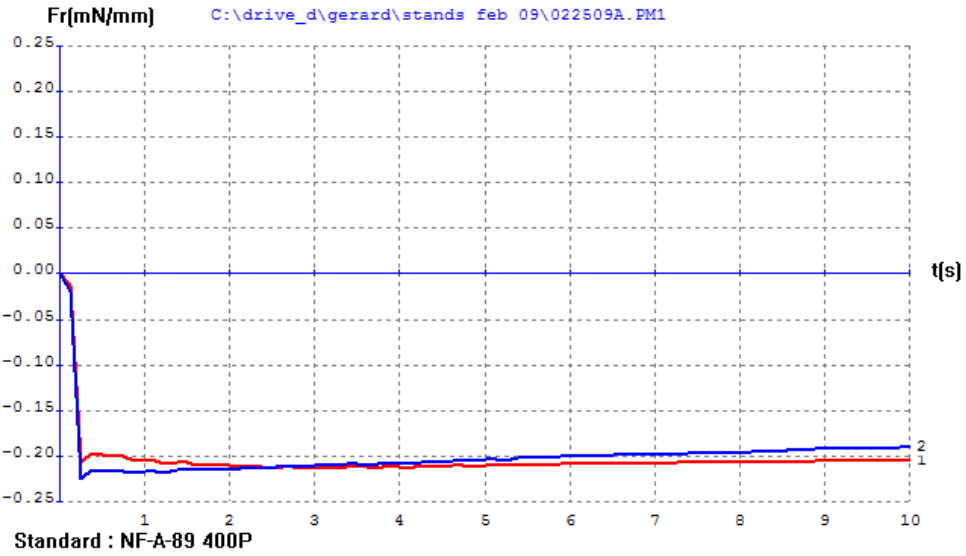


Wetting balance test results for Nicolloy™ tested as received using the Standard 0.5% test flux (ROL1) per the ANSI J-STD 002 - the part does not produce sufficient forces to cross the buoyancy line and produce positive wetting. Visual inspection of the parts post testing show non wetting to the surface of the terminals

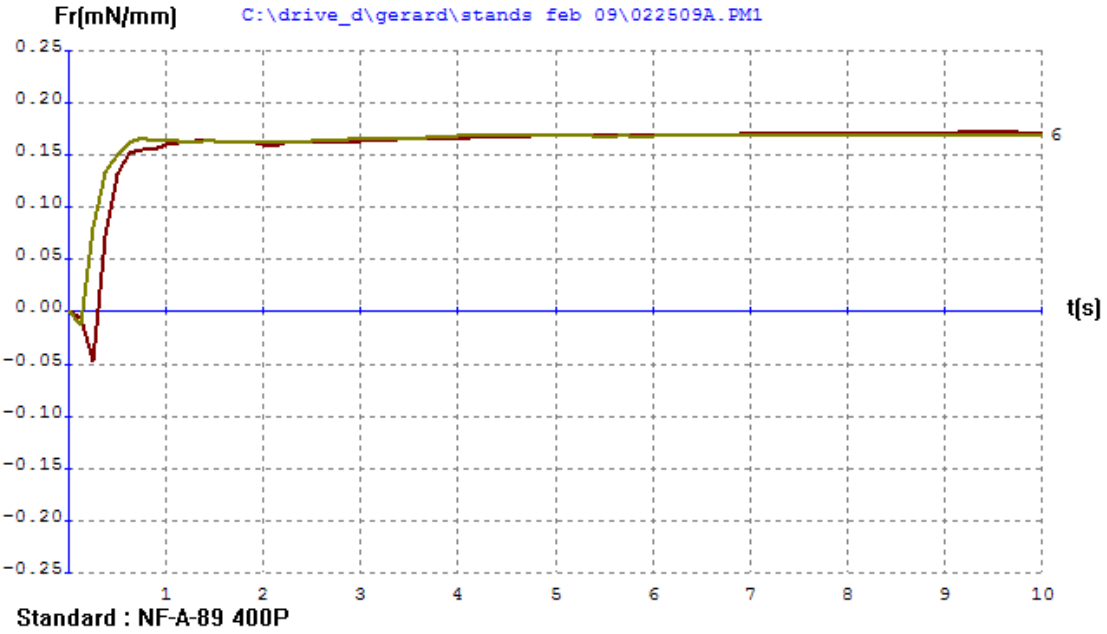


Wetting balance test results for Nicolloy™ tested as received using an ROL1 flux from a popular solder paste.
The improvement in wetting is dramatic with good wetting forces, quick wetting times and post test visual examination of the devices showing excellent uniform coating of the terminals by the solder.

Testing using Eutectic SnPb Alloy at 245°C



Wetting balance test results for Nicolloy™ tested as received using the Standard 0.2% test flux (ROL1) per the ANSI J-STD-002 - the part does not produce sufficient forces to cross the buoyancy line and produce positive wetting. Visual inspection of the parts post testing show non wetting to the surface of the terminals in the majority



Wetting balance test results for Nicolloy™ tested as received using an ROL1 flux from a popular solder paste – The improvement in wetting is dramatic with good wetting forces, quick wetting times and post test visual examination of the devices showing excellent uniform coating of the terminals by the solder.