RoHS COMPLIANT ~ ISO 9001 CERTIFIED

KEYSTONE ELECTRONICS CORP.

11-10-2009

Technical Bulletin

Solderability testing and successful assembly of Matte Tin plated battery holders 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

550, 550TR, 553, 553TR, 555, 555TR, 2981, 2981TR, 2982, 2982TR, 2983, 2983TR, 3070, 3070TR, 3072, 3072TR, 3078, 3078TR, 3080, 3080TR, 3082, 3082TR, 3084, 3084TR, 3086, 3086TR, 3088, 3088TR, 3090, 3090TR, 3092, 3090TR, 3096, 3096TR, 3098, 3098TR, 5330, 5330TR, 5331, 5331TR,

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.

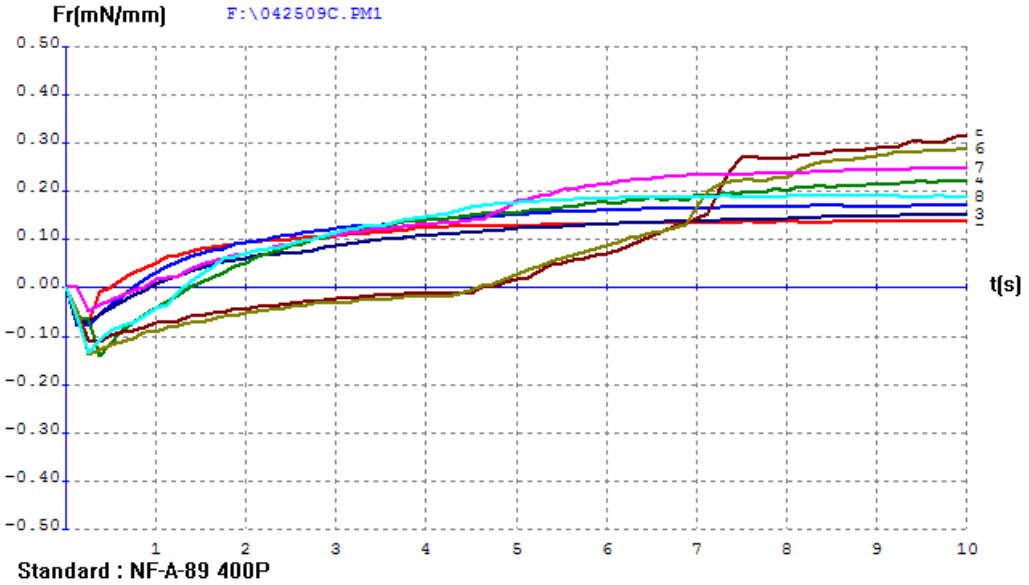
As such the activation levels of these fluxes as defined by the ANSI J-STD-004 are very low and the activator used, Diethylammonium Hydrochloride, is considered a weak non active component typically not found in assembly flux constituents.

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

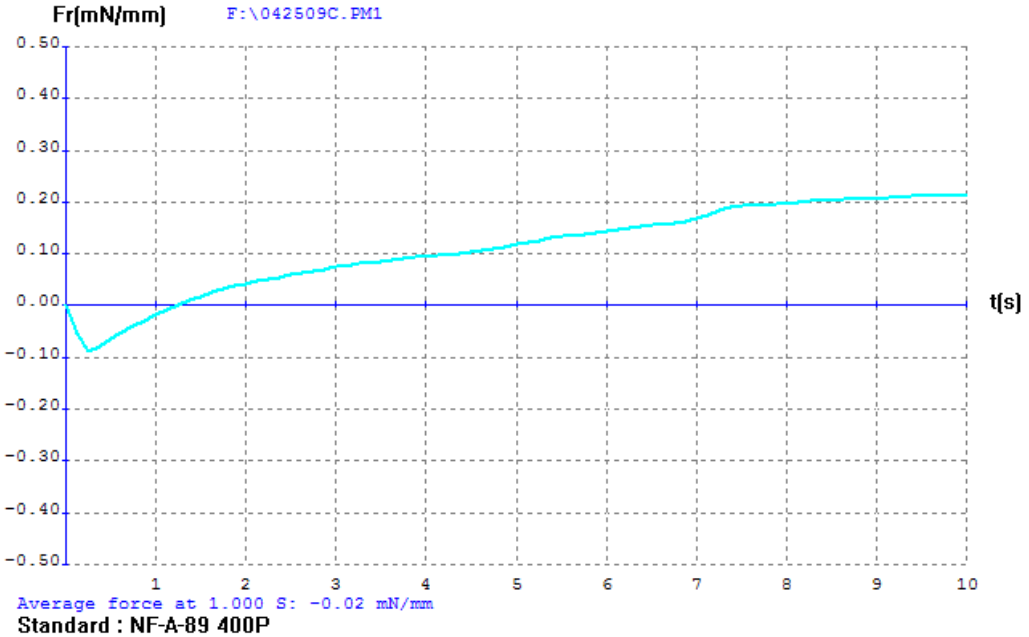
Testing of Matte Tin plate to the parameters detailed in the ANSI-J-STD-002 document using the specified protocols results in excellent wetting by the assembly solder with a well defined intermetallic compound visible by cross section.

Testing using Eutectic SnPb Alloy at 245°C

Wetting balance test results for Matte Tin plated contacts tested as received using the Standard 0.2% test flux (ROL1) per the ANSI J-STD-002 the parts produced near instantaneous wetting and excellent wetting forces.



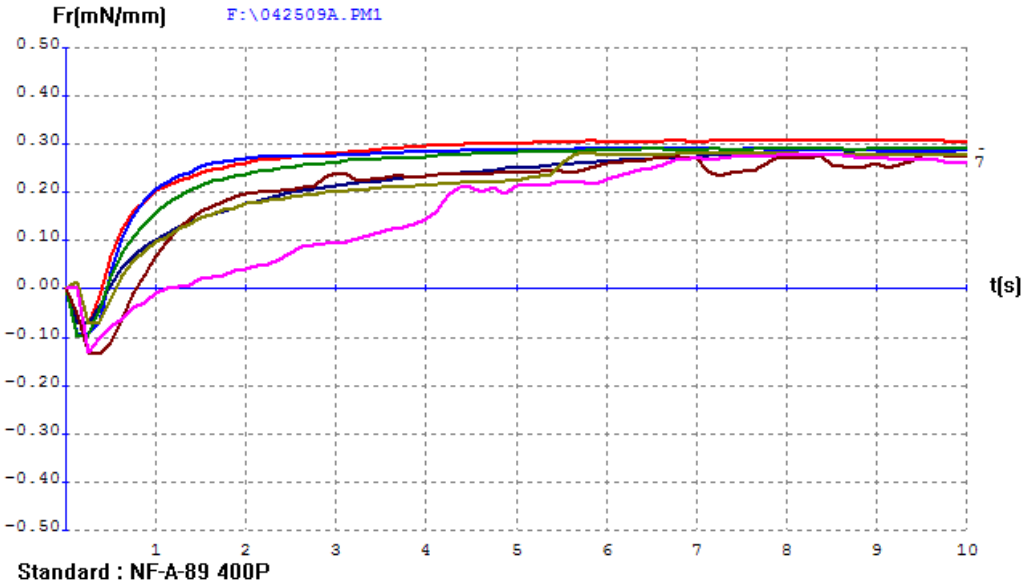
Merge of seven tests for sample with SnPb alloy at 245˚C



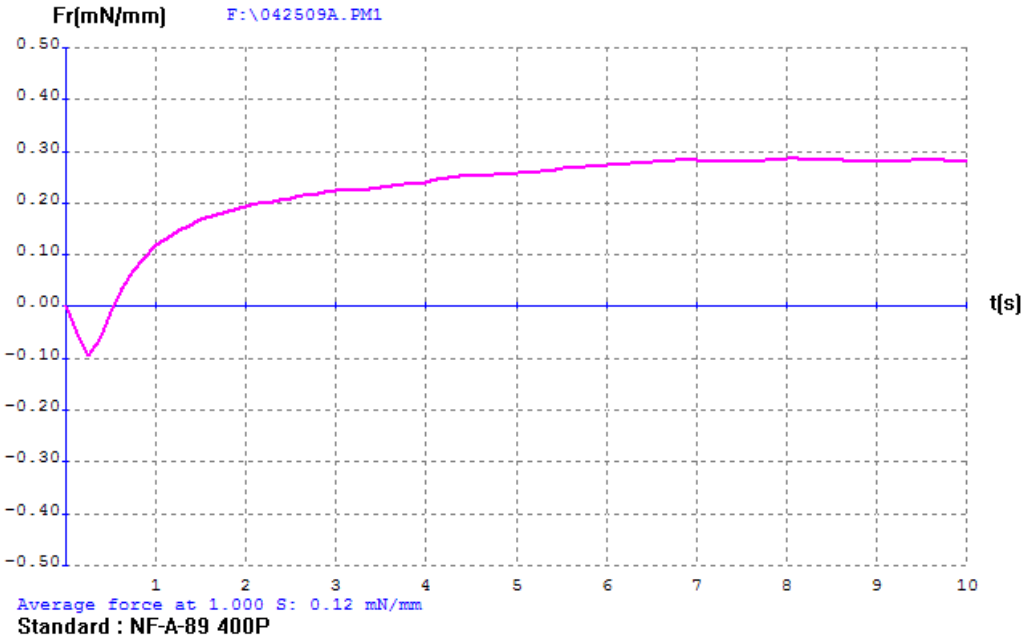
Average of seven tests for sample with SnPb alloy at 245˚C

Pb-Free testing using SAC305 Alloy at 255°C

Wetting balance test results for Matte Tin plated contacts tested as received using the Standard 0.5% test flux (ROL1) per the ANSI J-STD-002 the parts produced near instantaneous wetting and excellent wetting forces.



Merge of seven tests for sample with SAC305 alloy at 255˚C



Average of seven tests for sample with SAC305 alloy at 255˚C