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ATTENTION PASTE AND FLUX SUPPLIERS: J-STD-004B HAS BEEN RELEASED - WHAT NOW?

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The B revision of J-STD-004, *Requirements for Soldering Fluxes*, was published in December of 2008 and its release celebrated at the APEX conference held in Las Vegas in the spring. Although many flux users and suppliers are contributing members of the J-STD-004 group, there are others who have questions about how to move forward with the qualification of their products to the new standard.

Do I need to re-qualify my material?

The answer here is, not necessarily. Below, is an excerpt of J-STD-004B that allows suppliers to continue to supply their J-STD-004A or J-STD-004 base revision-qualified products. These products may still be sold as qualified to the document as long as the product datasheet is clear as to which revision the product is qualified.

Excerpt from IPC J-STD-004B:

3 General Requirements

*Unless otherwise specified on the design or assembly drawings or instructed by the user, the fluxes covered by this document **shall** conform with the following paragraphs.*

*Although the requirements of J-STD-004 have changed with each revision, fluxes that were classified to earlier revisions of IPC-J-STD-004 do not require re-classification. Anywhere the J-STD-004 classification is documented for a particular product, the revision level of J-STD-004 to which the product was classified **shall** be included.*

Why is this important, you may ask? The differences between the two documents are outlined below.

J-STD-004 to A to B

It is important that suppliers and users are aware of the differences between these three revisions. Materials qualified to the different revisions will, in many cases, have differing flux activity



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classifications (L, M or H). Users, if you have a material that works well in your process, contact your supplier to confirm that you continue to receive this product, regardless of how it is classified per the new B revision.

The base revision of J-STD-004 was published in 1995. The move from J-STD-004 to the A revision in 2004 brought the following changes:

- The addition of the Electrochemical Migration (ECM) as a means of activity classification
- The Bellcore SIR was added as an optional test
- The addition of the Quantitative Halide test as a required test

Many suppliers were required to run the Bellcore (now Telcordia Technologies) SIR and ECM tests to qualify their products. The ECM method was added to the J-STD-004A as a means for further classifying the flux and to allow the suppliers to qualify either per the Bellcore or J-STD-004A document. The Bellcore SIR was added as an optional method because the J-STD-004 already had a separate SIR method that was run at a different temperature and on different trace/space patterns, but again many suppliers were often required to qualify to the Bellcore document, as well.

With the increasing focus on the environment, suppliers were in need of exact halide concentration numbers. The qualitative halide test, silver chromate paper test and fluoride spot, were no longer a sufficient means for determining “halide-free”.

In 2008, the move from the A revision to the B revision brought the following changes:

- The change to Surface Insulation Resistance (SIR) testing at a lower temperature and with frequent monitoring
- The removal of the titration method for halide determination
- The addition of characterization tests to the initial product qualification
- Addition of criteria for flux changes that would require re-qualification

The change to the SIR method was long overdue. It has been shown that SIR/ECM testing performed at 85°C and elevated humidity could actually have a cleansing affect on the board that is not observed at lower temperatures, hence yielding false passing results. Also, it has been shown that dendritic growth can form and burn off in a matter of seconds. The old test with measurements at 24, 96, and 168 hours was not sufficient to detect these intermittent high resistance shorts. The addition of this method may cause some products to shift to a higher activity level.

The titration method was removed from the specification because the committee was unable to complete a round robin (due to lack of volunteers for titration method) to confirm that Ion Chromatography (IC) and titration yielded comparable results. The removal of the titration method may cause some products to shift to a higher activity level.



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There were four characterization tests that were required as tests for quality conformance inspection but were not listed for initial qualification. Initial results for these characterization tests are important to confirm lot-to-lot stability.

The base and A revisions did not specify when re-qualification was required of the flux. These criteria were added under paragraph 4.3.3 of the B revision and include formula and material changes or manufacturing site change.

In summary...

To summarize, it is important that flux suppliers and users understand the differences between the J-STD-004 documents. This is most critical because the same flux qualified under the base, A and B revisions may have a different recorded flux activity level. With each revision, there has been a move towards limiting the risk of leakage current development on the end product. More sensitive tests and an increased understanding of assembly chemistries have allowed us to move forward.

So what's in store for Revision C?

The main push for either Amendment 1 or revision C is the addition of halogen determination. The new European REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) regulations are requiring material suppliers to confirm that their products are Halogen-free. The test method is currently in the round-robin stage under committee IPC J-STD-709, Halogen Content Committee.

Additionally, the J-STD-004 task group will be performing further investigation on the phenomenon called Creep Corrosion presented by Chen Xu, et al. at the IPC APEX conference this past spring.

Contact Information

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