

USB ENGINEERING CHANGE NOTICE

Title: Material Change

Applies to: Universal Serial Bus Specification, Revision 2.0

Summary of ECN

Change several of the materials in the USB 2.0 specification and allow optional alternatives that are either better materials or equivalent substitutes that ultimately enhance the products. The substitute materials must meet all performance requirements as defined in the USB 2.0 document and Compliance Specification.

Reasons for ECN

By allowing alternate materials, designers will be able to make better USB 2.0 products. The optional materials lend themselves to either better performance and/or better costs to manufacture. One of the changes permits a broader range of materials, including halogen-free grades of plastics.

Impact on Existing Peripherals and Systems:

These changes are optional and they have no impact on existing products. The proposed substitutes will give the manufacturer the option to choose the most cost effective materials while maintaining the overall performance of the products.

Hardware Implications:

None

Software Implications:

None

Compliance Testing Implications:

If a product is submitted as RoHS compliant then the Independent Test Labs (ITLs) must verify that the product is lead free and verify that it meets Solderability requirements. This has already been communicated to the ITLs.

Specification Changes

Changes to Section 6.5.3.1, 6.5.4.1 and on all cable and connector drawings:

Remove all references to UL 94-V-0 rating and remove all references to use of PVC (Polyvinyl Chloride Jacket).

Changes to Figure 6-11 (Figure 6-14 in MiniB ECN) in Section 6.6:

Allow equivalent materials as braid material.

Outer shield interwoven \geq 65% Tinned Copper Braid **or equivalent braid material.**

Changes to Section 6.5.3.2 Receptacle Shell Materials from:

Add stainless steel as an optional shell material:

Substrate Material: 0.30 + 0.05 mm phosphor bronze, nickel silver, or other copper based high strength materials.

Plating:

1. Underplate: Optional. Minimum 1.00 micrometers (40 microinches) nickel. In addition, manufacturer may use a copper underplate beneath the nickel.

2. Outside: Minimum 2.5 micrometers (100 microinches) bright tin or bright tin-lead.

3. Optionally, the shell material may simply be unplated stainless steel

Changes to Section 6.5.3.3 Receptacle Contact Materials (Section 6.5.3.3.1 Series “A” and Series “B” in MiniB ECN)

Allow matte tin and matte nickel plating on solder tails. Add test method for tin based coatings.

Substrate Material: 0.30 + 0.05 mm minimum half-hard phosphor bronze or other high strength copper based material.

Plating: Contacts are to be selectively plated.

A. Option I

1. Underplate: Minimum 1.25 micrometers (50 microinches) nickel. Copper over base material is optional.

2. Mating Area: Minimum 0.05 micrometers (2 microinches) gold over a minimum of 0.70 micrometers (28 microinches) palladium.

3. Solder Tails: Minimum 3.8 micrometers (150 microinches) bright tin-lead, **matte tin plating or matte nickel plating** over the underplate

4. Tin based coatings may be susceptible to tin whiskering and shall be tested according to JEDEC Standard JESD201, Environmental Acceptance Requirements for Tin Whisker Susceptibility of Tin and Tin Alloy Surface Finishes, Class 2. The supplier should use a suitable tin whisker mitigation practice (see IPC/JEDEC JP002) and provide data demonstrating compliance with the Class 2 level tin whisker acceptance testing requirements of JEDEC standard JESD-201.

B. Option II

1. Underplate: Minimum 1.25 micrometers (50 microinches) nickel. Copper over base material is optional.

2. Mating Area: Minimum 0.05 micrometers (2 microinches) gold over a minimum of 0.75 micrometers (30 microinches) palladium-nickel.
3. Solder Tails: Minimum 3.8 micrometers (150 microinches) bright tin-lead, **matte tin plating or matte nickel plating** over the underplate
4. Tin based coatings may be susceptible to tin whiskering and shall be tested according to JEDEC Standard JESD201, Environmental Acceptance Requirements for Tin Whisker Susceptibility of Tin and Tin Alloy Surface Finishes, Class 2. The supplier should use a suitable tin whisker mitigation practice (see IPC/JEDEC JP002) and provide data demonstrating compliance with the Class 2 level tin whisker acceptance testing requirements of JEDEC standard JESD-201.

C. Option III

1. Underplate: Minimum 1.25 micrometers (50 microinches) nickel. Copper over base material is optional.
2. Mating Area: Minimum 0.75 micrometers (30 microinches) gold.
3. Solder Tails: Minimum 3.8 micrometers (150 microinches) bright tin-lead, **matte tin plating or matte nickel plating** over the underplate
4. Tin based coatings may be susceptible to tin whiskering and shall be tested according to JEDEC Standard JESD201, Environmental Acceptance Requirements for Tin Whisker Susceptibility of Tin and Tin Alloy Surface Finishes, Class 2. The supplier should use a suitable tin whisker mitigation practice (see IPC/JEDEC JP002) and provide data demonstrating compliance with the Class 2 level tin whisker acceptance testing requirements of JEDEC standard JESD-201.