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Welcome to the EPTAC Webinar Series: **Measles – Delamination - Crazing**

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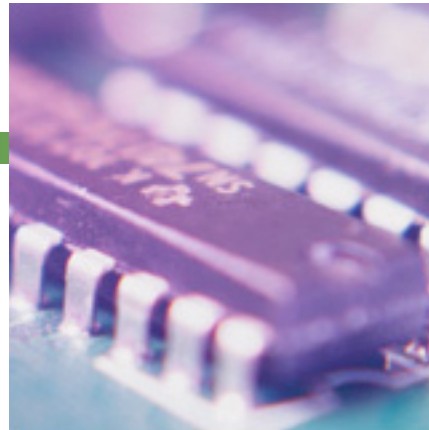


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Measles Delamination Crazing

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Measles

- What are they?
 - A separation of the epoxy from the fiberglass fiber bundles at the intersection of the warp and weft of the yarn fibers.

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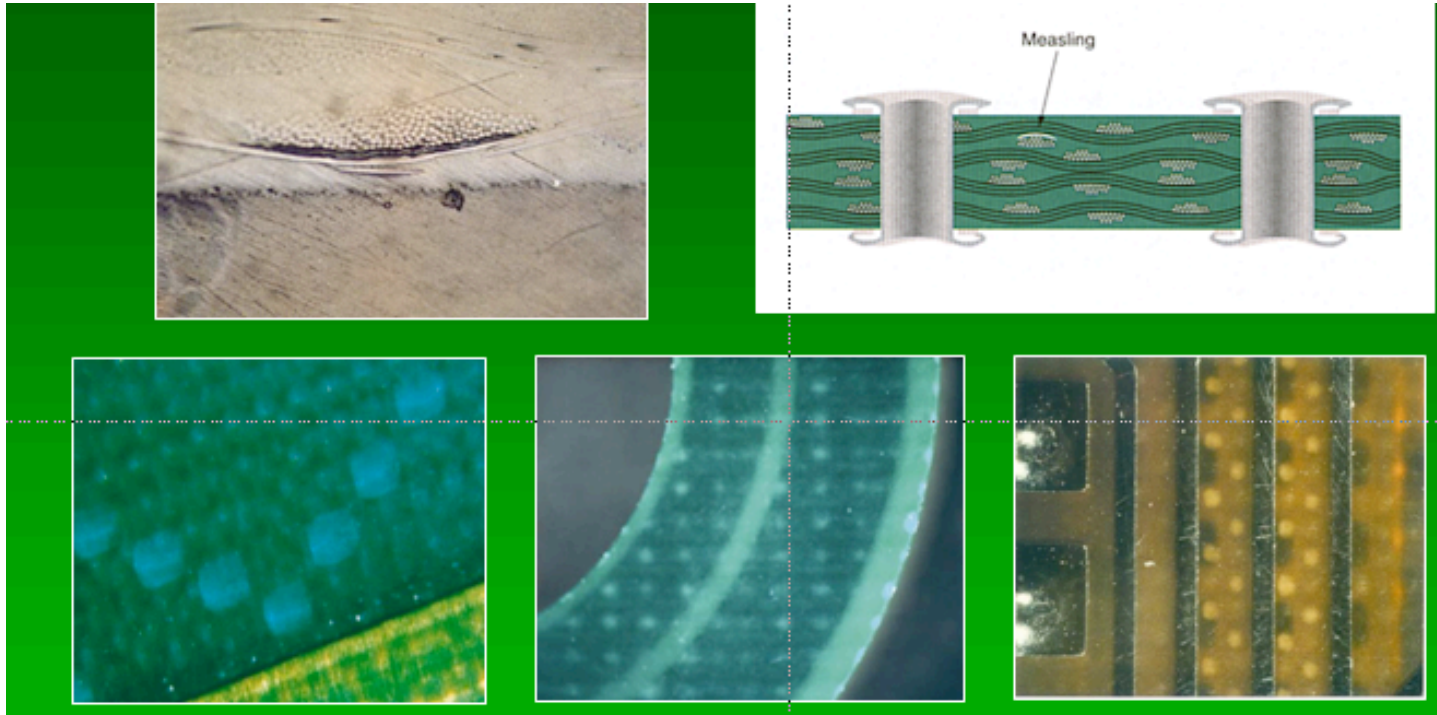


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Measles



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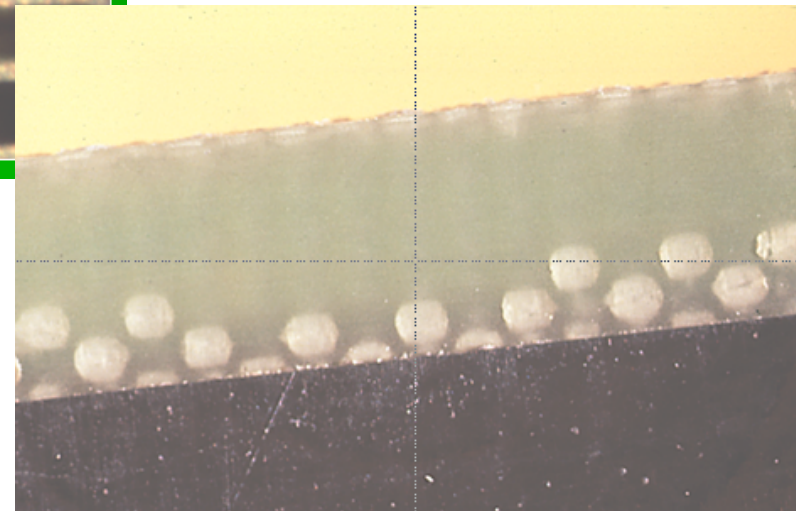
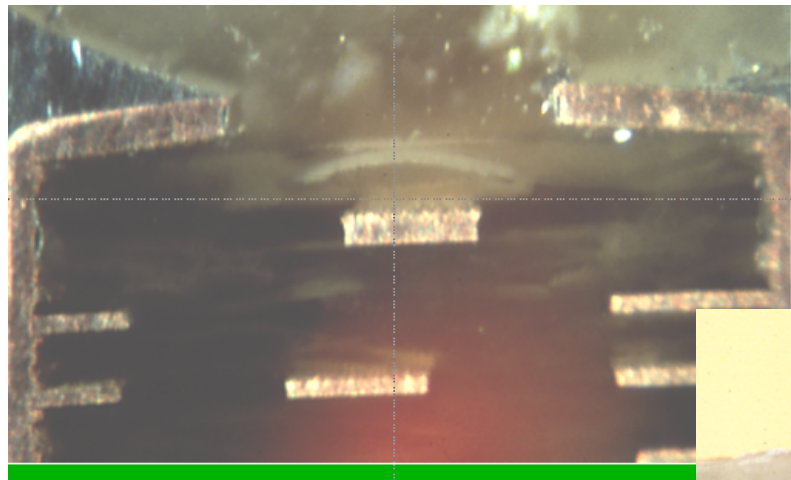


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Measles



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Measles

Accepted Wording for Measle Criteria in future IPC Documents – September 23 2007

Note: IPC-6012B Class 3A lists exception requirements to Class 3 criteria for the military/aerospace industry segment and does not allow for measling.

CURRENT MEASLING CRITERIA			
IPC-6012B w/AM1	IPC-A-600G	IPC-J-001D	IPC-A-610D
<p>3.3.2.1 Measling Measling is acceptable for all classes of end product, with the exception of high-voltage applications as defined by the customer. Refer to IPC-A-600 for more information.</p>	<p>2.3.1 Measling</p> <p>Acceptable – Class 1, 2, 3</p> <ul style="list-style-type: none"> Measles are acceptable for all products, except for high-voltage applications as defined by the customer. 	<p>9.1.10 Measles Measled areas in laminate substrates shall not⁸ exceed 50% of the physical spacing between internal conductors.</p> <p>Note: Visual aids can be found in IPC-A-610 and IPCHDBK-001.</p> <p>(6) Class 1-Not Est Class 2-Proc Ind Class 3-Defect</p>	<p>10.2.1 Laminate Conditions – Measles and Crazing</p> <p>Target – Class 1,2,3</p> <ul style="list-style-type: none"> No evidence of measling. <p>Acceptable – Class 1</p> <ul style="list-style-type: none"> The criteria for measling is that the assembly is functional. <p>Acceptable – Class 2,3</p> <ul style="list-style-type: none"> Measled areas in laminate substrates do not exceed 50% of the physical spacing between internal conductors <p>Process Indicator – Class 2 Defect – Class 3</p> <ul style="list-style-type: none"> Measled areas in laminate substrates exceed 50% of the physical spacing between internal conductors <p>Note: This document takes exception to the bare board measling criteria of some versions of IPC-A-600 and IPC-6012.</p>



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Delamination

- Cracking or delamination during reflow tends to be an overstress mechanism and can therefore be described as a stress vs. strength phenomenon. That is, either the environmental stress was higher than expected or the material strength was lower than expected.

Pb-Free Reflow, PCB Degradation and Moisture Absorption

Monday, July 20, 2009 | Kerin O'Toole, Bob Esser, Seth Binfield and Craig Hillman - DfR Solutions; College Park, MD Joe Beers—Gold Circuits



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Delamination: What does it look like?

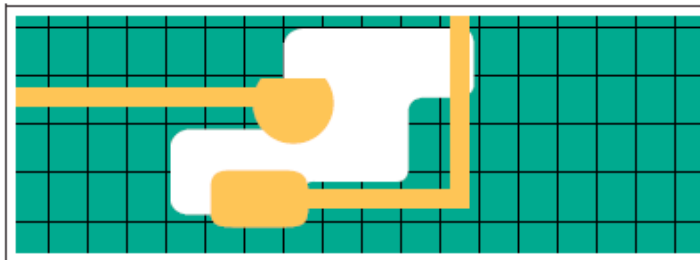


Figure 10-10

Delamination - A separation between plies within a base material, between a base material and a conductive foil or any other planar separation with a printed board.

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Delamination

- Criteria from IPC-A-610

Target - Class 1,2,3

- No blistering or delamination.

Acceptable - Class 1,2,3

- The blistering/delamination does not bridge more than 25% of the distance between plated-through holes or internal conductors.



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Delamination

Criteria from IPC-A-610

Defect - Class 1,2,3

- Blister/delamination exceeds 25% of the distance between plated-through holes or internal conductors.
- The blistering/delamination reduces the space between conductive patterns below the minimum electrical clearance.

Note: Blisters or delamination areas may increase during assembly or operation. Separate criteria may need to be established.

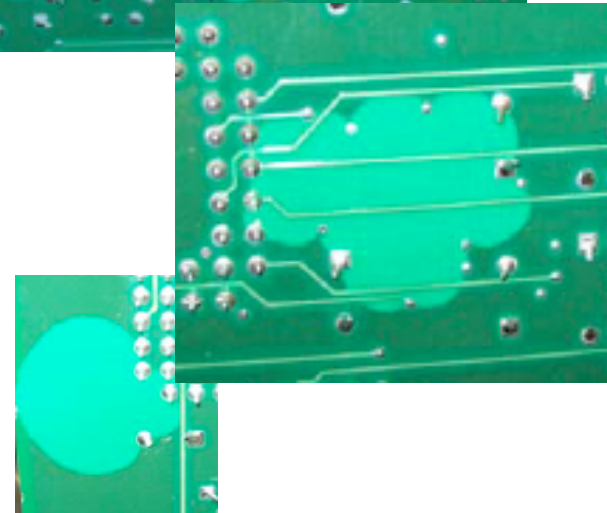
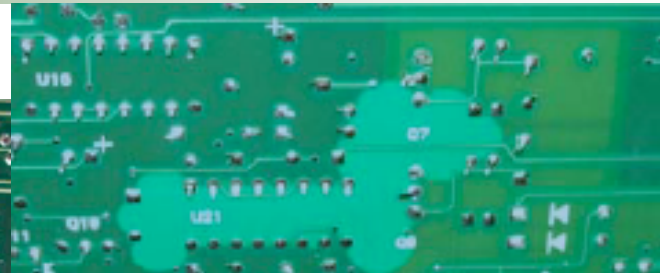
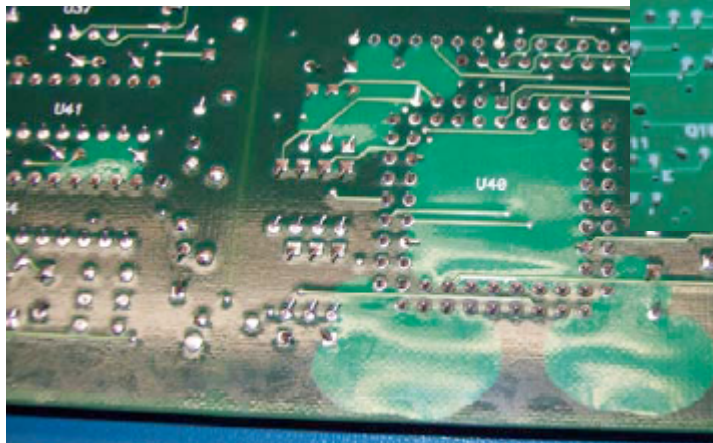


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Delamination: What does it look like?



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Examples



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Delamination: What does it look like?



Figure 10-14



Figure 10-15



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Crazing

“An internal condition occurring in laminated base material in which the glass fibers are separated from the resin at the weave intersections. This condition manifests itself in the form of connected white spots or crosses below the surface of the base material and is usually related to mechanically induced stress.”

Adapted from IPC-A-610 10.2.1



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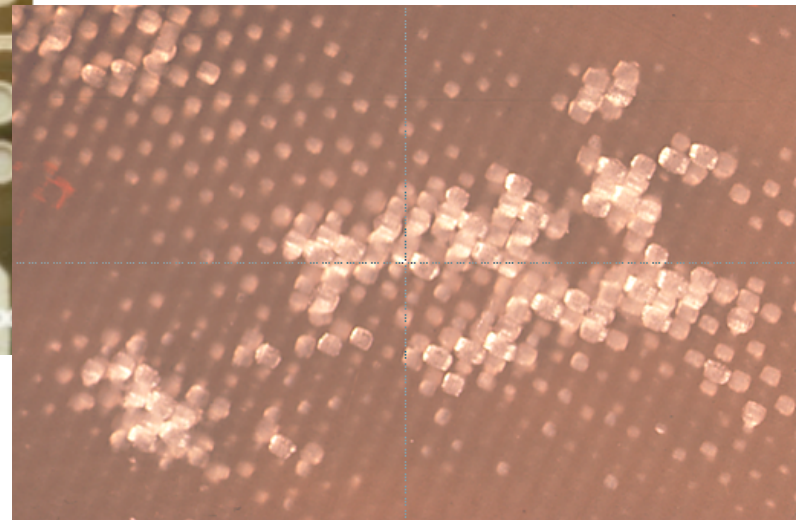
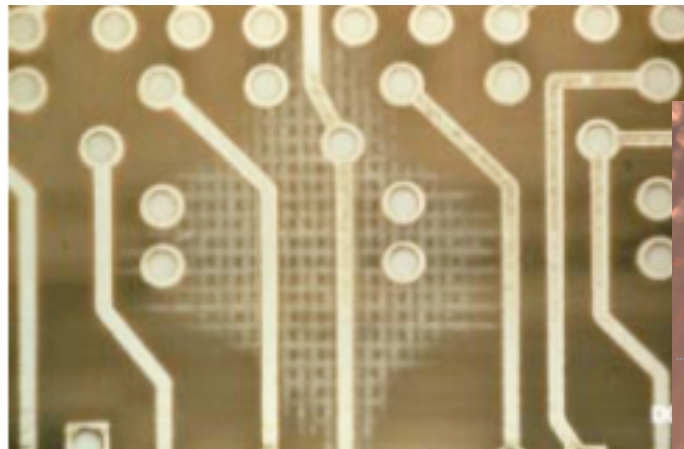


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Crazing examples



Adapted from IPC-A-600



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Further Information

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