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Our Top 10 Commonly Asked Soldering Questions This Year

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Chip Component Shifting

- Can be related to components floating on the molten solder plus the equipment may have vibrations, which may not be felt by humans in the area
- Consider the amount of solder paste deposited, to prevent components from floating

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Design Issue With Component Termination

- Layout orientation issue with IC
- Engineers have an idea to mount component upside down
- Nothing in 610
- Part is used 7 times on the product
- Class 3 product

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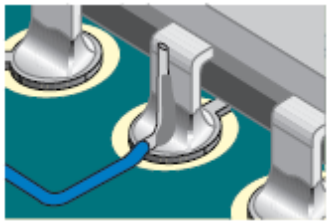
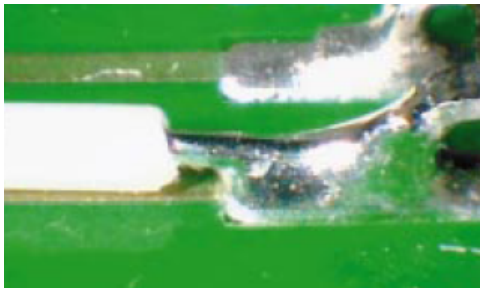
Design Issue With Component Termination

- Place the parts upside down and epoxy them to the laminate.
- Don't bend the leads, just solder the wire to the lead





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Design Issue With Component Termination

- Acceptance criteria is good wetting between the lead and the wire
- Instructions on installation of component should be on the drawing
- Don't bend the leads to prevent damage to the seal between component lead and body of component

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Where Can I Train As A CIT

- By being a 610 CIT you can train any CIS you want
- Follow IPC Policy and Procedures
- Since CIS program is modular you can train to whatever is required to satisfy the customer needs

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Standard Hole Size For Wires

- There is no requirement for hole size relative to particular wire size
- Component holes are sized based upon lead to hole size ratio which will allow solder to flow up into the plated through hole
    - Recommend between .008 and .020" larger than the maximum lead diameter

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Standard Hole Size For Wires

- Lead to hole ratio is based upon automatic component insertion and equipment tolerance
- Watch for the component being too big as the solder may drop out of the hole through the force of gravity.

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Coax Cable Center Conductor Installation

- This can be done two ways, crimping or soldering.
- The following are my thoughts on how to go about making sure we have enough solder and the conductor is far enough into the pin to be seen in the inspection hole

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Coax Cable Center Conductor Installation

- Define the volume of solder needed
  - Volume of wire, and volume of cup
- Create preforms
- Using resistance soldering tool
- Position pin over wire while heating it with resistance solder iron
- As the solder melts push the pin onto the center conductor of the wire

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Is There a Standard Wire Size for Jumper Wires

According to IPC-7721, Section on Jumper Wires, section 6.1, in the Jumper Wire Selection section #5 states:

- *"Recommended wire is solid, insulated, plated copper wire, 22 to32 AWG with a heat resistant insulation. Wire with tin-lead plating may be restricted due to environmental laws."*
- Wire color is up to you but keep jumper wires and ECO wires different color

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Microsection, What, How and When?

The question:

- Microsection PTHs to look and verify the reflow and wave solder profiles for the soldering
- Is it possible to see the inter-metallic layer within the cross section?
- Reference documents?

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Microsection, What, How and When?

- Microsectioning needs a good microscope, 200 to 300X
- Yes the intermetallic layer should be able to be seen, to study it however a SEM microscope would be more appropriate
- Use IPC-A-610 on page 7-43 and 7-44 as it relates to Table 7-4
- Good wetting must be evident between lead and barrel

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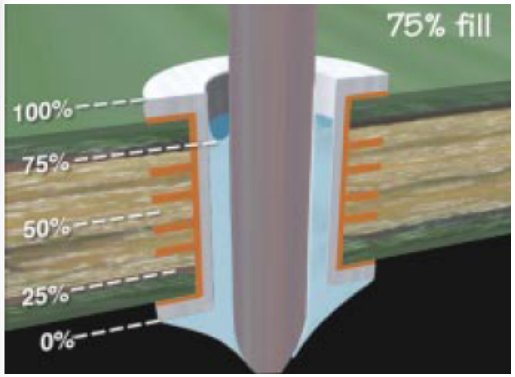
Microsection, What, How and When?

Criteria	Class 1	Class 2	Class 3
A. Vertical fill of solder[2,3] (see 7.5.5.1)	Not Specified	75%	75%
B. Wetting on primary side (solder destination side) of lead and barrel (see 7.5.5.2)	Not Specified	180°	270°
C. Percentage of land area covered with wetted solder on primary side (solder destination side) (see 7.5.5.3)	0	0	0
D. Fillet and wetting on secondary side (solder source side) of lead and barrel (see 7.5.5.4)	270°	270°	330°
E. Percentage of land area covered with wetted solder on secondary side (solder source side) (see 7.5.5.5)	75%	75%	75%

Note 1. Wetted solder refers to solder applied by the solder process.
Note 2. The 25% unfilled height includes both source and destination side depressions.
Note 3. Class 2 may have less than 75% vertical hole fill as noted in 7.5.5.1.



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Burnt Appearance on Connector Plating

- Most information on burnt condition in 620 addresses the insulation and dielectric material
- Burnt material is carbonized and potentially conductive which would allow electrical leakage, reducing insulation resistance
- If the connector pin is burnt, it may change the grain structure of the pin making the pin more brittle, which could impact long term reliability

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Toe Fillet Requirement

- Per IPC-610, section 8.3.5 Flat Gull Wing Leads and section 8.3.6 Round or Flattened (coined) Gull Wing Leads, there is no requirement for toe fillets
- In manufacturing of the gull wing lead frames the leads are cut which creates a condition on the end of the lead which may or may not be solderable
- The strength of the solder joint for gull wing components is in the heel fillet of the component and the length of the component lead

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Flux Penetration in PTH

- Flux penetration is important to the flow of solder up into the plated through hole.
- Elements needed to be inspected are flux coverage on the solder source side and flux penetration through the plated through holes
- Use a glass plate to check for flux coverage on the bottom side of the board.
- Apply a thin sheet of absorbent paper on the top side of the board and process
- Make sure the flux penetrates the hole near the edges of the board to make sure you get good solder flow in those holes

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Thank You

Questions?

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Further Information

For questions regarding this webinar, please contact Leo Lambert at leo@eptac.com or call at 800-643-7822 ext 215

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