

ENGINEERING PRACTICE STUDY
PROJECT NUMBER: 5998-2009-016

TITLE:

Printed Board Defects Used for Acceptance Criteria
Within DoD Printed Board Specifications

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FINAL REPORT

Prepared by:
Joshua Civiello

ATTCH

I. OBJECTIVES: The objective of this study was to review IPC-T-50 and compile a list of printed board defects to compare against the defects that are addressed in the DSCC managed printed board specifications (MIL-PRF-31032/1 through /6, MIL-PRF-55110, and MIL-P-50884). I want to find the defects in IPC-T-50 that are not referenced in the current versions of the DSCC managed printed board specifications.

II. BACKGROUND: IPC-T-50 "Terms and Definitions for Interconnecting and Packaging Electronics Circuits" is a DoD adopted non-Government standard (NGS) published by Association Connecting Electronics Industries (IPC). The NGS is an extensive dictionary covering electronics and contains many definitions of defects that can affect printed circuit and printed wiring boards.

III. RESULTS: After compiling a list of defects, I performed a comparison of the defects contained in IPC-T-50 to those covered in the DSCC managed printed board specifications. The results are documented in the attachment. Note that there are defects defined in IPC-T-50 that should be addressed in the DSCC managed printed board specifications. The attachment graphically shows what defects are and are not called out in the DSCC managed printed board specifications.

IV. CONCLUSION: The defects identified in the attachment as missing from the DSCC managed printed board specifications need to be addressed.

V. RECOMMENDATION: Projects to update the DSCC managed printed board specifications should be initiated to address the missing defects identified on the attachment.

List of identified defects:	55110G	50884E	MIL-PRF-31032 slash sheets				
			/1	/2	/3	/4	/5
Adhesion Failure	X	X	X	X			X
Barrel Crack		X					
Bleeding							
Blister	X	X	X	X	X	X	X
Blow Hole							
Bow (Sheet, Panel, or Printed Board)	X	X	X	X	X	X	X
Bulge		X					
Burr	X	X	X	X	X	X	X
Butt Plating Joint		X					
Butt Plating Joint (Wrap Plating)							
Chalking (Cured Solder Mask)		X					
Chipping		X					
Circumferential Separation		X					
Cohesion Failure							
Conductor Nick							
Conductor Protrusion							
Corner Crack (Knee Crack)		X		X			
Corner Crack	X			X			
Crack, Plating	X						
Crazing (Base Material)	X						
Crazing (Conformal or Solder Mask Coating)	X	X					
Crease		X					
Delamination	X	X					
Dendritic Growth							
Dent		X	X				
Dewetting	X	X					
Dewetting (Base Materials)							
Dielectric Breakdown	X						
Electromigration							
Embedded Copper (Base Materials)							
Embedded Fiber (Base Materials)							
Exfoliation							
Extraneous Copper (Base Materials)							
Extraneous Metal							
Fiber Exposure							
Filiform Corrosion							
Fish Eye							
Fish Eye (Adhesive)							
Fisheye (Prepreg)							
Flashover	X	X					
Flexural Failure							
Foil Burr							
Foreign Material		X					
Gouge							
Haloing	X	X		X			
Hole Breakout	X	X					
Hole Edge Roughness							
Hole Roughness							
Hole Void							
Inclusions	X	X		X			
Indentation							
Intumescence							
Ionizable (Ionic) Contamination			X				
Laminate Void		X					
Land Tearing							
Leakage Current							
Lifted Land	X	X	X	X			
Measling	X	X		X			
Misregistration				x			
Nail Heading	X	X					
Nick		X	X	X	X	X	X
Nodule		X	X	X	X	X	X
Nonwetting (Solder)		X					
Open, Electrical	X	X					
Outgrowth	X	X	X	X	X	X	X

X = In the specification

Overhang	X	X	X	X	X	X	X
Peeling (Cured Solder Mask)	X	X	X	X	X	X	X
Pin-hole (Base Materials)							
Pink Ring							
Pit		X	X	X	X	X	X
Burned Plating							
Plating Fold		X	X	X	X	X	X
Plating Void		X	X	X	X	X	X
Pull-Out Strength							
Resin Recession	X	X	X		X	X	X
Resin Smear	X	X	X				X
Resin-Starved Area							
Shadowing, Etchback							
Short, Electrical		X					
Skipping		X					
Sliver		X	X	X	X	X	X
Softening (Cured Solder Mask)		X					
Solder Bridging							
Solder Projection							
Solder Webbing							
Spalling							
Splay							X
Swelling (Cured Solder Mask)		X					
Tear (Base Materials)		X	X	X	X	X	X
Treater Dirt (Base Materials)							
Treatment Transfer (Base Materials)							
Treeing							
Tunnel Void, (Base Materials)							
Twist		X	X	X	X	X	X
Undercut, After Fabrication							
Undercut, In Process							
Undercut, Resist or Masking Material							
Vesical							
Vesication							
Voids (Base Materials)			X	X	X	X	X
Weave Exposure							X
White Spot							X
Wrinkles		X			X	X	