

ENGINEERING PRACTICE STUDY

PROJECT NUMBER: 5998-D091

TITLE: REVIEW OF NON-GOVERNMENT STANDARDS ON
PRINTED WIRING BOARD TEST METHODS FOR ADOPTION

15 April 2004

FINAL REPORT

Prepared by:

David Corbett

ATTCH 1

I. OBJECTIVES: The objective of this study was to obtain from the military users comments or concurrence on the adoption of twenty-eight (28) non-Government standards (NGS) published by the Association Connecting Electronics Industries (IPC). The 28 NGS documents are listed in attachment 1. Since these documents have been finalized and released by the Non-Government standards body, any essential comments received would either negate adoption or in the case of suggested comments, the comment would be submitted to the IPC for inclusion in the next revision of the NGS.

II. BACKGROUND: 20 of these documents are directly referenced in either the QPL or QML specifications for printed wiring boards, MIL-P-50884 (15 references), MIL-PRF-55110 (14 reference), or MIL-PRF-31032 (16 references). The other eight, are not referenced by any Department of Defense specification, but are planned to be referenced in the future "space level" specification sheets for MIL-PRF-31032. These NGS documents are used for verifying conformance in the manufacturing fabrication of printed boards.

III. RESULTS: A survey electronic mail message was sent to 22 Department of Defense and Government activities asking for their comments or concurrence concerning the contents of the NGSs. All 28 documents reviewed were found acceptable as written and no comments of any type were submitted by the activities that responded. All responses were concurrences with adopting the 28 NGS documents. There were no negative or essential comments submitted.

IV. CONCLUSIONS: Based on the fact that there were not any negative comments and all responses were in concurrence with the adoption of the NGS documents, the NGS documents should have DoD notices of adoptions prepared and issued.

V. RECOMMENDATIONS: Initiate standardization projects to prepare and issue notices of adoption for the 28 NGS documents.

IPC DOCUMENTS REVIEWED FOR ADOPTION

IPC-TM-650, Test Method Number 2.1.1, revision D, "Microsectioning"; dated March 1998.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.1.1.2, unrevised, "Microsectioning - Semi or Automatic Technique Microsection Equipment"; dated March 1993.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.1.8, revision B, "Workmanship"; dated December 1994.
This document is referenced in MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.2.1, revision A, "Mechanical Dimensional Verification"; dated August 1997.
This document is referenced in MIL-PRF-55110 and MIL-P-50884.

IPC-TM-650, Test Method Number 2.2.2, revision B, "Optical Dimensional Verification"; dated August 1997.
This document is referenced in MIL-PRF-55110.

IPC-TM-650, Test Method Number 2.3.4, revision B, "Chemical Resistance, Marking Paints and Inks"; dated August 1997.
This document is referenced in MIL-PRF-55110 and MIL-P-50884.

IPC-TM-650, Test Method Number 2.3.15, revision C, "Purity, Copper Foil or Plating"; dated August 1997.
This document is referenced in MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.3.25, revision C, "Detection and Measurement of Ionizable Surface Contaminants by Resistivity of Solvent Extract (ROSE)"; dated February 2001.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.3.38, revision B, "Surface Organic Contaminant Detection Test"; dated August 1997.
This document will be used in planned "space level" specifications sheets for MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.3.39, revision B, "Surface Organic Contaminant Identification Test (Infrared Analytical Method)"; dated August 1997.
This document will be used in planned "space level" specifications sheets for MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.4.1, revision D, "Adhesion, Tape Testing"; dated August 1997.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.4.1.1, revision B, "Adhesion, Marking Paints and Inks"; dated November 1988.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.4.3, revision D, "Flexural Fatigue, Flexible Printed Wiring Materials"; dated May 1998.
This document is referenced in MIL-PRF-31032 and MIL-P-50884.

IPC-TM-650, Test Method Number 2.4.3.1, revision C, "Flexural Fatigue and Ductility, Flexible Printed Wiring"; dated November March 1991.
This document is referenced in MIL-P-50884.

IPC-TM-650, Test Method Number 2.4.18.1, unrevised, "Tensile Strength & Elongation, in-house Plating"; dated August 1997.
This document is referenced in MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.4.20, unrevised, "Terminal Bond Strength, Flexible Printed Wiring"; dated April 1973.
This document is referenced in MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.4.21, revision D, "Land Bond Strength, Unsupported Component Hole"; dated August 1997.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.4.22, revision C, "Bow and Twist (Percentage)"; dated September 1999.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.4.28, revision B, "Adhesion, Solder Mask (Non-Melting Metals)"; dated August 1997.
This document will be used in planned "space level" specifications sheets for MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.4.28.1, revision C, "Adhesion, Solder Resist (Mask), Tape Test Method"; dated March 1998.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.4.36, revision B, "Rework Simulation, Plated-Through Holes for Leaded Components"; dated August 1997.
This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.5.7, revision C, "Dielectric Withstanding Voltage, PWB"; dated August 1997.
This document is referenced in MIL-PRF-55110 and MIL-P-50884.

IPC-TM-650, Test Method Number 2.6.4, revision A, "Outgassing, Printed Boards"; dated August 1997.
This document will be used in planned "space level" specifications sheets for MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.6.7, revision A, "Thermal Shock and Continuity, Printed Board"; dated August 1997.
This document will be used in planned "space level" specifications sheets for MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.6.7.2, revision A, "Thermal Shock, Continuity and Microsection, Printed Board"; dated August 1997.

This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.6.8, revision D, "Thermal Stress, Plated Through-Holes"; dated March 1998.

This document is referenced in MIL-PRF-31032, MIL-PRF-55110, and MIL-P-50884.

IPC-TM-650, Test Method Number 2.6.10, revision A, "X-Ray (Radiography), Multilayer Printed Wiring Board Test Methods"; dated August 1997.

This document will be used in planned "space level" specifications sheets for MIL-PRF-31032.

IPC-TM-650, Test Method Number 2.6.26, unrevised, "DC Current Induced Thermal Cycling"; dated May 2001.

This document will be used in planned "space level" specifications sheets for MIL-PRF-31032.