

FLYSHEET AN-26

REQUIREMENTS FOR PRINTED WIRING BOARDS/FLEX CIRCUITS

The following requirements are imposed for the procurement of printed wiring boards and multilayer flex circuits:

1. Suppliers are responsible to perform a review of data and/or artwork furnished by Boeing.
 - A. Data and/or artwork shall be verified for adequacy to assure that the supplier is able to meet all the requirements of the master drawing. The supplier shall not make changes to or deviate from the Boeing supplied PWB design without formal Engineering changes incorporated into the Purchase Contract by the Procurement Agent.
 - B. Test Coupons, when supplied with the Gerber Data, shall be considered an integral part of the Boeing PWB design.
 - C. When Boeing furnishes Gerber Data in a 274X format or with “.TIF” checkplot files, there is no requirement for Boeing to approve the supplier’s artwork plots. When Boeing furnishes Gerber Data without IPC-274X formatting or without “.TIF” checkplot files, the supplier shall submit artwork plots to Boeing Engineering for approval prior to PWB fabrication.
 - D. When Gerber Data is furnished without test files, the supplier shall extract and use an electrical test file from the Boeing original Gerber data.
 - E. When older designs rely on “Vault Master Artwork”, the Supplier shall verify working tools prior to fabrication.
2. When specified on the Purchase Contract. as Code 2A, Buyer in-process source inspection is required as follows:
 - A. Detail stage source inspection unless automated optical inspection is performed or waived by Buyer’s Procurement Quality Engineering responsible personnel.
 - B. After etch before soldermask, unless waived by Procurement Quality Engineering.
 - C. Boeing source inspection shall verify all first build inner layers, and any subsequent changes by Boeing that affect artwork or Gerber Data.
3. All coupons, cross-sections, PPA specimens, et cetera, must be traceable to individual printed wiring boards and must be shipped to The Boeing Company as follows:

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3. (continued)

- A. When Boeing Specification BSPS-23-001, AA0115-210, or D900-10400-1 is invoked, Boeing Lab approvals are required PRIOR to shipment. Please submit all test coupons, microsections, PPA boards and test specimens to the Boeing Anaheim Materials and Processes Labs, to the attention of Mike Paddack (714 762 7021) and Cliff Maddox (714 762 1210). A copy of Boeing's Lab Report will be furnished within a week of receipt of the test samples.

The Boeing Company
Attention: Mike Paddack and Cliff Maddox, M/S DE03
3370 Miraloma Avenue
Anaheim, CA 92803

A copy of Boeing's Lab Report must accompany each shipment.

- B. For all other procurements of multilayer PWBs, flex, and rigid flex boards (MIL-P-50884, MIL-P-55110, IPC-6012, etc.), all coupons, cross-sections, PPA boards and test specimens, et cetera, must be traceable to individual printed wiring boards and must accompany the shipment to the destination address on the Purchase Contract.

A copy of the supplier's test report analysis for microsections ("Group A") must accompany the test coupons and microsections shipped to Boeing. (A copy of the shop traveler must be sent along with certifications, when requested.) Serial numbers must also be on the packer.

Multilayer boards and flex circuits require Buyer's M&P Lab approval prior to any further assembly operations (i.e. next assy level, heatsinks, etc.). Test coupons and microsections shall be delivered to Boeing for analysis and approval by Engineering prior to subsequent assembly operations.

When shipments are split, or when the cross-sections are Gang-mounted, note the date of original shipment on the packer.

4. When PPA test boards are required per lot (reference AN-31, BSPS-23-001 or AA0115-210, para. 3.5.2, or other Boeing procurement documentation), ship the PPA board to the receiving location with the first delivery from the lot.
5. When specified on the Purchase Contract as Code 2A or Code 2, Final Source Inspection shall be performed (single sided, double sided, multilayer, flex, rigid flex) after route and test.

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5. (continued)

All assets, certifications, Purchase Contract and Purchase Contract changes, drawings, ECN's, specifications, and shipper shall be submitted at the time boards or flex circuits are presented for source inspection.

6. Supplier's Electrical Test Certifications shall include purchase order number, part number, Procurement Specification and a record of equipment used for testing along with the serial numbers, date code and/or traceability data and results for all items tested. Results shall record pass and/or failure characteristics, including shorted networks, isolation defects, or open networks.

A. The Electrical Test Machine used for product acceptance shall be identified along with settings for isolation and continuity tests, including voltage and resistance parameters, test file description and test method (fixtures, bed-of-nails, moving-probe, etc.) along with machine calibration status. Specific machine settings shall be recorded.

B. Test Certifications must include a description of the test procedure used for troubleshooting and/or manual testing. All testing, including re-testing from troubleshooting or manual testing, shall result in 100% successful completion of continuity and isolation testing requirements.