

QUALITY PROGRAM  
REQUIREMENTS FOR ADTRAN  
CONTRACT MANUFACTURERS



REV	DATE	Description
A	8/12/1997	Release
B	9/1/2000	Revised signature line on the "Foreword" to reflect current manager. Deleted section 1.5, "ADTRAN Outsource Process Engineering Technician (OPET)," and renumbered remaining sections. In new section 1.5, removed the word "only." In section. 2.4, added "IPC-A-610 and" to 4 <sup>th</sup> paragraph. In section 2.4, 5 <sup>th</sup> para., revised sentence to reflect only the IPC ANSI/J-STD-002 procedure. Revised section 2.5, 1 <sup>st</sup> para., to clarify ADTRAN's and Suppliers' roles in calibrating new equipment. Revised section 2.8, 6 <sup>th</sup> para. to reflect approval of alternate labels.
C	4/21/2004	General update to Outsource Manufacturing guidelines. Specifics include a) Revised signature line on the "Foreword" to reflect current manager of Outsource Manufacturing. b) Replaced term subcontractor with Contract Manufacturer. c) Updated Section 2.0 to comply with new TL9000 requirements. d) Added section 2.2 – Contract Manufacturer Training.
D	1/19/2010	ADD, 1.7 RMS Material requirements for Contract Manufacturers ADD, 1.8 First Article requirements for Contract Manufacturers ADD, SQE Manager to sign-off ADD, FORM Q110-1, rev A Change, 2.5 Process Control: "ADTRAN BOM notes or special instructions will supersede all other criteria.

## FOREWORD

ADTRAN designs and manufactures telecommunications equipment that has an enviable reputation for high reliability and quality content--a reputation that will be maintained and enhanced. This reputation is due to equipment design, production standards, and commitment by all management and operating personnel to the quality concept.

The elements contained in this document are those employed by ADTRAN to achieve its basic quality goals, which are probably best described as good commercial quality practice and are fundamental to any form of management or quality control. This document shall serve as both a requirement and a general guide to the extent of quality control that ADTRAN anticipates from Contract Manufacturers.

ADTRAN will assist the Contract Manufacturer in any reasonable manner to establish an understanding of and compliance with our contract requirements. The Contract Manufacturer must be particularly cautioned that no departure from any specification is permitted without a contract change. Clarification of this or any other ADTRAN document affecting contract compliance may be obtained through ADTRAN Outsourced Manufacturing and Business Operations

George Giles

---

Manager, Supplier Quality Engineering

Gerry Kelley

---

Manager, Outsource Manufacturing

## 1.0 GENERAL

### 1.1 Intent.

The intent of this document is best defined as GOOD COMMERCIAL PRACTICE. When viewed in this context, the requirements herein can be readily and economically satisfied by competent commercial Contract Manufacturers.

### 1.2 Applicability.

When specified in the contract, the requirements contained in this document must be adhered to by ADTRAN Contract Manufacturers. In the event a Contract Manufacturer desires an exception to the requirements contained herein, a request delineating the exception must be submitted for ADTRAN approval prior to acceptance of a contract. If a conflict exists between the provisions of this document and those of the contract, the contract shall take precedence.

### 1.3 Contract manufacturer Qualification.

Qualified Contract Manufacturers will be determined by capability surveys, product evaluation, compliance of procured material with ADTRAN requirements, and the promptness and effectiveness of corrective action taken by the Contract Manufacturers. Continued qualification will be contingent upon continued quality of performance, satisfactory results of Quality System Audits, and/or external TL9000 audit reports.

### 1.4 ADTRAN Quality System Audits.

Contract Manufacturer facilities and operations may be surveyed either before or after the placement of contract. The capabilities to meet ADTRAN requirements and to supply a product of consistent quality will be evaluated. Audits may be scheduled and conducted if required, to determine compliance with our purchase requirements and the requirements of this document.

### 1.5 ADTRAN Source Inspection

ADTRAN reserves the right to Source Inspect product at the Contract Manufacturer's facility after reasonable notice of such inspection. Final acceptance of all material will be made at ADTRAN regardless of the results of Source Inspection.

### 1.6 Deviations and Substitutions.

ADTRAN expects the Contract Manufacturer to comply with the requirements of the contract. No deviations and/or substitutions in material, design, specifications, or operating performance are permissible unless documented by a contract change. Such changes are permissible for single lots if approved by the ADTRAN Non-Conforming Material Report, Waiver or Deviation process.

### 1.7 Raw Material Sales (RMS) to Contract Manufacturer (CM)

ADTRAN may sell raw material to be used in the fabrication of ADTRAN assemblies. When this is required, the CM will provide a purchase order with an agreed quantity and price. The purchase order will be entered as an ADTRAN sales order and processed for shipment.

#### 1.7.1 RMS Material Date Code Requirements

RMS material is NOT subject to date code requirements specified in Q100. Batteries, epoxies and other perishable items are subject to manufacturer shelf life guidelines. The use of Aluminum Electrolytic capacitors and Printed Circuit Boards (PCBs) will follow the below mentioned criteria.

- Al Electrolytic capacitors (class code: 3136, 3137) ≤ 18 months [without Current Leakage and Equivalent Series Resistance (ESR) testing]
- PCBs
  - Hot Air Solder Leveling (HASL) ≤ date code + 24 mo. (without solderability testing)
  - Electroless Nickel Immersion Gold (ENIG) ≤ date code + 18 mo. (without solderability testing)
  - Immersion Silver (ImAg) ≤ date code + 12 mo. (without solderability testing)

NOTE: Material outside these limits does not mean its scrap but its use shall be strictly approved by ADTRAN Engineering via Q100 deviation/waiver process and may require additional testing.

#### 1.7.2 Non Conforming RMS Material

All material used on ADTRAN product shall be listed in the ADTRAN Approved Vendors List (AVL) and defect free. RMS material determined to be wrong/discrepant/damaged upon initial receipt, the CM will document the finding and report the discrepancy to ADTRAN Outsource and Supplier Quality (SQ) Engineering. The report shall include the following information at a minimum

- ADTRAN PN
- MFR PN
- Quantity received and Quantity defective
- Sales Order and Purchase Order
- Problem description
- Digital images of PN label and any other images helpful to problem description and root cause.

The CM will also be responsible for

- File a discrepancy report in BaaN session, "Maintain RMS Discrepancy", adsfco147m000.

If replacement material is NOT required, the purchase order will be credited at the same unit cost the supplier was invoiced.

#### 1.7.3 Obsolete RMS Material

Obsolete components due to Engineering Change Orders (ECOs), changes in production schedules or AVL changes may or may not be returned to ADTRAN.

- If the components can be consumed on other ADTRAN products, then ADTRAN will issue a purchase order to the supplier for the component at the cost paid by the supplier.
- If the components cannot be used, the supplier will be authorized to scrap the material and a purchase order will be issued by ADTRAN to cover the cost of the component.

#### 1.8 First Article Requirements

First Articles are required for all New Product Introduction (NPI) Assemblies, subassemblies and mechanical and formed part numbers. This may include current assemblies that incur major changes in Form-Fit-Function.

- The CM/supplier is responsible for meeting all requirements of the Bill Of Material (BOM), assembly drawing(s), engineering specification(s) and Purchase Order. All dimensions are to be considered critical.
- A completed ADTRAN First Article Inspection (FAI) Report form (Q110-1, page 1 and 2) must accompany all shipments of First Article units (Identify the container or box that will contain the FAI documentation). This report is to provide actual measurements in comparison to the specifications. A working print of the BOM and all assembly drawings shall be included in the FAI documentation package.
- It is recommended that FAI documentation also be forwarded to ADTRAN electronically to the following email address, [FIRST\\_ARTICLE@ADTRAN.COM](mailto:FIRST_ARTICLE@ADTRAN.COM)
- First Article units must be labeled and shipped per Work Instruction SC10.

The first articles will be inspected for workmanship and labels will be scanned to assure proper barcode printing. ADTRAN will review and approve/reject all First Article submissions. The CM may be required to re-submit First Articles based on engineering review. The ADTRAN Outsource department will notify the CM of disposition of all First Articles submissions in documented form (i.e. email, fax, etc.).

#### 1.8.1 Deviations to Specifications.

A request for deviation to a drawing or specification must be submitted and approved in writing by ADTRAN prior to first article submission. Once approved, the deviation must be clearly documented and attached to the ADTRAN First Article Inspection Report.

### 2.0 Elements of the Quality System

There are basic elements that a Contract Manufacturer of products & services used in telecommunications products is reasonably expected to have implemented and documented in its quality program.

Contract Manufacturer's of ADTRAN products are expected to have established, documented, implemented and maintained a reasonable quality management system and continually improve its effectiveness in accordance with the requirements of the current TL9000 standards.

It is required the Contract Manufacturers be TL9000 registered or be in the process of registration. The contract manufacturer can demonstrate this by providing the name of their registrar and the schedule for registration.

#### 2.1 Quality System

The quality system shall be documented and shall be in a quality manual and traceable to documented subset procedures/work instructions.

All workmanship and engineering specifications shall be documented.

Each inspection or testing activity shall have documentation that describes detailed requirements such as parameters to be checked, statistical methods, sampling plan, nonconformance criteria, etc.

#### 2.2 Training

The Contract Manufacturer shall establish methods for identifying and providing the training of all personnel performing activities affecting quality. The Contract Manufacturer shall ensure that Operator qualification and re-qualification requirements are established including, as a minimum, employee experience, training, and demonstrated skills. For audit purposes, the Contract Manufacturer is responsible to ensure that all training is recorded and can be easily retrieved.

### 2.3 Design Control (when applicable).

A program shall be established and operational to ensure that all design changes are implemented in a smooth and timely manner and do not adversely affect quality or reliability.

When applicable the quality system shall ensure that drawings and specifications establish a thorough design definition.

### 2.4 Purchasing.

When applicable to ADTRAN products vendors shall be subjected to re-qualification on a periodic basis. The re-qualification may be based on review of incoming inspection data or other analyses of performance.

### 2.5 Process Control.

Inspection and testing results shall be recorded and analyzed using control charts or a similar technique as appropriate for the purpose of identifying problem areas and monitoring the effectiveness of the quality system.

Each time any change is made in the established operation (for example, a new operator, new machine, new technique), a critical examination shall be made of the first unit(s) processed after the change is implemented.

Electro-Static Discharge (ESD) protection shall be utilized in accordance with IPC-A-610, IP-CM-770.

Where assembly processes are utilized, the contract manufacturer shall adhere to the requirements of the ADTRAN BOM, ADTRAN Q50 and IPC-A-610. ADTRAN BOM notes or special instructions will supersede all other criteria. Where contract manufacturer generated Workmanship Standards are to be used the contract manufacturer shall submit, to ADTRAN Quality, a copy for review.

All points to be soldered (terminal, leads, stranded wire, etc.) shall meet the solderability requirements defined in MIL-STD-202F Method 208. The preferred method is IPC ANSI / J-STD-002, section 4.2 and 4.3.

Any changes to the Contract Manufacturers materials and/or processes shall be reported to ADTRAN prior to use on any ADTRAN product.

### 2.6 Inspection, Measuring and Test Equipment.

The Contract Manufacturer's Quality Organization shall audit the records/equipment to ensure that no "out of calibration date" equipment is being used during testing and inspections. The Contract Manufacturer's Quality Organization shall audit the procedures, records/equipment to assure all equipment used in inspection and test are calibrated. Calibration is to be performed in compliance with the equipment manufacturers' guidelines.

Tools, gauges, test equipment, etc., that are inactive or do not require calibration, shall be so identified.

All test equipment shall be validated to assure that they have the accuracy and resolution to measure the parameters being tested. The test equipment shall maintain repeatability within their allowable tolerances.

#### 2.7 Control of Nonconforming Product.

Records shall be reviewed and analyzed for repetitive discrepancies and when noted they shall be brought to the attention of management for corrective action.

#### 2.8 Corrective and Preventive Action.

Completed corrective action reports shall be maintained in a recurrence file. Whenever it is suspected that a quality problem may be a recurrence of a similar problem on which corrective action has been completed, the recurrence file shall be examined. Preventive action shall be taken that assures the opportunity for recurrence is eliminated.

#### 2.9 Handling, Storage, Packaging and Delivery.

Areas used for handling, storage, packaging, inspection and test of products or services shall be clean, safe, and well organized to ensure that they do not adversely affect quality or personnel performance. Where applicable, the transporting of material shall be such as to avoid damage to the material and/or installed/completed equipment.

Protective packaging shall be employed on all products delivered to ADTRAN as required by the Bill of Material.

It is preferred that shipping containers not exceed a maximum of 35 pounds. Each container should have a consistent number of parts except the final container may have a quantity difference.

Where the possibility of spoilage exists, items in storage shall be date stamped/coded, etc., and used on a First-in First-out basis.

All containers must be marked with the green, red or yellow tags as described in Work Instruction SC14. Alternate labels may be approved to take advantage of CM's internal tracking and quality control systems.

#### 2.10 Quality Records.

Quality records shall be maintained and as a minimum include product identification; quantity of product inspected; inspection procedures followed; inspector, tester, quality representative; date of inspection, and number, type, and severity of defects found.

Quality reports shall be prepared at regular intervals and summarize inspection and test results. Quality records shall be tailored and distributed to specific audiences including upper management and ADTRAN. When a quality deficiency is noted in the reports, specific actions are required from appropriate levels of management.

#### 2.11 Statistical Techniques.

The contract manufacturer shall include, as required, training in statistical techniques, process capability studies, statistical sampling, data collection and analysis, problem identification, problem analysis, and corrective action.

## 2.12 Quality Improvement Program.

The contract manufacturer shall establish and maintain a documented Quality Improvement Program to improve the quality and reliability of the processes/product. The program shall be active and contain a prioritized list of scheduled quality/reliability issues being addressed.



**CM FIRST ARTICLE INSPECTION REPORT (Q110-1)**

Part No. \_\_\_\_\_ Rev. \_\_\_\_\_ Sheet \_\_\_\_\_ Of \_\_\_\_\_

Part Name: \_\_\_\_\_ Date: \_\_\_\_\_

Contract MFR: \_\_\_\_\_ Originator: \_\_\_\_\_

Work Order No. \_\_\_\_\_ Purchase Order No. \_\_\_\_\_ (If applicable)

Quantity \_\_\_\_\_ Test(s) conducted ICT FVT Hi POT Visual Inspection  
Shipped: \_\_\_\_\_

ADTRAN Assembly DWGs/specification(s) used


First Article unit(s) Serial Number


**Remarks:**

\_\_\_\_\_

1<sup>st</sup> Submission  2<sup>nd</sup> Submission  Tooling Rebuilt/Refurbish

**Certification Of Compliance**

I certify that the parts furnished on the above shipment meet all the necessary Engineering Instructions, Mechanical Specifications and Necessary Requirements, and that the above parts have been inspected by this Company. A copy of all working documentation used for verification to include deviation notices, assembly and label placement drawing(s), BOM and any other written instructions shall be included with this First Article Shipment.

**Quality Manager** \_\_\_\_\_ **Date** \_\_\_\_\_

**For ADTRAN use only**

Disposition:  Approved  Rejected  Conditional Approval

Resubmission of 1<sup>st</sup> Article Required?  YES  NO

**Remarks:**

\_\_\_\_\_

\_\_\_\_\_

