



ENC PURCHASE ORDER QUALITY CLAUSES

Revision B

The following clauses specify general as well as unique product requirements when specified by number on the purchase order. All ENC referenced purchase order clauses, terms and conditions must be flowed down through all subtler levels of the supply chain. ENC, their Customer and Regulatory Agencies reserve the right of entry for verification of the quality of work, records and material at any place including subtler facilities at all levels. Suppliers at all levels of the supply chain are also expected to demonstrate ethical behavior in all matters pertaining to performance of all ENC contract requirements including and where applicable, the awareness of their contributions to product safety. Exceptions to these requirements, as noted on the purchase order, must be approved by ENC Quality Assurance prior to shipment. Supplier questions or requests for clarification should be directed to the appropriate ENC Procurement representative. The minimum requirements are listed in table 1 (below) and are applicable for those product categories; however, additional Quality Requirements may also apply as specified on the Purchase Order.

ALL Suppliers	Fabrication/Machining/Castings	Wire Harness	PCBA
Q1, Q3, Q6, Q16, Q22, Q25, Q29	Q1, Q3, Q6, Q7, Q16, Q22, Q25, Q29, Q30	Q1, Q2, Q3, Q6, Q7, Q12, Q13, Q16, Q22, Q23, Q25, Q29	Q1, Q2, Q3, Q6, Q7, Q11, Q12, Q13, Q16, Q22, Q23, Q25, Q29
Assy & Test	Chemicals & Shelf Life	Special Processes	Calibration
Q1, Q2, Q3, Q6, Q7, Q16, Q19, Q22, Q25, Q29	Q1, Q6, Q9, Q10, Q16, Q22, Q25, Q29	Q1, Q2, Q3, Q6, Q16, Q17, Q22, Q25, Q29	Q1, Q3, Q6, Q15, Q16, Q22, Q25, Q29
Raw Material	Distributor		
Q1, Q3, Q6, Q8, Q16, Q22, Q25, Q29	Q6, Q13, Q16, Q22, Q25, Q29,		

Q1 SUPPLIER QUALITY SYSTEM REQUIREMENT:

The ENC supplier shall maintain a Quality Assurance Program that, as a minimum, shall generate and maintain records and data of all inspections and testing performed for those articles provided to meet the requirements of the purchase order. ISO 9001:2015, AS9100D or IATF16949:2016 is the preferred QMS. The Supplier's Quality System is subject to review and audit by ENC Quality representative. Any changes to the Supplier's Quality System or registration status, such as a change in certification (e.g. update, withdrawal, or disapproval) or registration body, must be forwarded to the ENC Quality Manager within 30 days. **ENC Supplier Quality Survey form QF-1001** shall be used to evaluate suppliers' capability and will be sent out every 3 years for re-evaluation.

Q2 CERTIFICATE OF CONFORMANCE:

The Supplier must furnish a Certificate of Conformance either by email or with each delivery attesting that each item of hardware and/or software conforms to all requirements of the Buyer's specification and purchase order, and that all required test and inspections have been performed. C of C shall include, the ENC PO number, part number(s) and revision(s), serial number(s) (if serialized), lot number or batch number (if applicable), quantity and reference to any required specifications. This document must also exhibit a Signature (or their Stamp) and printed name of the supplier's authorized quality representative and date. C of C and all documents shall be in English, legible if reproduced on copier.

Q3 QUALITY CONTROL: (Ref. ISO9001 / AS9100 / IATF16949 Clause 8.4)

Supplier must ensure that the clauses associated with this purchase order are flowed down to all its sub-tier suppliers. Supplier is required to direct all its external providers to ensure that the requirements of the final product are met.

Q4 COUNTERFEIT PARTS DETECTION:

Supplier must detect and prevent the use of counterfeit, suspect counterfeit, unapproved, or suspect unapproved parts.

Q5 PRODUCTION PART APPROVAL PROCESS (PPAP):

The PPAP submission will be based on the latest edition of the Production Part Approval Process (PPAP) Manual, available through AIAG (Automotive Industry Action Group). A ENC representative from Quality Assurance or Buyer will identify the appropriate PPAP submission level and additional requirements for the part or component to be ordered using **ENC PPAP Submission Checklist**. Unless otherwise specified, a Level 3 PPAP shall be submitted. All PPAP samples must be produced using production tooling and processes at the production line rate. Supplier shall ensure compliance to all requirements listed on provided ENC purchase orders, and engineering specifications. Sample parts shall be submitted to ENC Quality and/or specified ENC personnel. Suppliers may be required to perform annual layout/validation and PPAP submission as directed by ENC.

Q6 NOTIFICATION OF NONCONFORMANCE:

Supplier must notify the buyer of any nonconforming product or sub-component of the product verbally and in writing as soon as nonconformance is detected. All nonconforming parts shall be submitted to ENC Quality Manager for review using **ENC Supplier Discrepancy Request (SDR) QF-1012** form. Supplier shall submit SDR before sending in parts. ENC Quality and Engineering Team will disposition SDR and will return to supplier with instructions.

Q7 RECORD RETENTION:

The Supplier shall maintain records regarding Buyer's purchase order, specifications, drawings, process requirements, inspection/verification instructions and other relevant technical data. Records must be maintained by the Supplier for a minimum of 7 years or as specified by the Buyer after which the Supplier agrees to either return or destroy related records.

Q8 RAW MATERIAL CERTIFICATION:

One (1) legible copy of the original Mill CHEMICAL AND/OR PHYSICAL TEST REPORTS (as required by specification for each lot/batch/heat) must be attached to the C of C and must accompany each delivered shipment. The report must be identifiable to the product being delivered (PO and PN) and must show that the material/parts delivered are acceptable.

Q9 AGE SENSITIVE MATERIAL (SHELF LIFE):

For age sensitive materials, all items with limited shelf life shall be clearly marked with the manufacturer's name, type of material, shelf life, date of manufacture, and usability limiting date. All items must have a minimum of 80% shelf life remaining at time of receipt.

Q10 SAFETY DATA SHEETS:

Where Safety Data Sheets (SDS) exist, the supplier shall provide a copy with each shipment

Q11 ELECTROSTATIC SENSITIVE DEVICES (ESD):

If the items to be delivered under the Purchase Order are Electrostatic Discharge Sensitive (ESDS), the Supplier shall have an ESD control program which precludes ESD damage during all phases of fabrication, testing, handling, storage, and packaging for delivery. Nonmanufacturing Distributors shall handle, store, package and identify such items under an ESD control program which ensures continuation of the manufacturer's ESD control program. Shipping containers and packing slips shall have prominent marking/identification which identifies contents as ESD sensitive.

Q12 IPC WORKMANSHIP STANDARD:

Supplier shall comply with the applicable requirements of the IPC listed below: PWB'S WORKMANSHIP STANDARD IPC-A-610 Class 3 (Acceptability of Electronic Assemblies) CABLE AND WIRE HARNESS ASSEMBLIES WORKMANSHIP STANDARD IPC/WHMA-A-620 Class 3 (Requirement and Acceptance for Cable and Wire Harness Assemblies)

Q13 FOREIGN OBJECT DEBRIS/DAMAGE PREVENTION (FOD):

To establish the requirements for the prevention of contamination or foreign objects from becoming entrapped in the supplier's product during manufacturing, assembly, testing, storage or handling. The supplier shall develop and maintain a Foreign Object Debris/Damage (FOD) prevention program for manufacturing areas to prevent introduction of foreign objects into any item delivered under this purchase order. The supplier shall employ appropriate housekeeping practices to assure timely removal of residual/debris generated, if any, during manufacturing operations and/or normal daily tasks. The supplier shall determine if sensitive areas that may have a high probability for introduction of foreign objects should have special emphasis controls in place appropriate for the manufacturing environment. The supplier shall determine the need for, and implement, FOD prevention awareness training programs.

Q14 MEASURING AND TEST EQUIPMENT AND TEST:

The Supplier shall meet and maintain a Calibration System in conformance with Calibration System Requirements of ISO 10012-1 or ANSI Z540-1. Although obsolete, a calibration system which meets the requirements of MIL-STD-45662 is also acceptable. Suitable records must be maintained and available for review.

Q15 VENDOR/LAB PROVIDING CALIBRATION SERVICES:

All vendors will provide a certificate of calibration traceable to the NIST. The calibration services performed will be compliant with ANSI Z.540.3, ISO 10012 and ISO/IEC 17025. The standard(s) under which the calibration was performed must be listed on the certificate of calibration. Any items found to be out of tolerance shall be noted on the documentation returned with the items.

Q16 SUPPLIER CORRECTIVE ACTION:

In response to ENC Quality initiated corrective action requests, Supplier must advise Quality of root cause determination, corrective action taken to prevent recurrence of reported problems and/or discrepancies, and effectively dates of the planned corrective action(s). Supplier must maintain a corrective action system that determines the effectiveness of such corrective actions, and that prevents shipment of nonconforming articles without prior approval from Buyer. ENC uses Root Cause Corrective Action for QF-1008.

Q17 PROCESS CERTIFICATIONS:

Process certifications must accompany parts with each shipment made against this purchase order. Each certification must list the process specification shown on the Drawing and/or the Purchase Order and must be identifiable to the product being delivered.

Q18 IDENTIFICATION:

The Supplier shall identify all items in accordance with ENC drawings or as specified on the Purchase Order and/or in accordance with MIL-STD-130. Small parts, where size is prohibitive to physical marking, may be bag and tag identified.

Q19 TEST REPORTS:

Test reports must be attached to the C of C and be included with each shipment. These reports must include actual test results showing compliance to the specification and reference the purchase order number, supplier's name and address, specification number, part number, part name, date of test and, where applicable, serial numbers/lot number. These reports must be validated by an authorized QA representative. If equipment of sufficient capacity to test the articles is not available on-site, the items must be tested in a laboratory approved by ENC.

Q20 KEY CHARACTERISTICS:

Inspection report of all "Key Characteristics" (Critical Dimensions) as indicated on the ENC or Customer drawing is required with each shipment.

Q21 FIRST ARTICLE INSPECTION REPORT (FAIR):

The first time a Supplier delivers a part/assembly to an ENC / Customer designed part number, the Supplier shall furnish a complete First Article Inspection Report listing actual inspection results for all drawing dimensions (Balloon Drawing) and applicable notes. The parts used to perform the First Article shall be marked.

A balloon drawing is a drawing with each characteristic or requirement clearly marked with unique identifier numbers which correlates to the FAIR. The numbers must be circled or boxed for easy visual identification; preferably in a clockwise direction. All dimensions, GD&T and Notes require verification. Actual Results are required (Not Pass). Report shall include: Instrument used to verify, Date inspected, Inspected by whom, Part number, Revision and description of part. Reports shall be printed (No E-Files that can be changed/modified will be accepted.)

Q22 QUALIFIED PERSONNEL:

The Supplier's personnel performing work on contracted products and services should be adequately trained to assure that their skills and competency levels will result in products that meet all contract requirements.

Q23 SOLDERING:

Any soldering process shall be completed in accordance with IPC series of J-STD, depending on the type of soldering being accomplished. The following standards apply: J-STD-001, J-STD-002, J-STD-003, J-STD-004A, J-STD-005, and J-STD-006.

Q24 SOFTWARE:

Any software used for qualification or acceptance of hardware or software deliverables, including firmware, shall have a system for control including procedures and records available for review any time upon request from ENC.

Q25 ACCESS TO SUPPLIER AND SUBTIER FACILITY:

The Supplier shall grant ENC, its customers, and/or any regulatory authorities' right of access to the applicable areas of all facilities at any level of the supply chain involved in the Purchase Order and to all applicable records & processes used to manufacture parts for the PO. This shall also include the right to conduct a survey, audit, and/or assessment of the Supplier's facility and the Supplier's sub-tier Suppliers to determine their capability to comply with requirements.

Q26 MERCURY-FREE:

Materials delivered against this order cannot contain and have not come in contact with the element mercury (MC) or mercury compounds known to be chemically or thermally unstable. This statement shall be included in the Certificate of Conformance statement or be a stand-alone certification.

Q27 PROHIBITED MATERIALS:

Unless otherwise specified on the drawing or P.O., the use of zinc, cadmium, mercury, or pure tin (>97% Sn) is expressly prohibited.

Q28 ENC SOURCE INSPECTION:

If ENC inspection is required at the source of manufacture ("Source Inspection") the following steps must take place upon completion of the parts:

- a. Contact the ENC Buyer to schedule a Source Inspection date. The supplier must allow 48 hours for such coordination.
- b. The supplier's own inspection of the completed articles must be complete, including all certifications and other supporting paperwork.
- c. The supplier must make available any required drawings, specifications, or other related documents.
- d. The supplier must make available any tools, gages or other inspection instruments necessary to establish conformance of the articles. This includes personnel with the requisite skills to operate such devices.
- e. Any deviations from the design data must have a completed and approved "Supplier's Discrepancy Request" (SDR). This form may be obtained through Quality Assurance or Purchasing.

Q29 PACKAGING/PACKING/PRESERVATION/STORAGE:

The supplier shall ensure that all items are adequately packed and packaged to prevent damage or contamination during the normal course of shipment and to assure acceptance by common carriers. Best commercial practice may be used unless otherwise specified in the purchase order. Parts shall be individually wrapped, bagged, or otherwise protected to prevent part-to-part contact/damage when packaged within a larger pack. Finished parts shall be adequately protected to prevent damage during handling and shipment.

- Newsprint shall not be used for wrapping parts or as dunnage due to its acidic nature.
- Staples shall not be used at any time due to the possibility of foreign object damage (FOD).
- No Packing Peanuts - technically known as expanded polystyrene loose fill. Shipments will not be accepted and returned at the supplier's expense if item(s) are received packed with expanded polystyrene loose fill.
- ESD precautions shall apply as applicable on Electrical Components by using ESD shielded packaging.

Q30 INSPECTION DATA:

One copy of Supplier's variables dimensional inspection acceptance data, identifiable to the drawing, material or items supplied, must accompany each shipment. Features Bubble/Balloon inspection and reports shall reflect sound inspection practices, i.e. emphasis on major features, basic dimensions, datums and secondary operations, which are appropriate for the item supplied. Failure to provide this acceptance inspection data can result in ENC Receiving Inspection processing delay. All dimensions, GD&T and Notes require verification. Actual Results are required (Not Pass). Report shall include: Instrument used to verify, date inspected, Inspected by whom, Part number, Revision and description of part. Reports shall be printed (No E-Files that can be changed/modified will be accepted.) Sampling per AQL 2.5/4.9/0.10 (unless otherwise requested) in accordance with ANSI/ASQC Z 1.4, ANSI/ASQC Z 1.9, ISO 2859-1 or ARP9013.

- Q31 RoHS Compliance** TBD
The supplier shall certify that materials supplied to ENC is RoHS Compliant.
- Q32 Traceability and Serialization:** TBD
Traceability must be maintained from receipt of raw material through finished product. Records and material must be identified by lot number, material type, specification (including revision), batch number or heat number as applicable to provide a complete history traceable to records of acceptance. If Part/Assy **Serialization** is required, Supplier shall serialize parts and/or materials at the Supplier's facility in accordance with PO/Drawing requirements. Supplier to maintain records and track Serialization to assure duplicates do not occur.
- Q33 Conflict Minerals**
In accordance with section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, all conflict minerals (tantalum, tin, tungsten and gold or "T3G") used in products that are manufactured specifically for ENC must be sourced from non-conflict countries. This includes all PCB manufacturers and suppliers that provide plating services. All suppliers that incorporate conflict minerals into materials that are to be delivered to ENC must maintain records substantiating the source of the minerals with identification of the original smelter. This information is to be reported to ENC annually at a minimum. The preferred reporting method is the Conflict Minerals Reporting Template (CMRT) that is available from the Conflict Free Sourcing Initiative's web site: www.conflictreesourcing.org.
- Q36 Manufacturing Specifications**
Supplier shall provide latest manufacturing specifications or instructions for installing or applying product sold. This information shall be legible and in English. This information may be provided by: Printed document, CD, or direction to manufacturer's website.
- Q37 This requirement has been left blank intentionally**