

## TT Electronics Integrated Manufacturing Services Supplement to Purchase Order Quality Clauses TT Electronics Purchase Order

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### Q01 Quality System Requirements

The supplier shall establish and maintain a quality system that conforms to the requirements of ISO 9001:2008 or AS9100 Rev. C

### Q02 Supplier's Quality Plan

The supplier shall submit to TT Electronics a Quality Plan describing the production flow, special processes, and inspection and test points, used in the manufacture of the items described on the P.O. The supplier's plan is subject to audit by TT Electronics and shall not be changed without approval of TT Electronics, its Customer.

### Q03 Control of Inspection Equipment

The supplier shall establish and maintain a calibration system that conforms to the requirements of ANSI/NCSL Z540 or ISO 10012

### Q05 Workmanship

Electronic materials and workmanship shall comply with the requirements of J-STD-001 and IPC-A-610.

### Q06 Certificate of Compliance

The items or services being shipped or being performed against this order must be accompanied by a Certificate of Compliance that assures full conformity with the Quality requirements, applicable drawings, specifications, and terms and conditions of this order. When Q13 is a requirement, a copy of the special process sub-tier supplier's certification is to be included in addition to the overall certification.

### Q07 Physical and Chemical Analysis

Physical and/or chemical analysis report to be supplied with each shipment.

### Q08 Inspection Evidence

The supplier shall maintain evidence of final inspection of material for a period of 10 years minimum or as directed by TT Electronics. This is flow down from our Aerospace Customers, which is flowed-down to them by the OEM's, Boeing, Airbus, Bombardier and Embraer Air. And the OEM's get it from the FAA, EASA (European Aviation Safety Administration) and Transport Canada Aviation Safety.

### Q09 Inspection /Test Data

A copy of inspection and/or test data shall be supplied with each shipment identifiable to the serial numbers and/or date code of items supplied.

### Q10 First Article Inspection

First Article Inspection and acceptance by TT Electronics is required on the 1<sup>st</sup> shipment. Supplier shall submit a complete First Article Report in accordance with AS9102 with the part(s) that it represents. No production lots shall be shipped until written approval or waiver of the first Article Report is received from TT Electronics. A new or delta first article must be completed when the item has not been manufactured in the past two years, when a drawing change occurs, when a new supplier for a detail part is used or when the manufacturing process or location has changed.

### Q11 Non-Destructive Test Report

Reports of all special processes and inspection methods, such as welding, heat treating, brazing, plating, x-ray, magnetic particle inspection, fluorescent penetrant inspection, etc. demonstrating compliance with all applicable specification and notes referenced on the drawing and/or purchase order shall be supplied with the material.

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### Q12 QPL Requirement

The MIL, AN and MS parts supplied against this order shall be manufactured by QPL sources.

### Q13 Special Processing

- a) All special processing and/or non-destructive testing, such as welding, heat treating, brazing, plating, painting, magnetic particle inspection, fluorescent penetrant inspection, radiographic inspection, etc. shall be performed by TT Electronics approved sources.
- b) General Electric: The supplier shall meet GE specification St000. NOTE: Request the applicable GE documentation and yellow pages source listing from the TT Electronics buyer if access is otherwise unavailable.

### Q14 Printed Wiring Boards/Assemblies Identification

All printed wiring boards/assemblies shall be marked with the manufacturer's trademark and date code. Printed wiring assemblies shall be serialized; method of serialization is optional.

### Q15 JAN Semiconductor Devices

All JAN devices shall meet the requirements of MIL-PRF-19500 Para. 3.7(a) or 3.7(b), as applicable.

### Q16 Traceability

Items supplied on this order shall be identified and traceable to their origin i.e. manufacturer, manufacturing date, date purchased, lot inspection, test data or other pertinent information relating to control of processes.

### Q17 Age Control

Manufacturing date, cure date, shelf life and/or expiration date, as applicable, are required. Material received, with more than 20% of its shelf life/cure date expired, shall be rejected.

### Q18 Static Sensitive Material

All integrated circuits and/or electrostatic sensitive devices must be delivered enclosed in electrostatic shielded tubes, sleeves, or other suitable protective materials. External packaging shall also have caution labels or marking indicating the contents contain electrostatic sensitive devices.

### Q19 Customer-Furnished Material

The supplier prior to use must inspect TT Electronics or Government-furnished material. When deficient material is found, the TT Electronics buyer will provide written instructions for disposition of the material.

### Q20 Configuration Control Requirements

To assure uniform quality and material configuration, no changes in materials, construction, source or performance shall be made for the item(s) not covered by this order without prior approval from TT Electronics. The supplier is expressly prohibited from supplying nonconforming material to TT Electronics without advance approval. Material Review Board review and disposition of nonconforming material shall be the sole responsibility of TT Electronics.

### Q21 Government Source Inspection

Government Source Inspection is required prior to shipment. Upon receipt of this order, the supplier will promptly notify the cognizant Government Representative, or TT Electronics so that appropriate planning for Government Source inspection can be accomplished.

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### Q22 TT Electronics Source Inspection

TT Electronics Source Inspection is required prior to shipment. The supplier shall provide sufficient advance notice to TT Electronics to permit timely scheduling of source inspection.

### Q24 Dock to Stock

The supplier is authorized to ship directly to TT Electronics stock. TT Electronics reserves the right of revocation and the right to review and evaluate the supplier's processes and procedures. Only TT Electronics or authorized representatives of the supplier shall release material for shipment in accordance with the approved authorized release agreement.

### Q25 Workmanship

Electronic materials and workmanship shall comply with IPC-A-610, Class 2, current revision.

### Q26 Workmanship

Electronic materials and workmanship shall comply with IPC-A-610, Class 3, current revision.

### Q27 FAA/EASA Documentation

An original FAA/EASA authorized release certificate approval is required to accompany each shipment.

### Q28 Safety Data Sheets (SDS) / Material Safety Data Sheets (MSDS) Requirement

The current SDS/MSDS for material supplied is required for each shipment.

### Q29 Certificate of Origin

Each shipment is to be accompanied by a document, which declares the country of origin on forms acceptable to the originating country's regulations.

### Q30 Purchasing Requirements

Purchasing information shall describe the product to be purchased, including where appropriate the following:

- Requirements for approval of product, procedures, processes and equipment. With the First Article submission, TT Electronics needs to know your procedures, processes and equipment. This data is used in the OEM design.
- Requirements for qualification of personnel. TT Electronics and the OEM need to know that personnel are trained and understand Aerospace requirements.
- Requirements for design, test, inspection, verification (including production process verification), use of statistical techniques for product acceptance, and related instructions for acceptance by the organization, and as applicable critical items including key characteristics. TT Electronics and the OEM need to know your Company's processes, inspection points, tooling, calibration, key characteristics and all requirements listed are being performed per the approved process.
- Requirements for test specimens (e.g. production method, number, storage conditions) for design approval, inspection/verification, investigation or auditing, final inspection and final test verification.
- Requirements regarding the need for the supplier to
  - Notify the organization of nonconforming product. TT Electronics needs to know when you make bad product or parts.
  - Obtain organization approval for nonconforming product disposition. TT Electronics holds MRB disposition rights.
  - Notify TT Electronics of any changes in product and/or process, changes of suppliers, changes of manufacturing facility location and, where required, obtain organization approval, and any changes from the original FAI processes, equipment, your sub-tier suppliers, quality management, and top management, manufacturing change ownership or location. TT Electronics needs to know and approve.
  - Flow down to the supply chain the applicable requirements including customer requirements.

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TT Electronics' terms need to be flow down to your suppliers and we need to approve the same.

- Records retention requirements see Q32.

### Q31 Identification and Revision status of Specifications

The current revision of specification(s) called out on the drawing shall be provided by Quality.

Q32 Records retention requirements: Contracts, Quality Records, Inspection Records, Purchase Orders, Management Review Minutes, Planning for Product Realization, Training Records, First Article Inspection Records, Nonconforming Records, Corrective Action Request records, Internal Audits, Third Party Audits, Risk Management Records and Escape and Containment Records. Must maintain for ten (10) years unless change by contract.

Q33 First Article Requirements. First article documentation must include measurement results for all dimensions listed on the print (MIL-I- Bubble print). This must list the actual dimensions measured.

### Q34 First Article requirements for fabricated Items requiring raw material traceability

All items fabricated under this purchase order must be traceable to raw materials used. Please contact the buyer on the PO for the required first article report to be used (TT Electronics form # TT-Custom-AS9102).

- 1) Raw materials used must be identified by lot number, as well as material type, specification, heat number, etc., and must be traceable to records of acceptance.
- 2) All records must be maintained on file by the supplier for a minimum ten years. Supplier shall notify TT Electronics prior to the destruction of records.
- 3) This form must accompany first shipment.

Q99 None Required

### E-Q's E-Quality Clauses

#### E-Q7.1.2 TT Electronics Purchase Order Terms

All purchase orders are to be in compliance with TT Electronics Purchase Order Terms. Return confirmation of this purchase order constitutes agreement to TT Electronics Supplier contract acceptance.

#### E-Q7.1.3 Proprietary Information

The information contained in this document and any attachments is proprietary to TT Electronics the OEM and/or third parties. It is intended for the exclusive use of the addressee and may contain confidential, proprietary and/or privileged information. If you are not the intended recipient of this communication, you are hereby notified that any use, disclosure, distribution and/or copying of this documentation is strictly prohibited. If this communication was sent to you in error, please notify the sender immediately and delete it from your computer.

#### E-Q7.1.4 ITAR Restrictions

The information provided to you herewith is subject to the United States International Traffic in Arms regulations. This information may not be disclosed to a foreign national or exported from the United States without a license or authorization from the directorate of defense trade controls of the US Department of State.

#### E-Q7.1.5 DFARS Requirements

If supplier's product fall under the specialty metal clause of 252.225.7008 or 7009, supplier must comply with the Berry Amendment (DFARS) supplement 252.225.7008 or 7009, 'Preference for Domestic Specialty Metals' which include raw

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materials/components made with any steel, metal alloys, consisting of nickel, iron nickel, and cobalt base alloys, titanium and titanium alloys, zirconium and zirconium based alloys.

Supplier must provide TT Electronics with a certification of compliance with each shipment documenting that the product complies with 252.225.7008 or 7009, Alt 1 specialty metal requirements. If you have any questions, please visit the government webpage at <http://www.acg.osb.mil/dpap/dars/djarspgi/current/index.htm> or contact your TT Electronics buyer.

### E-Q7.1.6 Key Characteristics.

All suppliers must comply with the SAE – Aerospace Standard AS9103, Key Characteristics

### E-Q7.1.7 Certificate of Conformance Requirements

Certification of Conformance is required with each shipment attached to packing slip. All items need to be processed per specifications noted on part number drawing referring to revision spec sheet for current revision level.

Supplier is required to provide documented certification(s) that the material and/or services supplied against this order meet all applicable drawing, specification and purchase order requirements. All certifications, documents and/or reports provided by the supplier related to this order must be legible and reproducible and shall contain the following:

- TT Electronics purchase order number
- Item part number, revision, description, and quantity
- Line item number and schedule release number
- Applicable lot number(s)
- Applicable specification number(s)
- Date and signature of authorized representative
- Company name, title of authorized person, printed name of authorized person
- Records of materials, processes, and tests must be maintained for minimum ten (10) years, see E-Q59.
- For raw materials, copy of the original mill or resin manufacturers certification(s)
- For castings and forgings, physical and mechanical properties with heat treat batch lot number
- For distributors, certification from the original manufacturer
- Additional requirements apply for chemicals. See section E-Q7.1.10
- Additional requirements apply for special (outside) processing. See section E-Q7.1.11

### E-Q7.1.8 Accuracy

Federal law note: The recording of false, fictitious or fraudulent statements or entries on shipment document(s) may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

### E-Q7.1.9 General Quality

Unless otherwise noted, all of the following alphabetical items in this section apply to this purchase order.

- a. Certification of conformance, documents, and reports per section E-Q7.1.7 of this document
- b. Change in approved processes: Supplier may not change any drawing, process, material or procedures originally subject to TT Electronics without written authorization from TT Electronics' quality department.
- c. Use of subcontractors: Unless otherwise stipulated, suppliers may subcontract work on this order, provided the supplier's systems and procedures define the basis for sub-tier supplier selection and control of quality. Supplier documents shall document the basis of sub-tier supplier selection and subsequent quality performance. Requirements related to this order including any key characteristics shall be flowed down to any sub-tier suppliers involved in this order.
- d. Supplier's responsibility and final acceptance: Neither surveillance, source inspection or tests performed by TT Electronics or its customer, at the supplier's or TT Electronics' facility shall necessarily constitute final approval or acceptance of the items or goods on this order. Nor shall such actions or the supplier's conformance to all applicable quality requirements relieve the supplier of the responsibility of furnishing items in conformance to the requirement of

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this order. All items are subject to final inspection, test, etc. at TT Electronics' facility notwithstanding prior payments or inspections and final acceptance shall be determined by TT Electronics' receiving inspection department.

- e. Non-conformance: Supplier shall not repair, 'use as is' or ship to TT Electronics (or designee) any item which falls to conform to all drawing, specification, and/or purchase order requirements without prior approval by TT Electronics' material review board (MRB). All such nonconformance must be submitted in writing through TT Electronics' purchasing department and must clearly define the discrepancy and reference applicable specifications. All discrepant material shall be held in supplier's 'bond' area until final MRB disposition is made. Supplier must notify TT Electronics of any nonconforming product that has left their facility. Defective material reports will be created for each nonconforming material received by TT Electronics.
- f. Corrective Action Requests: When corrective action requests are issues for nonconformance, supplier shall respond within 15 days with an analysis of the cause of the discrepancy. A statement of corrective action taken to preclude recurrence and the date (lot, revision, etc.) of effectivity of such action will be through TT Electronics supplier quality tracking system.
- g. Partial shipments: No partial or unscheduled shipment may be made against this order without prior TT Electronics approval.
- h. Shipping, handling, and identification: All material shall be packaged so as to prevent damage during handling and shipping and shall be marked so as to be easily identified. Damaged goods received at TT Electronics may be rejected at supplier's responsibility.
- i. Access to supplier's facility: TT Electronics reserves the right of access (at any reasonable time) to any location where work is being performed under this purchase order and such right shall be extended to TT Electronics' customer and/or cognizant federal government representatives.
- j. Supplier's quality control system also see E-Q47: At a minimum, seller shall establish and maintain an orderly system that provides for defect detection, identification, segregation and correction. Such systems shall further comply with one or more of the following specifications as indicated on the purchase order.

- |                   |                    |
|-------------------|--------------------|
| a. MIL-45208A     | e. MIL-STD-1520B/C |
| b. MIL-Q-9858A    | f. MIL-STD01535A   |
| c. NH8-5300.4(1C) | g. MIL-STD-45662   |
| d. NH8 5300.4(1B) | h. OTHER _____     |

- k. TT Electronics requires all suppliers to notify TT Electronics organization of all changes in the product and/or process definition and where required to obtain customer approval.

**l. Revision Status of U.S. Military, Industry and Customer Process Specifications:**

The applicable revision status of specifications designated on Customer drawings and/or Purchase Orders shall be the revision in effect on the date of the Purchase Order, unless otherwise specified. *Direct Replacement of U. S. Military (DoD Controlled) Documents:* For Customer drawings that reference cancelled DoD controlled documents where a specific revision of the document is not specified, and the DoD document cancellation notice identifies a superseding document, the seller may elect to use the superseding document without revision to the drawing or purchase order. When the DoD document cancellation notice does not identify a superseding document, the seller shall contact the TT Electronics buyer.

**E-Q7.1.11 Requirements for Chemicals**

Ozone depletion in addition to and not in limitation of the quality attachments (including all) specifications incorporated herein by reference the seller hereby certifies the items listed here in were not manufactured with and/or do not contain 'ozone depleting chemicals'. Seller shall provide certification of this conformance in writing with each lot attached to packing slip. Seller is required to 'clearly' identify the outside of every shipping container with 'ozone' free label. If the material received against the purchase order does not conform to the requirements stated herein, they are subject to rejection and the cost to return will at the seller's expense. If the above subject material is considered hazardous material

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seller shall comply with Federal, State, Health, and Safety rules and regulations regarding identification, handling, and shipping of the above material. Seller shall identify the above material with the following information as a minimum.

- a. Packing sheets shall contain an accurate description of the material
- b. Containers shall be identified with hazardous material warning labels
- c. Seller shall deal with licensed carriers in the transportation of said material
- d. Seller shall provide Safety Data Sheets (SDS) / Material Safety Data Sheets for OSHA requirements.

Potting/epoxy/paint/lacquer/coatings: In addition to and not in lieu of the normal certifications and/or SDS/MSDS requirements, seller shall furnish shelf life certification, manufacturer batch lot number, and date of manufacture on every shipment. Failure to furnish the aforementioned data may result in rejection/return of material at TT Electronics inspection. Any material received at TT Electronics beyond a 30-day shelf life window must be approved by TT Electronics inspection prior to shipment or may be subject to rejection by TT Electronics.

### E-Q7.1.12 Outside Processing Requirements

Buyers standard specifications incorporated in this order and identified by revision or edition date are in the possession of seller.

All outside processing suppliers must be NADCAP certified.

TT Electronics furnished material by buyer shall be maintained in strict compliance with purchase order terms and conditions. It is mutually understood and agreed that at the completion of this purchase order all furnished material including attrition quantities whether completed or partially completed shall be delivered at no additional cost to buyer. Seller shall promptly execute and return to buyer all scrap and excess material. Seller shall be held liable for any lost materials exceeding the 5% allowable attrition. TT Electronics will bill back all inventories that cannot be accounted for by the seller. Should the buyer cause any delay in furnishing any of the material or supplies under the terms of this purchase order, buyer shall not in any event be responsible to seller for any damages or losses of such delay, but it is agreed that the seller promised delivery date shall be extended for any equivalent period of time to that directly attributable to such delay. Seller further agrees that the allowance of such additional time shall preclude, satisfy, and cancel any and all such other claims by seller of whatever nature as a result of such delay.

Additional certification requirements for outside processing apply as follows:

- a. The process(es) performed
- b. Spec # as defined on Customer's drawing.
- c. Lot size
- d. Sample size
- e. Applicable process specs and controls
- f. Applicable test results
- g. Serial numbers where applicable
- h. Statement that the job was completed per NADCAP certification referencing NADCAP accreditation number and expiration date

### E-Q7.2 Government Purchase Order Notes

If this Purchase Order and/or any subsequent modification or amendment documents on its face that it is placed in support of a U.S. Government funded prime contract or subcontract, or if the Buyer otherwise notifies the Seller that this Order is placed under a U.S. Government prime contract or subcontract, the following clauses of the Federal Acquisition Regulations (FAR), and the Department of Defense Federal Acquisition Regulation Supplement (DFARS) apply and are incorporated herein by reference with the same force and effect as if set forth below in full text. These clauses apply to all contract types; firm-fixed price (FFP), Cost reimbursable (CPFF), and Time & Material (T & M).

Seller agrees to flow-down, as required, all applicable FAR and DFARS clauses to its lower-tier suppliers. Seller further agrees that all notifications and other communications required by these clauses shall be made through the Buyer's Purchasing Representative, unless this Order specifically provides otherwise.

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*Note:* Full text versions of these clauses can be made available upon Seller's request to the Buyer's authorized representative.

### E-Q7.2.1 Flow Down Requirements for DoD and United States Government Orders

#### *Ground rules and Assumptions:*

"Contractor" or "prime contractor" shall mean "Seller."

"Government" shall mean "Buyer."

"Contracting Officer" shall mean "Buyer's Purchasing Representative."

"Contract" or "Schedule" shall mean this "Order."

A COMPLETE SET OF FAR AND DFAR CLAUSES CAN BE FOUND AT:

FAR: [HTTPS://WWW.ACQUISITION.GOV/COMP/FAR/INDEX.HTML](https://www.acquisition.gov/comp/far/index.html),

DFAR: [HTTP://WWW.ACQ.OSD.MIL/DPAP/DARS/DFARSPGI/CURRENT/INDEX.HTML](http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html)

HINT: GOOGLE SEARCH RETRIEVES MOST CURRENT INDIVIDUAL CLAUSES BY THE FAR/DFAR NUMBER

### E-Q7.2.2 Federal Acquisition Regulations (FAR)

52.203-3 – GRATUITIES (APRIL 1984)

52.203-6 – RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JULY 1995)

52.203-7 – ANTI-KICKBACK PROCEDURES (JULY 1995)

52.203-12 – LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (SEPT 2005)

52.209-6 – PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH SUBCONTRACTORS DEBARRED, SUSPENDED OR IF DEBARMENT IS PENDING (JAN 2005)

52.211-5 – MATERIAL REQUIREMENTS (AUG 2000)

52.211-15 – DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEPT 1990)

52.215-2 – AUDIT AND RECORDS – NEGOTIATION (JUNE 1999)

52.215-12 – SUBCONTRACTOR COST OR PRICING DATA (OCT 1997)

52.215-13 – SUBCONTRACTOR COST OR PRICING DATA – MODIFICATIONS (OCT 1997)

52.215-14 – INTEGRITY OF UNIT PRICES (OCT 1997)

52.215-19 – NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

52.216-7 – ALLOWABLE COST AND PAYMENT (DEC 2002)

52.222-19 – CHILD LABOR (JUNE 2004)

52.222-20 – WALSH-HEALEY PUBLIC CONTRACTS ACT (DEC 1996)

52.222-21 – PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)

52.222-26 – EQUAL OPPORTUNITY (APRIL 2002) – THRESHOLD IS >\$10K ANNUAL

52.222-35 – EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETS (DEC 2001) – THRESHOLD IS \$100K

52.222-36 - AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES – THRESHOLD IS >\$10K

52.222-39 - NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES. THRESHOLD IS >\$10K

52.223-3 – HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

52.223-6 – DRUG FREE WORKPLACE (MAY 2001)

52.223-11 – OZONE DEPLETING SUBSTANCES (MAY 2001)

52.225-1 – BUY AMERICAN – SUPPLIES (JUNE 2003)

52.225-8 - DUTY-FREE ENTRY (FEB 2000)

52.225-13 – RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (MARCH 2005)

52.227-2 – NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG1996)

52.227-11 – PATENT RIGHTS (JAN 1997)

52.228-7 – INSURANCE (MARCH 1996)

52.229-3 – FEDERAL, STATE AND LOCAL TAXES (APRIL 2003)



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- 52.233-4 – APPLICABLE LAW FOR BREACH OF CONTRACT (OCT 2004)
  - 52.239-1 – PRIVACY OR SECURITY SAFEGUARDS (MAY 2001)
  - 52.242-13 – BANKRUPTCY (JULY 1995)
  - 52.242-15 ALT I – STOP WORK ORDER (APRIL 1984)
  - 52.243-I ALT V – CHANGES/FIXED PRICE (AUG 1987)
  - 52.243-6 – CHANGE ORDER ACCOUNTING (APRIL 1984) – THRESHOLD IS >\$100K
  - 52.243-7 – NOTIFICATION OF CHANGES (APRIL 1984) – IN PARAGRAPHS (B) AND (D), INSERT THE NUMBER “30” IN THE APPLICABLE BLANKS.
  - 52.244-6 - SUBCONTRACTS FOR COMMERCIAL ITEMS (DEC 2004)
  - 52.245-2 ALT I – GOVERNMENT PROPERTY (FIXED PRICE) (JUNE 2003)
  - 52.245-9 – USE AND CHARGES (AUG 2005)
  - 52.245-17 – SPECIAL TOOLING (MAY 2004)
  - 52.245-18 – SPECIAL TEST EQUIPMENT
  - 52.246-15 – CERTIFICATE OF CONFORMANCE (APRIL 1984)
  - 52.247-64 - PREFERENCE FOR PRIVATELY OWNED U.S.-FLAG COMMERCIAL VESSELS (APRIL 2003)
  - 52.249-2 – TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (MAY 2004)
  - 52.249-14 – EXCUSABLE DELAYS (APRIL 1984)
- E-Q7.2.3 Defense Acquisition Regulations (DFAR)
- 252.203-7001 – PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE CONTRACT RELATED FELONIES (DEC 2004)
  - 252.204-7000 - DISCLOSURE OF INFORMATION (DEC 1991)
  - 252.209-7004 - SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MARCH 1998)
  - 252.219-7004 - SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (TEST PROGRAM) (JUNE 1997)
  - 252.225-7001 - BUY AMERICAN ACT AND BALANCE OF PAYMENTS PROGRAM (JUNE 2005)
  - 252.225-7002 - QUALIFYING COUNTRY SOURCES AS SUBCONTRACTORS (APRIL 2003)
  - 252.225-7004 - REPORT OF INTENDED PERFORMANCE OUTSIDE THE UNITED STATES AND CANADA—SUBMISSION AFTER AWARD – THRESHOLD IS >\$500K (JUNE 2005)
  - 252.225-7006 - QUARTERLY REPORTING OF ACTUAL CONTRACT PERFORMANCE OUTSIDE THE UNITED STATES – THRESHOLD IS >\$500K (JUNE 2005)
  - 252.225-7013 - DUTY-FREE ENTRY (JUNE 2005)
  - 252.225-7016 - RESTRICTION ON ACQUISITION OF BALL AND ROLLER BEARINGS (JUNE 2005)
  - 252.226-7001 - UTILIZATION OF INDIAN ORGANIZATIONS, INDIAN-OWNED ECONOMIC ENTERPRISES, AND NATIVE HAWAIIAN SMALL BUSINESS CONCERNS (JUNE 2004)
  - 252.227-7013 – RIGHTS IN TECHNICAL DATA/NON-COMMERCIAL ITEMS (NOV 1995)
  - 252.227-7014 – RIGHTS IN NONCOMMERCIAL COMPUTER SOFTWARE AND NONCOMMERCIAL COMPUTER SOFTWARE DOCUMENTATION (JUNE 1995)
  - 252.227-7015 – TECHNICAL DATA/COMMERCIAL ITEMS (NOV 1995)
  - 252.227-7016 – RIGHTS IN BID OR PROPOSAL INFORMATION (JUNE 1995)
  - 252.227-7019 – VALIDATION OF ASSERTED RESTRICTIONS – COMPUTER SOFTWARE (JUNE 1995)
  - 252.227-7025 – LIMITATIONS ON THE USE OR DISCLOSURE OF GOVERNMENT FURNISHED INFORMATION WITH RESTRICTIVE LEGENDS (JUNE 1995)
  - 252.227-7026 – DEFERRED DELIVERY OF TECHNICAL DATA OR COMPUTER SOFTWARE (APRIL 1988)
  - 252.227-7037 – VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA (SEPT 1999)
  - 252.227-7039 – PATENTS – REPORTING OF SUBJECT INVENTIONS (APRIL 1990)

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252.244-7000 – SUBCONTRACTS FOR COMMERCIAL ITEMS AND COMMERCIAL COMPONENTS UNDER DOD PRIME CONTRACTS (MARCH 2000)

252.247-7023 - TRANSPORTATION OF SUPPLIES BY SEA (MAY 2002)

252.247-7024 - NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA – ALT III (MAY 2002)

252.225-7014 – PREFERENCE FOR DOMESTIC SPECIALTY METALS W/ALTERNATE I – (JUNE 2005)

252.225-7016 - RESTRICTION ON ACQUISITION OF BALL AND ROLLER BEARINGS (JUNE 2005)

252.225-7022 – RESTRICTION ON ACQUISITION OF POLYACRYLONITRILE (PAN) CARBON FIBER (JUNE 2005)

### E-Q1.0 Quality Systems

Requirements shall be in effect for those suppliers who directly supply material to TT Electronics, service, and special process suppliers, regardless of tier.

- Distributors - Distributors shall have a quality system that conforms to AS9120.
- Special Process Suppliers - Special Process suppliers shall have a quality system that conforms to AS/EN9100 or accredited to AC7004 (by PRI-Nadcap).
- Calibration Suppliers - Calibration suppliers shall have a quality system that conforms to A2LA, ISO17025 (Guide 25) or other country certifying body.
- Raw Material Suppliers - Raw material suppliers shall have a quality system that conforms to relevant industry quality standards, and airworthiness regulatory requirements, as required.
- All other suppliers - All other suppliers shall have a quality system that conforms to AS/EN9100.

Conformity to the above quality standards must be evidenced by either: third-party certification; or a TT Electronics approved audit to assess any gaps to the AS/EN9100 requirements.

A supplier not meeting the above quality system requirement may be assessed at any time for reasons not limited to performance, and may be liable for the actual costs of such assessments, at TT Electronics option.

### E-Q2.0 Right of Access

The supplier shall provide TT Electronics and TT Electronics' customer, or a specified third party (customer/regulatory agency), right of access to the facility and all records related to product ordered by TT Electronics or one of its suppliers. TT Electronics reserves the right for TT Electronics, a TT Electronics' customer, or a specified third party (customer/regulatory agency), to perform an audit or inspection at the supplier's facility. Such verification shall not be used as evidence of effective control of quality. This verification does not absolve the supplier of the responsibility to provide acceptable product, and does not preclude any subsequent rejection by TT Electronics or its customer.

### E-Q3.0 Sub-Tier Selection/Control & Contract Requirement Flow-down to Sub-Tier Suppliers

TT Electronics reserves the right to specify or approve sub-tier suppliers contracted by its suppliers for work performed on TT Electronics' material. This includes but is not limited to special process, materials testing services, distributors, and other subcontractors.

- Suppliers shall flow down to its sub-tier contractors, all relevant quality requirements imposed by this manual and other contractual documents, including government-regulatory and Defense requirements.

### E-Q4.0 Special Process Suppliers

Regardless of tier, all suppliers shall use only TT Electronics approved special process suppliers, unless otherwise specified by contract. Any supplier may request that a sub-contractor be added to a TT Electronics' facility's ASL through the appropriate TT Electronics supply chain contact, however, such sources may not be used prior to receipt of documented TT Electronics Quality approval. Actual costs of approval for a new sub-contractor may be the responsibility of the requestor.

- TT Electronics Integrated Manufacturing Services participates in the Nadcap special process accreditation program administered by the Performance Review Institute (PRI). For the processes listed below, all special process suppliers must be Nadcap accredited and approved by TT Electronics unless specifically exempted by contract terms exhibiting a TT Electronics Supplier Quality approval.

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### *Process*

Non-Destructive Testing  
Heat Treating  
Welding  
Chemical Processing  
Coatings  
Material Testing Labs

### E-Q5.0 First Article Production Approval

First Article approval from the ordering TT Electronics site is required. First Articles shall be performed by the supplier in accordance with AS/EN9102.

- The designated quantity of components, randomly selected from a significant production run, must be produced utilizing production tooling, processing and cycle times. This approval includes dimensional and performance requirements and, in some cases, may also include specific visual and functional approvals. Where available, First Article Inspection reports shall be submitted to TT Electronics Quality or specified alternative method per the purchasing.
- In some instances, functional approval of components will be required. The supplier will be notified via PO/contract flowdown by the appropriate TT Electronics purchasing facility when such approval is necessary.

### E-Q6.0 Purchased Part Control

Suppliers must certify, as part of sample submission, compliance with current constraints on restricted substances as specified by PO or contract, especially toxic and hazardous substances.

### E-Q7.0 Process Control for Key Characteristics

Suppliers shall implement a process conforming to AS9103. Suppliers should use the recommended risk management process tools (i.e., PFMEA, Control Plans, Process flow diagrams, etc.) These can be found in the AS9100 Rev. C. SPC data, including quarterly Cp and Cpk summaries for key characteristics identified in the control plan, may be required with each shipment at the discretion of the receiving facility.

### E-Q8.0 Material Identification

The supplier is required to establish a documented system for the control and traceability of all materials. The inspection and test status of all materials should be easily identifiable by the system, and documentation should include a description of any applicable containment areas and/or devices. Parts or products removed from the normal process flow must be positively segregated and clearly marked per AS/EN9100 requirements.

### E-Q9.0 Sampling

The supplier may use reduced-frequency (sampling) inspection plans only when historical records indicate that a reduction in inspection can be achieved without jeopardizing the level of quality. The supplier may employ sampling inspection in accordance with nationally accepted or customer required standards, as-specified by the TT Electronics purchasing business.

- Sampling may not be used to justify the existence of known defectives or discrepancies in a lot.
- The supplier shall maintain quality records in sufficient detail to establish evidence that any sampling was representative, the required tests and verifications were properly performed, and that only material meeting specified requirements have been accepted for production and delivery to TT Electronics. These records shall be available for review by TT Electronics or TT Electronics authorized representative, as required.

Copies of individual records shall be furnished to TT Electronics upon request.

### E-Q10.0 Outgoing Product Controls

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The supplier's quality plan must have sufficient controls to ensure that the product to be shipped conforms to TT Electronics and/or TT Electronics Customer's physical, dimensional and visual requirements. These controls may include final inspection and dock audit (component and packaging) outlined in written procedures and detailed in individual instruction sheets.

### E-Q11.0 Source Inspection

When invoked via contract/PO, the supplier shall support Source Inspection activities by TT Electronics, Customer, or Government representatives. The supplier will contact the appropriate party for source inspection upon completion of the product in such cases.

Product shall not be shipped until source inspection has been completed including appropriate documentation. If the supplier has difficulty in reaching the appropriate source inspector, they shall contact their buyer for support without undue delays.

### E-Q12.0 Drawing and Change Control

The supplier's quality system must ensure that the latest engineering drawings and specifications are available at the manufacturing, test or inspection location. This includes applicable previous revisions if TT Electronics contract/PO language requires other than the most recent revision(s).

- The written procedure(s) should indicate the method utilized for receipt, review or distribution of all changes and the method of recalling and disposing of an obsolete item.

A review process must be established in that system to confirm that applicable drawings and specifications are at the latest revision level with the issuing source.

### E-Q13.0 Records

The supplier must retain adequate quality system records, not limited to all advanced quality planning documents, process guidelines, laboratory test instructions, gauge/test equipment verification and calibration and performance test methods.

- In addition, the supplier must retain quality performance records, not limited to control charts, FAI, inspection and test results.

At a minimum, the supplier must retain the records for the periods indicated herein and make them available for review as required:

- Quality system records (control charts, inspection and test records, audit records) - 10 calendar years
- Quality performance records (production part approvals, purchase orders and amendments, tooling records) - one calendar year after part production is discontinued. For some TT Electronics facilities, the above records must be retained for longer than 10 years (The supplier will be notified via PO/contract when this is a requirement).

The supplier agrees to transmit to TT Electronics, those records kept in support of TT Electronics work, in event that the supplier discontinues business operations.

### E-Q14.0 Changes to Process, Product, and/or Supply Chain

Direct material suppliers are required to obtain documentation of TT Electronics approval prior to implementing any change. This requirement includes direct material suppliers, including distributors. Applicable 'changes' include but are not limited to:

- Approved production processes
- Materials
- NDT and special processing
- Change of sub-tier suppliers for raw materials, purchased components or services
- Change to test/inspection sequencing or methods
- For bulk material suppliers: Alternative source of raw material from new or existing suppliers
- For distributors: Alternative sources of component parts other than those previously qualified

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The continuous improvement philosophy encourages process improvements. However, prior to any modification to a process being implemented, the supplier must complete all verifications and tests necessary (including preliminary capability studies) to ensure that a new process continues to yield components that meet specifications. First article requirements per AS/EN9102 always apply.

### E-Q15.0 Internal & Sub-Tier Audits

A supplier must conduct regular audits to ensure continued compliance with internal procedures and customer requirements; these audit activities must include internal and sub-tier suppliers.

To ensure internal audits are conducted appropriately and consistently, a supplier must have a procedure with established guidelines for conducting an audit. At a minimum, the audit procedure will establish:

- Responsibility
- Frequency
- Scope
- Distribution/review
- Correction action format

### E-Q16.0 Foreign Object Debris/Damage (FOD) Prevention program

Product suppliers must have a FOD program for the purpose of prevention, detection, and removal of foreign objects. The program should meet the following requirements as applicable:

- FOD prevention must be implemented in all areas as applicable and FOD training awareness must be given.
- Parts must be protected from handling damage in all areas; material handling awareness training must be provided to all employees and handling standards documented.
- Supplier must document all FOD incidents and perform root cause analysis.
- Metrics must be documented if FOD incidents occur.
- If critical FOD areas are noted / required, Physical Entry Controls shall be established with entry requirements visually posted outside each area. Internal auditing of FOD prevention in all critical FOD areas must be conducted and documented.

### E-Q17.0 Nonconforming Material

Suppliers shall begin containment action upon discovery/notification of a product nonconformance. For all non-conformances identified by a TT Electronics facility through an NCR, and unless otherwise specified, the supplier shall submit a formal corrective action response with containment actions (within 24 hours) and corrective actions (within 14 calendar days) from receipt of a corrective action request. If the product may have escaped their facility and have been shipped to TT Electronics and or its Customer, the supplier will notify their respective TT Electronics buyer.

- For product that has been found or suspected discrepant prior to shipment to TT Electronics, all requests for approval for repair or to be "used as is" must be submitted to TT Electronics for approval, following a material deviation request, and material must be held at the supplier's address pending receipt of documented Eaton approval, prior to further processing and/or shipment of nonconforming material.
- For products identified or suspected as nonconforming returned from the customer's facility; performance testing; and/or field vehicles, the analysis must determine the cause(s) of the nonconformance. Failure to respond to a corrective action request may result in penalties up to and including suspension and/or removal from the TT Electronics ASL.

### E-Q18.0 Certification of Conformance (C of C)

Unless otherwise specified by PO/contract, a supplier must provide adequate certification of conformance for all materials and processes specified on the purchase order or contract, for each shipment. Where available, these may be submitted electronically via e-mail.

Suppliers are responsible for all PO terms and conformity characteristics per the PO/contract accepted, i.e., for tier 1 (direct) suppliers delivering a product which includes sub-contracted or special processes, all such processes must be indicated on the direct supplier's certificate of conformance.

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When required by contract, components procured from a supplier holding an applicable Airworthiness Approval from their local regulatory authority, those components are to be supplied with the applicable Airworthiness Tag/Certification (i.e., EASA Form1 or 8130). This is particularly important for proprietary parts that may not be readily inspected / tested on receipt.

In addition to any specific requirement for Airworthiness Release Tags, the basic categories of C of C documentation for all products or services are General, Special Process, Raw (Mill) Material, and Age-Sensitive materials.

- **General Certificates**

A general certification of conformance, signed by the Quality Management Representative or designated company officer, shall be used for all parts and materials, unless otherwise indicated herein.

An approved format is shown in E-Q38. This form, or TT Electronics approved equivalent, shall be used unless otherwise specified by contract/PO. For machined components; if the supplier also supplies the raw metallic material, a copy of the original mill certificate shall be provided.

- **Special Process Certificates**

In addition to the general certification, an additional special process certification is required.

The certificate of conformance will contain at a minimum:

- the process(s) performed
- the specification number
- revision level
- purchase order number
- part number
- lot size
- sample size
- applicable process specifications/controls
- applicable test results
- serial numbers where applicable to contract

If the job was processed using a Nadcap accredited process, the supplier shall include a statement indicating the job was processed per their Nadcap accreditation, and shall include their accreditation number and expiration date.

- **Raw Material (Mill) Certificates**

Raw metallic materials (including forgings and castings) supplied shall include a copy of the original mill certificate or material test report (certification) from a test lab acceptable to TT Electronics.

Raw material mill certifications may not be altered or have any markings other than check marks from verification of physical and chemical values and/or indication of inspection acceptance. Stamps may be applied by warehouses/distributors to add incidental information such as the TT Electronics purchase order, weight shipped, etc.

- Casting and forging suppliers shall also include the physical or mechanical properties with heat treat batch-lot numbers.
- When required by contract/PO, certification shall show that all materials comply with all Government requirements including country of origin and country where the material is melted.

- **Age-Sensitive Material Certificates include Hose & Sleeving**

Age Sensitive Material suppliers shall additionally supply the lot number, source construction number (hose/sleeve only), and cure date (age-sensitive items) within the C of C document.

### E-Q19.0 DFAR Preference for Domestic Specialty Metals

Where required by contract or PO, DFAR requirements shall apply.

“Specialty Metals” means: Steel – With a maximum alloy content exceeding one or more of the following limits:

manganese, 1.65 percent; silicon, 0.60 percent; or copper 0.60 percent; or, Containing more than 0.25 percent of any of the following elements: aluminum, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, or vanadium;

Metal alloys - consisting of nickel, iron-nickel, and cobalt base alloys containing a total of other alloying metals (except iron) in excess of 10 percent;

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Titanium and titanium alloys; or, Zirconium and zirconium base alloys.

### DFAR Specific Requirements

Any specialty metals incorporated in articles delivered to TT Electronics when this Manual is referenced by contract or Purchase Order shall be melted in the United States, its possessions, Puerto Rico or a qualifying country. (Reference DFAR)

- This requirement shall be flowed down to all sub-tier raw material sources.
- Prior TT Electronics approval is required if specialty metals not meeting the requirements are planned for use in articles delivered under contract or purchase order to TT Electronics sites. Any and all exceptions to this requirement shall be noted on the Certification of Conformity.

### E-Q20.0 Supplier Validation of Raw Material

Unless material is procured directly from TT Electronics, the supplier shall perform & document periodic validation of test results for raw materials per AS/EN9100 requirements; if purchased using accredited inspection services approved by TT Electronics.

### E-Q21.0 General

Suppliers' personnel performing process control and inspection functions shall be identified and given sufficient, well-defined responsibility, authority and the organizational freedom to identify and evaluate quality problems; and to initiate, recommend, and provide solutions to TT Electronics Integrated Manufacturing Services.

ISSUE	REVISION DESCRIPTION	DATE APPROVED
01	New Form	6/1/12
02	Updated Q10 to state "on 1 <sup>st</sup> shipment" instead of "this order"	7/17/12
03	Added Q32 Record Retention Requirements	8/20/12
04	Added E-Q's for Eaton flow downs	9/7/12
05	Added Q33 1 <sup>st</sup> article requirements.	11/9/12
06	Added Q34 - Reformatted clause numbers to align with customer numbers	6/21/13
07	Updated company logo; minor formatting and clerical changes; no changes were made to any clause;	7/13/16