



# TELEDYNE ADVANCED ELECTRONIC SOLUTIONS (TAES) SUPPLIER QUALITY REQUIREMENTS

*Quality Program provisions are an integral part of the Purchase Order. Section I (A – S) is applicable to all Purchase/Subcontract Orders. The applicable Section II Quality Program provisions are indicated by number on the first page of the Purchase Order or Purchase Change Order in the description block labeled “Q.P. Rider Provisions”. The text for the numbers identified is defined in Section II herein, in numerical sequence. The term “Buyer” means Teledyne Advanced Electronic Solutions and the term “Seller” means the legal entity, which is the contracting party with the Buyer with respect to the purchase order.*

## SECTION I: GENERAL QUALITY ASSURANCE REQUIREMENTS APPLICABLE TO ALL PURCHASE / SUBCONTRACT ORDERS (MANDATORY):

- A. RESPONSIBILITY FOR COMPLIANCE** Seller is fully responsible for ensuring compliance to all the requirements of the Purchase Order including referenced Section II Quality Rider Provisions listed herein as specified on the Purchase Order. Performance of inspection and test by the Buyer’s representatives or the Buyer’s Customer representatives at either the Buyer’s or Seller’s facility shall not relieve the Seller of responsibility to furnish items which conform to the requirements of the procurement document. Seller shall control sub-tier procurements. Quality Riders included in the Teledyne Purchase Order and Customer requirements shall be flowed down to Seller’s sub-tier suppliers. Objective evidence of sub-tier control shall be available for review by Teledyne at reasonable requested times.
- B. NONCONFORMING MATERIAL** Seller is not authorized to perform Material Review Board (MRB) disposition of nonconforming material, with the intent of delivering such nonconforming materials, without expressed written authorization from the Buyer. Departures from drawings and specifications shall be approved by Buyer’s Material Review Board prior to shipment. Supplier to submit a Supplier Deviation Request (SDR) Form to the Buyer/Subcontract Administrator for Material Review Board processing at the Buyer’s facility.
- C. RESUBMITTAL OF REJECTED MATERIAL** All material rejected by the Buyer and subsequently resubmitted by the Seller shall bear adequate identification of such resubmission either with the material or the Seller’s shipping document. Reference shall be made to the Buyer’s rejection document and evidence given at the time of shipment or at Final Source Inspection that the causes for rejection have been corrected. Government Source inspected material shall have evidence that the resubmission has also been re-inspected by the Government Representative.
- D. CHANGE OF PRODUCT, PROCESS OR FACILITIES** The Seller/Manufacturer shall not implement any major changes in design, materials, processes or control without prior submission to the Buyer for review and approval. Major changes shall be defined as any change affecting performance, quality, reliability, ESD class or interchangeability. The intent of this requirement is to ensure all material supplied under this order will be homogeneous and the performance, reliability and quality of the material is not degraded. Changed items shall be clearly identified in a manner different from the original items. Buyer shall be notified of any production/manufacturing change in facilities locations.
- E. DOCUMENTATION REVISIONS** Unless specifically noted, specifications and/or drawings referred to in the Purchase Order shall be the revision in affect as of the date of the Purchase Order acceptance.
- E. CLEAN AIR ACT COMPLIANCE** The use of Ozone Depleting Chemicals (ODC’s) in the processing of materials or products delivered for this order is not allowed. If the product requires the use of ODC’s, the Teledyne buyer must be notified prior to the initiation of work on the order. If ODC’s are used, Teledyne requires that they must be used in compliance with existing laws and delivered items must be labeled in accordance with those laws.
- G. PREFERENCE FOR DOMESTIC SPECIALTY METALS (MILITARY ORDERS)** Any specialty metals incorporated in articles delivered under this contract shall be melted in the U.S., its outlying areas, or a qualifying country listed in DFARS 252.225.7008 & 252.225.7009 is imposed in regards to specialty metals as applicable. Exemptions to requirements of the above clauses may exist, as outlined in the clauses themselves or by operation of applicable Department of Defense Domestic Non-Availability Determinations (DNAD) posted on its public web site for that purpose.
- H. COUNTERFEIT RISK MITIGATION** Seller shall maintain a counterfeit item risk mitigation process internally and with its suppliers in compliance with the requirements set forth within. Seller represents and certifies that any and all electrical, electronic and electromechanical parts (hereinafter “Parts”) supplied and delivered to Buyer by Seller under this purchase order are new and authentic and are not counterfeit and that the Parts have not been marked or remarked to disguise or falsely represent the identity of the manufacturer. Seller is not authorized to deliver any item procured from sources other than the Original Component Manufacturer (OCM), or their authorized distributors without prior written authorization from Buyer in writing. Seller shall demonstrate that parts are new and authentic by providing an unbroken supply chain trail from original manufacturer via original Certificate of Conformance (C of C). Use of Un-franchised parts is prohibited unless Buyer authorizes procurement in writing.

- I. SAMPLING** The Buyer reserves the right to use either MIL-STD-105(E) or ANSI Z1.4 Sampling Plan for acceptance or rejection of supplies under this order.
- I. CALIBRATION SYSTEMS REQUIREMENTS** The Supplier is responsible for the calibration, accuracy, validation and maintenance of any equipment, tooling or gages utilized by the Supplier to produce, inspect or test articles to be delivered under this Purchase Order. The calibration system shall be in accordance with documented standards such as ISO 17025, MIL-STD-45662A, ANSI/NCSL-Z-540-1, or ISO 10012-1. Traceability of such system shall be traceable to the National Institute of Standards and Technology (NIST).
- K. PACKAGING, PRESERVATION AND STORAGE** The Supplier shall control all preservation, packing, storage, shipping and handling to assure that all materials are adequately protected during all phases of Procurement performance and assure compliance with any special handling and shipping requirements further delineated in Section II or Procurement document.
- L. EXPORT COMPLIANCE** Information provided may be considered a US Export controlled item(s) and the release of technology or source code, subject to the United States export rules and regulations is prohibited unless the appropriate authorization(s) are obtained prior to release to a foreign entity. The recipient of any controlled information must comply with all applicable export regulations and export licensing requirements.
- M. ACCESS TO FACILITY** Seller shall allow Access to Teledyne AES, its Customer and any Regulatory authorities to all facilities involved in the order and to all applicable records. A formal Request of the visit would be coordinated in a timely manner for all parties.
- N. FOREIGN OBJECT DAMAGE / ELIMINATION (FOD) CONTROL** The Seller shall establish and maintain an effective Foreign Object Damage (FOD) Prevention Program to reduce FOD. NAS412 and AS9146 may be used as a guideline. The program shall utilize effective FOD prevention practices. The program shall be proportional to the sensitivity of the design of the product(s) to FOD, as well as, to the FOD generating potential of the manufacturing methods.
- O. QUALITY MANAGEMENT SYSTEM** The Seller's Quality Management System shall be in accordance with the current revision of AS9100 and / or ISO 9001. Certificates shall be provided as evidence. Distributors that do not have AS9100 / ISO9001 shall require certification from their Suppliers. Teledyne Quality Assurance reserves the right to conduct an audit and / or review / investigation on uncertified Suppliers. If Seller loses its registration status by third party, it shall notify Teledyne's Quality Assurance within three (3) days of receiving such notice.
- P. SUPPLIER RATING SYSTEM** Teledyne maintains a supplier performance rating system. Purchasing rates the Supplier performance in the areas of on-time delivery and quality. The target OTD rating is 90% and the target blended quality rating is 95. At the beginning of each month, Purchasing will generate a supplier performance report for the previous month for all suppliers. KEY Suppliers, whose 1-month average rating in either of the performance areas identified above falls below the target, may be identified as a high-risk supplier for future program kick-offs and a risk mitigation plan created. Teledyne identifies KEY suppliers as those that represent the top 70% of the value of the spend dollars per month (and others identified as KEY suppliers by the Buyer/Planner team members). Non-KEY Supplier ratings will also be reviewed monthly to determine if any corrective action is necessary.
- Q. SUPPLIER AWARENESS** Supplier shall inform their employees and sub-tier suppliers of their contribution to product or service conformity and product safety. Suppliers are responsible for ensuring that all personnel are competent to perform work and ethical in all actions.
- R. RECORD RETENTION** The supplier and their sub-tier suppliers shall retain all of their inspection, examination, test and certification records for a period of at least seven (7) years after the completion of this purchase order unless otherwise specified.
- S. J-STD-003: SOLDERABILITY TEST FOR PRINTED BOARDS** The supplier shall be in full accordance with J-STD-003. All test reports, analysis and certifications shall be included with the product
- T. J-STD-004: SOLDERING FLUXES** The supplier shall be in full accordance with J-STD-004 and meet the requirements for the classification and characterization of fluxes for high quality solder interconnections when TAES is ordering soldering fluxes. All test reports, analysis and certifications shall be included with the product.
- U. J-STD-005: SOLDERING PASTE** The supplier shall be in full accordance with J-STD-005 and meet characteristics of solder paste through the definitions of properties and specification of test methods and inspection criteria when TAES is ordering soldering paste. All test reports, analysis and certifications shall be included with the product.
- V. J-STD-006: REQUIREMENTS FOR ELECTRONIC GRADE SOLDER ALLOYS AND FLUXED AND NON-FLUXED SOLID SOLDERS** The supplier shall be in full accordance with J-STD-006 and meet the alloy composition and impurity level classified when TAES is ordering any Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders. All test reports, analysis and certifications shall be included with the product.

## **SECTION II: QUALITY RIDER PROVISIONS AS ASSIGNED PER PO**

### **013. SOLDERABILITY / PRE-TINNING TESTING REQUIREMENT**

The seller, in performance of this order, is to certify that the external leads, pins, terminals and wires of all components and parts have been tested to satisfy the solderability requirement of this purchase order per J-STD-002.

**014. SOLDERABILITY TEST CERTIFICATION** The supplier shall certify that the external leads, pins and terminals of all components and parts have been tested to satisfy the solderability requirement of J-STD-002 Category 1. This certification shall accompany each lot of product. All test reports, analysis and certifications shall be included with the product.

**112. GOVERNMENT SOURCE INSPECTION – MILITARY CONTRACTS** Government Inspection is required prior to shipment from your facility. Upon receipt of this order, promptly notify the Government Representative who normally services your plant so that appropriate planning for Government Inspection can be accomplished.

**113. GOVERNMENT / CUSTOMER SURVEILLANCE** The Government and/or Teledyne Customer have the right to inspect any or all of the work included in this order at the Supplier's Plant. During performance of this order, your Quality Control or Inspection System and Manufacturing Processes are subject to review, verification and analysis by authorized Government/Customer Representatives. Government/Customer Inspection or release of product prior to shipment is not required unless you are otherwise notified.

**114. TELEDYNE IN PROCESS / FINAL SOURCE INSPECTION** Teledyne will perform In-Process or Final Source Inspection at a mutual agreed process. Notification of Source Inspection dates shall be made through Teledyne Purchasing and shall allow a minimum of three (3) working days for allocated travel for the Teledyne Quality Representative.

**222. FIRST ARTICLE (AS 9102)** A unit of the product being purchased, representative in every way of the product to follow, shall be identified and designated "First Article" and shall be approved by Teledyne Quality Assurance One (1) legible and reproducible copy of the Supplier's Inspection Report shall accompany the "First Article" submitted. This report shall contain, as a minimum, the following:

- (1) The Teledyne Purchase Order Number.
- (2) The Specification or Drawing Number, including the Revision Level to which the product was built.
- (3) A list of actual measurement data taken from the "First Article" on a form and in a format, which can be used to verify the results.

If the report is not 100% complete, please explain the omissions. If the product on which the "First Article" report was manufactured changes in any way, a new report is required. The new "First Article" report may cover only the changed items and those items affected by the change. Specific details on those items proposed for inspection shall be submitted with the request for the abbreviated/delta "First Article".

Inspection performed on a prototype product is not considered a "First Article" and cannot be used in lieu of one without written concurrence of Teledyne prior to any further submittal of the purchase quantity of the same product. Any additional submittal of the purchased quantity shall be at the Supplier's risk.

**230. PART SUBSTITUTION NOT PERMISSIBLE** The Substitution of "better than" parts is NOT permissible on this Purchase Order.

**232. PRINTED WIRING BOARDS** PWB's supplied under this order shall conform to IPC-A-600 "Acceptability of Printed Wiring Boards" and the Teledyne document T/L-40A266, "Specification for the Purchase of printed Wiring Boards". The classification shall be class 3 (unless specifically designated otherwise). Cross-sections, thermally stressed coupons, test coupons and solder sample are to be provided with every lot and/or date code.

**235. TIN LEAD FINISH REQUIRED** The product provided on this order must have a finish that consists of tin/lead coated soldering with at least a 3% (minimum) lead content. The Supplier shall not provide any products on this order that contains a pure tin finish to the component surface without written directions from the Buyer.

**236. TIN LEAD AND GOLD FINISH EXCEPTIONS** Devices with tin terminations containing less than 3% lead and Devices that have Gold terminations, do not have to be tinned per Customer exceptions.

**331. TRACEABILITY OF MATERIALS GENERAL** The Supplier shall provide traceability information to Teledyne on all materials, parts and assemblies used in fabricating the product. Traceability shall be maintained to the Supplier's procurement documents for materials used on this order.

**334. DATE CODE CONTROL** Class B Mission: No Electronic Parts with Manufacturers date codes older than 3 years can be accepted.

**335. DATE CODE CONTROL** Class C Mission: No Electronic Parts with Manufacturers date codes older than 5 years can be accepted.

**336. LOT CONTROL** Lot control is required. Lot number/date code is to be identified on outside of intermediate and/or unit packages. When more than one lot/date code are shipped together, individual lot/date codes are to be segregated and identified on outside of intermediate packages.

**337. DATE CODE CONTROL** No Electronic Parts with Manufacturers date codes older than 2 years can be accepted.

**338. CONTROL OF FACTORY REELED PRODUCT** This order requires the Vendor/Distributor to only furnish factory reeled product. No sub-tier tape and reel services desired. Written Authorization from TAES QA required to deviate on this order.

**339. OUTSIDE VENDOR SERVICES (OSV) – TINNING** The Seller shall ensure that all tinned parts meet the cleanliness requirements as specified in IPC-A-610 Para. 10.6.1. Processing using no-clean flux is exempt from this requirement. Components must be dried so as to remove any residual moisture and baked to meet the MSL requirement on the Manufacturers original packaging. Components are to be repackaged in a manner consistent with the original Manufacturers packaging, including tape and reel, matrix trays, waffle packs, etc., and sealed in an ESD safe package consistent with the manufacturer's MSL specification. Over packing shall be such as to ensure arrival at Teledyne in satisfactory condition.

**441. LIMITED (SHELF) LIFE AND TEMPERATURE OR LIGHT SENSITIVE MATERIAL** The Supplier shall, in addition to the prescribed identification of the deliverable items, label each container with the date from which the specified life period begins. Any other special handling, storage or identification requirements shall also be described on the container. **All special handling, storage temperatures (besides room temperature) or other identification requirements shall be recorded on any required certifications and on the shipping documents for the material.** The Manufacturer's batch or lot number shall be marked on each unit package. Upon receipt of this material at Teledyne, a minimum of 75% of its shelf life must remain. Moisture Sensitive Level components greater than 1 must be packed in a sealed Moisture Barrier Bag (MBB) with a desiccant and moisture level indicator. The MBB must have a moisture sensitive label indicating the MSL of the component inside.

**443. MATERIALS/PARTS / WIRE IDENTIFICATION** Materials, parts and spools of wire on this order must be legibly and permanently identified with:

- (1) Purchase Order Number
- (2) Gauge (Wire Only)
- (3) Military Specification Number (if applicable)
- (4) Teledyne Specification / Part Number
- (5) Manufacturer
- (6) Lot Number/Date Code

**444. STATIC SENSITIVE DEVICES – HANDLING PACKAGING AND MARKING** The Seller shall implement an electrostatic discharge control program in accordance with ANSI/ESD-S-20.20 or equivalent. The seller shall have a Compliance Verification Plan in place showing they are performing process monitoring (measurements) and shall be made available to the buyer upon request. Product shall be processed in a manner to protect from ESD damage. Product packaged for shipping shall be labeled to alert all handlers that the devices require

special handling.

**448. SERIAL NUMBER CONTROL** Serial Number control is required. All parts, shipping documents and unit container shall be identified with the Serial Number assigned.

**550. CERTIFICATE OF COMPLIANCE – GENERAL** The Supplier shall provide a legible and reproducible signed statement certifying that the product or service meets the requirements of Purchase Order, unless otherwise disclosed. All exceptions shall be traceable to a Teledyne approved deviation or waiver.

**551. CERTIFICATE OF CONFORMANCE – MILITARY ORDERS** Each shipment shall be accompanied by a legible and reproducible certificate of conformance to the procurement requirements, authenticated by the signature of an authorized representative, which shall include as a minimum:

- (1) Seller's name and address
- (2) Manufacturer's name, if different from Seller's
- (3) Purchase Order Number, Part Number, and Manufacturer's Lot Number/Date Code

**552. MATERIAL CERTIFICATION – EXTREME ENGINEERING ORDERS** For every order of service on PN 152-002367, the material used for touchup coating shall be added to the Certificate of Conformance to ensure Customer Requirements and traceability are met.

**554. TEST CERTIFICATION** Each shipment shall be accompanied by a legible and reproducible Supplier's Certification, identifiable with the submitted material, stating that test reports for the material are on file and available for examination by Teledyne. The certification shall be authenticated with the signature of an authorized representative of the Supplier or the agency performing the test.

**558. Mercury Containing Compounds** Each shipment shall be accompanied by a legible and reproducible Supplier's Certification, identifiable with the submitted material, stating that mercury or mercury containing compounds shall not be intentionally added to or, have come in to contact with hardware or supplies furnished under this contract. The supplier certifies that articles delivered under this PO/contract do not contain and have not been exposed to any mercury or mercury containing compounds to the best of the supplier's knowledge.

**559. ORIGINAL MANUFACTURER'S CERTIFICATE OF CONFORMANCE** Each shipment shall be accompanied by a legible Certificate of Conformance stating that the product ordered complies with the requirements of the Purchase Order and shall also be accompanied by a Certificate of Conformance by the original Manufacturer of the product being procured. The Certificate of Conformance shall include as a minimum:

- (1) Manufacturer's name and address
- (2) Part Number, Lot Number/Date Code

**661. TEST REPORTS** Each shipment shall be accompanied by a legible and reproducible copy of actual test results of the material submitted, identified with specified test parameters defined as operational, mechanical, electrical, hydraulic, inspection, etc. when the data is submitted in a format that is not comparable to the Teledyne specification. A parameter and test condition cross reference sheet must be supplied. These reports shall be authenticated by the signature

of an authorized representative of the agency performing the tests.

**662. NADCAP APPROVAL (NGC ORDERS)** Supplier shall be responsible to ensure that all special processes performed either by Supplier or Sub-contractor, be accredited by the National Aerospace and Defense Contractors Accreditation Program (NADCAP) OR provide evidence that process is approved by Northrop Grumman Corporation. Retain all Nondestructive Testing (NDT) records and results, including X-ray film, for a minimum of four (4) years from product shipment. Certification approval shall be provided to Teledyne upon request.

**663. NADCAP OR RAYTHEON APPROVAL (RAYTHEON ORDERS)** Plating, surface finishes, conditioning specifications, or heat treatment required by Raytheon Technical Data Packages shall be performed by approved National Aerospace and Defense Contractors Accreditation Program (NADCAP) Processors, Raytheon Approved Processors, or Raytheon Approved Manufacturers. Suppliers shall provide, in writing, the company name performing the process and state whether it was NADCAP or Raytheon approved for that process at the time it was performed.

**664. NADCAP APPROVAL OR A2LA (UNITED TECHNOLOGIES ORDERS)** Supplier shall be responsible to ensure that all special processes performed by Supplier or Sub-contractor, be accredited by the National Aerospace and Defense Contractors Accreditation Program (NADCAP) OR have American Association Laboratory Accreditation (A2LA).

**669. LOT SCREENING AND BURN IN ATTRIBUTE DATA** Seller shall include one copy of lot screening and Burn-In summary with each shipment. The summary shall include the conditions of test, quantity tested and quantity rejected at each test or screen.

**774. BEST COMMERCIAL PACKAGING** Packaging and packing shall be in accordance with best commercial practices. Methods used shall be sufficient for protection against damage from normal handling, shipping, and storage conditions. ESD precautions shall apply as applicable per QP Rider 444.

**779. INDIVIDUAL PACKAGING** Finished parts shall be adequately protected to prevent damage during handling and shipment. Parts shall be individually wrapped, bagged or otherwise protected to prevent part-to-part contact/damage when packaged within a larger pack. The Supplier shall be responsible to determine method of packaging to assure adequate protection during transit.

**887. SPECIAL FLOW DOWN REQUIREMENT FOR NORTHROP GRUMMAN CORPORATION PROGRAMS** The requirements of specification 2372A30 (Compliance Program) apply to this order. Vendor is responsible for compliance to this document.

**900. RoHS COMPLIANCE** The supplier shall be in full accordance with RoHS regulations (Directive 2002/95/EC) and documenting their testing results for RoHS controlled substances.

**953. GOVERNMENT CORRECTIVE ACTIONS** The seller shall notify TAES

of any Corrective Actions they have received from the United States Government on this product line.

**975. IPC/WHMA-A-620 CERTIFICATION** All wiring cable harness assemblies on this order must have Certificate of Conformance that inspection occurred to the IPC/WHMA-A-620 Requirements and Acceptance of Cable and Wire Harness Assemblies criteria.

**976. IPC-QL-653** Certification of Facilities That Inspect/Test Printed Boards, Components and Materials. This specification establishes the certification requirements for facilities that inspect/test printed boards, components and materials.

**977. IPC-MI-660** Certification Incoming Inspection of Raw Materials. Guidelines for Incoming Inspection of Printed Board Materials.

**978. Single Lot Date Code.** Components are manufactured in one continuous manufacturing run and all raw materials shall be from a single batch. Lot shall be processed through all the manufacturing steps on the same equipment without change to the original setup.

**979. DPA.** Parts shall have Destructive Physical Analysis completed to Goddard S-311-M-70 standards, using the sample size identified in the PO. The DPA report shall be included with shipment of the parts.

**980. Group A Testing.** Parts shall have Group A testing completed to MIL-STD-883, using the sample size identified in the PO. The Group A testing report shall be included with shipment of the parts.

**981. Group B Testing.** Parts shall have Group B testing completed to MIL-STD-883, using the sample size identified in the PO. The Group B testing report shall be included with shipment of the parts.

**982. Group C Testing.** Parts shall have Group A testing completed to MIL-STD-883, using the sample size identified in the PO. The Group C testing report shall be included with shipment of the parts.

**983. Group D Testing.** Parts shall have Group A testing completed to MIL-STD-883, using the sample size identified in the PO. The Group D testing report shall be included with shipment of the parts.

**984. Group E Testing.** Parts shall have Group A testing completed to MIL-STD-883, using the sample size identified in the PO. The Group E testing report shall be included with shipment of the parts.

**985. Pre-Cap Source Inspection.** Items on this procurement require precap source inspection by TAES, subsequent to 100 percent precap visual inspection performed by the Seller. Seller shall notify TAES Procurement or Quality Organization representative no less than five (5) working days prior to the time that the items are ready for inspection. Evidence of precap inspection shall be included with shipment.

**986. Final Source Inspection.** Inspection by TAES must be performed at Seller's facility prior to shipment, subsequent to 100 percent final visual inspection performed by the Seller. Seller shall notify TAES Procurement or Quality Organization representative no less than five (5) working days prior to the time that the items are ready for inspection. Evidence of TAES source inspection must accompany or be shown on the shipping documents.

**987. As Designed As Built List.** Supplier shall provide a final "As Designed As Built" summary of build with material delivery. As Designed As Built List Shall be provided with shipment of parts.

**988. Surge Testing.** Parts shall be 100% Surge Tested to the following conditions.

- 10 consecutive cycles at both -55oC and +85oC,
- Applied voltage DC rated +/- 2%,
- Energy storage bank of 50000 microfarad (mf) minimum across the input terminals,
- Charge and discharge time of 4 seconds.
- Total DC resistance of the of wiring and connections to be 1 ohm +/- 2 ohms including the impedance of the power supply.

The Surge Testing Report Shall be included with shipment of the parts.

**989. Dimensional Inspection Sampling** Parts shall dimensional inspected to AQL = 1.0, sampling per ANSI/ASQ z1.4, level iii, AQL xx (except all sample sizes shall be accept on "0" reject on "1") is acceptable.