

# Appendix QX Supplier Quality Requirements

## REVISION RECORD

The latest issue to this document is the version that is available on the Lockheed Martin Aero website: <http://www.lockheedmartin.com/material-management>.

| Revision       | Date       | Changes  |
|----------------|------------|--|
| Original Issue | 03/28/2002 | Completely revised / replaced QR to separate and clarify Program, Commodity, and General application of Quality Requirements based on Program application. This serves as a “pilot” version for other procurements. Adds Revision Record, Table of Contents, and Tables to enable supplier to identify the LM Program and understand which quality system and quality requirements apply based on his product (commodity) type.  |
| Revision A     | 5/31/2002  | Added definition of “Item or Items” in Document Overview paragraph; clarified First Article Inspection (FAI) requirements in paragraphs 2.3.1, 3.3, & 3.4; added the words “as applicable” to paragraph 2.3.6.1.8  |
| Revision 2     | 8/11/2003  | Changed revision scheme to numbers to align with LM AeroCode guidelines. Removed references to all other Programs to dedicate QX to F-35 JSF suppliers only. Added COTS to Table 2. Added Service Providers to Table 1. Added Test Items to Table 1 and incorporate self-deleting requirements for Test Items. Refined Deliverable Software requirements in Table 1. Enhanced FAI requirements in Para. 3.3 to include instructions for FAI in 3D Model Environment. Incorporated tooling quality requirements. Added Para. 3.5.4 prohibiting use of freeware, shareware, etc. without IPT approval. Aligned NCM control & QCS-001 sections with Appendix QR changes. Added F-35 JSF Critical Part categories to Para. 4.13. Added additional calibration references to Para. 4.19. Renumbered paragraphs and tables to align with changes. Updated web links to coincide with new websites. |
| Revision 3     | 2/13/2006  | Removed references which limited the entire Appendix QX to F-35 (JSF) suppliers only – Appendix QX replaces Appendix QR in its entirety. Major re-alignment of paragraphs to enhance flow of quality requirements. Revised tables to include industry standards and program specific requirements. Added AS9100 requirement for F-35 (by 1 Jan 2010) and AS9120 for Distributors (by 1 Jan 2008). Added Service Centers to listing of “Commodity/Product” in Table 1. Re-worded and re-named section on “Selection, Control and Contract Flow Down to Quality Control Specification (QCS)-001 Sources” to flow requirements of Appendix QJ, where applicable.  |

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| Revision 4 | 3/30/2007 | <p><b>Deleted:</b> (1) Table 2, its Notes and any references within the document; (2) Requirement for a copy of written correspondence addressing QX requirements to be provided to Buyer's PQA representative; (3) Para. 1.4.1, 1.12, 1.13.3, 2.04, 2.05, 2.8.1, 2.8.3 &amp; 2.9 (4) 3<sup>rd</sup> and 4<sup>th</sup> bullets from 2.0 (5) Note 5 in Table 1 referencing F35 (6) Bullets from 2.1.2; (7) The word "segregation" from 2.3.1; <b>Clarified:</b> (1) 1.0 Quality Requirements; (2) 1.7 Records – added "tooling controlled per TMS-MC-015"; 1.10 Calibration – added "MIL-STD-45662"; (3) 1.11 Tooling as a Media of Acceptance – added requirement for Seller to periodically validate their manufactured/owned tooling used as a media of acceptance; (4) Table 1 – Added "buyer-approved Distributors" to last item; Table 1 Notes – revised Note 1 to address Buyer-approved distributors; (5) Table 1, Note 1, added "Buyer-approved distributors must either meet ISO, AS, Military equivalent or QCS-122 Quality System; (6) Table 1, Note 5; (7) 2.01 changed "not less than 5 days" to "not more than 5 days; (8) 2.2 added "Industry" to standards; (9) 2.3.1 added "Repair" to disposition (10) 2.3.2 added "or Items in transit to Buyer"; (11) 2.3.4 changed "returned" to "rejected" (12) MRB 2.6.3 &amp; 2.6.4 <b>Re-Written:</b> (1) 1.1 Quality System Changes; (2) Table 1, Note 5 "Service Centers; (3) 2.01 &amp; 2.02 to incorporate 2.05 ; (4) Bulleted lines in 2.0 "Point of Acceptance" made sub-paragraphs; (5) 2.6.4 Seller corrective action plans <b>Added:</b> (1) 1.1 Notification requirement for Supplier relocations (2) Table 1, Note 6 for Buyer-approved Distributors and AS9210 compliance (3) 2.3.4 Requirement for Seller to identify true root cause findings and corrective actions (4) 2.7.2 Note for Sellers providing perishable tooling and Tool Service Requirements List</p> |
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The terms “Item(s)”, “PO”, “Seller”, and “Buyer” as used herein, have the same meaning as the terms “Work”, “Contract”, “SELLER”, and “LOCKHEED MARTIN”, respectively.

Questions regarding this Appendix QX or the applicability of this Appendix QX shall be addressed to Buyer’s Material Management representative who administers this PO.

- 1.0 Quality Requirements:** Seller shall meet the requirements in Table 1, as applicable, and the requirements of this Appendix QX for the latest revision in effect as of the date of this PO. Seller shall also meet all quality requirements identified elsewhere in this PO. Seller shall ensure all applicable quality requirements are imposed upon sub-tier suppliers and manufacturing facilities. Seller shall have and maintain Internet access for obtaining requirements of this PO.
- 1.1 Quality System Changes & Relocation:** Seller shall notify Buyer, in writing, within 10 days of any (1) adverse change in its quality system status resulting in the loss of 3rd party registrar’s certification status; or (2) adverse action taken by Seller’s customer, the Government, the Federal Aviation Agency (“FAA”), or the Civil Aviation Agency (“CAA”); or (3) change in Seller’s quality organization, process or procedures that affects conformity verification of any Item. Seller shall also notify Buyer, in writing, at least 90 days in advance of any sale, relocation, or transfer of Seller’s manufacturing operations.

- 1.2 **Language:** Unless otherwise authorized by Buyer in writing, upon request by Buyer, Seller shall provide all Seller records, reports, specifications, drawings, inspection and test results and other documentation in English.
- 1.3 **Reference Documents:** Seller may obtain Buyer-unique documents (e.g., Q2A, Q30, TMS-MC-015, etc.) referenced in this PO from Buyer's Material Management representative or Buyer's website at: <http://www.lockheedmartin.com/material-management>. Seller may obtain copies of Aerospace Standards (AS/EN documents) from the Society of Automotive Engineers at: [www.sae.org](http://www.sae.org).
- 1.4 **Supplier Control:** Seller shall ensure all Items procured from its suppliers for this PO conform to all requirements of this PO.
- 1.5 **Outsourcing of Critical Items:** Seller shall notify Buyer, in writing, when any Buyer-identified key characteristic, interchangeable-replaceable features, fracture critical features, durability critical features, maintenance critical features, safety critical features, critical safety hardware/features, mission abort critical features, or Seller changes affecting fit, form or function are to be subcontracted.
- 1.6 **Certificate of Conformance:** Seller shall prepare a certificate of conformance ("CoC") asserting that the Items contained within this shipment are in total compliance with the requirements of this PO. Seller shall provide Items under this PO that meet all applicable requirements. Seller shall annotate in the delivery package any exceptions, e.g. variances, Supplier Quality Assurance Report ("SQAR"), Advanced Engineering Authorization ("AEA"), etc. Seller shall include a copy of the CoC with Seller's product shipper.
- 1.7 **Records:** Seller shall maintain complete records of all manufacturing, process capability (if applicable), tooling controlled per TMS-MC-015, and inspection and test, including copy of CoC. Upon Buyer's request, Seller shall make records available to Buyer for at least three (3) years after completion of this PO and for longer periods as may be specified elsewhere in this PO. Upon Buyer's request, Seller shall forward specific records to Buyer at no additional cost, price, or fee to Buyer. Seller shall maintain records of all QCS-001 process control tests performed by Seller and inspection records of processed Items for at least seven (7) years after completion of this PO. Upon Buyer's request, Seller shall provide records of inspection tests of processed Items and process control tests to Buyer.
- 1.8 **Notification:** Seller shall notify Buyer when Seller or Seller's sub-tiers are found to be non-compliant to Buyer specifications, Seller is disapproved by a Government agency, or Government/Industry Data Exchange Program ("GIDEP") Alert is required or received affecting Buyer Items.
- 1.9 **Certified Materials:** Seller shall establish and maintain controls to prevent the use of non-certified materials when certified materials are required.
- 1.10 **Calibration:** Seller shall maintain a documented calibration system for the calibration and maintenance of tools, jigs, inspection and test equipment. Seller shall have and maintain a calibration system that is compliant to prevailing industry requirements in accordance with ISO 17025, ISO10012-1, ANSI Z540 or MIL-STD-45662.

- 1.11 Tooling as a Media of Acceptance:** Seller shall utilize mandatory/required tooling provided by Buyer and designated as production type tooling to be utilized for Item manufacture as Seller's media of inspection and for Buyer source acceptance for those part features created by, or depicted by, such tooling, e.g., contours, hole locations, and profiles. Seller shall periodically validate Seller manufactured and/or owned tooling that is used as a media of acceptance to its control media.
- 1.12 Buyer-Furnished, Seller-Manufactured or Seller-Owned Tooling:** Seller shall include in its documented quality system written procedures for the control, maintenance, and calibration of special tooling, jigs, inspection and test equipment, and other devices used in manufacturing processes.
- 1.12.1 Buyer Furnished Tooling for Buyer or Seller-Design Items:** Seller shall comply with the requirements of Buyer's tooling manual (TMS-MC-015) concerning Buyer-furnished controlled tooling, tooling tools, and production tools.
- 1.12.2 Seller-Manufactured or Owned Tooling for Buyer-Designed Items:** Where Seller manufactures and/or owns tooling for Buyer-Designed Items, Seller shall comply with the requirements of Buyer's tooling manual (TMS-MC-015) concerning Seller-manufactured and/or owned tooling that is used in the production of Item(s) for this PO.

**TABLE 1 – Quality System Requirements by Commodity**

| Commodity / Product   | Quality Management Systems |                                 |   | Fit Check                 | Software   | FAI                | FOD | Measurement Plan | Variability Reduction |
|---|----------------------------|---------------------------------|---|---------------------------|------------|--------------------|-----|------------------|-----------------------|
|   | QMS<br>See Note 1          | AS/EN 9100 (F-35)<br>See Note 3 | ISO9001: 2000 (F-35 or Service Centers) | Q3R (F-16 and C-130 only) | Q6R        | Q2A and AS/EN 9102 | Q4R | Q30 (F-35)       | AS/EN9103 (F-35)      |
| LM Aero Build-to-Print Metallic and Non-Metallic Parts, Castings & Forgings (including finished castings and forgings), Sheet Metal, Machined Parts, Structural Assemblies/Details, Honeycomb Core, Composite Parts             | X                          | X                               |   | X                         | X          | X                  | X   | X                | X                     |
| Metallic Raw Materials (Bar, Rod, Plate, Sheet, Extrusions, etc.), including Cut-to-Size  | X                          |                                 |   |                           |            |                    |     |                  |                       |
| Non-Metallic Raw Materials (Chemicals, Paints, Adhesives, Lubricants, Tapes), Composite Materials   | X                          |                                 |   |                           |            |                    | X   |                  |                       |
| Electrical Hardware/Components, Mil-Spec Standard Hardware, LM Aero Special Hardware, or Miscellaneous Hardware and Bearing, Detail Parts Controlled Under Manufacturer's Part Number, Support Equipment (SE) and Details of SE | X                          |                                 |   |                           |            |                    | X   |                  |                       |
| Ground Support Equipment  | X                          |                                 |   |                           |            |                    | X   |                  |                       |
| Electrical, Mechanical, Avionics (equipment, assemblies, sub-assemblies, details, and major components), including jet engines and propellers   | X                          | X                               |   |                           | X          | X                  | X   |                  | X                     |
| Aviation Fuel/Oil   | X                          |                                 |   |                           |            |                    | X   |                  |                       |
| Perishable Tooling  | X                          |                                 |   |                           |            |                    |     |                  |                       |
| Tooling   | X                          | X                               |   |                           |            |                    | X   |                  |                       |
| Electrical Harnesses  | X                          | X                               |   |                           |            | X                  | X   |                  | X                     |
| Software  | X                          | X                               |   |                           | See Note 4 |                    |     |                  |                       |
| Service Providers (See Note 2)  | X                          |                                 | X                                       |                           | X          |                    | X   |                  |                       |
| Service Centers (See Note 5 & 6)  |                            |                                 | X                                       |                           |            |                    |     |                  |                       |
| Engineering Test Units, Brass Boards, Lab-Use-Units, Non-Production Hardware Buyer-Approved Distributors  | X<br>See Note 1 and 6      | X                               |   |                           | X          |                    | X   |                  |                       |

**NOTES – TABLE 1**

- (1) Seller shall maintain an ISO, AS or Military Standard equivalent quality system acceptable to Buyer. Third party registration ISO/AS/EN Quality Management Systems (“QMS”) from an ANSI-ASQ National Accreditation Board ([www.anab.org](http://www.anab.org)) approved registrar is preferred. Buyer-approved Distributors must either meet ISO, AS, Military equivalent or QCS-122 Quality System.
- (2) Supply Service Provider – A company whose specialty and core business is integration and management of supply chain operations. Services may include, without limitation, kitting, transportation, distribution and warehouse management, inventory management tasks such as tactical inventory forecasting and optimization, supplier management for selected classes of supplies, and global material deployment and distribution.
- (3) Commodities requiring an AS/EN9100 QMS must be compliant no later than 01 January 2010. Until that date, Seller, at a minimum, shall meet the requirements of ISO 9001:2000.
- (4) Buyer’s quality clause Q6R applies to both deliverable and non-deliverable software.
- (5) A Service Center acts on behalf of Buyer as a Licensee. A Licensee shall have the right to provide spare(s) Item(s) or perform repair and/or rework of Buyer Items.
- (6) Buyer-approved Distributors must be compliant to AS9120 no later than 01 January 2008. “Distributor” is defined as any Seller that is buying Items from other suppliers and selling them to Buyer without adding value to Items. Repackaging shall not be considered a value-added task for the purpose of this definition

**2.0 Point of Acceptance:** The point of acceptance is indicated on each PO issued. The point of contact for a Buyer Procurement Quality Assurance Field Engineer (“PQAFE”) is located at: <http://www.lockheedmartin.com/material-management> > Quality Requirements > Information. Seller shall ensure that all requirements of this PO have been met.

**2.0.1** – Prior to shipment of Items designated “BUYER ACCEPT AT SOURCE”, Seller shall obtain final acceptance (signature/stamp), at Seller’s facility, of Seller’s shipping document by Buyer’s PQAFE or Seller’s quality assurance personnel, when Buyer has provided Seller with prior written authorization to act on Buyer’s behalf.

**2.0.2** – Prior to shipment of Items designated “GOVT & BUYER ACCEPT AT SOURCE”, Seller shall obtain final acceptance (signature/stamp), at Seller’s facility, of Seller’s shipping document by Buyer’s PQAFE or Seller’s quality assurance personnel, when Buyer has provided Seller with prior written authorization to act on Buyer’s behalf, as well as the assigned Government representative.

**2.0.3** – Seller shall notify Buyer’s PQAFE normally servicing Seller’s facility, not more than five (5) days after receipt of this PO, when PO calls for “BUYER ACCEPT AT SOURCE” or “GOVT & BUYER ACCEPT AT SOURCE”. Seller’s notification shall include PO number, date of scheduled shipment and any special security clearance required to perform Buyer activities. If Seller does not know Buyer’s PQAFE assigned to this facility, Seller may request this information from Buyer.

**2.0.4** – Seller shall notify Buyer’s PQAFE, not less than 48 hours prior to Items being ready for shipment, when this PO calls for “BUYER ACCEPT AT SOURCE” unless Seller has received Buyer’s prior written authorization to accept Items on behalf of Buyer.

**2.0.5** – Seller shall not claim entitlement to an increase in the PO price, cost, or fee based upon an assertion that “BUYER ACCEPT AT SOURCE” or “GOVT & BUYER ACCEPT AT SOURCE” imposes additional cost(s) or task(s) on Seller.

**2.1** **Facility Access:** Seller shall provide or obtain for Buyer, Buyer’s customers and regulatory agency personnel, access to any and all facilities where work is being performed or is scheduled to be performed, including those facilities of Seller’s subcontractors, in order to perform Item inspections, surveys or system surveillance as part of verification of conformance to the requirements of this PO. Seller’s denial of any such access may result in inactivation of Seller’s approval. Seller shall include the provisions of this facility access requirement in its POs with its subcontractors.

**2.1.1** – Seller shall provide, at no increase in price, cost or fee to Buyer, Buyer’s customers or regulatory agencies, suitable facilities at Seller and Seller’s subcontractors’ manufacturing locations for Buyer, Buyer’s customer and regulatory agency representatives to perform Item inspections, surveys or system surveillance.

**2.1.2** - Seller shall provide Buyer’s PQAFE with high speed internet access (DSL or wireless).

**2.2** **Sampling:** Seller shall have the right to use sampling plans, provided the sampling plans are in accordance with existing industry, military or Government standards, or have been prior approved in writing by Buyer.

**2.3** **Control and Processing Nonconforming Material and Corrective Action:**

**2.3.1** - Seller shall implement and maintain a documented quality system that provides for identification, documentation, and disposition of nonconforming material. Seller shall ensure effective corrective action is taken (including repetitive nonconformances dispositioned “Use-As-Is” or “Repair” by Buyer’s or Seller’s Material Review Board [“MRB”] actions) to prevent, minimize, or eliminate nonconformances. Seller’s quality management system shall ensure that non-conforming material is not used for production purposes.

**2.3.2** - Seller shall maintain records of all nonconforming material, dispositions, assignable causes, corrective actions, and effectiveness of corrective actions for the period specified in this PO.

**2.3.3** - Seller shall evaluate each nonconformance for its potential to exist in previously produced or delivered Items, or Items in transit to Buyer. If a nonconformance exists, Seller shall notify Buyer, in writing, within 24 hours for issues impacting flight safety or for Items in transit to Buyer, and, in writing, within 5 working days for all other issues.

**2.3.4** - Seller shall respond to all Buyer requests for corrective action. When requested by Buyer, Seller shall provide trend data and findings for Buyer rejected Items. Seller shall identify true root cause findings and corrective action(s) to preclude recurrence by utilizing tools such as cause mapping, cause and effect analysis, 5 why’s etc.

**2.3.5** - Seller shall assess all Buyer-identified nonconformances, whether or not Item(s)



was/were returned to Seller, and take appropriate actions to ensure causes of nonconformance are corrected. Seller shall notify Buyer of actions taken to prevent recurrence by completing Supplier Confirmation/Action Report ("SCAR"), per on-line SCAR instructions, for all Buyer-identified nonconformances. The SCAR form and instructions are located at:

<http://www.lockheedmartin.com/material-management> > Quality Requirements > Forms.

**2.4 Material Review Authority for Seller-Designed Items:**

**2.4.1** - Unless otherwise stated in this PO, Seller has Material Review Authority ("MRA"), except for nonconformances that affect a parameter controlled by Buyer drawing or specification, where form, fit or function, interchangeability, service life or reliability is affected. Seller shall submit dispositions of nonconformances, if any, affecting any such parameter(s) to Buyer for approval.

**2.4.2** - Buyer has the right to remove MRA if Buyer concludes that Seller has demonstrated abuse of the MRA process.

**2.5 Material Review Authority for Buyer-Designed Items:**

**2.5.1** - Seller disposition authority is limited to scrapping of Items, eliminating the nonconformance by rework to engineering, or returning to vendor. On Items of Buyer design, Seller shall document nonconformances for submittal to Buyer's MRB for dispositions as required by this PO. Seller's continued processing, prior to obtaining Buyer's MRB disposition, of any Buyer-designed Items containing a nonconformance shall be at Seller's risk.

**2.5.2** - If Buyer has delegated MRA to Seller on Buyer-designed Items, Seller shall exercise such MRA except for nonconformances of a parameter that affects form, fit, function, interchangeability, service life or reliability.

**2.5.3** - Seller shall submit requests for MRA on Buyer-designed Items in writing to Buyer.

**2.6 Material Review Board Submittals:**

**2.6.1** - Seller's request for Buyer MRB disposition of Seller or Buyer-designed Items shall be submitted in accordance with Buyer instructions located at:  
<http://www.lockheedmartin.com/material-management> > Quality Requirements > Corrective Action.

**2.6.2** - Seller shall not incorporate any nonconformances into any Item, process, procedure or data that affects a parameter controlled by Buyer drawing or specification or affects form, fit or function, interchangeability, service life or reliability unless and until Seller has received prior written approval from Buyer to do so.

**2.6.3** - Buyer and Buyer's customers shall each have the right to refuse to accept any Seller nonconformances. When the point of acceptance requirement of this PO is "GOVT & BUYER ACCEPT AT SOURCE" and Buyer's customer has delegated MRA to Seller's cognizant Government source representative, Seller shall submit material review dispositions to Seller's local Government representative for concurrence.

**2.6.4** - Seller shall ensure that root cause analysis and corrective action plans for all discrepancies exist and/or have been implemented based on corrective action effectivity, prior to delivering Items that have Buyer MRB dispositions. Seller shall submit corrective action plans to Buyer or Buyer's representative with final acceptance paperwork.

**2.7 QCS-001 Requirements for Buyer-Designed Items:**

**2.7.1** - QCS-001 sets forth both the process sources and the processes that require Buyer approval, prior to use for Items delivered to Buyer. A controlled process is an operation performed on an Item where the operation cannot be readily verified subsequent to its conclusion. Controlled processes have verifiable controls inherent to the process, e.g. heat treat, plating, nondestructive testing, etc.

**2.7.2** - Seller and Seller's sub-tiers shall meet all requirements of the latest version of Appendix QJ when Seller or Seller's sub-tiers are performing any Buyer-controlled process identified in QCS-001.

**NOTE:** Sellers providing perishable tooling and Tool Service Requirements List ("TSRL") Items are not required to use QCS-001 approved process sources or provide QCS-001 Quarterly Usage Reports.

**2.8 QCS-001 Requirements for Seller-Designed Items:** Buyer shall have the right to review and maintain surveillance of Seller's quality system for approval and control of any Buyer-approved process listed in QCS-001, including those performed in-house. Buyer shall have the right to withdraw Seller's authority to approve and control Buyer-approved processes listed in QCS-001, if Buyer determines Seller's system has failed to control processing or testing. Buyer shall have the right to direct Seller, at no increase in price, cost or fee to Buyer, to use Buyer-approved sources listed in QCS-001 and meet the requirements of Appendix QJ, in the event of withdrawal of such authority.