Millennium Space Systems Quality Clause Requirements

MSS08012-204-RQT

REV: E

Related AS9100D Clauses: 8.4

SIGNATURE APPROVALS, SEE JIRA ARTIFACT #: QMS-1119

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Document Control Management

REVISION HISTORY			
REV	**DATE**	**REASON FOR CHANGE/CHANGE**	**SECTION(s) AFFECTED**
-	2023.09.12	Initial release	All sections
A	2024.09.03	Clarified both general and specific quality requirements to ensure intent is clear. The following specific clauses were updated: MSSQC-1, MSSQC-2, MSSQC-3, MSSQC-4, MSSQC-5, MSSQC-6, MSSQC-7, MSSQC-9 (deleted and incorporated into general requirements section), MSSQC-10, MSSQC-11, MSSQC-12, MSSQC-14	All sections
B	2025.10.17	Added MSSQC-15	Section 5
C	2026.01.23	Split the general quality requirements (Sections 1-4) into the Supplier Quality Manual MSSXXXXXX Updated with clarifications and additions to MSSQC-1, MSSQC-2, MSSQC-3, MSSQC-7, MSSQC-10, MSSQC-11, MSSQC-12	Section 2
D	2026.02.09	Updated MSSQC-10, MSSQC-11, MSSQC-12 for clarification and incorporated new requirements	Section 2
E	Spencer Eakin Digitally signed by Spencer Eakin Date: 2026.05.06 08:25:54 -07'00'	Update to MSSQC-5. Implementation of MSS FAIR Form	Section 2

Millennium Space Systems Quality Clause Requirements are intended to define and clarify quality requirement expectations of material made for, sold and/or delivered to any Millennium Space Systems' business unit.

1. DEFINITIONS

a. Buyer shall mean Millennium Space Systems: A Boeing Company.
b. Seller shall mean the party that sells or contracts to sell material or services to Buyer.
c. Distributor shall mean authorized seller of original equipment manufacturer/original component manufacturer (OEM/OCM) items.
d. Material shall mean item(s) contracted by a Purchase Contract.
e. Service shall mean intangible labor, process, digital documentation, testing and/or other non-physical action or activity contracted by a Purchase Contract.
f. Purchase Contract shall mean the purchase order, subcontract, or contract. This may also incorporate by reference the Standard Terms and Conditions (TC-001).
g. Customer Furnished Material (CFM) - Material consigned by Millennium Space Systems for use by Seller in manufacturing or assembly process of Millennium Space Systems' contracted items.
h. Build to Print (BTP) – Item(s)/Material(s) designed by Buyer

2. MSS Quality Clauses

The following Quality Clauses shall be applicable when specified on the Purchase Contract.

MSSQC-1 Certificate of Conformance for Commercial Off the Shelf Parts (COTS)

Seller shall provide a Certificate of Conformance (CofC) with Seller's documentation package. As applicable, the following information shall be included on the CofC for a COTS item:

- Buyer's Purchase Contract number and part number
- Quantity
- Serial number, lot/batch number, or date lot code
- Seller's address
- Manufacturer's part number and/or generic part number
- Applicable specifications or standards and their revisions (if no revision identified assume latest revision)
- Any deviation or waiver to specifications or standards
- Country of origin (COO)
- Test results with dates of inspection/test
- Storage conditions/shelf-life expiration date
- Latest safety datasheet (SDS) for all chemicals

MSSQC-2 Certificate of Conformance for Millennium Designs (Build to Print/BTP)

Seller shall provide a Certificate of Conformance (CofC) with Seller's documentation package. As applicable, the following information shall be included on the CofC for a Millennium Design:

- Buyer's Purchase Contract number, part number, and/or revision for Millennium design
- Quantity
- Serial number or lot/batch number
- Seller's address
- Applicable specifications or standards and their revisions (if no revision identified assume latest revision)
- Any deviation or waiver to specifications or standards
- Country of origin (COO)
- Test results with dates of inspection/test
- Storage conditions

MSSQC-3 Dimensional Inspection Report

Seller shall provide Dimensional Inspection Reports (DIR) with Seller's documentation package. A DIR shall be provided for all inspected items. A sampling plan of the manufacturing lot based on Table 1 below or tighter shall be used. Inspection shall be performed on 100% of features, regardless of tolerance, for all sampled items (e.g. if lot size of 10, inspect all features on the 3 sampled items).

The DIR shall include:

- Part number and revision
- Serial or lot number(s)
- Dimensions or values, inclusive of tolerance ranges, of each product characteristic
- Evidence of compliance to applicable drawing, CAD files or other engineering documentation
- Cover sheet documenting the dates of inspection, quantity sampled/inspected and the accepted/rejected quantity

If any defects are found in the manufacturing lot, the defective characteristic(s) shall be 100% inspected on the entire lot (sampling not permitted).

The following shall always be 100% inspected on the entire manufacturing lot (sampling not permitted):

- Key/critical characteristics as defined by the drawing
- Threads and threaded features such as threaded holes, helical inserts, etc. Unless otherwise specified, acceptability of screw threads shall be determined based on System 21, ASME B1.3. Individually report inspections of each required thread characteristic on the DIR. Note that inspection of threaded features for helical inserts shall require inspection prior to helical insert installation.
- Visual inspection for defects (such as but not limited to damage and burrs) and conformance to all drawing notes as applicable

Table 1 – Sampling Plan (*Based on ANSI/ASQ Z1.4 for General Inspection Level II)

Sample Size per Lot Size

Lot Size	Sample Size*
2 to 8	2
9 to 15	3
16 to 25	5
26 to 50	8
51 to 90	13
91 to 150	20
151 to 280	32
281 to 500	50
501 to 1,200	80
1,201 to 3,200	125
3,201 to 10,000	200
10,001 to 35,000	315
35,001 to 150,000	500
150,001 to 500,000	800
500,001 and over	1,250

Note:

- No particular format is required for the DIR as long as all the above are captured (an AS9102 Form 3 or similar may be utilized to document the DIR)
- A reduced sampling plan, compared to Table 1, may only be utilized with written approval of the Buyer. Proof of approval shall be included with Seller's documentation package.

MSSQC-4 Raw Material Certification Report

As applicable, Seller shall provide Material Certification containing the material type and temper, specifications, physical and chemical testing report, and country of origin.

MSSQC-5 First Article Inspection Report

Seller shall submit a First Article Inspection Report (FAIR) and the clearly identified first article product(s) for all Buyer designed part numbers and modified standard catalog or COTS items. The FAIR shall be submitted in concurrence with the first production delivery and in accordance with the requirements of the latest revision of AS9102. Seller shall adhere to the latest revision of AS9102 within six months of release.

Use of the Millennium form MSS08081-101-FRM First Article Inspection Report is preferred, as it provides reduced and streamlined requirements from the AS9102.

Documents and data representing results of the Seller's First Article Inspection/Test shall show actual dimensions or values of each product characteristic and evidence of compliance to applicable drawing notes.

Note:

- The inclusion of this clause on the Purchase Contract does not indicate that a FAIR is required with this particular shipment. It does however indicate that this particular part number requires a full or partial FAIR, for the first production run or when changes occur which invalidate the FAIR, as defined by the latest revision of AS9102 (such as, but not limited to, a lapse in production for 2 years, change in engineering definition, and/or change in manufacturing

process(es))Shipments that do not require a full or partial FAIR, shall reference the Buyer's Purchase Contract number, where the last FAIR was provided, on the Certificate of Conformance

- Seller shall utilize the "Serial (or Lot) Number" field to specify the unique identifier of the FAI part, such as but not limited to the serial or lot number
- A FAIR is not required for standard catalog items, COTS, or deliverable software
- Buyer does not require completion of the "Customer Approval" (or "MSS Only") field
- Submitted FAIR shall be in a read-only format (such as but not limited to pdf, locked Excel) to prevent accidental edits

MSSQC-6 Special Processing Certification

Special Processes are processes where the resulting output cannot be verified by subsequent monitoring or measurement.

As applicable, Seller shall submit certification(s) for special processes (e.g. plating, painting, coating, welding, finishing) including special processing not performed by Seller, such as by sub-tiers.

MSSQC-7 Turn-Key Assembly Traceability

For partial or full Turn-key Build to Print assemblies, the Seller shall provide Certificate of Conformance for any material procured by Seller. As applicable, the following information shall be included on the Certificate of Conformance:

- Buyer's Purchase Contract number and part number
- Quantity
- Serial number, lot/batch number, or date lot code
- Seller's address
- Manufacturer's part number and/or generic part number
- Applicable specifications or standards and their revisions (if no revision identified assume latest revision)
- Any deviation or waiver to specifications or standards
- Country of origin (COO)
- Test results with dates of inspection/test
- Storage conditions/shelf-life expiration date

MSSQC-8 Drop Shipments

Should material be Drop Shipped, the Seller will verify the quantity and condition of delivered material and perform receiving inspection and/or test to verify compliance in accordance with internal turnkey buying process. The Seller shall notify the Buyer on the condition of the material and provide applicable vendor documentation. Should any furnished material be found discrepant, the Seller shall notify the Buyer immediately, mark and segregate the material until Buyer dispositions material. All customer furnished materials shall be identified, handled, stored, and protected from damage. Seller shall maintain all traceability and ensure all required documentation (e.g. Certificate of Conformance, material certs, etc.) is provided with the material.

MSSQC-10 Printed Circuit Board

1. General Requirements
    a. PCB shall comply with IPC-A-600 Class 3 and IPC-6012 Class 3 standards unless otherwise specified per drawing.
    b. Suppliers shall adhere to IPC-1602A as applicable for handling and storage.
2. The Purchase Contract shall identify the quantity of solder samples. Solder samples shall be packaged separately from PCBs and clearly marked with the words “solder sample” on each package. The quantity of solder samples shall be labeled in the documentation package and be included with each lot delivery. Seller shall provide the following inspection and test deliverables with each delivery of Printed Circuit Boards in accordance with IPC-6012, including but not limited to:
    a. Electrical Test Report
    b. Drill Report
    c. Bow & Twist Inspection -
    d. Ionic Cleanliness Report
    e. Micro-section / Coupon Test Report – Default to Coupon A/B unless otherwise specified; provide cross-section images as-is and after test, lamination quality, void/delamination analysis; pass/fail determination
    f. Thermal Test Results – as specified by drawing

MSSQC-11 Printed Circuit Board Assembly

1. General Requirements
    a. Printed Circuit Board Assembly shall comply with IPC-J-STD-001 Class 3 and IPC-A-610 Class 3 acceptability criteria unless otherwise specified.
    b. Suppliers shall bake boards in accordance with MSS06466-101-RQT unless otherwise specified.
    c. Suppliers shall adhere to IPC -J-STD-033D and IPC -1602A as applicable for handling and storage.
    d. Manufacturing lot for the purposes of this clause is defined as the total quantity of boards processed during the same continuous manufacturing run and on the same equipment.
    e. Suppliers shall adhere to IPC-J-STD-001 cleanliness requirements C-22
2. Seller shall provide the following inspection and test deliverables with each delivery of Printed Circuit Board Assemblies, including but not limited to:
    a. Ionic Cleanliness Report in accordance with IPC-J-STD-001
        i. When processing with automated cleaning, provide a report per manufacturing lot
        ii. When processing with manual cleaning, provide a report per board
    b. X-ray Inspection in accordance with IPC-J-STD-001; required for all hidden or partially visible solder joints, including plated through holes, images shall be provided for each board
    c. Visual Inspection Report for each board in accordance with IPC-J-STD-001 Section

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d. Automated Optical Inspection (AOI) Report for each board

e. When flying probe test is specified on drawing or Purchasing Contract, a flying probe test shall be performed to mutually agreed upon test criteria for each board.

Reflow profile for each profile used in assembly of the boards delivered

MSSQC-12 PCBA Polymeric Coating

1. General Requirements
   a. Polymerics application shall comply with MSS08014-107-MP acceptability criteria unless otherwise specified.
   b. Inspection shall be done with a minimum 10× magnification using a UV-A light source in the 320-400 nm range (ideally 365 nm); magnification shall not exceed 20×.
   c. Suppliers shall adhere to IPC-J-STD-001 as applicable for handling and storage.

2. Seller shall provide the following inspection and test deliverables for each board with each delivery, including but not limited to:
   a. Ionic contamination test
   b. Coating thickness measurement report
   c. Material report – including lot numbers and expiration dates

MSSQC-13 Build to Print Harnessing

Build per drawing, MSS08011-303-HBK "Harness Design for Manufacturing, Assembly, Assembly, and Test Handbook," and MSS08014-102-SOP “Harnessing Build Standard Practices and Inspection” unless otherwise noted, given preference in that order. Seller shall provide inspection, build, and test reports for Build to Print harnessing including but not limited to:

- Electrical Conformance Test Reports
- Mechanical Conformance Test Reports
- Work Order Traveler/Build Documentation

MSSQC-14 Serialization

This material shall be assigned serial numbers or unique identifiers and physically identified. Serial numbers shall contain no duplication within the given part number, shall be legible upon receipt to Buyer, shall be no longer than 20 characters, and shall conform to all drawing requirements. If drawing does not specify method of identification for serialization, Seller shall default to bag and tag per AS478-35D. Seller may use its own serialization system within the limitations outlined above unless otherwise specified in writing from Buyer. Seller shall indicate serial numbers on all documentation (such as but not limited to inspection reports, packing lists, First Article Inspection Reports).

MSSQC-15 Approved Special Processor Required

When one or more special processes are identified on the drawing and/or in the Purchase Contract, the Seller shall ensure that such processes are performed in accordance with the applicable process specification(s) and any associated requirements for processor approval. A special process is defined as any processes where the resulting output cannot be verified by subsequent monitoring or measurement, and whose product quality is therefore dependent on strict adherence to controlled process parameters.

Where the applicable process specification requires the use of an approved processor, only the processors identified in the process specification shall be used. If no approved processor list is specified, the supplier shall submit the processor's capability to meet all technical, quality, and process control requirements through qualification and documented evidence for MSS approval prior to use. Proof of approval shall be included with Seller's documentation package.

This requirement shall be flowed down to all sub-tier suppliers performing special processes, ensuring compliance at every level of the supply chain.

Seller shall submit certification(s) for special processes (e.g. plating, painting, coating, welding, finishing) including special processing not performed by Seller, such as by sub-tiers.