

# SUPPLIER QUALITY CODES

## DOCUMENT QA-049

### DEPLOYABLE SPACE SYSTEMS

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## Table 1 – Supplier Quality Group Codes

PO Group Codes	Type of Product	DSS Supplier Codes
FLT-01	<b>Machined Part</b> Flight / Flight Tool / Qual W Special Process	01 A-F, 02 A-C, 03, 04, 05 A-C, 08, 09, 10, 11A, 13A, 15, 17A-C
FLT-02	<b>Machined Part</b> Flight / Flight Tool / Qual No Special Process	01 A-F, 02 A-C, 03, 04, 05 A-C, 08, 09, 10, 11A, 15, 17A & C
FLT-03	<b>Machined Part</b> Flight, Non-Metallic	01 A-F, 02 A-C, 03, 04, 05 A-C, 08, 09, 10, 15, 17A & B
ENG-01	<b>Machined Part / Assemblies</b> GSE Tooling / Eng Only (Metallic / Non-Metallic) Cert of Conformance Only	01 A-E, 08 A & B Only
ENG-02	<b>Machined Part / Assemblies</b> GSE Tooling / Eng Only (Metallic / Non-Metallic) Mat'l Certs	01 A-E, 08, 10
ENG-03 COM-01	<b>Machined Part / Assemblies / Tools / Raw Material</b> GSE Tooling / Eng Only / Commercial Tools / Raw Mat'l (Metallic / Non-Metallic) No Certs	08 A Only
EEE-01	<b>Electrical</b> Component & Wiring	01 A-F, 02 A-C, 03, 04, 06 A&C, 08, 17 A-C
ASSY-01	<b>Assemblies</b> Flight / Flight Tool / Qual Special Process	01 A-F, 02 A-C, 03, 04, 05 A-C, 08, 09, 10, 11A, 13A, 15, 17A-C
ASSY-02	<b>Assemblies</b> Flight / Flight Tool / Qual No Special Process	01 A-F, 02 A-C, 03, 04, 05 A-C, 08, 09, 10, 11A, 15, 17A & C
RAW-01	<b>Raw Materials</b>	01 A-F, 02 A-C, 04, 08, 11A, 17C
SPL-01	<b>Special Processes</b>	01 A-F, 02 A-C, 04, 05B&C, 08, 13A, 15, 17A
TST-01	<b>Testing</b>	01 A-F, 02 A-C, 04, 08, 11A, 13B, 15, 17 A & B
CAL-01	<b>Calibration</b>	01 A-F, 02 A-C, 04, 05B&C, 06C, 08, 15
LSLM-01	<b>Limited Life Materials</b>	01 A-F, 02 A-C, 03, 04, 06A, 08
HAZ-01	<b>Hazardous Materials</b>	01 A-F, 02 A-C, 03, 04, 06B, 08
COTS-01	<b>COTS</b>	01 A-F, 02 A-C, 03, 04, 08 A & B
COTS-02	<b>Flight Fasteners</b>	01 A-F, 02 A-C, 03, 04, 08 A-D, 16, 17 C
COMP-01	<b>Composites</b>	01, 02, 03, 06 A,B, 08, 09, 11A, 15, 17, 18
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This document identifies specific quality requirements that may be levied on suppliers, distributors, and/or sub-tier contractors, who provide material and/or purchased items to Deployable Space Systems (DSS). This document is also intended to enhancement the purchase order/contract requirements.

## Quality Code: 01 - General Requirements

- A) These Quality requirements, codes and clauses are intended to be in addition to, not in derogation of, procurement action requirements.
- B) If a Supplier cannot comply with any applicable quality requirement listed within a quality code or quality clause of a purchase order (PO), resolution and/or changes to the requirements must be obtained prior to acceptance of the DSS purchase order.
- C) The primary point-of-contact for any modification to the Suppliers PO/ Contract shall be the DSS procurement representative.
- D) Distributors, as the direct Supplier to DSS, as well as, the original Manufacturer, are responsible for compliance with all purchase order requirements. The applicable requirements of all quality codes, quality clauses, and any technical requirements listed on the purchase order, will apply to both the Distributor and the Manufacturer of the product. All reasonable measures shall be taken by the Distributor and Manufacturer to validate all items sold to DSS are from an authorized source, and certify that all materials provided are not counterfeit articles. If any Distributor items or materials are discovered to be counterfeit, from any source, DSS shall be immediately notified in writing (See Q-Code 05).
- E) All data, documents and any certificates of conformance from the Supplier and sub-tiers shall be in English, or contain an English translation, and must be signed by a company management representative.
- F) **Record Retention:** All assembly/ production/ programing documents, material certifications (including inserts/ hardware), supplier generated quality documents (C of C, FAI reports, inspection records, and discrepancy reports), DSS models, POs and any customer related flow down documents shall be archived for 7 years and available upon request unless otherwise requested via PO.

## Quality Code: 02 - Quality Management System

- A) Supplier's Management System shall conform to a National and/or Internationally recognized QA system (i.e., AS9003, AS9100, AS9120, ISO9001, MIL-Q-9858, ISO10012-1, ISO17025, ANSI-Z-540, NADCAP) as applicable to the type of products and/or services provided to DSS, unless an alternate quality system level/type has been determined acceptable by DSS Quality.

- B) Suppliers shall notify DSS when changes occur that will affect their management system (address/ location, quality system approval level/ type). In order to maintain an accurate Approved Supplier List, DSS may conduct periodic reviews (surveys, questionnaires, on-site visit, etc.,) to ensure a Supplier's information is correct and current.
- C) **Configuration Control:** The Supplier shall have a documented system to DSS design model, DPD, supplier-derived files and PO change orders are placed under configuration control. Supplier-derived production files shall be validated prior to use and maintained in a manner that prevents misuse or alteration. All revisions shall be controlled. Supplier requests for changes to the design model or DPD shall be documented and submitted to DSS.

### Quality Code: 03 - Sub-Tier Flow Down

Direct Suppliers to DSS shall flow down applicable quality and purchase order requirements to their sub-tier Suppliers to ensure that the integrity of the specified requirements are maintained throughout the supply chain (i.e., first piece/article inspection, customer approved special processes, key characteristics, record retention, etc.) (Ref. AS9100 sect. 7.4.2). Subcontractor may not outsource fabrication efforts unless approved by DSS Procurement Representative.

### Quality Code: 04 - Customer Right of Access

DSS, our Customers and regulatory agencies may visit the Supplier's facility and/or their sub-tier Suppliers for the purpose of verifying contract compliance and product conformity (i.e., source inspection, witness testing, product audit, quality system audit). Supplier will provide the necessary support to the visiting personnel. Arrangements for such visits will be coordinated through the DSS Buyer or Quality Management representative.

### Quality Code: 05 - MRB Authority & Non-Conformance Reporting

- A) Supplier is NOT granted Material Review Board (MRB) authority for any product that is manufactured to a DSS drawing/specification or a DSS Customer's drawing/specification. Any deviations to engineering drawings/specifications must have DSS and/or the DSS Customer's approval prior to shipment of product.
- B) Supplier will notify DSS, when discrepancies in the Supplier's process or product are discovered or suspected which may affect the fit, form, or function of any product in process or delivered to DSS. Authorization to continue processing any material not meeting the drawing or purchase order requirements is required. Proceeding without this authorization shall be at the supplier's risk.
- C) Supplier is to provide Root Cause analysis and Corrective Action when a **Supplier Corrective Action Request (SCAR)** is issued as a result of non-conforming products, services, on-site survey/evaluation, or documentation and/or delivery discrepancies.

## Quality Code: 06 - Special Handling Materials

- A) **Limited Life Products** subject to degradation with age or varying temperatures must be clearly stated on the certificate of conformance/ packing slip or product/packaging in addition to expiration date, cure date and lot identification. Product/materials shall have a minimum of 75% shelf life remaining at time material is received at DSS. If the Supplier desires to provide product with less than 75% shelf life, Supplier is required to obtain approval from the DSS Quality management prior to shipment (including electronic components and wiring).
- B) **Hazardous Materials** shall be properly packaged in accordance with the applicable Federal Regulations (DOT). Containers will be plainly marked as to the contents with appropriate warnings, precautions, instructions and storage conditions. Appropriate documentation (MSDS, handling, etc.) shall accompany each shipment.
- C) **Electrostatic Sensitive Devices (ESD)** shall be packaged and labeled in accordance with the appropriate specification/drawing requirements (i.e., ANSI/ESD S20.20-1999) for the product/material being provided to DSS.

## Quality Code: 07 – Government/ Customer Furnished Equipment/ Materials

When property is furnished by DSS or the Government, the contractor shall inspect the shipment upon receipt for any damage that may have incurred while in transit, and provide for the protection, periodic inspection, and controls necessary to preclude damage or deterioration during handling, storage, or use. The contractor shall report to DSS any government furnished property found damaged, malfunctioning, or otherwise unsuitable for use, and shall determine and report the probable cause and necessity for withholding such property from use. Unsuitable property shall be properly handled to prevent further damage and/or additional repair costs. Damaged CFE or GFE shall be documented on the contractor's internal defect reporting record, and processed through the non-conforming material board.

## Quality Code: 08 - Data Package Documentation

Supplier is required to provide a documentation package with each shipment sent to DSS that contains the following documents:

- A) *Packing Slip and/or Invoice* which references the PO number, quantity shipped, part number, revision if applicable and description of the items being delivered.
- B) A signed *Certificate of Conformance* referencing the PO number, part number, revision, and quantity being shipped.
- C) *Material Certification* received from the source of origin.
- D) Each document shall have a *legible signature* and/or stamp of the Supplier's representative.

## Quality Code: 09 - First Article Inspection

First Article Inspection Report is required for the item / service ordered. The report shall contain the information listed as a minimum:

- 1) Engineering drawing number, configuration, and revision, DSS PO number and line item number.
- 2) Actual inspection results of all drawing features, dimensions, drawing notes, tolerance block and Purchase Order requirements. When inspecting more than one unit, the range of the actual results is acceptable. No check marks are acceptable as a form of dimensional acceptance.
- 3) Notation and verification of applicable materials, process specifications used and components installed per drawing or Purchase Order requirements, including traceability to lot number, heat number, date code or batch number (i.e. unique Certification number).
- 4) All information related to any non-conforming condition experienced during manufacturing shall be included in the FAI report.
- 5) The tools used to perform the inspection must be identified by a discrete control number, and listed in the inspection report. The objective being if a device fails calibration, identification of where it was used is readily retrievable.
- 6) If the quantity of the ordered item consists of more than one piece, the item from which the First Piece/Article Inspection report was generated from shall be identified and segregated (tagged, bagged, labeled, etc.).
- 7) A completed and signed *Inspection Report* (machined articles, Customer Molded and manufactured 3-D parts.
- 8) Any/all sampling plan shall be submitted to DSS for approval prior to use.  
Sampling is allowed and may conform to the requirements of ANSI/ASQ Z1.4, General Inspection Level II, Single, Normal, and AQL 1.0 or equivalent as approved by DSS.

**Note:** Compliance to specification AS9102 may be required if called out as part of a contract requirement, and may be used as a guide for formatting and reporting.

## Quality Code: 10 - Digital Product Definition

### DPD Definition:

This is an engineering definition of the product, provided in a 3D computerized presentation typically viewable on a Computer Aided Design (CAD) system. In addition to the CAD model, the entire product definition may include information such as a parts lists, material specifications, and tolerancing. (Ref: ANSI Y14.41-2012, ISO 16792:2006)

The DPD is usually provided to the supplier in the form of a .stp, iges, or .dxf, or parasolid.

### Supplier DPD System Requirements shall include:

- Revision control of the digital model supplied by DSS.
- Purchase Order reference of the digital model revision provided by DSS.
- A comprehensive inspection report that verifies the machined article meets the requirements of the digital model.
- The tools used to perform the inspection with their calibration status.
- Sampling size shall be defined and approved by DSS prior to submitting to final inspection.

## Quality Code: 11 - Raw Materials

- A) Raw Material Test Data** Supplier is to provide a copy of the raw material test data (chemical, physical, heat treatment, etc.) for the ordered product that demonstrates compliance with applicable specifications (QQ-N-; AMS-; SAE-; etc.) and/or drawings requirements. If the DSS purchase order or drawing requires specific materials, and the supplier substitutes these materials, approval by DSS QA management is required prior to procuring or using any material that is not on the applicable purchase order or drawing.
- B) Material Samples** Supplier shall submit test samples of each batch of material sufficient to conduct tests in accordance with specification or purchase agreement requirements. The test samples shall accompany the finished product and either be an exact duplicate, functional representative or a fully processed block sufficient to undergo testing. Each test sample shall be clearly and permanently marked and/ or *Bag and Tagged* with the following: batch or lot number; date manufactured; specification or material control information number; Supplier's designation; and the purchase agreement number.

## Quality Code: 12 – Customer Related Processes

- A) Customer Source Inspection** Source Inspection by DSS and/or the DSS Customer is required prior to shipment of product. Supplier is to contact DSS purchasing or the DSS quality management representative with a 48 hour advance notice of product shipment to make arrangements for source inspection activity.
- B) Customer Test Witnessing** DSS and/or DSS Customer may witness acceptance testing at Supplier facility if requested per Purchase order instructions. Supplier is to contact DSS Procurement representative or the DSS Quality Manager in advance of acceptance testing activities to make arrangements for witnessing of testing if instructed by PO.

## Quality Code: 13 - Special Process Certification

DSS reserves the right to request/ receive evidence of compliance to specification requirements (training, qualifications, etc.) for any employee or subcontractor that performed a special process associated with an ordered item. Technicians/ Personnel performing any Special Process described on this Purchase Order shall be qualified and certified to the current applicable standard/specification for that process referenced in the DSS drawing or PO. Each special process certification shall have QA Manager/ Supervisor approval.

- A) Special Process Certs** - Supplier is to furnish certificates of conformance for special processes (i.e., coatings such as electroplating, chemical film, anodizing, paint) that includes the specification(s) associated with the performed processes.
- B) Testing Certs** - Supplier is to furnish certificates of conformance for Testing (i.e., NDT/ NDI, spectral scans) that includes the specification(s) associated with the performed testing.



## Quality Code: 14 - Government Source Inspection

The Government reserves the right to perform Govt. Source Inspection (GSI) on this order. During performance of this order, all material certification, special processes, build documentation, and any other documentation related to this order. Your quality control, inspection system, and manufacturing processes are also subject to review, verification, and analysis, by authorized Government representatives.

## Quality Code: 15 - Calibrated Tools Certification

For each item/ service the Supplier shall provide a description of what tools are used to monitor conditions or validate dimensions. The Supplier is required to have a certificate of calibration for all measurement tools on file, and provide a copy to DSS if requested. Any equipment used to satisfy the requirements of this PO, must be certified to meet the requirements of ANSI-Z-540, ISO 10012-1, or ISO/IEC 17025 or equivalent approved by DSS. Equipment or calibration standards shall be traceable to the National Institute of Standards and Technology (NIST). Certificates of calibration will include a due date of the last day of the month for which the calibration was performed (i.e., cal date Jan 15. Due date Oct 31).

## Quality Code: 16 – Counterfeit Parts Prevention

DSS requires this commodity to be procured directly from the original manufacturer or authorized distributor only. Parts must be procured per AS5553.

The supplier is to provide a Certificate of Conformance that lists this information:

- A) If an OEM, Provide an OEM / OCM Certificate of Conformance.
- B) If an Authorized Distributor, Provide an Authorized Franchise Distributor Certificate of Conformance.

The Certificate of Conformance should also include, at a minimum, the following information:

1. DSS purchase order number.
2. Part number and/or description of the ordered item,
3. Revision number/letter of the item being provided, when applicable,
4. Signature and/or stamp of the Supplier's representative.

## Quality Code: 17 – Process Control

### A) Changes

DSS Supplier is required to notify DSS when changes occur to the manufacturing/ service process, process procedures and/ or products/ solutions that affect piece part and/ or assembly level configuration.

### B) Process Controls For Fabrication Process

The Supplier shall prepare procedures to control fabrication processes (e.g., metal joining, bonding, plating and coating, chemical or surface treatment, pressure testing) wherein inspection cannot ensure uniform quality. When samples or visual aids are necessary to define acceptable workmanship they shall be selected by the Supplier and approved by DSS QAM.

## C) Prohibited Metals

The use of any of the following materials in any flight hardware is prohibited unless specifically reviewed and approved by DSS:

- 1) Solder alloys with greater than 97% tin
- 2) Platings, coatings, or claddings of tin unless they contain a minimum of 3% alloying constituent (such as lead, silver, etc.)
- 3) Tin plated wire in crimped wire terminations (soldered terminations are acceptable)
- 4) Cadmium, selenium, magnesium, or zinc except internal to hermetically sealed devices
- 5) Brass with zinc content greater than 15% unless over-plated or over-coated with an approved material
- 6) Mercury or compounds of mercury
- 7) Zinc chromate protective coatings
- 8) Vinyl or polyvinyl chloride (PVC)
- 9) Tin-copper, tin-zinc, tin-bismuth solder alloys and other so called "lead free" solder alloys.
- 10) Corrosive solder fluxes (e.g. Type RA or IPC ANSI/J-STD-004 Type ROM0, ROM1, ROH0, & ROH1)

Class 1 Ozone Depleting Substances shall not be used in the manufacture, assembly, test, handle, packaging, ship, or store DSS hardware.

All subcontractors and their suppliers must also comply with these restrictions. Compliance to these restrictions is subject to review and periodic audit by DSS.

Subcontractors that do not perform physical testing of materials and/or EEE parts, for verification of compliance to the above prohibited materials restriction's, may be required to submit sample materials or parts to DSS or other outside testing service for validation.

## Quality Code: 18 – Composite Material/Hardware

Composite materials and hardware must be considered extremely critical to flight operations, and must be handled with extreme care. Protective gloves and clothing must be worn whenever handling this category of hardware. Traceability to all materials, processes, and procedures must be stringently adhered to at all times, and accurately recorded in the build documentation. Any/all deviations must be documented, and approved by DSS prior to implementation. Changes to DSS provided documentation cannot be made without written authorization from DSS engineering and Quality Assurance.



## **Quality Code: 19 – Safety/Lifting Requirements**

This order requires compliance to the safety requirements defined in NASA-STD-8719.9, National Consensus Standards, applicable Federal OSHA standards, or (approved equivalent) for handling, lifting, supporting, or manipulating critical and non-critical DSS hardware.

## **Quality Code: 20 – Human Space Flight**

FOR USE IN HUMAN SPACE FLIGHT; MATERIALS, MANUFACTURING, AND WORKMANSHIP OF HIGHEST QUALITY STANDARDS ARE ESSENTIAL TO ASTRONAUT SAFETY. IF YOU ARE ABLE TO SUPPLY THE DESIRED ITEM WITH A HIGHER QUALITY THAN THAT OF THE ITEMS SPECIFIED OR PROPOSED, YOU ARE REQUESTED TO BRING THIS FACT TO THE IMMEDIATE ATTENTION OF THE PURCHASER.

Revision	Date	Section	Paragraph	Summary of change	Authorized by
-	6/26/14			Initial issue	JE
A	8/15/14			Released into PDM	JE
B	10/30/14			Revised and reorganized quality codes and added Group Code Table 1	JE
C	02/17/15			Added QA Group Codes 34 & 35 'Tooling'  Code 8 - Defined Batch Inspection Sample sizes  Code 9 – Further defined material samples	JE
D	4/11/16			Corrected typo's throughout, added Quality Code 18 and group code 36 (composites)	JBC, JR, JE
E	08/22/16	Q Code 8 Table 1		Code 8 - Moved Inspection Report to Code 9  Added Group Codes a and b, to distinguish Inspection Report req.	JR, JE
F	10/13/16	Table 1 Q Code 9		Table 1, updated PO Group codes and moved to Page 1, Updated Q code 9	JR, JE
G	02/23/16	Table 1 Groups		Added Groups; ENG-02 & COTS-02	JR, JE
H	11/27/17	Table 1 Groups		Added Group: ENG-02, COM-01 Updated Quality Code 03: Added Subcontractor outsourcing requirement.	JR, JE

				<p>Updated Quality Code 08: Added "Invoice" and "If Applicable" in revision statement.</p> <p>Updated Quality Code 09: Removed "Inspection Report" &amp; "First Piece"</p>	
J	01/05/18	Table 1  QCODE 15		<p>PO Group Codes "ENG-03, COM-01: Added "Raw Materials"</p> <p>Added "or equivalent approved by DSS".</p>	JR, JE
K	03/15/18	Table of Contents, Table 1 and Quality Codes  Q CODE 09		<p>Added SAFE-01, Group Code Q19 "Safety/Lifting Requirements" and</p> <p>Added HSF-01, Group Code Q20 "Human Space Flight"</p> <p>8) Sampling Requirements</p>	JR, JE