Celestica Aviation, Space and Defense Requirements for Suppliers

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Reason for New/Revised Document

Following changes were made to this document:
Per Honeywell's SPOC 128.3 Sampling of Characteristics to add AS13002 : Qualifying an Alternate Inspection Frequency Plan .
AS13002 defines the process for qualifying an Alternate Inspection Frequency Plan for suppliers within the aero-engine sector.
Also added to the list following standards as per flowdown from our customer.
AS13002 Requirements for Developing and Qualifying Alternate Inspection Frequency Plans
AS13001 Supplier Self Release Training Requirements
AS13003 Measurement Systems Analysis Requirements for the Aero Engine Supply Chain
AS13004 Failure Mode & Effects Analysis & Control Plans
J1739 Potential Failure Mode and Effects Analysis in Design (Design FMEA),
Potential Failure Mode and Effects Analysis in Manufacturing and
Assembly Processes (Process FMEA)
AS13005 Quality Audit Requirements
AS13007 Supplier Management
AS13100 AESQ Quality Management Requirements
AS13006 Process Control Methods

Electronic Signature:

Guideline Supplier Quality Manual Description:

Celestica Aviation, Space and Defense Requirements for Suppliers

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Section 1.0-AS9100 requirements for aviation, space and defense parts suppliers

1.1. Purpose: This section defines the general requirements for quality standards that are applicable to suppliers supplying parts to Celestica.

1.2. Celestica recognizes the imperative role our Suppliers play in the value we offer our customers. As an extension of our own operations, we rely on our Suppliers to provide material, products and services which meet all of the quality requirements of our contracts, specifications and our quality management system.

Table A- List of applicable Aerospace and ISO Standards

AS9100	QMS Requirements for Aviation, Space and Defense
AS9110	QMS Requirements for Aviation Maintenance Repair Organizations
AS9120	QMS Requirements for Aviation, Space and Defense Distributors
AS9101	QMS Requirements for Aviation, Space and Defense audits
AS9115	QMS Requirements for Aviation, Space and Defense - Deliverable Software
AS9102	Aerospace First Article Inspection Requirements
AS9103	Variation Management of Key Characteristics
AS9107	Direct Delivery Authorization – Guidance
AS9114	Direct Shipment – Guidance for Aerospace Companies
AS9131	Quality Systems Non-Conformance Documentation (Disclosure for Nonconformities shipped)
AS9132	Data Matrix - Quality Requirements for Parts Marking
AS9133	Qualification Procedure for Aerospace Standard Parts
AS9134	Supply Chain Risk Management Guidelines
AS9162	Aerospace Operator Self-Verification Programs
AS9116	Notice of change requirements
AS9117	Delegated product release verification
AS9136	Root Cause Analysis and Problem Solving
AS9138	Statistical Product Acceptance
AS9145	Advanced Product Quality Planning (APQP) and Production Parts Approval Process (PPAP)
AS9146	Foreign Object Debris Control / Prevention
AS9101	Quality Management Systems Audit Requirements for Aviation, Space, and Defense Organizations

AS9147	Management of Unsalvageable Items
AS5553	Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition
AS6081	Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition – Distributors
AS6174	Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel
ANSI S20.20	ESD Control
ISO 17025 or AS9003	General requirements for the competence of testing and calibration laboratories OR Inspection and Test Quality System
AS13000	Problem Solving Requirements for Suppliers (based on 8D approach)
ISO 18490	Evaluation of vision acuity
AS13002	Requirements for Developing and Qualifying Alternate Inspection Frequency Plans
AS13001	Supplier Self Release Training Requirements
AS13003	Measurement Systems Analysis Requirements for the Aero Engine Supply Chain
AS13004	Failure Mode & Effects Analysis & Control Plans
J1739	Potential Failure Mode and Effects Analysis in Design (Design FMEA), Potential Failure Mode and Effects Analysis in Manufacturing and Assembly Processes (Process FMEA)
AS13005	Quality Audit Requirements
AS13007	Supplier Management
AS13100	AESQ Quality Management Requirements
AS13006	Process Control Methods

This manual applies to all Suppliers providing Celestica with materials, products and related services, and when applicable, to Supplier sub-tier sources. The general requirements outlined herein do not supersede conflicting requirements in the contract, or drawing, including applicable engineering specifications and process specifications, or applicable long term agreement(s). This document is referenced on all Celestica purchase orders.

For aerospace & defense (or aviation, space and defense) following AS requirements are expected to be built in to your QMS.

To assure customer satisfaction, the aviation, space, and defense industry organizations have to produce and continually improve safe, reliable products that equal or exceed customer and regulatory authority requirements. The globalization of the industry and the resulting diversity of regional/national requirements and expectations have complicated this objective. End-product organizations face the challenge of assuring the quality of product from a multi-level supply chain. Organizations face the challenge of delivering product to multiple customers having varying quality expectations and requirements.

The above list helps suppliers to align their processes and meet any challenges per AS requirements.

1.3.Supplier shall maintain a QMS suitable to the products and services provided to Celestica that is certified by an accredited third-party certification body to one or more of the following, as applicable to your business:

- ISO 9001 -Quality Management System Requirements
- AS9100 -Quality Management System Requirements (Aerospace)
- AS9120 -Quality Management System Requirements (Distributors/Stockists)
- AC7004 -Quality Management System Requirements (Nadcap Accreditations)

1.4.Special Processes like Soldering, Cable Wire Harness Assemblies, Welding, Coating, Paint, Sheet metal, Composites, Heat Treatment all require Nadcap certification.

1.5.Suppliers shall comply and structure their QMS with the following requirements, as applicable to your business:
1.5.1.Distributors/Stockists – Shall establish and maintain a QMS that is in compliance with AS/EN 9120, AS/EN/SJAC 9100 or ISO 9001.
1.5.2.Calibration Laboratories – Shall establish and maintain a QMS and measurement management system that is in compliance with ISO 9001 and ISO/IEC 17025 general requirements for the competence of testing and calibration laboratories.
1.5.3.Commercial-Off-The-Shelf Suppliers (COTS) – Suppliers that provide commercial products shall establish a QMS in compliance with ISO 9001, or equivalent.
1.5.4.Manufacturers Of Build-To-Print And Supplier-Controlled Designs – Shall establish and maintain QMS that is in compliance with AS/EN/SJAC 9100.
1.5.5.Suppliers are recommended to comply to Occupational Health and Safety Management as well as Environmental Management or a similar management system applicable to the location of the factory or business.
a) ISO 45001 Occupational Health and Safety Management
b) ISO 14001 Environmental Management

1.6. Suppliers are also recommended to comply with the following standards (as applicable):
ISO 22301 Business Continuity Management
ISO 27001 Information Security Management
ISO 20000 IT services

Section 2.0-Change & Disclosure Agreement:

2.1.Any changes to the drawing or process, the details of which needs to be conveyed to Celestica as soon as possible. Any deviation, concession or waiver to the drawing or drawing specifications must be communicated and only proceed after you get Celestica's approval.

2.2.Any non-conformities on the shipped product shall be disclosed to Celestica within 24 hrs. Failure to Disclose can be detrimental to the product safety. All disclosures related to nonconforming parts shall be communicated to us using "Appendix B – Form Layout Example in AS9131" standard.

2.3.For confirmed supplier disclosure escapes, a formal corrective action request will be made to the supplier using the Celestica 8D SCAR system.

Section 3.0- Rights of Access:

3.1.The supplier shall provide access to Celestica personnel, government, regulatory and civil aviation authorities, and customers (or customer's designated third party auditors) to their facilities, personnel and records, when requested.

3.2.This access will be required for QMS reviews, product/process validation evaluations or investigations, subject to proprietary considerations. This access is also a requirement to all of the Supplier's sub-tier suppliers.

Section 4.0- Record Retention:

Records of product/material manufacture, test, inspection (including radiographic film), calibration and acceptance/certification, are considered quality records and shall be retained as follows:

Records in Support of	**Minimum Retention Period(4.1)**
Radiographic Film, Digitized Film or Digital Radiographs	11 years
Non-traceable, non-serialized parts	11 years
Traceable parts as identified on the drawing or purchase order	Indefinitely (See 4.2)
Serialized parts as identified on the drawing or purchase order	Indefinitely (See 4.2)
Critical parts as identified on the drawing	Indefinitely (See 4.2)
Distributor standard off the shelf product	7 years

4.1. MINIMUM retention periods, beginning with the date the order was completed. In the case where a specification, contract or purchase order requires a greater retention period, the more stringent requirement will apply.
4.2. A lengthy period of time specified in the law that cannot be determined in advance. Indefinitely does not mean that the records must be retained permanently. Records having a retention period of "Indefinitely" should be reviewed periodically to determine if they have surpassed their useful legal and business life. Destruction of records with Indefinite retention period must be authorized by Celestica.
4.3. Quality records shall be all records as defined within the AS9100 Standard, section 4.2.4.

4.4.Prior to discarding, transferring or destruction of records, the Supplier and sub-tier supplier shall notify Celestica in writing and provide the opportunity to obtain records.
In case of takeover, transfer of ownership or joint venture, Suppliers shall maintain responsibility of record archiving, including possible transfer to the owner.
In case of bankruptcy, the Supplier shall ensure that archived records are made accessible for customers and Regulatory authorities.

Section 5- Control of Items with Limited Shelf-Life:

5.1 The supplier shall maintain a documented system for using, storing and controlling items with limited shelf or storage life. The system shall include a method of identifying and controlling such items to ensure expired items were not used in products shipped to Honeywell and that items shipped met remaining life requirements.
5.2 Shelf life shall apply per manufacturer expiry date or "use-by" date but not supersede applicable specs.
5.3 When shipping shelf-life controlled compounds and storage-life controlled elastomers, the supplier shall include the following additional information on the Certification of Analysis & / or Conformance:
-Date of manufacture for shelf-life controlled compounds
-Cure date (QQ/YY) for storage-life controlled elastomers
-Shelf-life expiration date (MMYY) for shelf-life controlled compounds

-Storage life expiration date (QQ/YY) for storage-life controlled elastomers
-Batch and or lot number as applicable
-Date of shipment
-Manufacturer's name

5.4 Certificate of Analysis is required for all chemicals and a statement of the current standard used to analyze the ingredients by Quality Control. The certificate shall contain all vital traceability details related to the batch / lot tested. Certificate shall also note the shelf life details and conditions of storage.

5.5 This spec defines remaining life requirements and the communication of date control information on items that require shelf life control per their product specification. Typical commodities that require shelf life controls are:
-Uncured compounds (for example: paint, adhesives, curing agents, primers, film adhesive, varnishes, elastomeric molding compounds, pressure sensitive adhesives, Prepregs, sealants, inks etc.)
NOTE: Items such as tapes and labels which have pressure sensitive adhesive (PSA) back are categorized under uncured compounds.
This includes metal nameplates with PSA backing applied.
-Cured Elastomers (for example: O-rings, gaskets, plate seals, molded shapes etc.)
-Electronic Components
-Applied Bearing Lubricants, Grease
-Applied Bearing Preservatives

5.6 Storage of Aerospace Elastomeric Seals and Seal Assemblies Which Include an Elastomer Element Prior to Hardware Assembly. Supplier shall follow ARP5316 (Aerospace Recommended Practice (ARP) addresses the general requirements for data recording procedures, packaging, and storing of aerospace elastomeric seals and seal assemblies which include an elastomeric element prior to the seal being assembled into hardware components.). Cure date and/or Storage Life expiration date on the part or container as defined by applicable specification or flowed by customer.

5.7 Solder bars, solder wires, solder alloys and flux shall conform and be analyzed as per IPC-J-STD series of standard specifications.
5.7.a -IPC J-STD-006 Requirements for Electronic Grader Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications.
5.7.b -IPC J-STD-004 Requirement for Soldering Fluxes.
5.7.c -IPC J-STD-005 Requirements for Soldering Pastes.

Section 6:
6.1.In Summary: Suppliers shall ensure that their trained personnel are aware of:
− their contribution to product or service conformity;
− their contribution to product safety;
− the importance of ethical behavior
(Preferred code of conduct as per : http://www.responsiblebusiness.org/)

6.2.Suppliers shall understand the need to:
− implement a QMS (quality management system);
− use customer-designated or approved external providers, including process sources (e.g., special processes);
− notify Celstica of nonconforming processes, products, or services and obtain approval for their disposition;
− prevent the use of counterfeit parts;

− notify Celestica of changes to processes, products, or services, including changes of their external providers or location of manufacture, and obtain the organization's approval;
− flow down to external providers applicable requirements including customer requirements;
− provide test specimens for design approval, inspection/verification, investigation, or auditing;
− retain documented information, including retention periods and disposition requirements
- the right of access by Celestica, our customer, and regulatory authorities to the applicable areas of facilities and to applicable documented information, at any level of the supply chain.

Section 7.0: Human Factors as related to aviation industry:
7.1.Suppliers shall train their employees to the human factors.
7.2.Human Factors are explained well on Transport Canada website (Human Factors Brochure) or FAA website (FAA Human Factors-Dirty Dozen)

Appendix:

Definitions & Acronyms:
Shall – Indicates a requirement
Must – Indicates a requirement
Should – Indicates a recommendation
May – Indicates a permission
Can – Indicates a possibility or a capability
Sub-Tier Suppliers - Also known as sub-suppliers or subcontract suppliers
First Article Inspection (FAI) - Provides objective evidence that engineering, design and specification requirements are understood, fulfilled, verified and recorded.
Rework - Additional operations that are not part of the basic production process flow. These additional operations will achieve full compliance to the product with applicable drawings and specifications.
Repair - Alternative manufacturing techniques, methods, materials, or processes which may bring product into full compliance with applicable drawings and specifications.
AESQ-Aerospace Engine Supplier Quality (https://aesq.sae-itc.com/content/aesq-standards)
QMS-Quality Management Systems

External References

Document Name	Document Number	Current Revision

End of Document