Supplier Quality Requirements

QAQ-82-001

Rev. 3

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1. Purpose and Scope

Insitu is committed to building strong supplier partnerships. These requirements apply to suppliers of production products or services produced to Insitu specified drawings or requirements that may affect our product quality or delivery. These requirements are in addition to the standard Insitu Purchase Order Terms & Conditions.

This document applies to suppliers that are defined as:

Contract manufacturers: perform final assemblies that go into or are used by Insitu's aircraft. This includes final wing and winglet assemblies, final avionics unit, final engine assembly, launcher, final ground control unit assemblies and finished carrying cases.

Fabricators: perform processes to Insitu defined drawing requirements that will be part of final assemblies. This includes manufacturers of composite materials, metal fabrications, electronic subassemblies and custom packaging materials.

Forms are referenced in this procedure that may be used and modified by the supplier to suit their needs.

Any document referenced in this procedure will be made available electronically to our suppliers by emailing a request to quality@insitu.com.

2. General Supplier Requirements

All products custom produced to Insitu-supplied or approved drawings must comply with all drawing and purchase order requirements. These include materials, subcontracted processes and drawing tolerances.

Purchasing requirements take precedence in the following order:

Insitu Purchase Order or Contract
↓
Referenced drawing(s) with revision number
↓
Referenced Insitu or customer specifications
↓
Industry specifications not listed

When required, certification, inspection and testing requirements are specified on the purchase order or referenced documents. Certificates may include material, processing, inspection and testing results, traceability and conformance.

Contract manufacturers are responsible for establishing and maintaining a documented quality system that includes the elements listed below. Insitu reserves the right to audit these systems upon request.

- Organization, personnel job descriptions and training
- Purchase order / contract review
- Document and data control
- Product identification and traceability
- Process control
- Inspection and testing
- Control of inspection, measuring and test equipment

- Control of nonconforming product
- Corrective and preventive action
- Storage, handling and packaging

Fabricators are encouraged to establish and maintain a documented quality system. If a quality system is required due to the critical nature of the fabrication process, the requirement will be stated on purchasing documents.

3. Records and Documents

All documentation generated as a result of this specification must, at a minimum, be retained and kept available for review at the supplier's facility 15 years from the date of manufacturing.

If the supplier ceases to deliver product or services to Insitu within the 15 year period, all records become property of Insitu.

Records should include:

- *Who* completed the documentation
- *When* the record was made
- *Who* made additions or corrections and *when* they were made
- If the rationale for a change is not evident, additional documentation is highly recommended for explanation. A note to the side or memo to the file may serve this purpose.

Handwritten entries must be recorded legibly in ink. ***Any correction should be crossed out with a single line, initialed and dated with current date. This is so the original entry is not obscured.***

Not acceptable:

- Additions to source documents that are not initialed or signed and dated.
- Write-overs of the original entry
- Correction fluid (white-out)
- Pencil

4. Production Control

It is recommended that the supplier develops effective methods of production control.

Templates for control plan and failure mode and effects analysis (FMEA) forms are available to suppliers by sending a request to doc.control@insitu.com for:

QAF-82-007 *Control Plan*

QAF-82-008 *Failure Mode and Effects Analysis*

Other recommended methods of control include documented work instructions, a production traveler or router, control charts, the use of fixtures and numerically controlled equipment.

Where the supplier uses material with limited shelf-life control, a method for ensuring that the material has not exceeded the recommended shelf life prior to use is required.

When Insitu requires specific methods of production control due to the critical nature of the process or product, these requirements will be stated on Insitu purchasing documents.

5. Inspection and Testing

5.1. Product Characteristics Definitions (from QAP-73-003)

5.1.1. Product Characteristics: Drawing or specification entities such as dimensions, tolerances, assembly interfaces, surface contours or shapes, materials, requirements for materials that would be an exception to an identified material specification, processes, surface preparations, etc.

5.1.2. Critical Product Characteristic (CPC ▷): Those product characteristics that if not controlled within the specified limits, may have an unacceptable affect to form, fit, function, safety, performance, agency approvals, or any governmental regulations.

5.1.3. Significant Product Characteristic (SPC ◇): Those product characteristics that if not controlled within specified limits will negatively affect form, fit, function, safety, performance, agency approvals, or any governmental regulations.

5.2. Incoming Inspection

Suppliers must perform an incoming inspection prior to performing release of components/material for further processing or assembly. This inspection is to include verification that quantities/part descriptions match and that there is no damage or nonconformances. Suppliers must verify that any required certifications or test reports are included.

Suppliers are fully responsible for controlling quality of their suppliers of subcontracted materials and processes.

In the case of Insitu-supplied items: if there is evidence of damage, nonconformances or paperwork discrepancies, the supplier must notify Insitu Quality within 3 working days of discovery. The Insitu Material Review Board will determine what action is required.

5.3. First Article Inspection

The supplier must perform a first article inspection prior to release of production product to verify that all dimensions, features, and product attributes meet specified requirements. Documentation of first article inspection must be submitted for review and approval by Insitu Quality prior to the first production shipment.

First article inspection must be performed from the first production run of a new part or following any subsequent change that invalidates the previous first article inspection result. In the case of changes to an existing part, a partial first article may be acceptable if stated on the purchase order.

Templates for first article inspection forms are available to suppliers by sending a request to doc.control@insitu.com for:

QAF-82-005 *First Article Inspection (Word format)*

QAF-82-006 *First Article Inspection (Excel format)*

The supplier may use either of these forms, modify them to best suit their needs or use their own equivalent documents.

First article inspection documentation must include:

- Part number
- Part name as shown on the drawing
- Part serial number, if applicable
- Characteristic number – a unique number for each design characteristic
- Reference location – drawing zone, page number and section, specification, etc.
- Requirement of the design characteristic including nominal and tolerances if applicable
- Results
- Identification of acceptance or nonconformance
- Type of measurement instrument(s) used and identification of the tool
- Who performed the FAI
- Date performed the FAI

First article characteristics found to be nonconforming are to be handled per section 6.

5.4. In-Process Inspection

Once approved for production, the supplier must monitor, at a minimum, all features identified as Critical and Significant Product Characteristics on the drawing and functional product specifications.

When sampling inspection is used by the supplier, the sampling inspection plans must be statistically valid and preclude the acceptance of lots whose samples have known nonconformities. Sampling AQL must be a minimum of 2.5.

An approved sampling plan is provided in Appendix A. If the supplier uses a different sampling plan, it may require Insitu approval, if requested.

5.5. Inspection Records

Inspection documentation must include:

- Purchase order number
- Part or piece number inspected
- Dimension or attribute being inspected
- Criteria for acceptance and/or rejection
- A record of the measurement/inspection result
- Type of measurement instruments used
- Name of person performing the inspection

See section 5.3 for specific requirements for first article inspections.

5.6. Manufacturer's Certificate of Conformance (C of C)

When required by contract or purchase order, C of C's will be provided and contain the following information:

- Name and address of manufacturer
- Insitu Purchase Order or contract number
- Statement attesting that goods and services conform to all contract and associated drawing requirements
- Part number(s), as applicable
- Drawing number and revision level to which goods were manufactured
- Management signature & date

6. Deviations on Production Product

6.1. Supplier Nonconformances

The supplier must submit a deviation request for any known nonconformance to a Critical or Significant Product Characteristic that will not be scrapped or reworked by the supplier. Nonconforming material must be clearly identified and segregated where practical to prevent unintended use.

The supplier must have written approval (i.e.: a PO amendment, CID, ECN, fax, e-mail) for the deviation by Insitu prior to shipment.

6.2. Supplier Recommendations

Suppliers are encouraged to partner with Insitu to make recommendations to material, design or processing changes that could benefit Insitu in the form of cost, time savings or product improvement during the design and development phases.

Once product is released for production, a deviation request is required for such a change.

The supplier must have written approval (i.e.: a PO amendment, CID, ECN, fax, e-mail) for the deviation by Insitu prior to making a change!

7. Packaging & Labeling Requirements

Components, materials and assemblies shipped to Insitu or other Insitu suppliers for final assembly and packaging must be:

- Free of metal or fiber shavings, sharp edges or burrs.
- Free of evidence of delamination or dry weave in composite material
- Free of visible voids that cannot be cosmetically repaired by subsequent operations.
- Packaged in a manner to prevent any sliding, distortion, bending, or other damage during transit.
- Easily identified by part or assembly number.

Open-cell foam shapes, closed-cell foam shapes, cardboard spacers and bubble wrap should be used to best suit the particular configuration and critical nature of the item to be shipped. Use shrink-wrap, pallets and other containers suitable to the product being shipped.

All static sensitive product must be wrapped in anti-static bubble wrap or placed in anti-static bags prior to boxing. Apply identification label to the outside of the package.

Unless specified, recycled boxes or other suitable shipping containers may be used. The supplier must ensure that no prior identification labels remain on the container that may conflict with the actual contents.

Shipping documents and product labeling should provide for clear identification of contents, including purchase order number, part numbers, revisions and serial numbers.

Documents (packing list, MSDS, inspection sheets, etc) attached to the outside of the container must be attached to allow damage-free removal.

Document Revision History

Rev	Date	Description	Author
0	1/6/06	Original issue to define supplier first article requirements	Paul Cater
1	8/22/06	Significant revision to expand requirements from only first article inspection to other requirements for suppliers of custom product and services. Referenced forms that can be provided to suppliers for first articles, control plans and failure mode and effects analysis. Defined AQL if sampling inspection is used and provided a statistically valid sampling plan in appendix A. Covered good practices for record keeping, defined how long suppliers are to keep records based on requirements given in QAP-42-002 Records Retention. Changed title from Supplier Quality Inspection Requirements to Supplier Quality Requirements.	Marcia Buser
2	11/28/06	Added Section 5.6, Manufacturer's Certificate of Conformance	Paul Cater
3	8/15/07	Added FAI requirements to conform to AS9102 including provision for partial FAI. Corrective action for AS9100 registration audit – see CAPA # 91, and recommendation by auditor for provision for partial FAIs. Added statement about shelf-life sensitive material control per CAPA # 94	Marcia Buser

Appendix A:
C=0 SAMPLING PLANS
INDEX VALUES
(ASSOCIATED AQLS)

From: *Zero Acceptance Number Sampling Plans*, 4th edition by Nicholas L. Squeglia

Note: The acceptance number in all cases in ZERO nonconforming

AQL⇨	.010	.015	.025	.040	.065	.10	.15	.25	.40	.65	1.0	1.5	2.5	4.0	6.5	10.0
LOT SIZE																
2 to 8	*	*	*	*	*	*	*	*	*	*	*	*	5	3	2	2
9 to 15	*	*	*	*	*	*	*	*	*	*	13	8	5	3	2	2
16 to 25	*	*	*	*	*	*	*	*	*	20	13	8	5	3	2	2
26 to 50	*	*	*	*	*	*	*	*	32	20	13	8	5	5	5	3
51 to 90	*	*	*	*	*	*	80	50	32	20	13	8	7	6	5	4
91 to 150	*	*	*	*	*	125	80	50	32	20	13	12	11	7	6	5
151 to 280	*	*	*	*	200	125	80	50	32	20	20	19	13	10	7	6
281 to 500	*	*	*	315	200	125	80	50	48	47	29	21	16	11	9	7
501 to 1200	*	800	500	315	200	125	80	75	73	47	34	27	19	15	11	8
1201 to 3200	1250	800	500	315	200	125	120	116	73	53	42	35	23	18	13	9
3201 to 10,000	1250	800	500	315	200	192	189	116	86	68	50	38	29	22	15	9
10,001 to 35,000	1250	800	500	315	300	294	189	135	108	77	60	46	35	29	15	9
35,001 to 150,000	1250	800	500	490	476	294	218	170	123	96	74	56	40	29	15	9
150,001 to 500,000	1250	800	750	715	476	345	270	200	156	119	90	64	40	29	15	9
500,001 and over	1250	1200	1112	715	556	435	303	244	189	143	102	64	40	29	15	9

*Indicates entire lot must be inspected

SMALL LOT SIZE SUPPLEMENT
(ASSOCIATED AQLS)
(Use for small lots when the associated AQL values are 1.5 and below)

LOT SIZE	.25	.4	.65	1.0	1.5
5-10	*	*	*	8	5
11-15	*	*	11	8	5
16-20	*	16	12	9	6
21-25	22	17	13	10	6
26-30	25	20	16	11	7
31-35	28	23	18	12	8