

HSQR	Harlow Aerostructures, LLC	Revision
001	Supplier Quality Requirements	D

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Quality Assurance Manager

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1.0 Purpose

Harlow Aerostructures, LLC (HAC) Quality Policy is, "Meeting or exceeding our customer's requirements and expectations for product quality and performance through Teamwork, Continuous Improvement, Six Sigma, Lean Manufacturing and Product Excellence". The achievement of this policy requires a similar desire and commitment to excellence from our Harlow Aerostructures, LLC Supply Chain partners.

HAC Quality Assurance has created this Supplier Quality Requirements Document to clearly communicate our requirements and the Web-based communication tools that have been made available to achieve this end.

2.0 Scope

This document establishes Harlow Aerostructures, LLC quality requirements for suppliers. These requirements apply to Manufacturers, Distributors, and Special Processors providing parts or services for Harlow Aerostructures, LLC when this document is specified by inclusion on purchase order or contract issued by Harlow Aerostructures, LLC.

In the event that the purchase order or contract conflicts with the requirements of this document, the purchase order or contract requirement will supersede.

3.0 Harlow Supplier Approval

Suppliers’ quality systems shall comply with the latest revision of the appropriate quality systems standard along with the Harlow specific quality requirements within this document. Documented evidence of compliance to the appropriate quality management system (QMS) standard: e.g. ISO 9001, ISO 9002, (AS/EN/JISQ) 9003, (AS/EN/JISQ) 9100 or (AS/EN/JISQ) 9120. Ref: Quality Clause Q1

Harlow approval is required for all Manufacturers, Distributors and Special Processors who supply aerospace parts or services. All written and oral communications with the supplier as well as the customer’s specifications, procedures and reports shall be in English.

Harlow sub-tier manufacture suppliers are limited from sub-contracting any manufacturing process without direct notification and approval from Harlow Aerostructures LLC.

Questions regarding quality approval shall be directed to Harlow Aerostructures Quality Department. Quality@harlowair.com.

4.0 Supplier Performance Monitoring

Harlow evaluates supplier performance in the areas of quality and delivery as applicable.

The supplier is responsible for complying with quality system requirements noted herein and for meeting performance expectations. Failure to comply with requirements or to achieve an acceptable performance level may result in an on-site audit and/or disapproval from Harlow Aerostructures approved supplier list. Harlow suppliers are required to maintain a Quality and Delivery rating of 98% or greater; failure to comply may result in the supplier presenting a corrective action recovery plan.

- Delivery ratings are determined on the occurrence of the following criteria only when it is determined to be the Supplier’s responsibility:
 - a. Late deliveries (Item(s) received after due date)
 - b. Early Shipment (Greater than 5 days)
 - c. On Time (Between 4 days early and 0 days late)

RED	< 94.9
YELLOW	95.0 – 97.9
GREEN	98.0 - 100

- Quality Ratings: This is monitored but not limited to a quarterly review through the NCR Reports.

RED	< 94.9
YELLOW	95.0 – 97.9
GREEN	98.0 - 100

5.0 Manufacturers

In addition to other requirements within this document, Harlow requires manufacturers of materials, parts and assemblies to have a quality management system that complies with the (AS/EN/JISQ) 9100 Quality Management Systems - Aviation Requirements, Space and Defense Organizations.

Copies of the AS standards can be purchased from SAE International at www.sae.org or IHS-ASTM Book of Standards - http://global.ihs.com/industry_stds.cfm.

6.0 Special Processors

Special Processors must have a quality management system that is compliant to (AS/EN/JISQ) 9100 Quality Management Systems / Aerospace / Requirements. Approval by Harlow Quality may involve an on-site audit of the supplier's QMS and the applicable special processes. The QMS audit may be waived for suppliers accredited to (AS/EN/JISQ) 9100 or ISO 17025. The ISO 17025 scope of accreditation must cover the NADCAP scope of accreditation and be from an approved NACLA / ILAC accreditation body.

NADCAP/NUCAP accreditation is required in the following disciplines:

- Non-Destruction Testing (RT, UT, PT, and MT)
- Chemical Processing (painting, plating, anodize, etch and various other wet processing)
- Heat Treating (including furnace brazing)
- Welding and Brazing
- Surface Enhancement - shot peen only
- Materials Testing Laboratories (raw material testing)

Information regarding the NADCAP/NUCAP accreditation process can be found at www.primetech.com/Nadcap/. It is the supplier's responsibility to ensure that Harlow's Quality department is notified regarding any change of NADCAP/NUCAP certification status. Ref: Quality Clause Q3

7.0 Distributors

A distributor is defined as a supplier that procures parts, materials or assemblies and sells these products to a customer without affecting product characteristics or conformity. Distributors must employ a documented quality system that is compliant to (AS/EN/JISQ) 9120 Aerospace Requirements for Stock-list Distributors or (AS/EN/JISQ) 9100 Quality Management Systems / Aerospace / Requirements.

Copies of the AS standards can be purchased from SAE International at www.sae.org or IHS-ASTM Book of Standards - http://global.ihs.com/industry_stds.cfm.

8.0 Harlow Furnished Tooling

Harlow Tool Control will notify the supplier when periodic inspections are due. The notification will be transmitted by e-mail, facsimile or mail and consist of a list of the tools and the dates the inspections are due. The supplier's authorized quality representative will date, stamp and sign the letter certifying the periodic inspections are complete and return the letter to Harlow Tool Control by e-mail, facsimile or by mail. The supplier's quality representative will facilitate having the tooling and tooling log inspection stamped to note the completion of the periodic inspection.

9.0 Periodic Inspection of Tooling

The supplier shall ensure that tooling which controls or checks the final configuration of controlled parts and assemblies are inspected to ensure compliance to tool design, master control tools at a minimum annually.

10.0 Part Identification *(When Required by Contract Only)*

Parts that are not design controlled shall have the supplier part number applied. Part marking shall be accomplished by permanent ink stamping of the parts when the identification method is not specifically regulated by the drawings, specifications or other documents. Parts that are too small to be surface marked legibly shall be tagged either individually or by the bundle.

11.0 Raw Materials

Where the supplier supplies raw material (e.g., bar, castings, extrusion, forging, plate, sheet, etc.) either directly to Harlow Aerostructures LLC or purchases the material for use in manufacturer of machined or sheet metal products for Harlow Aerostructures LLC (standard hardware items are specifically excluded from this paragraph), the supplier shall assure that the material is manufactured and distributed by sources approved by Harlow's customer.

Harlow's Quality Assurance must approve any substitution of material, size and/or shape.

All items delivered to Harlow Aerostructures LLC must maintain Job/Lot traceability.

Where our customer does not specifically require approval of the manufacturer and/or distributor of the raw material then:

Where the material is for use on commercial aircraft the supplier shall assure that the material is manufactured in the United States of America or in a country with which the United States of America has ratified a Bi-Lateral Airworthiness Treaty. For a list of countries with bi-lateral agreements consult FAA AC 21-18 and AC 21-23.

Where the material is for use on military aircraft and the material is considered a specialty metal (as defined in DFARS 252.225-7014), then the supplier shall assure that the materials are melted in the United States of America, its possession, or Puerto Rico unless supplier gains prior written approval through Harlow Aerostructures LLC from our customer for use of other sources.

Raw material test reports and/or notarized reports, in accordance with all applicable specifications, must be kept on file and traceable to end item products delivered to Harlow Aerostructures LLC.

Certificate of compliance with actual results of physical and chemical test reports must accompany each shipment where supplier furnishes the raw material. Material must be identified by heat lot and/or heat treat load, (if applicable). Test reports must be traceable to the material lots supplied.

Supplier should contact Harlow's Quality Assurance for assistance in assuring the source of raw material supply is acceptable to Harlow's customers. Ref: Quality Clause Q4

12.0 Military/Standard Specification Hardware

Suppliers shall deliver military/standard specification hardware (AN, MS, NAS, etc.) compliant with the latest document revision. Supplier shall provide a certificate of supplier's source of supply where the product is controlled by a qualified producer's list (QPL) when the supplier is not on the QPL.

Where the supplier supplies hardware items (e.g., Bolts, Nuts, Nutplates, Rivets, Loc Bolts, Hi-Locs, Collars, etc.) of standard design (whether industry or Harlow's customer standard) and the hardware is controlled by a qualified producer's list (QPL) the supplier shall provide a certificate of source of supply when the direct Harlow's supplier is not on the QPL.

Where Harlow's customer requires the distributor to be approved, then the supplier shall only use and or supply hardware from Harlow's customer approved distributor.

Supplier should contact Harlow's Quality Assurance for assistance in assuring the source of standard hardware items is acceptable to Harlow's customers.

13.0 Right of Access

The supplier guarantees the right of access to their facilities and quality related data to Harlow Aerostructures, LLC / Customer and/or Regulatory authorities. This right of access is extended to all sub-tier and raw material suppliers.
 Ref: Quality Clause Q12

14.0 Quality Records

The supplier shall establish a system to retain records for a minimum of seven years after product shipment. Suppliers of serialized assemblies under Harlow’s customers design control shall retain assembly inspection records and delivery records, including all bonded assembly inspection records, for the duration of the contract/7years.
 Ref: Quality Clause Q9

Quality records include but are not limited to:

First Article Inspection Results	Purchase Order	Rework and/or Repair Logs
Final Inspection Criteria	Test Results	Raw Material Certification
Final Inspection Results	Shipping Documentation	Special Process Certification
Nonconforming Part/Material Documentation	Any Waivers Granted	Shop Traveler / Router / Planner

15.0 First Article Inspection

The supplier shall perform a first article inspection, on a part from each first lot shipment of parts, to verify all engineering characteristics. Variable gauging shall be used when possible. Suppliers shall comply with AS9102 for all first article inspections. The FAIR (First Article Inspection Report) shall be retained as a quality record at the supplier's facility and a copy be submitted to Harlow Aerostructures, LLC along with the first lot shipment. If applicable, a Harlow source inspector may verify FAIR at the supplier’s facility.
 FAI requirements also include;

- 3D Models furnish by Harlow Aerostructures; the supplier is responsible for creating a 2D drawing and approval of the drawing through their Document Control process.
- Required information from the 3D Model on the 2D drawing minimum;

CUSTOMER:	CAGE CODE:	PART NUMBER:	2D REVISION:	
MODEL NUMBER:	CREATED BY:	APPROVED BY:	DATE:	SHT:

- A complete dimensional bubble drawing of the detail and/or assembly FAI part.
- Material Certifications (if applicable)
- Special Processing (If applicable)
- First Article Part shall be clearly marked/tagged FAI.
- Delta FAIR; First production lot after engineering changes and/or changes to manufacturing processes that may affect conformance to design, (Fit, Form or Function).
- Changes in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling or materials, numerical control program or translation to another media that can potentially affect fit, form or function. . In most cases, the First Article Inspection Report (Delta) need only record those features that may have changed. In most cases, the First Article Inspection Report (Delta) need only record those features changed, using an AS9102 form.
- A lapse in production for two years warrants a new FAIR.
 Ref: Quality Clause Q6

Follow the Guidelines of AS9102 Standard except as shown on example.

AS9102 Form 1 Part Number Accountability

Sheet ___ of ___

1. Part Number <i>123-123456-123</i>	2. Part Name <i>COVE</i>	3. Serial Number <i>If Applicable</i>	4. FAI Report Number <i>XXXXXX</i>
5. Part Revision Level <i>This is from Drawing Revision sheet that the part is located on. (Optional)</i>	6. Drawing Number <i>123-123456 and/or MBD Number if applicable</i>	7. Drawing Revision Level <i>Sht 1 Rev A & Sht 2 Rev B and Parts List Revision "B"</i>	8. Addition Changes <i>Other Information as needed SPECO, OPPS, DCN, CO, etc</i>
9. Manufacturing Process Reference <i>XXXXXX</i>	10. Organization Name <i>Your Company Name</i>	11. Supplier Code <i>N/A</i>	12. P.O. Number <i>Harlow's P.O. Number</i>
13. Detail FAI <input checked="" type="checkbox"/> Assembly FAI <input type="checkbox"/>	14. Full FAI <input checked="" type="checkbox"/> Partial FAI <input type="checkbox"/> Baseline Part Number Including Revision Level Reason For Partial FAI:		
a) if above part number is a detail part only, go to Field 19 b) if above part number is an assembly, go to the "INDEX" section below.			
INDEX of part number or sub-assembly numbers required to make the assembly noted above.			
15. Part Number	16. Part Name	17. Part Serial Number	18. FAI Report Number
1) Signature indicates that all characteristic are accounted for; meet drawing requirement or are properly documented for disposition. 2) Also indicate if the FAI is complete per Section 5.4 <input checked="" type="checkbox"/> FAI Complete <input type="checkbox"/> FAI Not Complete			
19. Signature <i>JOHN DOE</i>			20. Date <i>XX/XX/XX</i>
21. Reviewed By <i>(Optional)</i>			22. Date
23. Customer Approval			24. Date

Note: If Harlow P.O requires Manufactured Complete and requirements of purchasing of Raw Material and Special Processing, then AS9102 Form 2 shall be required as noted.

AS9102 Form 2 Product Accountability - Raw Material, Specifications and Special Process (es), Functional Testing. Sheet ___ of ___

1. Part Number 123-123456-123		2. Part Name COVE		3. Serial Number If Applicable		4. FAI Report Number XXXXXX	
5. Material or Process Name 7075-T7351 Aluminum 4.00" x 5.50" x 9.00"		6. Specification Number and Latest Revision Level AMS-QQ-A-250/12 (NC) Also List Prime Specification if applicable		7. Code Prime Process Code if Applicable N/A		8. Special Process Supplier Code Name Address & Zip-Code KAISER ALUMINUM TENTWOOD WORKS SPOKANE, WA 99215 SUNSHINE METALS 3941 NORMAN WICHITA, KS 67215	
				9. Customer Approval Verification (Yes/No/NA) Yes		10. Certificate of Conformance Number P/S# SHP0013361WK PO# 74483 HL: 537189A3	
PRE-PENETRANT ETCH		ASTM-E-1417 (05)		N/A		123 Processing 2012 S. Blvd Wichita, KS 67213 Yes J123456	
PENETRANT INSPECTION Grade A		ASTM-E-1417 (05) MIL-STD-1907 (N4)		N/A		123 Processing 2012 S. Blvd Wichita, KS 67213 Yes J123456	
Chemical Conversion Coat (Chemfilm) Class 1A		MIL-DTL-5541 (F)		N/A		123 Processing 2012 S. Blvd Wichita, KS 67213 Yes J123456	
(1) COAT MIL-PRF-23377 EPOXY PRIMER TYPE 1		MIL-F-18264 (D)		N/A		123 Processing 2012 S. Blvd Wichita, KS 67213 Yes J123456	
Hardness		AMS2658 (C)		N/A		Your Company Your Co Address Your Co City/State/Zip NA NA	
11. Functional Test Procedure Number		12. Acceptance report number, if applicable					
13. Comments							
14. Prepared By JOHN DOE				15. Date XX/XX/XX			

AS9102 Form 3 Characteristic Accountability, Verification and Compatibility Evaluation Sheet ___ of ___

1. Part Number 123-123456-123			2. Part Name COVE			3. Serial Number If Applicable	4. FAI Report Number XXXXXX
Characteristic Accountability				Inspection / Test Results			
5. Char No.	6. Reference Location	7. Characteristic Designator	8. Requirements	9. Results	10. Designed Tooling or Measurement Equipment	11. Non-Conformance Number	Comments
1.	Sht 1 1A		∅.2240/.2170	∅.2200	Gage Pins		
2.	Sht 1 1B		1.262" +/- .010"	1.263"	Calipers		
3.	Note 7	Rockwell	HRB 78 min	HRB 80	Wilson #21234		
4.	Note 7	Conductivity	38% - 43% IACS	40% - 40.5% IACS	Verimet #13234		
Signature indicates that all characteristic are accounted for; meet drawing requirement or are properly documented for disposition.							
12. Prepared By JOHN DOE						13. Date XX/XX/XX	

16.0 Nonconforming Material

Supplier shall submit all nonconforming material to Harlow's Quality Assurance for approval prior to shipping of the product. The supplier may use documents or supplier's documents to identify discrepant material. Supplier shall investigate the cause of each nonconformance, whether identified by supplier or by Harlow Aerostructures LLC. The supplier shall establish corrective action to preclude the recurrence of the nonconformance. The supplier shall provide a statement of the cause and the corrective action to Harlow's Quality Assurance whenever the supplier is submitting a nonconformance for Harlow's approval. The supplier shall provide a statement of the cause and the corrective action to Harlow's Quality Assurance within ten days whenever Harlow has identified a nonconformance to the supplier. Ref: Quality Clause Q7

16.1 Counterfeit Parts Prevention

a. For purposes of this section, work consists of those parts delivered under this Contract that are the lowest level of separately identifiable items (e.g., articles, components, goods, and assemblies). "Counterfeit Work" means Work that is or contains items misrepresented as having been designed and/or produced under an approved system or other acceptable method. The term also includes approved Work that has reached a design life limit or has been damaged beyond possible repair, but is altered and misrepresented as acceptable.

b. SELLER agrees and shall ensure that Counterfeit Work is not delivered to HARLOW AEROSTRUCTURES.

c. SELLER shall only purchase products to be delivered or incorporated as Work to HARLOW AEROSTRUCTURES directly from the Original Component Manufacturer (OCM)/Original Equipment Manufacturer (OEM), or through an OCM/OEM authorized distributor chain. Work shall not be acquired from independent distributors or brokers unless approved in advance in writing by HARLOW AEROSTRUCTURES.

d. SELLER shall immediately notify HARLOW AEROSTRUCTURES with the pertinent facts if SELLER becomes aware or suspects that it has furnished Counterfeit Work. When requested by HARLOW AEROSTRUCTURES, SELLER shall provide OCM/OEM documentation that authenticates traceability of the affected items to the applicable OCM/OEM.

e. In the event that Work delivered under this Contract constitutes or includes Counterfeit Work, SELLER shall, at its expense, promptly replace such Counterfeit Work with genuine Work conforming to the requirements of this Contract. Notwithstanding any other provision in this Contract, SELLER shall be liable for all costs relating to the removal and replacement of Counterfeit Work, including without limitation HARLOW AEROSTRUCTURES costs of removing Counterfeit Work, of reinserting replacement Work and of any testing necessitated by the reinstallation of Work after Counterfeit Work has been exchanged. The remedies contained in this paragraph are in addition to any remedies HARLOW AEROSTRUCTURES may have at law, equity or under other provisions of this Contract.

f. This procedure applies in addition to any quality provision, specification, statement of work or other provision included in this Contract addressing the authenticity of Work. To the extent such provisions conflict with this clause, this clause prevails.

g. SELLER shall include paragraphs (a) through (d) of this clause or equivalent provisions in lower tier subcontracts for the delivery of items that will be included in or furnished as Work to HARLOW AEROSTRUCTURES.

16.2 RCCA - Root Cause Corrective Action Statement QAF-021 Instructions

Completing a QAF-021 Corrective Action Statement Form:

1. **Brief Description of Nonconformance:** *(or attach a copy of the NCR)*

2. **Immediate Corrective Action:**

This section should describe actions taken by the supplier to correct symptoms in the short term. Include information that ensures that the non-conforming condition has been corrected. The extent of non-conforming condition must be determined and contained. The response must document that all parties involved have been informed of the problem. Also imperative is the determination of Direct Cause and development of the Direct Cause corrective

action plan (what, who, where, how and date) that includes a schedule for completion, and verification of the effectiveness of Direct Cause Solution. Was there a Product Impact?

Effectivity:

The response includes the "Effectivity" (Date or Unit/Ship Number) of the next shipment when the same part or product will be shipped to the customer without the noted defect.

3. Root Cause Analysis:

The 5 Why approach - The root cause statement(s) shall be a statement of fact and must address a basic systemic issue without any obvious "why" questions embedded in it. The root cause will focus on a single issue of the 5 why approach.

4. Corrective Action Plan:

The Root Cause Corrective Action Plan addresses the root cause statement, establishes an implementation plan with dates and assigns responsibility for the completion of action plans. The plan must reference evidence of revisions to policies, procedures, or work instructions, as well as affected supporting documents. Root cause correction involves long-term prevention and process improvement rather than an immediate fix.

Effectivity:

Include the serial numbers (if applicable) or date (Effectivity) as appropriate, when the root cause corrective action will be complete.

5. Corrective Action Verification Plan:

Determine and include a plan to ensure the committed action has been implemented. This section indicates the supplier has verified or will verify that the root cause corrective action has been accomplished (who, where, when, how and date).

6. Follow-up:

Determine and include what will be audited to ensure the corrective action has been and continues to be effective in precluding recurrence of the nonconformance. Incorporate a schedule for completion of the audit. If appropriate, a query addressing follow-up may be added to the annual audit questionnaire.

17.0 Latent Defect Reporting

In the event a condition is discovered that affects previously delivered product, Harlow shall be notified of the condition in a timely manner. Notification shall be in the form of a letter addressed to the attention of the Harlow's Quality Department. The letter must include all pertinent information concerning the condition (i.e. part numbers, serial number, quantities, time frame, description of condition, etc.) and the corrective action taken to prevent recurrence.

18.0 Quality Clauses

Assurance that the requirements of all purchase order notes or quality clauses are understood and implemented throughout supplier planning and clearly communicated to sub-tier suppliers for inclusion in their planning.

Suppliers shall obtain and comply with the latest released revision of Harlow Supplier Quality Clauses (HQA-01) referenced on Harlow Aerostructures, LLC Purchase Orders, available at www.harlowair.com.

19.0 Delivery Documentation

The supplier shall provide delivery documentation for each item delivered in accordance with the purchase order/contract. The contents shall include:

- A company Certifications of Conformance statement denoting acceptance of the product
- Identity of actual manufacturer (manufacture of origin) on the packing sheet if the end item manufacturer is a company other than themselves
- When performed, name and location of all special process suppliers including all sub-tier special processor(s), ref 6.0 Special Processors (Certifications Required)
- Part serial numbers, when applicable
- First article inspection reports / Delta when performed
- Any other documentation required by purchase order or contract

Material certifications are required to be submitted with all part shipments if the material was purchased and furnished by the supplier. Suppliers are required to maintain a copy of the material certification records traceable to the product shipped to Harlow, Ref: 14.0 Quality Records.

20.0 Source Inspection

When source inspection is required by Harlow Quality Assurance Quality Clause Qb shall be listed on the purchase order contract.