

**Program Specific Requirements – Supplement to QA-MAN-0002**

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## 1. General Information

This document provides program specific Quality Management System requirements. Compliance with these requirements apply to all purchase orders in addition to those found in the QA-MAN-0002 Supplier Quality Assurance Manual, Qarbon Aerospace purchase order, Engineering design and Qarbon Aerospace General Terms and Conditions.

## 2. Boeing

### 2.1. Boeing Commercial and Military Programs – Common Requirements

#### 2.1.1. First Article Inspection (FAI):

The Qarbon Aerospace commercial contract flow down from Boeing requires all AS9102 compliant First articles be loaded into Net Inspect. The Supplier is responsible to load all new baseline FAI’s into Net Inspect as of October 1, 2014. The original baseline FAI’s prior to October 1, 2014, need to be available but are not required as an attachment. A baseline FAI refers to the last “Full Approved FAI” for that part number. The Supplier is responsible for all FAI’s to be loaded into Net Inspect. This includes all PO line items and the details that feed into them.

**Note 1:** If Qarbon Aerospace is purchasing a small sub-assembly/ kit at the PO line-item level, then the subassembly/ kit FAI and all of the associated detail FAI’s that make the subassembly / kit shall be loaded into Net Inspect. The detail FAI’s shall be linked to the PO Line Item in Net Inspect. Net Inspect is available for training if required.

**Note 2:** All requirements for FAI approval prior to Shipment shall remain in effect at the PO line-Item level per the site level requirements defined in the FAI Section of this document. This does not include prior approval in Net Inspect of the detail FAI’s that feed the Sub assembly. All FAI’s must be identified and linked within Net Inspect.

It is mandatory that Form 1 be completed within Net Inspect. Qarbon Aerospace’s FAI requirements are delineated in SC-PRO-00.00.SQR11 Supplier Quality Requirements for First Article Inspection. All Qarbon Aerospace suppliers will be assessed to SC-PRO-00.00.SQR11.

**Validation of Raw Material Test Reports:** When the seller utilizes test reports to accept seller purchased raw material, the following requirements apply.

Test reports shall be checked 100% against seller’s requirements and applicable Specifications (reference BCA document X31764 and note Q29).

**Validation test requirement:** Seller shall periodically validate test reports for raw material accepted on the basis of test reports. That validation shall be accomplished by seller or other independent party through periodic, scheduled tests of raw material samples. Schedules for frequency of tests will be established by seller based on historical performance of the raw material supplier.

1. Seller shall retain test reports provided by the raw material supplier, as well as seller’s validation test results as quality records traceable to the conformance of goods, as specified elsewhere in this contract. Seller shall have implemented process and procedures for “Validation of Raw Material Test Reports”.

2. Seller shall implement process and procedures for “Validation of Raw Material Test Reports”.

2.1.2. FOD Risk Assessment

The supplier shall perform a documented risk assessment for the impact of FOD to product(s) that they provide to Qarbon Aerospace and The Boeing Companies, per D6-85622.

**Note:** See Supply Chain Management Handbook (SCMH) FOD Program Robustness Assessment Tool for future guidance.

The risk assessment shall have documented results that at a minimum include the following:

- Product/ process family characteristics.
- Product/ process family sensitivity to FOD.
- Foreign object (FO) detectability.

The supplier shall implement, manage, and execute an effective FOD prevention program based on the results of the risk assessment. Program requirements shall be progressively more stringent based on the risk level defined.

2.1.3. Procurement

This procurement is under Boeing's Federal Aviation Administration (FAA) issued Production Certificate 700 quality system supplier control program. Unless explicit contractual direction is given to the contrary, no articles (or constituent parts thereof) ordered by Boeing Commercial Airplanes (BCA) shall contain any Federal Aviation Administration- Parts Manufacturer Approval (FAAPMA) markings and the accompanying paperwork (e.g., packages, shippers, etc.) shall not contain any FAA-PMA markings.

**The seller will place the following statement on the shipping documentation of all shipments to Qarbon Aerospace for Boeing programs:**

"Seller hereby acknowledges that the parts and/or materials being shipped under this order is intended for use under Boeing's Federal Aviation Administration (FAA) issued Production Certificate 700 and no articles (or constituent parts thereof) or the accompanying paperwork (e.g., packages, shippers, etc.) contain any Federal Aviation Administration- Parts Manufacturer Approval (FAA-PMA) markings."

**Delegated Product Release** Supplier Delegated for Product Release must meet the requirements of AS9117

2.1.4. BCA Quality Requirements and Reference Documents

- D6-87282, Boeing Quality Management System – Requirements
- Form X31764, Boeing Quality Purchasing Data Requirements (BCA/BGS)
- Form X38656, Boeing Advanced Product Quality Planning (APQP) & Production Part Approval Process (PPAP)

**2.2. Boeing Military (V-22 & T-7A Programs)- Additional Requirements**

ITAR Controls/Requirements apply on the noted programs.

2.2.1. First Article Inspection (FAI):

Seller shall perform First Article Inspections (FAI) in accordance with AS/EN/SJAC 9102 Aerospace First Article Inspection Requirement.

FAI is required for unique single run production orders not intended for on-going production, regardless of exclusion in AS9102 (section 1.3 Applicability)

Boeing reserves the right to conduct surveillance of the Sellers FAI, referred to as Boeing First Article Inspection (BFAI). BFAI may include in-process inspections to be accomplished during performance of the Seller’s FAI. When a BFAI is required, the Seller will be notified by Qarbon Aerospace to schedule the BFAI prior to the start of related manufacturing and/or processing.

In the event a BFAI is scheduled, the supplier shall make available to Qarbon Aerospace and Boeing’s Supplier Quality Representatives (SQR) the following:

1. Applicable purchase document, material/process certifications, manufacturing, and inspection records; including inspection plans developed to identify progressive inspection checkpoints for the FAI as a result of coordination and planning with SQR’s.
2. Applicable Design Data
3. Applicable material review actions
4. Applicable acceptance and qualification test results
5. Applicable record(s) of Boeing approval for non-Boeing drawing and test procedures.

2.2.2. Validation of Raw Material Test Reports:

When the Seller utilizes test reports to accept Seller purchased raw material, the following requirements apply:

1. Test reports shall be checked 100% against Seller’s requirements and applicable

specifications.

2. Validation test requirement: Seller shall periodically validate test reports for raw material accepted on the basis of test reports. That validation shall be accomplished by Seller or other independent party through periodic, scheduled test of raw material samples. Schedules for frequency of test will be established by Seller based on historical performance of the raw material supplier.
3. Seller shall retain test reports provided by the raw material supplier, as well as Seller's validation test results as a quality records traceable to the conformance of Goods, as specified elsewhere in the Contract.
4. Buyer and Customer furnished raw material is not subject to the validation test requirement.
5. Seller shall implement processes and procedures in support of this clause.

#### 2.2.3. Digital Product Definition (DPD) / Model Based Definition (MBD):

Seller shall conform to Boeing's document D6-51991 "Quality Assurance Standard for Digital Product Definition at Boeing Suppliers" and the following shall apply:

1. If Seller receives Buyer's DPD geometry in MBD format, Seller is required to obtain Buyer's approval as MBD-capable.
2. If Seller provides Buyer's DPD geometry to Seller's subcontractors in any format, Seller shall impose Boeing's document D6-51991 as a requirement and is responsible for its subcontractor's conformance.
3. If Seller provides Buyer's DPD geometry in any format to Seller's subcontractors, Seller shall comply with all applicable export laws.
4. Supplier's CMM/CMS Report must be created in an acceptable format that meets ALL requirement(s) of D6-51991. The report must provide sufficient information and properly present the necessary data that effectively demonstrates full compliance to D6-51991 as well as acceptability to the authoritative engineering. This acceptable format will be provided in a template developed by the buyer (Qarbon).
5. Supplier must provide an acceptable Inspection Plan that will accompany every CMS/CMM Report. This acceptable format will be provided in a template developed by the buyer (Qarbon).

#### 2.2.4. Additional T-7A Program Specific Requirements

When manufacturing parts to BAC5114 (Enhanced Process Control for CNC Machining):

1. Part-specific machining CNC programs must be programmed to nominal engineering requirements. Any deviations from nominal engineering requirements must be approved by Qarbon Aerospace’s technical organization.
2. Final part inspection must be performed using engineering datums per GD&T rules specific to the geometry type of Datum.

**NOTE: IF BEST FIT ALIGNMENT IS NECESSARY, THE ENGINEERING DATUMS MUST BE USED WITH THE PROPER APPLICATION OF THE GD&T RULES SPECIFIC TO THE GEOMETRY TYPE OF DATUM.**

When manufacturing parts to PS20722 (Hole Masking for Enhanced Process Controlled Metallic Parts):

3. 9M1084 plugs may only be used once (ONLY NEW PLUGS) and upon removal, discard accordingly.  
  

**\*\*\*\*\*NO REUSAGE OF 9M1084 PLUGS IS ALLOWED. AFTER ONE USE, ALL PLUGS MUST BE SEGREGATED AND DISCARDED. \*\*\*\*\***
4. Evidence of proper plug insertion for each operation is required. When both pickling and anodizing are performed on the same part or groups of parts, there shall be two separate hole masking operations. Hence, two different sets of objective evidence.
5. A digital date/time stamped photograph shall be taken of each part or group of parts.
6. The photographic Objective Evidence shall specify (or be clearly linked to) the following:
  - Date and time stamp
  - The manufacturing/process record (e.g., work order, shop traveler, etc....)
  - The related process (e.g., pickling, anodize)
7. The supplier shall retain the digital photo(s) in the manufacturing/processing record.  
Note: These records will be made available to Qarbon upon request(s).

2.2.5. 100% Inspection Criteria:

1. Qarbon requires 100% inspection for all characteristics for every part produced and sourced.

**EVIDENCE OF INSPECTION (INSPECTION REPORT)**

The seller shall furnish with each shipment to Qarbon Aerospace evidence of inspection and acceptance for each characteristic and applicable Part List or drawing notes per AS9100 Sect 8.5.1.

The minimum data required is as follows:

- Part number and revision
- Qarbon’s purchase order number
- Suppliers packing slip and/or Job #
- Evidence of inspection and acceptance of each characteristic including dimensions and material,
- Validation that any outside supplier/processor was properly vetted against D1-4426
- Quantity submitted for inspection
- Quantities accepted
- Method of inspection used (micrometer, surface plate set up, visual, fixture number, etc.)
- Stamp or signature of the inspector and date
- Verification of material, processes, and inspection must include certification numbers on the inspection report.

(See Attachment 1 for an example of the Dimensional Inspection Report)

**EXCEPTION:** COTS items, Standard Hardware, OEM Specification, AN, MS, NAS, etc. when not required by the hardware specification or on the purchase order.

### 2.3. Applicable Boeing Quality Clauses and Notes

The following Quality Clauses are applicable to all T-7A Purchase Orders issued to suppliers and subsequently sub-tier suppliers:

- D057S NDT Procedure
- Q004 Boeing QMS Requirements for Suppliers
- Q011S Supplemental Quality Requirements
- Q020 D1-4426 Approved Process Source
- Q029 DPD (Digital Product Definition / MBD (Model Based Definition))
- Q033 BAC5114 NC Programming and Machine Controls Specifications-Contractual



and Process Control Requirements (Applicable where BAC5114 and PS20722 required)

- Q035 BSS7156 Early Production Verification and Requirements for BAC5114 Parts (Applicable where BSS7156 required)
- Q053 Buyer's Source Inspection Required
- Q074 First Article Inspection and Boeing BFAI
- Q091W Certification of Conformance
- Q132 Counterfeit Parts
- Q227 Record Retention
- Q300 Corrective Action
- Q186 FOD Prevention Program
- Q320 Seller's NOE
- Q831 Validation of Raw Material Test Reports
- Q836S Instructions for Submittal and Handling of External Nonconformance Documents
- Q927 AS9117 – Requirement for Delegated Product Release Verification Copies of the above noted Quality Clauses may be obtained from the assigned Qarbon Aerospace Buyer.
- GTA NO. G1700007 GTA No. G1700007 Applicable Modified GP7 Terms

#### 2.3.1. Audits

The following audits will be performed by Qarbon Aerospace (or a delegated 3<sup>rd</sup> party). Audits may be invoked on-site and/or remote. Note: Audits will continue until acceptable level of proficiency is achieved. Proficiency will be determined based on supplier performance as defined in QA-MAN-0002 – Supplier Quality Assurance Manual.

- BAC5114 will be conducted every 3 years.
- PS20722 will be conducted every 2 years

#### 2.3.2. Tooling

All jigs and tools provided to Seller and those manufactured by Seller in support of work carried out shall be inspected by Seller prior to use for completeness, freedom from damage and evidence of inspection.

## 2.4. C-17 Program

The following requirements are unique to the C17 Program and the supplier should pay particular attention to these areas to ensure compliance:

- 2.4.1. Fracture Critical parts and the requirement for traceability are controlled by Boeing book form drawings 17P9M2004 and 17P9M2005.
- 2.4.2. Assignment of serial numbers is handled by Qarbon Aerospace for Category A parts – there are no exceptions.
- 2.4.3. Where a government or Industry Standard is shown on an engineering drawing in addition to the Boeing DPS/DMS standards, the use of the Boeing standards is mandatory for suppliers fabricating or assembling parts per Boeing design requirements.
- 2.4.4. When DPS 4.747 is invoked per the drawing, NDI procedures must be submitted and approved by Qarbon Aerospace NDI Level 3 in the applicable method prior to performing NDI.
- 2.4.5. Supplier Delegated for Product Release must meet the requirements of AS9117.

## 3. Gulfstream

### 3.1. G650 Program

In addition to the Quality System requirements identified in Table 1 of QA-MAN-0002, the following requirements and appendices shall apply to all POs for the G650 Program.

#### 3.1.1. Required Specification and Approved Source Listings

All applicable process specifications, tooling specifications and Approved Source Listings shall be provided by Qarbon Aerospace to the responsible supplier. When specifications and/or processes are listed within the detail design, specification control or envelope drawing, incorporated by this Purchase Order that are copy controlled by organizations other than the Product Design Authority (e.g. AS, AMS, ASME, NASM, etc.), Seller shall be responsible for obtaining these documents from the issuing organization or appropriate distribution source. Seller must adhere to the latest revision of Qarbon Aerospace or Qarbon Aerospace's customer specification and/or process, unless otherwise specified within the Purchase Order.

#### 3.1.2. Tooling

All jigs and tools provided to Seller and those manufactured by Seller in support of work carried out shall be inspected by Seller prior to use for completeness, freedom from damage and evidence of tooling acceptance. All tooling is to be manufactured, maintained and validated per Qarbon Aerospace Tooling Procedure STM (mentioned in

this document Section 2.12 Tooling Requirements) as applicable with the following exception, the tooling must be properly identified in accordance with Gulfstream Tooling and Planning Manual for Subcontractors, revision B, dated May 7, 2003, to indicate its ownership by Gulfstream.

Supplier shall maintain CATIA and Adobe Acrobat revision in accordance with GER 7818(Omni Part Knowledge Base Environment External Supplier Revision Management Application Set).

### 3.1.3. Gulfstream Aerospace Corporation (GAC) Special Process Sources

All Special Processes performed by Seller or Seller's Sub-tier suppliers shall be approved by GAC as applicable, prior to performing any Special Process. Reference document: GAC Approved Process Sources.

For those shipments including parts which have undergone a First Article Inspection, a statement that the FAI has been accomplished, including the FAI number must be included in the COC.

### 3.1.4. Process Control

Seller and its Sub-tier suppliers shall ensure that all appropriate personnel are familiar with engineering drawings and Gulfstream Manufacturing Standards (GMS) for the Program and that controlled copies of engineering and GMS are made available at the place of operation. Upon receipt of Purchase Orders and prior to planning the work, Seller shall verify that all processes are within the approved scope of work. Seller shall incorporate the engineering within its route cards, travelers or job instructions and only qualified equipment and/or operators shall perform the process.

### 3.1.5. Seller's Inspection and Test

Seller shall prepare an appropriate Inspection Plan in order to ensure all its production processes, parts and assemblies comply with the drawings/engineering data. Seller which performs acceptance sampling in lieu of one hundred percent (100%) inspection shall develop such Inspection Plan from recognized industry standards with C = 0.

Qarbon Aerospace reserves the right to review and approve Seller's acceptance /verification test plans, software, and procedures. Revisions to approved software/documents must be coordinated with Qarbon Aerospace prior to use.

When statistical process control is used as an option for either in-process or final inspection, Seller must satisfy the provisions for Variation Management as defined in this Flysheet. In all cases, inspection and test requirements identified by engineering drawing/model or specification take precedence over the inspection options described herein. Qarbon Aerospace reserves the right to require 100% inspection for selected

characteristics.

### 3.1.6. Identification Marking and Traceability of Parts and Assemblies

Traceability classification shall be defined by engineering. Traceability and serialization shall be compliant to GAC14D Control, Serialization, and Traceability Requirements for Parts.

1. Identification marking for non-critical metallic parts shall be compliant with GAMPS 1105 Identification Marking of Fabricated Metallic Part and Assemblies.
2. Identification marking for non-critical non-metallic parts shall be compliant with GAMPS 1106 Identification Marking of Fabricated Non-metallic Parts and Assemblies.

Once a serial number is assigned it shall never be changed or reused for that part number. If a part is rejected and scrapped or it is lost, the serial number shall go out of existence with the part. The replacement part shall be assigned a new serial number. All serial numbers delivered and scrapped shall be accounted for in Seller's Quality Records.

Prior to fabrication, raw material batch number shall be documented on router/traveler to ensure documented traceability of raw material batch number to fabricated part serial number. Given any conflict or question exist, regarding identification, consult the engineering.

### 3.1.7. Regrading Material

The disposition "regrade" shall not be used on products of Qarbon Aerospace, and Qarbon Aerospace customer's proprietary design.

### 3.1.8. Procurement of Raw Materials and Hardware.

1. Seller or its Sub-tier supplier shall provide objective evidence of the conformance of all procured supplies and services. The objective evidence shall be maintained on file by Seller and/or Seller's Sub-tier suppliers and made available for review by Qarbon Aerospace, its customers or involved authorities (FAA).
2. Raw material and fastener chemical/ physical test reports shall be verified by a third-party laboratory a minimum of once every 12 months for each manufacturer.
3. For material substitution direction refer to the following Gulfstream standards: GAS30BF Material Substitution List, GAS30TV Material Thickness Substitution, and GAS30J Substitution of Fasteners and Related Hardware.
4. Ultrasonic inspection shall be performed in accordance with GAMPS 9101 (Aluminum), GAMPS 9102 (Steel), and GAMPS 9103 (Titanium).
5. Laboratory tests shall be performed by GAC approved or NADCAP accredited

laboratories. NADCAP accredited laboratories can be viewed at: [PRI Login \(sae.org\)](https://www.pri.sae.org).

### 3.1.9. Control and Storage of Inventory

Seller shall strictly control all inventory of Qarbon Aerospace and Qarbon Aerospace 's customer's proprietary Product that is in excess of Purchase Order quantity in order to prevent Product from being sold or provided to any third party without prior written authorization from Qarbon Aerospace. Seller shall physically separate and clearly identify raw materials, hardware and parts stored for Qarbon Aerospace Programs. Products will be shipped according to Purchase Order requirements.

### 3.1.10. Supplier Quality Performance

Seller shall be responsible for achieving and maintaining a minimum quality performance level of either:

A Qarbon Aerospace Supplier Quality Acceptance Rating of ninety-eight percent (99.5%) as calculated by taking the ratio of acceptable units delivered for the prior twelve (12) month period. This calculation may be based on a composite performance score from all Purchase Orders between Seller and the Qarbon Aerospace contracting site, or specific by Program to which the Master Order Agreement applies.

If Seller fails to achieve and maintain the acceptable performance criteria above, Seller shall be responsible for one or more of the following as directed by Qarbon Aerospace at no additional costs to Qarbon Aerospace:

1. Seller shall at its own expense obtain source inspection from a Qarbon Aerospace qualified contractor.
2. Seller shall reimburse Qarbon Aerospace contracting site(s) for reasonable Qarbon Aerospace costs incurred at the point of manufacture. Such costs shall include travel, lodging and Qarbon Aerospace labor costs.

### 3.1.11. Flow Down to Sub-tier Suppliers

For articles, processes and raw materials purchased from Subtier suppliers in support of this Purchase Order, Seller shall ensure that all Purchasing Documents include all Quality and Technical Requirements required, including key characteristics as applicable.

## 3.2. G550 Program

In addition to the Quality System requirements identified in Table 1 of QA-MAN-0002, the following requirements and appendices shall apply to all POs for the G550 Program.

### 3.2.1. Required Specification and Approved Source Listings

All applicable process specifications, tooling specifications and Approved Source Listings shall be provided by Qarbon Aerospace to the responsible supplier. When

specifications and/or processes are listed within the detail design, specification control or envelope drawing, incorporated by this Purchase Order that are copy controlled by organizations other than the Product Design Authority (e.g. AS, AMS, ASME, NASM, etc.), Seller shall be responsible for obtaining these documents from the issuing organization or appropriate distribution source. Seller must adhere to the latest revision of Qarbon Aerospace or Qarbon Aerospace 's customer specification and/or process, unless otherwise specified within the Purchase Order.

### 3.2.2. Tooling

All jigs and tools provided to Seller and those manufactured by Seller in support of work carried out shall be inspected by Seller prior to use for completeness, freedom from damage and evidence of tooling acceptance. All tooling is to be manufactured, maintained and validated per Qarbon Aerospace Supplier Tooling Manual SC-MAN-0003.

Supplier shall maintain CATIA and Adobe Acrobat revision in accordance with GER 7818(Omni Part Knowledge Base Environment External Supplier Revision Management Application Set).

### 3.2.3. Gulfstream Aerospace Corporation (GAC) Special Process Sources

All Special Processes performed by Seller or Seller's Sub-tier suppliers shall be approved by GAC as applicable. In addition, suppliers shall be an approved source for applicable Vought specs prior to performing any Special Process. Reference document: GAC Approved Process Sources.

For those shipments including parts which have undergone a First Article Inspection, a statement that the FAI has been accomplished, including the FAI number must be included in the COC.

### 3.2.4. Process Control

Seller and its Sub-tier suppliers shall ensure that all appropriate personnel are familiar with engineering drawings. Upon receipt of Purchase Orders and prior to planning the work, Seller shall verify that all processes are within the approved scope of work. Seller shall incorporate the engineering within its route cards, travelers or job instructions and only qualified equipment and/or operators shall perform the process.

### 3.2.5. Seller's Inspection and Test

Seller shall prepare an appropriate Inspection Plan in order to ensure all its production processes, parts and assemblies comply with the drawings/engineering data. Seller which performs acceptance sampling in lieu of one hundred percent (100%) inspection shall develop such Inspection Plan from recognized industry standards with C = 0.

Qarbon Aerospace reserves the right to review and approve Seller's acceptance /verification test plans, software, and procedures. Revisions to approved software/documents must be coordinated with Qarbon Aerospace prior to use.

When statistical process control is used as an option for either in-process or final inspection, Seller must satisfy the provisions for Variation Management as defined in this Flysheet. In all cases, inspection and test requirements identified by engineering drawing/model or specification take precedence over the inspection options described herein. Qarbon Aerospace reserves the right to require 100% inspection for selected characteristics.

### 3.2.6. Identification Marking and Traceability of Parts and Assemblies

Traceability classification shall be defined by engineering.

Once a serial number is assigned it shall never be changed or reused for that part number. If a part is rejected and scrapped or it is lost, the serial number shall go out of existence with the part. The replacement part shall be assigned a new serial number. All serial numbers delivered and scrapped shall be accounted for in Seller's Quality Records.

Prior to fabrication, raw material batch number shall be documented on router/traveler to ensure documented traceability of raw material batch number to fabricated part serial number. Given any conflict or question exist, regarding identification, consult the engineering.

### 3.2.7. Regrading Material

The disposition "regrade" shall not be used on products of Qarbon Aerospace, and Qarbon Aerospace customer's proprietary design.

### 3.2.8. Procurement of Raw Materials and Hardware.

1. Seller or its Sub-tier supplier shall provide objective evidence of the conformance of all procured supplies and services. The objective evidence shall be maintained on file by Seller and/or Seller's Sub-tier suppliers and made available for review by Qarbon Aerospace, its customers or involved authorities (FAA) .
2. Raw material and fastener chemical/ physical test reports shall be verified by a third-party laboratory a minimum of once every 12 months for each manufacture.

### 3.2.9. Control and Storage of Inventory

Seller shall strictly control all inventory of Qarbon Aerospace and Qarbon Aerospace 's customer's proprietary Product that is in excess of Purchase Order quantity in order to prevent Product from being sold or provided to any third party without prior written authorization from Qarbon Aerospace. Seller shall physically separate and clearly identify raw materials, hardware and parts stored for Qarbon Aerospace Programs.

Products will be shipped according to Purchase Order requirements.

#### 3.2.10. Supplier Quality Performance

Seller shall be responsible for achieving and maintaining a minimum quality performance level of either:

A Qarbon Aerospace Supplier Quality Acceptance Rating of ninety-eight percent (99.5%) as calculated by taking the ratio of acceptable units delivered for the prior twelve (12) month period. This calculation may be based on a composite performance score from all Purchase Orders between Seller and the Qarbon Aerospace contracting site, or specific by Program to which the Master Order Agreement applies.

If Seller fails to achieve and maintain the acceptable performance criteria above, Seller shall be responsible for one or more of the following as directed by Qarbon Aerospace at no additional costs to Qarbon Aerospace:

3. Seller shall at its own expense obtain source inspection from a Qarbon Aerospace qualified contractor.
4. Seller shall reimburse Qarbon Aerospace contracting site(s) for reasonable Qarbon Aerospace costs incurred at the point of manufacture. Such costs shall include travel, lodging and Qarbon Aerospace labor costs.

#### 3.2.11. Flow Down to Sub-tier Suppliers

For articles, processes and raw materials purchased from sub-tier suppliers in support of this Purchase Order, Seller shall ensure that all Purchasing Documents include all Quality and Technical Requirements required, including key characteristics as applicable.

## 4. Northrop Grumman

### 4.1. Global Hawk / HALE Program

#### 4.1.1. Shipping and Documentation Requirements

1. For Fracture Critical items, supplier certification must include the date and/or revision level of the manufacturing plan used and the Northrop Grumman PO005 survey/RCI number approving the plan.
2. All material and process certification for all Fracture Critical 1, Fracture Critical 2 and durability parts must be sent in with every shipment. All manufacturing plans



and NDT/NDA techniques must be submitted for approval by the customer via the SIR system

Note: All aluminum fabricated parts require 100% conductivity inspection after fabrication. Conductivity ranges shall be per AMS 2658.

## 5. Pratt and Whitney

### 5.1. F-135 Program

5.1.1. The requirements of Raytheon Technologies document ASQR-01 is applicable in its entirety with the following exceptions:

1. All of Section 2. Informative References. Configuration of all documents In support of Qarbon Aerospace product/deliveries will be defined by Qarbon Aerospace,
2. All elements of ASQR-01, Section 8.2.1.1. All communications/requests for Information associated with the F-135 program shall be to Qarbon Aerospace via ASQR-01 Form 3 Supplier Request for Information (SIR).
3. ASQR-01, Section 8.5.1.9. Request and obtain approval for an Operator Self-Verification Program - also known as an Operator Certification Program shall be submitted to Qarbon Aerospace via ASQR-01 Form 3 Supplier Request for Information (SIR).

5.1.2. The latest revision of ASQR-01 is available from Qarbon Aerospace and may be obtained by request via the Portal. Copies of Approved Processor Listings shall also be provided via the Qarbon Aerospace Supplier Portal.

5.1.3. F-135 Suppliers: The requirements of ASQR-01 apply to all Organizations that furnish product, material, processes, or product related services to P&W as a contractual requirement regardless of Organization's Industry, regulatory accreditation, or certification status, and each Organization shall be responsible for ensuring that all members of Its supply chain comply with the requirements set forth herein.

Note: All hardware must be LCS certified to MCL F-17 in accordance with PWA 300.

5.1.4. Compliance to the requirements of AS13100 – Aerospace Engine Supplier Quality (AESQ) Quality Management System Requirements for Aero Engine Design and Production.

## 6. Virgin Galactic

### 6.1. Internal Audit of SQRM Requirements

Suppliers shall include verification of compliance with the below Virgin Galactic (VG) program quality requirements during normally scheduled internal audits of their Quality Management System.

### 6.2. Supplier Approval

Suppliers may be subject to approval by VG Quality. When deemed necessary by Qarbon Aerospace, or VG, suppliers shall undergo an on-site audit or visit by VG Supplier Quality. Qarbon Aerospace representatives will coordinate and attend VG on-site activity when the approval is not related to a special process.

Special Process suppliers should be certified to AS9100 and/or Nadcap AC7004. In the absence of certification, VG reserves the right to perform an audit. VG may use suppliers Nadcap Certification to industry processes as evidence of compliance to the industry process for approval.

VG approval is required of those special processors as defined in the VG special process specifications.

Suppliers may use Nadcap certified special process suppliers for industry processes.

### 6.3. Flow Down to Subcontractors

The supplier shall have a formalized process to flow VG requirements to sub-tier suppliers(subcontractors). This process shall include a method to control the configuration of the delivered article/process and shall indicate the documentation required with delivery of the article or process.

### 6.4. Composite Suppliers and Equivalency

When VG Procurement identifies a new composite supplier, VG Engineering will determine the product equivalency for this supplier's manufacturing site. Suppliers will be included as a qualified composite supplier for the applicable VG Special Process if the product equivalency has been approved by VG Engineering.

VG's Equivalency Test Plan for VG Processing of Composite Materials and VG's Equivalency Test Plan for VG Bonding of Structural Parts are intended to be used in conjunction with a test plan, which will detail specific test requirements for the supplier being subjected to the qualification.

## 6.5. Process Control Documents

Process Control Documents (PCD) are written descriptions of manufacturing plans developed to control variation in Key Characteristics. These are living documents which require revision as changes occur to Key Characteristics. (Source: SAE AS9103).

When PCDs are required, the following apply:

- The supplier's PCD shall be submitted to Qarbon Aerospace for VG approval. VG Engineering approval is required prior to the start of the manufacturing process.
- To request a change to an approved PCD, the supplier shall contact Qarbon Aerospace Procurement representative to coordinate the approval with VG Engineering.
- The supplier shall maintain the PCD current to VG Engineering.
- Changes to the PCD require approval by VG Engineering.
- The supplier shall maintain evidence of approval on file.

## 6.6. Right Of Access

VG requires Qarbon Aerospace to make program books and/or records available to VG or representatives of the FAA within 24 hours of a request when the requestor is at the supplier's facility or received as a written request. The supplier will expend necessary efforts to support Qarbon's response requirement. The response must be made within 48 hours for non-US suppliers.

In situations where access to physical locations or facilities are required, Qarbon Aerospace will provide advanced notice to the supplier. Qarbon representatives will coordinate and attend VG on-site activity.

## 6.7. Notification of Changes

Approval of a supplier is specific to each unique location. The supplier shall request approval prior to a change affecting the manufacturing location, major equipment, or test facilities. The supplier shall notify Qarbon Aerospace Procurement and Qarbon Aerospace Supplier Quality no less than one hundred (100) business days prior to the relocation, with details of the planned change and impact on the VG program processes, product, and/or services. The supplier will notify Qarbon Aerospace Procurement within 5 business days of an extenuating circumstance which does not allow notification within the 100-day required time frame.

Qarbon Aerospace Supplier Quality shall evaluate the change with respect to continued approval and respond in writing to the supplier within twenty (20) business days of the initial notification.

The supplier's change may result in additional requirements, e.g. on-site audit, FAI, etc.

The supplier shall be responsible for all impacts resulting from the supplier's change.

**6.8. Manufacturing Planning**

Manufacturing planning shall be capable of repeatedly producing a Space Flight System article and inspecting/testing the Space Flight System article to ensure it conforms to the contractual configuration. The system shall be closed loop to ensure that all design requirements per the purchase order are met. The manufacturing planning shall:

- Directly indicate the part number of the Space Flight System article made.
- Indicate the revision of the drawing to which it is produced.

In the event the supplier uses synthetic part numbers for planning purposes, the supplier shall have a procedure to use and track the configuration for acceptance. The procedure shall define:

- The methodology for synthetic part numbering.
- The tracking used to ensure the end configuration is met (including the article identification), and the relationship to the First Article Inspection (FAI) of the Space Flight System article.

**6.9. Identification Of Article**

The Supplier shall have a process to control the identification and traceability of all articles to the manufacturing process. This process shall ensure, as applicable to the Space Flight System article, that a means for full or complete traceability are in place including:

- Manufacturing operator/operation traceability.
- Components and materials in relation to the delivered Space Flight System article (date code, batch No., serial No.).
- Methodology used to serialize parts ensuring uniqueness of serial number.
- A recording system providing an ongoing cross-reference between the manufactured items and the working documents.

**6.10. Configuration Management**

The supplier shall ensure the documentation (engineering drawings, specifications, test plans, etc.) supporting the required configuration is available at the supplier's manufacturing facility in a secure location.

**6.11. Special Requirements**

When VG Engineering identifies requirements which have high risks of not being met (e.g., due to product or process complexity, the limit of the industry’s capability, experience, and product or process maturity), or if the supplier determines the requirements to be at the limit of its technical or process capabilities, these are deemed “special requirements”. The supplier shall ensure there is an operational risk management process with evidence of controls (control plans) for these “special requirements”.

**6.12. Critical Article**

The supplier shall provide serialization to articles where VG Engineering has designated specific articles as “Critical.”. The designation will be noted in the design data.

For articles designated as “Critical”, the notation “Critical” shall be included in the supplier's manufacturing planning.

**6.13. Design Data Changes**

The supplier shall not work outside the parameters/limits of the Engineering design data nor change any VG design data. When engineering data is in error or not producible, the supplier shall request direction by utilizing the Supplier Information Request option from the Corrective Action section within the Qarbon Aerospace supplier TIPQA website at: <https://qarbonprod.tiptech.cloud/TipQAWeb/views/index.spa.html#!/app/correctiveaction/calists>.

Refer Corrective Action (CA) Type “SR”.

Nonconformances resulting from engineering errors must be processed through the Material Review Board. The Supplier Notice of Nonconformance is created by selecting the Nonconformance Process from the Nonconformance section of the Qarbon Aerospace TIPQA website at:

<https://qarbonprod.tiptech.cloud/TipQAWeb/views/index.spa.html#!/app/nonconformance/nclists>.

Refer Nonconformance (NC) Type “SN”.

Documented root cause must clearly describe how the engineering design features caused the nonconforming condition.

**6.14. Control of Documented Information**

6.14.1. When using synthetic part numbers for planning purposes, the supplier shall have a procedure for the use and tracking of configuration for acceptance. The procedure shall define the methodology for numbering, the tracking used to ensure the end configuration is met (including the article identification), and the relationship to the FAI of the Space Flight System article. The system shall be closed loop to ensure that all design requirements per the purchase order are met.

6.14.2. The supplier shall establish and fully document methods/procedures for the systematic control of quality-related records. All quality-related records shall be:

- Accurate/authentic, complete, and legible.
- Traceable
- Filed in a logical, organized manner.

- Maintained (e.g., through amendment/changes, correction of errors, revision or updating to ensure accuracy).
- Protected from unintentional alteration, loss, or damage (e.g., computer viruses, corruption, physical damage from fire, water, extreme temperature, or humidity).
- Held secure from unauthorized access and/or alteration (e.g., password protected computer systems, restricted access areas, locked file cabinets).

6.14.3. Supplier shall ensure:

- All records do not contain incorrect (e.g., due to mathematical errors), misleading, or distorted data that does not conform with this manual. Record falsification, forgery, or misrepresentation may be grounds for supplier disapproval, immediate revocation of any contract or purchase order, and subject to legal action.
- All original information remains legible after correction.
- Procedures are implemented to control approval of corrected, deleted, or added information.
- All corrections and modifications are traceable to the individual who made the correction/modification.
- Corrected/modified records requested by the customer are accompanied by an explanation for the correction/modification.

6.14.4. The supplier shall not :

- Identify quality-related methods and/or information used for the completion of VG requirements, with “For Reference Only”, “For Information Purposes Only”, or “Uncontrolled”.
- Modify documents defining the requirements of the purchase order (e.g., drawings, specifications), unless such modification is for the enhancement of manufacturability and/or clarification of users understanding the original requirements and does not allow the supplier to operate outside the parameters/limits of the requirements.
- Allow correction (e.g., correction fluid, black out methods) to obliterate information.

**6.15. Personnel**

There shall be a sufficient number of experienced personnel in all key departments as relevant to meeting the requirements of the purchase order.

The supplier shall demonstrate that all personnel are given the appropriate authority to discharge their responsibilities and their contribution to product or service conformity.

### 6.16. Visual Acuity

The supplier shall utilize qualified personnel to confirm that the selected personnel possess the required abilities when quality-related tasks require supplier personnel to have a defined level of visual acuity (e.g., nondestructive testing (NAS 410), visual inspections of welds (AWS D17.1)) and/or the ability to distinguish one or several chromatic colors. The supplier shall:

- Ensure these eye examinations/tests are performed, at a minimum, bi-annually.
- Retain records of all eye examinations/tests.
- Require the use of any prescribed corrective lenses for those individuals performing quality-related tasks with a defined level of visual acuity and/or the ability to distinguish one or several chromatic colors.

### 6.17. Furnished Articles, Materials and Equipment

The supplier shall fully document the methods used to verify, control, and maintain accountability of articles, materials and/or equipment provided by Qarbon Aerospace in support of the VG program. Control shall include, but is not limited to, providing training to all personnel utilizing these furnished articles and equipment, including any confidentiality and access restrictions.

Qarbon Aerospace has a requirement to notify VG within three (3) working days subsequent to the loss or identifying an unsuitable condition of furnished articles or equipment. When loss or unsuitability has been established at the supplier's facility, the supplier will expend necessary efforts to support Qarbon's requirement to notify VG. Notification to Qarbon Aerospace must include the cause of its current condition.

Upon fulfillment of the contract, the supplier shall disposition all remaining furnished articles or equipment in accordance with the contract or as instructed by Qarbon Aerospace. Records of the disposition of articles or equipment furnished by Qarbon Aerospace shall be retained.

### 6.18. Material Traceability

The supplier shall:

- Maintain material lot/batch traceability on all materials from receipt of the article to the incorporation into a deliverable.
- Be capable of determining the manufacturer's lot/batch number of every raw material included in a VG program article. This includes lot/batch traceability of fly-away consumable items, manufactured details, raw material, and hardware.
- Control inventory of raw materials and shall ensure that materials of differing heats, lots, or batches of, material are not comingled.
- Not procure articles from brokers, unless otherwise authorized in writing from VG. Shipments must include certificate of compliance with reference to lot/batch number.

- Maintain complete traceability to each raw material batch (heat lot, fiber lot, etc.), each processing certification, article test data (batch release, batch acceptance, in- testing, etc.) and inspection data for each individual critical article produced.
- Have a system in place to provide requested information for each critical part number and the assigned serial number.

### 6.19. Raw Materials Test Report

The raw material supplier shall include with each shipment:

- The raw material manufacturer's test report (e.g., mill test report) which states the lot of material furnished has been tested, inspected, and found compliant with the applicable material specifications (e.g., identified on the Qarbon Aerospace Purchase Order or drawing in support of the VG program).
- The test report which lists the specifications, including revision numbers or letters, to which the material has been tested and/or inspected and the identification of the material lot to which it applies.
- The test report when the material specification requires quantitative limits for chemical, mechanical, or physical properties, to contain the actual test and/or inspection values obtained.

For aluminum mill products (except castings), certifications for chemistry may indicate compliance within the allowed range. Certifications for physical properties should show actual values. When the supplier provides converted material produced by a raw material manufacturer, the supplier shall submit:

- All pre and post conversion chemical/physical test reports.
- Verification of all raw composite materials (such as pre-impregnated materials, etc.) that are produced per a VG Material Specification or applicable standard(s) prior to use.
- A Certificate of Analysis when required by VG specification with material delivered to Qarbon Aerospace in support of the VG program.

### 6.20. Counterfeit Material and/or Parts

The supplier and relevant subcontractors shall have in place a documented program to comply with the requirements of SAE AS5553 for electrical, electronic, and electromechanical (EEE) parts and/or SAE AS6174 for all non-electronic product (e.g., raw material, mechanical assemblies) to prevent and mitigate the use of counterfeit parts.

The supplier and relevant subcontractors shall not use material and hardware with broken traceability or sourced from a non-authorized supplier.

NOTE: ECIA (Electronic Component Industry Association) Members listed on the “ECIA Authorized” database <https://www.trustedparts.com/>) buy direct from 100% authorized sources.



**6.21. Physical Environment Requirements**

The supplier shall ensure that materials produced for the VG program are handled and stored in accordance with the VG specifications identified in the Engineering.

Supplier shall:

- Have a system to monitor material that is time, temperature, humidity, and/or time-at-temperature (e.g., out-life) sensitive.
- Maintains records indicating the storage temperature, humidity, time-at-temperature (e.g., out-life), and shelf-life when incorporated into a Space Flight System article.

**6.22. Electrical, Electronic and Electromechanical (EEE) Parts**

The supplier and/or supplier’s subcontractor shall ensure that all Electrical, Electronic or Electromechanical (EEE) parts incorporated in a Space Flight System article are:

- Manufactured within three (3) years from the delivery date for Plastic Encapsulated Microcircuits (PEMs)
- Manufactured within five (5) years for all others. This includes all sub-assemblies of the article being procured.

Any deviation from this requirement requires written authorization from Qarbon Aerospace, and the authorization shall be included with each shipment.

**6.23. Electrostatic Discharge Sensitive (ESDS) Parts**

The supplier and/or the relevant subcontractors handling and/or providing Electrostatic Discharge Sensitive (ESDS) materials, devices, or assemblies shall:

- Document and implement an ESD Control Program in accordance with ANSI/ESD S20.20, ESD Association “Standard for the Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)”.
- Properly package and identify parts as required in ANSI/ESD-S20.20 Protection of Electrical and Electronic Parts.

**6.24. Equipment**

The supplier shall ensure that all required equipment (e.g.: machinery, tooling, molds, jigs, fixtures, templates, instrumentation, M&TE, computers, software, air compressors, water filtering systems) is available and capable of producing articles and/or services that fulfill all requirements of QA-MAN-0002, QA-MAN-0002-01 and the associated Qarbon Aerospace Purchase Order. Supplier shall maintain evidence of the capability assessment.

**6.25. First Article Inspection**

The supplier shall perform a First Article Inspection (FAI) on each new article part number produced for the VG program. The FAI shall be conducted and reported per the requirements of SAE AS9102 “Aerospace First Article Inspection Requirements” Revision B or revision C. Compliance to Revision B or Revision C has been authorized by VG Contract letter QA24-017.

**6.26. Inspection and Test**

The supplier shall have a method to ensure that inspection and test activities conform to all drawing and specification requirements.

**6.27. Article Acceptance Software**

If the supplier uses article acceptance software or equipment, such as a coordinate measuring machine (CMM) or laser tracker to inspect articles, the supplier shall comply to the following requirements:

- Two- or Three - dimensional (2D/3D) design data are the only media acceptable during the manufacturing process and for use for article acceptance.
- All article acceptance software shall be capable of reporting inspection results traceable to the 2D/3D drawing geometry.

**6.28. Discrepancy Management**

The supplier shall submit all known deviations of VG designed product, process, or service to Qarbon Aerospace for disposition as soon as the discrepancy is discovered. MRB dispositions will be established by VG and provided by Qarbon Aerospace. The supplier may choose to rework to print or scrap any discrepant article within the limitations of their quality system except for articles furnished by Qarbon Aerospace or articles manufactured from material furnished by Qarbon Aerospace. The supplier shall have a system in place that ensures the activity to scrap is overseen by the supplier’s Quality department.

**6.29. Nonconforming Product Disposition**

When Material Review Board disposition is required on a nonconforming product, the supplier shall:

- Include the Qarbon Aerospace Supplier Notice of Nonconformance (SN) number and VG issued Nonconformance Report (NCR) number in the part marking.
- Use the original marking method as called for per design, but the rubber-stamping method, ink jet marking method, hand marking method, or stenciling method may be used as alternatives.
- Deliver the article to Qarbon Aerospace with no further action, when the disposition is “USE AS IS,” except for the part marking requirement.

- Rework the article following the instructions provided with the disposition, when the disposition is “REWORK PER ENGINEERING DISPOSITION”.

Upon completion of MRB disposition instructions, the supplier shall:

- Stamp each line item in the disposition section.
- Maintain a copy of the stamped original NCR with the supplier’s manufacturing and inspection documentation.
- Submit a new SN if the work conducted per the disposition was unsuccessful or a new nonconformance was created. The original NCR and SN number must be referenced as information within the new SN. The Supplier Notice of Nonconformance is created by selecting the Nonconformance Process from the Nonconformance section of the Qarbon Aerospace TIPQA website at:

<https://qarbonprod.tiptech.cloud/TipQAWeb/views/index.spa.html#!/app/nonconformance/nclist> .

Refer Nonconformance (NC) Type “SN”.

### 6.30. Notice of Quality Escape

When the supplier identifies or becomes aware of a suspect product / service that has escaped from the supplier’s facility to Qarbon Aerospace, the supplier shall notify the appropriate Qarbon Procurement Representative within 24 hours.

The Notice of Escape (NOE) shall include the type of inspection that revealed the discrepant condition.

If multiple articles are included in the NOE, the supplier shall provide an editable table containing the information relating to the escape (e.g., part numbers, purchase order numbers, lot/batch numbers, shipment dates).

Dimensional violation must include the Engineering "should be" requirement, the actual measured "is" dimension value, and the unique identification of the Measuring & Test Equipment used (e.g., asset numbers).

The Supplier NOE is created by selecting the Corrective Action Process from the Corrective Action section of the Qarbon Aerospace TIPQA website at:

<https://qarbonprod.tiptech.cloud/TipQAWeb/views/index.spa.html#!/app/correctiveaction/calist> .

Refer Corrective Action (CA) Type “NE”.

### 6.31. Corrective Action

VG Supplier Quality shall have the authority to request corrective action, through Qarbon Aerospace, at any time for any nonconformance or discrepant condition.

VG requires Qarbon Aerospace to:

- Respond to any corrective action request within 10 business days or before the due date entered on the Corrective Action request by VG Supplier Quality.
- Address corrective action requests marked “Safety of Flight” or “Work Stoppage” within 24 hours of corrective action notification.

The supplier will expend necessary efforts to support Qarbon’s response requirement, with a level of effort which supports Qarbon Aerospace’s requirement to send VG a response within 24 hours of the corrective action request.

Extensions may be requested in writing but must include the reason for the request.

VG reserves the right to request further investigation and activity if the corrective action response is deemed inadequate. All requests will be coordinated through Qarbon Aerospace.

### **6.32. Continuous Improvement**

The supplier shall have a method to continually improve the effectiveness of the quality management system and related processes. The supplier shall:

- Monitor the implementation of improvement activities and evaluate the effectiveness of the results.
- Identify continual improvement opportunities from lessons learned, problem resolutions, and the benchmarking of best practices.

The supplier shall have a method to eliminate potential nonconformances by preventing their occurrence. Preventative actions shall be appropriate to the severity or frequency of the potential problems.

Improvement ideas affecting VG article design/process specifications can be forwarded to Qarbon Aerospace for coordination with VG Procurement. Requests should include a full account of impact to the supplier.

### **6.33. Shipping Document Requirements**

Distributors are required to include manufacturer certifications with shipping documents. Suppliers are required to maintain the distributor shipping documents as part of receiving inspection records.

### **6.34. Packaging and Shipping**

Suppliers shall ensure, unless otherwise specified:

- All articles are packaged and marked in accordance with the latest version of ASTM D3951, “Standard Practice for Commercial Packaging”, or an equivalent documented and industry-accepted methodology, to protect the articles (e.g., from deterioration, corrosion, or damage) during delivery/shipment.



