

QA-MAN-0002

Supplier Quality Assurance Manual



Approved by:
Quality Assurance Management
Supply Chain Management

Process Owner:
Qarbon Aerospace Quality Assurance
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1. Purpose

This quality manual provides Quality Management System requirements for suppliers doing business with Qarbon Aerospace and is a contractual obligation by reference within the Qarbon Aerospace General Purchase Order Terms and Conditions noted in purchase orders. Suppliers must also comply with requirements in QA-MAN-0002-01 Program Specific Requirements – Supplement to QA-MAN-0002.

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2. Scope

This quality manual is applicable to suppliers under contract with Qarbon Aerospace sites located at:

Qarbon Aerospace (Foundation)
300 S. Austin Blvd
Red Oak, TX 75154

Qarbon Aerospace (Lafayette)
90 Highway 22 West
Milledgeville, GA 31061

Officially released and current versions of the Supplier Quality Assurance Manual QA-MAN-0002 and General Purchase Order Terms and Conditions can be accessed through the Qarbon Aerospace Supplier Portal. Printed documents are uncontrolled, and the on-line versions shall be used as governing documents.

3. Objective

Qarbon Aerospace is committed to establishing a dynamic supply network that will maximize our combined capabilities to exceed customer expectations for first time quality, on time delivery and long-term cost management.

Customer expectations require Qarbon Aerospace and its suppliers to maintain Quality Management Systems which ensure the quality of the products. To meet this commitment, it is necessary that Qarbon Aerospace suppliers develop, execute, and sustain key business, operational and process management practices that demonstrate that they are capable of meeting and exceeding the contractual obligations of Qarbon Aerospace and our customers.

4. Supplier System Requirements, Approvals and Evaluations

4.1. Supplier Resources

- 4.1.1. Qarbon Aerospace provides resources to suppliers through the Supplier Portal at: [Supplier Portal - Qarbon \(qarbonaerospace.com\)](https://qarbonaerospace.com).
- 4.1.2. TIPQA is a Qarbon Aerospace cloud-based software system available via the Supplier Log In on the Supplier Portal. TIPQA is divided into modules which provide resources to the supplier allowing immediate communication with Qarbon Aerospace. TIPQA supplier accounts, access and navigation through the modules are explained in the TIP Supplier Portal Guide found on the Supplier Portal.

4.2. Approved Source List

Qarbon Aerospace maintains an Approved Supplier List (ASL) as a basis for identifying part / material, special processing and service suppliers who meet the standards necessary to fulfill its procurement needs. Approved supplier lists can be accessed from the Supplier Portal.

4.3. Quality Management System Requirements

- 4.3.1. The Quality Management Systems identified in Table 1 shall be the Quality System standards used in determining eligibility for Qarbon Aerospace Approved Suppliers Listing (ASL). Qarbon Aerospace suppliers shall implement and maintain a Quality Management System in accordance with the Quality System standards listed in Table 1 as appropriate for the type of product being delivered to Qarbon Aerospace. All costs associated with obtaining and maintaining Quality System approvals are the responsibility of the supplier.
- 4.3.2. In addition to the Quality System requirements identified in Table 1 the below documents are imposed on all purchase orders unless otherwise specified.
 - a. AS9102 Aerospace Series – First Article Requirements is applicable in coordination with SC-PRO-00.00.SQR11 for parts, assemblies, sub-assemblies, castings, forgings and raw material cut to a part number or engineering shape.
 - b. AS9103 Quality Management Systems - Variation Management of Key Characteristics is applicable when Key Characteristics have been identified on the engineering drawing, specification or as part of the configuration requirements on the purchase order.
 - c. SC-MAN-0003 Supplier Tooling Manual establishes and defines the requirements to Qarbon Aerospace suppliers and their sub-tiers for the fabrication, rework, design, inspection, maintenance, accountability, control and disposition of Special Tooling and Special Test Equipment.
 - d. SC-PRO-00.00.SQR03 Suppliers Quality Requirements for Documenting and Handling Nonconformances provides direction to suppliers for documenting nonconformances

to either Engineering or purchase order requirements that require Qarbon Aerospace Engineering liaison and/or Manufacturing Engineering disposition.

- e. SC-PRO-00.00.SQR3.7 Supplier Quality Requirements for Control and Use of Digital Product Definition/Model Based Definition is applicable to purchase orders where part design and/or configuration is defined via a released digital dataset (e.g., CATIA, UNIGRAPHICS, etc.). DPD system approval is required before a supplier can use digital data for part production. This does not apply during the Request for Proposal/Quote phase; however, approval must be obtained prior to the acceptance of a formal purchase order and release of engineering.
- f. SC-PRO-00.00.SQR09 Quality Assurance Acceptance Sampling Requirements for Suppliers is applicable to purchase orders which authorize sampling inspection. Sampling inspection requirements imposed by Qarbon Aerospace customers take precedence over SC-PRO-00.00.SQR09 and will be flowed to the supplier within the purchase order.
- g. SC-PRO-00.00.SQR10 Supplier Hardness and Conductivity Testing Requirements is applicable to purchase orders for metallic parts (i.e., sheet metal and machined) in the final heat treat condition, unless explicitly prohibited by engineering requirements. This requirement is not applicable to annealed material. This does not apply to Boeing T-7A Program unless otherwise specified by the engineering requirement.
- h. SC-PRO-00.00.SQR11 Supplier Quality Requirements for First Article Inspection outlines the FAI requirements to ensure that verification of all design characteristics of a deliverable product are documented and that its subcomponents meet all applicable levels of design drawing, material and process specifications requirements. This procedure provides requirements which will produce consistent FAI documentation from Qarbon Aerospace suppliers.
- i. QA-PRO-00.02.0001 Supplier Corrective Action provides guidance for supplier responses to corrective action requests.
- j. SC-PRO-00.04.0001 Delegated Product Release Verification (DPRV) Program provides the requirements and full description of delegating product verification to suppliers.
- k. QA-PRO-00.21.0100 CMS Operating Instruction and Reporting Requirements is applicable to purchase orders which include product manufactured and inspected to digital data definition. Suppliers will provide CMS inspection results to Qarbon Aerospace upon request.
- l. Supplier shall ensure personnel involved and performing work in support of a Qarbon Aerospace purchase order be made aware of:
 - m. their contribution to product or service conformity,
 - n. their contribution to safety,

o. the importance of ethical behavior.

4.3.3. Qarbon Aerospace will recognize AS/EN/SJAC9100, AS/EN/SJAC9110, AS/EN/SJAC9120 (referred to generically as 9XXX) Quality System Certifications issued only by an accredited Certification/Registration Body (CRB). The accredited 9XXX CRB listing can be found on the SAE web page: sae.org/oasis. Suppliers that cannot or will not meet these requirements shall notify their Qarbon Aerospace Procurement representative. IAQG no longer recognizes AS9003. Suppliers desiring to be IAQG recognized should seek approval to other industry standards in Table 1 upon recertification.

4.3.4. Initial and subsequent periodic review of a supplier's Quality Management System may be performed at the option of Qarbon Aerospace. Objective evidence of supplier's compliance, either by submittal of requested evidence, or evidence of "Other Party" evaluation, may be acceptable for the purpose of re-survey to Qarbon Aerospace.

"Other Party" is defined as a registrar that has their accreditation body participate in the IAQG Quality System Certification oversight process. An "Other Party" Quality System Certification would be one issued by an accredited registrar that participates in the aerospace industry's IAQG oversight process.

Qarbon Aerospace retains the right of access to perform assessments, surveys, and reviews. Coordination with the supplier will occur prior to any on-site activity.

4.3.5. Suppliers shall provide Qarbon Aerospace access to their IAQG OASIS information upon request. IAQG OASIS information access may include but is not limited to the supplier's 9XXX audit record and/or copies of a supplier's past audit reports. Suppliers that do not provide this access or copies may be subject to additional Qarbon Aerospace approval audits or disqualification as a Qarbon Aerospace supplier. Access to the supplier's IAQG OASIS records or previous audit reports does not necessarily preclude the requirement for a Qarbon Aerospace approval audit.

4.3.6. Once added to Qarbon Aerospace Approved Supplier Listing, the supplier must continue to demonstrate an acceptable level of performance as noted in Section 9 in order to remain eligible for new business and to maintain their approved status.

4.3.7. Supplier name changes, changes in ownership, facility changes or changes in senior Quality management may subject the supplier's Quality System to re-evaluation by Qarbon Aerospace. Supplier shall notify the Qarbon Aerospace Procurement Representative within 48 business hours of the occurrence.

4.4. New Suppliers

4.4.1. A supplier application is initiated by Qarbon Aerospace Procurement for a prospective supplier. Unsolicited application requests from suppliers will not be reviewed.

4.4.2. The supplier application is reviewed by Qarbon Aerospace Quality and Procurement Management to determine if the prospective supplier is qualified to become a Qarbon Aerospace supplier.

4.5. Supplier Appraisals

4.5.1. A comprehensive risk assessment and appraisal will be conducted on the supplier’s capabilities, capacities, compliance, strengths, and weaknesses. Suppliers may be provided direction regarding developmental needs and opportunities in support of the approval.

4.5.2. The method of appraisal is based upon the scope and criticality of the work to be performed. Past performance will be used to support establishing the frequency of appraisals on existing/sustaining suppliers.

4.5.3. Prior to any on-site activity, documentation and operational evidence to demonstrate performance should be organized to facilitate timely presentation and review by Qarbon Aerospace personnel. Qarbon Aerospace personnel cannot conclude compliance unless they are presented with objective, verifiable evidence that the criteria have been met.

4.6. Minimum Quality System Requirements

4.6.1. Aerospace - This supplier is approved to provide materials/products for use in Aerospace (Commercial and DOD) applications.

4.6.2. Non-Aerospace - This supplier is approved to provide materials/products for use in applications which are not Aerospace, e.g., Nuclear, Space, MRO, etc.

Table 1

Required Quality System Level	Applicable Minimum Quality System Document (7)	Supplier Description
Level 1 (3)	AS9100	Manufacturer with design authority (Major Assemblies, Source/Spec. Control Product); Engineering Services with design/release authority
Level 2 (3)	AS9100 (1) or AS9003A (8)	Manufacturer (Build-to-Print) Value Added Distributor, JIT Suppliers, Inspection Services (e.g., CMM), Raw Material Suppliers
Level 3 (4)	AS9120 or, ASA100	Pass Through Distributor, Standard Hardware Suppliers
Level 4 (2)(4)	Nadcap AC7004, or AS9003A (8)	Processor
Level 5	AS9100 (3), AS9003A (8), or ISO9001 (3)	Tooling with design authority

Level 6	AS9100 (3), AS9003A (8), or ISO9001 (3)	Tooling (Build-to-Print) , technical service provider with delegated Inspection Authority
Level 7 (5)	NONE	Commercial, Off-The-Shelf (COTS), non-technical service providers, or those without delegated inspection authority, Customer authorized, CFE/CFM/PMI (6)
Level 8 (3)	ISO 10012-1 or, ISO 17025 or, ANSI Z540-1 or A2LA, or NVLAP or AC7006	Calibration/Laboratories
Level 9 (3)	FAA FAR Part 145/21 or AS9110	Repair Stations
Level 10 (3)	ISO9001	Manufacturer, Single source, Customer directed not able to meet AS QMS Requirements

Table 1 Notes

When AS9100 is referenced, EN9100 and SJAC9100 are also applicable.
When AS9110 is referenced, EN9110 and SJAC9110 are also applicable.
When AS9120 is referenced, EN9120 and SJAC9120 are also applicable.
(1) Less the “Design” requirements of the standard
(2) Requirement is Nadcap Process A approval
(3) “Other Party” certification required
(4) “Other Party” certification required, Approval to AS9100 will also satisfy this requirement
(5) Service Providers may require other audits if Qarbon Aerospace is to transmit Digital Data
(6) CFE/CFM/PMI Customer Furnished Equipment/Material; Partner Managed Inventory. Customer authorized requires documented concurrence from the QAE customer.
(7) These requirements are for Aerospace supplier designation only. Qarbon Aerospace will define the QMS requirements for non-aerospace.
(8) Suppliers desiring to be IAQG recognized should seek approval to other industry standards in Table 1 upon recertification. IAQG no longer recognizes AS9003 certification.

4.7. Maintenance of Approved Supplier Status

4.7.1. Qarbon Aerospace monitors supplier performance on a monthly basis using Supplier Quality Performance Ratings. Suppliers who continue to demonstrate unsatisfactory performance may lose their approval status and become suspended or terminated. To

changes in a supplier's facility occur, major management changes, facility upgrades, equipment movement, major capacity changes, etc.

4.10. Pre-Production Qualifications

- 4.10.1. Pre-production qualification is typically required by the governing engineering specification and is used to verify that fabrication and inspection processes of the first production part comply with engineering requirements. This process includes a Qarbon Aerospace review of the production planning to ensure all required engineering elements are addressed by the supplier.
- 4.10.2. Examples of pre-production qualifications include, but are not limited to:
 - a. first part qualification,
 - b. thermal profile plan/report,
 - c. pre-production verification plan,
 - d. AS9145 PPAP/APQP.
- 4.10.3. Engineering specifications associated with pre-production qualifications require supporting documentation and/or materials. Build to engineering(print) programs utilize engineering specifications from Qarbon Aerospace customers. These engineering specifications may require those customers to review the documentation/materials for approval. Regardless of the customer specification requirements, the supplier shall not contact the Qarbon Aerospace customer without prior written approval from Qarbon Aerospace. Suppliers shall submit all documentation/ materials to Qarbon Aerospace unless otherwise directed in writing from Qarbon Aerospace. Supplier shall use a Secure File Transfer site, (e.g., FTP) or encrypted email, (e.g. Preveil) to send sensitive, proprietary and/or controlled data.
- 4.10.4. Nonconformances identified during the review may require formal corrective action requests in order to document the resolution. Additional actions resulting from the corrective actions may require Qarbon Aerospace oversight. This additional oversight will be coordinated with the supplier to ensure the scope is understood and that technical support is provided.
- 4.10.5. Qarbon Aerospace will require on-site or virtual follow-up to review evidence of implemented corrective actions associated with pre-production qualifications.

5. Supplier Responsibilities

5.1. Quality Assurance Requirements

- 5.1.1. Qarbon Aerospace supplier quality assurance requirements are included in the Buyer's Standard Purchase Order Terms and Conditions which references this QA-MAN-0002. Quality Clause(s) may also be added to the PO on a part number or contract number basis.

Suppliers shall ensure these requirements are covered by their existing Quality management system or make special provisions to implement processes which are not addressed in their existing procedures/ processes.

5.2. Identifying Purchase Order Requirements

- 5.2.1. Suppliers shall perform an in-depth review of the purchase order to ensure that the supplier can comply with the requirements, this includes subordinate documents which are referenced in the Buyer's Standard Terms and Conditions as well as documents referenced within the engineering requirements. It is also the supplier's responsibility to request or otherwise obtain subordinate documents, specification and data referenced within the Purchasing documentation.
- 5.2.2. Verbal communication and/or e-mails are not recognized as a means to communicate PO requirements and shall not be used. Any requests or deviation shall be forwarded to the issuing Qarbon Aerospace Purchasing representative in writing for agreement or re-assignment of the purchase order. The Supplier Information Request (SR) function within TIPQA can also be used to initiate dialog to change or clarify PO requirements. All liability as a result of the supplier accepting verbal changes to the purchase order shall be the responsibility of the supplier.
- 5.2.3. The Qarbon Aerospace Procurement representatives will assist suppliers in gaining the necessary access for the purposes of reviewing:
 - a. Quality Assurance Requirements,
 - b. Technical engineering requirements defined on an engineering drawing,
 - c. Specifications,
 - d. Requirements for Certificates of Conformance,
 - e. Quantified test results,
 - f. Qualified sources,
 - g. Special part / material identification requirements,
 - h. Program, Customer-Specific Quality Requirements.
- 5.2.4. Acceptance of Qarbon Aerospace purchase order constitutes acceptance of the accountability to comply with the requirements listed on the purchase order, in subordinate documents and the requirements contained herein.

5.3. Correspondence and Data

- 5.3.1. All correspondence and data submitted to Qarbon Aerospace in support of the requirements contained herein must be in English.

5.3.2. Documented measurements will be derived using equipment that measures in the original native engineering unit of measure (i.e. engineering dimensions in English must be measured with equipment capable of measuring in inches. Mathematical conversions are not allowed). Requests for deviations to this requirement must be submitted to Qarbon Aerospace Procurement representative. Requests will contain a Measurement Plan detailing the documented process(es) that will ensure calculations are accurate, no rounding is utilized that could compromise engineering tolerances and individuals are adequately trained.

5.4. Contract Configuration

5.4.1. Unless otherwise specified in the purchase order / contract agreement, manufacturing and inspection shall be performed to the latest Qarbon Aerospace released planning/engineering. The supplier is authorized to work to the drawing revision level noted on Qarbon Aerospace supplied planning (where applicable) or to a more current revision of released engineering supplied by Qarbon Aerospace.

If a drawing change notice or drawing revision changes the configuration of the part and is not called out on the purchase order or planning control sheet, the supplier is required to immediately notify the Qarbon Aerospace Procurement representative prior to continued manufacture of the part.

5.4.2. If the purchase order does not indicate the revision of the drawing or specification, the drawing and/or specification revision in effect on the issue date of the purchase order shall be utilized.

5.4.3. Requests to utilize a later revision of a process specification may be submitted to Qarbon Aerospace Procurement representative, but must meet the following requirements:

5.4.3.1 There is no Qarbon Aerospace initiated Engineering Order associated with the process specification that the author of the specification has not incorporated in the later revision.

5.4.3.2 There is no cost or schedule impact to deliverable product under contract. If an impact does exist as a result of using a later process specification revision than that is shown on purchase order, the supplier shall contact the applicable Qarbon Aerospace Procurement representative for disposition instructions.

5.4.4. The supplier shall meet the requirements for configuration management and control as stated in AS9100. The supplier is responsible for maintaining or assuring configuration control at their sub-tier suppliers.

At a minimum, the supplier's configuration management disciplines will be applied to:

- a. Identifying and documenting a product's characteristics,
- b. Controlling, recording and reporting changes to a product's documentation,

- c. Conducting and documenting configuration audits,
- d. Managing, controlling and retrieving contract data.

5.4.5. Configuration Control is managed at the PO part number level. Qarbon Aerospace Supplier Specification Plan (SSP) defines the configuration requirements for the purchased detail, assembly or installation. Documents specified on the SSP will be sent with the PO to the supplier. The supplier shall request any clarifications or revisions to the SSP through the TIPQA SR process. Once the SR request is approved and the SSP is revised, it shall automatically be added to the “Keep Up to Date” (KUTD) process for all future revisions.

5.5. Government Source Inspection

5.5.1. When Government source inspection (GSI) is a purchase order requirement, Qarbon Aerospace source inspection shall be accomplished before the Government source inspection.

5.5.2. Unclassified Programs

5.5.2.1 The supplier shall determine if the product needing GSI supports an Unclassified Program. This should be evident within the “Government Source” requirement shown on the purchase order, at the purchase order line-item level or within the purchase order “notes” section. If this is not evident, contact the Qarbon Aerospace Procurement representative immediately.

5.5.2.2 If applicable, the supplier shall promptly notify the government representative normally servicing supplier’s facility. The supplier shall furnish a copy of the purchase order to the respective government office. If the government representative/agency cannot be identified, notify Qarbon Aerospace Procurement representative immediately.

5.5.3. Classified Programs

5.5.3.1 The supplier shall determine if the product needing GSI supports a Classified Program. This should be evident within the “Government Source” requirement shown on the purchase order, at the purchase order line-item level or within the purchase order “notes” section. If this is not evident, contact the Qarbon Aerospace Procurement representative immediately.

5.5.3.2 When applicable, the supplier is specifically instructed NOT to contact the Government representative normally servicing supplier’s plant. The supplier shall contact Qarbon Aerospace Procurement representative that will advise through Qarbon Aerospace security channels of the Government representative accessed and designated for this contract.

5.6. Special Process Requirements

5.6.1. When the use of only Qarbon Aerospace “Approved Special Processors” are specifically required by drawing, specification, purchase order, or other media, the supplier shall ensure that the processing source for these requirements, including those performed by the supplier, are listed on Qarbon Aerospace Approved Special Processor List prior to any processing. Qarbon Aerospace Approved Special Processors List (ASPL) is available on the Supplier Portal.

As a prerequisite for Qarbon Aerospace ASPL approval, special processors require Nadcap accreditation. Qarbon Aerospace subscribes to Nadcap for the following process categories:

- a. Nondestructive Testing,
- b. Heat Treating,
- c. Material Testing Laboratories,
- d. Chemical Processes,
- e. Coatings,
- f. Welding,
- g. Non-Conventional Machining & Surface Enhancement – Shot Peening,
- h. Composite Handling and Fabrication.

5.6.2. Qarbon Aerospace reserves the right to validate Nadcap compliance to any processes that are unique to Qarbon Aerospace or outside the scope of normal industry practice and/or Nadcap general audit practice. This requirement also applies to the Qarbon Aerospace suppliers with internal processing capabilities. Suppliers utilizing external special process sources must flow this requirement to the sub-tier supplier performing those special processes.

5.6.3. All costs associated with Nadcap accreditation shall be borne by the processor. Performance Review Institute (PRI), a nonprofit affiliate of the Society of Automotive Engineers(SAE), must perform all Nadcap accreditation audits. Information regarding the Nadcap accreditation process, including the audit schedule is available from PRI at: <https://www.p-r-i.org/nadcap>.

- 5.6.4. When processes listed in Qarbon Aerospace's customer approved processor list are required by drawing, specification, or purchase order, the supplier shall ensure that the processing source for these processes, including those performed by the supplier, are approved by Qarbon Aerospace's customer prior to processing parts. Links to Qarbon Aerospace's customer approved special processor lists are available on the Supplier Portal, then select Approved Processors and reference the links under Customer Approved Processors.
- 5.6.5. Supplier purchase orders to Qarbon Aerospace approved special processors must contain the following statement: "Suppliers conducting processes in support of this purchase order must be on the Qarbon Aerospace approved special processor list or the Qarbon Aerospace customer approved special processor list. Approved special processors can be accessed from the Supplier Portal at <https://qarbonaerospace.com/supplier-portal/>".
- 5.6.6. Subcontracted processes on components of supplier design must be performed by supplier-approved facilities. Sub-tier special processor evidence of capability shall be supported by objective evidence including but not limited to audits and/or manufacturing and test results. In the event that the sub-tier supplier is customer approved, it remains the responsibility of the supplier to verify all processes are performed in accordance with the engineering requirements. Suppliers in these circumstances are encouraged to subscribe to Nadcap and require Nadcap accreditation by their processors.
- 5.6.7. A listing of all facilities being used by the supplier must be available for review by Qarbon Aerospace which reserves the right of disapproval of those facilities not considered satisfactory. Suppliers shall not substitute their own or other party process specifications for Qarbon Aerospace or customer process specifications without prior written approval provided through the Qarbon Aerospace Procurement representative.
- 5.6.8. Suppliers are responsible for ensuring parts provided by their sub-tier suppliers meet all special process requirements.
- 5.6.9. The special processor shall review, perform, inspect, and certify to the process specification as required by the purchase order. Any departure from specification requirement requires the prior written approval from the Qarbon Aerospace Engineering responsible for the specification.
- 5.6.10. Listing in the ASPL does not assure or imply that the work performed by the ASPL processor is acceptable, nor does it compel the listed processor to accept the work. It is the responsibility of the supplier to verify all processes are performed in accordance with the specification requirements.
- 5.6.11. The ASPL processor shall comply with Qarbon Aerospace program unique requirements such as submission of test coupons, written approval of the process procedures, use of specific chemicals and/or concentrations, witnessing of first part processing, etc.

property without the written approval from a Qarbon Aerospace authority constitutes the supplier's acceptance of all costs related to repair or replacement.

Suppliers shall not return Qarbon Aerospace furnished property without written direction of Qarbon Aerospace Procurement representative. Articles returned to Qarbon Aerospace must include copies of the previously received Qarbon Aerospace shipping documents.

5.10. Nonconforming Product Disposition Authority

5.10.1. Supplier disposition authority of nonconformances is limited to rework, return to supplier and scrap unless identified otherwise by a Qarbon Aerospace purchase order or Quality requirement. Additional requirements for documenting nonconformances that need Qarbon Aerospace disposition are included in SC-PRO-00.00.SQR03.

Suppliers that do not hold design authority must contact Qarbon Aerospace for dispositions of use-as-is and repair.

Disposition authority terms are defined as follows:

5.10.1.1 Rework

A process performed entirely within the confines of engineering requirements that will eliminate the nonconformance and result in a characteristic that conforms completely to the drawings, specifications, and/or contract requirements.

Suppliers must document the nonconformance and provide rework instructions as part of their manufacturing planning process. This is considered a part of the supplier's approved Quality system relative to the control, documentation, and disposition of nonconforming material.

Alteration of a product which changes the chemical or mechanical properties, or the final engineering configuration is not rework and must be submitted to Qarbon Aerospace Material Review Board for disposition, refer SC-PRO-00.00.SQR03.

5.10.1.2 Return to Supplier

Return of nonconforming product to the sub-tier supplier or customer.

5.10.1.3 Scrap

Product found to be unfit for use shall be dispositioned as scrap. Scrapped product shall be conspicuously/permanently identified and segregated from production until it is destroyed. Unless otherwise negotiated in writing with Qarbon Aerospace all scrap material shall be rendered useless by destructive means within 24 hours of disposition.

Scrapping Qarbon Aerospace furnished property is prohibited without prior written authorization from Qarbon Aerospace.

5.11. Material Review Board (MRB) Dispositions for Supplier Designed Product

- 5.11.1. Suppliers of product that retain design authority to a Source / Specification Control Drawing(SCD) may use dispositions of use-as-is or repair as long as the nonconformance does not result in a departure from the requirements of the SCD / Customer Specification. This includes suppliers that produce products of proprietary design, and products to military and industry standards.
- 5.11.2. The supplier MRB shall not disposition any part that is nonconforming to a customer requirement which affects form, fit, function, weight, interchangeability, reliability or safety. These nonconformances shall be submitted to Qarbon Aerospace per the requirements of SC-PRO-00.00.SQR03 Suppliers Quality Requirements for Documenting and Handling Nonconformances .

5.12. Responsibilities upon Notification of Nonconformances

- 5.12.1. Qarbon Aerospace will utilize TIPQA as the primary means to notify suppliers of a nonconforming product that requires a corrective action response. Supplier representatives will receive an automated email from the TIPQA system requesting corrective action. Containment must be initiated to eliminate any further impact to Qarbon Aerospace and/or its customers which may be in-process, in the supplier's inventory, at supplier's sub-tier sources, and/or in the process of delivery.
- 5.12.2. Suppliers will also be expected to participate in discussions with their Qarbon Aerospace Procurement representative regarding appropriate disposition options for nonconformances as well as the availability of known-acceptable replacement parts.
- 5.12.3. When schedule permits, suppliers may request return of nonconforming product, at their expense, when such product is not otherwise suitable for immediate use or rework by Qarbon Aerospace. Alternately, suppliers are encouraged to examine nonconformances at Qarbon Aerospace prior to final disposition in order to aid the development of timely corrective actions.
- 5.12.4. Process requirements and additional guidance are provided in procedures QA-PRO-00.02.0001 and SC-PRO-00.00.SQR03 Suppliers Quality Requirements for Documenting and Handling Nonconformances.

5.13. Cost Recovery

- 5.13.1. At the discretion of Qarbon Aerospace, suppliers may be subject to charges for recovery of costs associated with any supplier-responsible nonconforming product. Reference Table 2 for description of conditions that may warrant cost recovery and the associated value.

Cost recovery does not apply to nonconformances caused by engineering, customer issues, or build package data/tooling provided by Qarbon Aerospace.

5.13.2. Cost recovery charges can include:

- 5.13.2.1 An administrative charge for each nonconformance document generated by a Qarbon Aerospace supplier,
- 5.13.2.2 An administrative charge for each request for error corrections required on a Certificate of Conformance,
- 5.13.2.3 A “to be determined” charge (USD) for each part requiring rework/repair by Qarbon Aerospace or Qarbon Aerospace customer personnel, (amount as determined by actual rework/repair cost),
- 5.13.2.4 Part / material charges (USD) per purchase order or contract pricing for each part / material scrapped at Qarbon Aerospace or its customer (amount as determined by scrap cost).
- 5.13.2.5 Additional charges may also apply where customer furnished product is scrapped at the supplier as a result of the supplier’s actions (amount as determined by scrap cost),
- 5.13.2.6 Additional charges may also apply where supplied parts / materials require extensive repair at Qarbon Aerospace or its customer, e.g., an assembly needing to be disassembled, part removal or replacement from an assembly, etc. (amount as determined by actual repair cost).

Table 2

CATEGORY	DESCRIPTION	VALUE
V1	TIPQA tag type SN Supplier Initiated PRA (Rework to Print, Scrap)/MRB (Customer Disposition)	\$500.00
V2	TIPQA tag type SC, SI, RI Qarbon Aerospace Initiated PRA (Return to Vendor, Rework to Engineering, Scrap)	\$750.00
V3	TIPQA tag type SC, SI, RI Qarbon Aerospace Initiated MRB (Customer Disposition)	\$1250.00
V4	Major Issue (Open Traveled Repair/Rework, multiple parts, shop disruption, major repair/rework, etc.)	Actuals

5.14. Notification of Escape

5.14.1. When the supplier identifies a product / service provided to Qarbon Aerospace that has, or is suspect of having, a nonconforming condition the supplier shall notify the Qarbon Aerospace Procurement representative within 48 hours.

Suppliers must notify Qarbon Aerospace Procurement representative immediately upon identifying product escapes which affect, or potentially affect, Safety of Flight.

Suppliers may lose their approved supplier status and be removed from the Qarbon Aerospace ASL for failing to report a known product quality escape.

5.14.2. The supplier notification shall consist of two methods of communication.

5.14.2.1 The supplier will initially notify the Qarbon Aerospace Procurement representative by telephone.

5.14.2.2 A second notification shall occur in writing utilizing the TIPQA Corrective Action module found on the Supplier Portal. Once the Supplier Portal is accessed select Supplier Log In, TIPQA TIP-Prod, select settings in the upper right-hand corner to ensure the NOE is being sent to the business unit identified as ROF (Red Oak facility) or MVF (Milledgeville facility). The NOE template is available by selecting the "+" sign within the Corrective Action module, then selecting CA Type "NE" Notice of Escape. Additional guidance can be provided from the Qarbon Aerospace Supplier Quality representative.

5.14.3. Suppliers are required to attach the last FAI performed for the affected part(s). It is acceptable to list the FAIR number from Net Inspect.

5.14.4. If it is immediately known, it is expected that supplier root cause and long-term corrective action will also be submitted with the notification. If the root cause and long-term corrective action it is not immediately known, it shall be provided within 14 calendar days.

5.14.5. Qarbon Aerospace may require additional information to support internal investigations and/or customer requests.

5.14.6. The containment report within the NOE must include an explanation of the review conducted on similar product/service which has not yet been provided to Qarbon Aerospace.

5.14.7. It is Qarbon Aerospace's option to report supplier Notification of Escape incidents to the suppliers Quality System certification body via the OASIS feedback process.

5.15. Inspection Sampling

5.15.1. Design characteristics shall be 100% inspected unless sampling plans are flowed down by Qarbon Aerospace, or an alternative sampling plan has been approved by Qarbon Aerospace Quality Assurance. Sampling plans and procedures must meet the requirements within SC-PRO-00.00.SQR09 and should be based on SAE AS9138 “Statistical Product Acceptance Requirements”.

5.16. Nondestructive Test (NDT) Submittal Requirements

5.16.1. Non-destructive test procedures and part specific technique sheets must be approved by Qarbon Aerospace unless otherwise authorized in writing from Qarbon Aerospace. Qarbon Aerospace approval may require approval from the end item customer. Changes to subject documents shall be submitted to Qarbon Aerospace for approval prior to implementation.

Minimum content for procedures and techniques are found in the engineering requirements.

5.16.2. Suppliers using outside (sub-tier) NDT suppliers shall ensure those NDT suppliers have Qarbon Aerospace approved NDT procedures / technique sheets prior to testing production parts.

5.17. Manufacturing Planning

5.17.1. Manufacturing planning requiring customer approval shall be submitted to Qarbon Aerospace Procurement representative at least 30 calendar days prior to start of scheduled production, or as required by the customer.

5.17.2. Approved manufacturing plans are considered “frozen”. No deviations are permitted on approved/frozen planning without written authorization from Qarbon Aerospace.

5.17.3. Manufacturing plans for critical parts shall include the notation “Critical”. Critical designation will be evident on the engineering or will be identified through notification from Qarbon Aerospace.

5.18. Qarbon Aerospace Furnished Tooling and Equipment

5.18.1. Supplier shall verify customer furnished tooling prior to production and records of the verification will be made available to Qarbon Aerospace upon request.

5.18.2. Supplier shall have procedures which ensure customer furnished tooling is maintained on an inventory list with a recall process that provides the ability to locate each tool. Suppliers will periodically verify tool condition, quantity of tools and their details. The verification schedule will be established by the supplier unless a specific schedule is otherwise dictated by Qarbon Aerospace customer. Verification of tool condition will include assurance of no damage and no wear which may lead to the production of nonconforming parts/assemblies.

- 5.18.3. The supplier shall provide Qarbon Aerospace Procurement written notification within three working days when furnished tooling is determined as lost or an unsuitable condition has been identified. Notification of an unsuitable condition should include the cause of its current condition.
- 5.18.4. Furnished tooling requiring a tool prove-out shall require written acceptance from Qarbon Aerospace prior to using the tool for continued production.
- 5.18.5. The supplier shall induct all Qarbon Aerospace furnished Precision Measuring Equipment (PME) into their calibration system and is responsible for maintaining periodic calibration of the furnished PME unless otherwise negotiated with the Qarbon Aerospace Procurement representative. PME is defined as any device used to measure, gage, test, inspect or otherwise determine compliance with engineering requirements. PME includes, but is not limited to, calipers, micrometers, linear scales, pin gages, thread gages, spline gages, custom gages, optical comparators, coordinate measuring machines, hardness and conductivity testing equipment, optical flats, roughness testers, torque wrenches, tensiometers, protractors, sine bars and angle blocks.

5.19. Supplier Manufactured Tooling

Qarbon Aerospace SC-MAN-0003 Supplier Tooling Manual (STM) provides requirements for suppliers who have POs that require manufacture or rework of tooling. Suppliers will flow requirements identified in the STM to their sub-tier suppliers. The STM can be accessed from the Supplier Portal under Supplier Provision Quality, Tooling Requirements. Copies of materials referenced in STM can be obtained by contacting the Qarbon Aerospace Procurement representative.

5.20. Key Characteristics

- 5.20.1. Key characteristics identified in the Engineering or Qarbon Aerospace purchase orders shall be controlled through variation management methods defined in SAE AS9103.
- 5.20.2. Where SPC is chosen as the method to control key characteristics the process shall be statistically stable and capable of $Cpk \geq 1.33$ unless otherwise agreed upon in writing with Qarbon Aerospace.
- 5.20.3. Qarbon Aerospace reserves the right to perform Advanced Quality System assessments at the supplier facility, and/or sub-tier supplier facility, to ensure compliance to Qarbon Aerospace purchase order requirements
- 5.20.4. Records shall be retained at the supplier's facility and provided to the Qarbon Aerospace representative upon request.

5.20.5. Software Control (End-Item Deliverable)

Suppliers providing software supporting a procurement shall maintain a Software Quality Assurance (SQA) program in accordance with ISO 9001 by utilizing ISO 90003 as guidance for software development, supply, maintenance and writing SQA plans.

5.21. Right of Entry

Qarbon Aerospace retains the right of entry into the supplier's facility and the supplier's sub-tiers that support the Qarbon Aerospace purchase order. This right of entry extends to Qarbon Aerospace customers and Government regulatory agencies.

These provisions shall allow the examination of product, records, processes, material and tooling as a minimum.

5.22. Information Requests

Supplier requests for information and clarification shall be submitted to Qarbon Aerospace utilizing the Supplier Information Request found within the TIPQA Corrective Action module.

6. Shipping & Deliverable Documentation Requirements

6.1. Shipping/Packing Sheets

6.1.1. Shipping and Documentation Requirements

Supplier shall provide a shipping/packing sheet for each separate shipment.

Corrected shipping documentation may be transmitted electronically in lieu of paper copies when coordinated with Qarbon Aerospace Procurement representative.

Packing sheets or attachments shall include the below information as a minimum. This applies to all products from suppliers and distributors.

- a. Supplier company name and address,
- b. Qarbon Aerospace PO number, change order number and applicable PO line item(s),
- c. Part number(s),
- d. Engineering drawing revision and engineering changes (ADCN, EO, etc.), as stated in Qarbon Aerospace PO,
- e. SC-FRM-00.CD.4020 (Form CD-4020), Supplier Certificate of Compliance
- f. Suppliers approved for Qarbon Aerospace's Delegated Product Verification Program are not required to include the SC-FRM-00.CD.4020 (Form CD-4020) unless the product is listed as an exception to the DPRV program (which requires source inspection to be performed). However, a CoC must still accompany all shipments,

- g. Qarbon Aerospace dispositioned nonconformance document number(s) shall be noted on the packing sheet and the SC-FRM-00.CD.4020 (Form CD-4020) if shipment includes nonconforming product,
- h. QA-FRM-00.CD.4020B (Form CD-4020B), Supplier Certificate of Compliance is required by all suppliers, including suppliers listed in the Delegated Product Release Verification Program, when shipment has been authorized and contains an open rejection tag (i.e., work or further evaluation is required at Qarbon Aerospace). QA-FRM-00.CD.4020B (Form CD-4020B) can be obtained on Qarbon Aerospace Supplier Portal.

6.1.2. Deliverable Documents

Supplier shall apply the actual date of manufacture, date code(s) or control number(s) to the shipping document and/or CoC, signed by the Supplier's designated Quality representative.

Supplier must clarify the type of information being provided by typing the words "Date Code," "Control Number," etc. next to the information provided. When the shipment of deliverable items includes multiple date codes, control numbers, etc., each must be listed on the CoC document.

6.2. Certification of Conformance

- 6.2.1. Certificate of Conformance (CoC) documents provide written assurance that all work performed in connection with the Qarbon Aerospace purchase order conforms to purchase order requirements. The certification statement must state the supplier's Quality Assurance department has inspected the parts and they adhere to all contract requirements, applicable drawings and/or specifications. This can be a separate document from the packing sheet or included on the packing sheet.

The original signature and/or stamp of supplier's authorized Quality representative is required and must be dated. Secured computer-generated signatures are acceptable.

The supplier must clarify the type of information being provided by typing the words "Date Code," "Control Number," etc. next to the information provided. When the shipment of deliverable items includes multiple date codes, control numbers, etc., each must be listed on the "Certificate of Conformance" document.

- 6.2.1.1 All Certifications of Conformance shall be traceable to the product submitted and at a minimum shall contain:
 - a. Supplier's name,
 - b. Supplier's address,
 - c. PO number,

- d. PO item number,
- e. Drawing number and revision,
- f. Quantity delivered,
- g. Serial/lot/batch number(s) (as required),
- h. Nonconformance document number.

6.2.1.2 The CoC for product that has been subjected to special processes shall at a minimum be accompanied by the sub-tier special processor documentation or all of the following:

- a. The order in which special processing was performed,
- b. Name of special process facility,
- c. Address of special process facility,
- d. Special process designation, nomenclature, and revision,
- e. Date that special process was performed,
- f. The Certificate of Conformance number from the special processor.

6.2.2. Certification of Conformance - Machined Part Suppliers, Sheet Metal Part Suppliers, Composite/Nonmetallic Part Suppliers, Casting & Forging Suppliers, and Raw Material Manufacturers

6.2.2.1 The supplier shall provide the raw material certifications which were provided by the original mill. Mill certifications shall include conformance with the applicable material specification as noted on the applicable Qarbon Aerospace purchase order, material description, alloy and condition, physical properties, chemical analysis, and heat lot number.

Unless specifically required by the purchase order or otherwise directed, copies of the material certifications are not required with shipments from suppliers that have been granted delegation through the DPRV process or shipments which have been subjected to Qarbon source inspection. Material certifications shall be made available for review during source inspection. Material certifications must be included with the Certificate of Conformance / packing documents when source inspection has been waived.

6.2.2.2 If the raw material was purchased from a distributor, include the distributor's Certificate of Conformance along with the mill certification.

Recertification by any means other than by the original mill is not authorized unless specifically directed through Qarbon Aerospace Quality requirements.

- 6.2.2.3 Castings and forgings procured in support of Qarbon Aerospace purchases of machined parts must have documented evidence of Qarbon Aerospace / customer qualification acceptance prior to production. All chemical analysis and physical test certifications shall be provided for castings and forgings.
- 6.2.2.4 Suppliers using Qarbon Aerospace provided material may provide evidence of Qarbon Aerospace consignment in lieu of raw material certifications.
- 6.2.2.5 Hardness (when applicable) and conductivity values shall be recorded on the CoC documents. If metallic product is in the annealed condition, no hardness and/or conductivity are required. If metallic product does not go through any heat treatment, follow requirements in accordance with SC-PRO-00.00.SQR10. Qarbon Aerospace may specifically identify what surfaces to perform hardness tests, and what methods to utilize. Incorrect scale or location may result in a scrap part of which the supplier shall be responsible.
- 6.2.2.6 The supplier shall apply the actual date of manufacture, date code(s) or control number(s) to the shipping document and/or “Certificate of Conformance”, signed by a supplier’s designated Quality representative.
- 6.2.3. Certification of Conformance - Distributors of Standard Parts / Hardware / Raw Materials
 - 6.2.3.1 To discourage the potential for counterfeit parts or materials from entering the supply chain, Qarbon Aerospace does not accept raw materials from pass through distributors(Level 3) that have not been procured directly from the manufacturer, unless certified copies from the original mill are available or prior written approval has been provided by Qarbon Aerospace Quality Assurance. Any purchase of recertified raw material or raw material that has departed from direct control of the manufacturer is prohibited. Attempts to make such sales to Qarbon shall be grounds for supplier disapproval.
 - 6.2.3.2 Qarbon Aerospace approved distributors of raw material shall provide certified copies of manufacturer’s test reports with each shipment.

Qarbon Aerospace classifies a supplier as an approved distributor for a specific manufacturer when the distributor has written authorization from the manufacturer to procure and distribute specific products produced by that manufacturer. It is the distributor’s responsibility to provide a copy of the manufacturer’s authorization letter to Qarbon Aerospace upon request.
 - 6.2.3.3 Suppliers who procure from distributors must utilize only distributors with QualityManagement Systems that comply with either AS/EN/SJAC9100, “Quality Management Systems – Requirements for Aviation, Space and Defense Operations,” and/or AS/EN/SJAC9120, “Quality Management Systems – Requirements for Aviation, Space and Defense Distributors”. Methods for

6.2.9. Certification of Conformance - Kitted Parts

- 6.2.9.1 All deliveries must be accompanied with a legible CoC or equivalent with each kit. The supplier must certify that all material / parts have been processed, inspected, and tested in accordance with the purchase order and engineering requirements. The supporting data is on file and will be made available for Qarbon Aerospace review upon request. Any deviations / waivers associated with material / parts in the kit must be listed on the packing sheet / CoC along with the affected part number.
- 6.2.9.2 Any additional data package requirements will be itemized on the purchase order and/or planning configuration sheet (i.e., work order, manufacturing order, etc.).

6.3. Marking, Packaging and Handling

- 6.3.1. Suppliers shall mark all deliverable products and documents in accordance with the purchase order, engineering, manufacturing planning, and/or this document in that order of precedence.
- 6.3.2. The supplier shall ensure that all articles are packaged with materials necessary to prevent deterioration, corrosion, or damage. Requirements for packaging shall consider conditions affecting the article while at the supplier's facility, transportation to destination, and the expected or specified conditions at the destination.
- 6.3.3. The supplier shall provide special handling for articles sensitive to handling damage. During fabrication and processing, special carts, boxes, containers, and transportation vehicles shall be used as necessary to prevent damage due to handling. During individual packaging of parts, the use of staples is prohibited. This requirement excludes multi-part box packaging. All parts shall be checked by the supplier for damage at receipt and prior to shipment.
- 6.3.4. When specific packaging requirements are flowed down to Qarbon Aerospace by their customer, the same requirements shall be flowed down to the supplier. Customer and/or engineering packaging requirements which are more stringent than requirements provided herein take precedence over these Qarbon Aerospace requirements.
- 6.3.5. Initial PO part number may contain a "-FP" suffix utilized internally at Qarbon Aerospace to control work orders issued during the "Make to Buy" transition. The related planning instructions will direct the supplier to disregard the "-FP" suffix when identifying the part or assembly.

Example: PO Part Number: 65B03500-5-FP

Planning ID Operation Text: Supplier shall omit the -FP suffix when performing part marking activity, e.g. 65B03500-5-FP shall be part marked as 65B03500-5.

6.4. Interchangeability and Replaceability (I&R) Requirements

- 6.4.1. Supplier shall review Qarbon Aerospace purchase order and associated engineering to determine if Interchangeability & Replaceability (I&R) features apply to supplier's deliverable product and/or statement of work.
- 6.4.2. I&R records shall be maintained by supplier and made available for Qarbon Aerospace review upon request. Supplier deliverable documentation must include Qarbon Aerospace designated I&R control numbers as specified in this purchase order configuration statement of work.

6.5. Records Retention and Disposition

- 6.5.1. Records shall be readily available for review by Qarbon Aerospace, its customers, and Government regulatory agencies. An English version (copy of the record) shall be available for all quality data and/or approved design data. Prior to destruction of any Quality records related to Qarbon Aerospace procurement, the supplier shall notify and submit a records disposition request to the appropriate Qarbon Aerospace Procurement representative.
 - 6.5.1.1 Records are those as defined in AS/EN/SJAC9100 or other governing Quality Management System specifications and shall be retained in paper, film media, and/or electronic for the period required by contract or purchase order. If no record retention period is specified otherwise, records will be retained for a minimum of ten (10) years after purchase order completion. . Qarbon Aerospace will be offered first right of refusal prior to record destruction.
- 6.5.2. Records include but are not limited to:
 - 6.5.2.1 Inspections and test results per the appropriate Qarbon Aerospace purchase order requirements. The records shall indicate the nature and quantity of nonconformances, the quantities approved and rejected, the nature of corrective action taken and the final acceptance by Quality personnel.
 - 6.5.2.2 Manufacturing information and all supporting documentation such as raw material certifications, special processing records and certifications, manufacturing records, e.g., routers and travelers, shall be retained and remain accessible at no cost to Qarbon Aerospace by the supplier in accordance with the terms of the purchase order.
- 6.5.3. If supplier is not the original fabricator, processor or assembly source of the product(s) which make up the deliverable end item(s), supplier shall obtain and retain on file sub-tier supplier/ processor certifications and test results. Supplier's sub-tier supplier/processor certifications and test results shall be made available to Qarbon Aerospace upon request.

6.6. Traceable Records

The supplier shall maintain parts traceability records as required per applicable drawing and/or purchase order requirements. The supplier's shipping documentation shall include parts traceability data.

6.7. Foreign Object Damage (FOD) Control Program

6.7.1. When required by Qarbon Aerospace purchase order or Quality requirement, the supplier shall establish, document, and maintain a FOD control program in accordance with NAS412 and/or AS9146. The goal of the program is to control and eliminate foreign object damage and/or contamination appropriate to the supplier's manufacturing, assembly, test, inspection, packaging and shipping operations.

6.7.1.1 **Foreign Objects (FO)** is defined as a substance or article alien to a product or system that could potentially cause Foreign Object Damage if not removed.

Some potential sources of FO include:

- a. Manufacturing by-products and materials,
- b. Solder balls, screws, nuts, washers; insert tangs, component lead ends, wire and sleeve clippings, pieces of electronic components, flux, excess solder, tin whiskers,
- c. Dust/dirt from bench tops, equipment, and facility infrastructure,
- d. Finger oils or lotions, fibers from clothing, wrist bands or accessories, hair,
- e. Consumables, expendables, hardware, personal items.

6.7.1.2 **Foreign Object Damage (FOD)** is defined as any damage attributed to a foreign object that may be expressed in physical or economic terms, which may or may not degrade the product's required safety and/or performance characteristics.

6.7.1.3 **Foreign Object Debris (FOd)** is defined as any foreign object (FO) that has entered and/or migrated into/on the product or system and could potentially cause FOD if not removed or controlled. Examples include, but are not limited to:

6.7.2. The supplier Foreign Object Damage control program shall include controls to preclude Foreign Object Damage or contamination at the supplier's sub-tier sources.

6.7.3. The following basic elements shall be included in the supplier's Foreign Object Damage control program:

- a. FOD prevention training,
- b. Performance measurement,
- c. Design and manufacturing planning consideration for FOD prevention,

- d. Work sequencing,
- e. Cleanliness of work area (housekeeping),
- f. Control of tools, personal items, fasteners, scrap, etc. (accountability)
- g. Lost items search and documentation process,
- h. Protection from FO during handling, packaging, and shipping,
- i. Physical entry control into FOD critical areas,
- j. FO focal point(s),
- k. Periodic (at least annually) evaluation of the FOD control program effectiveness.

6.7.4. The supplier FOD control program is subject to on-site review and approval by Qarbon Aerospace.

7. First Article Inspection Requirements

7.1. First Article Inspection Requirements

- 7.1.1. Qarbon Aerospace requires suppliers to conduct a First Article Inspection (FAI) on parts, assemblies, sub-assemblies, castings, forgings and raw material cut to a part number or engineering shape. The FAI process shall be in accordance with SAE AS9102 and SC-PRO-00.00.SQR11. The supplier will ensure FAIs conducted by their sub-tier suppliers are also compliant with these requirements. Additional First Article inspection requirements above and beyond SAE AS9102 may be imposed by Qarbon Aerospace.
- 7.1.2. The purpose of a supplier FAI is to ensure that all design characteristics of a deliverable product and its sub-components meet the design drawing, material, specification, and purchase order requirements.
- 7.1.3. Supplier FAIs shall not be conducted on prototype parts, or parts manufactured using methods different from those intended for the normal production process.
- 7.1.4. Suppliers must notify the Qarbon Aerospace Procurement representative if the first delivered unit does not represent the processes under which the subsequent production deliveries will be produced.
- 7.1.5. Suppliers that proceed at risk and produce products prior to acceptance of the First Article by Qarbon Aerospace shall not have recourse to recover losses resultant from a failed First Article. All costs associated with the result of a rejected supplier First Article produced at risk by the supplier, shall be borne by the supplier.

Suppliers can proceed without risk to themselves, at Qarbon Aerospace risk, only when the supplier is authorized in writing by the Qarbon Aerospace Quality Manager or designee.

7.2. First Article Inspection Performance

- 7.2.1. Supplier must load FAIs in Net-Inspect and obtain approval from Qarbon Aerospace, or a Qarbon Aerospace authorized service provider, prior to shipment of the FAI part and subsequent production parts. Qarbon Aerospace reserves the right to request and obtain all documentation which supports the first article inspection.
- 7.2.2. Parts may also be re-inspected to support the validation of supplier First Article reports.
- 7.2.3. Qarbon Aerospace will notify suppliers upon rejection of their First Article and will coordinate with the supplier to resolve the issue(s). Resolution may require the supplier to resubmit complete or partial First Article data.
- 7.2.4. Suppliers may be required to provide a formal corrective action response in order to identify the reason the rejected First Article was not detected by the supplier's Quality system.
- 7.2.5. Suppliers are required to identify the part tagging or packaging by a suitable means that conspicuously identifies the First Article part as such.

7.3. Casting and Forging Qualification

Prior to initial production of castings and/or forgings, the die or pattern must be qualified per the engineering requirements. The supplier of the castings or forgings shall document actual dimensions on the First Article Inspection SAE AS9102 form. Supplier equivalent forms are acceptable providing they address all the elements of the AS9102 form. The FAI along with the qualification package (as defined by governing engineering) shall be submitted to Qarbon Aerospace for review and approval.

8. Control of Sub-Tier Suppliers

8.1. Sub-Tier Suppliers

- 8.1.1. Qarbon Aerospace suppliers shall utilize sub-tier suppliers that are certified to the most current versions of AS/EN/SJAC9100, 9110, 9120, AC7004 or ISO 9001 by a recognized standard accreditation agency (as noted in Table 1).
- 8.1.2. Suppliers must ensure items procured from sub-tier suppliers meet and conform to all requirements contained in their Qarbon Aerospace purchase order. Qarbon Aerospace does not authorize delegated product inspection on behalf of the supplier without providing written approval.
- 8.1.3. Sub-tier supplier approval is contingent upon a compliance audit performed by the supplier showing acceptable results. Audit result must be made available to Qarbon Aerospace upon request. Any risk of utilizing sub-tiers without the recommended Quality System shall be borne solely by the supplier.

8.2. Requirement Flow Down

- 8.2.1. Suppliers are responsible for flow down of all requirements and provisions of the Qarbon Aerospace purchase order and this document to the supplier's sub-tier suppliers. Deviations to this document and/or the Qarbon Aerospace purchase orders are not authorized without written consent of Qarbon Aerospace. When customer specific documents are flowed down to the supplier, the supplier shall also flow down the same documents to their sub-tier suppliers as applicable to the process / service being provided by the sub-tier suppliers.
- 8.2.2. Suppliers shall provide purchasing information to their suppliers that adequately describe the product/service to be procured.

8.3. Special Process Approvals

- 8.3.1. Qarbon Aerospace suppliers are required to utilize prime contractor approved suppliers when designated, e.g., Boeing D1-4426. Qarbon Aerospace suppliers and their sub-tiers are responsible to ensure that only approved process sources are used. When required by Qarbon Aerospace purchase order or Quality requirement, Nadcap approved processors shall be utilized.
- 8.3.2. Customer approval does not assure nor imply that work performed by a processor listed on the approved processor list is acceptable. Qarbon Aerospace suppliers and their sub-tier suppliers are solely responsible to assure that a processor meets all contract, purchase order, drawing and process specification requirements. When processors are not designated, the supplier must approve the processor and the supplier becomes responsible for the processor's performance as an approved supplier.

8.4. Engineering and Quality Requirements

- 8.4.1. The supplier's Quality system shall ensure the engineering and quality requirement revisions are compatible with current purchase order agreements, are available and in use by the manufacturing and inspection areas. Military standards and specifications utilized shall be the latest revision in effect on the date of process or manufacturing process performance, unless otherwise specified from Qarbon Aerospace.
- 8.4.2. For specifications controlled by the OEM and/or industry sources, suppliers shall independently verify the correct revision of the same and utilize the information in support of purchase order performance. Qarbon Aerospace will not actively provide applicable revision levels for these types of documents.
- 8.4.3. Suppliers may contact the applicable Qarbon Aerospace Supplier Quality representative for information in regard to OEM or industry web access points where the required revisions are available.
- 8.4.4. It is the responsibility of the supplier to notify the Qarbon Aerospace Procurement representative when engineering does not agree with the revision data provided on the

purchase order. Product or process nonconformance resulting from the failure of the supplier to notify the Qarbon Aerospace representative shall be deemed supplier responsibility.

8.5. Use of Non-US Suppliers on Commercial Programs

- 8.5.1. The use of suppliers or sub-tier suppliers in countries that maintain a bilateral agreement with the United States, as listed in FAA Advisory Circular AC 21-23, will require a routine validation of the product / service supplied upon receipt or at the source. This may be in the form of inspection or test as determined for the type of product and must be documented. The validation of the product or service may be accomplished by the Foreign Civil Aviation Authority and evidenced by an Airworthiness Tag supplied by that agency accompanying the shipment. The use of suppliers or sub-tier suppliers in countries that do not maintain a bilateral agreement with the United States must have a plan presented in advance for approval by the appropriate Qarbon Aerospace Quality Assurance representative.
- 8.5.2. The plan must delineate how the supplier will control the product or service to assure conformance with all the approved design data. The plan must incorporate how the foreign supplier's Quality Assurance organization will control their operations and any foreign sub-tier suppliers to assure conformance of the product / service to the approved plan. The use of a supplier in a country that does not have a bilateral agreement with the United States is also predicated upon both that country's government and the supplier's documented assurance that the FAA and/or local Airworthiness Authority, will not be inhibited in any manner from performing an evaluation of the supplier.

8.6. Sub-tier Supplier/Processor Certification

- 8.6.1. If the supplier is not the original fabricator, processor or assembly source of the product which make up the deliverable end item the supplier shall obtain and retain on file sub-tier supplier/ processor certifications and test results. The supplier's sub-tier supplier/processor certifications and test results shall be made available to Qarbon Aerospace upon request.

9. Supplier Measurement

9.1. Quality Performance Measurement

- 9.1.1. The risk-based Supplier Quality scorecard calculation is based on six independent components. The Supplier Quality Scorecard represents the supplier's demonstrated performance based on the below noted components.
- 9.1.1.1 Twelve (12) month cumulative delivered quality yield rating: this is displayed as a percentage that is established from dividing the quantity of nonconforming product by the total quantity of delivered product.

Example: 1 piece nonconforming / 1500 pieces delivered = 99.93% acceptance yield

9.1.1.2 Twelve (12) month cumulative Cost of Poor Quality (COPQ) with respect to an estimate or actual Cost of Quality: this is displayed as a percentage that is established from dividing the COQ by the receipt dollars.

Example: \$300 cost / \$10,000 receipt value = 3% COPQ

9.1.1.3 Supplier Corrective Action first time yield: this is the percentage of corrective action response for the previous 12 months that were found acceptable on the initial review.

9.1.1.4 Corrective action response on time: this is the percentage of corrective action responses that were submitted on or prior to the due date.

9.1.1.5 Twelve (12) month cumulative Notification of Escapes: this is the number of notifications submitted by the supplier in the previous 12 months.

9.1.1.6 Latest month Notification of Escapes: this is the number of notifications submitted by the supplier in the latest month.

9.1.2. The supplier risk level (ranging in value from 1 to 5, with 1 being low risk and 5 being high risk) is calculated based on evenly weighting the supplier's performance in each of the six individual components (Table 3). For the purposes of calculating the risk score, red = 5, yellow = 3 and green = 1 and the total is divided by the number of components rated.

Components having no data to report, will be shown as "N/A" and the risk calculation will be adjusted accordingly.

9.1.3. Suppliers not maintaining a satisfactory Supplier Quality Performance Rating (SQPR) score may be required to provide formal documented corrective action plans and/or participate in formal performance reviews with Qarbon Aerospace. Where these remedial activities are unsuccessful, suppliers may be subject to the actions in accordance with the Supplier Performance Improvement Program(SPIP). Suppliers will be considered for removal from Qarbon Aerospace ASL if results from the SPIP do not significantly improve performance.

9.1.4. Nonconformances reported by the supplier shall not be counted against the supplier's cumulative yield rating. Repeat nonconformances, which at the judgment of Qarbon Aerospace Quality, that are not adequately addressed by the supplier may be counted against the supplier's quality rating.

Table 3

Qarbon Aerospace Supplier Quality Performance Rating (SQPR) Thresholds				
Activity	Measure	Green Threshold %	Yellow Threshold %	Red Threshold %
12 Month Cumulative Quality Yield Rating	Percent Accepted	100 - 99.50	99.49 - 98.0	97.99 - Less
12 Month Cumulative Cost of Quality	Percent of Receipt Dollars	0 - 0.50	0.51 - 2.00	2.01 - Higher
Latest Month Notification of Escapes	Quantity	0	1	2
12 Month Cumulative Notification of Escapes	Quantity	0	1 - 5	6 - More
On Time Corrective Action Response for each Phase	Percent on Time	100 - 99.50	99.49 - 98.0	97.99 - Less
Corrective Action First Time Yield	Percent Accepted	100 - 99.50	99.49 - 98.0	97.99 - Less

9.2. Quality Performance Rating

- 9.2.1. Supplier Quality Performance Rating scores are available on the Qarbon Aerospace TIPQA.
- 9.2.2. Suppliers shall review their Quality Performance data on a monthly basis to confirm the information and implement corrective action measures to address adverse trends. Suppliers may request revision to the data or rating by using the process outlined in Section 9.5 Appeal Process.

9.3. Delivery Performance Measurement

- 9.3.1. The supplier on time delivery performance measurement is displayed as a Supplier Delivery Performance Rating (SDPR). Ratings will be calculated as the number of pieces received on time versus the total number of pieces received in a reporting period, i.e. (total pieces received on time for a reporting period) / (Total pieces received for a reporting period) = % on time. Units of measure will not affect the calculation. Any one unit of measure will be viewed as one piece.
- 9.3.2. The on-time delivery window will be +7 days early to -5 days late.
- 9.3.3. The supplier’s month to month performance will be posted as a year-to-date cumulative measure.

9.3.4. The supplier’s performance shall be monitored as a 12-month rolling average.

Table 4

Qarbon Aerospace Supplier Delivery Performance Rating (SDPR) Thresholds				
12 Month Rolling Performance				
Performance Level Designation	High Threshold %	Low Threshold %	Supplier Performance Position	
Gold	100	100	Exceptional Supplier Performance	Acceptable Performance
Silver	99.99	98.00	Very Good Supplier Performance	
Bronze	97.99	96.00	Acceptable Performance	
Yellow	95.99	90.00	Marginal Performance: Informal supplier improvement may be requested	
Red	< 90.00	-	Unsatisfactory Performance	

9.4. Delivery Performance Rating Thresholds

9.4.1. Gold Supplier – Excellent Performance

Suppliers whose rolling 12-month ratings demonstrate excellent will retain their existing business and will be considered eligible for new business opportunities, single source supplier opportunities, supplier partnerships and business collaboration.

9.4.2. Silver Supplier – Very Good Performance

Suppliers whose 12 month rolling ratings demonstrate very good performance will retain their existing business and will be considered eligible for new business opportunities.

9.4.3. Bronze Supplier – Satisfactory Performance

Suppliers whose 12 month rolling ratings demonstrate satisfactory performance will retain their existing business and will be considered eligible for new business opportunities.

9.4.4. Yellow Supplier – Marginal Performance

Suppliers whose 12 month rolling ratings demonstrate marginally acceptable performance will be allowed to retain existing business but may not be considered eligible

15.1. Documents

AIA/NAS NAS412	Foreign Object Damage (FOD) Prevention Guidance Document
SAE AS/EN/SJAC9100	Requirements for Aviation, Space, and Defense Organizations
SAE AS9102	First Article Inspection Requirements
SQE AS9103	Variation Management of Key Characteristics
SAE AS/EN/SJAC9110	Requirements for Aviation Maintenance Organizations
SAE AS/EN/SJAC9120	Requirements for Aviation, Space, and Defense Distributors
SAE AS9003	Inspection and Test Quality Systems Requirements for Aviation, Space, and Defense Organizations
ISO 9001:2015	Quality Management Systems – Requirements
SAE AS9117	Delegated Product Release Verification

15.2. Definitions and Acronyms

3D: Three Dimensional

ASL: Qarbon Aerospace Approved Supplier List

Build Package: Data, work instructions and tools required to produce and inspect product.

Change of process: Any change to the materials, methods, machinery or location of the process that was previously approved by Qarbon Aerospace, Qarbon Aerospace customer or that which produced the FAI article.

CRB: Certification/Registration Body

Design Characteristic: Dimensional, visual, functional, mechanical, and material features or properties, which describe and constitute the design of the product. These characteristics can be measured, inspected, tested, or verified to determine conformance to design requirements as specified on the parts list, purchasing document, drawing, or DPD, to which the product is to be produced.

- Dimensional design characteristics include in-process locating features (e.g., additive manufacturing, target-machined or forged/cast dimensions on forgings and castings, weld/braze joint preparation necessary for acceptance of finished joint).
- Material design characteristics include processing output variable (e.g., plating or coating thickness/runout, material hardness/conductivity). These provide assurance of intended characteristics that could not be otherwise defined.

Disposition: Action taken to address a nonconforming condition associated with an Engineering and/or contractual requirement, e.g., rework, repair, use-as-is, scrap, return to vendor.

Digital Product Definition (DPD): Electronic data elements that specify the 3D Computer Aided Design (CAD) geometry and all design requirements for a product (including notation and parts lists), and the use of this data throughout an integrated Computer Aided Manufacturing (CAM) and Coordinate Measurement Systems (CMS).

Delegated Product Release Verification (DPRV): The process whereby a supplier is delegated the authority to act on behalf of the delegating organization to verify and release products/services.

First Article Inspection (FAI): The action resulting in objective evidence which validates product realization processes are capable of producing characteristics that meet engineering and design requirements.

GD&T: Geometric Dimensioning and Tolerancing

GSI: Government Source Inspection

IM&TE: Inspection, Measuring and Test Equipment

May: This term indicates an optional or permissible course of action.

Must: This term indicates a mandatory requirement.

N/C: Numerical Control

Pay for Source: Supplier requirement to contract with a Qarbon Aerospace approved service provider to perform source inspection prior to shipment.

Partial FAI: A partial FAI addresses differences between the current configuration and prior approved configurations, and/or addresses design characteristics that failed the original FAI.

Product: Article referenced on the purchase order, e.g., part, assembly, hardware and/or material.

PO: Purchase Order

QA-MAN-0002-01: Program Specific Requirements–Supplement to QA-MAN-0002 includes Qarbon Aerospace customer requirements which are not defined in QA-MAN-0002.

Shall: This term indicates a minimum requirement in order to conform.

Should: This term indicates a recommendation.

SPIP: Supplier Performance Improvement Program

SDPR: Supplier Delivery Performance Rating

SQPR: Supplier Quality Performance Rating

Sub-Tier Supplier: A supplier(subcontractor) that has a contract/purchase order with the Qarbon Aerospace supplier.

Supplier Portal: Qarbon Aerospace website at [Supplier Portal - Qarbon \(qarbonaerospace.com\)](http://Supplier Portal - Qarbon (qarbonaerospace.com)) providing operational resources to the supplier.

16. Revision History

Rev.	Date	Summary of change	Authorized by
Original	09/23/2022	Initial Issue	Head of Process Engineering
A	11/08/2022	Paragraph 3.2.8 - Added verbiage to clarify requirement.	Head of Process Engineering
B	10/03/23	Clarified difference between service providers in Table 1	Head of Process Engineering
C	08/21/24	Updated document with current processes and reformatted	Head of Supply Chain / Sites Quality Manager