AS9100D

Supplier Tooling Manual (STM)

Manual

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Red Oak, TX 75154

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Approved by:

Supply Chain Management

Qarbon Aerospace

Suppliers May View This Document via The Internet at:

https://qarbonaerospace.com/supplier-portal/Qarbon Aerospace has established a supplier Web page on the Internet to provide suppliers a quick on-line link to this (SQAM) document. Qarbon Aerospace website can be accessed at:

https://qarbonaerospace.com/supplier-portal/Suppliers do not need a password to access the (SQAM) document; however, a password is required to access certain "Technical Data."

Note: Contact Qarbon Aerospace procurement for access.

In addition to (SQAM),the supplier web page has links to other information resources. It provides quick access to PO Terms & Conditions, Standard Notes, PODS (PO Discreet Scheduling System), Min/Max, Process Specifications, and Approved Supplier Sources for Process Specifications (including those requiring Customer approval).

The Qarbon Aerospace Supply Chain

Vision:

To establish a dynamic, global, supply network that maximizes the combined strength of Qarbon Aerospace, provides common processes and integrated systems, identifies aerospace suppliers and capitalizes on their skills with the objective of exceeding our Customer's' expectations for first time quality, on time delivery and long-term cost management.

Qarbon Aerospace is emerging as a leader in the production of aerospace components and product integration to the aerospace industry. As we continue to grow, Qarbon Aerospace is striving to become the supplier of choice for aerospace prime contractors. We also endeavor to be the customer of choice for our aerospace suppliers.

As Qarbon Aerospace is continually on the move to improve this position, our industry demands a total commitment to continual quality improvement and process performance from both Qarbon Aerospace and our aerospace suppliers.

This document is considered a contractual obligation of Qarbon Aerospace suppliers, when referenced in part or in whole by Qarbon Aerospace's Purchase Orders for all contract deliverable production, overhaul, and modification programs including; tooling, ground support equipment and repair stations.

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This Document is effective for the following Qarbon Aerospace Sites:

Qarbon Aerospace
300 S Austin Blvd
Red Oak, TX

Qarbon Aerospace
90 Highway 22 West,
Milledgeville, GA 31061

1. General Information

1.1. Purpose

This 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 (ST) and Special Test Equipment (STE) (hereafter referred to as tooling). This tooling is associated with the development and fabrication of the production or services as defined in the purchasing documents.

This document may reference appendices which define program specific deviations from the Supplier Tooling Manual.

Tooling not governed by the provisions of this manual includes but is not limited to: consumable property, buildings, non-severable structures (except foundations and similar improvements necessary for the installation of special tooling), general or special machine tools, capital items, and expendable tools. Examples are catalogue items readily available on the open market, which because of their size and/or nature are considered perishable. Drills, reamers, taps, snap gages, and all types of cutting tools are considered perishable tools, even though they are altered for production purposes and may be special in nature.

1.2. Policy

The supplier shall comply with all provisions of this manual unless stated otherwise in the purchasing documents. Exceptions shall be documented on the purchasing documents as agreed upon by the Qarbon Aerospace purchasing representative and the supplier.

In the event of a conflict between this manual and other referenced document contained herein, the Supplier Information Request (SIR) process shall be utilized for direction/ clarification.

1.3. Tool Codes

Only the Qarbon Aerospace tool codes that are authorized for use on purchasing documents are contained and described in Section 12 of this manual. Address any questions to the Qarbon Aerospace representative

For the Embraer program, see Appendix A for tool type codes.

1.4. Responsibilities

Suppliers are responsible for quality, care and accountability of tooling in their possession, the specifications listed in Section 12 of this manual and the purchasing documents. Suppliers are also responsible for ensuring that any sub-tier suppliers selected to fabricate, rework, design or utilize tooling

or portions thereof shall adhere to these same requirements.

The purchasing representative is the central source of communication and control with regard to tooling. Qarbon Aerospace and its customer retain the right of access to the supplier and their sub-tier supplier facilities as necessary for in-plant surveillance of tooling and related control records and procedures.

1.5. Supplier Liability and Compliance

The supplier is responsible at all times for the care, maintenance, adaptation, safekeeping, and proper use of tooling in their possession and/or at any of their sub-tier suppliers. Supplier responsibilities include the prompt reporting of any loss, damage or destruction of tooling. Subject to the terms of the purchasing document, the supplier may be liable when tooling deficiencies are disclosed.

Qarbon Aerospace -furnished tooling is often used by suppliers on equipment or in support of processes and manufacturing methods differing from their initial intent and may need to be adapted to perform properly. Tooling adaptation that might affect identification, fit, form and function or to modify interchangeable and replaceable (I&R) tools is allowed only with written authorization. Adaptation costs for changes to Qarbon Aerospace -furnished tooling for use on the supplier's equipment and processes shall be the supplier's responsibility, unless otherwise negotiated. Suppliers are responsible for the accuracy of all tooling and shall perform first part verification prior to production use.

The supplier shall obtain written authorization from Qarbon Aerospace prior to using program-specific tooling to produce parts for any other program or customer. The supplier is responsible for compliance with all applicable elements of this manual. Contact the purchasing representative to resolve any conflicts between the instructions in this manual and those contained in the purchasing documents.

1.6. Supplier Information Request (SIR)

The SIR system is available for use by suppliers to request information or disposition regarding technical issues, and approval requests. The SIR is also used as a general communications document between the supplier and Qarbon Aerospace. The supplier shall use the SIR system for communication with Qarbon Aerospace when directed to do so by this document.

1.7. Definitions

Accountable Tools: The terms Tools, Tooling, Special Tooling are used synonymously and refer to Special Tooling (ST) or Special Test Equipment (STE) as defined in this manual. When the term ST is used, it excludes STE and likewise when the term STE is used, it excludes ST. These tools are subject to the accountability requirements of the affected contract and shall be accounted for, or called out, on the purchasing documents. These tools must be available for return to the customer upon request or contract completion/termination.

Blocks: Generally singular male shaped tools whereby material is applied and a forming operation is accomplished by forces applied to the work piece from a piece of equipment or by hand.

Certified Tool List (CTL): Qarbon Aerospace form SC-FRM-00.02-80226 that is used by suppliers to report new, reworked and re-identified accountable tooling. The CTL can be used as a preliminary tool list for suppliers to identify the need for new or additional tooling to support a production contract.

For the Embraer program, see Appendix A for CTL requirements.

Control Media: The physical or digital tooling authority that controls configuration of an I&R assembly and/or secondary structure and verification tools or families of tools, for the purpose of configuration management.

Customer: This term refers to the entity for which Qarbon Aerospace is under purchase order agreement to provide products or services.

Dies: Tools fixed in presses and forces are applied to the tool (die) to perform an operation on a work piece. The work piece is generally enclosed and actually molded, formed, trimmed or pierced by the die as opposed to by equipment or hand. Dies are typically matched sets of male/female tools.

Digital Product Definition: The electronic elements that specify the geometry of all design requirements of a product and encompass all aspects of CAD/CAM/CAI/CAE.

Duplicate Tool: A tool is identical to an existing tool used for rate purposes or multi-spindle machines. Duplicate tools are used to perform the identical function as the original tool.

Fixture: A holding or work-supporting device secured or fixed in a relative position to allow a machine to perform work on a detail or assembly.

Ground Support Tools: Tools that are provided for purposes of supporting, handling, servicing, maintaining, and/or protecting the end product and/or major interchangeable or replaceable components of the end product. Ground Support tools are accountable, ST/STE.

Interchangeable and Replaceable (I&R) Plan: An I&R plan is a written description of the manufacturing, tooling and quality acceptance plans necessary to achieve the engineering I&R requirements. I&R plans consist of a primary item and its corresponding secondary item(s). I&R plans are normally developed and/or require approval by the Customer. The I&R plan shall be updated and approved prior to any changes made to the manufacturing process, engineering, tooling, or quality plans. Any deviation from an approved I&R plan shall be requested in writing for review and Customer approval prior to implementation.

Interchangeable: Interchangeable items are defined by engineering and/or manufacturing operations and are fabricated with the aid of control media tools. Interchangeable items are capable of being readily installed, removed, or replaced without alteration, misalignment, or damage to items being installed or adjoining items or structure.

JIG: Tools that hold a work piece in a stationary position and provide guides for hand equipment to perform drilling, tapping, and boring, reaming, bonding and assembly operations.

Jigs are devoted to hand operations and are not attached or used in conjunction with machines to perform work (see Fixture).

Master Tools: Physical tools (gages) used to establish a dimensional standard and to define/control contractual I&R features and interfaces throughout the production tool family.

Mechanical Equipment: Equipment assets that are specialized, accountable to specific contracts, and that are required to facilitate fabrication and assembly operations.

Miscellaneous Tool: Miscellaneous tools are those that cannot be categorized as Templates, Blocks, Dies, Jigs, Fixtures, Master and/or Tooling Tools, Expendable Tooling, or Digital Tooling Data.

Multiple Use Tools: Tools that are used to fabricate multiple dash numbers other than that contained in the tool identification.

Non-Accountable Tool: The following tools are considered non-accountable and do not require acceptance by Qarbon Aerospace Quality personnel: Expendable Tools, Shop Equipment or Durable Tooling, Shop Aid (Industry Practice), Test Equipment that is **NOT** designed or fabricated for use on a single purpose task, and Machine Control Media (i.e., N/C tapes).

Periodic Tool Inspection (PTI): The PTI is a system involving the re-inspection of special tooling at regulated intervals to ensure accuracy for product control. The re-inspection is based on prescribed conditions and may vary depending upon tool classification, history, usage, and application. PTI, as described in this procedure, applies to major assembly tools, subassembly tools, check fixtures, and detail tools used as a media of inspection or as a configuration control tool.

Perishable Tooling: Perishable tooling is commercial, non-designed, consumable, non-accountable or temporary tool.

Portable/Fixed Coordinate Measurement System (PCMS/CMS): Portable and fixed equipment such as laser tracker, theodolite, and coordinate measurement machine, Faro Arm, etc., utilized for building, reworking and inspecting tools.

Purchasing Documents: Purchase documents relates to Purchase Orders, Tooling Purchase Orders, Contract Letters, Tool Planning Orders, Terms and Conditions, Purchase Order general notes, etc.

Purchasing Representative: Relate to the Qarbon Aerospace buyer, subcontract administrator, or their delegated representative.

Replaceable/Interchangeable at Attach Points Only (R/IAPO): A part that is designed to be interchangeable at the attach points so that it may replace or be replaced by the existing part, irrespective of part number and installation location. It shall meet all physical, functional, and structural requirements of the substituted part and be installed by normal means of attachment and only minor trim of the item to suit surrounding structure. This specifically excludes the use of drilling and or reaming of attach points during installation. It allows the use of adjustment operations such as shimming; drilling and/or reaming

of other than attach points. No tools other than those normally available to service mechanics are required for installation of the item.

Rotable Tools: Reusable shipping and handling tools (ME, SME, TME, etc.) utilized to transport hardware between suppliers and Qarbon Aerospace.

Sequence/Series Tool: Similar tool types, having the same tool number and tool symbol performing different operations or stages of an operation. A tool's progressive (or series) number is determined by the sequential position in which the tool is used. For the Embraer program, see Appendix A for Order Number of Tooling of Equal Classification.

Shop Aids: Shop Aids are simple time and labor saving devices made by the manufacturing shops and are limited use tools. Shop Aids are not charged as a direct item of cost, do not qualify as ST/STE, and are not accountable.

Shop Aids shall be clearly identified with the part number and the words "Shop Aid" afterwards (example: 9999999-00 Shop Aid). Shop Aids must be under configuration and quality control. Shop Aids shall reflect supplier quality acceptance prior to use. Shop aids if furnished by the customer for use will be documented on customers planning flow down documents.

Special Test Equipment: Special Test Equipment (STE) consists of either single or multipurpose integrated test units engineered, designed, fabricated, or modified to accomplish special purpose testing in performing a contract. STE consists of items or assemblies of equipment including standard or general-purpose items or components that are interconnected and interdependent so as to become a new functional entity for special testing purposes. STE does not include material, special tooling, facilities (except foundations and similar improvements necessary for installing STE) and plant equipment items used for general plant testing purposes.

Special Tooling: Special Tooling (ST) consists of jigs, dies, fixtures, molds, patterns, gages, or other equipment and manufacturing aids. This includes all components and replacement of these items that are of such a specialized nature that without substantial modification or alteration, their use is limited to the development or production of particular supplies or parts thereof or to the performance of particular services. ST does not include material, STE, facilities (except foundations and similar improvements necessary for installing special tooling), general or special machine tools, or similar capital items.

Standard Tools: Production tools that are used for any type of manufacturing operation and that are not directly chargeable to a specific contract. Includes standard brake dies, standard cutting, dimpling, drilling, reaming, broaching and riveting tools; standard thread, plug, snap, taps and ring gages, etc.

Supplier Information Request (SIR): The SIR is used by suppliers to request information or disposition regarding contractual or technical issues, and approval requests. The SIR is also used as a general communications document between the supplier and Qarbon Aerospace.

Supplier Quality Engineer (SQE): SQE is the primary interface with the supplier on quality issues.

Supplier Quality Assurance Manual (SQAM): Document used to define supplier quality system requirements and technical configuration properties for items being produced under a Qarbon Aerospace contract. SQAM is invoked in the T&C's

Templates: Developed tools that are applied to a work piece or assembly and help define contour, trim, hole location and hole sizes. Templates can be either developed flat sheet metal patterns or contoured glass lay-ups and may include provisions for hand routing or drilling.

Tools Categories:

Category I - Program master tools include interface control tools, master control tools, master models, master gages, secondary gages, master templates, and master control drawings (MCDs).

Category II - Production tooling includes interchangeable tooling, production end-item assembly fixtures, check fixtures for end-item assemblies and/or I&R assemblies. Any tools which includes handling equipment that are furnished to Boeing by suppliers.

Note: Tooling defines "production end item assembly" as a production assembly that is installed or may be installed on the aircraft at final assembly or is designated as a spares assembly.

Category III - All other tools (except Category I & II) used by suppliers and their subcontractors.

Tool Code: The alphabetic abbreviation of the tool name, i.e., "AJ" for Assembly Jig; "FB" for Form Block; "BPD" for Blank and Pierce Die as defined by program in reference documents in Section 12, Table 1 of this manual.

Tool Proof: The planned process that demonstrates the tool and the associated manufacturing processes produce parts to drawing and specification requirements. Suppliers are required to ensure all tooling meet the requirements of the purchasing document, the planning configuration document, applicable tool fabrication specifications, engineering drawing and that the tools produce conforming hardware.

Tool Workaround/Tool Limited Use Tag: A provision to allow a discrepant tool to continue in use provided that an assembly or part conforming to engineering can be produced. This provision can only be approved by Qarbon Aerospace and authorized by SQE. Suppliers may initiate this process via the SIR.

2. Digital Product Definition (DPD)

The Qarbon Aerospace document SC-PRO-00.00.SQR4,Supplier Quality Requirements for Control and Use of Digital Product Definition, establishes requirements for suppliers DPD Quality Assurance/Quality Control System. The supplier shall have a quality system in place that complies with SC-PRO-00.00.SQR4, and is approved by Qarbon Aerospace; in order to obtain Qarbon Aerospace provided DPD datasets.

The incorporation of this document shall be required for all phases of design and inspection when Qarbon Aerospace DPD data is used to produce products or for product acceptance. Suppliers shall have a comprehensive DPD plan which assures data integrity is maintained and configuration management controlled throughout the process.

Suppliers utilizing portable CMS equipment to fabricate, rework, or inspect requires special qualification and approval as defined in SC-PRO-00.00.SQR4.

Supplier requests for DPD for the fabrication, control and/or inspection of tools will be submitted through the SIR process. Data exchange methods shall be in accordance with SC-PRO-00.00.SQR4.

3. Tool Design

3.1. New Tool Designs

When requested by purchase order, suppliers shall provide Qarbon Aerospace with tool designs for specified tools. In order to maintain tool design standards, facilitate the transfer of tools, and to ensure tool adaptability to change and or growth of the product, tool designs will be governed by the requirements of Qarbon Aerospace Tool Design Standards or as otherwise specified in Section 12, Table 1.

Note: Foreign suppliers shall provide information on the design master copy in English with dimensioning in inches. Subsequent design copies may be in the supplier's language and dimensioning system.

Designed tooling which produces interchangeable, replaceable or spares shall be designed so that consistent items may be produced continually meeting the degree of interchangeability specified and per the I&R plan.

Qarbon Aerospace ME/SQE shall perform tool design reviews and approval (as specified by PO) for major new or reworked tools including assembly tools, shipping & handling tools, master tools, tools controlled by master tooling, and tooling that controls interchangeable or replaceable items. The type and quantity of reviews shall be determined by the scope of the tool design effort

Designs shall be reviewed for function, stability, and reference system used for alignment. Qarbon Aerospace may grant preliminary partial approval at the concept stage in order to release rough structures for fabrication. A detail design dimensional check will not be made. The supplier is responsible to assure that the tooling shall produce acceptable parts or assemblies. Once approved, no changes or revisions shall be made without prior written concurrence from Qarbon Aerospace.

After basic design approval and during fabrication of the tools, the supplier may deviate from the tool drawing to correct minor errors in design calculations, clearances, etc., that do not affect fit, form, or basic function of the tool. These deviations do not require Qarbon Aerospace approval, but shall be forwarded for information purposes via the SIR process.

Note: All Category I & II tool designs require preliminary design review, critical design review, and final design review and approval per Qarbon Aerospace Tool Design standards. Designs shall be forwarded to Qarbon Aerospace for review and subsequent Customer approval when required. Once approved, no changes or revisions shall be made without written concurrence from Qarbon

Aerospace

Customer. Upon design completion and final Customer approval, Qarbon Aerospace shall provide Customer with maintained reproducible copies of tool designs for their master file.

Rotable tools used by both the supplier and Qarbon Aerospace may be designed and fabricated by the supplier. However, Qarbon Aerospace will provide and/or approve supplier pick-up points and will approve the supplier tool designs. The tool design must accommodate both Qarbon Aerospace and the supplier's technical and safety standards. The supplier, as described below, will design shipping fixtures for the specific environment encounter:

a) If the method of shipment varies (truck, sea and/or air), the shipping equipment will be designed to protect the production end item against the most severe conditions encountered in transit.

b) Where practical, the design will incorporate features suitable for in-plant handling, outside storage, and out-of-plant transportation.

All revisions to the tool design, after Qarbon Aerospace approval, that affects fit, form or function must be approved prior to incorporation.

For the Embraer program, see Appendix A for Tool Design requirements.

3.2. Tool Design Approval

Supplier shall provide two copies of the tool design or deviations for Qarbon Aerospace review and approval as required or requested. Designs will be forwarded via the SIR process to the responsible site for approval.

Joint reviews may be requested and conducted at Qarbon Aerospace or supplier's facility. One copy will be returned to the supplier indicating approval or in the case of disapproval, the drawing will indicate the necessary changes.

For the Embraer program, see Appendix A for Tool Design Approval.

3.3. Tool Design Requirements

Design requirements such as, but not limited to: format, drafting practices, reference systems, dimensioning, tolerances, tool coordination, structure standards, tooling components, ergonomics, symbols, etc., shall be as defined in Section 12, Table 1.

3.4. Tool Design Maintenance

The supplier shall maintain tool design originals, active deviations and the latest change notices unless otherwise specified by the purchasing documents. At contract completion/termination, suppliers will receive written tooling and tool design disposition instructions. Approved tool designs are maintained by the supplier, per applicable tool design procedures, to the current configuration of the tools, and are subject to maintenance surveillance. Revisions to the tool design drawing shall be authorized and will

require Qarbon Aerospace approval. Original tool designs become the property of Qarbon Aerospace, and suppliers are expected to provide copies of tool designs upon request.

Suppliers shall notify their Qarbon Aerospace Site representative (SQE or ME) when tool design corrections or clarifications are required using the SIR process. The Qarbon Aerospace Site Representative will evaluate and determine the appropriate corrective action. Suppliers shall not revise QA tool designs without written authorization from Qarbon Aerospace.

4. Special Tooling (ST)

4.1. Tool Fabrication

New tools fabricated and delivered directly for Qarbon Aerospace use shall be procured on a Tooling purchase order and Qarbon Aerospace tool planning will be provided. Tools shall comply with requirements defined in the tool planning and this document. If anomalies exist between the planning and this document, submit a SIR for Qarbon Aerospace interpretation.

New tools fabricated for supplier use to support their production effort may be procured on either a Tooling or Production purchase order. Suppliers are responsible to provide planning for these tools. Tools shall comply with the requirements of this document and purchase order. Suppliers shall notify their purchasing representative of requirements for new tooling using the Qarbon Aerospace CTL as instructed in the purchase order “Terms and Condition notes”.

Category I Tools

The supplier shall not fabricate a new Category I tool unless directed by Qarbon Aerospace. Category I tools require Qarbon Aerospace approval prior to fabrication. See Section 5 for requirements.

Category II Tools

Category II tools fabricated by the supplier shall be fabricated per Qarbon Aerospace tool standards or approved tool designs. There shall be no deviation of coordination to physical master tools as listed on tool design without written authorization from Qarbon Aerospace. These tools require Qarbon Aerospace quality acceptance prior to release for production use.

Category III Tools

Category III tools fabricated by the supplier shall be fabricated per Section 12 table 1.

4.2. Tool Rework

Tool rework is defined as alterations to tools to incorporate engineering changes, to facilitate manufacturing changes, or correction of tool discrepancies not considered tool maintenance or tool adaptation.

Suppliers shall notify their Qarbon Aerospace representative of tool rework requirements using the SIR form. The request shall include the tool identification, a complete description of the required rework,

estimated cost and hours of the rework, and the reason for rework. Rework of Qarbon Aerospace -fabricated and Qarbon Aerospace -furnished tools shall be coordinated with SQE. Rework authorization shall be provided by SQE. Tool planning for rework of supplier made tooling is the supplier's responsibility.

Note: No rework may be allowed on any tool discrepancy affecting fit, form or function of the hardware produced unless written authorization is obtained from Qarbon Aerospace Procurement Representative and SQE.

After tool rework, the supplier is responsible to perform and document a new first article as specified in the SQAM document.

If an engineering change results in a question of tool rework feasibility, the supplier will review the tool to determine the action to be taken. Whenever possible, the tool should be reworked to produce the new part and, with minor conversion, the previous configured part as well.

4.3. Tool Maintenance

Tool maintenance is defined as tooling repairs to correct for normal wear, misuse, production damage, handling damage, inaccurate tool rework, etc., so as to produce acceptable parts. Tool repair that would affect form, fit, or function of the deliverable item is not considered maintenance and requires written authorization from Qarbon Aerospace's purchasing representative.

Maintenance is the responsibility of the supplier and shall be performed at the supplier's expense. The repairs may include but are not limited to the following examples: elongated tooling holes and bent tooling pins in form blocks, imperfections to form block surfaces due to production use, gouges in router jigs, worn drill bushing, dull blank and pierce dies, rusted details, etc.

Note: If any possibility exists that tool family coordination (detail tool to assembly tool coordination) could be affected by the above-mentioned conditions, do not perform rework without written authorization from SQE. Failure to do this could adversely affect assembly part fit-up.

Suppliers will ensure that all tools in their control are adequately cared for and utilized only as authorized by the purchasing document, and that records of tool maintenance activities are maintained. The removal of tooling from production to storage does not relieve the supplier of these responsibilities. All tools will be maintained in a manner that will ensure their continued function to produce acceptable hardware in accordance with all purchasing documents.

4.4. Tool Adaptation

Qarbon Aerospace -furnished tooling is often used by suppliers on equipment or in support of processes and manufacturing methods different from their initial intent and may need to be adapted to perform properly. Tooling adaptation must not affect identification, fit, form or function. Adaptation may not be performed on I&R tools without written approval. The supplier shall be responsible for the costs associated with adaptation of Qarbon Aerospace -furnished tooling for use on the supplier's equipment

and processes, unless otherwise negotiated. Suppliers are responsible for the accuracy of all tooling and shall perform first piece verification for a tool check prior to production use.

4.5. Too Proof/Tryout

Tool tryout is a specific process used, in addition to the dimensional acceptance process, to establish the acceptability of a tool prior to release for production use. The process is applicable to new or reworked tools that affect fit, form or function of the product produced by that tool. The intent is to assure the tooling and manufacturing process will produce an acceptable part for production use.

5. Category I (Master) Tools

5.1. Responsibilities for Master Tools

Master tools are precision instruments that shall be maintained to ensure that engineering tolerances can be met in production parts and or assemblies. Qarbon Aerospace is primarily responsible for the creation, accountability, controls and maintenance of master tools However, the responsibility for certain master tools may be delegated. The degree of delegation shall be specified in the purchasing document.

Master tool(s) assigned to a supplier become(s) the supplier's responsibility. The supplier shall not transfer a master tool to a sub-tier supplier without written approval from SQE. If a master tool is released to a sub-tier supplier, the principle supplier retains responsibility for the tool.

There are special requirements associated with Qarbon Aerospace and/or Customer master tooling. All requirements specified in this section and or other related issues to master tooling shall be initially coordinated with SQE. Required approvals or Customer interface shall be provided by SQE.

5.2. Master Tool Maintenance

The supplier shall maintain assigned master tools throughout the program life and spares obligation.

Master tools shall not be reworked, repaired, added to, or have any part deleted without specific written approval of SQE. Master tools shall not be used for direct manufacture or inspection of parts and or assemblies

The supplier shall maintain appropriate records of assigned master tooling activity (design, fabrication, change incorporation, periodic inspection, rejections, repair, sub-tier supplier's use of duplicate masters, etc.). Master tools shall be inspected for damage to locating surfaces after each use. Inspection records for all master tools shall be retained for the duration of the program and made available upon request.

5.3. Storage and Handling of Master Tools

Storage and handling of masters shall be in accordance with this manual.

Proper handling of master tooling is the supplier's responsibility and is subject to surveillance by SQE. Large master tools shall not be lifted from points other than the lifting lugs, eye bolts, hoist rings, lift holes, or other designed lift points per the applicable tool design.

Damage to master tools shall be reported immediately to the purchasing representative and SQE in writing. The tool identification (including the tool part number, tool type and Lifetime Serial number), a description of the damage with how the damage occurred (if applicable) and pictures of the damage shall be included.

Special care must be taken to provide warehousing and storage that shall adequately prevent distortion and corrosion of master tools. Treat all critical surfaces with MIL-PRF-16173 Grade 2 corrosion preventative or equivalent as authorized by SQE before shipping or storage. When not in use, master tools shall be stored in buildings that will prevent atmospheric or other physical damage to tools and containers. Under no circumstance shall outside storage of master tools be permitted. Master tools require an annual inventory to ensure proper care is taken.

Master tools shall be stored securely so that there will be no movement of the tool regardless of the position in which the box may be placed. Loose parts shall be secured to prevent free movement and possible damage. All bolts, washers, wing nuts, and other attaching devices shall be firmly secured to prevent loosening.

5.4. Opening and Closing Master Tool Boxes

Upon receipt or prior to shipment, all master tools shall be opened and/or closed in the presence of a SQE or their authorized delegate. The Qarbon Aerospace representative shall conduct a visual inspection for general condition of the tool and details. All master tools shall be inspected for shoring, preserving, inventory of loose details and stowing of loose details prior to closure for shipment.

Tool Inspection Gage Storage Record or equivalent shall accompany each boxed tool. In addition, a current tool design drawing will be kept inside the box. The Qarbon Aerospace representative shall be responsible for dating and stamping the Storage Record form following each opening and prior to each closure and tamper proof (wire, lead seals, etc.) sealing of the box. SQE shall note any discrepancy on a Tooling Rejection Tag (TRT) or equivalent. Discrepant masters shall be held at the supplier's facility until SQE processes the TRT for disposition.

6. Special Test Equipment (STE)

6.1. STE Request

The supplier or the Qarbon Aerospace purchasing representative shall prepare a Notice of Intent to Acquire or equivalent document, for the acquisition of production STE. The supplier shall certify that the requested STE or components thereof are not available in the supplier's inventory.

6.2. STE Accountability, Maintenance and Disposition

Accountability, maintenance, inventory and disposition requirements for STE shall be the same as the requirements for Special Tooling (ST) contained in Section 4 of this manual. However, STE data shall be reported separately from ST data since ST and STE are distinct items of property.

STE accountability records shall identify the type of system on which the test equipment unit is used and all easily removable general-purpose components. Before requesting and/or recommending STE disposal action, suppliers reporting surplus STE that contains standard, general, or multi-purpose components shall describe the units in order to permit screening of the standard components.

7. Quality Requirements

7.1. General

Suppliers fabricating tools are required to have an approved property control and quality system per the applicable terms and conditions of the purchasing document. These requirements shall be applicable for all tooling fabricated in support of Qarbon Aerospace procured hardware. Suppliers shall flow down the requirements identified in this manual to any sub-tier suppliers that fabricate or design tooling on their behalf.

The supplier's responsibility shall include function, durability, and accuracy of all tools to produce parts or assemblies within the limits of specifications and tolerances of the engineering drawing and purchasing documents. Tool acceptance by SQE does not relieve the supplier of his contractual responsibility, nor does it guarantee acceptance of the tool at its destination.

All equipment used to verify the acceptability of tooling requires calibration and control. Suppliers using portable coordinate measurement systems (CMS) such as laser tracker, theodolite, photogrammetry, etc., to fabricate, rework, and inspect tools require Qarbon Aerospace approval to SC-PRO-00.00.SQR4.

Note: Some programs may require Customer approval for CMS usage.

7.2. Acceptance Tools

Control and inspection of all tools manufactured or acquired by the supplier and or the supplier's sub-tiers shall be the supplier's responsibility. Tools shall be inspected and accepted to applicable data (first article acceptance, engineering, master layouts, tool designs, tool specifications, control tools, tool prove, etc.) as specified in the purchasing documents prior to release for production use.

The supplier's quality system shall ensure the inspection and recording dimensions of all critical tool features. Qarbon Aerospace form SC-FRM-00.PO.F171 “Supplier Tooling Inspection Record” may be used or a supplier equivalent to record features. The supplier shall complete all inspections and documentation, and assure compliance with all requirements prior to requesting support from the SQE representative. The supplier shall provide records, facilities, equipment, and assistance as may be reasonably required by SQE in the performance of their duties.

New, relocated, reactivated, or converted Category I and II tools require acceptance by Qarbon Aerospace, unless otherwise delegated. These tools or any tool specifically designated by Qarbon Aerospace may require Customer acceptance prior to release for production use. The supplier shall coordinate all inspection activities for these type tools with SQE. Suppliers shall provide a tooling schedule

for review and incorporation of Qarbon Aerospace inspection points. Tools requiring in-process/progressive inspection shall be identified by the supplier and coordinated with SQE.

For tools that are accepted based on supplier First Article, the supplier shall provide the following (but not limited to) when requested by Qarbon Aerospace: tool inspection record, physical tool, first article inspection report, CTL and any applicable process certifications.

7.3. Periodic Tool Inspection (PTI)

GENERAL REQUIREMENTS

When Qarbon Aerospace -furnished or supplier-owned tooling is used as a media of inspection (product acceptance), the supplier is responsible to implement a PTI system made-up of the following elements:

a. Database containing tooling nomenclature, date of last periodic inspection, by whom, and the next inspection due date.

b. Written procedure specifically for periodic inspection of tooling.

c. Records documenting periodic inspection results.

d. Tools designated for an annual PTI method shall contain stickers, labels, etc., showing when periodic inspection was accomplished and the next due date unless otherwise controlled via production shop planning.

e. Unless stated otherwise in the purchase order or contract documents, periodic inspections shall be performed on a 12-month cycle.

PTI shall be performed in accordance with the applicable quality requirements as specified by the purchasing document. The supplier shall maintain complete accountability, including periodic inspection for excessive wear, damage, and missing details of all tooling. Past-due PTI tools shall be rejected and withheld from use until PTI is completed or a Qarbon Aerospace approved limited use/work around plan is established. Inactive tools may be allowed to become overdue for PTI while in storage, but must have PTI performed prior to release to production. Supplier shall provide PTI records upon request.

CATEGORY II REQUIREMENTS

PTI, also known as routines, shall be conducted on all Category II tools used as a media for Quality Assurance acceptance. New, re-located, reactivated, or tools which have been converted to a new configuration require PTI. The initial routine will be witnessed and concurred with by Qarbon Aerospace, unless otherwise delegated. The routine shall be conducted after each assembly completion or until tool stability is achieved. The tool shall then be released for production use per an established PTI schedule (typically, 12 month major and 6 month minor). All records shall be maintained and made available upon Qarbon Aerospace's request. The supplier shall notify Qarbon Aerospace Procurement 90 days prior to the PTI due date.

Note: Performing major or minor PTI shall be completed in accordance with Attachment A of this document and shall be verified and acceptance stamped by SQE. After completion of a major PTI, inspection data shall be forwarded to the applicable Qarbon Aerospace site via the electronic SIR process.

Immediately following an earthquake of 5.0 or greater on the Richter scale or similar disturbance, and within a 50-mile radius, Category II tools shall have major routines performed until tool stability is re-proven. This action is mandatory unless a written waiver is requested, and granted by Qarbon Aerospace.

Minor PTI Requirements

a) Screen tool for latest drawing configuration.

b) Verify that jacks, lock wire, dowels, etc., have not broken loose.

c) Visually inspect tool for loose, damaged or missing details.

d) Perform base level, plumb, and/or square to ensure proper tool configuration per tool design.

Major PTI Plan Requirements

Qarbon Aerospace shall either provide a specific plan or require the supplier to develop a plan for SQE approval. Once the plan is approved, no changes are allowed without SQE approval. The plan shall consist of the following:

a. Depict the method of PTI required (i.e., physical master, baseline, or digital) and frequency.

b. Detailed instructions for performing the required PTI. If tolerances are not defined in the plan, then the tool design tolerances shall apply.

Major PTI Requirements

a. Perform items listed in minor PTI.

b. Verify all tool features defined in the PTI plan.

Frequency

Frequency shall be on a 12-month cycle for major routines with a minor routine (as required) 6 months after first major. The supplier shall not change the frequency without written authorization from Qarbon Aerospace. Qarbon Aerospace reserves the right to change the supplier's frequency based upon tool stability.

Note: These tools may require Customer participation and acceptance of initial and subsequent routines. PTI's of these type tools shall be coordinated with the Site Quality Engineers representative.

CATEGORY III REQUIREMENTS

PTI is based on prescribed conditions and may vary based upon tool classification, history, usage, application and/or legacy program requirements. Only tools specifically designated as Quality inspection tools require PTI. Detail tools such as dies, forming blocks and templates used strictly in the manufacturing process do not require PTI. If an approved plan does not exist, the supplier shall use one of the two options listed below to perform the required PTI.

a. An annual PTI consisting of a visual inspection of the tool for damage, wear or missing details (some tools may require level and plumb). The supplier shall have a tracking system documenting the frequency, last PTI and next due date.

b. The supplier shall either place a placard, decal or other documentation on the tool depicting PTI expiration date and QA acceptance as evidence.

c. Perform PTI by visually inspecting the tool prior to each usage in production. The supplier shall have an operation in the production planning stating "visual inspect tool for wear, damage or missing details." This production planning paper shall serve as the evidence of performing the PTI.

7.4. Rejection of Tooling

Tooling that fails to meet the acceptance criteria (i.e., purchasing documents, tool design drawings, engineering drawings, first article acceptance or the applicable tool specifications) shall be rejected by the supplier and or Qarbon Aerospace. Disposition for the tool may require tool maintenance or rework as defined in Section 4 of this manual.

Tooling that is rejected for maintenance issues, shall be repaired by the supplier as defined by the purchasing documents Terms and Conditions.

Tooling rejected for issues that affect form, fit, or function of the part requires notification to Qarbon Aerospace using SIR form. Limited use of rejected tools is at the discretion of Qarbon Aerospace and shall be authorized in writing. Upon satisfactory completion of the disposition, SQE, or their designee shall remove tool rejection tags.

When a tool rejection is found that could affect fit, form or function of the production hardware, the supplier shall ensure that the previously produced hardware conforms to engineering requirements. If the hardware is non-conforming, the supplier shall immediately notify Qarbon Aerospace as specified in the SQAM document.

8. Tool Control and Accountability

8.1. Tool Accountability

The supplier shall be responsible for maintaining accountability of tooling in its possession in accordance with the purchase order terms and conditions note(s) as noted in Section 12, Table 1. This consists of sighting, tagging or marking, describing, recording, reporting the ST/STE, and reconciling records of all

property including items in storage.

Suppliers shall flow responsibilities for tool inventory to sub-tier suppliers. Inventory requirements are defined in the terms and conditions note(s) and may differ between contracts.

New and rework tooling, after successful tool acceptance, shall be reported on a Certified Tool List (CTL) and accompany each invoice for payment of tooling charges. The suppliers shall provide pictures of the tooling that clearly depict the entire tool and its identification. The pictures shall be forwarded to the Qarbon Aerospace procurement representative along with the CTL form.

The supplier's Quality Control/Assurance manager and an officer of the supplier or designee responsible for tooling accountability shall sign the CTL. These signatures shall serve to validate the existence of each tool listed and that the listed tools have performed satisfactorily per the requirements of the purchasing document.

At contract completion/termination, records of all suppliers tooling (including tool planning, design, and usage data) shall be provided to Qarbon Aerospace. All loft and tooling data, tooling layouts, manuals, and loft records/lists, whether supplier or Qarbon Aerospace derived, shall be returned.

The CTL and forms for reporting inventory are available on the Qarbon Aerospace Supplier web site @ https://qarbonaerospace.com/supplier-portal/

8.2. Movement of Tools

Suppliers may exercise the option to ship tools to sub-tier suppliers and shall be liable for the complete scope of effort for transportation and any special packaging or premium transportation requirements per the terms and conditions of the purchasing documents.

Note: Category I & II tools require Qarbon Aerospace and Customer written authorization prior to any movement. Suppliers shall contact their SQE representative for authorization.

When directed to move tooling, a Qarbon Aerospace tool transfer document is required. Suppliers shipping tools from their facility shall ensure that the tools are properly identified, complete and accepted by quality prior to shipment. Tool shipments shall contain copies of pertinent manufacturing, inspection and design records. Prior to transfer, the supplier shall contact the SQE representative for an onsite review of tool condition, identification, history data and completion of transfer form.

Qarbon Aerospace tool (CAT III) transfer documents are not required to move tooling from suppliers to their sub-tiers. However, the responsibility of the tooling and accountability remains with the supplier.

8.3. Lost or Damaged Tools

Suppliers shall immediately notify Qarbon Aerospace in writing of any loss, destruction, or damage of Qarbon Aerospace owned/supplied tooling. Notification shall include the following data:

a. Identification and nomenclature of the ST/STE item

b. Date lost or damaged

c. Last known location

d. Circumstances surrounding loss or damage and the investigation results

e. Applicable purchase order number

f. Action taken to prevent recurrence

g. Description of damage.

Qarbon Aerospace shall notify the supplier once disposition of the tool is determined.

8.4. Tool Storage and Preservation

The supplier shall prepare and store tooling in accordance with the requirements of this manual and the terms and conditions of the purchasing document.

All tooling surfaces or edges subject to corrosion shall be cleaned in accord with C-5 of MIL- STD-2073-1 and greased with MIL-PRF-16173 Grade 2 preservative or equivalent. At no time shall tools be subjected to conditions that will tend to induce corrosion or damage from atmospheric conditions without adequate protection. All tooling shall be stored indoors unless written authorization is provided otherwise.

Tooling in storage shall be protected in a manner that contributes to the preservation of the equipment. In addition, the following requirements will apply:

a. Equipment with conventional electrical wiring, motor-starting relays, or plumbing shall be stored inside weather-tight buildings.

b. Equipment with electronic circuits, circuit-switching relays, capacitors, electro-mechanical devices, etc., shall be stored in buildings with a temperature range between 35-deg. F minimum and 120-deg. maximum, and a relative humidity below 80 percent.

c. Active chemicals in STE components such as batteries will be removed or rendered as inactive as possible.

d. All replacement, calibration, and certification requirements shall be recorded for the benefit of personnel ordering reactivation of the equipment.

e. Operating time and malfunction record required for reliability computations shall be retained. Spare parts peculiar to and purchased for the equipment, drawings, and/or instructions shall be packaged with the equipment.

f. Suppliers are responsible for the proper use and storage of assigned tooling until relieved of responsibility. Tools returned to Qarbon Aerospace shall be in good condition with steel working surfaces protected with a corrosion preventative lubricant.

g. All master tools and boxes, check fixtures, and electronic test equipment shall be stored indoors.

h. Production tools shall be stored indoors whenever possible. When it is necessary to store them outdoors on a temporary basis, a corrosion preventative lubricant shall be applied to steel working surfaces and the entire tool covered with a tarpaulin.

i. All empty tool storage boxes stored outdoors will be closed and covered with a waterproof cover.

For the Embraer program, see Appendix A for Tool Storage and Maintenance.

9. Tool Identification Requirements

9.1. General Requirements

All tooling shall be clearly identified as defined by the purchasing document, tool planning, tool identification standards, and Sections 9.2 through 9.6 of this manual. Accurate identification data shall be reflected on inventory records, shippers, receiving reports, and all other tooling records.

ST that resides in the state of California or Washington shall have either a Boeing tooling I.D. tag (UT-6904) applied or the words “Property of Boeing” permanently marked on the tool if an

I.D. tag is not used. ST that does not reside in California or Washington will be identified with either the QAE I.D. tag (DS-018.001-0034) having the words “Property of Qarbon Aerospace” or the words shall be permanently marked on the tool if an I.D. plate is not used.

Note: “Property of” information will remain the same throughout the life of the tool regardless of where it resides. For instance: If the tools originally reside in California, and later get moved to Texas, the property of information will remain as “Property of Boeing.”

For the Embraer program, see Appendix A for tool identification requirements.

9.2. Data Requirements

All tools utilized on Qarbon Aerospace programs shall be identified in accordance the applicable tool identification standard document in Section 12, Table 1.Tools shall be identified with the following minimum information:

a. Ownership designation

Property of _____

Designation will be provided in the purchasing documents.

b. Engineering drawing and part dash number

The part or assembly for which tool is made. Use one drawing and dash number only except when the tool is used to fabricate right and left-hand mirror image details or assemblies. These tools will be identified with both dash numbers.

Examples: 65B12345-1 (left-hand components)

65B12345-2 (right-hand components)

65B12345-1,-2 (makes left- and right-hand components)

c. Tool Code

The standard abbreviation to indicate general configuration and tool function as specified in the purchasing document (Ref. Section 12, Table 1). Tool codes will follow the engineering drawing and part dash number identification.

Examples: 65B12345-1 MF

65B12345-2 MF

65B12345-1,-2 LT

d. Contract number

Customer contract number (when applicable) will be defined in the purchasing or tool planning documents.

e. Statement of origin

Identify "Made By _____", name of supplier who fabricated tool.

f. Weight

Inscribe weight on tools weighing 25 pounds or more.

g. Inspection stamp and date

After final acceptance of the tool, quality must place an inspection stamp and date the tool.

9.3. Additional Identification Data

a. Additional data

Additional data may be required on tools procured by Qarbon Aerospace. When required, data shall be defined in the purchase order, tool planning documents or tool identification standard.

Examples:

- Model of Aircraft
- Life time serial number
- Duplicate serial number
- Unit number
- Engineering/Tool design change letter
- Multiple use tools

- Tool sequence / series number
- Purchase or work order number

b. Specialized information

Additional information may also be a part of the tool identification. Refer to the applicable tool identification standard for specific instructions. This may include, but is not limited to the following:

Examples:

- I&R prove record/I&R identification plate
- Tool coordinate, or reference system data.
- Special cautionary information
- Tool use instructions
- Tool components / removable details
- Periodic tool inspection data

c. Tool reworks

Tool identification of a reworked tool shall include records of reworks performed on the tool. These records shall be kept on the parent tool. Information shall be applied to the rework tag or stamped/etched in an orderly manner near the tool identification title block. Refer to the applicable tool identification standard for specific program instructions.

9.4. Identification Information Location

Unless otherwise specified, identification information shall be positioned anywhere on the tooling provided that it is does not interfere with the operation of the tool, will not be obliterated through normal tool usage and is readily visible when stored or in working positions.

9.5. Method of Identification

Whenever possible, use the Qarbon Aerospace or Customer tool identification tags for identifying tools. When the size or nature of the tool makes it impractical to use the identification tag, the tool shall be marked with steel stamping, electric pencil, acid etching, stencil or stamp, or any permanent method that does not damage or impair the use of the tool.

Note: When tool identification tags are used, it is mandatory to additionally stamp or etch the tool part and serial number on the tool. This is done to ensure traceability should the tool tag be lost or destroyed.

Basic Tool Identification

Figure 1

Property of XX Inc.

Part No. & Tool Type

65B12345-1M

Serial Number: 1234567

Purchase Order Number XXX-XX-XXXX

Made By XXX Weight 56 lbs

Tool Inspection Date 1-1-2000

Proof Inspection Q Stamp when req'd

Note: See documents noted in section 12 Table 1 for specific tool ID requirements.

9.6. Identification Changes

Whenever a tool is reworked to support a new configuration, the identification shall be changed to reflect the new part dash number. When applicable, additional tool usage information will also be applied. Tool identification shall not change unless the tool is physically altered to support a new detail or assembly configuration. **Tool re- identifications shall always maintain the original make serial number and date**. When tool identification changes become necessary, the tool number is changed or added directly on the tool and/or a new identification plate is attached. A purchase order shall be issued to authorize any rework and re-identification efforts. Tool re-identification data shall be provided in all supplier tool accountability reports. Refer to the applicable tool identification standard for specific instructions.

10. Records

10.1. Control of Records

The supplier is required to maintain and control all tooling commodity records, which includes but is not limited to fabrication, inspection, test, quality acceptance, designs, N/C, CMS, tool manufacturing and rework records.

All supplier tool manufacturing and inspection records shall show evidence of Quality Assurance acceptance. The inspection record will include all data necessary to describe the tool design/non-design characteristics as well as the actual status of the tool with regards to its compliance with reference documents. Qarbon Aerospace form SC-FRM-00.PO-171 "Supplier Tooling Inspection Record" may be used or a supplier equivalent to record features. Records shall be readily available upon request.

11. Rotable Tooling (Common Use)

11.1. General Requirements

The supplier shall develop and submit a material handling plan to Qarbon Aerospace prior to fabrication of rotable tools. The handling plan shall include the following:

a. Method of transportation

b. Identifies number of units required (Mechanical equipment (ME) and shipping equipment)

c. Schedule for fabrication of rotable tools

d. Route of shipment with alternative route, if required

e. Production end item protection.

The supplier shall use welders qualified to AWS D1.1 for all welding on rotable tools. All welds shall not be painted (use clear lacquer only). All wire rope assemblies shall have swaged fittings for fastening thimbles or end connectors.

Proof-load test, duplicating actual usage condition, shall be performed when a tool or component of the primary tooling structure is to be used by Qarbon Aerospace or common-use overhead handling or jacking. Proof-load requirements shall appear on the tool design, and the load limits shall be identified on the tool. A safe load and inspection record tag shall be applied, as required per the Qarbon Aerospace tooling standard.

Proof-load test shall NOT be waived. All rework or repair shall be approved by Qarbon Aerospace. After proof-load testing, the equipment shall be given a thorough visual inspection, and critical weld areas shall be inspected with magnaflux, die-penetrant, or radiograph. An inspection record of the above checks shall be made and maintained on each unit fabricated. All rotable tooling and jacking equipment that lifts or supports an aircraft assembly or section shall be designed and proof-loaded per the Qarbon Aerospace tool standard.

All rotable tools shall be accepted and stamped by Qarbon Aerospace after completion by the supplier.

Note: Some programs require Customer acceptance of the tools.

12. Applicable Documents & Forms

This manual shall be used in conjunction with but not limited to the following applicable documents. Submit an SIR if a conflict arises between the purchasing document, tool planning, content of this manual or any of the following specific program specifications and documents listed below.

Use the Qarbon Aerospace Site that issued the PO and the Program Identifier in Table 2 to determine all of the Tooling Documents required.

a. Attachment A – Supplier PTI (Routine) Requirements for Category II Tools

b. Certified Tooling List (CTL) - Form SC-FRM-00.02-80226

c. Supplier Tooling Inspection Record -Form SC-FRM-00.PO-F171

All forms for reporting inventory are available on the Qarbon Aerospace Supplier portal at https://qarbonaerospace.com/supplier-portal/

Table 1

QAE Site	**Red Oak, Milledgeville**
Tool Codes & Identification Standard	QAE SS 620.100 and Appendixes
Tool Design Standards	QAE Design Standard (DS) Manual
Tool Fabrication Standards	QAE Standard Specifications (SS) Manual
Supplier QMS	AS9003 or AS9100
Control of Digital Data	SC-PRO-00.00.SQR4
Purchase Order Terms & Conditions	T55 Property Control (Government – Fixed Price) T56 Acquisition and Property Control Government – Cost Reimbursement T58 Tooling Commercial

Table 2

Common Program Names	Program Identifier	Description
737	C-EI	737 Inboard Flaps
747	C-ER	747 Program
747	C-EY	747-8
747	C-WG	747-8 Transcowl
767	C-ED	767 Horizontal
767	C-EE	767 WCS
767	C-EP	767 Section 48
767	C-EQ	767 Doors
777	C-EF	777 Inboard Flaps
777	C-EG	777 Spoilers
777	C-EO	777 Outboard Flaps
787	C-EU	787
A320	C-HA	A320 WRE
A330	C-HF	A330/340
A330	C-HH	A330/340 DA
A340	C-HG	A340/600
A350	C-HB	A350 Cabin BR
BA Wing	C-WH	7000/8000 Global Wing
Bell 525	C-BC	Bell 525
C-130	G-MF	C-130
C-17	G-CA	C-17
C-5	G-MV	C-5 REC / TOPS
CF6	C-WD	CF6 Transcowl
CH-53 Drop Test	G-BB	CH35 Drop Test
Embraer	C-GB	Embraer Fuselage
Embraer	C-GC	Embraer Rud/Elev
F-35	G-MD	F-35 P&W F-135 Upr. Lwr

GIV	C-WB	G450 Wing
GIV	C-WC	GIV Nacelles
GV	C-WA	G550 Wing
Gulfstream	WP-G280	G280 Wing
Gulfstream	WN-G650	G650 Wing
H-60 Blackhawk	G-BA	H-60 Blackhawk
Hawker 800	C-WE	Hawker 800
KC-46	G-ET	767 Tanker
Other Military	G-MB	Other Military
P-42 Stringers	C-WI	P-42 Stringers Mdl 1
P-42 Stringers	C-WJ	P-42 Stringers
P-42 Stringers	C-WK	P-42 Stringers Mdl 3
RQ-4 Global Hawk	G-MG	Global Hawk Wing
V-22	G-BV	V-22 Fuselage
V-22	G-BW	V-22 Empennage

13. Revision History

Rev.	Date	Summary of change	Authorized by
Original	09/23/2022	Initial Issue	Head of Supply Chain