

Unless otherwise specified in the body of the Purchase Order, the following Purchase Order clauses apply to this Purchase Order based on the Commodity/Product/Service being provided to Ducommun Structural Systems Solutions (SSS).

**Raw Materials (Mill Products)**

QC07, QC09, QC10, QC15, QC17, QC19, QC20, QC21, QC25, QC33, QC44, QC47

**Materials (Consumables)**

QC07, QC09, QC10, QC15, QC17, QC19, QC20, QC21, QC25, QC33, QC36, QC47

**Standard Hardware (Nuts/Bolts/Screws...)**

QC07, QC09, QC10, QC15, QC19, QC20, QC21, QC39, QC47

**OP Processing Non-Special (Forming/Polishing)**

QC02, QC07, QC08, QC10, QC15, QC17, QC18, QC19, QC20, QC21, QC22, QC25, QC27, QC28, QC34, QC35

**OP Processing (Machining/Routing)**

QC02, QC07, QC08, QC10, QC15, QC16, QC17, QC18, QC19, QC20, QC21, QC22, QC24, QC25, QC27, QC28, QC34, QC35

**OP Special Processing (Chemical/Plating/Painting/NDT/Thermal...)**

QC02, QC07, QC08, QC10, QC11, QC15, QC17, QC18, QC19, QC20, QC21, QC22, QC25, QC27, QC28, QC29, QC31, QC32, QC34, QC35

**Purchase Parts (Fabricated Components)**

QC02, QC07, QC08, QC10, QC11, QC12, QC15, QC16, QC17, QC18, QC19, QC20, QC21, QC22, QC24, QC25, QC33, QC34, QC35, QC40

**Assembly Parts**

QC02, QC04, QC07, QC08, QC10, QC12, QC15, QC16, QC17, QC18, QC19, QC20, QC21, QC22, QC24, QC25, QC27, QC31, QC32, QC33, QC34, QC35, QC36, QC39, QC40, QC42

**Testing**

QC02, QC07, QC08, QC10, QC11, QC15, QC19, QC20, QC21, QC25, QC30, QC32

**Calibration**

QC02, QC07, QC08, QC10, QC19, QC21, QC35, QC42

**QC01 MANDATORY SOURCE INSPECTION** – Ducommun Source Inspection shall be performed at supplier's facility prior to shipment to Ducommun and at required in-process operations, as directed by Ducommun. Supplier shall provide evidence of Ducommun Source Inspection with each shipment.

**QC02 OPTIONAL SOURCE INSPECTION** – Ducommun reserves the right to inspect any and/or all work on this purchase order at supplier's facility. The supplier will be notified in advance of shipping date if Ducommun source is required. Supplier shall provide evidence of Ducommun Source Inspection with each shipment.

**QC03 MANDATORY CUSTOMER SOURCE INSPECTION** – Ducommun's Customer Source Inspection shall be performed at supplier's facility prior to shipment to Ducommun and at required in-process operations, as directed by Ducommun purchase order. Supplier shall provide evidence of Ducommun's Customer Source Inspection with each shipment.

**QC04 OPTIONAL CUSTOMER SOURCE INSPECTION** – Ducommun's Customer reserves the right to inspect any and/or all work on this purchase order at the supplier's facility. The supplier will be notified in advance of shipping date if customer source is required. Supplier shall provide evidence of Ducommun's Customer Source Inspection with each shipment.

**QC05 MANDATORY GOVERNMENT SOURCE INSPECTION** – Government Source Inspection (GSI) shall be performed at supplier's facility prior to shipment to Ducommun and at required in-process operations, as directed by Ducommun. Supplier shall provide evidence of GSI with each shipment.

**QC06 OPTIONAL GOVERNMENT SOURCE INSPECTION** – The Government reserves the right to inspect any and/or all work on this purchase order at the supplier's facility. The supplier will be notified in advance of shipping date if government source is required. Supplier shall provide evidence of GSI with each shipment.

**QC07 RIGHT OF ENTRY** – Ducommun customers (including government representative) reserve the Right-Of-Entry into any Ducommun supplier facility to determine and verify the quality of work and material at all production stages. Visitation by Ducommun customers shall be conducted with prior knowledge of, and jointly with, Ducommun and its' supplier.

**QC08 QUALITY MANAGEMENT SYSTEM** – The supplier shall have a Quality Management System that meets the current revision in effect of AS9100 or equivalent, as in the case of a distributor, QMS shall meet the current revision in effect of AS9120, as in the case of a special processor, QMS shall meet the current revision in effect of AS-7004 (Nadcap); as in the case of a calibration service provider, QMS shall meet the current revision in effect of ISO-17025.

**QC09 QUALITY MANAGEMENT SYSTEM** – The supplier shall have a Quality Management System that meets the intent to the latest revision in effect of ISO-9001 or equivalent.

**QC10 SUPPLIER SURVEY** – The supplier's Quality Management System is subject to initial survey and approval by Ducommun and its customer. Surveys or audits, including sub-tier suppliers and processors may be conducted before or after issuance of a purchase order. The supplier shall be notified of deficiencies and shall follow-up and ensure that deficiencies are promptly corrected. Corrective actions shall be subject to review and approval by Ducommun Quality Assurance. Subsequent surveillance or periodic review of the system may be accomplished as deemed appropriate for the articles being purchased.

**QC11 SUPPLIER PROCESS APPROVAL** – Manufacturing and inspection processes used in the performance of this purchase order must be accomplished by sources approved by Ducommun and/or its customer.

**QC12 SUB-TIER SUPPLIERS** – Material, supplies and services contracted to a sub-tier supplier must be obtained from Ducommun approved sources. The Ducommun supplier shall flow down all the applicable requirements in the Ducommun P.O. to the sub-tier supplier.

**QC13 SUPPLIER PROCEDURE APPROVAL** – Manufacturing and Inspection special process procedures used in the performance of this purchase order must be approved by Ducommun and/or its customer. Procedures are to be submitted to Ducommun and approved prior to start of work to this purchase order.

**QC14 MANUFACTURING PROCESS APPROVAL** – Manufacturing routing document must be submitted to Ducommun for approval prior to start of work. Subsequent changes to approved routing document must be submitted to Ducommun for approval prior to implementation of changes. A change is defined as any change including sequence, equipment, material, tooling, certified personnel, etc.

**QC15 CERTIFICATE OF CONFORMANCE** – Supplier is responsible for processing and certifying to the latest engineering and/or specification revisions unless otherwise noted on purchase order. Supplier is to provide Ducommun with a legible and reproducible Certificate of Conformance with the signature and title of an authorized representative of the supplier. Supplier shall certify to all specifications and special instructions required by purchase order.

Product and services associated with Boeing process specifications shall list all applicable PSD's worked in support of each specification listed as specified in D1-4426 and its flow-downs.

D1-4426 can be accessed at URL: <http://active.boeing.com/doingbiz/d14426/index.cfm>

**QC16 FIRST ARTICLE INSPECTION** – First Article Inspection shall be performed per AS9102 on the first part produced from the first lot. Partial or re-accomplishment of First Article requirements shall be performed as stated in AS9102. Supplier is to supply FAI report and all substantiating data to Ducommun Quality Assurance.

**QC17 NON-CONFORMING PRODUCT OR PROCESS** – Any deviation to requirements set forth in this purchase order shall be documented and submitted to Ducommun for disposition prior to shipment from supplier's facility. In the event that product or material is received for processing in a nonconforming condition (i.e. damaged, paperwork/traceability issues, etc.), supplier shall notify Ducommun Quality Assurance PRIOR to performing work.

**QC18 CORRECTIVE AND PREVENTIVE ACTION** – Supplier shall establish and maintain documented procedures for Corrective and Preventive Action, which shall include: effective handling of customer complaints and reports, investigation of cause of non-conformance, determination of corrective action needed to eliminate cause, application of controls to ensure corrective action effectiveness.

**QC19 MONITORING AND MEASURING DEVICES** – The supplier's calibration system shall conform to the requirements of ISO-17025 or ANSI/NCSL Z540-1+ in that current calibrated equipment, traceable to a national or international standard shall be used for product acceptance. Random and systematic error in any article or material measurement process shall not exceed 25% of the tolerance of the parameter being measured. When ASTM, ASA, ISA, Military Standards or other Aerospace Industry recognized standard test methods are used in physical, chemical, analytical, optical and/or environmental measurement processes, the tolerance ratios established in those test standards shall apply.

**QC20 STAMP CONTROL** – Supplier shall have documented process for the control and use of inspection and process stamps. The design of supplier stamps shall be such that process and inspection stamps are distinctly different. Inspection stamps shall be designed to identify the supplier and the supplier's inspector who affixes the stamp.

**QC21 RECORD RETENTION** – Quality Records shall be retained for a minimum of Ten (10) years after completion of purchase order, or as directed by Ducommun Customer's Quality Requirements. Records shall be identified and stored in a manner that allows them to be easily retrievable and adequately protected.

**QC22 TOOLING UTILIZATION AND MAINTENANCE** – Supplier shall maintain a formal tool control system that allows for the proper segregation, care, upkeep and maintenance, and accountability of Ducommun, end-customer / Government owned tooling provided for use in the manufacture and/or inspection of deliverable product. The supplier is responsible for compliance with the applicable end-customer / Government tooling requirements incorporated herein and made a part hereof by reference. Refer to documents Boeing D33200 (Comm.) & D950-11059-1 (BDS), Bombardier QD4.6-40, Cessna CQRS, and FAR Part 45, government property for compliance. Supplier manufactured special tooling required in the performance of this contract used as a media of inspection (MOI) must be a part of the supplier's calibration system and must not consume more than 1/3 of the product engineering tolerance.

**QC23 STATISTICAL PROCESS CONTROL** – Management of Process Variation is required per AS9103 where Key Characteristics are identified via purchase order or supplied engineering data set (models, blueprints, process specifications, etc). When requested by Ducommun, supplier shall provide SPC data for review or with product shipments.

**QC24 DATA SET CONTROL** – Seller shall employ a Digital Data Control system, (DPD, MBD, etc.) so electronic data is controlled at a level to assure that integrity of item and/or tooling engineering and configuration and manufacturing data is maintained throughout the supplier's Digital Data Control system from receipt of the electronic data through creation of derivatives, to item acceptance and process improvement. Refer to Ducommun's procedure WI-00006 and the following customer documents Boeing D6-51991, Bombardier BM4041.04.00.05, Vought SQR-004, and Cessna CQRS for compliance. Noted specifications can be requested from your Ducommun buyer.

**QC25 PRESERVATION** – In order to prevent corrosion, supplier shall store all raw material and work-in-process in a covered structure, except forgings, castings and extrusions from which subsequent machining requirements will remove 100% of the as forged, cast or extruded surface. Any corroded condition of such material after acceptance by the supplier shall be the supplier's responsibility.

**QC26 MATERIAL ACCOUNTABILITY** – Supplier is to return all unused/scrap material to Ducommun for accountability.

**QC27 100% TRACEABILITY** – Traceability to raw material must be maintained throughout the manufacturing process. Supplier is to maintain heat lot, work order and/or serial number traceability at all times.

**QC28 TEMPORARY PART MARKING** – Each individual article on this purchase order shall have temporary identification applied/maintained prior to shipment to Ducommun. Any one of the following methods of identification may be used:

1. Vibro-etching of part/serial number on tool tab, or in excess areas of no tool tab is present.
2. Tag tied to part indicating part/serial number.
3. Attach label to the outside of each individually wrapped, boxed or bagged part.
4. Lot tag indicating part number and quantity.

**QC29 CUSTOMER STANDARD STATEMENT** – Standard statement(s) as required by Ducommun's Customer's Quality Requirements must appear on process certificate.

**QC30 SUPPLIER APPROVAL NUMBER** – Ducommun's Customer's Supplier Approval number must appear on certificate.

**QC31 TRAINING/CERTIFICATION** – Supplier shall conduct training, personnel certification and recertification as necessary to assure effective accomplishment of special processes and inspection operations.

**QC32 ENVIRONMENT, HEALTH & SAFETY** – Supplier shall maintain in Environment, Health & Safety Program applicable to their operations, facilities and equipment, which includes identification, elimination and/or control of hazards in employee and environmental accident prevention in accordance with Federal, State and local standards and regulation.

**QC33 CERTIFIED TEST REPORT/RAW MATERIAL CERTIFICATION** – Product or material shall be supplied with Certified Test Report and Raw Material Traceability/Certification.

**QC34 FOREIGN OBJECT DEBRIS (FOD)** – Supplier shall have a written system for the prevention of FOD. This system must show evidence of a written practice, effective employee training and a corrective action system when FOD is detected. This system must demonstrate employee awareness and be audited on an on-going basis. Supplier shall certify in their Certificate of Conformance (C of C) that parts are free from FOD. NAS-412 may be used as a guide for an effective FOD program.

**QC35 CUSTOMER FURNISHED MATERIAL** – Material furnished by the customer shall be inspected upon receipt for obvious damage, corrosion, inadequate preservation or other conditions which would adversely affect the usability of the material or its suitability for storage. Materials received in an unsatisfactory condition shall be reported immediately to Ducommun Quality, and shall be protected against further damage or deterioration pending disposal instructions from the customer.

**QC36 SHELF LIFE CONTROL** – As applicable, materials with limited-life shall reflect the date of manufacture, cure date, lot number, and applicable specification on the container. Each container must be identified. Unless otherwise agreed upon in writing, all material shall have at least 60% of its shelf-life remaining, at time of receipt.

**QC37 SOURCE INSPECTION OF FIRST ARTICLE** – Supplier is to provide FAI report, FAI part(s) and all substantiating data to Ducommun Source Inspector for verification and approval. Where supplier has been contracted to fabricate tooling or complete programming in support of FAI part(s), the FAI report shall list all associated tools and/or programs. Objective evidence of the existence of the tools and/or programs shall also be provided (such as a photo with Ducommun Tool ID visible or copy of planning indicating NC program call-out).

**QC38 INSPECTION REQUIREMENTS AFTER FAI** – Subsequent to approval of FAI part(s), 100% inspection is required for all parts and/or assemblies. However, an inspection sampling plan may be implemented when approved by Ducommun Quality (and Ducommun customer where required) under the following conditions:

- Inspection sampling plan must not allow any rejections (ie c=zero)
- Inspection sampling plan must be per standard industry guidelines such as ANSI or MIL-HDBK
- Inspection sampling plan must be documented

NOTE: Sampling of non-destructive inspection (e.g liquid penetrant, eddy current, mag particle, radiographic, c-scan, a-scan) is not allowed.

**QC39 100% TRACEABILITY** – Traceability to manufacturer lot number shall be maintained throughout the manufacturing process for all hardware (standard parts, rivets, fasteners, etc) and bonding/finishing materials (primers, paints, adhesives, sealants, potting compounds, coatings, etc).

**QC40 PART MARKING – PRODUCTION LOT TRACEABILITY** – All parts (excluding standard hardware) shall be identified with part number and revision level, cage code, production order number and inspection acceptance stamp.

**QC41 PART MARKING – SERIALIZED TRACEABILITY** – All parts (excluding standard hardware) shall be identified with part number and revision level, cage code, production order number, unique serial number, special processing transfer stamp(s), and inspection acceptance stamp.

**QC42 TOOLING IDENTIFICATION** – Tooling shall be identified using a Ducommun Tooling Identification Tag.

**QC43 PROHIBITED MATERIALS** – The use of pure Tin, Zinc and Cadmium shall be prohibited as a surface finish for Space hardware, and as follows, except when approved in advance in writing. A) TIN: The prohibition of pure unalloyed Tin shall include the surface finish on components or parts used inside a hermetic cavity or encapsulated within an assembly (i.e. terminations on chip capacitors in hybrids; the potted portion of leads on devices that are encapsulated). Solder-dipped Tin alloy finishes shall contain at least 3% Lead or at least 3 ½% Silver. All other Tin and Tin alloy finishes shall contain at least 3% Lead. B) ZINC: Un-plated Brass (an alloy containing Copper and Zinc as the main constituents) containing greater than 21% Zinc shall be prohibited. Brass with greater than 21% Zinc shall be acceptable if the Brass is over-plated with a minimum of 50 micro-inches of Nickel or 100 micro-inches of either Copper or Gold. Un-plated alloys other than Brass that contain greater than 10% Zinc shall be prohibited. Un-plated alloys other than Brass alloys that contain greater than 10% Zinc shall be acceptable if they are over-plated with a minimum of 50 micro-inches of Nickel or 100 micro-inches of either Copper or Gold. Zinc or alloys containing Zinc that are sealed within a hermetic cavity shall be acceptable. C) CADMIUM; Un-plated alloys containing greater than 5% Cadmium shall be prohibited. Alloys containing greater than 5% Cadmium shall be acceptable if they are over-plated with a minimum of 50 micro-inches of Nickel or 100 micro-inches of either Copper or Gold. Cadmium or alloys containing Cadmium that are sealed within a hermetic cavity shall be acceptable.

**QC44 RAW MATERIAL** – Supplied raw material shall meet the requirements of the specified Industry Specification and any applicable flow-down specification requirements as detailed in the Ducommun Purchase Order. Material as applicable shall be oiled/preserved with full surface area interleaved after manufacture and whilst in storage/transportation, and packaged/protected per ASTM B660 (including ‘overseas’ packaging where applicable).

**QC45 INTERCHANGEABILITY & REPLACABILITY** – Interchangeability demonstrations are required on products identified as Interchangeable and Replaceable (I and R) on the drawing. When the requirement is identified, the design of the demonstration shall be coordinated with Ducommun Quality Assurance.

**QC46 CRITICAL/SPECIAL PROCESS APPROVAL** – Manufacturing routing document must be submitted to Ducommun for approval of those processes identified by the contract/PO prior to start of work. Subsequent changes to these processes must be submitted to Ducommun Quality for approval prior to implementation of changes.

**QC47 COUNTERFEIT MATERIAL/PARTS PREVENTION** – Seller shall have a process that is compliant to the latest revision of AS6174 as a whole, and specifically have processes in place to support all the requirements of section D3.1 thru D3.7.

Refer to Ducommun’s CWI-00013 Supplier Requirements, and Terms and Conditions clause 12 for full company policy with regards to counterfeit materials/parts prevention.

These documents may be viewed from URL: <http://www.ducommun.com/dco/supplierlinks.aspx>