

Changes from previous revision identified with a bar in the right side of the page 12-18-2017

Q0 Instructions:**General:**

- Specific “Q” clauses other than Q0 apply only when listed on the PO, see Note below.
- All certifications provided to CIRCOR Aerospace, Inc. (CAI) are to be complete, legible, reproducible (at least 3 iterations), and in English.
- Failure to comply with the imposed clauses, as applicable, could result in rejection by CAI Receiving Inspection.
- MRB authority is not flowed down for CAI or CAI customer designed parts.
- If you have any questions regarding these clauses contact CAI Supplier Quality Assurance Department.

PROHIBITED PRACTICES: Unauthorized

- A) Product repair or salvage
- B) Product change or substitution
- C) Altering data on documents so that the original data is unreadable.

Application of Acceptance Authority Media (AAM)

Supplier shall comply with the AS/EN/JISQ 9100 requirements and 14CFR Part 21.2 regarding the application of the Acceptance Authority Media (AAM) requirements

Supplier shall, within its organization and its supply chain, ensure that the use of AAM is clearly defined within its Quality Management System (QMS).

Supplier shall, upon CIRCOR request, be able to demonstrate evidence of communication to its employees and to its supply chain; use of AAM must be considered as a personal warranty of compliance and conformity.

Supplier shall maintain compliance to the AAM requirements by assessing its process and supply chain as part of its internal audit activities. The areas of focus of this assessment shall include but not limited to:

- Authority Media Application Errors (i.e. Omission, Typos, Legibility, etc.)
- Authority Media Application Untimely Use (i.e. Documentation is not completed as planned, “Stamp as you go”, etc.)
- Authority Media Application Misrepresentation (i.e. uncertified personnel, Falsification of documentation, Work not performed as planned, etc.)

- Authority Media Application Training Deficiencies (i.e. Ethics, Culture awareness, Proper Use of authority media, etc.)

Specification Supersession and Revision Levels:

- For specifications that have been superseded, you may use the superseding specification, at your option, unless otherwise specified.
- Use the latest revision of the applicable specifications.

Note:

Some of these standard requirements may not be applicable to your PO (obvious by definition and PO requirements) and should be ignored, for example;

- Q46 applies to certified suppliers only. Certified Suppliers are suppliers with delegated inspection authority and CIRCOR provided stamps and green cards.
- Q3A applies only when ferrous material is required per drawing.
- First Article Inspection Report (FAIR) is required by clause Q6 per AS9102.
 - A copy of FAIR is required with initial submission only and partial FAIR is required when triggers described in AS9102 occurs.
 - Supplier is expected to inform CAI when these triggers/ changes occur and provide partial FAIRs.
 - COTS and standard parts (catalogue items) do not require a FAIR.
- Q13 will not apply if your product doesn't have shelf life.
- Q43 applies only if key characteristics are identified on the drawing or PO.

Q01 Certification of Conformance:

A signed statement is required certifying the shipment of all products or services as applicable meet or exceed all requirements of the purchase order or contract, and must include the following;

- Part revision level and ECN number as noted on the purchase order, note this revision and ECN number must match the drawing that you are using to produce product, see examples on next page. Effectivity: All PO's issued after 1-01-2018
- Material Supplier Name(s) and Heat Lot Number(s) – or other unique traceability numbers, e.g. Serial Numbers, Casting lot number, etc.... This does not apply to Commercial off the Shelf (COTS) and standard hardware items, e.g. NAS, MS, Catalogue, etc....
- Processor Name(s) and Certification Number(s), reference Q02, This does not apply to Commercial off the Shelf (COTS) and standard hardware items, e.g. NAS, MS, Catalogue, etc....

Revision is "A, ECO 25744A"

PART NUMBER / DESCRIPTION	PROMISE DATE	ECN
A 05C00021-801-1 INSERT A APPLICABLE QUALITY CLAUSES: Q0 Q01 Q02 Q02B Q03 Q06 Q10A Q17 Q18 Q19 Q24 Q25 Q46	08/14/2013	25744A

REV	DESCRIPTION	DATE
-	RELEASED PER ECO 24679A	11-07-20
A	REVISED PER ECO 25744A	12-12-12

30581		CHANGE
REV	C.O.	REVISION
3657	REL	1-15-69

REV	DESCRIPTION	DATE
C	SEE PERM RECORDS	
	REVISED PER ECO 18226C	02-11-05
D	REVISED PER ECO 21364C	05-01-13
E	REVISED PER ECO 25411C	12-06-09
	REVISED PER ECO 26659C	14-10-31

Revision is "NC, C.O. 3657"

PART NUMBER / DESCRIPTION	PROMISE DATE	ECN
IA -30581A INSERT APPLICABLE QUALITY CLAUSES: Q0 Q01 Q02 Q02B Q03 Q06 Q10A Q17 Q18 Q19 Q24 Q25 Q30 Q46	08/14/2013	3657

Line Item Number/Description	Rev	ECN Number
001 -61388 GUIDE E		26659C

Revision is "E", ECO is 26659C

When delivered items are manufactured from CAI furnished material, include on the certificate of compliance (C of C), a statement that parts were produced with the material furnished by CAI, Work Order Number xxxxxx, work order number will be identified on the purchase order.

For shipments that include an approved CIRCOR NC Deviation Request, the C of C must include this "NC XXXXX is applicable to this shipment," a copy of the NC must be included in the shipping package to CIRCOR.

Q01B Supplier declaration of conformity

In addition to the requirements of Q01, a supplier declaration of conformity in accordance with ISO/IEC 17050-1 is required to be completed and supplied with each shipment. Effectivity: All PO's issued after 1-01-2018

Q02 Process Certification:

A certification is required for all Special Processes (with applicable specifications and latest revisions) which is traceable to the lot. Special processes are those processes where the resulting O/P cannot be verified by subsequent monitoring or measurement without destructive testing.

Certification for these processes and/or test reports is to be submitted with each shipment.

Special processes include, but are not limited to, the following processes;

- | | | |
|----------------------|------------------------|---------------------------------------|
| A. Welding | G. Nondestructive test | M. Adhesive Bonding |
| B. Brazing | H. Testing Materials | N. Shot Peening |
| C. Soldering | I. Heat Treatment | O. Chemical Milling |
| D. Surface Condition | J. Precision Cleaning | P. EDM Electrical Discharge Machining |
| E. Coating | K. Casting | Q. Electro Chemical Machining |
| F. Plating | L. Forging | |

Q02B Approved Sources – Special Processes, Hardware, & Material:

Only suppliers approved by CAI's customer shall be used when CAI's customer name is specified / provided on the CAI Purchase Order.

CAI: Only NADCAP Approved Special Process suppliers may be used, when CAI customer is not specified on purchase order. Casting, Forging, Metal Straightening, & Commercial off the shelf (COTS) items do not require NADCAP Approved Special Process Sources.

BF Goodrich:

Approved sources shall be used, contact your CIRCOR buyer for sources.

Boeing:

Approved sources per D1-4426.

<http://active.boeing.com/doingbiz/d14426/index.cfm>

Honda Aircraft Company Inc.

Honda Approved Sources, use the following link.

<http://www.circoraerospace.com/company-circor-customer-info.asp>

Commercial off the Shelf, Material, and Hardware items etc.... Must be procured from USA based sources and must be made in the USA

Honeywell:

Contact your CAI buyer for approved source verification.

Israel Air:

When IAI's PS documents are called out or referenced on the drawing or purchase order, IAI approved sources must be utilized. Contact your CAI buyer for approved source verification

Lockheed Martin:

QCS-001 Processor Quality Requirements and Approved Process Sources.

Lockheed Martin “QCS-001 SOURCE”:

Appendix QJ (including requirements C, E, F(12) (a-f)” and “LM Quality Clause Q4R” are imposed.

Messier-Dowty-Toronto:

Approved sources for **material** and **processing** will be identified in DK6000
Contact your CAI buyer for approved source verification.

Messier-Dowty-Gloucester:

Approved sources for **material** and **processing** will be identified in DK6000
Contact your CAI buyer for approved source verification.

Messier-Bugatti (A350):

NADCAP approved sources are required

Northrop:

Northrop Grumman Approved sources shall be used, use the following link.

<https://oasis-aspl.myngc.com/>

Williams International (WI):

Special Processes and Non-Destructive Testing (NDT) requires the use of WI certified suppliers, please contact you CAI buyer in order to identify current approved sources for WI.

Foreign Object Debris (FOD) Elimination Program. The supplier shall maintain a documented FOD Elimination Program in accordance with National Aerospace Standard (NAS) 412. Procedures shall be submitted to the appropriate CAI buyer upon request.

Q03 Chemical and Physical Test Material Reports:

Test reports must be provided that support compliance to the **requirements** of the applicable material specification, must be applicable to the specific lot of material being used, and any special requirements specified on CAI purchase order.

For material procured by CIRCOR’s supplier, the following statement will be required on the material certifications;

“We have verified this material certification against the applicable material specification and have found it in compliance.”

Include printed name, date, and signature/stamp.

Effectivity: All PO’s issued after 1-01-2018

For COTS and Catalogue items, Material certifications are not required, standard certificate of conformance from the distributor is acceptable.

When the Make From is a COTS or Catalogue item, Material certifications are not required, standard certificate of conformance from the distributor is acceptable

NOTE: PED/PB (Pressure Equipment Directive/Pressure Boundary) designated parts must have both Physical and Chemical reports from the Mill, Reference quality Clause Q62

This is applicable to metals.

Q03A Ferrous Materials:

The material report shall include the actual test results obtained from the lot or heat of material as **required** by the applicable material specification.

For material procured by CIRCOR’s supplier, the following statement will be required on the material certifications;

“We have verified this material certification against the applicable material specification and have found it in compliance.”

Include printed name, date, and signature/stamp.

Effectivity: All PO’s issued after 1-01-2018

Q03B Material Certificates:

Certificate of Conformance for material is required with each shipment. Chemical & Physical test analysis is not required and is optional.

This applies to non-metallic materials, this does not apply to qualification testing or approval.

Q04 First Article Inspections:

Must be performed by supplier per AS9102 (complete with inspection report) on a sample part of the first production run and approved by CAI prior to submittal of production run. Any parts produced prior to approval of this FAIR will be produced at suppliers own risk.

Q06 First Article Inspection Report (FAIR):

Required from supplier per current revision of AS9102. This report must accompany shipment. The FAIR requirement, once invoked, shall continue to apply even after initial compliance. Supplemental/ Delta FAI requirements are also required based on AS9102, please note the following;

- FAIR Number, block 4 on all forms is required,
- Form 1, Block 7, drawing revision and ECO number to be entered,

EXAMPLE A, 24730C	REV	DESCRIPTION	DATE
	A	SEE PERM RECORDS	
		REV PER ECO 12679C	99-08-31
		REV PER ECO 24730C	11-03-10

- Form 1, Block 14, Baseline Part Number is required to be entered for partial FAI’s,
- Block 7, form 3, only is completed when identified on the drawing,
- Block 10, form 3, only applies when; design tooling or specially designed tooling, including NC programming as a media of inspection, is used for attribute acceptance of the characteristic.
- Bubble drawing required.

NOTE: This FAIR requirement does not apply to Atkomatic parts or Special Process Suppliers.

Q07 Government Source Inspection:

GSI is required at supplier facility. Contact the Government Representative that normally services your plant immediately upon receipt of this purchase order, contract and/or statement of work. Notify CAI Purchasing when inspection has been coordinated. Relevant purchasing documents are to be furnished to Government Representative at your facility. This clause in its entirety is a "Requirement for Purchase".

Q08 Customer Source Inspection:

CSI is required at your facility. Contact CAI's Quality Assurance Department at least 48 hours prior to the product being ready for inspection. CAI will coordinate the required inspection with CAI's Customer or Regulatory Agency.

Q08A CAI Source Inspection:

Contact CAI at least 48 hours prior to the product being ready for inspection. CAI will coordinate the required source inspection.

Q10 100% Inspection:

Inspection is required with actual recorded results, for all characteristics on all parts to ensure conformance to drawing, specification and purchase order/contractual requirements.

Q10A Sampling Inspection:

In lieu of 100% inspection of all parts, the supplier may use sampling, unless otherwise stated on contract, specification, or blue print (B/P).

Note: Acceptance testing of valves is 100% of parts, sampling is not allowed

Sampling shall be in accordance with the following table;

When 100% inspection is imposed by contract, 100% inspection of each part and characteristic is required.

ZERO ACCEPTANCE NUMBER SAMPLING PLANS 5th Edition

c=zero		1.0 AQL	
LOT SIZE	SAMPLE SIZE	ACCEPT ON ZERO DEFECTS	REJECT ON ONE DEFECT
2 TO 8	All		
9 TO 15	13		
16 TO 25	13		
26 TO 50	13		
51 TO 90	13		
91 TO 150	13		
151 TO 280	20		
281 TO 500	29		
501 TO 1,200	34		
1,201 TO 3200	42		
3,201 TO 10,000	50		
10,001 TO 35,000	60		
35,001 TO 150,000	74		
150,001 TO 500,000	90		
500,001 AND OVER	102		

Sampling requirements contained in this document shall not be construed as permitting defective parts to be sold to CAI. CAI continues to expect all purchased parts to be 100% conforming to all requirements of the Purchase Order, Engineering Drawing and/or product definition requirements.

Q11 Inspection Report Required:

Showing documented evidence of inspection and verification of all dimensions in AS9102 format. If sampling plan is used, inspected units must be bag or tag identified. Inspection report must accompany shipment. Sampling inspection does not relieve seller of ultimate responsibility of producing dimensionally acceptable units. Any units known to be defective by seller which are shipped to CAI must be identified either by bag or by tag, and must include documentation indicating CAI approval of the non-conformance.

Q11A Supplier Inspection Data:

The supplier shall provide inspection data that lists actual measurements of all characteristics that cannot be verified without disassembly at CAI due to subsequent processing or assembly at the Supplier or their sub tiers. The range of measurements is acceptable.

Q11B Supplier Inspection Data (Controlled Products):

The supplier shall provide inspection data that shows that characteristics controlled by tooling (i.e. castings, etc...) has been inspected and accepted by the Supplier's Quality Control (QC) representative. Notify CAI buyer when characteristics have changed to the extent that tooling may produce nonconforming product. Minimum data is to include lot size, sample size, features measured inspector's stamp or signature, number of parts accepted and rejected.

Q12 NDT Supplier (Magnetic Particle, Liquid Penetrant, Radiographic, etc.):

NADCAP certification is required. NDT stamp must appear on parts, when size permits, and certification. The inspection process and acceptance criteria shall be to the latest revision of stated documents.

Q12A Ultrasonic:

Inspect per drawing and contract requirements. Pay special attention to QQ-A-367 requirements when applicable.

Q13 Age / Temperature Sensitive Material:

Certifications to include specification number, date of manufacture, batch / lot number and recommended shelf life.

Q13A Seals / O-Rings:

Shall be sealed and labeled in packages conforming to MIL-PRF-121 (waterproof) or MIL-PRF-131 (water vapor proof).

Q13B Age / Temperature Sensitive Material:

O-rings to have at least 75% remaining shelf life upon receipt at CAI. For Buna-N and Nitrile elastomer parts shall have at least 60% remaining life.

Q13C Material Age Control:

The seller shall identify containers, parts or materials with the manufacturing date, cure date, expiration date, and any special storage or handling condition required.

Q14 Contract / Drawing Directed Source / Qualified Products List:

This item or service is to be procured from a listed source.

Q15 Rockwell Hardness / Electrical Conductivity Test:

Verification as applicable and certified with results per heat treat or other specifications.

Q16 Serialization:

All parts have unique serial numbers assigned. Maintain S/N traceability at all stages of manufacturing or processing. Indicate S/N's on all certifications, shipping reports and/or documents.

Q17 CAI or Customer Furnished Property:

All CAI or customer furnished tooling utilized in this order shall be returned with final shipment of parts / product or sooner if CAI buyer deems necessary.

Q17A Government Tool or Furnished Item:

FAR clauses 52.245-2 and 52.245-17 are applicable, including the following statement "With acceptance of this PO, you assume the risk of and the responsibility for any loss, destruction or damage to the Government property while it is in your control or possession, with the exception of reasonable wear and tear".

Q18 Subcontracted Operations:

Approved subcontracted operations shall meet all provisions of the PO and be certified to by the subcontractor. The supplier must flow down to sub-tier suppliers the applicable requirements in the purchasing documents.

NOTE: This clause does not apply to Catalog Items

CAI must be notified in writing of any changes (see Q40) in product and / or process definition and, where required, CAI approval. Purchasing information must describe the product to be purchased including, where appropriate, this Quality Clause (items A-K):

- A) Requirements for approval of product, procedures, processes and equipment.
- B) Requirements for qualification of personnel.
- C) Quality management system requirements.

- D) The name or other positive identification and applicable issues/revision status of specifications, drawings, process requirements, inspection/verification instructions and other relevant technical data.
- E) Requirements for design, test, examination, inspection, verification (including production process verification, use of statistical techniques for product acceptance) and related instructions for acceptance and as applicable critical items such as key characteristics.
- F) Requirements for test specimens (e.g. production method, number, storage conditions) for design approval, inspection, investigation or auditing.
- G) Requirements relative to supplier notification to CAI of nonconforming product and obtain arrangements for CAI approval of sub-tier supplier nonconforming material/product disposition.
- H) Requirements for the sub-tier supplier to notify supplier of changes in product and/or process definition and, where required, obtain supplier approval.
- I) Right of access by the supplier, CAI, our customers, Government or Regulatory/Statutory agencies to all applicable facilities involved in the purchase order at any level of the supply chain and all applicable records to verify the quality of work, records and materials.
- J) Record retention in accordance with Q25
- K) The supplier is to flow down to any sub-tier supplier the applicable requirements in the purchasing documents (including critical operations / hardware, key characteristics, ITAR/EAR, when required).

Q19 Right of Entry:

CAI, our customers, Government or Regulatory/Statutory agencies shall have “right of entry” into all relevant facilities involved in the purchase order and all applicable records to verify the quality of work, records and materials. These visits will be arranged in advance.

Q24 Quality / Inspection System Requirements:

Supplier QMS must comply with ISO9001 or AS9100 (or AS9120 for distributors) no later than end of year 2018, unless higher Quality System requirements are imposed by CAI and/or CAI’s customer as identified below. A Quality System compliant with MIL-I-45208 or equivalent will be accepted until the end of year 2018.

CAI Customer Flow down requirements:

BF Goodrich:

Document 300, “Supplier and Quality Product Requirements” is imposed, including Foreign Materials Requirement (paragraph 5.1.6).per Quality Clause 33.

Boeing:

D6-82479 requirements are imposed (AS9100C Certified).

<http://www.boeing-suppliers.com/supQual.htm>

Boeing specifications and PSD'S applicable to those specifications apply.

The provisions/ requirements set forth in FORM X31764 of Boeing Quality Purchasing Data requirements (BCA) applies, including but not limited to Validation of Raw Material Test reports.

<http://www.boeing-suppliers.com/supQual.htm>

Lockheed Martin:

Appendix QX and "LM Quality Clause Q4R" are imposed.

Messier-Bugatti (MB):

MBs "Procurement Quality Specification for Equipment, Document No. SQA10014, Issue 1". Key requirements are noted below.

Para.	Requirement
12.2	The supplier shall set up a 100% up and down traceability procedure (by batch or serial number) in order to find easily and quickly: <ul style="list-style-type: none"> - The equipment definition history - The delivered equipment manufacturing history (up and down traceability to material, component and part level, operator/operation traceability and operation/means traceability). - The anomalies and industrial process evolutions history (incident occurring in production, subcontractor or manufacturing process change) - The evolutions of the manufacturing and inspection changes from that presented at the development of the initial First Article.
12.5	Major Industrial change notification must be provided. <ul style="list-style-type: none"> - Plant location or layout - Transportation method - Major Enterprise Resources Planning (ERP) change - Major process (including main tools) change - Major suppliers (including sub-contractors) change
12.8.2	CAI must approve supplier's ATP (Acceptance Test Procedure) relevant to this PO.
12.9	O-Rings / Seals must have an expiration date in excess of 18 months.
13.4.2	Supplier shall not procure component or parts from brokers (distributors not authorized by the OEM to trade with components or parts). If the supplier procures parts from a dealer/distributor, it shall be EN9120 approved.
13.4.3	Suppliers shall flow down Messier-Bugatti requirements to its sub-tiers.
14.3	Supplier shall implement and maintain a process for part non-conformity root

	cause analysis
14.4	When non-conformity is identified after a part is released by the supplier, the supplier shall immediately submit to CAI a “Notification of Product Quality Escape” in accordance with EN 9131.

Messier-Dowty (M-D):

M-D’s “Process Requirements in Developing Excellence” (PRIDE), SCREQ-001. Key elements are enumerated below:

Para.	Requirement
0.1	<u>General:</u> PRIDE is part of the PO or contract terms and conditions and the stipulated requirements <u>apply in their entirety</u> . No deviations are acceptable unless signed jointly by CAI and the subcontractor.
0.8	<u>Parts and Assembly Classifications:</u> The supplier shall take into account the classifications of raw materials, parts and assemblies and their effects on product designs, industrialization and including identification.
3.3.2	<u>Cascading of CAI/Customer Requirements:</u> The subcontractor shall cascade CAI or its customer’s requirements as reflected in the PO, contract or other CAI documents, within its organization and to its suppliers and/or subcontractors.
3.4	<u>Industrial Validation Process including First Article Inspection (DVI/FAI):</u> The DVI/FAI process shall be consistent with the requirements of M-D document SCREQ-342, Issue 2. Build to print (BTP) suppliers for Class 1 and AFA designated parts shall submit to CAI manufacturing and assembly layouts for approval prior to start of production.
3.5	<u>Special Processes:</u> When special processes are required (see Appendix G of the PRIDE document), <ul style="list-style-type: none"> • The processes shall be identified on the manufacturing documents: manufacturing layout and traveler sheet. • The operation shall be identified on the manufacturing and inspection file. • The significant parameters shall be under control. • Each combined process/product shall be qualified on the first part, the records to this qualification shall be documented • Any modification shall be under control, qualified and reviewed by CAI. Implementation rank shall be defined.
4.6.2.1	Moved to Q02B, Effective 10-01-2014 Reference: NADCAP Requirements

Northrop:

QA System Requirements (SQAR), including para 2.13, are imposed.

Rolls-Royce Requirements SABRe requirements are imposed.

Supplier and sub-tiers must comply with all requirements, including RR9000:SABRe, specifications, revisions and Key Characteristics (including Conformance Control Features).

<https://suppliers.rolls-royce.com/GSPWeb/appmanager/gsp/guest>

- NADCAP approved sources are required to be used for special processing.

Q25 Record Retention

CAI – Records shall be retained for 7 years minimum, following closeout of P.O.

Customer requirements outlined below takes precedence over this requirement.

A) **Boeing Commercial Aircraft** – Records shall be retained for 10 years minimum.

B) **Gulf Stream** – Records shall be retained for 10 years minimum.

C) **Honda Aircraft Company Inc.** – Records shall be retained for 10 years minimum.

D) **Messier** – Records shall be retained for 10 years per SCREQ-001.

E) **Pilatus Aircraft** – Records shall be retained for 12 years minimum for items not in Safety Class 1. The start of the retention period starts on January 1st of the following year (i.e. for items produced and delivered in 2007, the retention period starts on 1st January 2008 and ends on December 31st 2019). Retention period for Safety Class 1 items has the same storage requirements, but over a minimum period of 25 years.

F) **Williams International** – Records shall be retained for 20 years minimum.

Q27 SDS:

Safety Data Sheet required (raw material-per material lot, non-commercial/non off-the-shelf items or coatings applied to CAI products – either manufactured complete or purchased separately)

Q28 Critical / Process Sensitive Operations:

Critical or Process Sensitive operations or hardware identified on the PO shall be identified as “CRITICAL” on supplier routers / travelers.

Q28A Frozen Planning Required:

CAI must approve supplier router / traveler prior to work being performed for CAI. No changes in the approved supplier router / traveler allowed without prior CAI review and approval.

Q28B Frozen Planning Required:

CAI must approve supplier techniques sheets/instructions prior to work being performed for CAI. No changes in the approved supplier techniques sheets/instructions allowed without prior CAI review and approval.

Q28C Frozen Planning Required:

CAI Customer must approve supplier router / traveler prior to work being performed for CAI. No changes in the approved supplier router / traveler allowed without prior CAI customer review and approval (Separate Approved Planning).

Q28D Rockwell Hardness:

Actual hardness for each item (by unique serial number) required.

Q28E Sub-Tier Supplier Documentation:

The supplier documentation will include the sub-tier documents as part of the submittal for CAI review.

Q28F Processes to Manufacture this Part are to be Frozen:

The supplier is to notify CAI's buyer in writing whenever a die, mold or pattern is repaired, replaced or modified or the process changes such that the chemical/physical or dimensional characteristics could be affected. The Supplier is to provide a First Article Inspection Report (FAIR) on the affected characteristics.

Q29 ESD Sensitive Items:

All voltage sensitive devices, including subassemblies and assemblies containing such devices, shall be protected from static electricity and transient voltages per requirements stated in the drawing and specifications under which the item was procured. Items will be identified by lot or batch number (may be a date) traceable to the original manufacturing process and manufacturer.

Q30 Packaging for Shipment:

Package to protect parts from movement and transit damage. Exterior protection required for sealing surfaces, finishes, threads. Interior protection required for threads and finishes.

Q30A Individually Packaged.

Parts shall be single packed. If packaged in polyethylene bags, the bags shall be at least 4 millimeters thick and sealed closed.

Q30B MIL-STD-794:

Military packaging requirements are imposed.

Q30C MIL-STD-2073:

Military packaging requirements are imposed.

Q30D Best Commercial:

Best commercial packaging requirements are imposed.

Q32 REACH

Registration, Evaluation, Authorization and Restriction of Chemicals Compliance of products required.

Q36 Calibration

- 1) Item, serial number, manufacturer (to conclusively and unambiguously identify the item) as well as any standard number you have assigned.
- 2) Calibration shall be undertaken against full manufacturers' specifications. Where equipment is found to be out of specification, full performance test results, in the as-received condition, must be obtained before any adjustment or repair is taken. On completion of the calibration work a certificate of calibration is required, signed by your authorized representative, containing a statement confirming that the calibration can be demonstrated to be traceable to National or Full performance test results, taking the form of measured values, are to be supplied. Any omissions from the full calibration are to be notified to us and shall be agreed in writing before a certificate, clearly annotated "Limited Calibration" is issued. A declaration of measurement uncertainty values shall be included with all test results.
- 3) If it is an electrical device or a device that can easily have the calibration tampered with, a statement such as "Tamper Resistant Seals Required"

Q38 Control of Critical Characteristics:

Where a Critical characteristic is defined on the drawing, the supplier will assure that a variation management process is in place per AS9103 that assures a minimum Cpk of 1.33. This clause is applicable to Motor Technologies drawings ONLY.

Q39 No Mercury Contamination Statement:

Material furnished under this PO shall not contain metallic mercury or mercury compounds and shall be free from mercury contamination, i.e. during the manufacturing process, tests or inspections, the material furnished shall not have come in direct contact with mercury or any of its compounds without the specific written approval of CAI.

Product provided by your supplier(s) for material furnished under this PO shall also be free from mercury contamination

Certificate of Conformance for shipment to CIRCOR must include no mercury contamination statement.

Note: Mercury is corrosive to gold, silver, nickel, stainless steels, aluminum, and copper alloys.

Q40 Supplier Required Notification:

Supplier is required to notify CAI's purchasing agent of changes to their organization that affects any one of the following criteria that was considered by CAI for supplier addition to the CAI ASL:

- Quality Management System (e.g. attainment or loss of certification, ISO9001; AS9100 etc)
- AS9100 / ISO9001 Certification
- Change in ownership
- Relocation of operations
- Change in product, material and processing.
- Change in senior management (e.g. President, CEO, COO, Quality Leadership)
- Obsolescence/End of life for Catalogue parts.

Q41 Traceability of Raw Material:

Upon request, supplier shall present positive evidence that supplied products are traceable to their original raw material lot(s) / ingots(s).

Q42 Measurement System Analysis:

Inspection devices used to accept product or process to requirements prior to shipment shall have a maximum Gage R&R of 25% and a minimum 4:1 level of measurement discrimination.

Q43 Control of Key Characteristics:

Where key characteristics are defined on provided drawings or specifications, the supplier will assure that a variation management process is in place per AS9103 that assures a minimum Cpk of 1.33.

Q44 Non-Conforming Goods or Services:

Supplier shall not ship any goods or services that are non-conforming to specified requirements UNLESS approved to do so by CAI Quality in writing and based upon an approved concession.

No "Use As Is" or Repair dispositions are allowed without written authorization from CIRCOR Aerospace & Defense. Contact the CAI Buyer for instructions.

Q45 Foreign Object Debris/ Damage (FOD):

To prevent damage to supplied goods and services, the supplier will develop and deploy a program to mitigate the introduction of foreign objects in accordance with NAS 412.

Q46 Delegated Inspection Authority/ Certified Supplier:

Suppliers with a "Certified" status on CAI ASL have delegated inspection authority on the parts listed in the scope of delegation.

1. The Delegate shall be responsible for performing the following inspections:
 - A. Final inspection to the applicable CAI drawings and Purchase Order (PO) requirements.
 - B. Document final inspection activity on CAI supplied blueprint by affixing checkmark next to each feature and notes. Forward blueprint to CAI with parts at time of shipment. The blueprint shall include lot size, sample size, delegate's stamp, number of parts accepted and rejected. In lieu of the blueprint the inspection activity can be documented on supplier's format as long as it meets requirements stated above.

Note: This does not apply to standard and (COTS) Commercial Off the shelf catalogue parts.
 - C. Delegate shall affix the "certified stamp" and date on the supplier's proof of inspection and / or C of C.
 - D. Any other inspections necessary for acceptance of product.
2. Green Certified Supplier cards, provided by CAI, will be completed except the DOC # is to be left blank for CAI use.

NOTE: Green Certified Supplier Cards are not to be used for "NON-CERTIFIED PART NUMBERS."
3. Supplier shall notify CAI's Procurement of any significant changes in the organization such as:
 - A. Management changes
 - B. Delegate leaving the supplier
 - C. Supplier change of address
 - D. Planning (certified products)
 - E. Misplaced or lost Certified Supplier Stamp
 - F. Any misplaced / lost Certified Supplier Stamp will result in a **\$250.00** replacement charge.
4. Supplier shall provide a list of their suppliers, if any, that have been delegated with inspection authority by the CAI supplier, in accordance with AS9015 requirements. Using delegated suppliers does not relieve seller of ultimate responsibility of providing acceptable product.

Q47 Fastener Quality Act:

The following fasteners apply:

- A nut, screw, bolt, or stud having internal or external threads, or a load-indicating washer, produced to a standard or specification published by a Consensus Standard Organization (CSO) such as ASME, SAE, ASTM or a Government Agency (GA) such as a Military Standard/ Specification, which:

1. Has a nominal diameter of 1/4 A or 5mm or more,

2. Contains any quantity of metal,
 3. Is held out as meeting a standard or specification that requires through hardening; or
 4. A screw, nut, bolt, or stud having internal or external threads which bears a grade identification marking required by a standard or specification; or
 5. A screw, nut, bolt, stud, or washer produced according to standards and specifications other than those published by CSO or GA but which (directly or indirectly) reference such standards and specifications for the purpose of delineating performance or materials characteristics.
- Manufacturers of fasteners sold to CAI shall include with each shipment the following:
 1. Test reports from an U.S. Government accredited laboratory National Institute of Standards and Technology (NIST) that substantiates qualification and/or acceptance.
 2. Certification of Compliance (C of C) signed by an officer of the company, declaring that the items conform to all requirements specified in applicable standard and/or specification documents, manufacturer's identity and lot number and that an original copy of the accredited laboratory report, if applicable, is on file for inspection and review by CAI.
 3. Items that are individually or intermediate packaged within a container shall be marked on the exterior of each package with the manufacturer's identity, lot number and CAI PO number.
 4. All records shall be maintained for a period of seven (7) years from the date of tests.
 - Distributors of fasteners shall include with each shipment the following:
 1. The approved manufacturer's certification statement as noted in (1) and (2) above.
 2. C of C signed by an officer of the company declaring:
 - a. That the items were manufactured by a manufacturer listed as approved for the item.
 - b. Conformity to all requirements based on the distributors' evaluation and review of the items and accompanying manufacturer's and laboratory's test reports.
 - c. The manufacturers' identity and lot number.
 - d. That no rework or alterations have been performed.
 3. Items that are intermediate packaged within a container shall be marked on the exterior of each package with the manufacturer's identity, lot number, the distributor's identity, and the CIRCOR Aerospace & Defense purchase order number.
 4. Records shall be maintained for a period of seven (7) years from the date of tests.

Q48 Intentionally left blank for future use.

Q49 Intentionally left blank for future use.

Q50 Process Bulletin 110:00 – Supplier Quality System Requirements

See Clauses: Q0 Q01 Q02 Q02B Q03 Q03A Q03B Q06 Q10A Q12 Q13 Q13B Q17 Q18 Q19 Q24 Q25 Q30 Q39 Q40 Q41 Q42 Q43 Q44 Q45 Q46

Q51 QA FLY SHEET NO. 1 – Castings, Forgings, Molded Parts, Die Cut Parts

See Clauses: Q01 Q02 Q03 Q02B Q06 Q11B Q24 Q28F Q39 Q44

Q52 QA FLY SHEET NO. 2 – Machined Parts, Springs

See Clauses: Q01 Q02 Q02B Q11B Q24 Q39 Q44

Q53 QA FLY SHEET NO. 3 - Processing

See Clauses: Q02 Q24 Q39 Q44

Q54 QA FLY SHEET NO. 4 – Supplier Catalog Items, Fasteners

See Clauses: Q01 Q39 Q44 Q47

Q55 QA FLY SHEET NO. 5 – O-Rings, Seals, Quad Rings, Etc...

See Clauses: Q01 Q13C Q24 Q39 Q44

Q56 Intentionally left blank for future use.

Q57 QA FLY SHEET NO. 7 – Assemblies

See Clauses: Q01 Q02 Q02B Q06 Q11A Q24 Q39 Q44 Q47

Q58 QA FLY SHEET NO. 8 – Atkomatic Products

See Clauses: Q01 Q02 Q02B Q24 Q39 Q44

Q59 QA FLY SHEET NO. 9 – Go Regulator ~ Supplied by HOKE

See Clauses: Q0 Q01 Q02 Q02B Q03 Q03A Q03B Q06 Q10A Q12 Q13 Q13B Q17 Q18 Q19 Q24 Q25 Q30 Q39 Q40 Q41 Q42 Q43 Q44 Q45 Q46

Q60 QA FLY SHEET NO. 10 – Go Regulator – Supplied by Go Regulator

See Clauses: Q0 Q01 Q02 Q02B Q03 Q03A Q03B Q06 Q10A Q12 Q13 Q13B Q17 Q18 Q19 Q24 Q25 Q30 Q39 Q40 Q41 Q42 Q43 Q44 Q45 Q46

Q61 Intentionally left blank for future use.

Q62 PRESSURE EQUIPMENT DIRECTIVE (PED) REQUIREMENTS

Formerly QA FLY SHEET 12

This part is a pressure boundary part or is raw material that is used for a pressure boundary part. The following requirements apply.

1. Material shall meet the requirements specified on Drawing 2011 and Drawing 2143:
 - a. Specifications identified,
 - b. Material Identified, type, alloy, temper, and
 - c. Ultimate Tensile Strengths or Other specified properties, per 2143.
2. Mill Certifications – Metals:
 - a. Chemical and Physical properties are required to be ACTUAL test results, a min/max value range is not acceptable.
 - b. Heat number or Lot number is required.
3. Manufacturer Certifications – Plastic Parts:
 - a. Mechanical properties are required at a minimum.
 - b. Certificate must be from the manufacturer, i.e. DuPont, etc...
 - c. Lot number is required.
4. Mill Certificate must state that the test results comply with the material specification requirements.
5. Mill Certificate must be signed by the manufacturer's authorized representative independent of the manufacturing department. This is usually a Quality representative.
6. The material suppliers (mill) must be ISO 9000 or equivalent third party quality system compliant and be certified by a registrar that is established within a member country of the EU. In the US this is usually Registrar Accreditation Board National Accreditation (RAB). If it is other than RAB, contact your buyer.
7. If another supplier changes the material properties (heat treat, aging, etc.) then that supplier must provide a certificate and must also have the above quality system.
8. If the mill certificate meets all the requirements listed above **except** the mill is not ISO9000 or PED approved, then the **ISO 9000 certified material distributor can send the material out** for chemical/physical analysis to a lab accredited by a member of INTERNATIONAL LABORATORY ACCREDITATION COOPERATION <http://www.ilac.org>. In the US this is normally A2LA American Association for Laboratory Accreditation.
9. Mercury Free Contamination Statement
All Material and/or processing certificates must warrant that the products on the order did not come into contact with mercury or any of its compounds nor with any mercury containing devices.

*Welding/Brazing may **NOT** be performed outside of CAI for this part.*

Q64 SPECIALTY METALS

Formerly QA FLY SHEET 14

DFARS 252.225-7008 Restriction on Acquisition of Specialty Metals (Jul 2009)

<http://www.acq.osd.mil/dpap/dars/dfars/index.htm>

Some customer contracts are flowing down DFARS 252.225-7008 (was 7014) as prescribed in 225.7003-5(a)(1). CAI identifies such material by adding “DFALT1” to the part number. This applies to any PO incorporating a specialty metal in articles delivered to CIRCOR Aerospace & Defense (CAI) for military applications. Specialty metals called out shall only be melted or produced in the United States, its outlying areas or a qualifying country.

Qualified Countries (see DFARS 225.872-1 and DFARS Case 2009-D022).

Australia	France	Poland
Austria	Germany	Portugal
Belgium	Greece	Slovenia
Canada	Israel	Spain
Czech Republic	Italy	Sweden
Denmark	Japan	Switzerland
Egypt	Luxembourg	Turkey
Estonia	Netherlands	United Kingdom of Great Britain and Northern Ireland
Finland	Norway	

NOTICE: WTO GPA Designated Countries Are Not Eligible for Exception to the Specialty Metals Restrictions.

(a) *Definitions.* As used in this DFARS clause—

“Alloy” means a metal consisting of a mixture of a basic metallic element and one or more metallic, or non-metallic, alloying elements.

- i) For alloys named by a single metallic element (e.g., titanium alloy), it means that the alloy contains 50 percent or more of the named metal (by mass).
- ii) If two metals are specified in the name (e.g., nickel-iron alloy), those metals are the two predominant elements in the alloy, and together they constitute 50 percent or more of the alloy (by mass).

“Produce” means:

- i) Atomization;
- ii) Sputtering; or
- iii) Final consolidation of non-melt derived metal powders.

“Specialty metal” means –

- i) Steel –
 - A) With a maximum alloy content exceeding one or more of the following limits:
manganese, 1.65 percent; silicon, 0.60 percent; or copper, 0.60 percent; or
 - B) Containing more than 0.25 percent of any of the following elements:
aluminum, chromium, cobalt, molybdenum, nickel, niobium (columbium), titanium, tungsten,
or vanadium;
- ii) Metal alloys consisting of –
 - A) Nickel or iron-nickel alloys that contain a total of alloying metals other than nickel and iron in
excess of 10 percent; or
 - B) Cobalt alloys that contain a total of alloying metals other than cobalt and iron in excess of 10
percent;
- iii) Titanium and titanium alloys; or
- iv) Zirconium and zirconium alloys.

“Steel” means an iron alloy that includes between .02 and 2 percent carbon and may include other
elements.

- (b) Any specialty metal delivered under this contract shall be melted or produced in the United States or its
outlying areas.

When a metal is encountered that is not included in either table below, CAI requests that the
material designation be submitted via email to CAI Buyer.

A determination will be made as to how the metal should be classified and it will be added to the
appropriate table of this list.

The omission of any material from either table does not indicate that the material is or is not a
specialty metal or do the two tables include every metal used by CAI.

TABLE I				
These Material Designations have been identified as "SPECIALITY METALS"				
STEEL				
300M	4037	4130	4140	4340, E4340, or 4340M
4340 per AMS6415	4630 or 4620H	52100	6150	8620 or 8620H
8630	8740	9254 per ASTM A877	9310	A2
Alloy Steel Per FF-S-86	AMS 6280	ASTM A351 All Grades	ASTM 600 All Types	ASTM A681 All Types
Carpenter Silicon Core B-FM	D2	D6AC	FS-0205	FX-1008
ASTM F835	H11	Chrome/Silicon Wire per ASTM A401	Chrome Vanadium Spring Wire per ASTM A232	M-50 per AMS 6490
Machinable Carbine Grade CM	Nitralloy or Nitralloy 135	QQ-W-412 COMP 1	QQ-W-412 COMP2	Silicon Core Iron per ASTM A867
Steel per AN-S-9 or MIL-S-6050		Steel per FF-S-200	Vascomax All Grades	
STAINLESS STEEL				
A286	AM 355	301 or 301 .250H or 301-HH	302 or 302 COND B	303
304 or 304L	316 or 316L	321	347	384
410	416	420	430f or 430f (Se)	431
440 or 440C	13-8 or 13-8 Mo, or PH 13-8 Mo	15-5	15-7 or 15-7 Mo or PH 15-7 Mo	17-4
17-7	18-8	AMS 5504	AMS 5610	AMS 5621
AMS 5688	AMS 5731	AMS 7245	ASTM A351 All Grades	ASTM B473
ASTM B729	Corrosion Resistant Steel per FF-S-86	CRES per ASTM 276 or ASTM A276	CRES per FED-STD-66	CRES per QQ-S-763
Custom 455	Greek Ascology	N08020	S34700	Steel wire per QQ-W-423
Steel per AMS 7211	XM-7			
NICKEL BASE ALLOYS				
Hastelloy X	Inconel 600	Inconel 625	Inconel 718	Inconel X
Inconel X-750	Monel K-500	Nickel Copper per QQ-N-281		
COBALT BASE ALLOYS				
Cobalt Alloy per ES2-171		Elgiloy	Haynes 25	Haynes 188
L-605	MP159	Stellite 6B		
TITANIUM				
Ti 6A1-4V or Ti 6A1-4V STA		All Titanium Compositions		
IRON-NICKEL BASE ALLOYS				
Nitronic 60				
MAGNETIC ALLOYS				
Alnico 5.5/0.64	Alnico-V	Alnico-I	Alnico-II	Alnico-III
Alnico-IV	Alnico-8	Alnico-XII		

TABLE II				
These Material Designations have been identified as NOT BEING "SPECIALTY METALS" per DFARS				
STEEL				
1010	1015	1018	1020	1025
1026	1075	1090	1095	B1113
C1117	C1137	1141	1144	1213 or C1213
1215 OR C1215	4750	Carbon Steel per FED-STD-66	Carbon Steel per FF-S-103	Carbon Steel per FF-S-107
Carbon Steel per MIL-S-7952	G10180 per ASTM A108	G12150 per ASTM A108	Low Carbon Steel per QQ-S-698	Low Carbon Steel IAW AISI 1067-1075
MIL-S-7952	Music Wire	Music Wire per QQ-W-470	Steel Weldless Safety Chain per RR-C-271	Wire per MIL-W-16878
NICKEL / IRON BASE				
HYMU80				
BRASS / BRONZE				
A1-Ni-Br, or A1-Ni-Br COND A, or A1-Ni-BRZ	AMS 4510	AMS 4720	ASTM B16	ASTM B36
ASTM B98	ASTM B99	ASTM B134	ASTM B206	Berylco 14
Beryllium Copper	BRASS per QQ-B-611	Cupro Nickel	CDA 715	CDA67300
C17200 or Be-Cu	C17510	C26000	C63000	C64200
C65100	C65500	C66100	C67300	C92900
642	6730	6731	674 Brass	675 Bronze
ALUMINUM				
850	1100	1145	2011	2024
2219	3003	356, A356 or A356.0	355, C355 or C355.0	357, A357 or A357.0
380, A380 or A380.0	6061	7050	7075	TENS 50
NICKEL				
N21				
MAGNETIC ALLOYS				
Hiperco 50A	MIL-N-14411 COMP 3	MIL-N-14411 COMP 5	Neodymium Iron Boron Type 30/18	Permendur 2V
Permendur 49				
OTHER METALS				
Chace 6650	Meehanite	Tantalum 10W	Tungsten	TZM Type 364
NON-METALS				
Nitrile	Vespel All Types			

Q65 Through Q98 Intentionally left blank for future use.

Q99. Write-In Requirement:

Any additional requirements not specified shall be explained in detail in the body of purchase order or in an accompanying document.

Obsolete Quality Clauses, These cannot be used.

Q01A Obsolete, Effective 6-19-2017
Q02A Obsolete, Effective 10-01-2014
Q02C Obsolete, Effective 10-01-2014
Q05 Removed 7-18-2016
Q09 Obsolete, effective 8-5-2014
Q20 Obsolete, Effective 10-01-2014
Q20A Obsolete, Effective 10-01-2014
Q20B Obsolete, Effective 10-01-2014
Q21 Obsolete, Effective 10-01-2014
Q21A Obsolete, Effective 10-01-2014
Q22 Obsolete, Effective 10-01-2014
Q22A Obsolete, Effective 10-01-2014
Q22B Obsolete, Effective 10-01-2014
Q23 Obsolete, Effective 10-01-2014
Q26 Obsolete, effective 06/02/2014
Q31 Obsolete, Effective 10-01-2014
Q33 Obsolete, Effective 10-01-2014
Q33A Obsolete, Effective 10-01-2014
Q34 Obsolete, Effective 10-01-2014
Q35 Obsolete, Effective 10-01-2014
Q37 Obsolete, Effective 10-01-2014
Q37A Obsolete, Effective 10-01-2014
Q37B Obsolete, Effective 10-01-2014
Q37C Obsolete, Effective 10-01-2014
Q37D Obsolete, Effective 10-01-2014
Q63 Obsolete – 9-26-14

END