

Changes from previous revision identified with a bar in the right side of the page for Corona Quality Clauses 6-5-2018, this does not include font changes or spelling corrections

NOTE

**QUALITY CLAUSES ON PAGES 2 THROUGH 24
APPLY TO CORONA, CALIFORNIA ISSUED
PURCHASE ORDERS**

**QUALITY CLAUSES ON PAGES 25 THROUGH 36
APPLY TO HAUPPAUGE, NEW YORK ISSUED
PURCHASE ORDERS**

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- For specifications that have been superseded, you may use the superseding specification, at your option, unless otherwise specified.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

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 the following statement "NC XXXXX is applicable to this shipment," and a copy of the NC must be included in the shipping package to CIRCOR.

Revision is "A, ECO 25744A"

PART NUMBER / DESCRIPTION	PROMISE DATE	ECN
A 05C00021-801-1 INSERT APPLICABLE QUALITY CLAUSES: Q0 Q01 Q02 Q02B Q03 Q06 Q10A Q17 Q18 Q19 Q24 Q25 Q46	08/14/2015	25744A

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

Purchase Order Requirements

Drawing Revision Blocks

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	08/14/2015	3657

REV	C.O.	REVISION	DATE	CEL
		3657	REL	1-15-68

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

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 "E", ECO is 26659C

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 process 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, see example,

<p>EXAMPLE</p> <p>A, 24730C</p>	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 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 table on the next page;

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	
2 TO 8	All	ACCEPT ON ZERO DEFECTS REJECT ON ONE DEFECT
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

Continued

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.

Continued

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.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.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.
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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.

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

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

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

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

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.

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 these parts.*

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
Machineable Carbide Grade CM	Nitalloy or Nitalloy 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			
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IRON-NICKEL BASE ALLOYS

Nitronic 60				
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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 <u>NOT BEING</u> "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 of CORONA, CALIFORNIA QUALITY CLAUSES

Hauppauge, New York SUPPLIER QUALITY CLAUSES 2018 Rev 1

SCOPE: The Quality Clause Requirements specified herein shall be, when included in the CIRCOR Aerospace Inc. contract/purchase orders, binding quality contract requirements. In accepting the purchase order/contract, the suppliers shall comply with all legal, regulatory and or administrative requirements. The supplier shall be responsible for ensuring its immediate implementation to the issued PO/Contract. The Supplier shall acknowledge receipt of said notice by sending CIRCOR a receipt notice either in writing or via electronic mail. Before bidding on, manufacturing, or delivering products to CIRCOR, it is essential that the Supplier fully understands the quality clause requirements of this document and any associated technical documents. To ensure proper understanding of this document, the Supplier shall address all questions and queries in written form, to the Supplier Quality Management and Material Control Manager.

CIRCOR's Material Manager and or designated Sales Agents, are the only authorized personnel able to issue or revise Contracts. It shall be the Supplier's responsibility to understand and comply with all clauses, terms and conditions specified within a Contract/Purchase Order and with all other applicable requirements, prior to accepting the order. Failure to do so may result in product rejection and may affect the Supplier's status. The supplier shall, for each order accepted, sign and date, the cover page of the SQR-2017 , and forward back to the Material Control Department verifying acceptance and understanding of the PO/Contract Quality clauses
By issuing this document, CIRCOR makes or gives no representation, warranties or guarantees whatsoever. In particular, CIRCOR in no way represents, warrants or guarantees that the Supplier, by complying with all the requirements herein contained, complies with all the requirements with which he needs to comply.

Q1	QUALITY MANAGEMENT SYSTEM - The Supplier shall maintain a Quality Management System in accordance with the requirements of ISO 9001, or equivalent.
Q1a	AEROSPACE QUALITY STANDARD - The supplier shall maintain a Quality System Third Party Certified by a qualified certifying body, in accordance with the latest AS9100 specification.
Q1b	AEROSPACE QUALITY STANDARD - The supplier shall maintain a Quality System in accordance with AS9100 or equivalent. Suppliers that maintain a self-certified Quality System shall provide a copy of their QM (quality manual). These QM shall be provided along with CIRCOR yearly desk audits (PB110) for review. Forms may be obtained from CIRCOR Purchasing Department.
Q2	OBJECTIVE EVIDENCE OF QUALITY - By delivery of items of this purchase order, Supplier certifies that all requirements of the specifications applicable to this order are complied with. Supplier shall make available to CIRCOR all inspection results and test data necessary to support evidence of such compliance. All certifications and/or data must include: <ul style="list-style-type: none"> * CIRCOR and/or supplier part number and revision * CIRCOR purchase order number * Quantity, Serial numbers and date lot codes * Applicable specifications and standards * Customer clauses based on contract requirements
Q3	ATTRIBUTE DATA - The supplier shall provide attribute data (Go/No-Go) for each lot delivered showing conformance of all inspections and/or tests specified by the applicable drawings, specifications, or supplier's acceptance test procedure as approved by CIRCOR. This data shall be included with each shipment of product.
Q4	VARIABLE DATA - The supplier shall provide variable data (measured values) for each item delivered showing conformance of all inspections and/or tests specified by the applicable drawings, specifications, or supplier's acceptance test procedure as approved by CIRCOR.
Q5	Certification of Conformance: Certification of Conformance shall be included with every shipment. Each Certification shall contain the following information: Purchase Order Number, line Item Number, Drawing and or Specifications associated with the part, revision to drawing and or specification, and printed title and name with signature of the authorized individual signing the certification. The supplier's certification of conformance shall also include, as applicable, a reference to all certification (raw material, outside process) used to produce the part.
Q5	CHANGED 2-1-18 WF: Was (Q5)Attribute Data, but Q5 was already taken by CofC.

<p>Q6</p>	<p>COUNTERFEIT PARTS PREVENTION: Supplier shall establish and maintain a Counterfeit Parts Prevention and Control Plan that meets the intent of AS5553 Counterfeit Electronic Parts, Avoidance, Detection, Mitigation, and Disposition.</p> <p>A. Prohibition The supplier shall ensure that only new and authentic materials are used in product to be delivered to CIRCOR. The supplier agrees and shall ensure that Counterfeit Parts are not contained in products delivered through the implementation of policies that include prevention methods to protect against the use of Counterfeit Parts.</p> <p>B. Prevention The supplier shall only purchase products, to be delivered or incorporated in an assembly to CIRCOR, directly from the Original Component Manufacturer (OCM) /Original Equipment Manufacturer (OEM), or through an OCM/OEM authorized distributor. The supplier shall maintain Original Component/Equipment Manufacturer (OEM) certificates for all Electronic, Electrical and Electromagnetic components and devices including those items in assemblies or subassemblies delivered as part of this purchase order. OCM/OEM Certificates of Conformance shall be available upon request.</p> <p>C. Notification In the event supplier becomes aware or suspects that it has furnished Counterfeit Parts under this Purchase Order, the supplier shall promptly disclose such item(s) to the Buyer and replace such item(s) with item(s) acceptable to Buyer at no increase in price, cost or fee.</p> <p>D. Remedies In the event that Products delivered under this Purchase Order are, or include, Counterfeit Parts, The seller shall promptly investigate, analyze and report in writing to the buyer. The parties shall agree upon the appropriate course of action.</p> <p>E. Flow Down The seller shall flow the requirements of this provision to its sub-tier suppliers at any tier for the performance of this Purchase Order.</p> <p>F. Assembly The assembly seller shall maintain a counterfeit prevention program and flow the requirements down to all their sub-tier suppliers to prevent the inadvertent use of counterfeit parts and materials. Compliance with these requirements are in no way to be interpreted as relieving the seller from their responsibility to assure that Counterfeit Parts are not contained in products delivered. Any deviations from this clause must be approved in advance, in writing, by CIRCOR.</p>
<p>Q7</p>	<p>CHEMICAL AND PHYSICAL ANALYSIS - The supplier shall forward with each shipment of material, a copy of the mill chemical and physical analysis for the raw material on this order. The report shall bear the heat number and a separate report shall be forwarded for each heat lot.</p>
<p>Q8</p>	<p>CIRCOR/CUSTOMER SOURCE INSPECTION - The inspections and tests indicated by the following sub-paragraphs are subject to CIRCOR (and/or customer) source inspection when they are included as part of the purchase order. Supplier shall notify CIRCOR purchasing department 5 days prior to the required inspection. CIRCOR reserves the right to perform in-process inspections and/or audits at any time during the life of this order. Includes First Article verification and inspection at supplier location.</p>
<p>Q9</p>	<p>IN-PROCESS INSPECTION – and/or audits are required at points selected by the CIRCOR Quality Assurance Representative and/or as specified by the Purchase Order, the drawing or applicable documentation.</p>
<p>Q10</p>	<p>HONEYWELL CERTIFICATE OF CONFORMANCE - By delivery of items of this purchase order, Supplier certifies that all requirements of the specifications applicable to this order are complied with. Supplier</p>

	<p>shall make available to CIRCOR all inspection results, raw material certifications, test data reports, evidence of source inspection or self-release (when applicable) necessary to support evidence of such compliance. All certifications and/or data must include:</p> <ul style="list-style-type: none"> * CIRCOR and/or supplier part number and revision * CIRCOR purchase order number * Quantity, Serial numbers and date lot codes * Applicable specifications and standards * Customer clauses based on contract requirements * Shelf life, date code, cure date.
Q11	<p>FINAL INSPECTION AND/OR TEST – Final inspection and/or test shall be performed prior to shipment. Final Inspection and testing shall be and in accordance with applicable drawings, product specifications, Purchase Order requirements and or other applicable documentation contained on the applicable purchase order.</p>
Q12	<p>SAMPLING OF CHARACTERISTICS - The supplier shall inspect all design characteristics per Aerospace Sampling Plan located on the Honeywell Aerospace Supplier Portal (SPOC Supporting Documents>SPOC 128-Sampling Plan">HTTPS://supplier.honeywell.com/SPOC Manual>SPOC Supporting Documents>SPOC 128-Sampling Plan).</p>
Q13	<p>GOVERNMENT SOURCE INSPECTION (ASSESSMENT) – Government Source Inspection (GSI) is subject to review for item(s) on this Order. Upon receipt of this Order, the Supplier shall promptly notify the Government Representative who normally services its plant so that appropriate planning for Government Inspection can be accomplished.</p>
Q14	<p>DATE CODE - material and applicable certifications shall be identified with the manufacturer's date code (date of manufacture).</p>
Q15	<p>SHELF LIFE MATERIAL – The supplier shall mark material, space permitting, or if bulk material, the containers of the items of this Order with the shelf life expiration date and/or cure date as applicable. Include on packing list, the temperature at which the product(s) should be stored and maintained. A minimum of seventy-five percent (75%) of shelf life must be remaining on unit at date of shipment.</p>
Q16	<p>HEAT LOT TRACEABILITY - The Supplier shall legibly mark in a permanent manner, each part furnished under this Order with a heat lot code, number traceable to final heat treat, the mill heat lot number, forging heat number and/or casting heat number as applicable (or the CIRCOR assigned heat lot code number). Lots which have permanent Serial Numbers on all parts shall be traceable by Serial Number with correlation to certifications.</p>
Q17	<p>PREVIOUSLY REJECTED ITEMS – Supplier shall note on return shipping documents for items that CIRCOR has previously rejected whether these items have been reworked, replaced or repaired. Failure analysis shall be performed, repairs shall not be performed without prior written approval from CIRCOR.</p>
Q18	<p>NONCONFORMING PRODUCT NOTIFICATION - Supplier shall promptly notify CIRCOR when nonconforming product has been produced prior to and/or after delivery. Formal failure analysis, containment, and root cause with corrective action responses shall be required.</p>
Q19	<p>WELDER CERTIFICATION – Welding shall only be performed by welders certified to the requirements of the welding specification listed on the drawing</p>
Q20	<p>HEAT TREAT CERTIFICATION – A copy of a certification for the heat treatment operation shall accompany each shipment of material. The certification shall contain the following information as a minimum: the company performing the heat treat operation; the furnace number, furnace accuracy (% ±), time at temperature (specify temperature), cooling method and time, results of physical tests to verify hardness and/or tensile, number of pieces checked, number of pieces accepted and rejected. In addition, the Supplier shall identify the heat treat recording chart with the above information and forward the chart or a copy thereof to CIRCOR with the certification.</p>

Q21	<p>FIRST ARTICLE INSPECTION REPORT CASTING – The Supplier, prior to production, shall perform a First Article layout inspection and prepare a First Article Inspection Report listing actual measurements for all cast dimensions. When multi-cavity molds are used, a separate layout and inspection report shall be prepared for a casting from each cavity. The cavities and castings shall be identified for correlation. The report and the first article “Sample Approval” casting shall be forwarded to CIRCOR Inspection for acceptance/disposition. The report shall also contain necessary affidavits and data for radiographic testing, chemical and physical report, Serial Number, casting heat number, and data for any other non-destructive tests performed or required.</p>
Q22	<p>MATERIAL TRACEABILITY AND LOT/BATCH CONTROL - The supplier shall forward with each shipment of material, mill certification of the raw material displaying actual chemical and physical analysis for the raw material used on this order. A separate report shall be forwarded with each heat lot provided. The supplier shall provide and maintain full traceability from raw material throughout the manufacturing process. Certifications must identify applicable serialization, heat/lot/batch numbers, and purchase orders for each shipment.</p>
Q23	<p>MECHANICAL WORKMANSHIP - Mechanical workmanship shall be in accordance with the requirements called out on applicable drawing or specification. For ITT orders, in the event no requirements are specified, EXELIS Specification 107700 or an acceptable supplier equivalent approved by CIRCOR shall be used.</p>
Q24	<p>EYE EXAMINATIONS - Supplier's inspectors who perform final inspection must have color vision and near-vision eye examination every 12 months. A medical professional must perform the eye examinations (eye clinic, occupational health clinic, onsite health clinic, or medical department).</p>
Q25	<p>ESD (FULL COMPLIANCE) – The Supplier shall implement an Electrostatic Discharge Control program that meets the requirements of MIL-STD-1686. Implementation may be audited in accordance with MIL-HDBK-263 (Appendix K) and MIL-STD-129 Marking for Shipment and Storage</p>
Q26	<p>ESD (PARTIAL COMPLIANCE) – The supplier shall comply with MIL-STD-129 Marking for Shipment and Storage and paragraphs 5.1 and 5.3 through 5.10 of MIL-STD-1686.</p>
Q27	<p>ESD PACKAGING - Products susceptible to damage from static electricity shall be packaged in tubes, tape & reel, or containers constructed of waterproof, electrostatic protective, static dissipative material with no talc, or residues that would inhibit solder ability or contaminate leads or finish of product. Connector products shall be protected with static shielding dust caps. When static shielding caps are not available for the product, selection of specific packaging material shall be the responsibility of the supplier providing aforementioned requirements.</p>
Q28	<p>CASTINGS - A radiographic inspection report per PS 21206, PS 23001.1 and PS 23001 (Para. 5.2 and Table 1). (Class 2B castings require only first article foundry control radiography). * Penetrant inspection report per PS 21202 and pre-penetrant etch per PS 12050. * Tensile testing of test bars cast for each casting heat and heat treated with castings. Testing shall be in accordance with the material specification and PS 23001. * Heat treatment and hardness testing report for castings.</p>
Q29	<p>FORGINGS - Ultrasonic inspection report per PS 21211 Class a (for raw forging stock) * Magnetic particle inspection report per PS 21201 Class A. * Hardenability testing report in accordance with the material specification. * Macrostructure and grain size analysis in accordance with material specification. * Grain flow analysis for first article forgings. The report shall include photos of an etched and sectioned forging.</p>
Q30	<p>CUSTOMER APPROVED SUPPLIERS/PROCESSORS REQUIRED - The supplier shall utilize only approved suppliers and/or special processors listed on the customer's ASL.</p>

<p>Q31</p>	<p>BOEING F-15 EXTRUSIONS – The Supplier shall furnish with shipment of material, a report of macrostructure analysis, grain size analysis and hardenability testing in accordance with the material specification. On First Article submission, the Supplier shall forward a report of grain flow analysis with photos of an etched and sectioned sample</p>
<p>Q32</p>	<p>BOEING APPROVED SPECIAL PROCESS SOURCES - When CIRCOR Engineering drawing cites Boeing Process Specification “PS” Document Number then the following requirement shall apply. The supplier and all of its sub-contractors shall use Boeing approved special processors as called out in the Boeing document D1-4426. If the source the supplier plans to use is not listed in the D1-4426, authorization must be obtained from CIRCOR prior to use. Boeing document D1-4426 is at: www.boeing.com/companyoffices/doingbiz/d14426/index.html</p>
<p>Q33</p>	<p>SPECIAL PROCESS CONTROL – Special processes are those yielding products which cannot be evaluated for conformance to requirements through inspection or non-destructive testing. These include welding, plating, heat treating, anodizing, glass or shot peening, printed circuit board fabrication, dry film lubricant application, etc. The Supplier shall, demonstrate a degree of control over these processes to provide assurance that specifications are complied with detailed procedures. Copies of special process procedures and certifications shall be supplied to CIRCOR upon request. If the Supplier uses facilities other than his own, that facility is subject to the same conditions stated herein.</p>
<p>Q34</p>	<p>TENSILE TEST REPORT – Supplier shall furnish with shipment of material, a report of tensile testing of three (3) test bars cast for each casting heat lot and heat treated with the castings. Test bars shall be as described in the material specification and may be cast separately.</p>
<p>Q35</p>	<p>PROHIBITED MATERIALS - Unless otherwise specified on the drawing, the following materials are strictly prohibited in parts or materials ordered by CIRCOR: Pure Tin (>97% Sn), Zinc, Cadmium and pure Beryllium. Use of these materials in base metals, either in pure form or alloyed, are acceptable only provided there is a 100% continuous (non-porous) surface finish of an approved material such as nickel, gold, etc. Assembly solder finish shall be compatible with a tin/lead soldering process. Tin finishes, if used, must contain a minimum of 3 percent alloying elements by volume. Once an item’s solder finish has been approved, any changes in the solder composition from tin/lead finish to lead free solder must be approved by CIRCOR.</p>
<p>Q36</p>	<p>PC BOARD MANUFACTURING - All printed circuit fabricated by the Supplier shall meet the requirements of IPC 6012 Class 3 or IPC 6018 Class3, or requirements specified on the CIRCOR drawing. Acceptability of printed boards shall be in accordance with IPC-A-600.</p>
<p>Q37</p>	<p>SOLDER CERTIFICATION – The Supplier shall furnish with shipment of material, a certification stating that the soldered electrical and electronic assemblies were fabricated and inspected to the applicable requirements of and J-STD-001. Acceptability for electrical/electronic assemblies shall be in accordance with IPC –A–610.</p>
<p>Q38</p>	<p>PRODUCT AND PROCESS CHANGE APPROVAL - Prior to implementing any change to any Process of manufacturing, the supplier shall obtain approval from CIRCOR, on all changes in manufacturing location, product and/or process definitions. Supplier shall notify CIRCOR 90 days prior to any intended changes of location. <u>Review and Approval of Supplier Requested Changes:</u> In order to ensure appropriate change classification, Supplier shall submit to CIRCOR all Product and Product Affected Process Changes for review and/or approval. No changes shall be made to CIRCOR design parts without prior CIRCOR written approval. Where the Supplier has design authority; Supplier shall submit Class 2 changes for concurrence and Class 1 changes for approval. All Product and Product Affected Process Changes shall be submitted to the CIRCOR Buyer for internal distribution. Supplier shall make submissions with sufficient time for CIRCOR concurrence and/or approval, without affecting delivery schedule. CIRCOR shall provide to Supplier written approval for Class 1 changes.</p>

<p>Q39</p>	<p><u>VARIATION MANAGEMENT OF KCs</u> -The following requirements are applicable to Key Characteristics if identified on CIRCOR drawings:</p> <ul style="list-style-type: none"> * Supplier shall develop and maintain a Variation Management Program in accordance with AS9103. * Supplier procedures shall include Process Control procedure (PCP) detailing how key characteristics are manufactured, critical process steps identified, and how variation shall be analyzed, evaluated, and method controlled. Supplier shall submit a PCP to CIRCOR Quality for approval prior to manufacture of parts. * Supplier shall submit to CIRCOR, control charts, histograms and/or other analytical charts. Supplier shall provide evidence of analysis of data and actions taken in response to identified variations, outside of established statistical control limits * Supplier shall flow down to sub tier suppliers the applicable requirements in the purchase order, including key characteristics, when the control; of key characteristics are a requirement of this order.
<p>Q40</p>	<p><u>ACCEPTANCE TEST PROCEDURE (ATP) APPROVAL REQUIRED</u> - The supplier shall submit for approval the test procedure, test characteristics and test set-up to comply with test requirements. Changes to approved procedures require customer approval in writing prior to incorporating change.</p>
<p>Q40a</p>	<p><u>QUALIFICATION TEST PROCEDURE (QTP) APPROVAL REQUIRED</u> - The supplier shall submit for approval the qualification test procedure, test characteristics and test set-up to comply with qualification requirements. The procedure shall be sent to the buyer for review and approval prior to qualification activities.</p>
<p>Q41</p>	<p><u>LM SUPPLIER CORRECTIVE ACTION REQUEST</u> - Seller agrees to provide a formal response to any supplier corrective action request within the timeframe indicated on the SCAR. A SUPPLIER CORRECTIVE ACTION TOOL IS AVAILABLE TO AID YOUR INVESTIGATION AND IS LOCATED AT: HTTPS://EMBASTION.EXTERNAL.LMCO.COM/QIS/SUPPLIER_CA/.</p>
<p>Q42</p>	<p>LMMFC – ORLANDO APPROVED SPECIAL PROCESS SUPPLIERS ARE REQUIRED</p>
<p>Q43</p>	<p><u>FIRST ARTICLE INSPECTION</u> – Supplier shall obtain First Article Approval upon implementation of Q43 on the purchase order. Submissions of FAIRs shall be I.A.W AS-9102 specification, and with the additional requirements of <u>Ballooned Drawings</u>. Delta FAIRs shall be required if CIRCOR authorized changes are implemented after the 1st article has been approved. CIRCOR retains the right to request new FAIR if it is determined the changes in method of production, suppliers and or processes are significant to warrant.</p>
<p>Q44</p>	<p><u>RIGHT OF ACCESS</u> - Authorized representatives of buyer, and its customer, government or FAA when accompanied by Buyers representative, shall have the right to visit the Supplier’s and its subcontractor’s facilities at any time during the performance of this purchase order. These visits are for the purpose of ascertaining progress, making inspections, performing surveillance and witnessing tests. The Buyer shall give prior notification of such visits, to minimize interference with the normal operations of Supplier’s plant. Such visits by CIRCOR and/or its customer do not absolve the Supplier of the responsibility to provide acceptable product. Verification by CIRCOR’s customer does not preclude subsequent rejection by CIRCOR of any nonconforming items.</p>
<p>Q45</p>	<p><u>FOREIGN OBJECT DEBRIS (FOD)</u> - The supplier shall employ appropriate housekeeping practices to assure timely removal of residue/debris generated, if any, during manufacturing operations and/or normal daily tasks. Sellers shall determine if sensitive areas that may have a high probability for introduction of Foreign Objects Debris/Damage should have special emphasis controls in place appropriate for the manufacturing environment.</p>
<p>Q46</p>	<p><u>FOREIGN OBJECT DEBRIS/DAMAGE (FOD PREVENTION)</u> - National Aerospace Standard 412 (Foreign Object Damage/ Foreign Object Debris Prevention) shall apply. Suppliers are required to incorporate the appropriate features of this standard as suited to their particular product or company.</p>
<p>Q47</p>	<p><u>CUSTOMER/GOVERNMENT OWNED PROPERTY</u> - The supplier shall have a system which includes written procedures for control of all tooling, test equipment, and material.</p>

Q48	J STANDARD 002: When implemented the supplier shall be responsible for assuring the training and process control required for providing full certification compliance with all required requirements of J-STD 002.
Q49	PASSIVATION - Prior to passivation treatment, parts that have un-machined surfaces which have been subjected to any high temperature process such as, casting, forging, heat treating, or welding etc. must be mechanically descaled in accordance with ASTM A380, section 5.3 thru 5.3.4 to remove discoloration, oxidation and scaling. CIRCOR prefers the abrasive vapor blasting process with all close tolerance, holes, threads, machined diameters and surfaces masked to prevent impacting and or damage. Supplier shall flow down to sub-tier suppliers the applicable requirements in the purchase order, including special cleaning instructions.
Q50	NADCAP SUPPLIERS - Supplier shall use NADCAP approved suppliers for special processes. Suppliers that are not NADCAP approved must be submitted to CIRCOR for approval prior to performing any of the required processes.
Q51	DOMESTIC SPECIALTY METALS - If a U.S. Government Contract number is called out on the face of the purchase order, the supplier shall only use raw materials that are IAW DFAR Clause 252.225-7014, "Preference for Domestic Specialty Metals, Alt 1." Metals must have been melted in the United States, its outlying areas, or a qualifying country listed in DFARS 225.872-1. These instructions must be flowed down to all sub-tier suppliers. Compliance certification shall be made available to CIRCOR upon request.
Q52	SUPPLIERS RECORD RETENTION - The supplier is responsible to maintain all inspection records of products being delivered to CIRCOR Corp. This includes travelers, material and plating certifications, electrical test data. Records shall be kept for (7) seven years from shipment of product. This information shall be made available to CIRCOR Corp upon request.
Q53	SUPPLIERS RECORD RETENTION - The supplier is responsible to maintain all inspection records of products being delivered to CIRCOR Corp. This includes travelers, material and plating certifications, electrical test data. Records shall be kept for (10) Ten years from shipment of product. This information shall be made available to CIRCOR Corp upon request.
Q54	SUPPLIERS RECORD RETENTION - The supplier is responsible to maintain all inspection records of products being delivered to CIRCOR Corp. This includes travelers, material and plating certifications, electrical test data. Records shall be kept indefinitely. This information shall be made available to CIRCOR Corp upon request.
Q55	SUPPLIER SUB-TIER CONTROL - The Supplier is responsible for insuring all items produced from its subcontractors conform to all requirements of the purchase order. Supplier shall ensure all applicable provisions of this document are flowed down to its subcontractors, including the use of AS9102 for first article inspection.
Q56	NONDESTRUCTIVE TEST (NDT) REPORT - Unless otherwise specified by the purchase order, drawing or specification, NDT shall be performed on 100% of the lot of products. With each delivery of products on the order, the supplier shall furnish a certified test and/or inspection report that shows the required NDT (i.e. radiographic, ultrasonic, magnetic particle, penetrant, etc.) test was performed on all delivered products. The certification shall be issued by the organization that actually performed the NDT and include: CIRCOR order number, applicable NDT specification, heat lot number, number of parts tested, accepted, rejected, the reason for rejection, the tester's/Inspector's name, certification level, date of expiration of certification, and date of inspection.

Q57	<u>PRESERVATION, & PACKAGING REQUIREMENTS</u> - Unless otherwise stated on the PO/contract, the items on this order shall be marked, packed, packaged and preserved to assure adequate protection from deterioration and physical damage due to material handling or shipment. Marking shall be legible and the material shall be free of nicks, dents, gouges, scratches and undue oxidation. Parts subject to oxidation shall be packaged with a suitable preservation or an oxidation inhibiting paper such as non-rust paper. Springs shall be packaged to preclude entanglement. When required by the purchase order and/or referenced documents, the supplier shall utilize customer specified bar code labels and pack and package supplies to specific packing and packaging specifications.
Q58	<u>HONEYWELL MARKING</u> - Marking shall be in accordance with drawing requirements. If there are no requirements on the drawing, marking shall be in accordance with AS478 Method 30, 35, or 37. Refer to Honeywell SPOC 200 for specific marking requirements for separate Honeywell site requirements.
Q59	<u>ELECTRONIC PART DEFINITION (SOLID MODEL)</u> - Applicable when using Honeywell-supplied EDP databases to manufacture and inspect hardware procured directly from Honeywell or indirectly through sub-tier supplier.
Q60	<u>FAA CONFORMITY</u> - FAA conformity inspection is required for parts under this purchase order.
Q61	<u>SPECIAL PROCESS CONTROL</u> – Special processes are those yielding products which cannot be evaluated for conformance to requirements through inspection or non-destructive testing. These include welding, plating, heat treating, anodizing, glass or shot peening, printed circuit board fabrication, dry film lubricant application, etc. The Supplier shall, as a minimum, demonstrate a degree of control over these processes to provide assurance that specifications are complied with. As applicable, the Supplier shall provide adequate training for personnel, certifications where required and destructive testing of samples and detailed procedures (AND BE CUSTOMER APPROVED WHEN APPLICABLE). Upon request, copies of special process procedures and certifications shall be supplied to CIRCOR. If the Supplier uses facilities other than his own, that facility is subject to the same conditions stated herein. All certifications supplied as objective evidence must indicate the name and location of the facility performing each special process.
Q62	<u>MIL-STD-883 SCREENING RESULTS</u> - The Supplier’s Screening Results data shall show compliance with Method 5004.11 of MIL-STD -883. The name and location of the facility at which the screening was performed shall be listed on the summary data sheet.
Q63	<u>CRITICAL DESIGNATED PARTS</u> - Parts designated or described as Fracture Critical, Fracture Critical Traceable, Fatigue Critical, Durability Critical, Maintenance Critical, Safety Critical, require submittal of the manufacturing plan prior to production.
Q64	<u>MATERIAL SAFETY DATA SHEETS (MSDS)</u> – The supplier shall submit MSDS with all products when this requirement is identified on the Purchase Order.
Q65	<u>SOFTWARE QUALITY ASSURANCE</u> - Supplier and sub-tiers shall comply with the appropriate version of RTCA-DO-178, "Software considerations in Airborne Systems and Equipment Certification", and DOD-STD-2168.
Q66	<u>REQUIREMENT FOR TEST CIRCUITRY FOR PRINTED WIRING BOARDS AND CERTIFICATION OF TESTING AND FABRICATION</u> - The Supplier shall furnish with shipment of material: (a) Serialized coupons. A sample board may be substituted for coupons when the CIRCOR supplied artwork does not provide for coupon circuitry. (b) Certification that the boards have been: <ul style="list-style-type: none"> • Manufactured to IPC Class III (Latest Revision) • Electrically tested (Type III boards only) • All boards have been vendor coded. NOTE: IPC Class III sample requirements shall be based on a Lot by Lot base. 100% is not required as

	indicated in IPC for Class III.
Q67	MRB AUTHORITY - Unless otherwise specified in this purchase order, the contractor and/or any of their suppliers/subcontractors does <u>not</u> have authority to process “USE AS IS”, “Repair”, “Standard Repair Procedures” (SRPS or non SRPS) via their Material Review Board (MRB). These dispositions, as well as deviations and request for waivers, requiring MRB disposition shall be submitted to CIRCOR Aerospace for approval. (This does not include rework or scrap) utilize its for approval. The supplier / subcontractor shall utilize its appropriate nonconforming material disposition form and submit it to the buyer of record for customer approval.
Q68	CALIBRATION SYSTEM REQUIREMENTS - The Supplier shall maintain a calibration system in accordance with the requirements of ISO9000, AS9000, or Mil-STD-45662. NOTE: CIRCOR shall be notified immediately upon determination of a condition where tools and gages which have been used for final acceptance are found to be out of calibration by an amount greater than twenty percent. Distributors are responsible for assuring that material supplied by them was procured from a manufacturer who maintains an inspection and calibration system as described above.
Q69	LOCKHEED MFC SUB-TIER RISK ASSESSMENT SURVEY - Seller will be provided survey form and instructions from LM MFC procurement representative. Seller shall complete survey form, which includes the sub-tier supplier responses, shall be returned to the LM MFC procurement representative within 30 days of form completion.
Q70	LOCKHEED MFC SPECIFICATION REV LEVEL - For Lockheed part numbers that reference military, industrial, and commercial standard processes, sellers shall use the latest revision at time of the PO unless otherwise stated in the PO. Single process initiative (SPI)
Q71	LOCKHEED MFC COMMON PROCESSES REVISION STATUS - When the specifications beginning with: 799, 79C, 79E, 79M, 79P and 79T, are applicable to the drawing shall use the latest revision at the time of the PO, unless otherwise stated.
Q72	LOCKHEED PROCURE TO PAY SHIP TO - ELECTRONIC - Submission of quality data required. This purchase order contains requirements for the seller to submit and certify quality data electronically using ship to via EXOSTAR prior to shipment. LM PROCURE TO PAY SHIP TO MODULE TRAINING IS AVAILABLE AT: http://www.myexostar.com/myexostarAll.aspx?id=1362
Q73	LOCKHEED IDENTIFICATION OF THE MANUFACTURER - The cage code of the manufacturer of the product supplied shall be recorded on the packing list and/or on the smallest unit container and/or the outer shipping container. If the cage code is not available then the name and address of the manufacturer shall be provided.
Q74	ITT/EXELIS CAGE CODE MARKING - Mark “CDA 82340” under “00752” on items that requires “00752” marking. Reference EXELIS Specification 980024 for details.
Q75	UNIQUE IDENTIFICATION (UID) MARKING REQUIREMENTS – UID marking shall be per MIL-STD-130. The UID marking shall have a passing grade when verified per ISO/IEC 15415. Sampling of the verification of the UID marking requirements shall be per ANSI/ASQC Z1.4. The first and last UID marking on labels of the lot shall be part of the samples that are verified. A verification report (quality and syntax validation) of the samples shall be included with each shipment.
Q76	TOOLING CONTROL – The supplier shall establish and maintain a system to ensure that all tooling used for manufacturing and acceptance is inspected, protected, and otherwise controlled according to specific conditions surrounding their use. Manufacturing tools, gauges, jigs, and fixtures used for acceptance shall be checked for accuracy prior to initial use and at intervals thereafter, not to exceed 12 months, to ensure continued accuracy. The supplier shall maintain records of the inspection results, available to the buyer upon request. Tooling shall be identified to indicate the date when re-inspection is to be accomplished. The supplier shall report to the contractor any contractor-furnished property found

	damaged, deteriorated, or otherwise unsuitable for use.
Q77	BLANK
Q78	BLANK
Q79	BLANK
Q80	Passivation: Parts shall be passivated after machining and NDT Testing (FPI, LPI, RT), is performed. Unless otherwise stated or advised, passivation shall be the final procedure perform on the product. Certification for the Process shall be provided for each processed lot. AMS-2700 Passivation shall be performed by a accredited NADCAP Supplier.
Q81	Statement of Work: When implemented into the contract/PO, the SOW shall be identified with a controlling number. This SOW shall take precedence over drawings and specification. Objective evidence shall be provided
Q82	Serialization: When implemented the supplier shall provide serialization to each part produced per line item of the purchase order. Unless provided by CIRCOR, the supplier shall use and maintain a log of these serialized numbers so as to ensure they are used only once. Supplier shall at the completion of the PO, provide a copy of the log sheet with the final shipment of product.
Q83	Preproduction Lot Testing (PLT): The supplier shall provide a preproduction lot (Qty to be determined by the PO) prior to the production run of the lot, to CIRCOR Quality for approval. The PLT shall be provided with full process certification (HT, Finish, ect.) and traceability of all raw material used in the production. Parts manufactured without approval shall be the full responsibility of the supplier, unless otherwise agreed to by CIRCOR Aerospace Inc. NY.
Q84	Process Control Plan (PCP): When implemented in the PO/Contract, the supplier shall provide a full Process Control Plan to CIRCOR Quality Management for approval prior to manufacturing. CIRCOR Quality Management shall review/approve all PCP in a timely manner. Once approved CIRCOR Quality shall sign and forward back the PCP to the supplier. The supplier shall not deviate from the approved PCP with out authority from CIRCOR Quality Management.
Q85	100% Actual Attribute Data: When implemented in the Purchase Order or Contract, the supplier shall perform 100% inspection on all detail characters and notations listed and or captured on all drawings required for compliance with the PO. Recording of this data shall be performed on the suppliers Final Inspection Format and provided with each shipment to CIRCOR.
Q86	BLANK
Q87	BLANK
Q88	FASTENER MATERIAL CERTIFICATION: For non-electrical standard parts such as procurement of ASTM, ASME, SAE, MS, AN, or NAS specified product, (bolts, nuts, screws, washers, rivets, pins, springs, O-rings etc.), certifications shall be provided attesting that materials, processes (including applicable inspection processes), and finished items were controlled and tested in accordance with the requirements of the contract and applicable specifications. Such records shall be kept on file and be available for review upon request. The certification shall identify the original manufacturers and their lot numbers for each lot in the shipment. Multiple lots within a shipment shall be kept separate and clearly identified as to the original manufacturers and their lot numbers. Seller shall include a copy of the certification with the packing sheet for each shipment.
Q89	CERTIFIED OPERATOR/INSPECTOR – Operators performing Verification and Inspection processes, shall be trained and certified specifically to their area of performance. The requirements for acceptance shall be i.a.w. specification, drawing, Purchase Order, and or customer's requirements.

Q90	ELECTRICAL WORKMANSHIP - Electrical workmanship shall be in accordance with the requirements called out on applicable drawing or specification. In the event no requirements are specified, CIRCOR Specification XXXXXXXX or an acceptable supplier equivalent approved by CIRCOR shall be used.
Q91	BLANK
Q92	CATALOG INFORMATION - The Supplier shall furnish with shipment of material, a copy of the catalog specification sheets which describes, as applicable, the material requirements, envelope and interface dimensions and any operating characteristics necessary to inspect the item(s) at CIRCOR Receiving Inspection Department.
Q93	BLANK
Q94	BLANK
Q95	SOFTWARE CONTROL -If Software is used to control the manufacture, inspection or test of supplied product, the supplier shall maintain a program for the positive control over the configuration status, validation, and program integrity of the software. This shall include, but not be limited to, the control of models, NC programs, test programs, inspection software, and software delivered in product.
Q96	ROHS CERTIFICATION COMPLIANCE - When specified on the drawing and or purchase order, the supplier shall ensure all supplied material and processes used in the manufacturing and processing of the purchased item shall be RoHs compliant parts meeting requirements specified in the European
Q97	ITAR REGULATIONS AND COMPLIANCE - The supplier, and their sub-tier supplier as applicable, shall comply with all export-import controls laws and regulations including, but limited to, the U.S. Export Administration Regulations (EAR) and the U.S. International Traffic in Arms Regulation (ITAR) to the extent applicable to the Supplier and CIRCOR respective activities under the Purchase Order.
Q98	SUPPLIER CHARGE BACK - CIRCOR reserves the right to charge back suppliers for recovery costs associated with any/all supplier's responsibility of non-conforming parts/material and or service, along with any effected parts, caused by suppliers non-conforming material, parts and or service. Such charges will include: 1) \$300.00 (USD) CIRCOR retains the right to charge any supplier, administrative charges for each non-conforming product and or services provided and delivered by a CIRCOR Supplier. 2) \$100.00 (USD) CIRCOR retains the right to charge any supplier, administrative charges for each Corrective Action Issued due to non-conforming product and or services. 3) Rework Charge Back: a) Product and or Services paid for shall be charged back (USD) for each part requiring rework by CIRCOR Personnel, (amount as determined by actual rework cost), will be charged back to supplier. b) Product and or Services that is unpaid for requiring rework shall require supplier approval prior to the start of any rework, (amount as determined by actual rework cost). 4) Product, material and or services, deemed non-conforming / non-reworkable by CIRCOR, shall be returned to the supplier(RTV) at no charge to CIRCOR.
Q99	SUPPLIER REQUIREMENT FLOWDOWN - The seller shall have systems and methods to assure full compliance to all Quality Purchase Order (PO) notes and requirements applicable to this PO. When products or services applicable to this PO are procured by the seller from sub-tier suppliers, the seller shall flow the Quality PO note requirements and all other requirements, as necessary, to assure full compliance is achieved.
Q100	Manufacturing Location Change - In the event the Supplier is planning to change location of manufacturing of an already approved or provided item and or service. They shall notify CIRCOR at least six (6) months prior to the actual move, and also provide CIRCOR the opportunity to implement a stock security buy. Based on the criticality of the item provided, CIRCOR reserves the right to implement Re-Qualification Process of the item and or services provided.