



Continental Disc Corporation
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SUPPLIER QUALITY ASSURANCE REQUIREMENTS

The following supplier quality assurance requirements, referenced by number on the Purchase Order, are an integral part of each order placed by Continental Disc Corporation. Compliance with these requirements is a condition for product or material acceptance. Additional requirements may be identified in the text of the Purchase Order.

1.0 GENERAL REQUIREMENTS (applicable to all purchases)

- 1.1 Purchased products or materials shall be in compliance with all referenced specifications, drawings or special instructions. Any nonconformance must be reported to the Purchaser's Material Review Board for disposition, prior to shipment.
- 1.2 All certifications and documents shall be legible and reproducible and shall accompany the shipment. Certifications and documents shall be packaged with the shipment such that they are not lost or damaged in transit. Additionally, soft copies of all certifications and documents may be emailed to the Purchaser at the time of shipment.
- 1.3 No work shall be subcontracted to sub-tier suppliers without prior written approval of the Purchaser. Should such approval be granted, all quality requirements shall flow down to any approved sub-tier supplier.
- 1.4 Suppliers shall allow access to their facilities by the purchaser, the purchaser's customer, or regulatory organizations for on-site quality surveys or source inspections. (See CDC Purchase Order Terms and Conditions, form GEF-CPO-1001). These requirements and any advance notification deadlines shall be incorporated in the text of the purchase order. As required, all applicable customer purchase order documents shall be available to the customer source inspector at the supplier's facility. Acceptance at source by the purchaser or purchaser's customer does not preclude product from being rejected at later inspection points.
- 1.5 No weld repair shall be performed without prior written approval of the Purchaser. No weld repair is permissible after heat treat processes.
- 1.6 Materials or product of multiple heat numbers shall be segregated and identified by a legible heat number.
- 1.7 A First Article Inspection (FAI) Report (FAIR) shall accompany Non-COTS¹ product. The FAIR shall be completed on one piece taken randomly from the first production run after lot acceptance by the Seller's Inspection Department and shall include all measurable drawing requirements, including notes from.

FAI shall be provided in the following circumstances:
 - First time produced – Full² FAI required;
 - Process Change (including facility location change) – Full² FAI required;
 - Revisions to the Purchaser's drawings – only a Delta³ FAI is required;
 - A two-year break in production – Full² FAI required;Note: Marked part and FAIR to accompany the shipment.
- 1.8 Supplier shall notify the Purchaser of changes to; company location, senior, or quality management. As well as changes to; equipment, processes, or quality system that may impact product quality.
- 1.9 Suppliers shall engage in ethical behavior in all business practices and processes.
- 1.10 Continental Disc prohibits the use of child labor.
- 1.11 All material to be radiation free.

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- 1.12 Supplier shall maintain records of all inspection and tests for a minimum of 10 years or as required on the CDC Purchase Order. These records shall be available to Continental Disc and/or Regulatory Agencies upon request and shall include but are not limited to: Receiving Inspection, First Article Inspection, In-Process and Final Inspection results, Traceability and Serialization, Calibrations, Material Test Reports, test data, and any other applicable inspection documents.
- 1.13 Supplier shall implement and control the processes necessary to assure product safety including: assessment of hazards and management of associated risks, management of safety critical items, analysis and reporting of occurred events affecting safety, and communication of these events and training of personnel.
- 1.14 Supplier shall ensure any purchased item that may contain conflict minerals (Tin, Tantalum, Tungsten, Gold) supplied to Purchaser shall be in compliance with the Dodd Frank Act Conflict Minerals requirements.

2.0 INSPECTION AND REPORTING (applicable when referenced in the P.O.)

- 2.1 First Article Inspection (FAI) compliant with AS9102 is required. Marked part and inspection report to be submitted with the shipment. (QCF-1003-2)
- 2.2 Source inspection by the Purchaser or Purchasers' customer is required. Advise purchaser 72 hours prior to parts being available for inspection.
- 2.3 A Certificate of Conformance (C of C) shall be provided by the supplier attesting that the item(s) shipped are in compliance with all purchase order and applicable specification requirements. The C of C must be signed by the Seller's authorized Representative.

The following minimum information shall appear on the C of C:

- Purchaser's Purchase Order and line item number;
- Quantity shipped;
- Item part number or raw material specification;
- Processing specification (as applicable);
- Drawing number and revision (as applicable);
- Item serial number (as applicable).
- Batch and/or Cure Date (as applicable)
- State the manufacturers trademark name when trademarked material is specified on the PO

3.0 MATERIAL TEST REPORTS (applicable when referenced in the P.O.)

- 3.1 Furnish certified material test reports (chemical and mechanical) with country of melt from producing mill or processor.
- 3.2 Material Test Report to be marked as an EN 10204, 3.1 or 3.2 Inspection Certificate
 - A. 3.1 inspection certificate is required for either of the following quality systems.
 - i. The material manufacturer has an approved quality system and a PED certificate.
 - ii. The material manufacturer has an ISO quality assurance system of at least EN ISO 9001 type, certified by a competent body established as a legal entity within the European community, and when the scope of the certification includes relevant material types.
 - B. If vendors do not meet the requirements outlined in bullet A, then the vendor must provide a signed 3.2 inspection certificate as provided by Continental Disc Corporation for each Purchase Order (GQCF 1003-3). Direct inspection of material testing and results is required by the company's delegated inspector, prior to shipment.
 - C. It is acceptable to transfer test results from a material test report to a 3.1 or 3.2 inspection document as long as the results are not modified or changed.

- 3.3 Hardness in BHN shall be included on Material Test Report.
- 3.4 NACE hardness requirements shall be per MP-7002, Paragraph 4.3.3 and Appendix B.
- 3.5 Carbon Steel main pressure bearing components: Charpy Impact testing required per ASTM A370 or ASTM E23. Impact testing shall be performed at -20°F (-28.9°C). Bending rupture energy shall be no less than 27 Joules (20 ft lbs). Results can be recorded on the MTR or in a separate impact test certificate.
- 3.6 Carbon Steel main pressure bearing components: Tensile results for elongation shall be no less than 14% when carried out by a standard procedure.

4.0 CLEANING, HANDLING AND PACKAGING (applicable to all purchases)

- 4.1 All product and material shall be suitably processed, packed and protected to prevent damage during handling and shipment.
- 4.2 All machined parts shall be free of chips, machining fluid, dirt or grease.
- 4.3 Carbon steel machined parts shall be protected with a light coating of anti-rust oil (Mobilarma 245, Castrol Rustilo DWX32, DW904 or DW902, Ensis DW 1255, Iaconol Rust Stop, or WD 40)
- 4.4 Threaded, machined, or polished surfaces must be protected from scratches, nicks or dents, during production and while in transit.
- 4.5 Parts furnished by Purchaser for special processing must be inspected upon receipt for surface damage. Supplier shall advise Purchaser of any damage, prior to performing work.
- 4.6 For components with flatness requirements, the components shall be packaged such that tolerances are not compromised in transit.

5.0 STEEL CASTINGS (applicable to all castings)

5.1 First Articles of all steel castings:

- A. Liquid Dye Penetrant Testing is required on 100% of Machined surfaces. Penetrant testing shall be conducted by qualified personnel per ASME BPVC.V SE 165, Standard Practice for Liquid Penetrant Examination.
 - i. Machined Surface acceptance criteria is per ASTM A903 Level II.
- B. Radiography will be conducted on first run molds or as required by purchase order per ASME BPVC.V and ASTM E94:
 - i. Acceptance criteria per ASTM E446, and MIL-STD-2175, Class 4, Grade B.
 - ii. Supplier shall provide RT report and films with order.

5.2 Production steel castings:

- A. Weld repair is not permitted without written approval from Continental Disc Corporation Engineering.
- B. Weld repair shall be performed using weld procedures qualified in accordance with ASME Section VIII, AWS D17.1, or applicable ISO welding standard.
- C. Weld repair shall only be performed by welders and weld operators qualified in accordance with ASME Section VIII, AWS D17.1, or applicable ISO welding standard.
- D. Welding consumables shall conform to the manufacturers specification and the supplier shall have a written procedure for storage and control of welding consumables.
- E. Weld repair shall be documented.

6.0 ALUMINUM CASTINGS

6.1 First Articles of all Aluminum Castings:

- A. Liquid Dye Penetrant Testing is required on 100% of Machined and Cast surfaces. Penetrant testing shall be completed by qualified personnel per ASTM E165.
- i. Machined Surface acceptance criteria is per ASTM A903 Level II.
 - ii. Cast Surface acceptance criteria is per ASTM A903 Level IV (equivalent to ASME B16.34 appendix III)
- B. Radiography will be conducted per ASTM E94 on critical sections of the castings defined in GQCI-5004 as areas with abrupt changes in section.

6.2 Production Aluminum Castings

- A. Aluminum castings shall comply with the acceptance criteria in the following reference documents for the applicable type of casting process:
- GGEP-9407 “Acceptance Criteria for Aluminum Sand Castings”.
 - CGEP-9408 “Acceptance Criteria for Aluminum Die Cast Castings”.

7.0 NUCLEAR SAFETY RELATED MATERIAL (applicable when referenced in the P.O.)

7.1 The provisions of 10 CFR 21 applies.

7.2 Purchased items shall be in compliance with all referenced specifications, drawings or special instructions. Any non-conformance must be reported to the Purchaser’s Material Review Board for disposition, prior to shipment.

7.3 Certified Material Test reports and/or Certificate of Conformance in accordance with the requirements of the ASME Code section, year of issue, and addenda cited on the purchase order. Documentation shall include:

- Material manufacturer's certified material test reports.
- Statement of conformance to ASME material requirements, supplier's authorization stamp, and expiration date on each Certified Material Test Report.

8.0 SPECIAL WORKMANSHIP STANDARDS (applicable when referenced in the P.O.)

8.1 All material shall be suitably processed, packed, and protected to prevent damage during processing and shipment to maintain workmanship standards in accordance with Aerospace and defense standards and GEP-9404.

8.2 All product and material shall be suitably processed, packed and protected to prevent damage during processing and shipment to maintain workmanship standards in accordance with GEP-9405.

9.0 KEY CHARACTERISTICS

9.1 The supplier shall measure, control and report manufacturing data on the variation of Key Characteristics as defined in the Process Control Document (PCD).

9.2 Key characteristics will be identified on company drawings with the (K) symbol and the process for measuring variation will be specified in a Process Control Document.

- 9.3 The company shall provide the supplier a revision controlled PCD with the purchase order. The PCD at a minimum defines the part number, key characteristic and method of measuring and monitoring the variation of the Key Characteristic.
- 9.4 The supplier is responsible for providing the company with the graphical representation of the process variation as defined in the Process Control Document. For example, an X Bar and R chart may be specified and therefore supplied with each shipment. Soft copies of the data are required.
- 9.5 In no way does the inclusion of Key Characteristics absolve the supplier of the responsibility to comply with all drawing dimensions, notes and requirements.

10.0 COUNTERFEIT/SUSPECT PARTS

- 10.1 The supplier shall not use or supply counterfeit/suspect parts identified as a copy or substitute part whose material, performance, or characteristics are knowingly misrepresented.
- 10.2 The supplier shall purchase only new and authentic materials used to manufacture products or goods delivered to Continental Disc Corporation. The products/goods delivered shall not contain any Counterfeit Parts. The supplier shall only purchase authentic parts/components directly from the OEMs or through OEM's authorized or franchised distribution chain. The supplier shall not purchase parts/components from independent distributors unless it has prior written approval by CDC.
- 10.3 Any supplied material/product identified as counterfeit shall be quarantined and supplier shall be responsible for all costs associated in the resolution of the issue including replacement of material/product and disposal of suspect parts.

¹ Commercial Off-The-Shelf (COTS) product – Non-customized, ready-made, commercial products sold in substantial quantities in the commercial marketplace, and is available for sale to the general public.

² Full FAI – First article inspection that requires documenting all measured characteristics including drawing notes, includes supporting documentation down to the component level, and includes (C of C, Material Test Certifications, and Testing documentation).

³Delta FAI (or Partial FAI) – A partial re-accomplishment of or amendment of the previous Full FAI that address only the difference between the current CDC engineering drawing revision and the prior revision configuration

QCF-1003-1 REVISION CONTROL

Rev.	Description	Date	Approved
B	Revisions to all sections. See archive for revisions.	03-28-2012	Todd Hawkins
C	Revised formatting and updating some nomenclature.	06-15-2012	Todd Hawkins
D	Changed formatting. Added paragraph 1.7 and 4.5, and moved paragraphs on GEP-9404 and GEP-9405 to Section 6.0.	08-17-2012	Todd Hawkins
E	See archive for revisions.	10-09-2012	Todd Hawkins
F	See archive for revisions. Added requirements for Groth and GCMPL.	12-21-2012	Todd Hawkins
G	Updated 7.2 to correct ASTM A903 reference and call out the acceptance level. Added 3.2 inspection certificate requirement	8/23/2013	Shane Bacon
H	Added 7.5 requirement for acid pickling, added 3.4 requirement for NACE hardness. Changed para 3.2.B to capture direct inspection process, changed 9.1 and 9.2	8/27/14	Shane Bacon
I	Added 1.4 and 9.4 paragraphs.	12/31/2014	Shane Bacon
J	Added paragraph 9.5 and trademark requirement in section 2.4	4/27/2015	Shane Bacon
K	Added requirement 3.5 and 3.6, impact testing for carbon steel. Revised 9.1 to require LP before pneumatic testing. Added requirement 9.6	6/26/15	Shane Bacon
L	Added 7.6 referencing GGEP-9407. Revised 9.6 from 10 minutes to 5 minutes. Added section 10.0.	07-9-2016	Shane Bacon
M	Removed all references and requirements for Groth and GCMPL. Each site will have their own SQAR form. Added Counterfeit Parts section.	06-05-2017	Darren Heyka
N	Added Section on Aluminum Castings	06/16/2017	Darren Heyka
O	Added Reference to GGEP-9408 in Section 6	10/2/2017	Darren Heyka
P	Added in Section 1: document retention, product safety, and conflict minerals requirements and in Section 10 additional requirement for counterfeit parts.	12/15/2017	Darren Heyka

ACKNOWLEDGEMENT

Department:	Name:	Signature:	Date:
Supply Chain	Tom Buehe	Tom Bueche	12/27/2017