

PCC Structural
Groton Division

Groton Quality Procedures
Purchasing
GQP 4.6-1

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Appendix 1

Guidelines for (SQAR) Selection

PROCURED MATERIAL OR SERVICE	THE FOLLOWING SQAR PARAGRAPHS APPLY.
ALLOY MATERIAL	1, 2, 3, 4, 5, 6, 7A, 10,11, 13, 13B ⁽⁴⁾ , 13D, 13E, 14, 17, 18, 23, 32A, 32B, 32C, 32D, 33, 35, 37, 38, 40, 51,
CALIBRATIONS	1, 2, 3, 10, 11, 13, 14, 17, 18, 23, 32, 32D, 33, 37, 37.C.4, 38B ⁽³⁾ , 39, 40, 41, 51,
CHEMICAL TESTING	1, 2, 3, 4, 6, 7, 8, 11, 12, 13A-13F, 14, 16, 17, 18, 24, 26, 30, 31, 32, 33, 37A-C (1-4), 38, 38A, 39, 40, 43, 45, 47, 51
ESA/VSE PROCESS	1, 2, 3, 10, 11, 13 ⁽¹⁾ , 14,16, 17, 18, 23, 31 ⁽¹⁾ , 32, 32D, 33, 34, 35, 37, 37.C.4, 38, 40, 42, 51,
ESA/VSE TESTING, LAB SERVICE	1, 2, 3, 6 ⁽¹⁾ , 7 ⁽¹⁾ , 10, 11, 13 ⁽¹⁾ , 14, 16, 17, 18, 23, 25 ⁽¹⁾ , 26 ⁽¹⁾ , 29 ⁽¹⁾ , 31 ⁽¹⁾ , 32, 32D, 33, 34, 35, 37, 37.C.4, 38, 38B ⁽³⁾ , 40, 42, 51,
HEAT TREAT	1, 2, 3, 10, 11, 13 ⁽¹⁾ , 13A, 14, 16, 17, 18, 23, 25, 30, 32A, 32B, 32C, 32D, 33, 35, 37, 37.C.4, 38, 38B ⁽³⁾ , 40, 42, 51,
HIP * ITAR CONTROLLED <u>(1 HIP process allowed. PCC Eng.& Quality must disposition any request for additional HIP cycles)</u>	1, 2, 3, 10, 11, 13 ⁽¹⁾ , 13A, 14, 16, 17, 18, 23, 25, 30, 32A, 32B, 32C, 32D, 33, 35, 37, 37.C.4, 38, 38B ⁽³⁾ , 40, 42, 51,
INDUSTRIAL GAS	Identified in applicable Material Specification 10,
KAWOOL	1, 2, 3, 4, 5, 6, 10, 11, 13C-13F, 16, 17, 18, 24, 29, 32, 33, 37A-C (1-4), 39, 40, 47, 50, 51
MACHINING	1, 2, 3, 10, 11, 13,14, 16, 17, 18, 20, 23, 32C, 32D,33, 37, 37.C.4, 38, 38A, 38B ⁽³⁾ , 40, 42, 44, 51,
NDT	1, 2, 3, 4, 10,11, 13, 13 ^(B) ,14, 17, 18, 23, 26 ⁽²⁾ , 32A, 32C, 32D,33, 37, 37.C.4, 38, 38B ⁽³⁾ , 40, 42, 44, 51,
PROCESS MATERIALS	1, 2, 3, 4, 5, 6, 9, 10, 11, 12 ⁽¹⁾ , 13 ⁽¹⁾ , 13A ⁽¹⁾ , 13B ⁽¹⁾ , 14 ⁽¹⁾ , 14A;14B;14C;14D;14E; 16, 17, 18, 23, 32A, 32B, 32C, 32D, 33, 35, 37, 37.C.4, 38, 40, 51,
PROCURED/CALIBRATED MEASURING DEVICES, WHITE LIGHT INSPECTION, AND CMM INSPECTION	1, 2, 3, 10, 13,14, 17, 18, 23, 32A, 37A, 37B, 37C, 37.C.4, 38, 38B ⁽³⁾ , 39, 40, 41, 51,
SHELL COMPONENTS	1, 2, 3, 4, 5, 6, 9, 10, 11, 13C-13F, 16, 17, 18, 24, 26, 29, 32, 33, 37A-C (1-4), 39, 40, 47, 50, 51
SURFACE TREATMENT	1, 2, 3, 4, 10, 11, 13 ⁽¹⁾ , 13A ⁽¹⁾ , 14, 16, 17, 18, 23, 28, 29, 30, 32A, 32B, 32C, 32D, 33, 35, 37, 37.C.4, 38, 38B ⁽³⁾ , 40, 42, 51,
TENSILE TESTING	1, 2, 3, 4, 6, 7, 11, 12, 13A-13F, 14, 16, 17, 18, 24, 26, 30, 31, 32, 33, 37A-C (1-4), 38, 38A, 39, 40, 43, 45, 47, 51
VALUE ADDED MACHINING	1, 2, 3, 4, 10,11,13A, 13B ⁽⁴⁾ , 13C, 14, 16, 17, 18, 20, 23, 32C, 32D, 33, 35, 37A ⁽¹⁾ , 37B ⁽¹⁾ , 37C ⁽¹⁾ , 37.C.4, 38, 38A ⁽¹⁾ , 38B ⁽³⁾ , 40, 42 44, 45, 46, 47, 48, 49, 50, 51
WAX	1, 2, 3, 4, 5, 6, 9, 11, 13C-13F, 16, 17, 18, 24, 29, 32, 33, 37A-C (1-4), 39, 40, 47, 50, 51
WELD ROD	1, 2, 3, 4, 7A, 10, 11, 13, 14, 15,17, 18, 23, 32A, 32B, 32C, 32D, 33, 37, 37.C.4, 38, 38B ⁽³⁾ , 40, 51,

(1) When applicable (2) Requisitioner must specify details (3) Applies to nuclear products (4) Applies for PW4000 & major rotating hardware

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Appendix 2

**Supplier Quality Assurance Requirements (SQAR)
Revision V**

*NOTE: SQAR, when referenced on the face of the Purchase Order, is an integral part of the Order. Failure by the Supplier to conform to the applicable SQAR requirement(s) listed on the Purchase Order shall be cause for rejection and return of articles at the Supplier's risk and expense. **Through acceptance of a purchase order, the supplier is acknowledging the requirements of the SQAR.***

QUALITY SYSTEMS

1. The supplier shall maintain a Quality System in compliance to the requirements of ISO 9001, AS9100, ISO 17025 or equivalent.
 - 1.1 The supplier shall maintain quality records as required by the purchase order and section 13 A, B, or C below in accordance with the applicable sections of the latest revision of PCC Structurals, Groton Division GQP 4.16-1. All Quality Records that are created by and/or retained by the supplier shall be available for review by PCC Structurals, Groton Division, its customers, and/or Regulatory Authorities upon request.
 - 1.2 Outside service suppliers (i.e. materials testing, welding, heat treating, NDT, etc.) must hold certification for Nadcap special processes, as applicable.
 - 1.3 Outside service suppliers for laboratory testing and calibration must provide certification of compliance to ISO/IEC 17025.
2. The material supplier shall maintain an Identification and Verification Program to provide traceability of material while under his control.

APPROVED SOURCES

3. All material furnished, or processing performed under this order must be by a source approved by PCC Structurals, Groton Division, and/or a customer approved supplier list, as applicable.
4. Supplier shall pass on to any sub-tier supplier(s) the applicable requirements of this Purchase Order.
5. All material supplied under this purchase order shall be in accordance with the latest Process Control Procedure revision as specified on the face of the purchase order.

MATERIAL CERTIFICATION/RECORDS OF INSPECTION

6. Supplier shall submit a Certified Material Test Report providing mill identity and mill tests and analyses of material.
7. Supplier shall provide a Certified Chemical and/or Physical Test Report per applicable specifications. The report shall reflect the mill source of material.
 - A. Chemical
 - B. Physical
8. Supplier shall certify as to the ferrite content of the material. (When called out in specification)
9. Supplier shall submit a certification which includes cure or manufacturing date for material whose acceptability is limited by age. Both the cure date and shelf life shall be listed on the container and on the document certifying the material.
10. Supplier shall provide certification as to the country of origin of the materials provided. Supplier shall not use any conflict materials in the processing of material and supplies to be used in the product for PCC Groton. If it is found that conflict materials were used, the supplier shall notify PCC Structurals Groton immediately in writing.
11. Supplier shall certify that all articles furnished against this order do not contain, nor have they been contaminated with metallic mercury or mercury compounds; nor do they include any mercury-containing devices employing only a single boundary of containment.
12. Supplier shall certify that only material furnished by PCC Structurals, Groton Division, was used in the processing of the product.

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13. Supplier's certification shall list the specification and the amendment or revision level to which material is supplied.
- A. Supplier shall record all specified measurements determined in the course of inspecting the item(s). Such records shall be maintained on file for a period of not less than thirty-(30) years and are subject to review by the Customer upon reasonable notice.
 - B. Supplier shall record all specified measurements determined in the course of inspecting the item(s). Such records shall be maintained on file for a period of not less than forty-(40) years and are subject to review by the Customer upon reasonable notice.
 - C. Sampling inspection may be employed on parts produced to this order, provided the supplier submits a proposed sampling plan and has received written approval from PCC Structurals, Groton Division, Quality Assurance Department prior to incorporating same. Once in place, records shall be kept on the sampling results; such records shall be retained on file for a period of not less than three years and are subject to review by the Customer upon reasonable notification at any time during that period.
 - D. DFAR-Defense Federal Acquisition Regulation Supplement & FAR-Federal Acquisition Regulations. Clauses when flowed down through the purchase order or work instructions, must be adhered to through the processing of the PCC part. Applicable FAR/DFAR clauses must be stated on C of C (Certificate of Conformance).
 - E. Counterfeit Material & Parts are defined as goods, materials, products or separately identifiable items that are an unauthorized copy or substitute of an Original Equipment Manufacturer (OEM) or Original Component Manufacturer (OCM). Suppliers are prohibited to the use of counterfeit or suspect parts and material.
 - F. FOD Free product: Foreign Object Debris is any substance, debris or article that is not a component of the part that would potentially cause damage.

MATERIAL IDENTIFICATION

14. All materials supplied under this purchase order must be identified and returned with the same lot and or serial number integrity as received. Failure to comply will result in product being returned and or vendor cost back.
- A. Heat/Lot Number
 - B. Specification
 - C. Grade
 - D. Mill marking including material type
 - E. Shop Number/ Lot and or Serial Number.
15. Each individual length of weld rod must be "Flag-Tagged" on one end with material type and applicable AMS number. Each individual lot must be identified with the material type, lot number of the material, as well as the applicable AMS number.
16. Parts must be identified on package or container.
17. PCC Structurals, Groton Division, Quality Assurance reserves the right to inspect any or all of the materials included in this order at the supplier's plant. Right of entry privileges are also extended to representatives of PCC Structurals, Groton Division's customers.
18. The Government reserves the right to inspect any or all of the materials included in this order at the supplier's plant.
19. Government inspection is required prior to shipment from your plant. Upon receipt of this order promptly notify and furnish a copy to the Government representative normally servicing your plant so that Government inspection can be appropriately planned. If a Government representative does not service your plant, contact the appropriate Government Inspection office in your area. If you cannot locate the Government office, our purchasing agent should be notified immediately.

DEVIATIONS/NONCONFORMANCE

23. For consideration by PCC Structurals, Groton Division any departure from drawings, specifications, or other Customer order requirements, must be promptly reported to PCC Structurals, Groton Division. Disposition of these departures must be approved in writing by PCC Structurals, Groton Division, Quality Assurance, Product

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Engineering or Process Control, as applicable, prior to shipment. When PW-QA 6088 is flowed down via PCC Purchase Order, any identified deviations /nonconformances must be processed in accordance with said specification. This starts with segregation of product and contacting PCC Groton.

SPECIAL PROCESSES

24. Supplier shall submit a written description of any Special Processes used.
25. Supplier shall submit a Certification of Heat Treatment/HIP, including items below, as/if specified:
 - A. Time/temperature chart for material (entire cycle).
 - B. Time/temperature chart for furnace (vessel).
 - C. Sketch of thermocouple placement(s) with key to multipoint recording if utilized.
 - D. Load Charts
26. Supplier shall submit N.D.T. items as specified below:
 - A. Radiographic Certification
 - B. Magnetic Particle Certification
 - C. Penetrant Inspection Certification
 - D. Ultrasonic Inspection Certification
 - E. Pressure Test Certification
 - F. Leak Test Certification
 - G. N.D.E. Personnel Qualifications
 - H. X-Ray Film
 - I. X-Ray Technique Sheets
27. Welding on material to facilitate a forming process is expressly prohibited without prior approval by PCC Structurals, Groton Division Quality Assurance.
28. Supplier shall submit a Certification of Plating per applicable specification.
29. Supplier shall submit a certification of the Special Process(es) as indicated below, per applicable specification(s):
 - A. Surface finish (roughness)
 - B. Coatings
 - C. Treatments
 - D. Adhesive Bonding

TEST MATERIAL AND SUPPLEMENTAL TESTING

30. TEST Material is required to be sent by PCC Groton, processed with parts, and returned with parts as detailed on PCC Purchase order. Test Material and its quantity are to be defined on PCC Purchase order: Test Bars, Test Coupons, Test Sample, etc. If test material is defined on Purchase Order but is not found upon receipt, contact PCC Groton PRIOR to process of product.
 - A. A Supplier shall submit, along with shipment and certifications, two (2) test samples, representative of the processed part(s), for the following: Plating
31. The Supplier shall obtain a Product Analysis from an Independent Testing Lab; certified results of that analysis shall be submitted, along with shipment and other certifications.
 - A. Chemical
 - B. Physical
 - C. The Independent Lab must be an approved lab.

CERTIFICATION OF CONFORMANCE

32. Supplier shall submit, with each shipment of items covered by this order, a Certificate of Conformance (“C of C”). This Certificate must reflect the revision level of all drawings and/or specifications referenced by the order. The “C of C” must be signed by a responsible representative, and shall attest to the following:
 - A. Materials supplied are those which have been specified by the Purchase Order; Supplier has on file Test Reports and/or other required evidence of conformance to applicable specifications.

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- B. Processes used in the fabrication of items delivered were in compliance with the applicable specifications forming a part of this Order.
 - C. Items delivered comply with all drawing requirements which form a part of this Order.
 - D. A replacement certification shall be issued when it's determined that the original certification does not represent the material or service referenced on the purchase order.
33. By making shipment under this Purchase Order, the Supplier automatically certifies that materials used in the items shipped (except material furnished by PCC Structurals, Groton Division) and the processes applied to such articles comply with the applicable drawings and specifications. Supplier agrees to retain objective evidence and/or records to substantiate significant activities in the manufacturing, inspection, testing, treating, preservation, packaging and packing of delivered items (as applicable). Such records shall be made available on request.

MANUFACTURING, INSPECTION, AND TEST CONTROL

34. A - The Supplier shall submit to PCC Structurals, Groton Division, a product flow chart which defines the operational sequence, initial acceptance and testing points, and process control points, with sufficient description to identify the system. The factory inspection and test plan must be submitted prior to fabrication on this order, and is subject to approval by PCC Structurals, Groton Division.
34. B - The Supplier shall submit a Quality Inspection Plan which provides a complete list of the drawing features and characteristics, as well as description of how those items are to be verified; e.g., Coordinate Measuring Machine, etc. The Quality Inspection Plan must be approved prior to shipment of items by the Supplier. Accordingly, it should be submitted within thirty (30) days after receipt of order, or two (2) weeks prior to completion of items...whichever is earlier.
35. Once practices are established and approved, they shall not be changed without informing the Customer PRIOR to performing changed process. This includes the following:
A: Changes to Approved process
B: Change of Facility location
B1: Changes of significant machinery within the Facility
B2: Change to another facility within Company
C: Change of Suppliers
36. Process and Procedure Sheets are required for source substantiation for Fixed Processes as defined by PCC Groton Customers. This is required of all initial part qualifications and subsequent changes. PCC Purchase Order shall detail applicable specifications and requirements. Supplier shall submit Process and Procedure Sheets for each individual item under this Order. In the event that the processes are complex and/or questions arise as to adequate description of those activities, the Supplier is encouraged to contact PCC Structurals, Groton Division, Quality Assurance for assistance.
37. A - GE Specifications S-1000 and S-1002 apply to this order. General Electric end use.
B - UTC Specifications ASQR-01 and PWA 300 applies. UTC end use.
a. Collins Aerospace end use.
b. Pratt & Whitney end use.

Special note about ASQR-01: If ASQR-01 (United Technologies Corporation) is flowed down to the supplier, then the supplier must verify that annual eye exams are performed for personnel performing inspection & measurement tasks, product acceptance tasks, and/or measurement & test equipment calibration. The verification must comply with the requirements of ASQR-01.

SPECIAL CATEGORY REQUIREMENTS

38. Supplier shall retain all final records applicable to this Purchase Order for a period of thirty (30) years (or as otherwise agreed upon) and shall notify PCC Structurals, Groton Division at the end of that period for disposition instructions.
- 38A. This order contains "Key Characteristics" which require 100 percent inspection at your facility, prior to shipment. Any sampling inspection proposed shall require prior approval by PCC Structurals, Groton Division, Quality Assurance.

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38B. TITLE 10, CHAPTER1, CODE OF FEDERAL REGULATIONS-ENERGY PART 21 (10CFR21), applies to this order.

MEASURING AND TEST EQUIPMENT (M&TE)

39. Each report must include a statement clearly describing whichever of the following is correct. All calibrations have been performed and results meet specification requirements, or All calibrations have been performed and results meet specification requirements except _____, which does not meet requirements, or All calibrations have been performed and results meet specification requirements except _____, which was not performed per the specification requirements.
40. Supplier must maintain a calibration system for measuring and test equipment which complies with the requirements of ISO –10012-1 or ANSI –Z540-1-1994.
41. Supplier of calibration services shall perform calibration of M&TE in accordance with ISO-10012-1 or ANSI-Z540-1-1994 as applicable. Certificates of Calibration must clearly state that the service was performed with equipment traceable to the N.I.S.T. Calibration accuracy shall conform to the requirements of PCC Structurals CM-CG-21 Table 1.

PACKAGING/PROTECTION

42. Castings shall be protected by appropriate material interleaved between individual sheets and on top and bottom surfaces of material.
43. Supplier shall individually wrap or box items to prevent damage in transit.
44. Supplier shall package items for shipment so as to prevent metal-to-metal contact on machined surfaces.
45. When protective devices accompany materials or items when shipped to supplier, the supplier shall maintain this protection during processing and return all such items with return shipment.

VALUE ADDED

46. First Article(s) must be accepted by PCC Structurals, Groton Division Quality Control prior to a production shipment unless specifically authorized by the buyer. Identifying the First Article with a tag is required.
47. Any departure from drawing, specifications, or other customer requirements must be promptly reported to PCC Structurals on the suppliers MRB form. Disposition must be approved prior to any shipment.
48. The supplier shall use a ballooned drawing along with the Characteristic Accountability, Verification, and Compatibility Evaluation Forms (3) and (3.1) GQP 4.10-D-2, provided by PCC Structurals, which provide a complete list of drawing features and characteristics to be measured, to develop a Quality Inspection Plan. The Quality Inspection Plan shall contain a description of how these items are to be verified; e.g., Coordinate Measuring Machine, fixture, etc. The Quality Inspection Plan must also include a router/flow chart and be approved prior to production run. Once the Quality Inspection Plan is established and approved, it shall not be changed without written approval from PCC Structurals, Groton Division.
49. The supplier is responsible for the cost of castings if the scrap exceeds what is on the quote and Purchase Order.
50. For drop shipments, a certification of work performed must be forwarded to PCC Structurals, Groton Division Production Control Manager/designee for review and approval. Shipment of product cannot be made without PCC Structurals approval and proper shipping documentation.

FRAUD AND FALSIFICATION REPORTING REQUIREMENT

51. Personnel shall be informed in writing, prior to their commencing work on any PCC Structurals, Groton Division, purchase order, that there is risk of criminal penalties associated with any falsification, concealment, or alteration of any material fact, or any false, fraudulent or fictitious statement or representation in connection with the performance of work on PCC Structurals, Groton Division, purchase orders.
- All employees engaged in the performance of this purchase order shall be notified as follows:
(Your Company Name) performs work for PCC Structurals, Groton Division and the requirements of these contracts are designed to ensure that the essential attributes of the work are carefully checked or inspected. Pursuant to criminal penalties, it may be punishable to falsify, conceal or alter any material fact or to make

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false, fraudulent or fictitious statement or representation in connection with work performed under contract to PCC Structural, Groton Division. Any deviation to the above will result in immediate loss of PCC Structural, Groton Division business and possible civil action by PCC Structural, its customer and/or applicable regulatory agencies.

In the event a false or fraudulent act has been committed, the Manager of Quality Assurance at PCC Structural, Groton shall be notified so that an evaluation/investigation may be conducted to determine the validity and severity of the act and the course of any action to be taken by PCC Structural Company.