

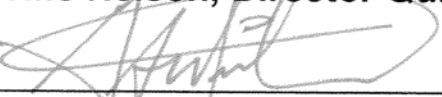


VACCO Quality Flow-Down Instruction

Prepared by:  7/24/13
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Approved by:  8/27/13
Greg Wieland, Vice President Quality Date

Distribution: Complete document distributed to all VACCO employees via IQS.

DOCUMENT CHANGE RECORD

Administrative Change Request

Changes to this document may require changes to the WDS system.

Changes to this document may require changes to the VACCO's internal routing process. The responsible party shall notify the appropriate personnel to ensure all changes will be compatible with the routing process.

When this document is updated, the updated document shall be posted on the VACCO webpage in the "Supplier" section.

Changes to this document may require changes to the PLM system.

Extensive changes to this document shall be communicated on the VACCO webpage in the "Supplier" section – "Supplier Instructions."

Rev	Date	Responsibility	Description of Change
Initial Release	08/27/2013	John Harmon	Initial Release
1.0	11/12/2013	John Harmon	See IQS History
1.1	12/11/2013	John Harmon	See IQS History
1.2	03/05/2014	John Harmon	See IQS History
1.3	08/25/2014	Birgitta Stocking	Section 6.23B
2.0	03/17/2015	Birgitta Stocking	See IQS History CR 0001168
2.1	03/31/2015	Birgitta Stocking	See IQS History CR 0001175
3.0	06/17/2015	Birgitta Stocking	See IQS History CR 0001200
4.0	10/30/2015	Birgitta Stocking	See IQS History CR 0001242
5.0	02/23/2016	Birgitta Stocking	See IQS History CR 0001278
6.0	05/16/2016	Birgitta Stocking	See IQS History CR 0001324
7.0	11/14/2016	Birgitta Stocking	See IQS History CR 0001366
7.1	11/16/2016	Birgitta Stocking	See IQS History CR 0001369
8.0	03/15/2017	Birgitta Stocking	See IQS History CR 0001440
8.1	03/21/2017	Birgitta Stocking	See IQS History CR 0001480
9.0	05/11/2017	Birgitta Stocking	See IQS History CR 0001498 - Additional requirements added
10.0	08/29/2017	Birgitta Stocking	See IQS History CR 0001531 - Additional QFDs added
10.1	09/06/2017	Birgitta Stocking	See IQS History CR 0001564 - Error correction; no content changed

VACCO Quality Flow-Down Requirements

1. PURPOSE

To document and control contractual and internal quality requirements required to be flowed down to suppliers.

2. SCOPE

This instruction is applicable to those internal clauses related to the quality requirements that are published on purchase requisitions, purchase orders and on the Internet for supplier and subcontractor access. Additional Quality flows down notes are identified in documents identified as VI-QFD-XXX.

3. REFERENCES

- VI-PQD-001 – Control of Suppliers for Fluid Flow Requirements
- VI-MRB-100 – Material Review Instructions
- VI-QFD-002 – Supplier Counterfeit Control Requirements
- VI-QFD-003 – Supplier False and Fraudulent Requirements
- VI-QFD-004 – Level 1 Material Handling for Suppliers
- VI-QFD-005 – Quality Flow-Down Requirements for Chemicals and Clean Room Items
- Supplier Instructions – Located on the VACCO Website
- Supplier Forms – Located on the VACCO Website
- VI-1000 – VACCO Industries Cleaning Facilities Document
- VI-DTS-001 – Dock to Stock for Commercial off the Shelf items and Weld Kits
- VI-HDL-004 – Chemical Management Procedure for Control of Chemical & Hazardous Materials
- VI-INSP-102-APPENDIX-1 – Supplier Instructions for Material Over-Check Program

4. ACRONYMS

- a) **ASL** – Approved Suppliers List (Reference VI-PQD-001)
- b) **COTS** – Commercial Off The Shelf
- c) **CAR** – Corrective Action Request (Reference VI-MRB-100)
- d) **C/A** – Corrective Action – Tier 2 Nonconformance (Reference VI-MRB-100)
- e) **PAR** – Preventative Action Request (Reference VI-MRB-100)
- f) **OEM** – Original Equipment Manufacturer
- g) **FAI** – First Article Inspection
- h) **FAIR** – First Article Inspection Report
- i) **NADCAP** – National Aerospace And Defense Accreditation Program
- j) **NDT/NDE** – Non-Destructive Test/Evaluation
- k) **QPL** – Qualified Products List

5. PROCESS

Quality clause flow downs shall be commensurate with customer requirements. Technical risk shall be considered when selecting Quality Clauses with the goal of mitigating and/or eliminating risk. It is the responsibility of the individual performing Quality Clause flow down review to perform an adequate contract review. They shall understand all applicable program requirements and technical risks to ensure that the appropriate clauses are flowed down to the sub-tier level. Templates are provided in VI-QFD-001 Section 11. Templates should be reviewed and tailored as necessary to meet specific contract requirements.

- a) Each clause will be listed on the purchase order in the following format: QFD- paragraph number and title; QFD2 (VI-QFD-002 – compliance to the entire document) and title; or QFD3- paragraph number and title, for example paragraph 6.25 Supplier Quality Control System Requirements would be listed as, “QFD-6.24 Supplier Quality Control System Requirements.” Input in WDS will be listed as “6.2”.
- b) QFD-6.23B – Purchase Orders placed after the release date of Revision 2.0 of this document shall identify this requirement per VI-QFD-003 6.1 or 6.2 based on program requirements. These clauses are identified on the Purchase Order as “QFD3-6.1 and title”, or “QFD3-6.2 and title.”
- c) Dock to Stock parts will have a template for the Quality flow down notes identified in last section of this document. Quality flow downs for these types of parts will be identified as DS0X. The Dock to Stock process is discussed in the VI-DTS-001 procedure.
- d) Quality clauses for Chemicals and Clean Room items are flowed down through the VI-QFD-005.

Penalty Clauses

Purchasing or Quality personnel may elect to impose a penalty clause on a purchase order.

Delivery dates offered and product/service Quality are binding. The Quality commitment shall include both product and documentation. The Supplier shall meet their commitments to both delivery and quality.

Quality penalties may be enforced on the supplier based on one or more of the following:

- Several requests to correct documentation,
- Supplier ships in nonconforming product without an SRMR or notification to VACCO,
- A history of SRMRs that are caused by the supplier,
- A history of failed source inspections (Supplier Source Process – Dated 12/19/16).

VACCO may choose to flow down one of the below Penalty clauses based on the supplier’s performance history, critical requirements for the product/service or other justifications. A letter identifying the criteria for a successful source inspection was sent on 12/20/16 to all VACCO Machine Shops. The supplier may request this letter from the buyer (Form QSC-12-19 Source Inspection Guidelines).

P0001 1% PENALTY FOR LATE DELIVERY OR UNACCEPTABLE QUALITY

If you default either wholly or partly from the order, a penalty at the rate of one (1) percent per week of default will be deducted from your invoiced amount.

P0002 2% PENALTY FOR LATE DELIVERY OR UNACCEPTABLE QUALITY

If you default either wholly or partly from the order, a penalty at the rate of two (2) percent per week of default will be deducted from your invoiced amount.

P0003 3% PENALTY FOR LATE DELIVERY OR UNACCEPTABLE QUALITY

If you default either wholly or partly from the order, a penalty at the rate of three (3) percent per week of default will be deducted from your invoiced amount.

P0004 4% PENALTY FOR LATE DELIVERY OR UNACCEPTABLE QUALITY

If you default either wholly or partly from the order, a penalty at the rate of four (4) percent per week of default will be deducted from your invoiced amount.

P0005 5% PENALTY FOR LATE DELIVERY OR UNACCEPTABLE QUALITY

If you default either wholly or partly from the order, a penalty at the rate of five (5) percent per week of default will be deducted from your invoiced amount.

P0006 NCR COST for UNACCEPTABLE Quality

A debit of \$50.00 may be charged to the Supplier as a cost for the processing of a "NON-CONFORMANCE REPORT" which is found to be caused by the Supplier.

P0015 15% PENALTY FOR LATE DELIVERY OR UNACCEPTABLE QUALITY

If you default either wholly or partly from the order, a penalty at the rate of fifteen (15) percent per week of default will be deducted from your invoiced amount.

P0020 20% PENALTY FOR LATE DELIVERY OR UNACCEPTABLE QUALITY

If you default either wholly or partly from the order, a penalty at the rate of twenty (20) percent per week of default will be deducted from your invoiced amount.

6. GENERAL QUALITY CLAUSES

All certifications, documents and/or reports provided by the supplier shall be legible and reproducible. Corrections to official records (such as certifications, test reports etc.) shall be in accordance with "Corrections to Supplier Documents" located on the VACCO website, Supplier Instructions.

All records shall be retained for 7 (seven) years minimum unless otherwise stated on the VACCO Purchase Order or documentation.

Order of Precedence:

If there is a contradiction between documents of information the following is the Order of Precedence:

- Purchase Order
 - Notes
 - Specifications identified on the Purchase Orders
 - Quality Flow Down Notes identified as QFD's (VI-QFD-XXX)
 - Purchase Order Flow Downs

- Drawings – identified on the purchase order
- Documents and specifications referenced in the drawings

6.1. SPECIFICATION EFFECTIVITY – VACCO QE will choose A, B, C or D

- A. **Current Revision of Defined Specification** – VACCO may intentionally flow down superseded revisions to specifications and standards to meet customer requirements; if a supplier questions the revision of a standard they may contact the buyer who will direct them to the Project Q.E. for further clarification. If the Purchase Order does not provide direction the following shall apply:
For Raw Material and C.O.T.S specifications – Suppliers shall certify work to standards and revisions directed in the purchase order. When no specific revision is called out in the purchase order and unless otherwise directed in writing, the current revision is preferred but not required.
For Process specifications – Suppliers shall certify work to standards and revisions directed in the purchase order. When no specific revision is called out in the purchase order the current revision is required, if a supplier questions the revision of a standard they may contact the buyer who will direct them to the Project Q.E. for further clarification.
- B. **Approved Materials & Process Substitution List (VI-AMPSL-1900)** – Suppliers shall use the specification directed in the purchase order unless this specification is not the current industry standard. The supplier shall then review the current revision of VI-AMPSL-1900 on the VACCO website. The supplier shall certify work and/or material to the current specification identified on the AMPSL that has superseded the specification identified on the purchase order/drawing or certify to the specification identified on the purchase order.
- C. **EB2P756-VA Specification Effectivity** – Revisions of Drawing Specification or Material Specifications that are used on this purchase order are controlled by EB2P756-VA. Any revision listed in the Specification Effectivity Index may be used on this purchase order. To get a copy of the index visit the EB website at http://www.gdeb.com/suppliers/3_doing_business_with_eb/ under the *Additional Requirements for Bid Solicitation* section.
- D. **EB2P756-OR Specification Effectivity** – Revisions of Drawing Specification or Material Specifications that are used on this purchase order are controlled by EB2P756-OR. Any revision listed in the Specification Effectivity Index may be used on this purchase order. To get a copy of the index visit the EB website at http://www.gdeb.com/suppliers/3_doing_business_with_eb/ under the *Additional Requirements for Bid Solicitation* section.

6.2. VACCO PROPRIETARY PROCEDURE AND DRAWING REQUIREMENTS

Drawings and procedures furnished with this purchase order are proprietary in nature. VACCO Industries retains the exclusive rights to these documents, and they shall be destroyed or returned upon completion of this purchase order.

6.3. PACKAGING REQUIREMENTS

All items are to be packaged in suitable containers for protection in shipment and storage, and in accordance with applicable specifications. Each container of a multiple container shipment shall be identified to show the number of the container and the total number of containers in the

shipment and the number of the container containing the packing slip. All shipments by supplier shall include a packing sheet containing VACCO's purchase order number, quantity, part number/size, description of the items shipped, and appropriate evidence of inspection. Materials from different purchase orders shall be listed on separate packing slips.

For custom machined, externally threaded, ground or machined material/hardware, the external areas shall be protected by plastic webbing and/or plastic protective caps. Items requiring protection from physical and mechanical damage shall be protected by wrapping cushioning, compartmentization, cartonizing or other means to mitigate shock and vibration to prevent damage during handling and shipment, at no time is it acceptable for machined parts or precision parts to be loose or free floating.

6.4. SAFETY DATA SHEETS

Initial shipments from the Supplier shall include material safety data sheets meeting the requirements of 29 CFR 1910.1200 (g) and the latest version of Federal Standard No. 313 in effect on the date of this purchase order for all hazardous materials (FAR 52.223-3). Data shall be submitted for all items included in this purchase order, whether or not the supplier is the actual manufacturer of the items. Repeat shipments shall only include SDS sheets when there is a new revision to the document or at the request of VACCO.

6.5. SHEET OR STRIP STOCK – METALLIC

- a) Sheet/strip material shall be of chemical milling quality. Surfaces shall be free from scratches, pits, inclusions and mill rolling marks. Additionally, no waviness or curl on the edges of the sheet/strip material will be accepted.
- b) Sheet/strip material shall be flat within 1/2 inch T.I.R. over an 18 inch length, and within 1/4 inch T.I.R. over a 12 inch width for material over .010 inch thickness.
- c) When a coil is to be provided, the maximum individual coil weight shall not exceed 300 pounds and have a minimum core I.D. of 16 inches.
- d) Material provided shall be degreased (28 dry finish) to be acceptable.
- e) Upon cutting an 18 inch long sample of coil, on a flat surface, coil set cannot exceed 1/8 inch on either end for the material under .010 inch thickness.

6.6. TUBING – METALLIC

Supplier shall provide a certification that stipulates the tubing is in fact "seamless" in condition.

6.7. PACKAGING AGE DATED MATERIAL (O-RINGS AND ELASTOMERS)

All synthetic O-rings and elastomers provided to VACCO industries shall be individually packaged. Each package shall have a minimum marking requirement of:

- a) Quantity per bag
- b) VACCO part number and revision
- c) Manufacturer part number
- d) Compound code
- e) Specification number and revision
- f) Cure date in quarters – identifying the quarter and year (1Q14)
- g) Batch code
- h) VACCO purchase order number
- i) Expiration date per MIL-HDBK-695

Components shall not have exceeded 20% of their shelf life (as defined by MIL-HDBK-695) at the time of shipment. This flow down note is applicable to components that have a shelf life. This shelf life requirement is in line with specific VACCO customer contracts.

6.8. RAW MATERIAL WELD REPAIR PROHIBITION (OTHER THAN CASTINGS)

If any weld repair is necessary during the fabrication process, VACCO Industries written approval shall be obtained **prior** to the performance of any such repair. The evidence of approval shall be shipped with the product.

6.9. QUALIFIED PRODUCTS LIST IDENTIFICATION

The items listed on this purchase order that are controlled by the government issued Qualified Products List shall be procured from a qualified source noted within that document and shall conform to the testing and processing requirements of the latest revision of the designated specification.

6.10. QUALIFIED PRODUCTS LIST CERTIFICATION

Supplier of qualified products (government or buyer) shall supply with each shipment, one legible copy of the certification. The certification shall state that the product is a qualified product under the applicable government or buyer specification requirements. If the qualified product is incorporated into a prime item, the certification shall attest to this fact and designate the supplier's name.

6.11. VACCO-SUPPLIED MATERIAL/PARTS

Any material provided to the supplier with this purchase order shall be used exclusively for the incorporation into VACCO products. Supplier shall not substitute any material for material provided. All material not used shall be returned to VACCO. Supplier shall maintain accurate records to account for attrition.

6.12. TITANIUM MATERIAL CONTAMINATION

Titanium shall not come into contact with halogenated fluids, such as; trichloroethylene, Freon, hydrochloric acid, anhydrous methyl alcohol and substance containing mercury, cadmium, silver and gold. Any fluorinated and sulfonated lubricants are prohibited for use on titanium hardware. The supplier shall have a written process or router instructions available for review by VACCO Quality upon request.

Upon completion of the cleaning process, handling shall be performed with glove-protected hands as bare skin contact is prohibited. Tools which are used on titanium, such as grinding wheels, shall be controlled in such a way that they do not come into contact with other alloys. During grinding operations no sparking is allowed. The supplier shall flow down this requirement to any sub-tier suppliers that are responsible for operations that occur after the machining process.

6.13. FIRST ARTICLE INSPECTION REPORT (FAIR) per AS9102

Suppliers fabricating parts for VACCO shall submit a completed FAIR in compliance with AS9102. **FAIR's are required only if the following has occurred:**

- The supplier is fabricating/manufacturing the parts/assembly for the first time.
- If there is a Revision change to the drawing since the last FAIR was submitted. In this case the supplier can submit a delta FAIR.
- If the supplier made significant process changes that affect the form, fit or function.
- If two years have lapsed since the last time the supplier has fabricated/manufactured the

parts/assembly.

This report shall include all the actual values of all drawings and other contractual requirements, including compliance to all drawing notes. The Supplier shall document physical and functional processes to verify that prescribed production methods have produced an acceptable item as specified by drawings, planning, purchase order, engineering specifications and/or applicable design documents. This shall be documented as the Manufacturing Process Reference (Box 9).

Suppliers are not required to submit a copy of the FAIR if a new FAIR is not required per AS9102. Suppliers shall maintain the FAIR reports for a minimum of seven (7) years unless otherwise stated in the contract and shall be made available to VACCO upon request.

6.14. AGE SENSITIVE MATERIAL

The supplier is required to submit with each shipment a certificate attesting conformance of elastomeric/organic materials/parts listed on/or used in the performance of the purchase order. Age sensitive materials shall be identified and packaged in accordance with the applicable procurement specification. Other age sensitive materials such as adhesives, sealants, coating materials, and potting compounds, etc.; shall, at a minimum be identified on each container or certification for material used in processes along with the following:

- a) manufacturer's name
- b) batch number
- c) storage temperature
- d) compound/spec number
- e) date of manufacture
- f) manufacturer's recommended expiration date (if applicable)
- g) shelf life, cure date, retest date (if applicable)
- h) compound number, etc. so as to indicate useful life of the material (if applicable)

Any applicable special storage requirements shall be defined. Material that has an expiration date shall have no less than eighty percent (80%) of its shelf life remaining at the time of delivery to VACCO unless otherwise stated on the Purchase Order. Exceptions to this requirement shall be submitted to the buyer for approval.

6.15. ITEM LOT/HEAT NUMBER INDIVIDUALITY

Supplier to provide each purchase order line item from one lot/heat. In the event that this is not possible, notify VACCO Industries' Purchasing to modify the Purchase Order to identify each lot/heat as a separate line item. Typically, this note is not used for casting, forgings or items that are permanently marked.

6.16. Deleted – See 6.14

6.17. Deleted

6.18. GIDEP ANNOUNCEMENTS

The Supplier shall respond in a timely manner to relevant GIDEP (Government Industry Data Exchange) alerts that are provided by VACCO or another source.

6.19. CHANGES IN APPROVED PROCESSES

Frozen method/plan/process prohibits suppliers and sub-tier suppliers from changing the established method/process/production plan of manufacturing. Any changes are subject to

VACCO's review & approval. The supplier shall not make changes to the frozen method/plan/process without first obtaining written authorization from VACCO Engineering or Quality.

6.20. MANNED SPACE FLIGHT

For use in human space flight; materials, manufacturing, and workmanship of highest quality standards are essential to astronaut safety. If you are able to supply the purchased item with a higher quality than that of the items specified or proposed, you are requested to bring this fact to the immediate attention of the buyer. This clause will be inserted in all subcontracts and purchase orders for such items down to the lowest tier.

6.21. VACCO FURNISHED MATERIAL/TOOLING/PARTS

Supplier shall ensure that all material furnished by VACCO is free from damage prior to commencing work. Supplier shall notify VACCO of any damage identified upon receipt of the material and/or tooling. Supplier is liable for the total value of material, parts, tooling, etc., when scrapped as a result of damage due to vendor processing or handling. Supplier is not responsible for VACCO controlled parameters, but is responsible for protecting VACCO's investment in raw materials, partially completed items and/or tooling.

6.22. PRELIMINARY PROCEDURE/CERTIFICATION REVIEW – VACCO will choose B and/or C

- A. **PRE – PRODUCTION – Deleted** – For all purchase orders with 6.22A dated prior to 23-Feb-2016 use 6.22B. For purchase orders with 6.22A dated 23-Feb-2016 or later use 6.22C.
- B. **PRE – SHIPMENT** – Applicable for Raw Material and casting shipments. Quality may impose this requirement based on the complexity of the material, test process or product. All required documentation shall be submitted and approved by VACCO Industries' Quality Assurance Department prior to release for shipment. All certifications and FAIR (if required) shall be submitted and approved prior to shipment of product. Shipments made prior to approval may not be accepted.
- C. **PROCEDURE** – Documentation for procedure approval shall be submitted to VACCO Industries for approval. These procedures include Non-destructive Testing Procedures (Examples include: Radiograph, Ultrasonic (UT) and Magnetic Particle Inspection), Welding Procedures (per Clause 10.10) and/or Sampling Inspection (per Clause 7.6 or 7.7).
- D. **Nameplate Proofs** are to be submitted and accepted before production. Shipments made prior to approval may not be accepted. The Supplier assumes the risk for the manufacture of items prior to approval.

6.23. FRAUDULENT STATEMENT REQUIREMENTS VACCO will identify A or B (6.23B - Additional statements in VI-QFD-003)

- A. The federal statement notification requirements are here by passed down to our suppliers. "The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under federal statutes." Statements on certifications and test documents shall be positive and unqualified. Statements such as "to the best of our knowledge" or "we believe the information contained herein" are not acceptable.
- B. See VI-QFD-003, Section 6.1 – Statements on certifications and test documents shall be positive and unqualified. Statements such as "to the best of our knowledge" or "we believe the

information contained herein” are not acceptable. Suppliers that are unable to meet requirements for VI-QFD-003 Section 6.1 or 6.2 on all certifications and test reports shall submit a letterhead document to the buyer for review and notification to VACCO’s customer prior to shipment. Product shall not be shipped until the buyer notifies the supplier.

6.24. SUPPLIER QUALITY CONTROL SYSTEM REQUIREMENTS

At a minimum, the supplier shall establish and maintain an orderly system that provides for defect detection, identification, segregation and correction. The system shall further comply with one or more of the following specifications as indicated on the purchase order. The latest revision of each specification shall apply unless noted:

- A. *MIL-I-45208
- B. *MIL-I-45208 with *ISR-1
- C. NHB 5300.4
- D. MIL-STD-45662
- E. ANSI /NCSL Z540.3 or Z540-1
- F. ISO 9001 or AS9001/ISO9001
- G. ANSI/ISO/ASQ Q9001
- H. ISO/IEC 17025

**Last released revision.*

Calibration of measurement equipment shall be in compliance with either ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3. If work is subcontracted, the applicable requirements of these specifications shall be imposed on the subcontractor. At a minimum, the supplier shall impose compliance to either ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3.

VACCO Industries reserves the right to perform on-site surveys or inspections at the supplier and/or sub-tier supplier to maintain system and product quality.

6.25. COUNTERFEIT WORK

For the purpose of this clause, work consists of those parts delivered under this contract that are the lowest level of separately identifiable items (e.g., articles components, goods and assemblies). “Counterfeit” is defined as an unauthorized copy, imitation, substitute, or modified part (e.g., material, part, component) which is knowingly misrepresented as a specified genuine part of an original or authorized manufacturer. Supplier agrees and shall ensure that Counterfeit Work is not delivered to VACCO Industries.

- a) Supplier shall only purchase products to be delivered or incorporated as work to VACCO Industries directly from the Original Component Manufacturer (OCM)/Original Equipment Manufacturer (OEM), or through an OCM/OEM authorized distributor chain. Original Component Manufacturer, or Original Equipment Manufacturer’s sell products or components under their brand name, they are the companies that manufacture the original part. Work shall not be acquired from independent distributors or brokers unless approved in advance in writing by VACCO Industries.
- b) Supplier shall immediately notify VACCO Industries with the pertinent facts if the supplier becomes aware of or suspects that it has furnished counterfeit work. When requested by VACCO Industries, supplier shall provide OCM/OEM documentation that authenticates traceability of the affected items to the applicable OCM/OEM.
- c) Supplier shall consult with the OCM/OEM or authorized distributor/franchise to confirm that the authorized distributor/franchise has been authorized by the OCM/OEM to sell the specific item being procured, prior to issuing a purchase order. If not procuring from the OCM/OEM, the supplier shall provide evidence from the OCM/OEM that the supplier used was indeed authorized by the OCM/OEM. For example, an OCM/OEM list of authorized distributors on OCM/OEM letterhead or website would suffice. If OCM/OEM does not have an authorized list

of distributors/franchises, documented evidence shall be provided stating such.

6.26. HANDLING PRECAUTIONS FOR OUTSIDE PROCESSING/TEST

Supplier to exercise extreme care in the handling of parts to ensure no dents, nicks, dings or scratches occur. Suppliers shall perform a visual inspection when receiving hardware from VACCO to ensure no damage has occurred. **Any damage shall be reported to VACCO Industries within 24 hours of the visual inspection.** Protective end caps shall be used on all tube end parts, VACCO Industries shall provide end caps.

6.27. MANUFACTURING AND INSPECTION PLAN

Supplier shall prepare and maintain an inspection test plan or shop traveler which provides records of all performed operations and inspection. At a minimum, routing sheets shall show operational sequence, inspection and test points and other pertinent control media. The documents shall provide traceability to personnel performing operations and inspection, acceptability by inspection, and reference of any associated documents such as rejection reports, processing procedures, inspection procedures, etc.

6.28. GRAIN STRUCTURE TEST PROCEDURE

When determining grain structure for A286 CRES materials made to AMS 5737 and subsequently welded, VI-MPT-1932 Modification of Test Procedure shall be used.

6.29. DEGREASING – CLEANING

Machined parts shall be degreased, cleaned and free of contaminants before shipment to VACCO Industries.

6.30. SPECIAL USE VARIANCE

The Special Use Variance clause shall be used to purchase Production parts, materials (including chemicals), and processes from suppliers on VACCO's Unapproved Suppliers List located in IQS. Approved by VACCO Management.

VACCO QUALITY MANAGER OR DESIGNEE _____ DATE

DIRECTOR, SUPPLY CHAIN OR DESIGNEE _____ DATE

6.31. VACCO APPROVED SUPPLIER LIST

If suppliers do not have a sub-tier control system they **may** use VACCO's approved suppliers list (ASL). They may contact their buyer to get a copy of VACCO's current Approved Supplier List located in IQS.

6.32. PROCUREMENT SOURCE PROHIBITION

No material from Western Titanium, Inc. and/or Mach-2 Metals will be accepted by VACCO Industries.

6.33. GOVERNMENT TOOLING IDENTIFICATION

Supplier to attach a tag or permanently mark on tool surface, depending on the size of the tool, the following information per FAR 52.245-1:

1. TOOL NUMBER: _____ REV: _____
2. SYMBOL: _____
3. SERIES: _____
4. DUPLICATE: _____
5. PO NUMBER AND LINE ITEM: _____
6. SALES ORDER NUMBER: _____
7. OWNERSHIP: _____
8. USED-TO-MAKE VACCO P/N (IF APPLICABLE): _____

If there is insufficient space on the tooling surface, mark on VACCO supplied I.D. Tag. Tool shall be placed in a storage container for protection and tag shall be affixed to container. Mark tool with revision when required on the tooling surface and rework tag. Also, if possible, insert picture of purchased tool inside the container.

6.34. CUSTOMER PROCEDURE APPROVAL

Document approvals are required from VACCO's external customer. The supplier should allow 45 days for VACCO's buyer to obtain the approval when quoting the lead time to complete the job. Upon receipt of the purchase order the supplier should perform all processes and purchases that are not affected by the process requiring procedure approval. The Supplier shall submit procedures in accordance with Procedure Clause 6.22C.

6.35. REACH COMPLIANCE (REGISTRATION, EVALUATION, AUTHORIZATION AND RESTRICTION OF CHEMICALS)

For each delivery, the supplier and their subtiers shall provide one of the following:

- A completed "VACCO Reach Declaration Form," Form QF-ENV-001. This form shall be completed based on the "Reach Annex XVII Restriction List," Form QF-ENV-002. This list is specifically tailored for VACCO hardware. Both forms are located on the VACCO website, Quality Clauses for Suppliers.
- A Certification of Reach Compliance or a Reach Compliance statement on their Certification of compliance. Suppliers and/or subtiers with an active Reach Program and have fully implemented the program into their facility may choose this option.

Suppliers shall flow down the requirement above to their subtiers.

Suppliers shall contact VACCO Safety Department for inquiries concerning Reach Compliance. Additional Reach information can be found at the European Chemicals (ECHA) Website:

<http://echa.europa.eu/>

6.36. SUPPLIER FMEA

(Applicable for high risk, high dollar and/or extremely complex parts/assemblies)

The supplier is required to provide a FMEA (typically a Process FMEA) that identifies the process steps that have a Risk Priority Number and how the supplier is mitigating the risk. The supplier shall ship a copy of the FMEA with the product.

Prior to commencing the manufacturing of the part or assembly, the supplier may contact the VACCO Supplier Quality Representative to review their approach to meeting this Quality Clause. A sample template is available on the VACCO webpage under the Supplier Instructions section.

6.37. LABELING OF OZONE DEPLETING SUBSTANCES

Suppliers and sub-tier suppliers shall comply with 40 CFR Part 82.100 thru 124, pursuant to Section 611 of the 1990 Clean Air Act Amendments by including a warning statement with the information required by regulation as part of the shipping documents accompanying delivery of the product to VACCO, if any of the following applies: (1) products manufactured with a process using a Class I or Class II substance, (2) products that contain a Class I or Class II substance, and/or (3) containers containing a class I or class II substance.

6.38. COMPLIANCE TO SEC CONFLICT MATERIALS RULE

A). Per US Security and Exchange Commission's Conflict Minerals Rule, suppliers and their sub-tier suppliers shall declare materials and their originating countries in accordance to Section 1502(b)-(p)-(1)-(A) of Dodd-Frank Act if any material defined in Section 1502(e)-(4) of Dodd-Frank Act is used in their products delivered VACCO.

B). Per US Security and Exchange Commission's Conflict Minerals Rule, suppliers and their sub-tier suppliers shall declare that their product is "DRC Conflict Free" on their certificates of conformance in accordance to Section 1502(b)-(p)-(1)-(D) of Dodd-Frank Act if none of the material defined in Section 1502(e)-(4) of Dodd-Frank Act is used in their products delivered VACCO.

6.39. METRIC SYSTEM

Work performed under this contract shall use the degree Celsius / Centigrade ($^{\circ}\text{C}$), and the metric system of units of measurements, e.g. ampere (A), candela (cd), gram (g), meter (m), mole (mol), newton (N), second (s), and their derived units.

7. SUPPLIER INSPECTION REQUIREMENTS

Unless otherwise specified, material supplied and operations performed by the supplier shall be inspected by following (referenced) quantitative and verifiable methods.

7.1. VACCO SOURCE INSPECTION (Choose **A** and/or **B**, plus **C** if source cannot be waived.)

VACCO source inspection is required at your facility. Notify VACCO Industries' buyer at least forty-eight (48) hours in advance of the time the items are to be inspected. Inspection documents, specifications, drawings and the purchase order covering the items on this order shall be available for VACCO inspection at your facility.

Exemption - This clause does not apply to the following instances:

- The purchase order is placed with a Distributor
- The purchase order is placed with an Approved Supplier that is over 60 miles away from VACCO Industries and has been a supplier with VACCO Industries for more than 1 year.

Suppliers that meet at least one of the above criteria are not required to request source or request a waiver for source.

Drawings that have dimensions that apply prior to coating/plating or having final slotting/cutting that would not allow the inspector to verify the measurement at final inspection shall require a request for source inspection prior to the processing or slot cutting.

REQUIREMENTS FOR IN-PROCESS SOURCE INSPECTION: Any dimensions that cannot be verified after processing, such as plating/coating application or final slotting/cutting or precision cleaning operations shall be inspected and accepted by VACCO Source Inspection prior to that process being performed. VACCO will advise the supplier of any additional in-process inspection points for which in-process inspection is required.

- A. IN PROCESS INSPECTION REQUIRED:** In-Process Source Inspection applies to all source inspection requests (see above), as applicable, this will include items identified above or any additional items defined in the Purchase Order.
- B. FINAL SOURCE INSPECTION:** Upon completion of Final Source Inspection, the shipping documents or the Certification of Conformance shall be stamped and/or signed by the VACCO source representative prior to shipping, unless instructed to do so by the source inspector/representative

- C. FINAL SOURCE INSPECTION REQUIRED:** Source on this Purchase Order cannot be waived. It is preferred that suppliers are chosen within a 60 mile radius.

Upon completion of Final Source Inspection, the shipping documents or the Certification of Conformance shall be stamped and/or signed by the VACCO source representative prior to shipping, unless instructed to do so by the source inspector/representative.

WAIVED SOURCE INSPECTION: The Source Inspection Supervisor or designee shall provide written authorization to the VACCO Industries' buyer, who will then send the authorization to the supplier when source inspection is waived. Supplier shall provide a copy of this authorization with the shipment of the part(s).

A record of the authorization is not required if the supplier met one or more of the instances listed as an "Exemption."

7.2. GOVERNMENT SOURCE INSPECTION

Government Source Inspection is required on this order; it may involve in-process and final inspection. Upon receipt of this purchase order, promptly notify the Government Representative who normally services your plant, so that appropriate planning for Government Inspection can be accomplished. If none is currently assigned, contact the nearest Army, Navy, Air Force, or Defense Supply Agency Inspection Office. In the event the representative or office cannot be located, notify VACCO Industries' buyer immediately.

DCMA Review: _____

QAR/EXTBF S4306A

_____ Date

7.3. VACCO FIRST ARTICLE SOURCE INSPECTION

VACCO inspection of the first acceptable piece is required at your facility prior to continuing your production run. Notify VACCO industries' buyer at least forty-eight (48) hours in advance of the time the items are to be inspected. Inspection documents, specifications, drawings and the purchase order covering the items on this order shall be available for VACCO inspection at your facility. The FAI item and report shall be presented, together with all completed items, at the time of such inspection.

7.4. VACCO WITNESSING OF FUNCTIONAL AND/OR ACCEPTANCE TESTING AT SUPPLIER'S FACILITY

Supplier's acceptance/functional testing shall be witnessed by a VACCO representative. Notify

VACCO Industries' buyer at least forty-eight (48) hours in advance to schedule VACCO witnessing. Test documents, specifications, drawings and the purchase order covering the items on this order shall be available for VACCO witnessing at your facility.

7.5. 100% FINAL INSPECTION BY SUPPLIER

Supplier shall perform 100% component and end item final inspection of all characteristics and items listed on both the purchase order and drawing to assure conformance to the specification requirements. All values and notes shall be recorded as specific dimensions or a range. In cases where attribute verifications are required an accept/reject notation shall be recorded.

Supplier inspection sheets shall be provided to VACCO Industries with the hardware at the time of shipment. The results shall be separate from the FAIR report/results. The Supplier may use the AS9102 Form 3 as a form for the Final Inspection report.

7.6. SAMPLING INSPECTION – See Clause 7.7.

7.7. SAMPLING INSPECTION

Items shall be inspected by the supplier's sampling inspection plan which complies with ANSI/ASQC Z 1.4 (normal, level II, single sampling procedures) and this compliance shall be stated on the supplier certification.

If the supplier elects to perform 100% inspection, then this compliance shall be stated on the supplier certification.

If the supplier prefers to employ an inspection sampling which does not comply with ANSI/ASQC Z 1.4 (normal, level II, single sampling procedures), the supplier shall provide the sampling inspection plan for that part to VACCO's Quality Department for approval prior to inspection of the product. Proof of approval of the plan for that part shall be provided with the shipment of the product.

8. CERTIFICATION REQUIREMENTS

Certification requirements are objective quality evidence of materials and processes performed. A review shall be performed of specifications, drawings and customer requirements to determine required certifications.

Statements on certifications and test documents shall be positive and unqualified. Statements such as "to the best of our knowledge" or "we believe the information contained herein" are not acceptable. **All reports supplied to VACCO Industries shall be legible and be capable of scanning three (3) times.**

8.1. MANUFACTURER/MILL TEST REPORTS

The Supplier shall furnish copies of the original manufacturer/mill test reports, containing all acceptance test results required by the material specifications.

Statements on certifications and test documents shall be positive and unqualified. Statements such as "to the best of our knowledge" or "we believe the information contained herein" are not acceptable.

- a. In addition to quantitative chemical and mechanical properties; the material test reports shall include the **class, form, condition** (heat treated, annealed, forged, cold/hot finished, hot/cold drawn, etc.), **grade, type and finish**, as applicable, for the material supplied.

b. **The manufacturer/mill test reports** shall contain the following information:

- Manufacturer/mill's letterhead
- The signature, name and title of the company representative
- The mill test report shall certify to the material specification and revision required by the Purchase Order
 - Exceptions to this requirement may be taken for Material that is reprocessed (such as heat treated, cold worked etc.)

Transcription of test report data is prohibited, unless the original manufacturer/ mill test report is attached.

c. **Distributor Certification** – Raw material purchased from a distributor requires a Certificate of Conformance from each distributor and shall accompany the manufacturer/mill test report. Each certification shall contain the following information:

- Name and address of the company purchasing the material
- Name and address of the company the material was purchased from
- Description of the purchase
- Printed name, title and signature of the supplier's qualified representative or manager
- In the case of raw material transferred by distributors, the material specification and revision are not required on the distributor certification

d. When a supplier document is revised, it shall be identified as a "corrected copy" and all changes shall be identified with an asterisk (*). The revised document shall be re- signed and dated at the time of shipment or submittal of preliminary review of documents (pre-cert review).

e. For "**Level 1**" Purchase Orders (marked as "Level 1" on the PO) Purchase Orders or Raw Material Purchase Orders the following applies:

Specification DI-MISC-81020 applies when chemical and or mechanical properties are altered from the original mill certification. VACCO is requiring in addition to all tests required by the material specification, tensile test shall be performed when material properties are altered due to heat treatment or cold work.

f. Level 1 Purchase Orders - It is recommended to ensure compliance to Level 1 traceability for raw material for Purchase Orders that are specified as "**Level 1**" the supplier should meet the requirements of one of the following:

- The Raw Material should be purchased from a distributor or mill that is trained to Level 1 requirements.
- The Raw Material should be purchased from a supplier that is approved by Electric Boat as a Level 1 Supplier.
- The Raw Material should be purchased from a Distributor that is an approved VACCO Level 1 supplier. The supplier may request a current list from the VACCO buyer.
- The Raw Material/Part is provided by VACCO.

8.2. CERTIFICATION OF CONFORMANCE – Machine Shop Certifications and/or VACCO Supplied Material

A Certification of Conformance on your company's letterhead shall accompany all shipments to VACCO Industries.

The supplier is required to provide documented certification(s) that the material and/or services supplied against this order meet all applicable drawings, specifications and purchase order requirements. Statements on material certifications shall be positive and unqualified. Disclaimers such as "to the best of our knowledge" or "we believe the information contained herein is true" are not acceptable.

The Supplier's Certification of Conformances shall contain:

- VACCO's purchase order number and line item
- Printed name of authorized representative, title, date and signature
- Part number, description, revision, name and quantity
- Applicable specification number(s) and revisions for processes certified by this Supplier. Material Specifications and revision required on mill certification only. Process specifications performed at a subtier are required only on the applicable subtier certifications.
- Where applicable material and/or processing specifications and their revisions if the shipment is not accompanied by the test reports (chemical and physical or original mill test reports).

VACCO Supplied Material - the supplier shall reference VACCO's material certification number (as noted on VACCO's shipping documents) on the supplier's certification of conformance.

When a supplier quality document is revised, it shall be identified as a "corrected copy" and all changes shall be identified with an asterisk (*). The revised document shall be re-signed and dated at the time of correction.

8.3. BASIC CERTIFICATION OF CONFORMANCE

Supplier shall include with each shipment a signed certificate of conformance or compliance to the requirements of the VACCO purchase order and references. The certification shall include:

- VACCO purchase order number,
- Part number or catalog number with dash number if applicable, and revision of product supplied (if applicable),
- Quantity,
- Supplier lot, work order, sales order, or another traceable number.

Additional quality records shall be available for VACCO review upon request.

8.4. Deleted: SPECIAL CERTIFICATIONS

8.5. SPECIAL PROCESS CERTIFICATION

A certification is required to be submitted to VACCO with the shipment of the product for material subject to "special processes" (such as heat treating, welding, surface treatment, etc.). It shall include identification of the process (by applicable specification number, revision, type, class, etc.), name of subcontractor (if other than supplier), signature and certification level of the person performing the process, and serial numbers of parts processed (if applicable).

8.6. WIRE/CABLE CERTIFICATION

Each type of wire or cable on this order shall include a certification indicating the size, color, class, type and the specification to which the material conforms.

8.7. LOX COMPATIBILITY

A certification attesting to the material's compatibility with liquid or gaseous oxygen per VACCO PS-325 (Impact Test Procedure) and NHB 8060.1 is required.

8.8. INDEPENDENT LABORATORY ANALYSIS

A certification, indicating the quantitative values of ingredients (as required by applicable material specification and/or purchase order requirements), from an independent laboratory, is required.

8.9. MERCURY FREE CERTIFICATION

A mercury free statement shall accompany all shipments to VACCO Industries on this purchase order. The mercury free statement may be made directly on all of the test report/certificate of conformance or may be a separate certification. The statement shall certify that during the manufacturing process, material furnished on the above purchase order did not come in contact with mercury or its compounds or any mercury containing devices with a single boundary of containment.

An exception to this statement is if the certification is for one of the following:

- A sample lot is sent for destructive testing,
- A sample lot is sent for testing and that lot is not to be used for production and is packaged separately from the other portion of the lot,
- Material is not moved onto the shop floor and is only processed through as inventory,
- Material is not moved into that company and the certification is for transfer purposes only.

If the supplier chooses to verify the material with a mercury sniffer, then the supplier shall provide a final certification stating a mercury free statement based on the product verification. Then certifications prior to the product verification do not require a mercury free statement.

8.10. DOCUMENTATION CORRECTIONS (Program Specific)

Corrections to documents shall be clearly identified and shall contain the following:

- Explanation of the change (state "added" or identify "removed"),
- Date and initial the change,
- Resign and date the Certification of Conformance to reflect the date of response and annotation,
- Date and initial the original certification date.

The person making any changes, to the documents, shall be the individual who is signing the document. If the person making the change is not authorized to sign the document, but is authorized to make a pen and ink change, they shall also sign with an authorized person.

9. TRACEABILITY AND IDENTIFICATION REQUIREMENTS

Traceability and identification requirements are a verifiable means of tracing materials and parts back to the mill, and or processes from which parts were fabricated. The level of control shall commensurate with the customer's contractual requirements.

9.1. MCS-6 REQUIREMENT (Choose A and amend with B, C, D, E and/or F as applicable per the MCS-6 specification) Suppliers accepting these Purchase Orders shall be identified in VACCO's Quality System as Level 1 and MCS-6 Suppliers.

- A) MCS-6 requirements shall be met as described in this paragraph and paragraphs (B) thru (E) as applicable unless otherwise noted in the Purchase Order or amended by a VACCO Quality

Flow Down text note. If work is subcontracted, this requirement shall be contractually imposed on the subcontractor. Material test specimens or samples as required by the MCS-6 specification shall be retained by the supplier for at least seven (7) years after completion of this purchase order. Material and Product Test Reports requirement is met through VACCO QFD 8.1 and/or 8.2.

- B) Testing for Confirmation of Material Condition (Level A Only) shall be amended to Paragraph (A) and its requirement flowed down in its entirety from MCS-6.
- C) Confirmation of Material Test Reports (Level A and B only) shall be amended to Paragraph (A) and its requirement flowed down in its entirety from MCS-6. The over-check frequency shall meet the additional requirements of VACCO Raw Material Overcheck Program, VI-INSP-102-APPENDIX-1, available on the VACCO website.
- D) Material Traceability (Level A and B Only) shall be amended to Paragraph (A) and its requirement flowed down in its entirety from MCS-6.
- E) Generic Material Identity Testing (Level A, B, and C) shall be amended to Paragraph (A) and its requirement flowed down in its entirety from MCS-6.
- F) Procedural Requirements (Level A, B, and C) shall be amended to Paragraph (A) and its requirement flowed down in its entirety from MCS-6.

MCS-Requirement	A	B	C	D	E	F*
Level C	X				X	X
Level B	X		X	X	X	X
Level A	X	X	X	X	X	X
*Procedural Requirement (F) and certification to MCS-6 is required when all requirements is met for each applicable Level.						

9.2. Deleted (See MCS-6 REQUIREMENT)

9.3. Deleted (See MCS-6 REQUIREMENT)

9.4. "LEVEL 1" TRACEABILITY (Supplier Requirements described in VI-QFD-004)

Suppliers that accept Purchase Orders that have this requirement are directed to review VACCO's procedure VI-QFD-004 located on the VACCO website.

Items with this QFD on the purchase order are designated as "Level I" (for crucial Navy shipboard applications). Suppliers accepting these Purchase Orders shall be identified in VACCO's Quality System as Level 1 Suppliers.

Suppliers shall have an internal process or procedure that addresses the requirements in VACCO's document VI-QFD-004 provided on the VACCO website.

Suppliers that have been reviewed for Level 1 with VACCO Supplied Material are identified in VACCO's Quality System as "VACCO Supplied Material-Level 1." VACCO shall supply material for Level 1 Purchase Orders with these suppliers.

9.5. RAW MATERIAL TRACEABILITY

Prior to machining, the supplier shall identify each piece of material and each test report to provide traceability to the corresponding heat/lot, casting, forging or batch number. This marking shall be applied with waterproof ink or other permanent process. Marking is not required to be visible after the machining process. The machined part shall remain traceable to the test report based on the traveler.

9.6. Deleted – MIL-STD-130 MARKING REQUIREMENTS

9.7. POSITIVE TRACEABILITY OF PARTS (machined metal parts or assemblies)

Parts traceability is required by cross-referencing all manufacturing and shipping documents with reports and certifications for heat lot or uniquely identified components.

9.8. NASA CERTIFICATION/ TRACEABILITY

Documentation, showing date of manufacture and heat, batch or lot number, shall accompany the material furnished on this order. Each lot shall not be intermixed with subsequent lots of the same piece.

9.9. Deleted

9.10. ADDITIONAL MATERIAL TRACEABILITY REQUIREMENTS

- a) Supplier is required to purchase extra raw material to provide a test sample to VACCO Industries.
- b) One sample per heat lot used to produce parts for VACCO shall be shipped with the first shipment of the parts made in the same heat lot per given contract as a test coupon. This requirement applies to each and every contract number on the VACCO purchase order, which means that if the contract number changes or the material heat lot number changes, a new sample will be required.
- c) It is permissible to make multiple lots of parts, dash numbers, or even different part numbers from the same heat lot of material, as long as the date, heat lot, and PO number of the original submission are referenced on the Certificate of Conformance for subsequent shipments. Records adequate to account for all use of the original heat lot shall be maintained. A copy of the traceability record shall be maintained with un-used material and updated as material is issued.
- d) The test sample is to be 8" +/- 0.25" long, by the dimensions of the stock supplied by the mill or distributor to make the parts. For example, if parts are made from 1" diameter rod, then the test sample should be 8" long by 1" in diameter (1" x 8"); if the parts are made from 1" x 1.5" x 48" pieces cut by the mill or distributor from 1" thick, 8" wide, and 84" long hand-forged bars, the sample dimensions should be 1" x 1.5" x 8".
- e) The samples shall be marked by legible metal impression stamp to include the original heat number and VACCO part and purchase order numbers, and be traceable through all production and conversion steps to the original heat number.
- f) The original heat number is defined as the original cast slab, billet, or ingot number from the original melter.
- g) Intermediate production and conversion steps include conversion to re-forging, rolling, drawing, or other intermediate stock, extrusion, conditioning, pickling, testing and inspections, and all other steps necessary to bring the material to the final condition, at which point it is supplied as machining stock. Each converter shall provide documentary proof of conversion of

a specific quantity to specification requirements.

- h) Sheet material less than or equal to 0.1875" thick, wire or rod less than or equal to 0.1875" diameter, weld wire and rod, and fasteners made to military or commercial standard are exempt from this requirement.

9.11. NASA FLOWDOWNS

The items on this purchase order are subject to the full requirements of NASA STD 6008. Unless otherwise stated the items on this purchase order are assumed to be classified as low risk fracture. Only VACCO approved NASA STD 6008 suppliers shall be used for procurement of NASA STD 6008 fasteners. The current list of approved suppliers is maintained in IQS. VACCO approves distributors for procurement; the distributor is required to monitor their subtier suppliers that are used for these orders. This monitoring can be accomplished by various methods such as: desktop audit, checklists or on-site audits. The period of monitoring shall occur within a maximum of 3 years. Traceability Requirements: Per Table 1 of NASA STD 6008 Partial traceability is required for low risk fracture along with certification validation testing (CVT). The validation testing sample size will be per table 4.11.2.2 for Non-approved Manufacturer. All manufacturers are considered Non-approved Manufacturers according to the NASA STD 6008 specification requirements.

A Manufacturer Test Report (MTR) shall accompany every lot procured under NASA STD 6008. The fastener manufacturer shall certify and include all information required by the applicable fastener specification. This shall include: fastener lot number, manufacturing date, lot quantity, raw material heat number, chemical composition, and mechanical and metallurgical test results, as well as special process (passivation, anodize etc.).

Low Risk Fracture document deliverables

- Approved Distributor Certificate of Conformance
- MTR
- Partial Traceability or Complete
- Certification Validation Testing (CVT)
 - 100% Visual
 - 100% Dimensional
 - Tensile (Sampling per lot)
 - Hardness testing may be performed in lieu of tensile testing for washers and inserts.
 - Chemical (Sampling per lot)

10. SPECIAL PROCESS REQUIREMENTS

All drawings that require castings manufactured and inspected to Tech Pub 278 shall be inspected to Tech Pub 278 Change A (issue date 2/14/13) for the clarification of inspection characteristics and acceptance criteria.

10.1. PENETRANT INSPECTION

Liquid penetrant inspection of hardware on this purchase order is required in accordance with the listed specifications, procedures and acceptance criteria. As a minimum, the supplier shall assure

that the following information is included on the certification of inspection.

- a) Part number
- b) Material and heat/lot number
- c) Description/type and/or classification of casting, forging or weldment
- d) Total quantity inspected, quantity accepted and rejected**
- e) Serialization, if delineated
- f) VACCO Industries' purchase order number or the Supplier's subtier purchase order number (if applicable)
- g) Supplier's internal control number
- h) Date of inspection
- i) Procedure, technique sheet # (if applicable*) acceptance criteria and their effective revisions

When required, hardware found to be acceptable by nondestructive examination shall be identified by placing the proper acceptance test/inspection stamp on the physical parts. All hardware found to be unacceptable shall be identified in such a manner which will adequately distinguish the material from the acceptable lot (without physically damaging the parts). In those cases where testing is performed by a subcontractor, a copy of the subcontractor's certification shall accompany any shipment to VACCO Industries. In those cases where testing is performed by VACCO's supplier a separate certification is not required, all requirements shall be provided on the supplier certification.

*Technique sheets are required if parameters are not defined based on the specified process.

**If a sampling process is chosen based on the specification on the drawing or purchase order, the supplier shall send the quantity specified by the purchase order to the testing house (internal or external). The testing house shall select the sample required and certify that the lot quantity is accepted.

10.2. ULTRASONIC INSPECTION

Ultrasonic inspection of hardware on this purchase order is required in accordance with the listed specifications, procedures, scan plans and acceptance criteria. As a minimum, the supplier shall assure that a copy of the corresponding scan plan is provided and that the following information is included on the certification of inspection.

- a) Part number
- b) Material and heat/lot number
- c) Description/type and/or classification of casting, forging or weldment
- d) Total quantity inspected, quantity accepted and rejected
- e) Serialization, if delineated
- f) VACCO industries' purchase order number or the Supplier's subtier purchase order number (if applicable)
- g) Supplier's internal control number
- h) Date of inspection
- i) Procedure, scan plan number, acceptance criteria and their effective revisions

When required, hardware found to be acceptable by nondestructive examination shall be identified by placing the proper acceptance test/inspection stamp on the physical parts.

All hardware found to be unacceptable shall be identified in such a manner which will adequately distinguish the material from the acceptable lot (without physically damaging the parts). In those cases where testing is performed by a subcontractor, a copy of the subcontractor's certification shall accompany any shipment to VACCO Industries. In those cases where testing is performed

by VACCO's supplier a separate certification is not required, all requirements shall be provided on the supplier certification.

10.3. MAGNETIC PARTICLE INSPECTION

Magnetic particle inspection of hardware on this purchase order is required in accordance with the listed specifications, procedures, technique sheets and acceptance criteria. As a minimum, the supplier shall assure that a copy of the corresponding technique sheets is provided and that the following information is included on the certification of inspection.

- a) Part number
- b) Material and heat/lot number
- c) Description/type and/or classification of casting, forging or weldment
- d) Total quantity inspected, quantity accepted and rejected
- e) Serialization, if delineated
- f) VACCO Industries' purchase order number or the Supplier's subtier purchase order number (if applicable)
- g) Supplier's internal control number
- h) Date of inspection
- i) Procedure, technique sheet number, acceptance criteria and their effective revisions

When required, hardware found to be acceptable by nondestructive examination shall be identified by placing the proper acceptance test/inspection stamp on the physical parts.

All hardware found to be unacceptable shall be identified in such a manner which will adequately distinguish the material from the acceptable lot (without physically damaging the parts). In those cases where testing is performed by a subcontractor, a copy of the subcontractor's certification shall accompany any shipment to VACCO Industries. In those cases where testing is performed by VACCO's supplier a separate certification is not required, all requirements shall be provided on the supplier certification.

10.4. RADIOGRAPH INSPECTION

Radiograph inspection (x-ray) of hardware on this purchase order is required in accordance with the listed specifications, procedures, shooting sketches and acceptance criteria. Completed films, technique sheets or shooting sketches and reader sheets shall be provided to VACCO Industries unless otherwise specified. At a minimum, the supplier shall assure that the following information is included on the certification of inspection.

- a) Part number
- b) Material and heat/lot number
- c) Description/type and/or classification of casting, forging or weldment
- d) Total quantity inspected, quantity accepted and rejected
- e) Serialization, if delineated
- f) VACCO Industries' purchase order number or the Supplier's subtier purchase order number (if applicable)
- g) Supplier's internal control number
- h) Date of inspection
- i) Procedure, shooting sketch number, acceptance criteria and their effective revisions

When required, hardware found to be acceptable by nondestructive examination shall be identified by placing the proper acceptance test/inspection stamp on the physical parts. All hardware found to be unacceptable shall be identified in such a manner which will adequately distinguish the material from the acceptable lot (without physically damaging the parts). In those

cases where N.D.E. is performed by a subcontractor, a copy of the subcontractor's certification shall accompany any shipment to VACCO Industries. In those cases where testing is performed by VACCO's supplier a separate certification is not required, all requirements shall be provided on the supplier certification.

10.5. ACCEPTANCE TEST REPORTS (FLOW, SHOCK, VIBRATION, ETC.)

Supplier shall include with each shipment actual copies of acceptance test results, signed by an authorized agent of the supplier, indicating the actual results of acceptance tests required by the purchase order. Where quantitative limits are established within the procedure or specification, the report shall indicate the actual values obtained. The test reports shall include the control identity (e.g. Heat, lot, serial number) of material/items tested.

10.6. HEAT TREATMENT CERTIFICATION REQUIREMENT

Supplier shall perform heat treatment in accordance with the specifications and revisions listed on this purchase order. Supplier shall supply a certification for the heat treatment.

10.7. HEAT TREAT DOCUMENTATION

In addition to the requirements of 10.6 (Heat Treatment Certification Requirement) above, copies of furnace charts and vacuum charts (if applicable) are required showing temperatures, ramp rates, time at temperature, furnace number, vacuum levels, etc.

10.8. HARDNESS REQUIREMENTS FOR HEAT TREATMENT PROCESSORS

Supplier shall record hardness readings on the heat treat certifications for items heat treated on this purchase order.

10.9. SOLDERABILITY

Solderability of external leads and terminals: External leads, pin and terminals of all components shall be tested and comply with the solderability requirements specified in IPC/EIA-J-STD-002.

10.10. WELDING PROCEDURE

Supplier shall furnish proposed welding procedures to buyer for approval prior to production. Changes to approved procedures require VACCO Quality re-approval prior to implementation.

10.11. ELECTROSTATIC DISCHARGE (ESD) PROTECTION

Protection from electrostatic discharge (ESD) damage shall be provided to all class I, II or III ESD susceptible devices in accordance with the manufacturer's requirements. The protection level provided by the original manufacturer shall extend through all procurement, handling, storage, packaging and shipping cycles. ESD shall meet the requirements of ANSI/ESD S20.20.

10.12. PRINTED CIRCUIT BOARDS

The supplier shall assure that the materials, manufacture, testing and packaging of printed circuit boards or printed wiring boards supplied to VACCO Industries are in accordance with all the requirements of MIL-PRF-31032, latest revision, printed circuit board/printed wiring board general and detailed specification, including solderability. Conformance test data shall be provided for each lot shipped to VACCO Industries.

10.13. CUSTOMER APPROVED SOURCES AND PROCESSES

Customer Approved Sources or Processes are required on this order; suppliers will use sub-tiers or approved processes identified on the P.O. The assigned quality engineer will review and sign

off the purchase order prior to release to the supplier.

Q.E. SIGNATURE

DATE

10.14. CERTIFICATION REQUIREMENTS – CLEAN ROOM USE - (Not entered in WDS)

Quality flow downs for Clean Room items and chemicals are provided in VI-QFD-005. All requirements are described on the Purchase Order. The supplier is not required to review the document VI-QFD-005.

10.15. CERTIFICATION REQUIREMENTS – SOLDERING PROCESSES

- A) Solder alloys shall be certified to J-STD-006 or equivalent
- B) Flux shall be certified to J-STD-004 or equivalent

10.16. CLEAN ROOM REQUIREMENTS – (Not entered in WDS)

Clean Room certification requirements are provided in VI-1000. All requirements are described on the Purchase Order. The supplier is not required to review the document VI-1000.

11.0 QUALITY CLAUSE SELECTION

The specific clauses to be used on a purchase order are identified during contract review. The below clauses are inputted into WDS to be used as a set of templates. During the requisition review process, the QE shall tailor the clauses and add or subtract other applicable clauses and any other contract requirements.

11.1 MACHINED PARTS

- QFD-8.2 Certificate of Conformance
- QFD-8.1 MFG/Mill Test Reports
- QFD-6.13 First Article Inspection Report per AS9102
- QFD-6.1 X Specification Effectivity (Shall state A or B)
- QFD-6.2 VACCO Proprietary Procedure and Drawing Requirements
- QFD-6.23A Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD3-6.2; if customer contract requires)
- QFD-6.8 Raw Material Weld Repair Prohibition (Other Than Castings)
- QFD-7.7 Sampling Inspection (Quantity dependent)
- QFD-6.24 Supplier Quality Control System Requirements
- QFD-6.32 Procurement Source Prohibition
- QFD-6.15 Item Lot/Heat Number Individuality (program dependent)
- QFD-8.9 Mercury Free (Navy, Manned Space Flight, Contract Specific)
- QFD-6.21 VACCO Furnished Material/ Tooling/Parts (if applicable)

OPTIONAL REQUIREMENT

- QFD-7.1X Source Inspection (A and/or B plus C as required) – as applicable according to VI-VPP-002

ADDITIONAL REQUIREMENTS FOR LEVEL I

- QFD-9.1 MCS-6 Requirement (Dependent on order)
- QFD-9.4 Level I Traceability (Reference VI-QFD-004)
- QFD-6.15 Item Lot/Heat Number Individuality
- QFD-6.1X Specification Effectivity (Shall state A, B, C or D)
- QFD3-6.X Fraud and Falsification (Program Dependent – VI-QFD-003)

11.2 CASTINGS & FORGINGS

- QFD-8.2 Certificate of Conformance
- QFD-8.1 MFG/Mill Test Reports
- QFD-10.6 Heat Treatment Certification Requirements
- QFD-6.1 X Specification Effectivity (Optional – A or B if required)
- QFD-6.2 VACCO Proprietary Procedure and Drawing Requirements
- QFD-6.23A Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD3-6.2 if customer contract requires)
- QFD-6.3 Packaging Requirements
- QFD-6.24 Supplier Quality Control Systems
- QFD-9.7 Positive Traceability of Parts
- QFD-6.21 VACCO Furnished Material/ Tooling/Parts (if applicable)

ADDITIONAL REQUIREMENTS FOR NON-SERIALIZED PARTS

- QFD 6.15 Item Lot/Heat Number Individuality

11.3 OUTSIDE PROCESSING

a) OUTSIDE TESTING

NOTE: Conduct testing PER _____, REV _____, PARA _____

- QFD-10.5 Acceptance Test Reports
- QFD-8.2 Certificate of Conformance
- QFD-6.23A Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD3-6.2; if customer contract requires)
- QFD-8.9 Mercury Free – Non Destructive Testing only (Navy, Manned Space Flight, Contract Specific)
- QFD-6.21 VACCO Furnished Material/ Tooling/Parts (if applicable)

b) OUTSIDE PROCESSING NDT

NOTE: Inspection to be conducted IAW _____, REV _____

- QFD-8.2 Certificate of Conformance
- QFD-6.18 GIDEP Announcements
- QFD-6.23A Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD3-6.2; if customer contract requires)
- QFD-10.1–10.4 As Applicable
- QFD-8.9 Mercury Free – Non Destructive Testing only (Navy, Manned Space Flight, Contract Specific)
- QFD-6.21 VACCO Furnished Material/ Tooling/Parts (if applicable)

c) OUTSIDE PROCESSING WELDING

NOTE: Welding to be conducted IAW _____, REV _____

- QFD-8.2 Certificate of Conformance
- QFD-6.18 GIDEP Announcements
- QFD-6.23A Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD3-6.2 if customer contract requires)
- QFD-8.9 Mercury Free – Non Destructive Testing only (Navy, Manned Space Flight, Contract Specific)
- QFD-6.21 VACCO Furnished Material/ Tooling/Parts (if applicable)
- QFD-10.1–10.4 As Applicable

d) **OUTSIDE PROCESSING PLATING**

NOTE: Plating to be conducted IAW _____, REV _____

- QFD-8.2 Certificate of Conformance
- QFD-6.18 GIDEP Announcements
- QFD-6.23A Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD3-6.2 if customer contract requires)
- QFD-8.9 Mercury Free – Non Destructive Testing only (Navy, Manned Space Flight, Contract Specific)
- QFD-6.21 VACCO Furnished Material/ Tooling/Parts (if applicable)

11.4 **C.O.T.S. PARTS**

- QFD-8.3 Basic Certificate of Conformance
- QFD-6.25 Counterfeit Work
- QFD-6.1X Specification Effectivity (Optional – A, B, C, or D if required)
- QFD-6.23A Fraudulent Statement Notification (Optional)
- QFD-6.3 Packaging Requirements
- QFD-6.18 GIDEP Announcements
- QFD-8.9 Mercury Free – Non Destructive Testing only (Navy, Manned Space Flight, Contract Specific)

11.5 **RAW MATERIALS**

- QFD-8.1 Manufacturer Mill Test Reports
- QFD-8.2 Certificate of Conformance
- QFD-6.23A Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD3-6.2 if customer contract requires)
- QFD-6.1 X Specification Effectivity (Optional – A or B if required)
- QFD-6.18 GIDEP Announcements
- QFD-6.32 Procurement Source Prohibition
- QFD-6.15 Item Lot/Heat Number Individuality
- QFD-8.9 Mercury Free – Non Destructive Testing only (Navy, Manned Space Flight, Contract Specific)

DOCK TO STOCK – DS05 – WELD KITS (Entered in WDS as DS05)

- QFD-6.1A Specification Effectivity
- QFD-6.15 Item Lot/Heat Number Individuality
- QFD-6.18 GIDEP Announcements
- QFD-6.24 Supplier Quality Control Systems
- QFD-6.25 Counterfeit Work
- QFD-6.26 Handling Precautions



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QFD-6.3	Packaging Requirements
QFD-8.3	Basic Certification of Conformance
QFD-8.9	Mercury Free Certification