

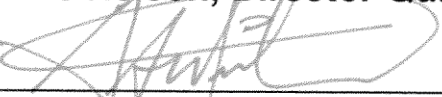


VACCO Quality Flow-Down Instruction

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DOCUMENT CHANGE RECORD

Administrative Change Request

Rev	Date	Responsibility	Description of Change
Initial Release	8/27/2013	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	3/05/2014	John Harmon	See IQS History
1.3	8/25/2014	Birgitta Stocking	Section 6.23B
2.0	3/17/15	Birgitta Stocking	See IQS History 0001168
2.1	3/31/15	Birgitta Stocking	See IQS History 0001175
3.0	6/17/15	Birgitta Stocking	See IQS History 1200
4.0	10/30/2015	Birgitta Stocking	See IQS History CR 0001242

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 flow 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

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) **OEM** – Original Equipment Manufacturer
- e) **FAI** – First Article Inspection
- f) **NADCAP** – National Aerospace And Defense Accreditation Program
- g) **NDT/NDE** – Non-Destructive Test/Evaluation
- h) **QPL** – Qualified Products List

5. PROCESS

- a) 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. Boiler plates are provided in VI-QFD-001 section 11. Boiler plates should be reviewed and tailored as necessary to meet specific contract requirements.
- b) Each clause will be listed on the purchase order in the following format: QFD- paragraph number and title; QFD-002 and title; or QFD3- paragraph number and title, for example paragraph 6.25 Supplier Quality Control System Requirements would be listed as, QFD-6.25 Supplier Quality Control System Requirements.

- c) QFD-6.23B – Purchase Orders placed after the release date of this document for Revision 2.0 shall identify this requirement as 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.

6. GENERAL QUALITY CLAUSES

All certifications, documents and/or reports provided by the supplier shall be legible and reproducible.

6.1. SPECIFICATION EFFECTIVITY

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. 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 shall apply. Contact the buyer if the recent revision of a standard is not available.

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. MATERIAL 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 MSDS 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:

- 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 (Q114)
- g) Batch code
- h) VACCO purchase order number
- i) Expiration date per MIL-HDBK-695

Components shall not have exceeded 25% 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.

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

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 submit their internal cleaning procedure to the Quality Engineer for approval. Procedure approval will be maintained at VACCO and is required only for the first part manufactured with Titanium or if there is a change to the approved procedure.

Upon commencement of the machining 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 subtier suppliers that are responsible for operations that occur after the machining process.

6.13. FIRST ARTICLE REPORT (FAIR) per AS9102

Suppliers fabricating parts for VACCO shall submit a completed FAIR in compliance with AS9102. **FAIR reports 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. 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 the AS9102. Suppliers shall maintain the FAIR reports for a minimum of seven (7) years unless otherwise stated in the contract. Reports 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 as a minimum be identified on each container or certification for material used in processes 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.

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. Deleted

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

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. Supplier is liable for the total value of material, parts, 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 and partially completed items.

6.22. VACCO INDUSTRIES PRELIMINARY CERTIFICATION REVIEW (Choose A and/or B)

A. PRE – PRODUCTION - Supplier test reports and material certifications shall be submitted and approved by VACCO Industries' Quality Assurance Department. Documentation shall be submitted to Quality Assurance Department. Shipments made prior to approval may not be accepted. The Supplier assumes the risk for the manufacture of items prior to approval.

B. PRE – SHIPMENT – All required documentation shall be submitted and approved by VACCO Industries' Quality Assurance Department prior to release for shipment. Shipments made prior to approval may not be accepted.

6.23. FRAUDULENT STATEMENT REQUIREMENTS (Additional statements in VI-QFD-003)

A. The federal statement notification requirements are hereby 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.

B. See VI-QFD-003, Section 6.1.

6.24. SUPPLIER QUALITY CONTROL SYSTEM REQUIREMENTS

At a minimum, supplier shall establish and maintain an orderly system that provides for defect detection, identification, segregation and correction. Such 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.

- | | |
|-----------------|--------------------------------|
| A. MIL-I-45208 | G. MIL-STD-45662 |
| B. ISR-1E | H. ANSI /NCSL Z540.3 or Z540-1 |
| C. MIL-Q-9858 | I. ISO 10012 |
| D. QRC-82 | J. ISO 9001 |
| E. NHB 5300.4 | K. ANSI/ISO/ASQ Q9001 |
| F. MIL-STD-1535 | L. AS9100 |

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 industry reserves the right to perform on-site surveys or inspections at the supplier and/or subtier 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 work" means work that is or contains items misrepresented as having been designed and/or produced under an approved system or other acceptable method. The term also includes approved work that has reached a design life limit or has been damaged beyond possible repair, but is altered and misrepresented as acceptable.

- a) Supplier agrees and shall ensure that Counterfeit Work is not delivered to VACCO Industries.

- b) 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.
- c) 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.
- d) 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. As 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 materials and processes from suppliers not on VACCO's Approved Suppliers List (ASL).

For Suppliers not on the VACCO ASL, usage is approved by VACCO Management.

VICE PRESIDENT QUALITY _____ DATE

DIRECTOR, SUPPLY CHAIN _____ DATE

6.31. VACCO APPROVED SUPPLIER LIST

If suppliers do not have a sub-tier control system they may use VACCO's approved suppliers listed. They may contact their buyer to get VACCO's most up to date Approved Supplier List.

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.

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 flowdown the information 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/>

7. SUPPLIER INSPECTION REQUIREMENTS

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

7.1. VACCO SOURCE INSPECTION

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.

- **IN-PROCESS SOURCE INSPECTION:** Any dimensions that apply prior to any type of plating coating, or slotting shall be inspected and accepted by VACCO Source Inspection prior to that process taking place VACCO will advise the supplier of any additional in-process inspection points for which in-process inspection is required.
- **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. Not required if source is waived.

WAIVED SOURCE INSPECTION: The Quality supervisor or designee shall provide written authorization to the VACCO Industries' buyer to send to the supplier when source inspection is waived. The buyer shall provide this notice to the supplier. Supplier shall provide a copy of this authorization with the shipment of the part.

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. On receipt of this order, promptly furnish a copy to the Government Representative who normally services your plant or, if none, to 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. Supplier inspection sheets shall be provided to VACCO Industries with the hardware at the time of shipment.

7.6. SAMPLING INSPECTION – Option I

Items may be inspected by the supplier's sampling inspection plan which has been pre-approved by VACCO's Quality Assurance Department and which complies with ANSI/ASQC Z 1.4 (normal, level II, single sampling procedures). If the supplier employs an inspection sampling plan, to MIL-STD-105, the latest revision shall apply. The Supplier shall ship evidence of the pre-approved sampling inspection plan with the product unless the file is available at VACCO.

7.7 SAMPLING INSPECTION – Option II

Items may be inspected by the supplier's sampling inspection plan which complies with ANSI/ASQC Z 1.4 (normal, level II, single sampling procedures). If the supplier employs 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 to VACCO's Quality Assurance Department for preapproval. The Supplier shall ship evidence of the pre-approved sampling inspection plan with the product unless the file is available at VACCO.

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.

8.1. MANUFACTURER OR MILL TEST REPORTS - Raw material or Machined Parts

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

- 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, of the material supplied.
- b. The manufacturer/mill test reports shall be on the manufacturer/mill's letterhead and shall

contain the name, title of the company representative and be signed by the suppliers' quality representative or management at the time of shipment or submittal of preliminary review. Transcription of test report data is prohibited, unless the original manufacturer/ mill test report is attached. Statements on test reports 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.

- c. All test reports provided to VACCO Industries shall be legible.
- d. If VACCO or the supplier purchases material from a distributor, a Certificate of Conformance from each distributor which meets the requirements of clause 8.2 shall accompany the manufacturer/mill test report. Each certification shall contain the name of the company purchasing the material.
- e. 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 shipment or submittal of preliminary review of documents (pre-cert review).
- f. For Level 1 (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.

- g. For Purchase Orders to manufacture parts complete that are not identified with "Level 1" on the Purchase Order the following applies (typically POs placed with machine shops): VACCO is requiring that the material specification shall control the method of verification for mechanical properties and or chemical properties anytime the material is altered from the original mill certification.

8.2. CERTIFICATION OF CONFORMANCE (VACCO supplied material or Material Processing)

A Certification of Conformance on your company's letterhead shall accompany all shipments to VACCO Industries. The certification shall contain the printed name, title and signature of the supplier's quality representative or manager.

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. Certification of Conformance shall include:

- part numbers,
- revisions,
- descriptions
- quantity,
- 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).
- In the case of raw material transferred by distributors, the material specification and revision are not required on the distributor certification.

All certifications provided to VACCO industries shall be legible. If VACCO supplied the raw material, the supplier shall reference VACCO's material certification number (as noted on

VACCO's shipping documents) on the supplier's certification of conformance. 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. All certifications, documents and/or reports provided by the supplier related to this order shall be legible, and shall contain the following:

- a) VACCO's purchase order number
- b) Company name
- c) Item part number, revision, name and quantity
- d) Title of authorized representative
- e) e) Applicable specification number(s)
- f) Printed name of authorized representative
- g) Date and signature of authorized representative at the time of shipment or submittal of preliminary review (precertification review)

Records of materials, processes and tests shall be maintained for seven (7) years minimum.

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, the part number or catalog number with dash number if applicable, and revision of product supplied (if applicable), quantity, and a supplier lot, work order, sales order, or other number through which all quality records necessary to verify conformance can be traced. Quality records shall be available for VACCO review upon request.

8.4. Deleted: SPECIAL CERTIFICATIONS

8.5. SPECIAL PROCESS CERTIFICATION - APPROVAL

A certification is required 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 military 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.

The supplier may choose to verify the material with a mercury sniffer and provide a final certification stating a mercury free statement based on the product verification.

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 be commensurate with customers' contractual requirements.

9.1. MCS-6 LEVEL A REQUIREMENT

MCS-6 Level A traceability shall be maintained at all intervals of production. If work is subcontracted, this requirement shall be contractually imposed on the subcontractor, material test specimens or samples required by sections 4.5 and 4.6 of the MCS-6 specification shall be retained by the supplier for at least seven (7) years after completion of this purchase order.

9.2. MCS-6 LEVEL B REQUIREMENT

MCS-6 level B traceability shall be maintained at all intervals of production. The over-check frequency shall meet the additional requirements of PNM-101A addendum. If work is subcontracted, this requirement shall be contractually imposed on the subcontractor. Material test specimens or samples required by sections 4.5 and 4.6 of MCS-6 specification shall be retained by the supplier for at least seven (7) years after completion of this purchase order.

9.3. MCS-6 LEVEL C REQUIREMENT

MCS-6 Level C traceability shall be maintained at all intervals of production. The over-check frequency shall meet the additional requirements of PNM -101A addendum. If work is subcontracted, this requirement shall be contractually imposed on the subcontractor. Material test specimens or samples required by sections 4.5 and 4.6 of MCS-6 specification shall be retained by the supplier for at least seven years after completion of this purchase order.

9.4. "LEVEL I" TRACEABILITY

The items on this purchase order are designated as "Level I" (for crucial Navy shipboard applications). Traceability shall be established by heat/lot, supplier shall ensure that heat/lot segregation is maintained at all times and is not lost, mixed or co-mingled. This requirement for traceability shall be imposed on any subcontractor if work is subcontracted.

The supplier shall have a procedure that addresses traceability requirements for Level 1 parts or material.

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 unused 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.

10. SPECIAL PROCESS REQUIREMENTS

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
- 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 N.D.E. is performed by a subcontractor, a copy of the subcontractor's certification shall accompany any shipment to VACCO Industries.

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

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
- 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 N.D.E. is performed by a subcontractor, a copy of the subcontractor's certification shall accompany any shipment to VACCO Industries.

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
- 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 N.D.E. is performed by a subcontractor, a copy of the subcontractor's certification shall accompany any shipment to VACCO Industries.

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
- 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.

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

11. QUALITY CLAUSE SELECTION

The specific clauses to be used on a purchase order are identified during contract review. During the requisition review process, the QE will tailor the clauses and add any additional applicable clarifying notes relative to Quality Clauses.

Note: For QFD-6.23 choose one of the following:

- 6.23A
- QFD3-6.1, QFD3-6.2, or 6.23B (same as QFD3-6.1) for Purchase Orders placed prior to the release of this document.

11.1. MACHINED PARTS

QFD-8.2	Certificate of Conformance
QFD-7.1	VACCO Source Inspection
QFD-8.1	MFG/Mill Test Reports
QFD-6.13	First Article Inspection Report per AS9102
QFD-6.1	Specification Effectivity
QFD-6.2	VACCO Proprietary Procedure and Drawing Requirements
QFD-6.XX	Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD-6.2)
QFD-6.8	Raw Material Weld Repair Prohibition (Other Than Castings)
QFD-7.6	Sampling Inspection (Based on Contract)
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-6.22 (A and/or B)	VACCO INDUSTRIES PRELIMINARY CERTIFICATION REVIEW

ADDITIONAL REQUIREMENTS FOR LEVEL I

QFD-8.9	Mercury Free
QFD-9.4	Level I Traceability
QFD-6.15	Item Lot/Heat Number Individuality

11.2. CASTINGS & FORGINGS

QFD-8.2	Certificate of Conformance
QFD-8.1	Manufacturer/Mill Test Reports
QFD-10.6	Heat Treatment Certification Requirements
QFD-6.1	Specification Effectivity
QFD-6.2	VACCO Proprietary Procedure and Drawing Requirements
QFD-6.XX	Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD-6.2)
QFD-6.3	Packing Requirements
QFD-7.6	Sampling Inspection (Based on Contract)
QFD-6.24	Supplier Quality Control Systems
QFD9.7	Positive Traceability of Parts
QFD-6.21	VACCO Furnished Material Tooling

ADDITIONAL REQUIREMENTS FOR NON-SERIALIZED PARTS

QFD 6.15	Item Lot/Heat Number Individuality
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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.XX Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD-6.2)

b) OUTSIDE PROCESSING NDT

NOTE: Inspection to be conducted IAW _____, REV _____

QFD-8.2 Certificate of Conformance
QFD-6.18 GIDEP Announcements
QFD-6.XX Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD-6.2)
QFD-10.1 – 10.4 As 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.XX Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD-6.2)

d) OUTSIDE PROCESSING PLATING

NOTE: Plating to be conducted IAW _____, REV _____

QFD-8.2 Certificate of Conformance
QFD-6.18 GIDEP Announcements
QFD-6.XX Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD-6.2)

11.4. C.O.T.S. PARTS

QFD-8.3 Basic Certificate of Conformance
QFD-6.25 Counterfeit Work
QFD-6.1 Specification Effectivity
QFD-6.23A Fraudulent Statement Notification (Optional)
QFD-6.3 Packing Requirements
QFD-6.18 GIDEP Announcements
QFD-6.31 VACCO Approved Supplier List

11.5. RAW MATERIALS

QFD-8.1 Manufacturer Mill Test Reports
QFD-8.2 Certificate of Conformance
QFD-XX Fraudulent Statement Notification (Choose 6.23A, QFD3-6.1 or QFD-6.2)
QFD-6.32 Procurement Source Prohibition
QFD-6.15 Item Lot/Heat Number Individuality