



An ESCO Technologies Company

ISO9001
& AS9100
Certified

VACCO Industries
10350 Vacco Street, South El Monte, CA 91733
TEL 626.443.7121 FAX 626.442.6943

VI-QFD-001 Revision AB

Total Pages: 34

Level: 3

Quality Flow Down Instructions

Prepared by: _____
T Tanurdjaja, Supplier Quality Engineer Date

Approved by: _____
J Gifford, Sen Manager, Supplier Quality Date

Approved by: _____
E Tucker, Manager, Purchasing Date

Approved by: _____
D Phipps, Manager, Purchasing Date

Approved by: _____
L Kahre, Sen Manager QA Date

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

Revision History

Rev	Date	Preparer	Control Number	Description of Change
Z	02/23/2023	T Tanurdjaja	DCR0002204	4.0, Added definitions: MSC & MMPDS 6.25, Revised requirements for Counterfeits Work. Added standardized practice for counterfeit material/part avoidance, detection, mitigation, and disposition. 7.1. Revised VACCO Source Inspection requirements. 7.8 replaced are with is 11.6. Added QFD 7.8
AA	03/01/2023	T Tanurdjaja	DCR0002205	4.0, Added definitions: SAE 6.0, Added references: AS9146 6.25, Revised point b Added New Clause 6.43, Foreign Object Damage/Foreign Object Debris (FOD)
AB	06/26/2023	T Tanurdjaja	DCR0002245	§4.0. Added definitions: EB §6.0. Added reference: EB Spec 2678 Appendix 6: 6.30 Variance clause - Deleted Appendix 7: 7.1. Added supplier requirement for source inspection. Appendix 8: 8.0. Added Electronic Signature requirements. Removed WDS references in Definition, Appendix 10 and Appendix 11.

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

1.0 PURPOSE

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

2.0 SCOPE

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

3.0 RESPONSIBILITIES

3.1 Document Owner: Supplier Quality in conjunction with Quality Assurance

3.2 Buyer/Planner: Ensure adherence to this document for selecting quality clauses. If there is an issue, the buyer/planner should seek clarification from the Supplier Quality and Quality Assurance departments.

3.3 Supplier Quality Engineer: Ensures this document is kept current in conjunction with Quality Engineering.

3.4 Purchasing: Ensures Appendix 5 is current and coordinates changes with Supplier Quality

4.0 DEFINITIONS

Term or Acronym	Definition
ANSI	American National Standards Institute
AS	Aerospace Standard
ASL	Approved Suppliers List
ASQ/ASQC	American Society for Quality/American Society for Quality Control
CAR	Corrective Action Report/Request
CCA	Circuit Card Assembly
COTS	Commercial of the Shelf
CVT	Certification Validation Testing
DCMA	Defense Contract Management Agency
DI-MISC	US Department of Defense Standard
DOM	Date of Manufacture
DTS	Dock to Stock
EIA	Electronic Components Industry Association
EB	General Dynamic Electric Boat
ECHA	European Chemicals Agency
EEE	Electrical, Electronic or Electromechanical
ERP	Enterprise Resource Planning
ESD	Electrostatic Discharge
FAIR	First Article Inspection Report
FAR	Federal Acquisition Regulation
GIDEP	Government Industry Data Exchange Program
ID	Inner Diameter
IEC	International Electrotechnical Commission
IPC	Institute of Printed Circuits
ISO	International Organization for Standardization
ISR	Military standard

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

Term or Acronym	Definition
J-STD	Joint Industry Standard
Level 1	US military designation
MCS-6	US military designation
MIL-HDBK	Military Handbook
MIL-STD/ MIL-I	Military Standard
MMPDS	Metallic Material Properties Development and Standardization Handbook
MSF	Marshall Space Flight Center
MTR	Manufacturer Test Report
NASA STD	National Aeronautics and Space Administration Standard
NAVSEA	Naval Sea Systems Command
NCSL	National Conference of Standards Laboratories
NDT/NDE	Nondestructive Test/Evaluation
NHB	NASA Standard
NIST	National Institute of Standards and Technology
OCM	Original Component Manufacturer
OEM	Original Equipment Manufacturer
PEM	Plastic Encapsulated Microcircuits
P/N	Part Number
PO	Purchase Order
PR	Purchase Requisition
QE	Quality Engineer
QFD	Quality Flow Down
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SAE	Society of Automotive Engineers
SRMR	Supplier Request for Material Review
Tech Pub	NAVSEA Technical Publication
TIR	Total Indicator Runout
US	United States

5.0 PROCEDURE

5.1 Quality clause flow downs are based on VACCO internal and customer requirements.

5.1.1 Each clause for other VI-QFD-XXX documents will be listed on the PO in the following format:

- Paragraph number and title (VI-QFD-001)
- QFD2 (VI-QFD-002 – compliance to the entire document) and title
- QFD3- paragraph number and title (VI-QFD-003)

5.1.2 Dock to Stock parts have a template for the Quality flow down notes identified in Appendix 11 of this document. Additional guidance for Quality Flow down requirements is provided in VI-DTS-001 and QF-SUP-002.

5.1.3 Quality clauses for Chemicals and Clean Room items provided in VI-QFD-005

5.2 Clauses are in located in the appendices of this document. Appendices 1-4 are intentionally left blank.

6.0 REFERENCES

6.1 External Documents

- ANSI/ISO/ASQ Q9001 – Quality Management System Requirements
- ANSI/ASQC Z1.4 – Sampling Procedures and Tables for Inspection by Attributes
- ANSI/ESD S20.20 – For the Development of an Electrostatic Discharge Control Program for – Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)
- ANSI/NCSL Z540-1 – Calibration Laboratories and Measuring and Test Equipment - General Requirements
- ANSI/NCSL Z540.3 – Requirements for The Calibration
- AS5553 – Aerospace Standard for Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition
- AS6081 - Aerospace Standard for Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition - Distributors
- AS6496 - Aerospace Standard for Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition - Authorized/Franchised Distribution
- AS9100 – Quality Systems - Aerospace - Model for Quality Assurance in Design, Development, Production, Installation and Servicing
- AS9102 – Aerospace First Article Inspection Requirement
- AS9146 - Foreign Object Damage (FOD) Prevention Program - Requirements for Aviation, Space, and Defense Organizations
- DI-MISC-81020 – Certification Data for Non-Nuclear Level I Material
- EB Spec 2678 – General Dynamic Electric Boat Quality Control
- FAR 52.245-1 – Government Property
- IPC-2221 – Generic Standard on Printed Board Design
- IPC/EIA J-STD-001 – Requirements for Soldered Electrical and Electronic Assemblies
- IPC/EIA-J-STD-002 – Solderability Tests for Component Leads, Terminations, Lugs, Terminals, and Wires
- IPC-A-610 – Acceptability of Electronic Assemblies
- ISO 9001 – Quality Management Systems-Requirements
- ISO/IEC 17025 – General requirements for the competence of testing and calibration laboratories
- J-STD-004 – Requirements for Soldering Fluxes
- J-STD-006 – Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Application
- MIL-HDBK-5 – US Air Force Metallic Materials and Elements for Aerospace Vehicle Structures
- MIL-HDBK-695 – Rubber Products: Recommended Shelf Life
- MIL-I-45208 with ISR-1 – Inspection System Requirements
- MIL-STD-45662 – Calibration System Requirements
- MMPDS-01 - Metallic Materials Properties Development and Standardization
- MSFC-STD-3619 – Marshal Space Flight Center Counterfeit Electrical, Electronic, and Electromechanical Parts Avoidance, Detection, Mitigation, and Disposition Requirements for Space Flight and Critical Ground Support Hardware
- NASA STD 6008 – Fastener Procurement, Receiving Inspection, and Storage Practices for Spaceflight Hardware
- NHB 5300.4 – Reliability and Quality Assurance Publication Inspection System Provisions for

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

Aeronautical and Space System Material, Parts, Components and Services

- Tech Pub 278 – Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

6.2 Internal Documents

- Supplier Instructions – Located on the VACCO Website
- Supplier Forms – Located on the VACCO Website
- QF-ENV-001 – VACCO Reach Declaration Form
- QF-ENV-002 – Reach Annex XVII Restriction List
- QF-LOG-100 – Property Transfer Authority
- QF-LOG-105 – Property Control System Limited Survey
- QI-SI-001 – Source Inspection Request
- QF-SUP-002 – Approved Suppliers for Dock to Stock
- 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
- VI-MRB-100 – Material Review Instructions
- VI-PQD-001 – Control of Suppliers for Fluid Flow Requirements
- 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
- VI-VPP-001 – APPENDIX-1 – VACCO Source Inspection

Appendix 5: Penalty Clauses

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

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

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.

5.1 1% PENALTY-LATE DELIVERY OR UNACCEPTABLE PRODUCT/DOCUMENT QUALITY

If the Supplier defaults 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.

5.2 2% PENALTY-LATE DELIVERY OR UNACCEPTABLE PRODUCT/DOCUMENT QUALITY

If the Supplier defaults 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.

5.3 3% PENALTY-LATE DELIVERY OR UNACCEPTABLE PRODUCT/DOCUMENT QUALITY

If the Supplier defaults 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.

5.4 4% PENALTY-LATE DELIVERY OR UNACCEPTABLE PRODUCT/DOCUMENT QUALITY

If the Supplier defaults 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.

5.5 5% PENALTY-LATE DELIVERY OR UNACCEPTABLE PRODUCT/DOCUMENT QUALITY

If the Supplier defaults 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.

5.6 NCR COST for UNACCEPTABLE PRODUCT/DOCUMENT 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.

5.15 15% PENALTY-LATE DELIVERY OR UNACCEPTABLE PRODUCT/DOCUMENT QUALITY

If the Supplier defaults 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.

5.20 20% PENALTY-LATE DELIVERY OR UNACCEPTABLE PRODUCT/DOCUMENT QUALITY

If the Supplier defaults 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.

Appendix 6: General Quality Clauses

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 Clause 8.10 Documentation Corrections.

All records shall be retained for 7 (seven) years minimum, unless Clause 6.41 is invoked.

Order of Precedence:

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

- PO
 - Special notes
 - Specifications identified on the PO
 - Quality Flow Down Notes identified as described above
 - PO Flow Downs
- Drawings – identified on the PO
- Documents and specifications referenced in the drawings

6.1 SPECIFICATION EFFECTIVITY

See **6. General Quality Clauses** for additional requirements.

Suppliers that agree to POs that specify raw material revisions are required to comply to these revisions, no substitutions are allowed without an updated PO. If the supplier is unable to locate the revision specified, then the supplier shall contact the buyer to determine how to proceed.

A. Current Revision of Defined Specification – VACCO may intentionally flow down superseded revisions to specifications and standards to meet customer requirements. If the PO does not require specific revisions the following shall apply:

For Raw Material and COTS specifications – Suppliers shall certify work to standards and revisions directed in the PO. When no specific revision is called out in the PO and unless otherwise directed in writing, the current revision is preferred but not required.

COTS specifications – For specifications that are superseded by other specifications, the supplier may provide parts that are certified to either the specification and revision directed on the PO/drawing or the current revision of the specification that supersedes.

For Testing and Process specifications – Suppliers shall certify work to standards and revisions directed in the PO. When no specific revision is called out in the PO the latest revision at the time of manufacture is required.

If the process on the PO or drawing is superseded by a new industry standard at the time of manufacture, then the supplier shall request that the processing house certify to the new industry standard at the current revision.

If the latest revision was released less than 6 months prior to the time of manufacture, a transition time is allowed. The supplier may certify to the previous revision.

6.2 VACCO PROPRIETARY PROCEDURE AND DRAWING REQUIREMENTS

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

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 PO number, quantity, part number/size, description of the items shipped, and appropriate evidence of inspection. Materials from different POs 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, compartmentalization, 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 Deleted

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 ID of 16 inches.
- d) Material provided shall be degreased (28 dry finish) to be acceptable.

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

See **6. General Quality Clauses** for additional requirements.

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 or Batch number
- h) VACCO PO number
- i) Expiration date per MIL-HDBK-695

Components/Materials shall have no less than eighty percent (80%) shelf life remaining at the time of receipt. This flow down note is applicable to components that have a shelf life.

6.8 RAW MATERIAL WELD REPAIR PROHIBITION (OTHER THAN CASTINGS)

See **6. General Quality Clauses** for additional requirements.

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

6.9 Deleted

6.10 Deleted

6.11 VACCO–SUPPLIED MATERIAL/PARTS/EQUIPMENT & CUSTOMER/GOVERNMENT PROPERTY (Flow down either 6.11A, 6.11B, or 6.11C)

See **6. General Quality Clauses** for additional requirements.

A. VACCO – SUPPLIED MATERIAL/PARTS (NON-CUSTOMER/GOVERNMENT PROPERTY) Any material provided to the supplier with this PO 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.

B. VACCO – SUPPLIED CUSTOMER/GOVERNMENT PROPERTY

The Supplier is required to comply with FAR 52.245-1. Supplier will perform annual physical validation of property at their facility and submit a Limited Survey (QF-LOG-105) response to VACCO when requested. Suppliers holding Government property are required to report any loss of property immediately. Supplier shall report immediately to VACCO all property no longer required for disposition of property at their facility. VACCO will provide all direction concerning Government property where VACCO has stewardship.

Supplier shall meet the following requirements:

- Tooling/Fixture is stored in protective storage
- Tooling/Fixture is maintained in good condition
- Tooling/Fixture is serialized
- Tooling/Fixture is retrievable upon request - photos to be provided annually to VACCO for VACCO's auditing process.

A subsidiary record for property accountable to VACCO will be established at the subcontractor's location upon receipt of Government-owned property. The subsidiary record will contain, at a minimum, the following information:

1. Customer Tool number – symbol- series – duplicate – serial
2. USED TO MAKE (VACCO tool number)
3. Current PO number for Property Asset

C. VACCO – TOOLING/FIXTURE MANUFACTURED (VACCO/CUSTOMER/GOVERNMENT PROPERTY)

The Supplier shall complete the form QF-LOG-100 as requested by the Buyer.

Tooling manufactured on this PO shall be used exclusively for VACCO POs. The supplier shall not use this tooling for other purposes. Tooling shall be returned to VACCO at request of VACCO. In addition to the requirements of FAR 52.245-1, the Supplier shall meet the following requirements:

- Tooling/Fixture is stored in a locked, protected storage
- Tooling/Fixture location is tracked
- Tooling/Fixture is maintained in good condition
- Tooling/Fixture is serialized or numbered as described in the PO
- Tooling/Fixture has indication of VACCO ownership
- Tooling/Fixture has "Used to Test VACCO part number" (applicable if dedicated for use to one part number)
- Tooling/Fixture is retrievable upon request - photos to be provided annually to VACCO for VACCO's auditing process.

Suppliers holding property are required to report any loss of property immediately per FAR 52.245-1. Supplier shall report immediately to VACCO all property no longer required for disposition of property at their facility. VACCO will provide all direction concerning Government property where VACCO has stewardship.

Upon completion of the manufacturing of the tool, the Supplier shall provide the following as proof of completion:

- Photos of the Tooling (including photos of the marking described above)
- Certification of conformance of the tool including the following:
 - PO number and Line Item
 - Quantity
 - Description
 - Date of completion

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 written instructions available for review by VACCO Quality upon request.

Upon completion of the cleaning process, handling shall be performed with glove-protected hands, 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

See **6. General Quality Clauses** for additional requirements.

Suppliers shall submit a completed FAIR in accordance with AS9102. **FAIRs are required only if one or more of the following has occurred:**

- The supplier is fabricating/manufacturing the parts/assembly for the first time,
- This is the first time a FAIR is required for this part/assembly,
- A Revision change has occurred to the drawing since the last FAIR submittal. The supplier may submit a delta FAIR,
- The supplier made significant process changes that affect the form, fit or function,
- Two years have lapsed since the last time the supplier has fabricated/manufactured the parts/assembly.

FAIR requirement is excluded for parts ordered by catalog numbers (COTS). Suppliers are not required to submit FAIRs for these parts.

Suppliers should not submit a copy of the FAIR if it is not required per the statements above.

6.14 AGE SENSITIVE MATERIAL

See **6. General Quality Clauses** for additional requirements.

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 PO. Age sensitive materials shall be identified and packaged in accordance with the applicable procurement specification. All materials such as adhesives, sealants, coating materials, and potting compounds, etc.; shall, be identified on each container 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. 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 receipt unless otherwise stated on the PO. Exceptions to this requirement shall be submitted to the buyer for approval.

6.15 ITEM LOT/HEAT NUMBER INDIVIDUALITY

See **6. General Quality Clauses** for additional requirements.

Supplier should provide each PO line item from one lot/batch/heat. In the event that the supplier has multiple lots, each lot shall be packaged separately and clearly identified. The packing slip and certification of conformance shall identify each lot/batch/heat.

6.16 Deleted – See 6.14

6.17 Deleted

6.18 GIDEP ANNOUNCEMENTS

Upon notification of GIDEP (Government Industry Data Exchange) nonconformities from GIDEP, VACCO, or another viable source; the supplier shall take actions to mitigate and eliminate negative effects of nonconformities identified.

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 the supplier is to supply the purchased item with a higher quality than that of the items specified or proposed, then it is requested to bring this fact to the immediate attention of the buyer. This clause will be inserted in all subcontracts and POs 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 (6.22A and 6.22B Deleted)

- C. PROCEDURE** – Documentation for procedure approval shall be submitted to VACCO Industries for approval based on PO and/or drawing requirements.
- D. Nameplate Proofs** are to be submitted and accepted before production. Shipments made prior to approval may not be accepted.

6.23 FRAUDULENT STATEMENT REQUIREMENTS (6.23B Deleted)

- 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.”

Supplier Certifications are not required to contain the statement above. 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 for mill certifications, test documents and VACCO's direct 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 PO. The latest revision of each specification shall apply unless noted:

- | | |
|-----------------------------|-------------------------------|
| A. +MIL-I-45208 | E. ANSI/NCSS Z540.3 or Z540-1 |
| B. +MIL-I-45208 with *ISR-1 | F. ISO 9001 or AS9100/ISO9001 |
| C. NHB 5300.4 | G. ANSI/ISO/ASQ Q9001 |
| D. MIL-STD-45662 | H. ISO/IEC 17025 |

+Last released revision.

Calibration of measurement equipment shall be in compliance with either ANSI/NCSS Z540-1 or ANSI/NCSS 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 ANSI/NCSS Z540-1, ANSI/NCSS Z540.3, or ISO/IEC 17025.

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

See **6. General Quality Clauses** for additional requirements.

For the purpose of this clause, work consists of those parts delivered under this contract that procure and integrate lower 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, and component) which is knowingly misrepresented as a specified genuine part of an original or authorized manufacturer, as further defined in VI-QFD-002. 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 meet the following additional requirements when applicable:
 - For Electronic, Electrical or Electromechanical (EEE) parts, supplier shall have a counterfeit electronic parts control plan that meets SAE AS5553, SAE AS6081, SAE AS6496 or MFSC-STD-3619
 - Full traceability of material for safety critical, fatigue critical and/or fracture critical applications, verifications of material properties shall meet the minimum specified in MIL-HDBK-5 or MMPDS-01
- 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

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

authorized distributor/franchise has been authorized by the OCM/OEM to sell the specific item being procured, prior to issuing a PO. 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.

e) Supplier shall flow down a similar statement to their subtier suppliers.

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 and/or threaded parts, VACCO Industries shall provide end caps.

6.27 Deleted

6.28 Deleted

6.29 DEGREASING – CLEANING

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

6.30 Deleted

6.31 Deleted

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 Identification Tag. Small tools shall be placed in a storage container for protection and a 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 Deleted

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

See **6. General Quality Clauses** for additional requirements.

For each delivery, the supplier 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. The list and form 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
- A statement on the company website declaring compliance.

Suppliers shall flow down the requirement above to their subtiers. Additional Reach information can be found at the European Chemicals (ECHA) Website: <https://echa.europa.eu/>

6.36 Deleted

6.37 Deleted

6.38 COMPLIANCE TO SEC CONFLICT MATERIALS RULE – VACCO will identify 6.38A or 6.38B

See **6. General Quality Clauses** for additional requirements.

These clauses are not applicable for products that are nonmetallic.

- A. Per US Security and Exchange Commission's Conflict Minerals Rule, the supplier of record and the mill certification (if applicable) 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 to VACCO.
 - A statement on the company website declaring compliance is a method of compliance.
- B. Per US Security and Exchange Commission's Conflict Minerals Rule, suppliers and their subtier

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.

- A statement on the company website declaring compliance is a method of compliance.

6.39 Deleted

6.40 EEE PARTS - DATE OF MANUFACTURE

All Electrical, Electronic or Electromechanical (EEE) parts procured from the organization, or its supplier shall have been manufactured within the following:

- Plastic Encapsulated Microcircuits (PEMs) - **Three (3)** years from the delivery date,
- All other EEE parts - **Five (5)** years from the delivery date.

This includes all subassemblies of the article being procured.

6.41 RECORD KEEPING

- A. All records and documents associated to the PO shall be retained at the supplier's facility for a minimum of 10 years. Records shall be available for VACCO review and submittal upon request within the 10 years.
- B. All records and documents associated to the PO shall be retained at the supplier's facility for life. Records shall be available for VACCO review and submittal upon request.

6.42 FLIGHT SAFETY PART

See **6. General Quality Clauses** for additional requirements.

This is a “Flight Safety Part” or “Safety Part” with one or more “Flight Safety Characteristics”. Failure or malfunction of this part after integration into its final assembly could directly result in an unsafe flight condition. Flight Safety Characteristics are designated as Key Characteristics on the VACCO drawing and marked by the symbol . These characteristics may include a dimension, tolerance, surface-finish, material, or electrical attribute which if nonconforming could result in loss of the vehicle or loss of ground or flight personnel. All Key Characteristics specifically marked with the  symbol shall be 100% inspected and actual results recorded regardless of lot size. Delivery of these inspection results with the part is required. Any deviation from the engineering drawing requirements or any nonconforming condition of a designated Key Characteristic (including supplier disposition of “Rework to Print”) is subject to VACCO and VACCO's customer's approval prior to continuing manufacturing and prior to shipment. When reference to a key characteristic appears only in the drawing notes or flag notes without a  symbol annotation (such as in pointing out a particular sealing surface), such features shall be handled with extreme care to prevent damage.

6.43 FOREIGN OBJECT DEBRIS/FOREIGN OBJECT DAMAGE (FOD) PREVENTION REQUIREMENTS.

Foreign objects such as tools, consumables, hardware, product protective devices, personal items, product process debris, operation debris and environmental debris could potentially enter and/or migrate into/on the product or system and can cause damage if not removed or controlled.

- A. Supplier is required to establish and maintain a FOD prevention program throughout the manufacturing process of VACCO product.
- B. Supplier is required to establish and maintain a FOD prevention program that meets the requirement of AS9146 Foreign Object Damage (FOD) Prevention Program.

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

Appendix 7: Inspection Requirements

7.1 VACCO SOURCE INSPECTION

Supplier is required to notify the VACCO Industries' Buyer and Supplier Quality at least two (2) VACCO business days in advance using VACCO Source Inspection Request Form [QF-SI-001](#) by emailing to source@vacco.com. All inspection documents per PO requirement (First Article, Certificate of Conformance, Material, Process and Test Certifications, etc) and parts shall be available at the time of inspection. Supplier shall have all the measurement and inspection equipment readily available during the source inspection.

Exemption - This clause does not apply to POs that is placed with a distributor:

- A. IN PROCESS SOURCE INSPECTION:** Dimensions that apply prior to and cannot be verified after processing, such as, but not limited to, plating/coating application, bending, machining, slotting/cutting or precision cleaning operations shall be reviewed by a member of the VACCO Supplier Quality team or a designated Quality representative prior to the process being performed.
Supplier shall request in-process source inspection and provide an inspection report of the affected dimensions to the Buyer. Supplier may be requested to perform the inspection (up to 100% dimensional) for VACCO Source Inspector to witness. All applicable documents shall be made available during source inspection. VACCO may waive the source inspection requirement by providing a waiver that will be provided by VACCO Supplier Quality that shall be sent along with the shipment of parts and documents.
- B. FINAL SOURCE INSPECTION:** See 7.1 for additional requirements. Parts should be in a ready to ship condition. Upon completion of Source Inspection by a member of Supplier Quality team or a designated Quality representative, the shipping documents or the Certification of Conformance shall be stamped/signed by the VACCO source representative prior to shipping. Supplier may be requested to perform the inspection (up to 100% dimensional) for VACCO Source Inspector to witness. All applicable documents shall be made available during source inspection. VACCO may waive the source inspection requirement by providing a waiver that will be provided by VACCO Supplier Quality that shall be sent along with the shipment of parts and documents.

C. DELETED

7.2 GOVERNMENT SOURCE INSPECTION

SUPPLIER-VERIFY THERE IS A MANDATORY SIGNATURE PRIOR TO PO ACCEPTANCE

A Government Source Inspection is required prior to shipment from your plant. Upon receipt of this Order, promptly notify the Government representative who normally services your plant so that appropriate planning for Government inspection can be accomplished. If you do not have an assigned Government representative, notify the nearest Defense Contract Management Agency (DCMA) Office. In the event that a local Government representative or DCMA Office cannot be located; notify the VACCO Industries' Buyer immediately.

SUPPLIER-NOTIFY THE BUYER IMMEDIATELY IF THERE IS NO SIGNATURE UPON RECEIPT OF THIS PO

DCMA/QAR: _____

Signature: _____

Date: _____

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

7.3 Deleted

7.4 Deleted

7.5 100% FINAL INSPECTION BY SUPPLIER

See **6. General Quality Clauses** for additional requirements.

Supplier shall perform 100% component and end item final inspection of all characteristics and items on the PO and drawing to assure conformance to the 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.

Inspection sheets, with the recorded dimensions, 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 for the Final Inspection report.

7.6 Deleted

7.7 SAMPLING INSPECTION

See **6. General Quality Clauses** for additional requirements.

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.

When 100% inspection is performed, this shall be stated on the supplier certification.

If the supplier performs 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 Department for approval.

For POs that have a deliverable count of less than or equal to 13 (≤ 13) the supplier shall perform 100% inspection. A statement is not required on the supplier certification.

7.8 DOCK TO STOCK PROCESS PER QF-SUP-002

All products that are identified as Dock to Stock shall have this 7.8 Clause on the PO. Dock to Stock products is defined by QF-SUP-002. Additional information is provided in Section 5 of this document.

7.9 CALIBRATION

This PO incorporates by reference:

The supplier shall calibrate the tools, gages and/or Test Equipment subject to this PO in compliance with the requirements of ANSI/NCSL Z540.1 OR ANSI/NCSL Z540.3.

Certification provided must specify direct National Institute of Standards and Technology (NIST) Traceability. If reconditioning is necessary, additional VACCO quality assurance calibration department authorization is required prior to proceeding.

*(*Note: ANSI/NCSL Z540.1 was withdrawn as an active standard (July 2007) and superseded by ANSI/ISO/IEC 17025 (latest revision) for part 1 and ANSI/NCSL Z540.3 (latest revision) for part 2)*

Appendix 8: Supplier Certification of Conformance

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.

When electronic signature is used, electronic signature should be unique and attributable to only one person who has the intent to sign the record with an established password policy use for adequate security and authentication measure. Electronic signature application shall not allow unauthorized users to change electronically signed documents or records. All changes to electronically signed documents, or records made by authorized users shall be revision controlled, identify the person making the change and shall clearly reflect the document, or record has been revised.

Supplier must have a policy for electronic signature use for the electronically signed documents which identify the electronic signer by name and as 'digitally signed' and ensure that all the changes to electronically signed documents are only performed by authorized personnel and that all changes to electronically signed documents or records are properly documented.

Note:

- For all applicable items below (*) signatures may be either electronic or manual. If the electronic signature is legible, then a manual signature and printed name are not required."
- All reports supplied to VACCO Industries shall be legible and be capable of scanning three (3) times.
- See **6. General Quality Clauses** for additional requirements.

8.1 MILL TEST REPORTS - Applicable for metal material/parts from machine shops or raw material houses) See 8.11 for non-metal parts.

See **8. Certification Requirements** for general certification requirements.

The Supplier shall furnish copies of the original 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.

When a supplier document is revised, it shall be identified as a "corrected copy" and all changes shall be identified as a change. The revised document shall be re-signed and dated at the time of correction.

a. **The mill test reports** shall contain the following information:

- Mill letterhead
- *Legible name of authorized representative, title, date, and signature
- The mill test report shall certify to the material specification and revision required by the PO
- All acceptance test results required by the material specifications

b. **Distributor Certification** – Raw material purchased from a distributor shall include a Certificate of Conformance from each distributor and the 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

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

- Description of the purchase
- *Printed name of authorized representative, title, date, and signature

In the case of raw material transferred by distributors, the material specification and revision are not required on the distributor certification.

- c. **Level 1 POs** - (marked as "Level 1" on the PO)-Specification DI-MISC-81020 applies when chemical and or mechanical properties are altered from the original mill certification (heat treated or cold worked). In addition to all tests required by the material specification, tensile test shall be performed.
- d. **Level 1 POs** – Recommended for Level 1 material.
 - 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 list from the VACCO buyer
 - The Raw Material/Part is provided by VACCO

8.2 SUPPLIER CERTIFICATION OF CONFORMANCE

See **8. Certification Requirements** for general certification requirements.

A Certification of Conformance on the 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 PO requirements. Statements on the supplier's certification 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 PO number
- *Legible name of authorized representative, title, date, and signature
- Part number, description, revision, 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
- 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) or processing certifications

NOTE: Specifications numbers and revisions that are identified on the Supplier/subtier certifications shall be the same as those mentioned on the PO or drawing.

When a supplier document is revised, it shall be identified as a "corrected copy" and all changes shall be identified as a change. The revised document shall be re-signed and dated.

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.

PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED

8.3 BASIC CERTIFICATION OF CONFORMANCE

See **8. Certification Requirements** for general certification requirements.

Supplier shall include with each shipment a certificate of conformance or compliance that meets the requirements of the VACCO PO. The certification shall include:

- VACCO PO number
- *Legible name of authorized representative, title, date, and signature
- Part number, tool 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 (if applicable)
- Chemicals and gases (expiration date if applicable) – If shelf life is indefinite Certification of Conformance shall state “indefinite”

Quality records specified in the PO shall be available for VACCO review.

Dock to Stock Suppliers only:

Suppliers that have a website login certification access, the certification shall be available online to applicable VACCO personnel. A packing slip will be submitted with the shipment.

For weld kits, the supplier will provide a Basic Certification of Conformance and the mill certification will be kept on file by the supplier for at least 7 years.

8.4 Deleted

8.5 SPECIAL PROCESS CERTIFICATION

See **8. Certification Requirements** for general certification requirements.

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

8.6 WIRE/CABLE CERTIFICATION

See **8. Certification Requirements** for general certification requirements.

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 wire conforms.

8.7 Deleted

8.8 Deleted

8.9 MERCURY FREE CERTIFICATION

See **8. Certification Requirements** for general certification requirements.

A mercury free statement shall accompany all shipments to VACCO Industries on this PO. The mercury free statement shall be on the test report/certificate of conformance of supplier and all subtiers or may be a separate certification. A REACH statement in accordance with QFD Clause 6.35 may be provided in place of this statement. The statement shall certify that during the manufacturing process, material furnished on the PO did not come in contact with mercury or its compounds.

Exceptions to this requirement include:

- Certifications with a distributor's name for electronics and hardware
- Nonmetallic parts or processing/testing of nonmetallic parts
- 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 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 mercury testing. Then certifications prior to the testing do not require a mercury free statement.

8.10 DOCUMENTATION CORRECTIONS

A corrected copy is a document that is defined as:

- A document that is Received at VACCO with cross outs
- A document that needs to be altered after VACCO has received the product
 - Including handwritten or typed information

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

- Document shall be identified as "Corrected Copy"
- A list of the items that were added or removed (state "added" or "removed")
- All changes shall be identified with an "*" and be Dated and initialed
- Manual changes - shall have a single line cross out
- Manual changes - The original entry shall remain legible
- The document shall be resigned, dated, and title. The signature shall be from one of the following:
 - The original person
 - Supervisor of the original person
 - Designee defined

8.11 SUPPLIER SOURCE CERTIFICATION (For Non-metallic material: plastics, nylon, delrin, magnets, magnetics etc.) Used in place of 8.1.

See **8. Certification Requirements** for general certification requirements.

The Supplier shall furnish a document identifying the original source of the material, containing the following information:

- Source company's letterhead – Name and address

- Description of the purchase
- Lot number (number may not match the final lot number of the product but should be referenced on the Supplier's certification)
- Applicable specifications (may not be the final specification on the PO or drawing)

The document may be identified as a Certification of Conformance, Packing Slip or Bill of Lading.

8.12 Deleted

8.13 Circuit Card Assembly (CCA) Certification

See **8. Certification Requirements** for general certification requirements.

Soldering and Component Mounting shall be in accordance with the requirements of IPC/EIA J-STD-001, Class 3 and the workmanship standards of IPC-A-610 Class 3.

The VACCO's supplier shall provide the following from the supplier point of origin:

- Certification from the Printed Circuit Board Supplier in accordance with clause 8.3
- Certification from the Circuit Card Assembly Supplier in accordance with clause 8.3
- Certification from any processing houses: such as conformal coating
- Certification from VACCO's supplier – if this is not one of the above

The above certifications shall include all of statements of all testing or processing performed including the specification and revision of the testing/processing based on PO and drawing requirements.

Printed Circuit Boards shall be in accordance with clause 10.12.

Testing and Processing revisions shall be in accordance with clause 6.1A.

ESD Packaging shall be in accordance with clause 10.11.

Components for CCA will be purchased per clause 6.25.

Appendix 9: Traceability and Identification Requirements

9.1 MCS-6 REQUIREMENT (MCS-6 Suppliers)

See 8. **Certification Requirements** for general certification requirements.

Supplier shall meet the requirements of MCS-6 specification based on Level identified in the drawing.

- A) 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 requirements of VACCO Raw Material Overcheck (Independent testing) Program, VI-INSP-102-APPENDIX-1, available on the VACCO website.

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 accepting POs with this requirement shall review procedure VI-QFD-004 located on the VACCO website and understand these orders are for crucial Navy shipboard applications. They shall have an internal process that addresses these requirements. These suppliers shall be identified in VACCO's Quality System as Level 1.

9.5 RAW MATERIAL TRACEABILITY

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

9.6 Deleted

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

See 8. **Certification Requirements** for general certification requirements.

Parts traceability is required by cross-referencing all manufacturing and shipping documents with reports and certifications for heat lot or uniquely identified components or lots. Records shall be available for review upon request.

9.8 NASA CERTIFICATION/ TRACEABILITY

See 8. **Certification Requirements** for general certification requirements.

The Supplier shall clearly state on the Supplier Certification the **"Date of Manufacture" or DOM and the heat, batch, or lot number**. Each lot shall not be intermixed with subsequent lots of the same piece. It will not be assumed that the certification date is the DOM.

9.9 Deleted

9.10 Deleted

9.11 NASA STD 6008 FASTENER TESTING REQUIREMENTS

See **8. Certification Requirements** for general certification requirements.

The items on this PO are subject to the requirements of **NASA STD 6008**. Unless otherwise stated, the items on this PO are assumed to be classified as low risk fracture. VACCO approved NASA STD 6008 suppliers shall be used for procurement of NASA STD 6008 fasteners. The following traceability requirements apply:

- NASA STD 6008 (Table 1) Partial traceability is required for low-risk fracture along with certification validation testing (CVT)
- Validation testing sample size, Table 4.11.2.2 Non-approved Manufacturer

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 in accordance with NASA STD 6008
 - Tensile (Sampling per lot)
 - Hardness testing may be performed in lieu of tensile testing for washers and inserts.
 - Chemical (Sampling per lot)

Appendix 10: Special Process Requirements

See **8. Certification Requirements** for general certification 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.

Applicable for Sections 10.1-10.4: 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' PO number or the Supplier's subtier PO number (if applicable)
- g) Supplier's internal control number
- h) Date of inspection
- i) Procedure, acceptance criteria and their effective revisions
- j) Applicable documents: Technique sheet number (*Penetrant and Magnetic), Scan plan number (Ultrasonic); Shooting sketch (Radiograph)
- k) Applicable Specifications
- l) Signature, Title and printed name of the Level 2 or Level 3 personnel who performed the test.
(Applicable for Penetrant Inspection only)

Alternate Approach – This applies to Suppliers that are the manufacturer and have the capability of performing In House Testing.

When testing is performed by VACCO's supplier a separate certification is not required, to certify to the results of these tests, the Supplier may list the test type and/or specification on their Certification of Compliance. The supplier may sign the Certification of Compliance as the authorized signature.

10.1 PENETRANT INSPECTION

See **10. Special Process Requirements** for additional requirements.

Liquid penetrant inspection of hardware on this PO is required in accordance with the listed specifications, procedures, and acceptance criteria.

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.

*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 PO, the supplier shall send the quantity specified by the PO 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

See **10. Special Process Requirements** for additional requirements.

Ultrasonic inspection of hardware on this PO is required in accordance with the listed specifications, procedures, scan plans and acceptance criteria. At a minimum, the supplier shall assure that a copy of the corresponding scan plan is provided.

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.

10.3 MAGNETIC PARTICLE INSPECTION

See **10. Special Process Requirements** for additional requirements.

Magnetic particle inspection of hardware on this PO is required in accordance with the listed specifications, procedures, technique sheets and acceptance criteria. At a minimum, the supplier shall assure that a copy of the corresponding technique sheets is provided.

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.

10.4 RADIOGRAPH INSPECTION

See **10. Special Process Requirements** for additional requirements.

Radiograph inspection (x-ray) of hardware on this PO 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.

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 NDE 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 copies of acceptance test results, signed by an authorized agent of the supplier, indicating the results of acceptance tests required by the PO. Where quantitative limits are established within the procedure or specification, the report shall indicate the 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 PO. Supplier shall supply a certification for the heat treatment.

10.7 HEAT TREAT DOCUMENTATION

In addition to the requirements of 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 PO.

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 Deleted

10.11 ELECTROSTATIC DISCHARGE (ESD) PROTECTION

Protection from electrostatic discharge (ESD) damage shall be provided to all Classes for ESD susceptible devices in accordance with the manufacturer's requirements. The protection level required by the original manufacturer shall extend through all procurement, handling, storage, packaging, and shipping cycles. ESD protection 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:

- IPC-2221 Class 3, 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.

For Customer Approved Sources not available to the Supplier the following will apply:

- A list of Approved Subtiers for each process shall be provided from the QE to the Buyer
- The Buyer shall provide a list to the Supplier

QE SIGNATURE

DATE

For Customer Approved Sources available on a public accessible website:

- The QE will provide the website address on the PO
- A QE signature is not required
- The Supplier shall select an approved subtier and location for the process required

Parts that are in Supplier stock – The Supplier shall contact the Buyer prior to shipment to verify that the subtier at that location was approved for that process at the time of manufacturing.

10.14 CERTIFICATION REQUIREMENTS – CLEAN ROOM USE

Quality flow downs for Clean Room items and chemicals are provided in VI-QFD-005. All requirements are described on the PO.

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

Clean Room certification requirements are provided in VI-1000. All requirements are described on the PO.

10.17 EDDY CURRENT NDE INSPECTION

Eddy Current NDE Inspection of hardware on this PO is required in accordance with the listed specifications, procedures, sketches, applicable specifications, and acceptance criteria.

At a minimum, the supplier shall assure that the following information is included on the certification of inspection.

- a) Part number
- b) Total quantity inspected, quantity accepted and rejected
- c) Serialization, if provided
- d) VACCO Industries' PO number or the Supplier's subtier PO number (if applicable)
- e) Supplier's internal control number
- f) Date of inspection
- g) Applicable Specifications

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.

10.18 EQUIPMENT COMMISSIONING

Equipment commissioning is required to ensure that all systems and components of a building, new or modified equipment and/or systems in a facility. This process ensures safety and compliance requirements are met and personnel are adequately trained.

10.19 PREVENTATIVE MAINTENANCE

Preventive maintenance is required for equipment that is serviceable, could possibly result in an unsafe condition if improperly maintained or could result in work interruptions if failure occurs.

10.20 CALIBRATION REQUIREMENT

Calibration is required for equipment that is used for acceptance of product, including 1st piece, First Article and final inspection, and should be performed on equipment that calibration is required by the manufacturer.

Appendix 11: Quality Clause Selection

The clauses are identified during contract review. The information below is a selection guide.

*Clause 11.3d is entered in PO for devices to be calibrated.

11.1 MACHINED PARTS (Metal parts)

6.1A	Specification Effectivity
6.13	First Article Inspection Report per AS9102
6.15	Item Lot/Heat Number Individuality
6.15	Item Lot/Heat Number Individuality
6.18	GIDEP Announcements
6.2	VACCO Proprietary Procedure and Drawing Requirements
6.21	VACCO Furnished Material/ Tooling/Parts (if applicable)
6.23A	Fraudulent Statement Notification
6.24	Supplier Quality Control System Requirements
6.3	Packaging Requirements
7.1X	In-process or Final Source Inspection (Optional A, B or C – as Required)
8.1	Mill Test Reports
8.2	Supplier Certificate of Conformance
8.9	Mercury Free

ADDITIONAL REQUIREMENTS FOR LEVEL 1

9.1	MCS-6 Requirement (Dependent on order)
9.4	Level 1 Traceability (Reference VI-QFD-004)
QFD3-6.X	Fraud and Falsification (Program Dependent – VI-QFD-003)

11.2 CASTINGS & FORGINGS

6.1A	Specification Effectivity
6.13	First Article Inspection Report per AS9102
6.15	Item Lot/Heat Number Individuality
6.2	VACCO Proprietary Procedure and Drawing Requirements
6.21	VACCO Furnished Material/ Tooling/Parts (if applicable)
6.23A	Fraudulent Statement Notification (QFD3-6.1 or QFD3-6.2 if required)
6.24	Supplier Quality Control System Requirements
6.3	Packaging Requirements
8.1	Mill Test Report
8.2	Supplier Certificate of Conformance
8.9	Mercury Free
9.7	Positive Traceability of Parts
10.6	Heat Treatment Certification Requirements (if applicable)

11.3 OUTSIDE PROCESSING

a) OUTSIDE TESTING

6.21	VACCO Furnished Material/ Tooling/Parts (if applicable)
6.23A	Fraudulent Statement Notification (QFD3-6.1 or QFD3-6.2 if required)
6.26	Handling Precautions for Outside Processing Test
6.3	Packaging Requirements
8.2	Supplier Certificate of Conformance
8.9	Mercury Free – Nondestructive Testing only
10.5	Acceptance Test Reports

b) OUTSIDE PROCESSING NDT and WELDING

6.18	GIDEP Announcements
6.21	VACCO Furnished Material/ Tooling/Parts (if applicable)
6.23A	Fraudulent Statement Notification (QFD3-6.1 or QFD3-6.2 if required)
6.26	Handling Precautions for Outside Processing Test
6.3	Packaging Requirements
8.2	Supplier Certificate of Conformance
8.9	Mercury Free – Nondestructive Testing only
10.5	Acceptance Test Reports
10.1 or 10.17	As Applicable

c) OUTSIDE PROCESSING PLATING

6.18	GIDEP Announcements
6.21	VACCO Furnished Material/ Tooling/Parts (if applicable)
6.23A	Fraudulent Statement Notification (QFD3-6.1 or QFD3-6.2 if required)
6.26	Handling Precautions for Outside Processing/Test
6.26	Handling Precautions for Outside Processing Test
6.3	Packaging Requirements
8.2	Supplier Certificate of Conformance
8.9	Mercury Free – Nondestructive Testing only
10.1 or 10.17	As Applicable

d) OUTSIDE PROCESSING CALIBRATION*

6.18	GIDEP Announcements
6.21	VACCO Furnished Material/Tooling/Parts
6.24	Supplier Quality Control System Requirements
6.26	Handling Precautions for Outside Processing/Test
6.3	Packaging Requirements
7.9	Calibration
8.3	Basic Certification of Conformance

11.4 COTS PARTS & Name Plates

6.1X	Specification Effectivity (Optional – A, B, C, or D if required)
6.18	GIDEP Announcements
6.22D	Nameplate Proofs (Name Plates only)
6.23A	Fraudulent Statement Notification
6.25	Counterfeit Work (COTS only)
6.3	Packaging Requirements
8.3	Basic Certificate of Conformance
8.9	Mercury Free

11.5 RAW MATERIALS

6.1A	Specification Effectivity
6.13	First Article Inspection Report per AS9102
6.15	Item Lot/Heat Number Individuality
6.15	Item Lot/Heat Number Individuality (program dependent)
6.2	VACCO Proprietary Procedure and Drawing Requirements
6.23A	Fraudulent Statement Notification (QFD3-6.1 or QFD3-6.2 if required)
6.24	Supplier Quality Control System Requirements
6.3	Packaging Requirements
6.32	Procurement Source Prohibition
8.1	Mill Test Reports
8.2	Supplier Certificate of Conformance
8.9	Mercury Free

11.6 DOCK TO STOCK – DS05 – WELD KITS

6.1A	Specification Effectivity
6.15	Item Lot/Heat Number Individuality
6.18	GIDEP Announcements
6.18	GIDEP Announcements
6.24	Supplier Quality Control Systems
6.26	Handling Precautions
6.3	Packaging Requirements
7.8	Dock to Stock Process for Weld Kits Parts
8.3	Basic Certification of Conformance
8.9	Mercury Free – Nondestructive Testing only

11.7 DOCK TO STOCK – COTS PARTS and Gases (as identified in QF-SUP-002)

6.18	GIDEP Announcements
6.1A	Specification Effectivity
6.20	Manned Space Flight (Manned Space Flight only) (COTS Parts only)
6.23A	Fraudulent Statement Notification
6.25	Counterfeit Work - (COTS Parts only)
6.3	Packaging Requirements (COTS Parts only)
7.8	Dock to Stock Process for COTS parts (COTS Parts only)
8.3	Basic Certification of Conformance
8.9	Mercury Free – (COTS Parts only)

11.8 CIRCUIT CARD ASSEMBLIES (CCAs)

6.1A	Specification Effectivity
6.18	GIDEP Announcements
6.23A	Fraudulent Statement Notification
6.25	Counterfeit Work (COTS only)
6.3	Packaging Requirements
8.9	Mercury Free
10.11	Electrostatic Discharge Protection
813	Circuit Card Assembly Certification