



**ATK Aerospace Structures
Clearfield, UT 84016-0433**

(801) 775-1262

QUALITY ASSURANCE DOCUMENT

HD-SG-2-1000CS REVISION 05

Effective: 29-February-2008

QUALITY ASSURANCE REQUIREMENTS

FOR PURCHASE AGREEMENTS

APPROVED

/s/ Don Pritchard

Don Pritchard
DIRECTOR, Quality Assurance

Date: 29-February-2008

/s/ Michael Meehan

Michael Meehan
DIRECTOR, Purchasing

Date: 29-February-2008

TABLE OF CONTENTS

INTRODUCTION 4

DEFINITIONS 5

QUALITY ASSURANCE SYSTEM REQUIREMENTS

 A1 MIL-Q-9858A 6

 A2 MIL-I-45208A 6

 A3 QUALITY SYSTEM PER PURCHASE AGREEMENT 6

 A4 ISO 9001 6

 A7 CALIBRATION..... 6

 A8 MIL-STD-1520 6

 A9 GE S-1000 6

 A10 AS9100 6

 A11 AC7004..... 6

 A12 NADCAP..... 6

GENERAL QUALITY REQUIREMENTS

 B1 RIGHT OF ACCESS 7

 B2 TRACEABILITY 7

 B3 CHANGE NOTIFICATION 7

 B4 DOCUMENTATION CONTROL 7

 B5 ACCEPTANCE TOOLING 8

 B6 PACKAGING AND SHIPPING 8

 B7 ACCEPTANCE TEST PROCEDURES 8

 B8 STATEMENT OF WORK 9

 B9 USE OF APPROVED SPECIAL PROCESS SOURCES 9

 B10 MATERIAL SPECIFICATIONS USED FOR PROCUREMENT OF MATERIALS 9

PROCESS CONTROL

C1	WORK INSTRUCTIONS	9
C1A	PROCESS MODIFICATION AND/OR CHANGES.....	9
C2	STATISTICAL PROCESS CONTROL	10
C2A	AS9103, VARIATION MANAGEMENT OF KEY CHARACTERISTICS.....	10
C3	SPECIAL PROCESSES	10
C4	AGE CONTROL	10
C5	ENVIRONMENTAL CONTROL	11
C6	MODIFICATION OF QUALIFIED MATERIAL AND PROCESSES	11
C7	PERSONNEL TRAINING	11
C8	CONTAMINATION CONTROL	11
C9	FOREIGN OBJECT DAMAGE (FOD) PREVENTION	11
C10	WELDING	11

INSPECTION AND REPORTING

D1	NONCONFORMING MATERIAL	12
D2	SAMPLING	14
D3	ATK INSPECTION DATA FORMS.....	14
D4	SUPPLIER INSPECTION FORMS.....	15
D5	SOFTWARE CONTROL.....	15
D6	ATK FURNISHED MATERIALS.....	16
D7	FIRST ARTICLE INSPECTION OR PROCESS PROOFING	16
D8	CERTIFICATE OF ANALYSIS.....	16
D9	CERTIFICATE OF CONFORMANCE.....	16
D10	RETENTION OF RECORDS	17
D11	INSPECTION DATA	17
D12	ACCEPTANCE AT DESTINATION.....	17

D13	ATK SOURCE INSPECTION	17
D14	GOVERNMENT SOURCE INSPECTION	17
D15	CRITICAL FASTENERS.....	18
D16	RAW CASTINGS AND FORGINGS	18
D17	HEAT TREAT	18
D18	TENSILE TEST	18
D19	TEST REPORTS.....	18
D20	FAILURE ANALYSIS REPORT	19
D21	CHEMICAL AND PHYSICAL TEST REPORTS	19
D22	TEST SAMPLES	19
D23	AGE CONTROL OF RUBBER GOODS.....	19
D24	RADIOGRAPHIC SUBMITTAL.....	19
D25	CRITICAL CHARACTERISTIC INSPECTION.....	19
D26	PRE-SHIPMENT REVIEW	20
D27	METAL RAW MATERIAL DATA PACKAGE.....	20
D28	FEDERAL AVIATION ADMINISTRATION (FAA) SOURCE INSPECTION	20
D29	AS9102, FIRST ARTICLE INSPECTION REQUIREMENT	20
D30	REPORTING, ROUNDING, AND RECORDING OF DIMENSIONAL INSPECTION DATA.....	20

AUDITS AND SURVEILLANCE

E1	PERFORMANCE OF AUDITS	21
E2	ATK AUDIT	21
E3	SOURCE SURVEILLANCE	21

INTRODUCTION

This document defines the quality assurance requirements for suppliers of materials (raw material, hardware, components, assemblies and tools) and services to ATK Space Systems, Aerospace Structures Division. THE SUPPLIER IS RESPONSIBLE FOR ASSURANCE, AND UPON REQUEST, TO PROVIDE OBJECTIVE EVIDENCE THAT ALL MATERIALS AND SERVICES PROVIDED ARE IN COMPLIANCE WITH THE PURCHASE AGREEMENT REQUIREMENTS WHETHER MATERIALS ARE MANUFACTURED OR SERVICES ARE RENDERED BY THE SUPPLIER DIRECTLY OR OBTAINED THROUGH PURCHASE AGREEMENTS WITH SUBTIER SUPPLIERS. Unless otherwise specified the supplier may select all subtier suppliers. However, whether the selection was dictated by ATK Aerospace Structures or of the supplier's choice the supplier must flow down the applicable ATK Aerospace Structures purchase agreement requirements to the subtier supplier.

Only the paragraphs of this document that are referenced in the purchase agreement apply. Additional quality requirements may be stated directly in the purchase agreement and supplement the referenced paragraphs. In the event of conflict between the quality provisions and other purchase agreement requirements, the supplier shall obtain clarification from ATK Aerospace Structures. All ATK Aerospace Structures approvals and supplier requests for approval referenced in this document shall be by and through the ATK Aerospace Structures buyer in writing. Unless otherwise specified ATK Aerospace Structures as referenced in this document for inquiry, notification or document submittal is the ATK Aerospace Structures buyer.

The word "Company" used throughout this document refers to ATK Aerospace Structures - Clearfield.

SUPPLIER EXCEPTIONS TO PURCHASE ORDER REQUIREMENTS ARE NOT ALLOWED. AN EXCEPTION IS DEFINED AS ANY ATTEMPT TO CERTIFY MATERIAL TO A SPECIFICATION WITHOUT MEETING ALL REQUIREMENTS. EXAMPLES OF EXCEPTIONS ARE VALUES THAT DO NOT MEET SPECIFICATION REQUIREMENTS, ALTERNATE TEST METHODS, OR CERTIFICATION TO REVISIONS THAT ARE NOT CALLED OUT IN THE PURCHASE ORDER.

DEFINITIONS

PRR – Preliminary Review Record –A record that is initiated when a nonconformance is found or the acceptability of material is in question (nonconformance is suspected).

DER - Discrepancy Event Record - A record that has been referred to the Material Review board (MRB) for action.

Lot or Batch - A collection of material compounded at one time or during one continuous, uninterrupted process, bearing identification and treated as a unique entity.

NOTE: Lot designation shall capture any change in special processes (e.g., heat treat, chemical processing, plating, welding, etc.) when a separate lot number has been assigned to document the process. (Example: A single lot of raw metal that is split into two heat treat lots, the supplier shall identify them uniquely and not combine them into a single lot number.

Nonconforming Material (NCM) - Deliverable material that has a departure from, or noncompliance to, a design document (specification, drawing, other approved product description, or planned quality inspection) or contractual requirement.

Process Control Tooling - Tooling used in the fabrication of a component wherein there exists a requirement to maintain specific environmental conditions, such as time, temperature and pressure during part manufacture.

QCID - Quality Control Inspection Data - Company document for identification of inspection requirements and recording of data.

QPSL - Qualified Product Supplier List - A Company document listing suppliers whose product has successfully met qualification requirements for a specific program. Document may be identified as (Qualified Product Suppliers List), (Products, Materials and Process List) or (Approved Parts List and Materials and Process List).

Note: For the D-5 Program, the QPSL is controlled by ATK Thiokol.

Quality Assurance Field Representative - A Company representative who visits a supplier to inspect products or otherwise verify supplier conformance to Company purchase agreements.

Scrap - Nonconforming material that is not useable for its intended purpose and which cannot be economically reworked or cannot be repaired in a manner acceptable to the Company.

Repair – An MRB disposition where nonconforming material is returned to a useable condition although not within drawing and/or specification requirements.

Rework – A Preliminary Review or MRB disposition where nonconforming material is returned to design requirements when it can be accomplished without adverse effect and without using methods of manufacturing other than those originally used.

Use-As-Is—An MRB disposition to use NCM without modifying the reported condition. The nonconforming condition is determined by the Company’s engineering and quality representatives to be satisfactory for its intended use. Use-As-Is dispositions shall be referred to MRB, require MRB approval, and shall be completed on a DER.

Special Process – Special processes are those where characteristics or features may be inaccessible after processing. Any process where the resulting output cannot be verified by subsequent monitoring or measurement. Examples of special processes include but are not limited to the following: plating, painting, NDT, coating, welding, etc.

Special Tooling - All jigs, dies, fixtures, patterns, molds, gages, process equipment, special test equipment and other special equipment, and manufacturing aids acquired and/or fabricated by or for the Company for compliance with the purchase agreement.

Subtier Supplier - A contractor that furnishes materials or services to a supplier who uses those materials or services to fulfill a Company purchase agreement requirement.

Supplier - A contractor that furnishes materials or services in accordance with a Company purchase agreement.

TULOG - (Tool Used in Lieu Of a Gage) Tooling used in the manufacture of product and also as a media of acceptance in lieu of Standard Measuring Instruments or gages to verify part dimensions.

QUALITY ASSURANCE SYSTEM REQUIREMENTS

- A1 The supplier shall provide and maintain a quality system that meets the requirements of MIL-Q-9858A and is acceptable to the Company.
- A2 The supplier shall provide and maintain an inspection system that meets the requirements of MIL-I-45208A and is acceptable to the Company
- A3 The supplier shall provide and maintain a quality system that will ensure that all products delivered conform to the drawings, specifications and requirements specified by the purchase agreement. Unless otherwise specified by the purchase agreement, that quality management system shall be ISO 9001 compliant.
- A4 The supplier shall provide and maintain a quality system that meets the requirements of ISO 9001 and is acceptable to the Company.
- A7 The supplier shall have and maintain a calibration system that meets the requirements of MIL-STD-45662, ISO 10012, or ANSI/NCSL Z540 and is acceptable to the Company. The supplier's signed certification must state (1) traceability to the National Institute of Standards and Technology (NIST), (2) tool or gage number, and (3) contract number.
- A8 The supplier shall provide and maintain a corrective action system that meets the requirements of MIL-STD-1520 and is acceptable to the Company. Delegation of Material Review Board (MRB) activities is not authorized by this clause.
- A9 The supplier shall provide and maintain a quality system in compliance to General Electric Aviation specification S-1000 as well as all applicable and ancillary required specifications. All lab testing shall be performed in accordance with S-400 and S-450 specification for labs. Special processes require GE approval or listing in the GE Yellow Pages.
- A10 The supplier shall provide and maintain a quality system that meets the requirements of AS9100 and is acceptable to the Company.
- A11 The supplier shall provide and maintain a quality system that meets the requirements of AC7004, "NADCAP AUDIT CRITERIA FOR INSPECTION AND TEST QUALITY SYSTEM."
- A12 The supplier shall be accredited to the applicable Nadcap requirements for the special process(es) that they perform as part of this purchase order.

GENERAL QUALITY REQUIREMENTS

B1 RIGHT OF ACCESS

All work and material may be subject to inspection and test by the Company and its customer and/or applicable government/regulatory authority representative at any place and time. The Company's access to processes considered proprietary by the supplier will be by mutual agreement. If applicable, the supplier or subtier supplier shall provide the necessary facilities, equipment and assistance for the safety and convenience of the Company or its customer's personnel in the performance of selected inspections and tests.

B2 TRACEABILITY

Parts to be delivered must be identified by serial or lot numbers (as specified by the purchase agreement) part number and revision and if applicable, change number and be traceable to the lots of raw materials used. When two or more parts are joined in an assembly, manufacturing and inspection records must identify each part by part number and revision and if applicable, change number and serial or lot number.

Materials to be delivered must be identified by lot or batch number, specification and revision and if applicable, change number and be traceable to manufacturing and inspection records. The supplier may determine lot size unless otherwise specified in the purchase agreement.

Serial or lot numbers shall not be duplicated within the manufacturing of the same part or material. If parts or material are scrapped or rejected, the serial or lot number shall not be reused.

Unless otherwise specified the supplier shall maintain traceability records on file available for review by the Company.

B3 CHANGE NOTIFICATION

The supplier shall notify the Company, through Purchasing / Buyer, of any change of the supplier's or subtier supplier's facility location, point of manufacture, management or ownership, labor disputes, or prolonged shutdown of normal manufacturing operations. changes listed below to qualified material. Qualified material is defined as products or components manufactured utilizing the same condition(s), method(s), material(s) and processes during the previous manufacturing period as well as acceptance criteria.

1. Proposed changes to the Company, supplier, and subtier suppliers approved designs (including proprietary designs)
2. Proposed changes to fabrication, test methods, processes, and / or tooling
3. Changes in point of manufacture.
4. Management or ownership changes.
5. Prolonged labor disputes.
6. Prolonged shutdown of normal manufacturing operations.
7. Changes in sub tier supplier locations

B4 DOCUMENTATION CONTROL

The supplier shall provide a system to ensure control of all documents (supplier and Company furnished drawings, technical documents, manufacturing procedures, inspection and test procedures) and for the incorporation of changes thereto. Documents shall be distributed to the proper places; e.g., manufacturing and inspection stations, receiving inspection, etc., at the prescribed times to ensure that changes are accomplished at the proper effectivity point, changed materials are appropriately marked and all obsolete documents are removed from use.

All documents shall be legible. If duplicate copies of documents are made in other language translations for the benefit of the supplier's employees, those documents must also be controlled.

B5 ACCEPTANCE TOOLING

Selection of tools and standard measuring instruments is the option of the supplier except as follows:

1. Supplier shall control standard measuring instruments and tools used for acceptance.
2. Tools and standard measuring instruments used for acceptance shall be calibrated in accordance with MIL-STD-45662A or ISO 10012 or ANSI/NCSL Z540.
3. Prior to use, manufacturing tools to be used as TULOGs and specially designed acceptance gages require Company approval and at the Company' option, proofing.
4. Tools that receive Company approval to be used as TULOGs must comply with a supplier established periodic inspection program acceptable to the Company. Use of the tools must be discontinued pending Company approved reproofing if the tool is:
 - a. Moved to a facility other than where proofed
 - b. Damaged
 - c. Removed from the Company inspection form
 - d. Found to produce a defective product
 - e. Classified defective as a result of periodic tool inspection.
5. Departure from Company specified inspection methods requires prior written Company approval.
6. Tooling furnished by the Company or its customer shall not be modified without prior written authorization.
7. Acceptance gage tolerance shall be no greater than ten percent of the total tolerance of the attribute being inspected unless otherwise approved by the Company.

B6 PACKAGING AND SHIPPING

The supplier shall maintain a system that assures adequate control of packaging and shipping. The use of commercial packaging practices does not relieve the supplier of the responsibility for controlling the packaging and shipping function in a manner which will prevent damage in-transit. Special instructions for packaging and shipment may be specified in the material specification or purchase agreement.

B7 ACCEPTANCE TEST PROCEDURES

The supplier shall prepare separate detailed test procedures detailing all tests required for acceptance. Each item or part thereof, which requires acceptance testing, shall be covered by an acceptance test procedure. Test procedures require Company approval prior to delivery of first article. All subsequent changes to any acceptance test procedure are subject to Company approval.

Where these tests are performed using equipment controlled by computer software or firmware, the software or firmware associated with, or affecting those tests, must be approved by the Company.

B8 STATEMENT OF WORK

Articles defined in the purchase agreement are subject to additional requirements per a statement of work, which must be met to achieve compliance to contract requirements. The Company may not accept material if the supplier fails to comply with the requirements of the statement of work.

B9 USE OF APPROVED SPECIAL PROCESS SOURCES

The supplier shall only use sub-tier suppliers that are approved by the Company or its customer.

B10 MATERIAL SPECIFICATIONS USED FOR PROCUREMENT OF MATERIALS

Materials procured for this contract and/or used to manufacture items per this contract shall be certified to the material specifications and revisions identified within the contract. Suppliers purchasing these materials shall flow the exact material specification and revision as identified in the contract to their sub-tier suppliers.

PROCESS CONTROL

C1 WORK INSTRUCTIONS

The supplier shall have written work instructions that provide for consistent manufacturing operations. All materials, process steps and process control tooling shall be identified in the work instructions. Special tooling shall be noted by its identifying number in the operational sequence in which it is used. Recording of all materials and processes used for manufacture shall be provided in the work instructions. Fabrication or processing of materials shall not begin prior to implementation and proofing of work instructions or changes thereto.

All inspection records, certifications and supporting documentation shall be done using permanent, reproducible ink. Supplier is to ensure legibility and reproducibility of all entries, stamps, imprints, and signatures. Errors may be voided by drawing a single line through the entry, recording the correct entry above or adjacent to the voided entry, **initialing** ~~initializing~~/ stamping and dating. Do not erase / write over, ~~or~~ blank out **or otherwise obliterate**. The use of liquid paper (white-out) or correction tape is prohibited.

If work instructions are in a second language for the benefit of the supplier's employees a copy shall also be available in English.

C1A PROCESS MODIFICATION AND/OR CHANGES

Prior to initiation of production, the supplier shall notify and make available documentation outlining the manufacturing process to the Company for approval. This documentation describing the process should at a minimum include but is not limited to the following:

- a) Method or type of processing utilized
- b) Manufacturing location, including any satellite locations
- c) Materials used, including processing aids, such as but not limited to gloves, brushes, orange sticks, etc.
- d) Process Work Instructions
- e) Process drawings
- f) Inspection Plans
- g) Packaging Methods and Materials
- h) Handling and Transportation

Once the manufacturing process has been approved, any change to the manufacturing process requires Company approval prior to implementation. Typographical errors, formatting errors, misspellings or clarifications changes

are not considered a process modification or change. Changes submitted to the Company must contain the following information:

- a. A complete description of the change, including a statement of the "From" and "To" conditions of the change.
- b. Justification for the change, including background information in sufficient detail to allow an adequate study of the proposed change.
- c. The proposed effectivity of the change, stated either in terms of a calendar date or a part serial number.
- d. A copy of the revised document may be required excluding proprietary information.

C2 STATISTICAL PROCESS CONTROL

The supplier shall use statistical process control (SPC) for controlling the manufacturing process in accordance with H050-02-2-003CS, "Supplier/Subcontractor Statistical Process Control Requirements and Guidelines". The Company will provide a Supplier SPC Requirements Agreement (H050-02-2-003CS, Appendix A) defining the applicable SPC requirements. The supplier shall complete and submit the agreement to the Company for approval. The Company must approve the agreement prior to manufacture of product.

The use of SPC does not supersede the requirements of C6, Modification of Qualified Material and Processes.

C2A AS9103 - VARIATION MANAGEMENT OF KEY CHARACTERISTICS

The supplier shall meet the requirements of AS9103.

C3 SPECIAL PROCESSES

Special processes are segregated into fabrication special processes (e.g., soldering, coating, welding, heat-treating and plating) and Nondestructive Inspection (NDI) special processes (e.g., ultrasonic inspection, radiographic inspection, eddy current inspection, magnetic particle inspection and penetrant inspection, including pre-penetrant etch). Personnel performing special processes shall be certified in accordance with applicable special process specifications. Personnel performing NDI special processes shall be certified to NAS-410 or as specified in the agreement. The supplier shall have records of his / her personnel certification and subtier supplier special process approvals on file, available for review by the Company.

The supplier and any subtier supplier shall have special process approval by the Company, or the supplier's system that controls his sub-tier supplier's special processes shall have been approved by the Company. Approval of special process subtier suppliers does not relieve the supplier of the responsibility for exercising those control measures necessary to ensure that work performed by subtier suppliers is in accordance with specification or drawing requirements.

Welding operations shall not be conducted by the supplier without Company approval of the process documentation.

For each part requiring NDI special processes, the supplier or subtier supplier shall complete a technique chart and submit it to the Company for approval. The chart may be in the supplier's or subtier supplier's format and shall be the document used for the actual inspection.

Note 1: The Company must approve the technique chart and any change thereto prior to NDI for product acceptance.

Note 2: Technique charts approved for the same part on previous procurements need not be resubmitted if the inspection technique is unchanged.

Note 3: The technique chart number and revision shall be recorded on the test reports submitted by the supplier to the Company.

C4 AGE CONTROL

Material that degrades with age shall be marked to indicate the date when the useful life expires as defined by the applicable specification, drawing or purchase agreement. Further, the compounding dates, curing completion dates, manufacturing processing completion dates, and assembly dates (date of assembly completion by the supplier), as required by the applicable specification, drawing or purchase agreement shall be included in the inspection data package.

C5 ENVIRONMENTAL CONTROL

The supplier shall establish and maintain a documented system for control of material sensitive to environmental degradation. Material that may degrade in shipment or during storage shall be shipped or stored as specified by the applicable drawing, specification or purchase agreement.

~~C6 MODIFICATION OF QUALIFIED MATERIAL AND PROCESSES~~

~~This order is for material, which has been previously qualified and listed on a QPSL. It must be manufactured and accepted under the same conditions using the same processes and methods by the same manufacturer and acceptance agency as material previously supplied.~~

~~The supplier shall notify the Company of any proposed changes to the Company, supplier, and sub-tier suppliers approved designs (including proprietary designs), fabrication and test methods, processes, tooling or nonconforming material and obtain Company approval prior to change incorporation.~~

~~Note: The supplier shall notify the buyer noted on the purchase order.~~

C7 PERSONNEL TRAINING

The supplier shall ensure that personnel whose work has an effect on the quality of the product are trained. Training shall include pertinent subjects relating to manufacturing, inspection, testing, packaging and handling techniques and shall be documented.

C8 CONTAMINATION CONTROL

The supplier shall clean articles ordered under this contract per Company contamination control specifications. Cleaning and/or testing of the articles shall be performed in facilities with Company approved procedures and equipment. Each article shall be identified with a tag certifying its cleaning status and identification. The tag shall not be in contact with significant surfaces.

C9 FOREIGN OBJECT DAMAGE (FOD) PREVENTION

The supplier shall maintain a FOD control program assuring work is accomplished in a manner preventing foreign objects or material from entering and remaining in deliverable items or contaminating deliverable items. Maintenance of the work area and control of tools, parts, and material shall preclude the risk of FOD incidents.

The supplier shall document and investigate all FOD incidents assuring elimination of the root cause. The Company shall have the right to perform inspections and/or audits as a method of verification that the supplier's FOD control program is functional, documented, and effective. The supplier shall identify a FOD control person responsible for implementing FOD prevention awareness and training.

Prior to closing inaccessible or obscured areas or compartments during assembly the supplier shall inspect for foreign objects/materials. Tooling, jigs, fixtures, test equipment, and handling devices shall be maintained in a state of cleanliness and repair to prevent foreign object damage. Supplier shall provide a statement of certification that deliverable products are free of any foreign materials that could potentially cause damage to the supplied product or any other components/systems that the product contacts.

C10 WELDING

The supplier shall maintain certified status of all welding personnel and welding facilities used in performance of this contract in accordance with AWS D17.1 for fusion welding and weld inspection and SAE-AMS-W-6858 for spot and seam welding.

WELDING CERTIFICATION

The supplier shall include a welding certificate listing the specification number and revision used, with a statement that welding has been performed on items being supplied in accordance with applicable specifications.

An authorized acceptance stamp or signature shall be affixed. A typed name on a submitted document by the supplier is an acceptable substitute for signature.

Class "A or B" WELD DOCUMENTATION REQUIREMENTS

Prior To Fabrication: The supplier will provide to the Company for review and approval, before the start of any production welding, the applicable weld procedure(s), each welder's or weld operator's qualification record/report and the process that will be used, in accordance with AWS D17.1 section 4.4.

With Shipment:

- Provide name of welder(s), welder(s) signature, and process(es) used on Certification of Conformance as compliance to AWS D17.1 paragraph 8.5.10.
- Provide a copy of the supplier Welding Approval sheet that has been approved by the Company.
- Provide an inspection report by an AWS CWI or qualified visual weld inspector approved by the Company. Include a copy of AWS certification if an AWS CWI is used, as Certification of Compliance to AWS D17.1 paragraph 6.1.2 and 6.2.

CLASS "C" WELD DOCUMENTATION REQUIREMENTS

Prior To Shipment: The supplier shall ensure each welder or weld operator is qualified in accordance with AWS 17.1 paragraph 8.4.1 and 8.4.2 prior to performing any welding.

With Shipment:

- Provide name of welder(s), welder(s) signature and process(es) on Certification of Conformance as compliance to AWS D17.1 paragraph 8.5.10.
- Provide inspection report by an AWS CWI or qualified visual weld inspector approved by the Company. Include a copy of AWS certificate if an AWS CWI is used as Certification of Conformance to AWS D17.1 paragraph 6.1.2 and 6.2.

INSPECTION AND REPORTING

D1 NONCONFORMING MATERIAL

The supplier shall notify the Company of any nonconformances that require Company material review. A report number shall be assigned each letter or message and shall include the following information:

- a. Date and purchase agreement number
- b. Supplier's name, and if different, manufacturer's name
- c. Nomenclature of material
- d. Drawing or specification number, revision, and if applicable, change number.
- e. Material serial or lot number (subcomponent serial or lot number if applicable).
- f. Exact description of nonconformance, QCID item number if applicable, reference to the drawing location and requirement (Example: Zone 4-B, Detail F, 5.000 ± 0.010 is 5.015).

Note: NDI nonconformances require submission of the NDI report with the discrepancy fully located and identified.

- g. Supplier's recommended disposition
- h. A positive statement defining the cause and corrective action, including effectivity of correction.

Note: Cause shall specifically address the nonconformance and designate effectivity by serial number, lot number or date. The Company requires objective evidence of corrective action implementation. If corrective action is complete, submit the objective evidence with the material review request; if not, submit upon completion.

- i. Company Quality Assurance Field Representative concurrence if in residence.

In the event the Company permits use of the nonconforming material, the supplier shall record the applicable DER number furnished by the Company on the inspection data forms for the material. A copy of the DER shall be included in the inspection data package.

When the supplier receives a copy of the DER with a disposition of "Rework" or "Repair", the supplier shall do the Rework or Repair specified and stamp the DER "Verification of Rework/Repair" block titled "Mfg Stamp" with an acceptance stamp or submit objective evidence (documentation) to verify work accomplishment. If rework or repair is not acceptable, the supplier shall repeat the material review process. If there is a Company Quality Assurance Field Representative in residence, he shall accept the Rework/Repair by signing or stamping the DER "Verification of Rework/Repair " block titled "QC Stamp". The supplier shall retain a copy of the completed DER bearing the acceptance stamp, include a copy in the inspection data package and immediately forward another copy to the Company.

Material rejected/scrapped by the Company requires Company approval of any subsequent effort to make the material useable.

Any material rejected by the Company and subsequently resubmitted by the supplier shall bear indication of such resubmission on the material and the associated supplier documentation. An "A" added to the end of the serial or lot number indicates the material is being resubmitted for the first time. A "B" indicates a second time, and so forth. The associated supplier documentation (Discrepancy Report, Corrective Action Report, reinspection data, etc.) shall be identified with the same lot or serial number as the material. The supplier shall contact the Company for identification of material submitted as replacements for Company or supplier rejected material.

Note: Material that has been returned to the supplier for Company authorized "rework" or "repair" shall not be reidentified.

FOR FBM PROGRAMS

The supplier may disposition nonconforming material as follows after the supplier's Quality and Engineering personnel determine which of the following applies:

1. Reject - material is not usable and cannot be economically reworked or repaired.
2. Complete - material is incomplete to requirements and can be readily corrected without adverse affect using the same methods or instructions as originally used.
3. Rework - material nonconformance may be eliminated using Company approved written procedures or other methods of correction that are allowed by the Company design.
4. Refer to the Company - The Company shall make all other material dispositions unless otherwise directed by the purchase agreement. Materials that require Company material review for disposition shall not be used, shipped or subjected to further processing that will alter or cover the nonconforming condition unless approved by the Company.

FOR NON-FBM PROGRAMS

Nonconforming material may be dispositioned scrap or rework by the supplier's Quality and Engineering personnel. The Company shall make all other material dispositions unless otherwise directed by the purchase agreement. Materials that require Company material review for disposition shall not be used, shipped or subjected to further processing that will alter or cover the nonconforming condition unless approved by the Company.

D2 SAMPLING

Sampling plans shall not be used to accept design parameters of serialized hardware unless specifically authorized by the Company inspection data forms (QCIDs), Company approved supplier inspection plan, or the purchase agreement. Unless otherwise specified in the material specification, QCID, Company approved supplier inspection plan or purchase agreement, sampling of lotted material shall be in accordance with Military Standard Sampling Plans (MIL-STD-105, MIL-STD-414, or ANSI/ASQC Z1.4) only with prior Company approval of the inspection level. Should the supplier wish to implement a different sampling plan, he shall obtain Company approval prior to use.

D3 COMPANY INSPECTION DATA FORMS

The Company will furnish the supplier with inspection data forms (QCID's) that detail the inspection requirements for the material.

The QCID's furnished may be one or all of the following:

1. QCID's titled "Submit with Shipment" contain the inspection requirements for data that is to be submitted with the material.
2. QCID's titled "Retain at Supplier" contain the inspection requirements for data that will be retained at the supplier's facility.
3. QCID's titled "Technical Use Requirements" contain special requirements associated with the use of TULOGs, gages and special SMI methods. This QCID shall be submitted with the material.

Each attribute is assigned an identification number called an item number that is found in the "Item Number" block of the QCID. The "Dimension Description" Block is the description of the parameter to be inspected, using the method defined in the "Method" block. The limits used to determine acceptance is shown in the "Spec" block.

Three types of data are normally requested:

1. Variable Data - Actual measured value of the parameter recorded in the "Data" block. This type data is required when the word "Record" appears in the "Spec" block.
2. Special Data – (Certificate of Analysis or Certificate of Conformance) This type of data is identified by the entry in the "Dimension Description" block. This type of data shall meet the requirements of paragraph D8 or D9, as applicable, and be included in the inspection data package with the QCID.

Note: Test Reports, which provide the same data as a Certificate of Analysis, may be titled "Test Report", "Certification of Test", "Material Certification", etc. by the supplier.

3. Attribute Data - Indication in the "Data" block of acceptable or discrepant data.

Note: All QCID items require attribute data if "variable" or "special" is not indicated.

All items of the QCID require indication of QC inspection. This is to be accomplished by the QC inspector legibly affixing his stamp or initials and date of inspection to each item of the QCID in the "Insp Stamp" block. This certifies that the required data is supplied and each requirement is acceptable. If the requirement is accepted by material review action, the Company DER number(s) shall be recorded in the "Deviation Waiver No." block of the affected item(s) and a copy of the supplier's request and the Company's reply attached to the QCID. If material review action is requested on a requirement of the "Retain at Supplier" QCID, the nonconforming item number(s) from the "Retain" QCID, the supplier request number(s) and the Company's DER number(s) shall be recorded in the block titled "Waiver/Deviation Document Numbers" of the "Submit with Shipment" QCID and copies of the supplier requests and Company replies shall be attached.

Selected symbols and abbreviation used in the QCID are:

TULOG	Tool Used in Lieu of Gage
TR	Test Report
SMI	Standard Measuring Instrument
C/A	Certification of Analysis
C/C	Certification of Conformance
S-SMI	Special Standard Measuring Instrument - This SMI requires a procedure generated by the supplier and is subject to approval by the Company. The Company will assign a number to S-SMI procedures that will be reflected on the QCID.
TUR	Technical Use Requirements - The method of defining the inspection performed in using a TULOG.

Note: Additional symbols may be used per MIL-STD-12 in the "Method" block when specific inspection instruments are specified.

D4 SUPPLIER INSPECTION FORMS

The supplier shall perform inspection of all material manufactured for this order. The supplier's inspection of each requirement shall include all dimensions and tests on applicable specifications and drawings unless otherwise stated in the purchase agreement. The requirement and inspection data to show acceptance shall be recorded on the supplier's own format. A copy of the inspection data shall accompany each shipment, marked to the attention of Receiving Quality Control. Sampling inspection is not authorized under this provision unless specifically stated in the purchase agreement.

NOTE: A copy of the inspection data may be sent to the company prior to the shipment of the material as part of a pre-ship review where applicable or where specified in the Purchase Order.

D5 SOFTWARE CONTROL

When computer software is used as media of acceptance, either singly or in conjunction with tooling, the supplier shall develop and implement a plan for control of software (or firmware). Configuration and change control, method for design review, verification and proofing, storage of master control software and firmware shall be included in the plan. The Company must approve the plan before the software is used to accept product.

This paragraph does not apply to software used in the operation of **commercial** off-the-shelf inspection devices.

D6 COMPANY FURNISHED MATERIALS

It is the supplier's responsibility to inspect Company furnished material upon receipt for identification, count, condition and assurance of the presence of required documentation. Nonconforming material or material not fitting the supplier's tooling shall be identified, segregated, withheld from further processing and the Company shall be notified.

When material is Company furnished, and the inspection requirements of the QCID require a C of A or C of C, the following are acceptable QCID entries:

- a. Record the words " Company Furnished", the specification or part number and the lot or serial number of the material.
- b. If acceptance data is supplied with the furnished material, include the data in the inspection data package if required by the QCID.

D7 FIRST ARTICLE INSPECTION OR PROCESS PROOFING

The Company will perform a First Article Inspection or process proofing of material produced at the Suppliers facility. The First Article may be for proofing a tool or software prior to approving the tool for product acceptance, or to verify material compliance to the design.

The Company will notify the supplier and establish the requirements for the inspection or proofing.

D8 CERTIFICATE OF ANALYSIS

The supplier shall include in the inspection data package a legible and reproducible copy of a Certificate of Analysis (C of A). Another copy shall be sent to the Company buyer at time of shipment or prior to shipment if so specified in the Purchase Order.

The C of A shall contain the following data:

- a. Company Purchase Agreement Number
- b. Material Name, Drawing or Specification Number and Revision Letter and Change Number, if applicable.
- c. Serial or Lot/Batch Numbers
- d. Signature, title and date signed by an An authorized official of the agency performing the testing or the agency providing the certification shall provide signature, title and date or stamp and date. A typed name on a submitted document is an acceptable substitute for signature.
- e. Name and address of company that performed the tests, if different from the manufacturing facility.
- f. Manufacturer's name and address, if different from the supplier.
- g. Chemical and/or physical test data that show compliance to the requirements of the applicable drawing or specification. Test data shall be actual values obtained from testing of the material (lot) submitted. Where applicable, the test methods used shall agree/comply with the methods stated in the specification/drawing.

D9 CERTIFICATE OF CONFORMANCE

The supplier shall include in the inspection data package a legible and reproducible copy of a Certificate of Conformance (C of C). Another copy shall be sent to the Company buyer at time of shipment or prior to shipment if so specified in the Purchase Order.

Note: A valid C of C indicates that the product/material being offered meets all the requirements in the controlling specification/drawing, including applicable test methods.

The C of C shall be traceable to chemical or physical testing data or manufacturing quality records as applicable, which shall be made available for examination upon request.

The C of C shall contain the following data:

- a. Company Purchase Agreement Number
- b. Material Name, Drawing or Specification Number and Revision Letter and if applicable, Change Number
- c. Serial or Lot/Batch Numbers and quantity shipped
- d. Signature, title and date signed by an An authorized official of the agency performing the testing or the agency providing the certification shall provide signature, title and date or stamp and date. A typed name on a submitted document is an acceptable substitute for signature.
- e. Name and address of company that performed the tests, if different from the manufacturing facility
- f. Manufacturer's name and address, if different from the supplier.

D10 RETENTION OF RECORDS

The supplier shall have on file certifications, in-process records, incoming records, final inspection records,

X-ray film and other manufacturing, inspection and test data, whether generated by the supplier or his sub-tier suppliers to show compliance to purchase agreement requirements. Unless otherwise specified these records shall be the originals. Data shall be available at the supplier's facility at no cost to the Company for a period of four years after final delivery, unless otherwise specified by the purchase agreement.

D11 INSPECTION DATA

With each shipment, the supplier shall include an inspection data package marked for the attention of Receiving Quality Control with the required inspection data and all approved DER's. The supplier shall furnish inspection data for each serialized part or each lot, unless otherwise specified.

For Company shipment destinations other than Utah, another copy of the inspection data package shall be forwarded to the Company.

D12 ACCEPTANCE AT DESTINATION

Materials are subject to final acceptance based on Company and customer inspection at Company facilities. The Company reserves the right to reject and/or return shipments that are found nonconforming as a result of our inspection.

D13 COMPANY SOURCE INSPECTION

Approval by a Company Quality Assurance Representative is required prior to shipment of the material. Approval will require completion of inspection records, test data, and shipping documents. The supplier shall notify the Company five (5) working days prior to presentation of material for source inspection.

D14 GOVERNMENT SOURCE INSPECTION

Government Inspection is required prior to shipment from the supplier's plant. Upon receipt of this purchase agreement, promptly notify and furnish one copy of the agreement to the Government Inspection Agency. If a Government representative does not service the supplier's plant, contact the nearest Air Force, Army or Navy Inspection Office. If the Government Agency cannot be located, the Company shall be notified immediately.

The supplier shall notify the cognizant Government office in advance when an item is ready for inspection. In the event the Government representative cannot be located, the supplier shall contact the Company for instructions.

A copy of the documentation bearing the Government source inspection verification shall accompany each shipment.

Pertinent data and equipment required for Government inspection shall be made available at the supplier's facility and shall be furnished to the Government representative upon request.

The supplier shall also furnish the Government representative with copies of discrepancy notifications and Company replies.

D15 CRITICAL FASTENERS

For part numbers identified as "critical fastener" in the purchase agreement, the supplier shall randomly select three (3) fasteners from each lot for verification of ultimate tensile strength through mechanical testing of tensile

load and hardness. Testing shall be in accordance with NASM1312 or ASTM F 606-02 and shall be performed by an agency different than the agency that performed the testing for acceptance. Fasteners with verification test results that do not comply with the applicable product specification shall not be delivered or incorporated into assemblies to be delivered. The three fasteners subjected to verification test are additional to the quantity ordered. Verification test results shall be included in the acceptance data package.

Note: Fasteners and rivets too short for tensile testing as defined by the above standards and rivets will undergo hardness testing only.

Suppliers who are responsible for design of the product to be delivered shall perform the fastener criticality analysis as specified in the purchase agreement, identify the "critical fasteners" and comply with the verification testing as stated above.

D16 RAW CASTINGS AND FORGINGS

Two samples of all raw castings and forgings are required from new or reworked dies or molds and must be approved by the Company prior to manufacture of production parts. The samples shall be provided to the Company along with the actual results of layout inspection, radiographs, and chemical and/or physical test results.

The supplier is responsible for obtaining Company approval of any change in processes, raw materials, or tooling before implementing the change.

D17 HEAT TREATMENT

Two (2) test bars shall be heat treated with each lot of heat treated material and submitted with the shipment of the parts. Documentation shall accompany the test bars identifying which parts they accompanied through the heat-treat process.

D18 TENSILE TESTING

Two (2) separately cast test bars, coupons, or appendages as defined by the applicable specification or drawing shall be submitted with each lot delivered.

D19 TEST REPORTS

All functional test reports should reference the Contract number, Contractor's name and address, and independent laboratory's name and address (as applicable). Other information that must accompany each shipment includes the following: part number, serial number or lot number, date and run time (if applicable), and summary of test results.

All test reports shall be validated by an authorized Contractor's Representative, either by a dated inspection stamp or signature, date, and title. A typed name on a submitted document is an acceptable substitute for signature.

D20 FAILURE ANALYSIS REPORT

The supplier shall perform a failure analysis on all items returned under this contract and shall provide the Company, as a minimum, the following information:

- 1) Date of report
- 2) Contract number
- 3) Supplier's name and address
- 4) Part name, part number, revision level, and serial/lot number
- 5) Company DER number, if applicable
- 6) Specific and contributory causes of failure
- 7) List of parts required to make repairs
- 8) Corrective action(s) taken to preclude recurrence
- 9) Effectivity of corrective action(s), date or serial number
- 10) Signature, ~~and title~~ ~~and date or stamp and date~~ of Contractor's Quality Representative approving the failure analysis report. **A typed name on a submitted document is an acceptable substitute for signature.**

D21 CHEMICAL AND PHYSICAL TEST REPORTS

One copy of test reports indicating chemical composition and/or actual physical properties identifiable to each lot, batch or heat treat lot shall accompany each shipment of material. An authorized representative of the supplier shall validate the test report(s) either by signature, ~~and title~~ ~~and date~~ or inspection stamp ~~and date~~. **A typed name on a submitted document is an acceptable substitute for signature.**

D22 TEST SAMPLES

The supplier shall furnish test sample(s) of each batch of material sufficient to conduct tests in accordance with specification or contract requirements. The test sample(s) shall accompany the material shipped. Each test sample must be clearly and permanently marked with the following: batch or lot number; date manufactured; specification or material control information number; supplier's designation; and the contract number.

D23 AGE CONTROL OF RUBBER GOODS

Rubber goods delivered under this contract shall conform to the requirements set forth in MIL-STD-1523. If applicable, Non-installed 'O' rings shall be individually packaged in a 'cure date' marked preservative wrapping in accordance with MIL-P-116, and shall be delivered to the Company within six (6) months of the cure date."

D24 RADIOGRAPHIC SUBMITTAL

The supplier shall submit an x-ray Control Document to the Company, identifying areas to be x-rayed, image views, and orientation to allow precise film interpretation. When welding is a requirement, identify each weld by number, direction, and the number of views required per weld.

D25 CRITICAL CHARACTERISTIC INSPECTION

The supplier shall perform 100% inspection of critical characteristics identified in the Company engineering document. The supplier shall submit a certificate of compliance with each shipment attesting that all critical characteristics have been verified to meet the requirements of the engineering document(s). The certification shall contain as a minimum a listing of the critical characteristics verified, the name of the supplier, the part number(s), purchase order number, serial number(s) (if applicable), and quantity shipped. An authorized representative of the supplier shall date and validate the certificate either by signature, ~~and title~~ ~~and date~~ or inspection stamp ~~and date~~. **A typed name on a submitted document is an acceptable substitute for signature.**

D26 PRE-SHIPMENT REVIEW

Products and components delivered under this purchase order are subject to Company Pre-Shipment Review. Written notification of acceptable Pre-Shipment Review is required prior to shipment of products or components defined herein. The Acceptance Data Package (ADP) shall be delivered to the Company Buyer/Sub-Contract Manager not less than 5 working days prior to the required ship date. The supplier will be notified within 5 working days after the Company has received the ADP of the Company's acceptance or rejection and, when applicable, authorization of release for shipment.

D27 METAL RAW MATERIAL DATA PACKAGE

Advance approval is required with an ATK review of material data packages prior to any processing. Raw material forms include, but are not limited to: plate, rod, bar, extrusions, and castings. Data packages should include certifications, test reports and physical analysis as a minimum. Resubmittal of a material data package is required if heat treatment operations are performed following the initial ATK review.

D28 FEDERAL AVIATION ADMINISTRATION (FAA) SOURCE INSPECTION

The FAA may at any time perform a source inspection of the supplier's manufacturing facility. Scope of the inspection may include the inspection system and/or manufacturing system used by the supplier as well as the materials used in manufacture and the final product.

D29 AS9102, FIRST ARTICLE INSPECTION REQUIREMENT

The supplier shall conform to the requirements of AS9102.

D30 REPORTING, ROUNDING, AND RECORDING OF DIMENSIONAL INSPECTION DATA

Measurement instrument shall be selected for use based on their capabilities for accuracy, stability, range, and resolution required for its intended use. Accuracy ratios may be used to determine adequacy but shall not exceed a 4:1 ratio. Recorded values must indicate the unit of measurement.

Note: Measurement instruments used to verify drawing/specification dimensional requirements shall be calibrated in accordance with MIL-STD-45662A, ISO 10012, or ANSI/NCSI Z540.

Recorded values shall reflect at a minimum the same resolution (number of decimal places) as the tolerance even if the final digits are zeros.

Example: Dimension requirement is $9.015 \pm .020$. The recorded value must show a minimum of three decimal places (e.g., 9.010 not 9.01 or 9.0100).

Interpretation of Limits is as stated in ASME Y14.5M: "All limits are absolute, hence all tolerance limits of a dimension are absolute with an infinite number of zeros beyond the last stated digit." In accordance with ASME Y14.5.1, internal diameters (ID) shall be determined by the inscribed circle method, outside diameters (OD) shall be determined by the circumscribed method. Under no circumstances shall least mean square or root mean square be used to calculate ID or OD size, without written authorization from the Company.

For purposes of determining conformance with drawings and specifications, an observed value or a calculated value shall be rounded "to the nearest unit" in the last right-hand significant digit used in expressing the limiting value in accordance with the rounding method of ASTM E29, Using Significant Digits in Test Data to Determine Conformance with Specifications. Under no circumstances shall values be rounded into tolerance. Since limits are absolute, "rounding in" is not correct or proper in increasing or decreasing the value of a

reported dimension to fall within the tolerance.

AUDITS AND SURVEILLANCE

E1 PERFORMANCE OF AUDITS

The supplier shall periodically audit his performance to determine compliance with purchase agreement requirements as they relate to the deliverable items listed on the purchase order. Audits shall be conducted throughout the life of the contract and shall be performed by personnel not having responsibilities in the area being audited. Audits shall review all program elements for adequacy of and compliance to policies and procedures. Audits shall also review operations and manufacturing test and inspection areas for adequacy of and compliance with process controls and inspection and test methods. Audits shall also review operations in manufacturing, test and inspection areas.

The scope of these audits shall include subtier material and service suppliers.

Audit results shall be communicated to appropriate management. Action to correct deficiencies and follow-up to verify effectiveness shall be performed. Audit results shall be made available to the Company upon request.

E2 COMPANY AUDIT

The Company may schedule and conduct an on-site audit of supplier's operations to assure compliance with purchase agreement requirements. Audit coverage will include examination of product quality program elements, operations, material and documents and review of supplier audit reports of subtier suppliers.

During the performance of this purchase order, the supplier quality system is subject to audit by the company. This requirement is applicable to the supplier's facilities where company products and services are processed as well as the Supplier's sub-tiers. If requested by the company the supplier shall schedule and conduct an on-site audit of the supplier's sub tiers with the participation of the company's personnel

Note: The Company's customer may accompany the auditor to observe the audit.

E3 SOURCE SURVEILLANCE

Source surveillance shall be conducted by the Company at the supplier's facilities or where designated in the contract prior to shipment. Inspection/test and in process inspection/test of the material defined in the contract shall be performed by the supplier and may be subject to witness by the Company. The supplier shall contact the Company prior to the start of fabrication so that mandatory in-process inspection/test points can be agreed upon.