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Contracts Deliverable Requirements

Platforms & Services
Combat Mission Systems

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Rev	Date	Change Description	Approved By	Change Request #
00	11/27/2012	New Document Release		BPMS-00647
01	09/03/2013	Added verbiage to CDR 017 , deleted 071	Tom Frazho	BPMS-01446
02	09/20/2013	Added verbiage to 001, 032, changed verbiage to 057, 058, 059, 060, 061, 063, and 068	Tom Frazho	BPMS-01476
03	01/15/2014	Changes to CDR 006, 053 and 070	Tom Frazho	BPMS-01593
04	03/10/2015	Deleted the supplier website link	Tom Frazho	BPMS-02194
05	08/31/2015	Revisions to CDR 001, 002, 003, 004, 005, 006, 009, 016, 018, 019, 020,023, 026, 028, 032, 034, 041, 042, 051, 057, 058, 059, 060, 081. Deleted 017, 040, 053, 054, 063, 068, 069, 070, 072, 073, 074, 075, 076, 077, 078, 079, 080. Added 083.; all reference of deleted CDRs have been removed from the body of the document; Consolidated all data submission CDRs into CDR 047; deleted 048, 049, 050, 051, 052	Tom Frazho	BPMS-02450
06	12/16/2015	Changes to CDR 034; Changes to CDR 006 for corrective action response to Louisville DCMA	Tom Frazho / Anthony Conley	BPMS-02612
07	01/14/2016	Re-instated CDR 017 back onto document	Tom Frazho / Anthony Conley	BPMS-02631
08	04/25/2016	Added new San Jose email address, changed any reference of Santa Clara to San Jose; added process approval to CDR 034	Tom Frazho / Anthony Conley	BPMS-02876
09	09/20/2016	Deleted CDR 002, 042, 047, 062, 081; "are located in the Supplier Quality Assurance Manual (SQAM)" added to CDR 001 as well as added verbiage in the 5 th and 8 th bullets below; verbiage added in CDR 003 and 004; in the 2 nd paragraph in 004 "the" was added and "Government" was deleted; CDR 005, 2 nd paragraph, verbiage was added and the 3 rd paragraph was added; last bullet added to CDR 007; deleted 4 th and 5 th bullets regarding training and approval prior to use for each individual part number; CDR 009 verbiage was added in the first bullet; CDR 010, "For each shipment" deleted, "(located in the SQAM)" added; "(located in the SQAM)" added to CDRs 011, 013, 015, 017, 018, 025, 026, 027, 032, 034, and 041; reworded verbiage in 2 nd paragraph in CDR 014; Changed verbiage of 8 th bullet in CDR 016 and 9 th bullet in CDR 017; "With each shipment" deleted from CDR 018, 019, 020, and 021; Deleted the 2 nd bullet in CDR 023; Added the last sentence in CDR 025; Changed/added several things in CDR 034 (please take careful note); Changed verbiage in B. Marking paragraph of CDR 044; Removed "defined in SQAM paragraph 8.3" in	Tom Frazho / Anthony Conley	BPMS-03124

		CDR 055; Addition of verbiage to last sentence of 3 rd paragraph in CDR 057, 058, 059, 060 as well as changes and additions to the 4 th paragraph.		
10	02/08/2017	Define document submittal requirements; Added CDR's 084 and 085, corrected several typo's and made minor corrections to the verbiage in the document	Tom Frazho / Anthony Conley	BPMS-03252
11	10/23/2017	Added 012 Flammability, changed 019 to 019A and added 019B Material Process Samples, added 029 Serialization, added 030A Approved Special Process (BAE), added 030B Approved Special Process (Customer), added 042 SPC Program, added 053 Dock to Stock Eligibility, changed 055 to 054, changed 056 to 055, added 056 PPAP Level I, added 086 Counterfeit Material Program and update 034 to remove requirement for micro hardness. Added verbiage to CDR 020, C.	Tom Frazho Richard Zuniga Ken Sturm Rosario Sciortino	BPMS-03819
12	06/20/2018	CDR 004 removed "and shall be approved by BAE Systems", 005 Added "for Combat Vehicles and Form 089559 for Weapon Systems", Added 007 A Welding Combat Vehicles Inspection Criteria for Armor Steel, 084 Removed from Item A & B "and approved", 085 Removed "and approved", 086 added This requirement is applicable to Phoenix for hardware and electronic purchases and to Combat Vehicles for electronic purchases only." Added/changed verbiage to CDR 032	James Dolan, Tom Frazho, Richard Zunga, Kenneth Sturm, Rosario Sciortino	BPMS-04027
13	03/25/2019	Added verbiage, "paragraph 8.12" to the following CDRs: 001, 003, 004, 005, 011, 012, 013, 015, 016, 017, 018, 020, 025, 026, 027, 032, 033, 034, 041, 057, 058, 059, 060, 084, 085 Added "and documented" to 007A and 008 Added "prior to" to 014, 016, 017, 018, 020, 033, 034 Added "or with the" to 015, 016, 017, 018, 020, 033, 034 Added "shipment of product" to 015, 016, 017, 018, 020, 033, 034 Added "and bake the temperature and time values" to 016 Added "for this part" to 032, 034, 084, 085 Changed 034 firing records from aluminum forgings to just forgings and reworted the whole section	James Dolan, Tom Frazho, Richard Zunga, Kenneth Sturm, Rosario Sciortino	BPMS-04525

14	02/17/2020	Reformatted the fonts, and footer on all pages. Added CDR 042 back into document, 021B added, approved requirements added to many sections, rewrote CDRs, 003, 004, 034, 041A, added the Sterling Height Cage Code.	James Dolan, Tom Frazho, Ryan Cunningham, Kenneth Sturm, Rosario Sciortino, Ross Davis, William Slocomb	BPMS-05098
15	04/08/2021	Added 1 st sentence in 003 and 004, added VIR form number and added verbiage to 004, deleted reference to Combat Vehicles and Weapons Systems in 005, completely changed verbiage in 007, added 007B, changed document number from KA-021 to 091721 in 008, completely changed 016, changed verbiage in 023, added 026A, added 030C, changed verbiage throughout 034, changed VIR form number to 089725 in 057, changed to DFMEA & PFMEA in 058 as well as various verbiage, added new bullets to the beginning of 059	James Dolan, Tom Frazho, Ryan Cunningham, Kenneth Sturm, Mike Luciow, Ross Davis, William Slocomb	BPMS-06437
16	1/19/2022	001: Added, deleted and changed verbiage 004: Added, deleted and changed verbiage 007: Added, deleted and changed verbiage 012: Added and changed verbiage 015: Added verbiage 016: Added and deleted verbiage 017: Added verbiage 019A: Deleted verbiage 021A & 021B: Added to the table of contents 026A: Added and deleted verbiage 027: Added and deleted verbiage 028: Added and deleted verbiage 030A: Added verbiage 030B: Added verbiage 030C: Added to the table of contents 041: Added and changed verbiage 042: Added, changed and deleted verbiage 068: Added to the table of contents 044: Deleted C and moved D up to C	James Dolan, Tom Frazho, Scott Heyd, Kenneth Sturm, Mike Luciow, Ross Davis, William Slocomb	BPMS-XXXXX

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001 Inspection/Test Data Reports

The Supplier to BAE Systems shall submit for each piece all of the Supplier's actual inspection/test data for the specified characteristics identified and specified in the purchasing agreement on a suitable form. If your purchasing agreement does not clarify specific inspection or test data requirements, contact your Purchasing Representative for direction or complete a full FAI for each piece is required. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item. As applicable, the data shall include the following information:

- Part Number
- Serial Number
- Quantity of parts
- Identification of each characteristic inspected/tested.
- A ballooned drawing shall accompany the report to identify the notes/characteristics inspected/tested.
- Actual Inspection/test results
- Date of inspection/test
- Inspector's signature, stamp or initials (electronic or digital signatures are acceptable)
- Indication of First Piece (when applicable)

003 First Piece Inspection Report

The Supplier shall submit their First Piece Inspection Report as specified in the SQAM paragraph 8.3. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

004 First Article Test (FAT)

First Article Testing is required to validate that the production processes are producing results within specification. In the event that First Article Testing is required, BAE Systems may adjust order quantities accordingly in order to define additional parts for the testing. The FAT Report shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item. *Suppliers are required to inform the BAE Systems Quality Department in writing using VIR 089725 when any of the following occur for any operation or step in the supply chain/manufacturing process, prior to shipment of any affected product to determine what additional testing is required:*

- 1.) *Change in manufacturing process at tier 1 or any sub-tier suppliers (BAE Systems to be notified prior to the change (s) being made)*
- 2.) *Drawing changes provided by BAE Systems or any/all suppliers*
- 3.) *Manufacturing location change at tier 1 or any sub-tier suppliers (BAE Systems to be notified prior to the change (s) being made)*
- 4.) *Break in production of 24 months or more at any sub-tier suppliers.*

The Supplier shall update/resubmit the FAT plan within 30 days following contract award and cover any changes to the schedule prior to start of the test. The procedure and test reports may be prepared using MIL-HDBK-831 as a guide. BAE Systems and its customer reserve the right to witness FAT testing at any point in the schedule.

005 Customer Source Surveillance (CSS)

Source surveillance, inspection, and/or test by a BAE Systems source inspection representative is required for each shipment of this item. In order to accommodate BAE Systems source inspection representatives, the Supplier shall make all facilities, equipment, inspection records, and assistance readily available.

The Supplier shall provide five (5) working days advance notification of requests for source inspection through submission of Form 092245. Requests shall be submitted in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) specified for this item. Unauthorized/unapproved shipment of product without BAE Systems source inspection may result in the shipment being rejected, a supplier corrective action request may be issued and product may be returned to the Supplier at the Supplier's expense.

If parts are returned for repair or rework, a resubmission of source is required. Parts are not to be shipped until the resubmission source has been approved and the source form is annotated with 'Repair or Rework', and lists the NCR number on the form as applicable.

006 Government Source Surveillance/Inspection (GSS/GSI)

Government surveillance/inspection is required prior to shipment from your plant and **cannot be waived** by BAE Systems. The surveillance/inspection approval evidence shall be submitted prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12.

Upon receipt of the Purchasing Agreement, promptly notify the Government representative who normally services your facility so that appropriate planning for Government inspection can be accomplished. If the local Government Representative directs that surveillance/inspection should take place at a sub tier supplier facility, the full wording of this requirement shall be incorporated into the Purchasing Agreement with that sub tier supplier. The text of this requirement may be incorporated by reference. At no time shall the Supplier flow any Government surveillance/inspection requirements to their sub tier suppliers without the direction of their local Government Representative.

Unauthorized shipment of product without Government Source Surveillance may result in rejection and subsequent return at the Suppliers' cost, and withholding of the invoice payment.

GSS shall not replace Supplier inspection nor relieve the Supplier of its responsibility to meet all requirements of the Purchasing Agreement.

Supplier must notify BAE Systems prior to, or in conjunction with, notification to DCMA so that BAE Systems has the opportunity to schedule and perform any reviews/inspections prior to submission to DCMA.

Supplier shall notify the local Government DCMA Representative of pending inspections in accordance with FAR 52.246-2(i) (2), at:

https://www.acquisition.gov/far/current/html/52_246.html.

The Supplier shall submit the GSS approval document with each shipment.

007 Welding-Combat Vehicles

- Suppliers **SHALL** be up-to-date with the required Weld Process Audit PRIOR to submitting Weld Procedure(s) to BAE Systems Weld Engineering for review. Suppliers **SHALL** provide supporting documentation and evidence for a Weld Process Audit in accordance with the requirements listed in the SQAM. All supporting documentation **SHALL** be made available to BAE Systems upon request.
- **PRIOR** to the start of fabrication, the Supplier **SHALL** review WE-005, submit and gain approval for all procedure(s) per the Purchase Order Part Number. The Supplier **MAY** utilize BAE Systems Weld Procedure Specification(s) (WPS) in the event that the Supplier has completed the BAE Systems required Weld Procedure Training and Weld Process Audit.
- In the event that the Supplier is **NOT** approved to utilize BAE Systems Weld Procedures and/or BAE Systems **DOES NOT** have applicable Weld Procedure(s) to fabricate the Weldment to fulfill the purchase order, the Supplier **SHALL** be responsible for providing and/or qualifying Weld Procedure(s) **PRIOR** to fabrication. BAE Systems Weld Engineering **SHALL NOT** be responsible for providing additional procedure qualifications for the sole use of our Suppliers.
- The Supplier **SHALL** submit the WPS(s) intended for part fabrication to BAE Systems Weld Engineering for review and approval via the Supplier Welding Procedure Submission Form 089136 **PRIOR** to the start of welding and fabrication. The latest version of the form **SHALL** be utilized and is accessible via the BAE Systems Purchasing Website. Each Weldment Part Number and the applicable WPS(s) **SHALL** be submitted individually.
- In the event that the Supplier provides a non-BAE Systems qualified Weld Procedure, the Procedure Qualification Record(s) and Mechanical Testing Results **SHALL** be submitted along with the respective WPS(s) for review and approval.
- Supplying product to BAE Systems with an unapproved, rejected, and/or incorrect Welding Procedure Specification (WPS) is a violation of the BAE Systems Purchasing Agreement and is considered non-conforming and parts are subject to rejection and **MAY** be returned to the Vendor (RTV) at the Supplier's expense.
- The Supplier **SHALL** resubmit the Supplier Welding Procedure Form to BAE Systems Weld Engineering in the event that the Base Material, Weld Procedure(s), and/or the Part Number Configuration changes from the previously approved form. The form **SHALL** also be resubmitted if the BAE Systems Purchasing Agreement Part Number changes throughout configuration, regardless if all other variables have remained consistent from the previously approved form.
- The Supplier **SHALL** be responsible for maintaining all supporting documentation including, but **NOT** limited, to the following; Performance Qualifications, Sub-Tier

Supplier Certifications, Machine Calibration Documentation, and other applicable documentation required to demonstrate compliance in accordance with the requirements per the BAE Systems Purchasing Agreement. All documentation **SHALL** be made available as requested BAE Systems at all times.

- Supplier **SHALL** submit Standard and Non-Standard Repair Procedure(s) via the Vendor Information Request (VIR) Form 097908 for review and approval **PRIOR** to use.

Aluminum and Steel Arc Welding; Resistance Welding and Brazing

Procedure submittal requirements for aluminum, steel, resistance, and brazing weldments are addressed on the following forms/ procedures:

Form Number/ Procedure	Document Title
090451	Visual Testing Inspection In Accordance With Ground Combat Vehicle Welding Code – Aluminum (12472301)
090504	Visual Testing Inspection In Accordance With Ground Combat Vehicle Welding Code – Steel (12479550)
091866	Brazing or Braze Welding Procedure - Cover Sheet (LAA-5130)
091868	Recorded Joint Welding Procedure for Resistance Welding Cover Sheet (LAA-5131)
092587	Weld Supplier Approval and Weld Procedure Submission Process Guideline (WE-005)
092579	SRP Repair of Steel Base Metal (WE-SRP02)
092580	SRP Repair of Aluminum Base Metal (WE-SRP01)
092585	BAE Systems Weld Procedure Book - Steel
092586	BAE Systems Weld Procedure Book - Aluminum
089136	Supplier Welding Procedure Submission Form
089725	Vendor Information Request

Forms are available via the BAE Systems Purchasing Website and/or a BAE Systems Authorized Purchasing Representative.

Ground Combat Vehicle Welding Code – Aluminum (12472301) replaced the following specifications (reference page 4, Table P.1):

- MIL-STD-1946
- MIL-STD-372
- MIL-W-45205
- MIL-W-45206

Ground Combat Vehicle Welding Code - Steel (12479550) replaced the following specifications (reference page 4, Table P.1):

- MIL-STD-1261
- MIL-STD-1941
- MIL-STD-1185
- MIL-W-46086

007A Welding Combat Vehicles Inspection Criteria

- Form 090475 shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.
- All visual weld inspection must be conducted by either of the following 3 inspector certification platforms, and completed and documented on 100% of all welds.
 - An American Welding Society certified CWI, SCWI
 - A qualified CWB level 2 or 3 through the Canadian Welding Bureau as determined through the Canadian Standards Association.
 - A Government CWI or TARDEC Quality Assurance CWI approved welding inspector certification program.
- All visual weld inspection on armor steel and quenched and tempered steel must be held for 48 hours prior to final inspection.
- Where NDT is required per print, all welded armor steel and low allow steels 100 KSI tensile strength or greater shall be held a minimum of 48 hours prior to NDT inspection, this is for welded material.
- Welding fixtures to be designed per ASME Y14.43

007B Welding- Combat Vehicles: Additional Weld Requirements

The Supplier **SHALL** reference the applicable code designated on the BAE Systems Purchase Order and Contract Quality Requirements and its entirety. The Supplier **SHALL** be responsible for reviewing **AND** adhering to the **ALL** requirements listed in the designated Weld Code.

Aluminum:

In addition to the requirements specified in CDR007, additional Aluminum Weld Requirements, the following requirements do **NOT** encompass **ALL** changes implemented within the specified Weld Code:

- Weld Procedure Qualifications: the requirements for utilizing Multiple Welding Processes within a single procedure has updated
- Operator Qualifications: the requirements for the Number of Electrodes an Operator is qualified to utilize has updated

Steel:

In addition to the requirements specified in CDR007, additional Steel Weld Requirements, the following requirements do **NOT** encompass **ALL** changes implemented within the specified Weld Code:

- Weld Procedure Qualifications: the requirements for Preheat/Interpass Temperature, Travel Speed, Heat Input, and Charpy V Notch (CVN) Testing have updated
- Non-Destructive Testing (NDT): Following welding, for all high strength steels and armor grade steels greater than 0.25" (6mm) in thickness, the final NDT examination for

acceptance shall be conducted no less than 48 hours after the final weld has cooled to ambient temperature. Preliminary NDT examinations are advisable to avoid production related delays by identifying defects not related to delayed hydrogen cracking. These defects can be addressed before the 48 hour hold is complete, restarting the 48 hour period. Defects identified and addressed following the first 48 hour hold shall be subject to an additional 48 hour hold. Alternative strategies to mitigate delayed hydrogen cracking must be supported by data and shall be submitted to the procuring activity for review for acceptability prior to amending the length of this hold time.

- Procedure Transfers: It is allowable to transfer qualified and approved welding procedure(s) between an entity and its sub-entities, for all classes of welds. The receiving transferee (Supplier and/or Fabricator) **SHALL** create an initial validation test plate using the WPS parameters to qualify for welding with the WPS in accordance with the applicable Weld Code.
 - The sub-entity **SHALL** submit the BAE Systems Validation Test Plate Data Sheet and document the applicable information as required. Failure to provide the necessary information **SHALL** result in the ineligibility to utilize the entity's Weld Procedure(s).
 - A re-Validation Test **MAY** be required to demonstrate that the sub-entity is capable of adhering to the requirements specified in accordance with the Weld Procedure in question, as a result of the following events:
 - Non-conformance(s) identified during a Weld Process Audit conducted by BAE Systems' Supplier Quality Team
 - Non-conforming welded part(s) received by BAE Systems

008 Welding-Weapon Systems

- Prior to the Supplier's start of fabrication (or repair to raw material, casting, forgings, etc.), the Supplier shall submit procedure(s) and supporting qualification test data in accordance with the applicable specifications (including weld personnel certifications) and form 091721 to the BAE Systems Authorized Purchasing Representative
- Supplying product to BAE Systems without an approved Welding Procedure Specifications (WPS) is cause for rejection
- The WPS shall include the Procedure Qualification Record (PQR) for the process when applicable
- The Supplier is responsible for the performance and maintenance of all supporting documentation required to demonstrate compliance with the Purchasing Agreement requirements
- Changes/revisions to previously approved weld procedures must be submitted for re-approval

009 Soldering

- The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item. The Supplier shall submit soldering plans in accordance with the applicable specification requirements for this item within (30) days

of receipt of the Purchasing Agreement to the BAE Systems Authorized Purchasing Representative

- Procedures shall be submitted for all subcontracted soldering operations
- BAE Systems reserves the right to disapprove the plan or to require changes in the plan, which it deems necessary to ensure the product conforms to IPC J-STD-001, Class 3 and Purchasing Agreement requirements
- A new Purchasing Agreement number with the same prime contract number as previously approved does not require extension of approval
- The plan shall include, as a minimum, detailed procedures to be followed and utilized throughout all areas of performance
- The Supplier must have approval from BAE Systems prior to beginning production. This approval will be in the form of a letter notifying you that your facility has satisfactorily completed a Soldering Audit. The approved program must be utilized in the performance of Purchasing Agreement
- Any and all records required by the approved program may be requested at any time and must be immediately available for review
- BAE Systems must approve changes to this program following approval

010 Solderability

The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item. Material supplied shall meet the solderability requirements of the product fabrication specification. When no solderability test is specified, the test shall be performed in accordance with MIL-STD-202, Method 208.

Note: One hour steam aging is required for wire.

The Supplier shall provide a written certification stating that the components provided were tested and meet the applicable solderability requirements as stated above. Certification shall be submitted in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item.

011 Printed Wiring Boards (PWB)

The Supplier shall provide for each shipment a written certificate stating that the boards were fabricated to the relevant specifications identified within the TDP. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item. Test coupons and microsections must be maintained for a period of two (2) years and available for examination by BAE Systems.

012 Flammability

A flammability certification to the specification noted on the drawing from the original material manufacturer or a flammability test report from a BAE Systems approved facility is required. Certification shall be submitted in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item. This requirement is only applicable to Phoenix parts.

013 Nondestructive Examination Procedures

When the Purchase Order specifies Nondestructive Examination such as radiography, magnetic particle, liquid penetrant, or ultrasonic inspections, the data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item. The procedure shall be submitted within thirty (30) days after receipt of the Purchasing Agreement. If the submittal is requested during performance of the Purchasing Agreement, the Supplier shall submit the procedure within three (3) days of receiving the request.

All changes to the approved procedure shall require re-submittal and approval. The revised procedure shall not be implemented until written approval is received from BAE Systems.

014 Nondestructive Examination Inspection Report

The Supplier shall furnish a certified test report prior to the shipment stating that Nondestructive Examination(s) required per the TDP have been performed in accordance with an approved test procedure as required by the referenced specification and that the material is acceptable. The certification shall also include:

- Type of test and coverage
- Applicable procedure specification (title, number and revision)
- Applicable acceptance criteria (title, number and revision)
- Actual data as defined in the applicable procedure specification
- Name and address of the company that actually performed the testing
- Certificate of process compliance

The certification/data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

A test plan shall be developed detailing the Nondestructive Examinations parameters to be used in accordance with the applicable specification and shall be made available to BAE Systems upon request. Product NDT verification shall be completed by an ASNT TC1A or NAS 410 level 2 certified NDT technician or higher.

015 Control Tests

The Supplier shall perform Control Tests at the frequency defined by the specification/QAP. The Supplier is responsible for determining the test schedule based on the production and delivery schedule per the Purchasing Agreement. The Supplier shall notify the BAE Systems Authorized Purchasing Representative of the projected test schedule and any changes as they occur. If any failures occur, either through defect of the test equipment or of the test sample itself, the Supplier shall immediately notify the BAE Systems Authorized Purchasing Representative for further instructions prior to continuance of testing.

Following the completion of testing, a test report shall be submitted in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item prior to or with the shipment of product for approval.

MIL-HDBK-831 should be used as a guide in developing the test report format. As a minimum, the test report shall include:

- BAE Systems part number
- All applicable BAE Systems Purchasing Agreement Number(s)
- Prime Contract Number (this is specified on the Purchasing Agreement)
- Applicable drawings/specification and revision level
- Type of test (i.e., Group "C," Group "D," etc.)
- Tests performed and results
- Test completion date
- Next test date/submittal
- Applicable serial number(s) tested
- Sample size
- Sample identification, if applicable
- Production interval (or Purchasing Agreement line number)
- Printed name, signature, and title of Supplier's representative
- Report date
- Any additional data or information required to show full compliance to the control test requirements

016 Plating

The supplier shall provide written certification that the plating was performed in accordance with all Purchasing Agreement, drawing, and Purchasing Agreement specification requirements prior to shipment of the product. The facility actually performing the plating shall prepare the certification.

The Certification **MUST** include as a minimum:

- Part number
- Purchasing Agreement number
- Plating process specification used
- Complete lot traceability to all certifications related to the BAE Systems Purchasing Agreement
- Printed name, signature, and title of Supplier's representative
- Report date

The certification/data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

The following requirements apply when zinc plating per ASTM B633 is specified:

When embrittlement relief pretreatments and/or post treatments are required and unless otherwise specified on the component, drawing the following requirements shall apply:

- A) Pretreatment on steel parts with a tensile strength 1000 MPa (31 HRC) or greater that have been machined, ground, cold-formed, or cold-straightened subsequent to heat treatment. Bake times and temperatures shall be in accordance with Table 1 of ASTM B849.
- B) Post coating treatments for the purpose of reducing the risk of hydrogen embrittlement in accordance with ASTM B850 on iron or steel parts having a tensile strength ≥ 1000 MPa (with corresponding hardness values 303 HB, or 31 HRC) and surface-hardened parts unless otherwise specified. Bake times and temperatures shall be in accordance with Table 1 of ASTM B850.
- C) The certification shall also include:
 - Baking temperature; Requirement and Actual
 - Baking time; Requirement and Actual
 - A statement that the baking operation for hydrogen embrittlement relief was started within 3 hours of plating completion or as required per specification

017 Paint Certification

The Supplier shall provide a copy of the written certification documenting that painting was performed in accordance with all Purchasing Agreement, drawing, and specification Purchasing Agreement requirements prior to or with the product shipment. Certification shall be submitted in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item. The facility actually performing the painting shall prepare the certification, which shall include:

- Name and address of the finisher
- Part number
- BAE Systems Purchasing Agreement number
- List of specifications used in the processing of the paint
- Paint thickness of a sample of actual parts for the primer
- Paint thickness of a sample of actual parts for the top coat
- Material lot/batch number(s)
- Material expiration date(s)
- Printed name, signature, and title of Supplier's representative
- Certification date

All test and inspection documentation shall be available for BAE Systems' review upon request.

Documentation submittal is required for Anniston Spares and for all non-approved paint resources.

BAE Systems Combat Vehicle approved CARC painters are not required to submit any documentation with the parts but are required to maintain all required documentation validating compliance to all requirements and make this documentation available for BAE Systems review upon request.

Items requiring painting in accordance with MIL-STD-1303 shall instead be painted in accordance with NAVSEA Drawing 7250920 and associated paint photographs (if applicable).

018 Physical and Chemical Test Reports

The Supplier shall provide a material certification including all actual chemical, mechanical, and/or physical test results pertaining to the material shipped under this Purchasing Agreement with traceability to the original mill/manufacturer, heat lot, and country of origin, as applicable prior to the product shipment. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

019A Test Samples – Tensile Testing

The Supplier shall provide a set of two samples (un-machined test bars/sheet stock) suitable for the mechanical testing as required by Purchasing Agreement or referenced specification. Both shall be made from the same melt and heat treated in the same lot as the supplied parts.

019B Material/Process Samples

A representative material test sample (the same as the material lot) is required. The test sample shall be processed simultaneously with the material it represents, through all special processing. The sample shall be of sufficient size and configuration to permit BAE Systems to determine heat treatment, plating, painting, etc., results in lieu of destroying a completed part. The supplier shall submit the processed test sample with completed material / parts to BAE Systems.

020 Heat Treating

The certification shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

Supplier shall conduct a visual inspection for cracks or other injurious defects.

When the drawing specifies a hardness range for materials due to quench and temper or other practices, actual results shall be recorded on the certification.

When heat-treating is performed by a facility other than the Supplier shown on Purchasing Agreement, the name of that subcontractor and a copy of the certificate furnished by the subcontractor for the heat treatment shall be furnished to BAE Systems.

When specified on the drawing and/or the Purchasing Agreement, test samples shall be provided to BAE Systems for evaluation.

The below processes shall be completed as stated per specific drawing requirements. When a conflict is noted between this document and specific drawing requirements, the drawing requirements take precedence.

The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

A. Visual Metallographic Inspection

Visual inspection at a magnification of 5X shall be performed on heat treated items. Cracks, seams, laps or other injurious defects shall not be allowed. For steel carburized parts, the heat treat condition prior to carburizing shall be either quench and tempered or normalized and tempered. Heat treat process and atmosphere control shall be such that no decarburization occurs on the surface as detectable by metallographic sectioning under magnification at 100X, method specified on drawing or appropriate specification. Exceptions are stress-proof, fatigue-proof, precipitation hardening grades of steel, margining steels and structural steel such as HY-, HY-100, Cor-ten, etc. This will minimize distortion and assure that proper hardness is achieved.

B. Quench and Temper (Core Hardness Specified)

A test specimen (or additional part) of the same alloy and same size, within 20% of the largest cross section thickness, shall be heat treated with each heat treat lot. The test sample shall have a length at least one inch longer than the section thickness or two times the diameter. The specimen or sample part shall be cross-sectioned at mid-length of the largest cross section thickness plus or minus 3/8 inch. The Supplier shall submit a report including the actual surface hardness and core hardness at 1/2 radius (core hardness measured on cut surface) the data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item..

C. Quench and Temper (Surface Hardness Specified, Core Hardness Not Specified)

The report shall include a statement of the surface hardness findings for each heat treat lot. Testing shall be done in areas identified on the drawing or in such a manner as to not damage the critical surface finish as defined by the drawing.

A test specimen (or additional part) of the same alloy and same size, within 20% of the largest cross section thickness, shall be heat treated with each heat treat lot. The test sample shall have a length at least one inch longer than the section thickness or two times the diameter. The specimen or sample part shall be cross-sectioned at mid-length of the largest cross section thickness plus or minus 3/8 inch. The Supplier shall submit a report including the actual surface hardness and core hardness at 1/2 radius (core hardness measured on cut surface). The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

D. Case Hardening - Carburizing

A test specimen of the same alloy and similar configuration as the part shall be processed with each heat treat lot to verify case depth, surface and core hardness requirements, and microstructure. The Supplier shall submit a report with the required case depth hardness actual results obtained and microstructure per specified standard. Certification shall be submitted with each heat treat lot. The data shall be submitted

and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

E. Case Hardening - Nitriding

A test specimen of the same alloy, same hardness, and similar configuration as the part shall be processed with each heat treat lot to verify case depth, hardness requirements, and to monitor thickness of white layer. The Supplier shall submit a report with required case depth, hardness, process temperature, and actual results obtained. Certification shall be submitted with each heat treat lot. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

F. Surface Hardening - Flame or Induction

The Supplier shall provide certification with each lot reporting the actual case depth, surface and core hardness values obtained. First Article proof tests with pattern, equipment power setting, quench media, and other critical process parameters shall be maintained by vendor. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

G. Stress Relief

Certification for stress relief shall report the actual processing time, temperature and number of cycles for each lot as defined in the drawing or specification. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

021A Mercury

The Supplier shall certify that the material shipped under this Purchasing Agreement does not contain functional mercury in any form and that no mercury-bearing instruments and/or equipment that might cause contamination have been used in the manufacture, fabrication, assembly, or testing of any material shipped under this Purchasing Agreement. This requirement must be included in all sub-tier Purchase Orders however, certification is only required from the BAE Systems tier1 suppliers when requested.

021B Lead

The Supplier shall certify that the material shipped under this Purchasing Agreement does not contain lead in any form and that no lead-bearing instruments and/or equipment that might cause contamination have been used in its manufacture, fabrication, assembly, or testing of any material shipped under this Purchasing Agreement. This requirement must be included in all sub-tier Purchase Orders however, certification is only required from the BAE Systems tier 1 suppliers.

022 Material Traceability

All finished product lots must be traceable to raw material heat/lots, and the Supplier must maintain material traceability throughout all steps of the manufacturing process including any outside processing.

023 Age Control

Age-sensitive items include, but are not limited to, paint, adhesives, and rubber products. The following requirements apply to all items with this requirement:

- Age-sensitive items shall be delivered as directed by the requirement assigned below.
 - a) With a minimum of 50% of the shelf life remaining
 - b) With a minimum of 75% of the shelf life remaining.
 - c) With a minimum of 85% of the shelf life remaining.
 - d) Other as directed by contract.
- All age-sensitive items and their respective shipping containers shall be permanently marked with the cure/manufacture and expiration dates in addition to any other required markings
- For parts delivered on a spool or reel, the marking must be applied to a visible location on the outside of the spool or reel
- The cure/manufacture and expiration dates shall be in either Quarter/Year format (for product with a shelf life in excess of three (3) years) or Month/Year format (for product with a shelf life of three (3) years or less). The method of marking and the marking height shall be in the manufacturer's format, however the marking shall not affect the part's form, fit, or function

Example: CURE 4Q/2010
 EXP 4Q/2016
- In addition to the requirements of SQAM paragraph 8.5, When a Certificate of Conformance for age sensitive items is required it shall include:
 - a) Lot traceability by run, batch, lot, or date of manufacture
 - b) Shelf life expiration date (as required by specification)
 - c) Storage conditions to achieve shelf life, if not stated on the material package

024 Non-manufactured Coniferous Wood Products

All wooden pallets and wood containers produced entirely or in part of non-manufactured softwood, species shall be constructed from heat-treated coniferous material. This material must be certified accordingly by an accredited agency recognized by the American Lumber Standards Committee (ALSC) in accordance with Non-manufactured Wood Packaging Policy and Non-manufactured Wood Packaging Enforcement Regulations. The Supplier shall maintain on file at their facility, and provide upon request to BAE Systems, a certificate of conformance from the accredited heat treat facility.

025 Special Packaging

Material is to be packaged in accordance with the packaging instructions provided in the body of or attached to this Purchasing Agreement. A statement that the packaging is in accordance with the specified requirements will be included in the Certificate of Compliance (reference

SQAM paragraph 8.5). The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

026 Quality Requirements

The Supplier shall maintain on file, and provide to BAE Systems upon request, objective quality evidence demonstrating compliance to all of the requirements of this Purchasing Agreement. When BAE Systems request documentation, the documentation shall be provided in a commonly readable electronic format and shall be provided to BAE Systems in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this part.

026A Quality System Requirements

The Supplier shall maintain on file, and provide to BAE Systems upon request, objective quality evidence demonstrating Registration/Certification by an Accredited Registrar to ISO 9001, AS 9100, TS 16949, IATF 16949, ISO/IEC 17025 or a quality system approved by an Accredited Third Party Registrar. When the Registration/Certification Certificate is requested by BAE Systems, the documentation shall be provided in a commonly readable electronic format and shall be provided to BAE Systems in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) or uploaded to HICX.

027 Certificate of Compliance

The Supplier shall provide an electronic copy of their Certificate of Compliance for each shipment as defined by paragraph 8.5 of the SQAM. Copies shall be delivered and approved prior to shipment as specified by the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item.

028 Unique Identification (UID)

This item requires UID marking in accordance with the Mil-Std-130/TDP requirements. If the UID marking is already present, verify that it is intact and able to be scanned. If the scan fails, replace the existing marking with new UID marking.

029 Serialization

The supplier shall identify items using marking methods as required by drawings, specifications, and/or the PO. Serialization logs shall be maintained to prevent duplication of serial numbers. The supplier's quality system shall ensure traceability of all serialized items and materials to the original materials. When two or more serialized parts are joined in an assembly, the supplier shall include a list for each assembly serial number with the part numbers, change letters, and component serial numbers making up the assembly serial number. This information shall be supplied with each shipment.

030A Approved Special Processors (BAE Systems)

The supplier is to use BAE Systems approved sources for special processes such as thermal processing, metal finishing, metal joining, non-destructive testing, etc. A current Approved Processor Listing may be obtained from the cognizant BAE Systems Buyer. This requirement is only applicable to Phoenix parts.

030B Approved Special Processors (Customer)

The supplier is to use BAE Systems' customer approved sources for special processes such as thermal processing, metal finishing, metal joining, non-destructive testing, etc. A current approved processor listing may be obtained from the cognizant BAE Systems Buyer. This requirement is only applicable to Phoenix parts.

030C NADCAP Approved Special Processes

All special processes identified herein and utilized on a BAE Systems purchase order/subcontract require certification by NADCAP. NADCAP Certification will be required for heat treating, painting/coating (non-CARC) and plating. These Special Process requirements identified herein shall be flowed down to all sub-tier suppliers as applicable. The supplier shall provide a current Certificate of Conformance (C of C) certifying compliance for the special process identified and performed as required by the TDP. All Special Process suppliers or their sub-tier suppliers utilized on the purchase order/subcontract shall have a current accreditation by NADCAP. The Certificate of Compliance shall define and document each process used in satisfying the TDP/Subcontract requirements and the date of the last audit. Special processes will be as defined in our SQAM, AS9100 and by NADCAP. All costs associated with NADCAP accreditation shall be borne by the Special Processor. The NADCAP Certificate shall be provided to BAE Systems in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) or uploaded to HICX when requested.

032 Ballistic Requirements-Transparent Armor

A ballistic first article test shall be performed and accepted prior to any production of transparent armor. All drawing and specification requirements shall be met as required for the ballistic FAT and ballistic lot testing.

Ballistic sample submission process for York purchased material tested at BAE Systems San Jose:

- Supplier shall request BAE Systems source inspection prior to shipping the samples for ballistic testing.
 - Supplier shall submit Form 092245 Source Inspection Request/Approval Form as required by CDR005 with Form 089689 Supplier CDR or Source Submission Cover Sheet Form 089689 per the Data Submission Instructions on Form 092245.
 - Both forms are available on the Purchasing website listed in the PO text.
- During source inspection, the supplier and BAE Systems P&S source inspector shall complete Form 091889 Ballistic Test Submittal Form.
 - Source inspector shall determine if contract requires DCMA witness of the ballistic test.
 - Source inspector shall enter the Project and Task numbers on the submittal form (when applicable).
- Signed copies of the Source Inspection Approval and the Ballistic Test forms shall be included with the shipping documents for the test sample

- In addition to the marking requirements, specified in the PO and on the drawings, ALL test specimens, shipping containers and associated documents shall be clearly marked "First Article Sample" or "Lot Sample."
- Following Ballistic First Article approval, the supplier shall submit lot samples for testing per the schedule in the ballistic test specification.

Ballistic sample submission process for Anniston purchased material tested at BAE Systems San Jose:

- Supplier shall submit a copy of 091889 Ballistic Test Submittal Form in accordance with the Data Submission Instructions located in the SQAM paragraph 8.12 for this part.
- Signed copy of the Ballistic Test form shall be included with the shipping documents for the test sample
- In addition to the marking requirements, specified in the PO and on the drawings, ALL test specimens, shipping containers and associated documents shall be clearly marked "First Article Sample" or "Lot Sample."
- Following Ballistic First Article approval, the supplier shall submit lot samples for testing per the schedule in the ballistic test specification.

Ballistic sample submission process for Anniston purchased material tested at another testing facility other than BAE Systems San Jose:

- All ballistic test documentation shall be provided in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item prior to or with the product shipment.
- The supplier shall submit lot samples for testing per the schedule in the ballistic test specification.
- The supplier is responsible for tracking compliance to ballistic testing for each product supplied to BAE Systems P&S.

034 Ballistic Requirements- Metal and Composite Materials

FIRING RECORDS (Plate and Composite):

The Supplier shall provide a copy of the:

- Physical and Chemical Test Reports
 - a. For non-armor options allowed per the print, the supplier shall submit the physical and chemical test reports for the optional material used. BAE Systems shall be notified of the use of the optional material during documentation submittal.

Government Ballistic Test Certification, including firing number for each heat/lot of ballistic material. Results shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

- **FIRING RECORDS (CASTING):**

For armor castings and extrusions, the Supplier shall maintain a listing of Government approved firing numbers for all material recipes supplied to

BAE Systems. Results shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

- FIRING RECORDS (FORGINGS):
 - a. Aluminum Armor Forgings require ballistic test for each lot, including longitudinal and transverse tensile tests per MIL-DTL-45225 and the material certificate of analysis.
 - b. Ferrous Armor Forgings require ballistic test for each lot, including results for all testing specified in the ballistic test specification and the material certificate of analysis.

Results shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

MACHINING ALLOWANCES FOR ARMOR PLATE

In general, mill certifications and ballistic test certifications are required to be provided at the thickness designated on a drawing's material note. In instances where there is no requirement for the thickness of armor material designated in the material note, the following requirements shall apply –

- If the thickness of the armor material is not specified on the material note, thicker material may be procured and machined to final size with the following limitations.
 - MIL-DTL-46027 – allowable to machine 25% from the original thickness to meet requirement.
 - MIL-DTL-32375 (Class 1, All Grades) – allowable to machine 10% from the original thickness to meet requirement.
 - MIL-DTL-12560 (Class 1) – allowable to machine within the applicable hardness ranges specified in Table 1 in this section.
 - MIL-DTL-12560 (Class 2 & 4) – allowable to machine 25% from original thickness to meet requirement.
 - MIL-DTL-46100 – allowable to machine 25% from original thickness requirement.
- When assessing machining allowances per the above requirements, measurements shall be taken from nominal ordered thickness to the nominal measurement at the thickest section of the component as designated on the drawing.
- Exceptions outside of the allowances in this document must be reviewed and approved by BAE Systems engineering and requires the submission of a VIR.

Per previous, these allowances for machining of armor product from thicker procured plates is only applicable when a material thickness is not designated in the material note. Note that Class 3 MIL-DTL-12560 armor is not allowable for use in the fabrication of vehicle product and is typically used for other test and evaluation purposes. As a result, machining allowances for this material require submission of a VIR if procured in a thickness other than that requested in the PO.

Table 1. Machining Allowances for MIL-DTL-12560 Wrought Armor Plate.

Armor Class (MIL-DTL-12560)	Allowable Machining Ranges
1	.098 - .249 incl.
	.250 - .624 incl.
	.625 – 1.125 incl.
	1.126 – 1.999 incl.
	2.000 – 3.999 incl.
	4.000 – 6.000 incl.
2	25% original thickness
4	25% original thickness

MATERIAL REDUCTION OF ARMOR PLATE (STEEL & ALUMINUM)

During the handling and fabrication of armor plates, occasionally small material defects – such as mechanical gouges and scratches – accumulate on the plate surface. In general, surface imperfections that do not affect the functionality of the material or its fitness for fabrication are acceptable and do not need to be repaired. These requirements are outlined in Paragraph 3.11 (MIL-DTL-46027), Paragraph 3.9 & 3.10 (MIL-DTL-32375), and Paragraph 3.2.11 (MIL-DTL-46100 and MIL-DTL-12560).

Given that it is difficult for vendors to assess what surface imperfections may affect the functionality or serviceability of a plate in fabrication, vendors shall assess surface imperfections based on the following criteria –

- Identify indications of surface imperfections visually and determine base material type and thickness per applicable engineering drawing.
- Measure plate thickness at the indication site via ultrasound thickness gage, caliper, or other process approved by BAE Systems SQA representative.
 - Ultrasound thickness gage measurements shall be taken at the deepest area of the surface imperfection. In instances where an indication cannot be assessed in this manner, measurements shall be taken adjacent to the indication.
 - Measurements by caliper or mechanical measurement shall be taken at the plate edge nearest the indication. A depth gage shall then be used to measure the depth of the imperfection at its deepest point and subtracted from the as-measured thickness to determine final thickness in the area of the indication.
 - Imperfections may be deburred in order to allow effective measurement of the indication.
- Compare the measured thickness of the plate to the minimum allowable material thickness per applicable specification. In instances where the thickness at the location of the indication is defined on the drawing, refer to the applicable drawing tolerances for the minimum allowable material thickness.

If material is found to meet or exceed the minimum thickness at the deepest point of the defect, it is acceptable as-is and no repair is needed. All surface imperfections deemed acceptable by this method shall be deburred to remove sharp edges. If the material is found to be thinner than the minimum allowable thickness at the deepest point of the defect, the material is non-conforming to specification and shall be rejected. Alternatively, vendors with defective indications may submit a VIR to authorize a repair or use as-is.

Table 2. Thickness Tolerances for MIL-DTL-46027.

Ordered Thickness (Inches)		Allowable Material Reduction from Specified Thickness (Inches)
Over	Thru	Minus Tolerance
.250	.315	.018
.315	.394	.023
.394	.630	.032
.630	.984	.043
.984	1.575	.055
1.575	2.362	.070
2.362	3.000	.100

Table 3. Thickness Tolerances for MIL-DTL-32375.

Ordered Thickness (Inches)		Allowable Material Reduction from Specified Thickness (Inches)
Over	Thru	Tolerances (\pm)
.500	1.000	.043
1.001	1.575	.055
1.576	2.362	.070
2.363	3.000	.100

Table 4. Thickness Tolerances for MIL-DTL-12560.

Ordered Thickness (Inches)		Allowable Material Reduction from Specified Thickness (Inches)
Over	Thru	Tolerances (\pm)
.2500	.3749	.022
.3750	.6249	.025
.6250	.9990	.030
1.0000	1.4990	.035
1.5000	1.9990	.045

2.000	2.9990	.065
3.000	3.9990	.070

Table 5. Thickness Tolerances for MIL-DTL-46100.

Ordered Thickness (Inches)	Allowable Material Reduction from Specified Thickness (Inches)
Specified Thickness	Tolerances (\pm)
.1250-.3125	.019
.313-.750	.023
.751-1.000	.026
1.001-1.1875	.031
1.188-1.4375	.036
1.438-1.5625	.039
1.563-1.750	.043
1.751-2.000	.048

THERMAL CUTTING OF STEEL ARMOR PLATE:

Shall meet the following requirements:

- Parts produced by thermal cutting of plate material shall be subject to process qualification. Submission of parts which are thermally cut, shall meet the following requirements:

APPLICABILITY:

- Thermal cutting processes include any methods, which rely on, or result in, the generation of temperatures in excess of 1,300 °F at the point of cutting. These processes include (but are not limited to) laser, plasma, and the family of oxy-fuel cutting processes. These processes do not include abrasive cutting methods such as waterjet, abrasive disk or saw, and machining. Products that are first cut by thermal process (such as plasma) and then finished to final dimension by abrasive method (such as machining or grinding) are not subject to the qualification requirements for thermal cutting processes.
- MIL-DTL-46100 materials, all tempers.
- MIL-DTL-12560 materials, Class 1, Class 2, Class 4a, and Class 4b. Qualification for cutting of Class 1, Class 4a, or Class 4b material shall be applicable to cutting of Class 2 material. Class 3 armor is not intended for use in vehicle applications and is exempt from the requirements of this section.
- MIL-DTL-32332 materials, all tempers.
- MIL-A-11356 materials, all tempers.

PROCEDURE:

- Supplier shall have a written and controlled Procedure for cutting steel armor. Documentation of the Procedure shall be made available to BAE Systems on request.
- Initial Procedure Qualification Test: The supplier shall produce a production quality sample in order to verify that the Procedure is capable of achieving edge quality in accordance with the applicable material specification. Documentation for this test shall be submitted to BAE Systems representatives for acceptance prior to working on production parts. The required tests for initial procedure qualification are as follows:
 - Sample coupons shall be cut with process to be qualified. Coupons may be on a production part, a sample attached to a production lot, or an independent sample.
 - Visual inspection, no indications of cracking along cut plate edges is acceptable.
 - Non-destructive testing (NDT) per ASTM E1417 or ASTM E1444 or equivalent. Acceptance criteria in accordance with the applicable material standard.
 - Heat affected zone hardness (HAZ) to be determined by hardness indentation at the mid-length of the cut edge. 5 measurements shall be taken, equally spaced, from the cut edge to a distance of 1.2T or .625 inches (whichever is less).
- Procedure Documentation: Once the Supplier has completed the evaluations outlined by the Initial Procedure Qualification Test, documentation of the test results shall be submitted to BAE Systems for final review and approval. This report shall contain form 089475 and the following information at minimum:
 - Material documentation: Includes material standard, temper, heat or lot number, and material thickness tested.
 - Process documentation: Includes process type (e.g. plasma, laser, oxy-fuel), method of cutting (manual or automatic), and environment (e.g. ambient condition, water immersion, controlled non-reactive environment).
 - Major Processing Parameters: Includes the primary processing parameters affecting the quality of the cut edge. Some examples are shown below but should not be considered an exhaustive list.
 - Laser: Beam source, cutting power, travel speed, primary shielding gas, travel speed, minimum pre-heat & post-heat (if applicable).
 - Plasma: Electrode type, voltage, primary cutting gas, travel speed, minimum pre-heat & post-heat (if applicable).
 - Oxy-Fuel: Cutting gas, gas pressure, travel speed, minimum pre-heat & post-heat (if applicable).
 - Secondary Processing: In some cases, suppliers may elect to use secondary tempering, grinding, or machining processes to ensure the quality of the cut edge and decrease the propensity for cracking. In these cases, suppliers are not required to submit their secondary processing as part of the qualification for their thermal cutting procedure.
 - Documentation shall be provided with the results of visual inspection and NDT in accordance with the Initial Qualification Test. Supplemental documentation may be attached to support NDT results.

- Documentation shall be provided with the results of the Initial Qualification Test. Supplemental documentation may be attached to support the results of NDT and hardness testing.
- Date, printed name and electronic or hard copy signature shall be included to confirm the validity of the test results from the contracted vendor's authorizing authority. In instances where a vendor sub-contracts work to a secondary shop, the authorizing signature shall be provided by the primary vendor. In these cases, the primary vendor will be responsible for maintaining the qualification records and is accountable for products contracted to them, but processed by that secondary shop.

PROCEDURE APPROVAL & PERIOD OF QUALIFICATION:

- Supplier shall have the Procedure Qualification for Thermal Cutting of Steel Armor Form number 089475 completed and approved by BAE Systems Materials Engineering prior to shipment of product. This should include all provisions of the Procedure Documentation listed.
- The form shall be submitted per Data Submission instructions (located in the SQAM, paragraph 8.12) for this part.
- After final approval, period of qualification shall be indefinite unless there is reason to believe that the Qualified Procedure is no longer capable of meeting the edge quality requirements of the applicable material specification.
- Rejection of a submitted Procedure Documentation for qualification, or revocation of an existing qualification, shall be followed by corrective action for requalification by BAE Systems.

EFFECTIVITY OF QUALIFICATION:

- A qualified procedure is applicable to the following ranges. For a given tested material thickness, that process qualification shall be sufficient for the same process used on materials applicable to the qualification test.
 - $.380 < T$
 - $.380 \leq T < .625$
 - $.625 \leq T < 1.000$
 - $T \geq 1.000$
 - Example: Vendor A qualifies a laser cutting process, using a CO₂ beam source at 4,500 Watts, at 100 IPM on .500 on Class 1 MIL-DTL-46100 material. That qualification is sufficient to cover MIL-DTL-46100 Class 1 materials, to a minimum thickness including .380 and a maximum thickness excluding .625.
- Procedures qualified prior to Rev 09 shall remain in effect under the provisions of this release unless there is reason to believe that the Qualified Procedure is no longer capable of meeting the edge quality requirements of the applicable material specification.

PROCESS INSPECTION:

- Only qualified inspection personnel shall conduct visual and NDT process inspections. Documentation of inspection personnel's qualification shall be kept and provided to BAE Systems on request.

- Inspection personnel shall be certified per a written practice in accordance with ASTN SNT-TC-1A, AWS QC1, CSA W178.2, or comparable.
- Alternatively, an engineer or technician who by training and experience in metals fabrication, inspection, and testing, is competent to perform the inspection of thermally processed material (welding, cutting, and/or heat treating) may be considered qualified inspection personnel for the purposes of this process inspection.
- Process inspection shall consist of the following:
 - Visual inspection to be performed by qualified personnel, conducted in accordance with the supplier's procedure. Inspection frequency shall be 100%.
 - Non-destructive testing (NDT) in accordance with ASTM E1417, ASTM E1444, or equivalent. Frequency shall be General Inspection level II, AQL 2.5%, spec ANSI/ASQ Z1.4. If rejectable indication is found, institute 100% inspection of subject lot.

DEFINITION:

Lot – Shall mean “inspection lot” or “inspection batch” of parts of the same material, the same thickness and processed continuously under one Procedure. Example – Supplier A cuts 10 Part Numbers, with different quantities, all from the same thickness of high hardness armor. If they are processed (cut) in a constant continuous process, then the collection of parts can be inspected as one Lot.

041 Critical Safety Items (CSI)

The Supplier shall provide documentation for all Critical Safety Items (CSI), Hardness Critical Items (HCI), or Observable Critical Items (OCI) identified for this item by the TDP. **Sample size for this inspection shall be 100% for the identified characteristic (s).** Actual results, including an authorized signature and date of acceptance, traceable to a specific shipment shall be recorded, provided and approved prior to shipment. Submission of documentation shall be made in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item.

- A. The heat treat supplier shall conduct 100% testing for hardness. Hardness testing will occur at designated locations identified on the BAE Systems drawing. Hardness testing will be conducted in accordance with the method defined in the Standard Process Specification (SPS) document specified on the drawing. In the event location for hardness testing is not indicated on the BAE System's drawing, the heat treat supplier may select an appropriate location on the part for testing to be conducted. In the event the BAE Systems drawing does not specify an SPS document for hardness testing, hardness testing is to be conducted per ASTM-E18. Actual results, including an authorized signature and date of acceptance, traceable to a specific shipment shall be recorded and provided prior to shipment. Submission of documentation shall be made in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item.

042 SPC Program

Statistical methods and procedures used by the supplier to implement and maintain a documented continuous improvement program may be subject to review by BAE Systems' Quality Assurance. Using Statistical Process-Control (SPC) methods, tools, and documentation, the supplier must monitor key characteristics noted directly on the PO or engineering documents. Copies of the control charts, (including notes and corrective action for assignable causes) must be delivered with each shipment. Processes yielding a Cpk of less than 1.33 require 100% inspection for key characteristics prior to certification and delivery of the production lot. Documented inspection reports shall accompany each shipment. The supplier is responsible for the flow down of this CDR to their subcontractors. Submission of documentation shall be made in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item.

044 Packaging Instructions for Hardware Kits

All hardware and small components kits shall be packaged, marked, and packed as follows unless other requirements are provided through the Purchasing Agreement.

The contents of this kit shall be packaged, identified, consolidated and packed per the instructions below. The BAE Systems Purchasing Order and/or Engineering Drawing provide the part numbers and quantities required for each kit. Packaging of this kit is to be accomplished through good commercial practices, and is intended to provide adequate protection of the kit(s) and the kit components during transit and handling as well as for short-term storage.

A. Packaging

Cleanliness – Items shall be free of dirt and other contaminants that would contribute to deterioration of the item.

Preservation – Bare steel surfaces shall be provided protection such as preservative coatings. Zinc or cadmium plating are not considered bare and will not require preservative protection. Items made from stainless steel material do not require preservative protection. When rubber items are unit packaged in quantities of more than one, the items shall be dusted with talcum (soapstone).

Unit Package – The unit packaging shall consist of an item of the same part number and the specified quantity per kit. Place the required item quantity in a close fitting poly bag as to keep package cube to a minimum. Use multiple bags per part when applicable. The minimum size bag shall be 3 x 4 inches; the bag shall be a minimum of 3-MIL thick. The bag shall be heat-sealed in a manner to keep the items contained within the bag. The trapped air volume in the bag shall be kept to a minimum to reduce package cube.

Consolidation – Consolidate the required unit packages for each specified part number into a poly bag, 6-MIL thick, or a snug fitting fiberboard carton (a fiberboard carton is preferred method). If a poly bag is used for consolidation, the weight shall not exceed 10 lb. A Packing List will be enclosed in each consolidated package detailing the contents, to include; the kit part number, and the part number, description, and quantity for each component included. The bag and/or carton size used for the specified kit shall be identical throughout the contract.

B. Marking

Each package used in this kit, shall identify the contents with the applicable part number, nomenclature, quantity, and kit number. For unit packaging and consolidation packages, see Label Example A. The markings for each pack can be printed on a label or applied directly on to the bag or carton. If a label is used it shall meet the requirements as outlined below, and if a label is used to identify a bag, the label may be heat-sealed in the bag along with the item(s). If the label is placed in the bag, the label identification must be able to be read from the exterior of the package. If a Packing List is enclosed in the package, the package is to be marked with "Packing List Enclosed", and is to be located in the same area and adjacent to where the kit identification is applied.

Age Control – Shelf-life markings shall be shown as part of the item identification data on unit packs, intermediate containers, exterior containers, and unpacked items. Shelf-life markings shall include the manufactured, cured, assembled or packed date (apply one date), and the expiration or inspect/test date, as appropriate. This information must appear on the unit package unless it is visible through a clear plastic bag, and on the intermediate and exterior container (only when unit pack is exterior container). When two or more unit packs of identical items are marked with different dates, the earliest date should be shown on the intermediate container. Exterior containers and multi-packs containing age control items shall be marked "CONTAINS SHELF-LIFE ITEMS).

- a. Non-extendable shelf-life items: manufactured (MFD) date, cured date, assembled date, packed date (subsistence only) (apply one date, as appropriate), and expiration (EXP) date. For items that contain rubber or synthetic elastomers, the expiration date shall be calculated from the cured date of the rubber/elastomer.
- b. Extendable shelf-life items: manufactured date, cured date, assembled date, packed date (subsistence only) (apply one date, as appropriate), and inspect/test (INSP/TEST) date. For items that contain rubber or synthetic elastomers, the inspect/test date shall be calculated from the cured date of the rubber/elastomer.

EXAMPLE 1
(Non-extendable)
MFD DATE 10/10
EXP DATE 10/13

EXAMPLE 2
(Extendable)
ASSEMBLED DATE 10/10
INSP/TEST DATE 10/13

EXAMPLE 3
(Extendable)
CURED DATE 4Q09
INSP/TEST DATE 4Q11

Labels - All labels used shall meet or exceed the following requirements: pressure sensitive, water-resistant, size 2 x 2-1/2 inches (min). The part number, nomenclature, quantity, and kit number shall be in a stacked configuration, font size 12 to 14, black ink on white label, and upper case letters. Direct printing on the bag is also acceptable.

C. Packing

Palletize and/or consolidate required kit quantities per contract schedule. Before stretch wrapping or banding, place fiberboard on four sides and top to further protect cartons from damage. The palletized load(s) shall be marked with the appropriate shipping address as specified in the Purchasing Agreement. Apply special handling marking "Do Not Stack".



Example A

Unit Pack Label



Example B

Consolidation Pack Label

045 MRB Authority

MRB Authority is granted for the associated item number and the Supplier is authorized to perform repairs or disposition parts use-as-is so long as the disposition does not affect the form, fit, function, performance, or reliability of the part. The Supplier is required to keep records of all MRB activity related to this part for this Purchasing Agreement and shall make those records available to BAE Systems personnel upon request.

The Supplier is **not** authorized to flow this authority to their sub-tier suppliers.

053 Dock-To-Stock Eligibility

This part number is not eligible for the dock-to-stock program. All CDRs specified apply including the requirement to provide associated certifications, inspection and test reports.

054 AQL 1.0

This item requires inspection at AQL 1.0 to the C=0 Sampling Plan for all major drawing characteristics. Major drawing characteristics are dimensions with a total tolerance of $\leq .010$ or where the characteristic is identified as a "major" by a drawing note or SQAP/QAP/QAR

055 100% Inspection

This item requires 100% inspection of all critical drawing characteristics. Critical characteristics are any dimensions with a total tolerance of $\leq .001$ or where the characteristic is identified as a "critical" by a drawing note or SQAP/QAP/QAR.

056 PPAP-Level 1

The Supplier shall complete a PPAP in accordance with Level 1 of the Production Part Approval Process manual and shall submit a Warrant and an Appearance Approval Report as required to BAE Systems for approval. The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

057 PPAP-Level 2

The Supplier shall complete a PPAP in accordance with Level 2 of the Production Part Approval Process (PPAP) manual and shall submit the following to BAE Systems for approval:

Design Record

Engineering Change Documents (if applicable)

Dimensional Results with ballooned drawing (all characteristics, including drawing notes, numbered)

Photograph of the part marking

Material, Performance Test Results

Qualified Laboratory Documentation

Appearance Approval Report (if applicable)

Sample Product

Part Submission Warrant (PSW)

All other requirements of the PPAP shall be completed, retained on file, and made available to BAE Systems upon request.

The Supplier shall not ship product to BAE Systems prior to receipt of a signed/approved PSW. Product shipped in advance of PPAP approval shall be subject to rejection and may be returned at the supplier's expense.

Process or product changes require PPAP resubmission. Notification to BAE Systems prior to changes is essential, as additional audits/reviews may be required prior to resubmission; such changes are to be communicated to your BAE Systems Procurement Representative via the Vendor Information Request Form (Form 089725). Process or product changes are defined as

changes in the processing of the product that could affect its ability to meet design, durability, and reliability requirements, including:

- Use of a process or material other than those which were previously approved,
- Production from new or modified tools (except perishable tools), dies, molds, patterns, etc., including additional or replacement tooling,
- Production following any refurbishment or rearrangement of existing tooling or equipment,
- Production from tooling and equipment transferred from another manufacturing site,
- Change of a supplier for parts or services (e.g. heat treating, plating, welding),
- Break in production or product produced after tooling has been inactive for 24 months or more,
- Any change in material, including not only raw material but also chemical compounds or processes (i.e. paints, adhesives, sealers, lubricants, plating, heat treat processes, etc.) which become part of the finished product; this includes changing to an engineering approved alternative material or any change in the sequence of operations,
- Upon request of BAE Systems' Purchasing Representative.

The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

058 PPAP-Level 3

The Supplier shall complete a PPAP in accordance with Level 3 of the Production Part Approval Process (PPAP) manual and shall submit the following to BAE Systems for approval:

Design Record

Authorized Engineering Change Documents (if applicable)

Customer Engineering Approval (if required)

Design Failure Modes and Effects Analysis (DFMEA)

Process Flow Diagrams

Process Failure Modes and Effects Analysis (PFMEA)

Control Plan

Measurement System Analysis Studies

Dimensional Results with ballooned drawing (all characteristics, including drawing notes, numbered)

Photograph of the part marking

Records of Material / Performance Test Results

Initial Process Studies

Qualified Laboratory Documentation

Appearance Approval Report (AAR) if applicable

Sample Production Parts

Master Sample

Checking Aids

Customer Specific Requirements

Part Submission Warrant (PSW)

All other requirements of the PPAP shall be completed, retained on file, and made available to BAE Systems upon request.

The Supplier shall not ship product to BAE Systems prior to receipt of a signed/approved PSW. Product shipped in advance of PPAP approval shall be subject to rejection and may be returned at the supplier's expense.

Process or product changes require PPAP resubmission. Notification to BAE Systems prior to changes is essential, as additional audits/reviews may be required prior to resubmission; such changes are to be communicated to your BAE Systems Procurement Representative via the Vendor Information Request Form (Form 089725). Process or product changes are defined as changes in the processing of the product that could affect its ability to meet design, durability, and reliability requirements, including:

- Use of a process or material other than those which were previously approved,
- Production from new or modified tools (except perishable tools), dies, molds, patterns, etc., including additional or replacement tooling,
- Production following any refurbishment or rearrangement of existing tooling or equipment,
- Production from tooling and equipment transferred from another manufacturing site,
- Change of a supplier for parts or services (e.g. heat treating, plating, welding),
- Break in production or product produced after tooling has been inactive for 24 months or more,
- Any change in material, including not only raw material but also chemical compounds or processes (i.e. paints, adhesives, sealers, lubricants, plating, heat treat processes, etc.) which become part of the finished product; this includes changing to an engineering approved alternative material or any change in the sequence of operations,
- Upon request of BAE Systems' Purchasing Representative.

The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

059 PPAP-Level 4-Predefined Requirements

The Supplier shall complete a PPAP in accordance with Level 4 of the Production Part Approval Process (PPAP) manual and shall submit the following to BAE Systems for approval:

- Design Record
- Authorized Engineering Change Documents (as applicable for Supplier Designed Product)
- Customer Engineering Approval (if required)
- Process Flow Diagrams
- Process Failure Modes and Effects Analysis (PFMEA)
- Control Plan

- Dimensional Results with ballooned drawing (all characteristics, including drawing notes, numbered)
- Photograph of the part marking
- Records of Material / Performance Test Results
- Initial Process Studies (for Critical/Safety/Significant Characteristics identified on the drawing)
- Qualified Laboratory Documentation
- Checking Aids (Picture of non-standard/special acceptance fixtures, e.g. holding fixture, not applicable to standard inspection equipment, i.e. calipers)
- Customer Specific Requirements
- Part Submission Warrant (PSW)

All other requirements of the PPAP are waived for this order and do not need to be completed.

The Supplier shall not ship product to BAE Systems prior to receipt of a signed/approved PSW. Product shipped in advance of PPAP approval shall be subject to rejection and may be returned at the supplier's expense.

Process or product changes require PPAP resubmission. Notification to BAE Systems prior to changes is essential, as additional audits/reviews may be required prior to resubmission; such changes are to be communicated to your BAE Systems Procurement Representative via the Vendor Information Request Form (Form 089725). Process or product changes are defined as changes in the processing of the product that could affect its ability to meet design, durability, and reliability requirements, including:

- Use of a process or material other than those which were previously approved,
- Production from new or modified tools (except perishable tools), dies, molds, patterns, etc., including additional or replacement tooling,
- Production following any refurbishment or rearrangement of existing tooling or equipment,
- Production from tooling and equipment transferred from another manufacturing site,
- Change of a supplier for parts or services (e.g. heat treating, plating, welding),
- Break in production or product produced after tooling has been inactive for 24 months or more,
- Any change in material, including not only raw material but also chemical compounds or processes (i.e. paints, adhesives, sealers, lubricants, plating, heat treat processes, etc.) which become part of the finished product; this includes changing to an engineering approved alternative material or any change in the sequence of operations,
- Upon request of BAE Systems' Purchasing Representative.

The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

060 PPAP-Level 4-Unique Requirements

The Supplier shall complete a PPAP in accordance with Level 4 of the Production Part Approval Process (PPAP) manual and shall submit requirements as specified in the PPAP Requirements Checklist included as part of the Purchasing Agreement. All other requirements of the PPAP shall be completed, retained on file, and made available to BAE Systems upon request. Inspection data shall be accompanied by a ballooned drawing (all characteristics, including drawing notes, numbered) and a photograph of the part marking.

The Supplier shall not ship product to BAE Systems prior to receipt of a signed/approved PSW. Product shipped in advance of PPAP approval shall be subject to rejection and may be returned at the supplier's expense.

Process or product changes require PPAP resubmission. Notification to BAE Systems prior to changes is essential, as additional audits/reviews may be required prior to resubmission. Such changes are to be communicated to your BAE Systems Procurement Representative via the VIR Form 089725. Process or product changes are defined as changes in the processing of the product that could affect its ability to meet design, durability, and reliability requirements, including:

- Use of a process or material other than those which were previously approved;
- Production from new or modified tools (except perishable tools), dies, molds, patterns, etc., including additional or replacement tooling;
- Production following any refurbishment or rearrangement of existing tooling or equipment;
- Production from tooling and equipment transferred from another manufacturing site;
- Change of a supplier for parts or services (e.g. heat treating, plating, welding);
- Break in production or product produced after tooling has been inactive for 24 months or more; or
- Changes in material, including raw material, chemical compounds or processes (i.e. paints, adhesives, sealers, lubricants, plating, heat treat processes, etc.), which become part of the finished product, including changing to an engineering approved alternative material or any change in the sequence of operations, upon request of BAE Systems' Purchasing Representative.

The data shall be submitted and approved prior to shipment of the item in accordance with the Data Submission Instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item.

061 PPAP-Level 5

The Supplier shall complete a PPAP in accordance with Level 5 of the Production Part Approval Process (PPAP) manual and shall retain all documentation at their facility. Inspection data shall be accompanied by a ballooned drawing (all characteristics, including drawing notes, numbered) and a photograph of the part marking. The documentation shall be made available to BAE Systems upon request.

064 York CAGE Code

The CAGE code to be marked on this part is 06085.

065 San Jose CAGE Code

The CAGE code to be marked on this part is 80212.

066 Anniston CAGE Code-Aftermarket Spares

The CAGE code to be marked on this part is 076M6.

067 Anniston CAGE Code-Forge Facility

The CAGE code to be marked on this part is 05386.

068 Sterling Heights CAGE Code

The CAGE code to be marked on this part is 6BTJ2

083 Electrostatic Discharge (ESD)

- A. Supplier **shall** have an ESD program in place per ANSI/ESD S20.20.
- B. Supplier **shall** protect the parts using approved ESD protective packaging per MIL-STD-2073 preservation code GX.
- C. Labeling **shall** be per MIL-STD-130 and MIL-STD-129.

084 Process Failure Mode and Effects Analysis (PFMEA) and Control Plans (CP)

- A. PFMEA AND CONTROL PLANS PER THE TOP LEVEL DRAWING, AND FLOW DOWN TO ALL SUPPLIERS

The contractor shall develop and implement the use of PFMEA and CPs that ensure compliance with the requirements of this contract. The PFMEA and CP must involve the entire production system and flow down of these requirements to its suppliers.

The contractor shall submit, for BAE Systems approval, an implementation plan, which describes in detail: schedule, milestones, exception criteria, submission methodology and Supplier flow down requirements. Specific processes in the manufacturing of the components must be identified that are used to ensure conformance to the requirements. The Implementation plan is to be completed and submitted 30 days following receipt of the contract in accordance with the data submission instructions located in the SQAM paragraph 8.12 for this part.

Control plans shall include outputs from the PFMEA's. Special or key characteristics, whether identified by the Customer or the Supplier, must be used in the development of the control methods. The control methods must also include specific reaction plans when any undesirable measurement results are obtained. The reaction plans, in conjunction with the inspection/test frequency shall effectively

mitigate the risk of suspect material being released for shipment from the contractor's/suppliers facility.

The CP and PFMEA documents are to be completed, submitted and approved in accordance with the data submission instructions located in the SQAM paragraph 8.12 for this part prior to shipment of any product. CPs shall be treated as a living document and shall always reflect the current process. CPs shall be controlled documents and retained for the life of the contract.

The contractor shall use Automotive Industry Action Group (AIAG) publications "Potential Failure Mode and Effects Analysis" version 4, 2008, and "Advanced Product Quality Planning and Control Plan" version 2, 2008 for development and use of PFMEAs and CPs.

B. PFMEA AND CONTROL PLANS PER THE TOP LEVEL DRAWING, TIER I & II SUPPLIERS

The Contractor shall develop and implement the use of PFMEA and CPs that ensure compliance with the requirements of this contract. The PFMEA and CP must involve the entire production system as defined on the top level drawing.

The Contractor shall submit, for BAE Systems approval, an implementation plan, which describes in detail: schedule, milestones, exception criteria, and submission methodology. Specific processes in the manufacture of the components must be identified that are used to ensure conformance to the requirements. The Implementation plan is to be completed and submitted 30 days following receipt of the contract in accordance with the data submission instructions located in the SQAM paragraph 8.12 for this part

Control plans shall include outputs from the PFMEA's. Special or key characteristics, whether identified by the Customer or the Supplier, must be used in the development of the control methods. The control methods must also include specific reaction plans when any undesirable measurement results are obtained. The reaction plans, in conjunction with the inspection/test frequency shall effectively mitigate the risk of suspect material being released for shipment from the supplier's facility.

The CP and PFMEA documents are to be completed, submitted and approved, in accordance with the data submission instructions located in the SQAM paragraph 8.12 for this part prior to shipment of any product. CPs shall be treated as a living document and shall always reflect the current process. CPs shall be controlled documents and retained for the life of the contract.

The Contractor shall use Automotive Industry Action Group (AIAG) publications "Potential Failure Mode and Effects Analysis" version 4, 2008, and "Advanced Product Quality Planning and Control Plan" version 2, 2008 for development and use of PFMEAs and CPs.

085 First Article Inspection

The Contractor shall conduct First Article Inspection (FAI) in accordance with AS9102B for all provided parts and those not previously subjected to First Article Inspection requirements in

accordance with the Supplier Quality Assurance Manual, to ensure Supplier product/processes have the capability of meeting design and/or specification requirements.

FAI's shall be conducted, reviewed, submitted and approved in accordance with the data submission instructions located in the SQAM paragraph 8.12 for this part prior to the first shipment of product. Where changes require only a delta FAI, the delta FAI will be limited to the impact of the change only. The customer reserves the right to review any/or all associated FAI documentation at its discretion.

086 Counterfeit Material Program

This requirement is applicable to Phoenix for hardware and electronic purchases and to Combat Vehicles for electronic purchases only.

Prior to first product delivery, the supplier is required to submit and gain approval by BAE Systems Procurement, documentation confirming the traceability of parts to be delivered were produced by the Original Equipment/Component Manufacturer or sourced directly from an Authorized Distributor. Parts from sources other than the OEM/OCM or Authorized Distributor will require submission and approval, by BAE Systems Procurement, of Certificates of Conformance, Certificates of Origin and/or Performance Test Reports. With every delivery, the supplier is required to provide a Certificate of Authenticity stating compliance with sourcing from OEM/OCM, Authorized Distributor or BAE Systems pre-approved supplier.