

Summary of Changes

095871 Contracts Deliverable Requirements CDR

Rev 20

This serves as notification that our BAE Systems Supplier Quality Assurance Manual (SQAM) has been updated. Please note that the changes below are listed with the older version first, then the new revision is below it, unless otherwise noted. Please see the following changes/additions/deletions:

Legend:

- Addition
- Change
- Deletion

CDR Manual Preface:

The Supplier is required to adhere to assigned CDRs on the PO and deliver requested objective evidence per the data submission instructions and CDR specific requirements. The supplier is required to meet and have available objective evidence to all other SQAM, PO and TDP requirements as applicable.

CDR Manual Preface:

The Supplier is required to adhere to assigned CDRs on the PO and deliver requested objective evidence per the data submission instructions and CDR specific requirements. The Supplier is required to meet and have available objective evidence to all other SQAM, PO and TDP requirements as applicable. **Requests for records SHALL be fulfilled within five (5) business days. BAE Systems strongly advises all Suppliers to consider documentation submittal and BAE Systems review and approval times into your schedule and BAE Systems promise dates.**

ALL the CDRs in this manual (outside of the CDRs in table A below) SHALL have documentation submitted and approved prior to shipment of the item (s) in accordance with the data submission instructions located in the Supplier Quality Assurance Manual (SQAM) paragraph 8.12 for this item. The Supplier SHALL NOT ship without an approved Vendor Information Request (VIR), waiving any CDRs they are unable to meet. Shipment without BAE Systems approval constitutes the material as non-conforming. For any CDR submittal where the documentation covers the whole PO order quantity, identify this on form 092245.

For CDRs outside of table A, payment may be predicated on submittal and approval, prior to shipment.

Table A: CDRs that do not require submittal:

CDR 022	CDR 023	CDR 026	CDR 028	CDR 030A	CDR 030B
CDR 030D	CDR 044	CDR 046	CDR 053	CDR 054	CDR 055
CDR 064	CDR 065	CDR 066	CDR 067	CDR 068	CDR 083
CDR 087					

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. **These specified characteristics will be recorded on a suitable form.** If your purchasing agreement does not clarify specific inspection or test data requirements, contact your Purchasing Representative for direction or 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/Revision
- Serial Number/Lot Number/Identifier as applicable
- 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)

001 Inspection/Test Data Reports

The Supplier of BAE Systems SHALL submit for each piece. All the Supplier's actual inspection/test data for the specified characteristics identified and specified in the purchasing agreement. If your purchasing agreement does not clarify specific inspection or test data requirements, contact your Purchasing Representative for direction, or a full FPI for each piece, as required **per SQAM 8.3.**

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.**

003 First Piece Inspection Report

The Supplier SHALL submit their First Piece Inspection (FPI) report as specified in the SQAM paragraph 8.3.

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 if any additional parts for the testing, is required.** The FAT Report shall be submitted and approved by BAE Systems 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 tier 1 or any sub-tier Suppliers.

The Supplier shall update and submit the FAT plan within 30 days following contract award covering all 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.

004 First Article Test (FAT)

FAT is required to validate that the production processes are producing results within specification (s). Suppliers are required to inform BAE Systems, using VIR form 089725 when any of the following **situations** occur, prior to shipment, to determine what additional testing is required:

- 1.) Change in the manufacturing process at tier 1 or any sub-tier Suppliers (BAE Systems is 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 is to be notified prior to the change (s) being made)
- 4.) Break in production of 24 months or more at tier 1 or any sub-tier Suppliers.

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 at any point in the schedule.

For initial FAT the Supplier SHALL create and submit the FAT plan within 30 days following the contract award. For delta FAT testing, the Supplier SHALL create and submit the FAT plan within 30 days following the identified need of delta FAT. Supplier SHALL notify BAE Systems a minimum of 15 days prior to start of testing. The FAT Report SHALL be submitted a minimum of 15 days prior to shipment and approved by BAE Systems.

004A TRR Test Readiness Review (New)

TRR is required for this part and is conducted to increase the probability of success during 'formal' testing. The review ensures the maturity of the test article (s), the test documentation and the test environment prior to initiating formal testing. The TRR verifies, from a test perspective, that the proper level of preparation is complete, the required coordination has been completed and that the resources are adequately planned to support the test objectives. Supplier is responsible for coordinating TRR with BAE Systems and as required BAE Systems will include the US Government. Advanced notification of 15 days is expected to coordinate review. The review may be held virtually or at the Supplier's facility. All data submissions shall be per SQAM 8.12 Data Submission Instructions.

A TRR will be conducted before each FAT/DFAT and formally **presented in slide deck** form to BAE Systems prior to the start of testing.

The TRR may consist of but not limited to:

- LRU name
 - Test (s) being performed
 - Test Schedule including set-up, breakdown, shipping times, test duration (s)
 - Quantities of LRU's undergoing testing
 - Test Location (s)
 - Test Objectives
 - Test Parameters
 - Test Limitations (if any)
 - Test Readiness Criteria Including
 - Test Plan
 - Test Asset Availability and Status
 - Test Equipment Availability and calibration status
 - Test Support Personnel
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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. The product shall be presented with all required contract or TDP requirements met prior to presentation. 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 a minimum five (5) business 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 is cause for rejection, a Supplier corrective action request may be issued and product may be returned to the Supplier at the Supplier's expense and withholding of the invoice payment.

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

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. The product SHALL be presented with all required contract or TDP requirements met prior to presentation. In order to accommodate BAE System's source inspection representatives, the Supplier SHALL make all facilities and equipment available to support source inspection. **The following documentation SHALL be presented to the source inspector:**

- A copy of the current PO
- Variances and or completed VIRs attached to PO
- Current CQR (Configuration Quality Requirements) attached to PO
- All drawings defined on CQR
- Inspection records
- OQE supporting CDR / drawing requirements on PO

The Supplier SHALL provide a minimum five (5) business working days advance notification of requests for source inspection through submission of Form 092245. Unauthorized/unapproved shipment of product without a BAE Systems source inspection is cause for rejection, a Supplier corrective action request may be issued and product may be returned to the Supplier at the Supplier's expense and withholding of the invoice payment.

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

006 Government Source Surveillance/Inspection (GSS/GSI)

Government source surveillance/inspection is required prior to shipment from your plant and cannot be waived by BAE Systems. The source 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 source 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 source surveillance/inspection requirements to their sub tier Suppliers without the direction of their local Government Representative.

Unauthorized shipment of product without Government Source Surveillance is cause for 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:

[52.246-2 Inspection of Supplies-Fixed-Price. | Acquisition.GOV](#)

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

006 Government Source Surveillance/Inspection (GSS/GSI)

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 **completed**. If the local Government representative directs the source 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 source surveillance/inspection requirements to their sub tier Suppliers without the direction of their local Government representative.

Unauthorized shipment of product without Government Source Surveillance is cause for 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.

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

[52.246-2 Inspection of Supplies-Fixed-Price. | Acquisition.GOV](#)

The Supplier SHALL submit evidence of GSS review with each shipment.

007 Welding-Combat Vehicles

PRIOR to the start of fabrication, the Supplier **SHALL** **review WE-005 Weld Supplier Approval and Weld Procedure Submittal Process**, submit, and gain approval for all procedure(s) per the Purchase Order Part Number. Unless otherwise specified and/or prohibited by the applicable Purchase Order, Contract, Drawing, and/or Specification, authorized Suppliers **MAY** utilize BAE Systems Weld Procedure Specification(s) (WPS) in the event that the Supplier has received authorization by completing the BAE Systems required Weld Procedure Training and subsequent Weld Process Audit.

Note: CDR007 submittals in accordance with Mil-STD-3040 and/or Mil-STD-3057, along with subsequent document revisions, strictly prohibit the use of BAE Systems Weld Procedures. For Purchase Orders, Contracts, and/or Drawings requiring welding in accordance with Mil-STD-3040 and/or Mil-STD-3057, the Supplier **SHALL** qualify and provide Weld Procedure(s) and Supporting Documentation in accordance with the requirements listed in the applicable specification.

In the event that the Supplier is **NOT** authorized to utilize BAE Systems Weld Procedures and/or BAE Systems **DOES NOT** have applicable Weld/Braze Procedure(s) to fabricate the Weldment/Brazement to fulfill the Purchase Order, the Supplier **SHALL** be responsible for providing and/or qualifying Weld/Braze Procedure(s), in accordance with the specified code, **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/BPS(s) intended for part fabrication to BAE Systems Weld Engineering for review and approval via the CMS Supplier Weld/Braze Procedure Submission Form (BMS 089136) **PRIOR** to the start of welding/brazing and fabrication. The latest version of the form **SHALL** be utilized and is accessible via the BAE Systems CMS Supplier Website.

Each Weldment/Brazement Part Number and the applicable WPS/BPS(s) **SHALL** be submitted individually. In the event that the Supplier provides a non-BAE Systems qualified Weld Procedure, or is not authorized to utilize BAE Systems Weld Procedures, the Supplier **SHALL** submit the following documentation, as required per the applicable code and/or specification, **PRIOR** to the start of welding/brazing and fabrication:

- **Welding Procedure Specification (WPS)/Braze Procedure Specification (BPS)**
- Supporting **Procedure Qualification Record (PQR)/ Braze Procedure Qualification Record (BPQR)**- to include Non-Destructive and Destructive Supporting Test Data
- Any **additional supporting documentation** that is required for submittal in accordance with the applicable drawing and/or specification

All Weld Procedures and/or Braze Procedures to be utilized **SHALL** be approved **PRIOR** to use; which **SHALL** include tack welding and/or rework. Supplying product to BAE Systems with an unapproved, rejected, and/or incorrect WPS/BPS is a violation of the BAE Systems Purchasing Agreement and SQAM and **SHALL** be considered non-conforming.

The Supplier **SHALL** be responsible for resubmitting the form in the event that any changes in Base Material, Weld/Braze Procedure(s), the Part Number Configuration, and/or any other changes that impact the Welding/Brazing processes from the previously approved submittal. The form **SHALL** be resubmitted if the BAE Systems Purchasing Order Part Number changes throughout configuration, regardless if all other variables have remained consistent from the previous approval.

The Supplier **SHALL** be responsible for maintaining all supporting documentation including, but **NOT** limited, to the following; Procedure Qualifications, 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, to BAE Systems at all times.

For weld repairs and/or clarifications regarding weld/braze drawing requirements, the Supplier **SHALL** submit a Vendor Information Request (VIR) Form (BMS 097908) for review and disposition **PRIOR** to use.

007 Welding/Brazing-Combat Vehicles

PRIOR to the start of fabrication, the Supplier **SHALL** submit and gain approval for all procedure (s) per the PO Part Number. Unless otherwise specified and/or prohibited by the applicable PO, Contract, Drawing, and/or Specification, authorized Suppliers **MAY** utilize BAE Systems Weld Procedure Specification (s) (WPS) in the event that the Supplier has received authorization by completing the BAE Systems required Weld Procedure Training and subsequent Weld Process Audit.

NOTE: Suppliers may utilize BAE Systems Weld Procedures under the Hybrid Weld Codes 4399307 and 4399308. However, under the Hybrid Weld Code- Steel (4399307) Section 4.5.4.2 Procedure Transfers, the Supplier **SHALL** create a validation test plate using the WPS parameters to qualify for welding with the WPS in accordance with Section 4.6 Welder Performance Qualification to demonstrate the entity is capable of meeting the requirements of the transferred WPS. This validation test is **ONLY** to be performed for each BAE Systems Steel Weld Procedure utilized under the Hybrid Weld Code-Steel (4399307).

NOTE: CDR007 submittals in accordance with Mil-STD-3040 and/or Mil-STD-3057, along with subsequent document revisions, strictly prohibit the use of BAE Systems Weld Procedures **for Weld Classes II, III, and IV**. For POs, contracts, and/or drawings requiring welding in accordance with Mil-STD-3040 and/or Mil-STD-3057, the Supplier **SHALL** qualify and provide Weld Procedure(s) and supporting documentation in accordance with the requirements listed in the applicable specification.

In the event the Supplier is **NOT** authorized to utilize BAE Systems Weld Procedures and/or BAE Systems **DOES NOT** have applicable Weld/Braze Procedure (s) to fabricate the Weldment/Brazement to fulfill the PO, the Supplier **SHALL** be responsible for providing and/or qualifying Weld/Braze Procedure (s), in accordance

with the specified code, **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/BPS(s) intended for part fabrication to BAE Systems Weld Engineering for review and approval via the CMS Supplier Weld/Braze Procedure Submission Form (BMS 089136) **PRIOR** to the start of welding/brazing and fabrication. The latest version of the form SHALL be utilized and is accessible via the BAE Systems CMS Supplier Website.

Each Weldment/Brazement part number and the applicable WPS/BPS(s) SHALL be submitted individually.

In the event the Supplier provides a non-BAE Systems qualified Weld Procedure, or is not authorized to utilize BAE Systems Weld Procedures, the Supplier SHALL submit the following documentation, as required per the applicable code and/or specification, **PRIOR** to the start of welding/brazing and fabrication:

- **Welding Procedure Specification (WPS)/Braze Procedure Specification (BPS)**
- Supporting **Procedure Qualification Record (PQR)/ Braze Procedure Qualification Record (BPQR)**- to include non-destructive and destructive supporting test data
- Any **additional supporting documentation** that is required for submittal in accordance with the applicable drawing and/or specification

All Weld procedures and/or Braze procedures to be utilized SHALL be approved **PRIOR** to use; which SHALL include tack welding and/or rework. Supplying product to BAE Systems with an unapproved, rejected, and/or incorrect WPS/BPS is a violation of the BAE Systems Purchasing Agreement and SQAM and SHALL be considered non-conforming.

The Supplier SHALL be responsible for resubmitting the form in the event that any changes in base material, Weld/Braze procedure (s), the part number configuration, and/or any other changes that impact the Welding/Brazing processes **and/or procedures** from the previously approved submittal. The form SHALL be resubmitted if the BAE Systems Purchasing Order part number changes throughout configuration, regardless if all other variables have remained consistent from the previous approval.

NOTE: The processes and procedures that are to be used in fabrication SHALL directly align with the latest approval on record. Should the Supplier resubmit and gain approval on the PO part number and Weldment/Brazement part number combination, any previous approvals containing that specific combination are superseded by the most recent approval.

Example: If the Supplier has a previously approved process (GMAW) and wishes to add an additional process (GTAW), both procedures and processes must be included in the resubmittal if they are intended to be used on the subject part.

The Supplier SHALL be responsible for maintaining all supporting documentation including, but **NOT** limited, to the following; procedure qualifications, 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, to BAE Systems at all times.

For weld repairs and/or clarifications regarding weld/braze drawing requirements, the Supplier SHALL submit a Vendor Information Request (VIR) Form (BMS 097908) for review and disposition **PRIOR** to use.

007A Welding Combat Vehicles Inspection Criteria

Visual Testing (VT) SHALL be completed and documented on 100% of all welds. The Certificate of Conformance Weld Certification Form 090475 SHALL be submitted with **all shipments**. For the **first shipment**, the First Submission Weld Roadmap Form 091460 SHALL also be included with the Certificate of Conformance Weld Certification Form.

Documentation 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 Testing (VT) SHALL be conducted by one of the following certification platforms:

- An American Welding Society Certified Welding Inspector (CWI) and/or Senior Certified Welding Inspector (SCWI)

- A qualified CWB Level 2 or 3 through the Canadian Welding Bureau, as determined through the Canadian Standards Association.
- Other certifications, as defined by the applicable Weld Code and/or Specification

All Visual Testing (VT) on armor steel and/or quenched and tempered steel SHALL be held for 48 hours PRIOR to final inspection. When NDT is required per the drawing, all welded high strength steels including, but not limited to, armor steel and low alloy steels 90 KSI (620MPa) in tensile strength or greater SHALL be held a minimum of 48 hours PRIOR to NDT inspection.

007A Welding Combat Vehicles Inspection Criteria

Visual Testing (VT) SHALL be completed and documented on 100% of all welds. The Certificate of Conformance (CoC) Weld Certification form 090475 SHALL be submitted with **all shipments**. For the **first shipment**, the First Submission Weld Roadmap Form 091460 SHALL also be included with the CoC Weld Certification Form.

All Visual Testing (VT) SHALL be conducted by one of the following certification platforms:

- An American Welding Society Certified Welding Inspector (CWI) and/or Senior Certified Welding Inspector (SCWI)
- A qualified CWB Level 2 or 3 through the Canadian Welding Bureau, as determined through the Canadian Standards Association.
- Other certifications, as defined by the applicable weld code and/or specification

All Visual Testing (VT) on armor steel and/or quenched and tempered steel SHALL be held for 48 hours PRIOR to final inspection. When NDT is required per the drawing, all welded high strength steels including, but not limited to, armor steel and low alloy steels 90 KSI (620MPa) in tensile strength or greater SHALL be held a minimum of 48 hours PRIOR to NDT inspection.

008 Welding-Weapon Systems

PRIOR to the start of fabrication, the Supplier **SHALL** submit and gain approval for all procedure(s) per the Purchase Order Part Number. The Supplier **SHALL** be responsible for qualifying and providing Weld/Braze Procedure (s) **PRIOR** to fabrication.

The Supplier **SHALL** submit the following documentation, as required per the applicable code and/or specification, to BAE Systems for review and approval via the CMS Supplier Weld/Braze Procedure Submission Form (BMS 089136) accessible via the BAE Systems CMS Supplier Website, **PRIOR** to the start of welding/brazing and fabrication:

- **Welding Procedure Specification (WPS)/Braze Procedure Specification (BPS)**
- Supporting **Procedure Qualification Record (PQR)/ Braze Procedure Qualification Record (BPQR)**- to include Non-Destructive and Destructive Supporting Test Data
- **Personnel Performance Qualifications***- to include Welder/Welder Operator Performance Qualification (WPQ) and Brazer/Braze Operator Performance Qualification (BPQ) *submittals **ONLY** required for personnel executing the respective welding and/or brazing operations
- Any **additional supporting documentation** that is required for submittal in accordance with applicable drawing and/or specification

All Weld/Braze Procedures to be utilized **SHALL** be approved **PRIOR** to use; which **SHALL** include tack welding and/or rework. Supplying product to BAE Systems with an unapproved, rejected, and/or incorrect WPS/BPS is a violation of the BAE Systems Purchasing Agreement and SQAM and **SHALL** be considered non-conforming.

The Supplier **SHALL** be responsible for maintaining all supporting documentation including, but **NOT** limited, to the following; Procedure Qualifications, 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, to BAE Systems at all times.

For weld repairs and/or clarifications regarding weld/braze drawing requirements, the Supplier **SHALL** submit a Vendor Information Request (VIR) Form (BMS 097908) for review and disposition **PRIOR** to use.

008 Welding/Brazing-Weapon Systems

PRIOR to the start of fabrication, the Supplier SHALL submit and gain approval for all procedure(s) per the PO Part Number. The Supplier SHALL be responsible for qualifying and providing Weld/Braze Procedure (s) **PRIOR** to fabrication.

The Supplier SHALL submit the following documentation, as required per the applicable code and/or specification, to BAE Systems for review and approval via the CMS Supplier Weld/Braze Procedure Submission Form (BMS 089136) accessible via the BAE Systems CMS Supplier Website, **PRIOR** to the start of welding/brazing and fabrication:

- **Welding Procedure Specification (WPS)/Brazing Procedure Specification (BPS)**
- Supporting **Procedure Qualification Record (PQR)/ Brazing Procedure Qualification Record (BPQR)**- to include Non-Destructive and Destructive Supporting Test Data
- **Personnel Performance Qualifications***- to include Welder/Welder Operator Performance Qualification (WPQ) and Brazer/Braze Operator Performance Qualification (BPQ) *submittals **ONLY** required for personnel executing the respective welding and/or brazing operations
- Any **additional supporting documentation** that is required for submittal in accordance with applicable drawing and/or specification

All Weld/Braze Procedures to be utilized SHALL be approved **PRIOR** to use; which SHALL include tack welding and/or rework. Supplying product to BAE Systems with an unapproved, rejected, and/or incorrect WPS/BPS is a violation of the BAE Systems Purchasing Agreement and SQAM and SHALL be considered non-conforming.

All Weld Procedures and/or Braze Procedures to be utilized SHALL be approved **PRIOR** to use; which SHALL include tack welding and/or rework. Supplying product to BAE Systems with an unapproved, rejected, and/or incorrect WPS/BPS is a violation of the BAE Systems Purchasing Agreement and SQAM and SHALL be considered non-conforming.

The Supplier SHALL be responsible for resubmitting the form in the event that any changes in Base Material, Weld/Braze Procedure(s), the Part Number Configuration, and/or any other changes that impact the Welding/Brazing processes and/or procedures from the previously approved submittal. The form SHALL be resubmitted if the BAE Systems Purchasing Order Part Number changes throughout configuration, regardless if all other variables have remained consistent from the previous approval.

NOTE: The processes and procedures that are to be used in fabrication SHALL directly align with the latest approval on record. Should the Supplier resubmit and gain approval on the PO Part Number and Weldment/Brazement Part Number combination, any previous approvals containing that specific combination are superseded by the most recent approval.

Example: If the Supplier has a previously approved process (GMAW) and wishes to add an additional process (GTAW), both procedures and processes must be included in the resubmittal if they are intended to be used on the subject part.

The Supplier SHALL be responsible for maintaining all supporting documentation including, but **NOT** limited, to the following; Procedure Qualifications, 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, to BAE Systems at all times.

For weld repairs and/or clarifications regarding weld/braze drawing requirements, the Supplier SHALL submit a Vendor Information Request (VIR) Form (BMS 097908) for review and disposition **PRIOR** to use.

008A Welding/Brazing-Procedures Requiring NAVSEA Approval (New)

As a prerequisite, the Supplier SHALL be responsible for satisfying all requirements in Sections 5.2.3 and 5.2.3.1 of S9074-AQ-GIB-010/248 REQUIREMENTS FOR WELDING AND BRAZING PROCEDURE AND PERFORMANCE QUALIFICATION **PRIOR** to accepting POs with these requirements.

PRIOR to the start of fabrication, the Supplier SHALL submit and gain approval for all procedure (s) per the PO Part Number.

The Supplier SHALL be responsible for providing and/or qualifying Weld/Braze Procedure (s), in accordance with the specified code, **PRIOR** to fabrication.

The Supplier SHALL submit the WPS/BPS (s) intended for part fabrication to BAE Systems Weld Engineering for review and approval via the CMS Supplier Weld/Braze Procedure Submission form (BMS 089136) **PRIOR** to the start of welding/brazing and fabrication. The latest version of the form SHALL be utilized and is accessible via the BAE Systems CMS Supplier Website. Each Weldment/Brazement part number and the applicable WPS/BPS (s) SHALL be submitted individually.

The Supplier SHALL submit the following documentation, at a minimum, as required per the applicable code and/or specification, **PRIOR** to the start of welding/brazing operations:

- **Welding Procedure Specification (WPS)/Braze Procedure Specification (BPS)**
- Supporting **Procedure Qualification Record (PQR)/ Braze Procedure Qualification Record (BPQR)**
- **Non-Destructive and Destructive Supporting Test Report**; tests SHALL be performed in accordance with AWS B4.0 and NAVSEA T9074-AS-GIB-010-271 REV 1
- **Filler Material Certificate of Conformance (CoC)** for filler material utilized in the development of the applicable PQR
- **Procedure Approval Notice and/or artifact from NAVSEA and/or NAVSEA AR**, if the applicable PQR was previously reviewed and approved by NAVSEA
- For Special Welds and/or Special Processes, provide any **additional supporting documentation** that is required for submittal in accordance with the applicable drawing and/or specification

BAE Systems SHALL be responsible for submitting the package to NAVSEA, for review and approval, as required.

All weld procedures and/or braze procedures to be utilized SHALL be approved by BAE Systems **PRIOR** to use; which SHALL include tack welding and/or rework. Supplying product to BAE Systems with an unapproved, rejected, and/or incorrect WPS/BPS is a violation of the BAE Systems Purchasing Agreement and SQAM and SHALL be considered non-conforming.

The Supplier SHALL be responsible for resubmitting the form in the event that any changes in base material, weld/braze procedure(s), the part number configuration, and/or any other changes that impact the welding/brazing processes from the previously approved submittal. The form SHALL be resubmitted if the BAE Systems PO part number changes throughout configuration, regardless if all other variables have remained consistent from the previous approval.

The Supplier SHALL be responsible for maintaining all supporting documentation including, but **NOT** limited, to the following; procedure qualifications, 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, to BAE Systems at all times.

For weld repairs, clarifications, and/or deviations regarding weld/braze drawing and/or specification requirements, the Supplier SHALL submit a Vendor Information Request (VIR) Form (BMS 097908) for review and disposition **PRIOR** to use.

009 Soldering (Deleted)

- 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 previous approval (s)
-

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.**

010 Solderability

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.

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.

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. 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.

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. 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.** Approval of procedure is to be completed by or with oversight from BAE Systems, level 3 personnel. 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.

013 Nondestructive Examination Procedures

When the PO specifies nondestructive examination such as radiography, magnetic particle, liquid penetrant, or ultrasonic inspections, approval of the procedure is to be completed by or with oversight from BAE Systems, level 3 personnel. The procedure SHALL be submitted within thirty (30) days after receipt of the Purchasing Agreement.

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.

014 Nondestructive Examination Inspection Report

The Supplier SHALL furnish a certified test report stating that non-destructive 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, **at a minimum:**

- 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
- **Quantity of parts that were evaluated**

- BAE PO number (s)

In addition to the above, data as required by the testing specification in the contract SHALL be included.

A test plan SHALL be developed detailing the non-destructive 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 a certified individual required per the PO requirements, with a level II or higher certification.

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 with form "092245 Source Inspection Request / CDR Paperwork Submission" in accordance with the Data Submission Instructions (located in the SQAM, paragraph 8.12) for this item prior to shipment of product for approval.

BAE Systems requests that the supplier clarify any details or guidance applicable to the control test submission. The following are details that may be included but are not limited to:

- Number of units the control test documentation covers
- Timing of the next control test plan to be submitted
- Serial numbers the control test covers

Note: Details clarifying the control test submission may be included in email or as convenient to the supplier. This is only to aid clarity with the control test approval and documentation at BAE Systems.

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

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.

Note: If the TDP allows shipment prior to completion of the testing the supplier must submit form "092245 Source Inspection Request / CDR Paperwork Submission" and form 093504 "CDR 015 Part Submission Form Review Notification". Identification of projected date of test completion must be included in section B, section C will be approved by BAE Systems prior to shipping.

Following the completion of testing a test report SHALL be submitted and approved with form "092245 Source Inspection Request/CDR Paperwork Submission" and form 093504 "CDR 015 Part Submission Form Review Notification".

Suppliers are required to inform BAE Systems using VIR form 089725 when any of the following situations occur. A change in the planned test schedule that may impact delivery, a failure through test equipment or a failure with product itself prior to continuance of testing.

Forms are available on the Purchasing website.

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 numbers
- 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 numbers that were 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 proving the plating was performed in accordance with all Purchasing Agreement, drawing, and 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 and revision
- Purchasing Agreement number
- Plating process specification and revision 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.

Pretreatment on steel parts with a tensile strength of 1000 MPa (31 HRC) or greater that contain tensile stresses caused by cold forming or cold straightening which have not been heat treated after the cold forming

process, shall be heat treated for stress relief to reduce the risk of hydrogen embrittlement in the part before the clean and electroplate processes. Heat treatment times and temperatures shall be in accordance with Table 1 of ASTM B849 for steel, based on its tensile strength.

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

Post Coating Treatments of Iron and Steel for the Purpose of Reducing the Risk of Hydrogen Embrittlement (Baking)—Electroplated steel parts having a tensile strength greater than 1200 MPa (39 HRC) as well as surface hardened parts, shall be baked to reduce the risk of hydrogen embrittlement. Baking of electroplated steel parts with tensile strength 1200 MPa (39 HRC) or less is not mandatory. Steel parts having a tensile strength greater than 1200 MPa (39 HRC) as well as surface hardened parts, shall be baked to reduce the risk of hydrogen embrittlement. For such parts, when the purchaser did not specify the bake requirements in the ordering information, bake times and temperatures shall be in accordance with the appropriate ER Class in Guide ASTM B850 Table 1.

The certification for baking 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

016 Plating

The Supplier SHALL provide a written certification proving the plating was performed in accordance with all Purchasing Agreement, drawing, and specification requirements prior to shipment of the product. The facility performing the plating SHALL prepare the certification.

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

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

Pretreatment on steel parts with a tensile strength of 1000 MPa (31 HRC) or greater that contain tensile stresses caused by cold forming or cold straightening which have not been heat treated after the cold forming process, SHALL be heat treated for stress relief to reduce the risk of hydrogen embrittlement in the part before the cleaning and electroplating processes. Heat treatment times and temperatures SHALL be in accordance with Table 1 of ASTM B849 for steel, based on its tensile strength.

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

- Post Coating Treatments of Iron and Steel for the Purpose of Reducing the Risk of Hydrogen Embrittlement (Baking)
- Electroplated steel parts having a tensile strength greater than 1200 MPa (39 HRC) as well as surface hardened parts, SHALL be baked to reduce the risk of hydrogen embrittlement.
- Baking of electroplated steel parts with tensile strength 1200 MPa (39 HRC) or less is not mandatory.
- Steel parts having a tensile strength greater than 1200 MPa (39 HRC) as well as surface hardened parts, SHALL be baked to reduce the risk of hydrogen embrittlement. (For such parts, when the purchaser did not specify the bake requirements in the ordering information, bake times and temperatures SHALL be in accordance with the appropriate ER Class in Guide ASTM B850 Table 1).

The certification for baking 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 the 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 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 and revision
- BAE Systems Purchasing Agreement number
- List of specifications and their revisions used in the processing of the paint
- Dry film paint thickness of a sample of actual parts for the primer and top coat
- Salt spray evidence as required per specification
- Adhesion testing evidence as required per specification
- 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 include as required any associated paint photographs.

017 Paint Certification

The Supplier **SHALL** provide a copy of the written certification documenting that painting was performed in accordance with all Purchasing Agreements, drawing, and specification requirements prior to product shipment. The facility performing the painting **SHALL** prepare the certification, which **SHALL** include:

- Name and address of the finisher
- Part number and revision
- BAE Systems Purchasing Agreement number
- List of specifications and their revisions used in the processing of the paint
- Dry film paint thickness of a sample of actual parts for the primer and top coat
- Salt spray evidence as required per specification
- Adhesion testing evidence as required per specification
- 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.

Items requiring painting in accordance with MIL-STD-1303 SHALL instead be painted in accordance with NAVSEA Drawing 7250920 as required by any associated paint photographs.

018 Physical and Chemical Test Reports

The Supplier shall provide the raw material certification including all actual chemical, mechanical, and physical test results required by the TDP for the material or finished product 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.** For material subject to the SQAM paragraph 6.6 Traceability of Specialty Metals, evidence of compliance shall be included. **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.**

018 Physical and Chemical Test Reports

The Supplier SHALL provide the raw material certification including all actual chemical, mechanical, and physical test results required by the TDP for the material or finished product shipped under this Purchasing Agreement with traceability to the original mill/manufacturer, heat lot, and country of origin. For material subject to the SQAM paragraph 6.6 Traceability of Specialty Metals, evidence of compliance SHALL be included. **Certificate is required to state affirmation/compliance to DFARS 252.225-7008 and 252.225-7009.**

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.

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. **Contact Purchasing Representative for sample delivery location requirements if unspecified.**

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 the 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.

020 A-G Heat Treating

The Supplier SHALL conduct a visual inspection for cracks or other injurious defects with qualified personnel as required.

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 the 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.

All below are new:

020A - 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. The 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 the 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 ensure that proper hardness is achieved.

020B - 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).

020C - 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).

020D - 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.

020E - 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.

020F - 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.

020G - 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.

022A Material Traceability – Weapon Systems - VPM

For Legacy Weapon Systems, VPM program, the following requirements apply:

- Supplier SHALL comply with all provisions of sow EB5638.
- Material verification SHALL be accomplished upon receipt and prior to delivery.
- Photographic evidence of product condition as received and as shipped MUST be provided.

022A Material Traceability – Weapon Systems - VPM

For Legacy Weapon Systems, VPM program, the following requirements apply:

- Supplier SHALL comply with all provisions of sow EB5638 and EB6075.
 - Material verification SHALL be accomplished upon receipt and prior to delivery.
 - Photographic evidence of product condition as received and as shipped MUST be provided.
 - Inspection/OQE Reports SHALL include the Unique Identification Number (UIN) from the provided raw material and a unique serial number that SHALL also be marked on the part to match the inspection records.
 - Part markings should include a minimum of the following:
 - MFR name (Symbol) and cage code, material traceability serial number and heat number (EB Unique Number – Mill SN for plate,
 - EB/OEM SN for forgings/castings, lot number(Bar), MIC NO (CU-NI, AL-BZ PLATE, BAR STOCK),
 - Material Specification (EX) HY-80, DELRIN-150, FORGING/PLATE SPEC),
 - Material Inspection Markings (VT, MT, RT, UT), EB Drw No- Item No/Revision from the BAE Systems provided-Discrete Dwg Numbers page, BAE Systems material tracking number provided on raw material,
 - Hull Code ID
-

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.

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 requests documentation, the documentation SHALL be provided in a commonly readable electronic format.

026A Quality System Requirements Deleted

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.**

027 Certificate of Compliance

The Supplier SHALL provide an electronic copy of their CoC for each shipment as defined by paragraph 8.5 of the SQAM.

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.

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.

Weapon Systems VPM program – The Supplier SHALL comply with the above provisions and the entirety of EB5638.

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.

030C NADCAP Approved Special Processes

All special processes identified herein and utilized on a BAE Systems PO/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 CoC 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 PO/subcontract SHALL have a current accreditation by NADCAP. The CoC 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.

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 per the Data Submission Instructions on Form 092245.
 - Forms are available on the Purchasing website listed in the PO text.
- During source inspection, the Supplier and BAE Systems CMS 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 CMS.

032 Ballistic Requirements-Transparent Armor

A ballistic FAT 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:

- The Supplier SHALL request BAE Systems source inspection prior to shipping the samples for ballistic testing.
 - The Supplier SHALL submit Form 092245 Source Inspection Request/Approval Form as required by CDR005 per the data submission instructions on Form 092245.
 - Forms are available on the Purchasing website listed in the PO text.
- During source inspection, the Supplier and BAE Systems CMS source inspector SHALL complete Form 091889 Ballistic Test Submittal Form.
 - The Source inspector SHALL determine if contract requires DCMA witness of the ballistic test.
 - The 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.
- 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.
- 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 CMS.

034 Ballistic Requirements- Metal and Composite Materials

FIRING RECORDS (Plate and Composite):

The Supplier shall provide a copy of the:

- Summary Template for Armor Product 093550.
- a. Submission of this form is only required for parts fabricated from the following material specifications:
- i. Aluminum Armor
 - 1. MIL-DTL-32262
 - 2. MIL-DTL-32341
 - 3. MIL-DTL-32375
 - 4. MIL-DTL-32505
 - 5. MIL-DTL-45225
 - 6. MIL-DTL-46027

7. MIL-DTL-46063
8. MIL-DTL-46083
9. MIL-DTL-46192

ii. Steel Armor

1. MIL-A-11356
2. MIL-DTL-12560
3. MIL-DTL-32332
4. MIL-DTL-46100
5. MIL-DTL-46177

iii. Titanium Armor

1. MIL-DTL-46077
2. 19207-12933366
3. 19207-12462708

- b. Any other items listed with CDR034 who do not make use of these listed specifications are not required to complete the submission form 093550.
- c. Completion of this form does not exempt vendor from submission of all other required documentation listed in CDR 034.

• 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.
- b. Test reports shall be provided in accordance with the applicable material standard and the definitions and requirements therein.

Government Ballistic Test Certification, including firing number for each heat/lot of ballistic material. **Results shall 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 armor material lot and heat certification traceability must be maintained and tracked to the sub-component and or end item the material was consumed in.

• 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, or a part is machined to final dimensions from a thicker section, 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.

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	Minus Tolerance
.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	Minus Tolerance
.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	Minus Tolerance
.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.

034 Ballistic Requirements- Metal and Composite Materials

FIRING RECORDS (Plate and Composite):

The Supplier SHALL provide a copy of the:

- Summary Template for Armor Product 093550, [held on the purchasing website](#).
 - a. Submission of this form is only required for parts fabricated from the following material specifications:
 - i. Aluminum Armor
 - 1. MIL-DTL-32262
 - 2. MIL-DTL-32341
 - 3. MIL-DTL-32375
 - 4. MIL-DTL-32505
 - 5. MIL-DTL-45225
 - 6. MIL-DTL-46027
 - 7. MIL-DTL-46063
 - 8. MIL-DTL-46083
 - 9. MIL-DTL-46192
 - ii. Steel Armor
 - 1. MIL-A-11356
 - 2. MIL-DTL-12560
 - 3. MIL-DTL-32332
 - 4. MIL-DTL-46100
 - 5. MIL-DTL-46177
 - iii. Titanium Armor
 - 1. MIL-DTL-46077
 - 2. 19207-12933366
 - 3. 19207-12462708
 - b. Any other items listed with CDR034 that do not make use of these listed specifications are not required to complete the submission form 093550.
 - c. Completion of this form does not exempt the vendor from submission of all other required documentation listed in CDR 034.
- 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.
 - b. Test reports SHALL be provided in accordance with the applicable material standard and the definitions and requirements therein.
 - c. Certificate is required to state affirmation/compliance to DFARS 252.225-7008 and 252.225-7009.

Government Ballistic Test Certification, including firing number for each heat/lot of ballistic material.

All armor material lot and heat certification traceability must be maintained and tracked to the sub-component and or end item the material was consumed in.

- 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.
- FIRING RECORDS (FORGINGS):
 - a. Aluminum armor forgings require a 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 a ballistic test for each lot, including results for all testing specified in the ballistic test specification and the material certificate of analysis.

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, or a part is machined to final dimensions from a thicker section, 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.

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.

- o 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.
- o 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.
- o 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	Minus Tolerance
.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	Minus Tolerance
.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-

Ordered Thickness (Inches)	Allowable Material Reduction from Specified Thickness (Inches)
Specified Thickness	Minus Tolerance
.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:

- The Supplier SHALL have a written and controlled procedure for cutting steel armor. Documentation of the procedure SHALL be made available to BAE Systems upon 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 the 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) will be determined by the hardness indentation at the mid-length of the cut edge. Five (5) measurements SHALL be taken and 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 a 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 the secondary shop.

PROCEDURE APPROVAL & PERIOD OF QUALIFICATION:

- The 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.
- 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, the process qualification SHALL be sufficient for the same process used on materials applicable to the qualification test:
 - o $.380 < T$
 - o $.380 \leq T < .625$
 - o $.625 \leq T < 1.000$
 - o $T \geq 1.000$
 - o 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 personnel's inspection qualification SHALL be kept and provided to BAE Systems upon request.
 - o Inspection personnel SHALL be certified per the contract specification or a written practice in accordance with ASNT SNT-TC-1A, AWS QC1, CSA W178.2, or comparable.
- Process inspection SHALL consist of the following:
 - o Visual inspection to be performed by qualified personnel, conducted in accordance with the Supplier's procedure. Inspection frequency SHALL be 100%.
 - o NDT will be 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.
 - o Provided certification SHALL include the inspector name, credentials, quantity inspected and approved.

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.

036 REACH Assessment (New)

Refer to SQAM section 9.5.3. The Supplier SHALL submit a REACH assessment with each PO listing the identified substances found on the current SVHC list. A copy of the assessment is to be included with each shipment against the PO. If available, the Chemical Abstracts Service (CAS), identification number of the SVHC substance SHALL be

included in the REACH Assessment. If there are no SVHC substances present in the article, the supplier's REACH Assessment should state "Article supplied does not contain SVHC". The REACH Assessment SHALL include the date of the assessment along with the PO number and the part number.

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.

041 Critical Safety Items (CSI)

The Supplier SHALL provide documentation for all Critical Safety Items (CSI), 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 and provided.

041A Critical Safety Items (CSI) Heat Treat Supplier (New)

The heat treat Supplier SHALL conduct 100% testing for Hardness Critical Items (HCI). 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 the location for the 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. The actual results, including an authorized signature and date of acceptance, traceable to a specific shipment SHALL be recorded.

045 MRB Authority (Deleted)

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.

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.**

056 PPAP-Level 1

The Supplier SHALL complete a **Production Part Approval Process** (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.

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.

057 PPAP-Level 2

The Supplier SHALL complete a PPAP in accordance with Level 2 of the (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 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.
- 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.

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.

058 PPAP-Level 3

The Supplier SHALL complete a PPAP in accordance with Level 3 of the 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 VIR F 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.
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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.

059 PPAP-Level 4-Predefined Requirements

The Supplier SHALL complete a PPAP in accordance with Level 4 of the 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 VIR 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.
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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.
- 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.

060 PPAP-Level 4-Unique Requirements

The Supplier SHALL complete a PPAP in accordance with Level 4 of the 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.
 - 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.
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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.

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.

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/Supplier's facility.

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.

Control plans SHALL include outputs from the PFMEAs. 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.

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 (9AIAG) 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.

FAIs 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.

085 First Article Inspection

The Contractor SHALL conduct First Article Inspection (FAI) in accordance with [the most current AS9102 requirements](#) for all provided parts and those not previously subjected to [FAI](#) requirements in accordance with the [SQAM](#), to ensure Supplier product/processes have the capability of meeting design and/or specification requirements.

[FAIs SHALL be conducted, reviewed, and submitted a minimum of 5 days prior to shipment.](#) 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.

087 Material Workmanship Standard (New)

The Supplier SHALL conduct a visual inspection of product delivered in accordance with and compliant to BAE Systems Inc. 093815 – Supplier Workmanship Standard and/or 093435 – Soft Goods Workmanship Standard. If there are any questions, please submit a VIR for clarification.

