



SUPPLIER QUALITY GUIDELINES

QUALITY ASSURANCE REQUIREMENTS

AM GENERAL FM1261-1

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AM GENERAL, LLC
SUPPLIER QUALITY GUIDELINES
QUALITY ASSURANCE REQUIREMENTS
AM GENERAL FM1261-1

1.0 General Information

This document establishes quality requirements for procurement and defines supplier responsibilities for ensuring that purchased items conform to AM General drawing, specification and procurement requirements. This document shall be incorporated by reference into every purchase order issued by AM General.

It is the supplier's responsibility to read and comply with all the requirements within this document. If there is any part of this document and the implied requirements that are not fully understood, contact your AM General Purchasing Representative.

2.0 Quality System

- 2.1 The supplier must maintain a Quality System that ensures to AM General that all items furnished have been inspected or tested (prior to shipment) and conform to AM General drawing, specification and procurement documents. This Quality System can meet either ISO9001:2000, QS9000 or TS16949 standards. The supplier must ensure that its sub tier suppliers also conform to AM General's quality requirements.
- 2.2 The supplier shall have and use, as a basis of its Quality plan, written procedures that may be reviewed and approved by the AM General Quality Assurance Representative. These procedures shall provide for the control of quality of all parts, either produced or assembled within the supplier's plant or procured by the supplier from other sources. These procedures must describe, as a minimum, the receiving, in process and final inspections, control of non-conforming material and calibration system in place. All inspection results must be documented. Written standards defining work quality, process controls and acceptance or rejection criteria are also required.
- 2.3 If the supplier elects to use a sampling plan for acceptance of any material, at receipt, in process or at final acceptance, such plan must be documented and reviewed and approved by your AM General Quality Assurance Representative. Examples of acceptable sampling plans are MIL-STD-105, zero based sampling plans, or American Society for Quality (ASQ) adopted sampling plans.
- 2.4 The supplier must maintain a documented calibration system in accordance with ISO9001:2000, QS9000 or TS16949 Calibration System Requirements to control the accuracy of devices used to measure, gauge, test, inspect or otherwise examine items to verify acceptability of materials or services. All standards used for this calibration system must be traceable to national or international standards.
- 2.5 The supplier must maintain a measuring equipment system in accordance with ISO-10012-1 for managing confirmation and use of measuring equipment, including measurement standards, used to demonstrate compliance with specified requirements.

2.6 A distributor, as a minimum, must maintain a Quality System that meets Supplement 1 to AM GENERAL FM-1261-1 and that ensures material supplied to AM General conforms to the requirements of this procurement. Unless otherwise specified, the distributor is responsible for material acceptability and performance.

2.7 Regulated or Critical Safety Item Characteristics Requirements

For any part designated as having Regulated [R] or Critical Safety Item [CSI] characteristics, the supplier must submit to AM General Quality Assurance with the First Piece Sample Inspection Report:

- A Control Plan on how the supplier is going to monitor, control and document compliance to the [R] and [CSI] characteristics.
- SPC, Control Test, Certificates and Measurements for first piece sample approval and at specified frequencies for [R] and [CSI] characteristics.

2.7.1 The supplier must maintain a First-In/First-Out (FIFO) material rotation system for all parts with [R] and [CSI] characteristics for:

- ✓ Finished goods shipment
- ✓ In-Process material

2.7.2 Parts with [R] and [CSI] designated characteristics cannot be changed or modified in any respect without approval of AM General Product Engineering and re-submittal of samples and data for approval by AM General Supplier Quality Assurance prior to delivery of product.

2.8 Specific Requirements for Fasteners and Hardware

Requirements are specified in Supplements 1 and 2 of this document. Objective evidence of compliance to these requirements must be included with the First Piece Sample Inspection Report required in 4.0 et al. These requirements apply to all suppliers furnishing any product with fasteners included as part of the purchased part.

2.9 Statistical Process Control (SPC)

Suppliers are encouraged to have a Statistical Process Control (SPC) program in effect in their facilities with applicable procedures developed. AM General's Supplier Surveillance Group will conduct SPC audits as part of their normal supplier quality systems technical visit and/or source control audit, to ensure compliance with their procedures should you elect to use an SPC program. Certain characteristics such as major classification characteristics on the assigned QAP's, Critical Safety Items or Regulated items may be considered candidates for SPC.

2.10 Nonconforming Product or Service

2.10.1 The supplier must have a documented procedure for control of non-conforming material. This procedure must provide for implementation of appropriate action to correct recurring or repetitive nonconformities. The supplier shall take prompt and effective action to correct conditions, which have resulted or could reasonably be expected to result in the submission of items in a defective or non-conforming condition.

2.10.2 Report of Discrepancy – AM General Quality Assurance and Purchasing are to be notified immediately upon discovery of any deviation from drawings, specifications or procurement requirements. Suppliers are also to implement immediately

containment procedures to prevent additional non-conforming material from being supplied to AM General.

2.10.2.1 Disposition of any nonconforming material other than by reworking to conformance with the applicable requirements or by scrapping the nonconforming material at the expense of the supplier must be approved in writing by AM General.

2.11 Quality Records

The supplier is responsible for maintaining quality records of inspections and outgoing product quality of all lots of material shipped to AM General. These records include but are not limited to inspection records, certificates of conformance and control test reports. The supplier is required to maintain these records for five (5) years, unless otherwise relieved by Government contract, after completion of the purchase order. At the completion of time required for retention of Quality Control records, AM General shall be advised by supplier in advance of any intended disposition of such records. This requirement must be imposed by the supplier on any sub-suppliers.

2.12 Changes

The supplier must obtain approval from AM General Purchasing, in writing by Purchase Order Change (POC), before any change can be made such as those listed in Section 4.2. A First Piece Sample Inspection Report IAW 4.0 must be submitted when any non-record only change is implemented. All change requests must be submitted to AM General Purchasing in writing or via e-mail. Additional testing may also be required to insure changes have no impact on intended use or long term durability. This testing may be above the technical data package requirements (drawings and other quality provisions) in your possession but may be deemed necessary to assure AM General's customers requirements will continue to be met. These requests could also require submission of parts manufactured to the requested change configuration in advance of requested production implementation of parts.

2.13 Part Identification and Packaging Requirements

2.13.1 Identification requirements are as follows for shipment: Part Number, Rev. Level, Part Name, P.O. Number, Manufacturer's Identification, Lot or Date Code and Quantity. This information must be included on shipping paperwork and package labels. Individual parts are to be identified in accordance with drawing requirements unless exempted by purchase order.

2.13.2 Identification of Shelf Life Material

Supplier must identify the shelf life of material for each item, package or container with its cure or manufacture date, expiration date and special storage and handling conditions in addition to the standard identification requirements.

2.13.3 Marking of Tools, Molds and Test Equipment

Supplier must mark AM General owned tools, molds and test equipment with the applicable part number, dash and revision number as stated on the purchase order. If a mold contains more than one cavity producing the same part number, each cavity is to be numbered.

2.13.4 Packing and Packaging

Supplier is responsible to ensure that all items are adequately packed and packaged to prevent damage or contamination.

3.0 Access to Supplier's Facilities

3.1 The Quality System of each supplier will be subject to periodic audits by AM General Quality Assurance Representative(s). The records and documentation described herein shall be made available for review by AM General and/or Government representatives as applicable upon request:

- Evidence of inspection to assure adherence to applicable drawings and/or specifications and revisions thereto.
- Periodic calibration of inspection equipment and control of certification records per ISO9000 Series or QS9000 Series.
- Test data records or all qualifications and acceptance tests performed.
- Certification of personnel and processes such as heat treating, plating, anodizing, magnetic particle inspection, etc., when required by specification or contract.
- Failure analysis and corrective action reports.

3.2 AM General and/or the Government may also send a representative to supplier's facilities to perform any of the following activities:

- Source Inspection (Mechanical or Visual Inspection)
All items are subject to inspection at the supplier's facility by AM General Quality Assurance personnel before shipment.
- Source Inspection (Test)
All items are subject to test at the supplier's facility for witnessing by AM General Quality Assurance personnel before shipment.
- Source Surveillance
All items are subject to surveillance by AM General Quality Assurance personnel. This may include review of the supplier's inspection system, procedures and quality or test records during the production run to ensure conformance to drawing, specification and supplier procedure requirements.

NOTE: Supplier's proprietary products and processes are not subject to this provision.

4.0 First Piece Sample Inspection Report

4.1 A first production part inspection record of 100% dimensional inspection for all characteristics listed on the drawings, specifications and/or special instructions noted on the purchase order must be provided to AM General by the supplier upon initial production. This must include all data for not only the final assembly drawing but all subassembly or individual components that make up the final purchased part number. If CAD or other electronic data are used to produce a product, objective evidence must be provided to demonstrate

conformance to this math model. This data should be sent via express or overnight mail to the attention of Supplier Quality Assurance, AM General, 105 North Niles Avenue, South Bend, IN, 46617. Also, this complete inspection report and all supporting data should be sent so that AM General will receive it prior to delivery of the product. The inspection report must state the actual values of findings for dimensional and test data. Documentation will be submitted to AM General Supplier Quality Assurance using the Supplier Sample Inspection Report contained in the First Piece Sample Inspection packet. All required test data and material certifications, by print specification or purchase order, must also be provided with the First Piece Inspection Report. Failure to complete this inspection or submit an inspection report will be cause for rejection of material shipped to AM General. Documented results of the review by AM General shall be provided to the supplier indicating approval or rejection of the submitted sample. This complete inspection must be performed on a minimum of one of the first ten production parts produced. When requested, a process capability study must be performed to demonstrate the supplier's ability to consistently provide conforming goods or services.

4.2 First Piece Inspections must be completed:

- Every time the supplier changes sources of components of any assembly produced for AM General.
- Any time the supplier moves its production facility. This includes when the supplier sends the tooling and personnel to set-up production at a new location. AM General is to be notified in advance of any such move.
- Any time the supplier undergoes a major management or ownership change, AM General is to be notified in advance of the change.
- Anytime a request is made by AM General for revisions to the Technical Data Package (TDP).
- Anytime a process or procedure change is made that will affect the part or component being produced for AM General.
- Any time a tooling change is made. For parts produced with prototype tooling, another submittal is required once the hard or production tooling has been implemented. Final approval will not be granted until the production tooled sample has been approved.
- When requested by AM General.

4.3 First Piece Sample Inspection Reports must contain the following items that apply to the goods or services being purchased:

Note: Each of these documents must also have the date that the activity or operation was performed.

4.3.1 Certificate of Conformance (C of C)

A C of C must be supplied with the First Piece Sample Inspection Report and must be supported by inspection and test data, material analysis or certification from the raw material producer/processor and made available to AM General for specifications covering raw material, processed material and processes. Form 1AF2500 (F933SBR5), which is included in the packet provided with these guidelines, should be used.

4.3.2 Complete dimensional inspection results.

4.3.3 Process Flows and Control Plans including control of fasteners. See paragraphs 2.7 and 2.8 of this document.

4.3.4 Chemical and Physical Test Reports

All chemical and physical test reports must contain actual test values and must bear the signature and title of the authorized representative of the agency performing the test. All data must conform to specification requirements. The report must also show the purchase order number and part number.

4.3.5 Process and Material Certification

Processes such as heat treating, welding, soldering, and surface preparation and treatment and conformal coating require the completion and submission of a Process and Material Certificate. The certificate identifies the process or material used, the purchase order number, the specification to which process or material conforms, and the name of the agency that tested the process or material (if other than the supplier). In addition, the signature and title of the authorized representative approving the information is to be included.

4.3.6 Functional Test Reports

These reports must contain the signature and title of the authorized representative of the agency performing the test and must demonstrate conformance to specified requirements.

4.3.7 Environmental Test Reports

These reports contain the signature and title of the authorized representative of the agency performing the test and must conform to specified requirements.

4.3.8 Seller-Controlled Products

One legible and reproducible copy of applicable specifications, drawings and catalogs should accompany the initial shipment on this purchase order.

4.3.9 Nondestructive Test Reports

One legible and reproducible copy of actual nondestructive test results, such as magnetic particle inspection, dye penetrant inspection, ultra-sonic inspection, that are traceable to acceptance requirements and material submitted. The reports with these results shall contain the signature and title of the authorized representative of the agency performing the inspection and must conform to specified requirements.

4.3.10 Tool Proofing

Tooling and dimensional samples must conform within the engineering drawings and specifications stated on the purchase order. The inspection of tooling and/or dimensional samples shall be at the supplier's facilities, or the items will be shipped to AM General for inspection, as directed by AM General Quality Assurance personnel. Dimensional samples are to be identified by tool numbers.

4.3.11 Traceability

All items produced for AM General must be traceable at all levels of production (examples: receiving, in-process and final) in supplier's facility. If outside processors (example: heat treat, painting, etc.) are used, such outside processors must have traceability of all processes they complete for supplier. Raw materials used are to be identified by lot number as well as material type, specification, and heat number as well as be traceable to records of acceptance. Parts, when fabricated, are to be identifiable to the lot of raw material used.

4.3.12 Radiographic Inspection

Personnel performing film interpretation must be certified in accordance with the specification required by the drawing or procurement specification. Copies of their interpretations and their certifications must be included in the First Piece Sample Inspection Report.

4.3.13 SQAP/QAR/QAP/Drawing Inspection Report Supplemental Information

When Supplementary Quality Assurance Provisions (SQAP) or Quality Assurance Requirements (QAR), Quality Assurance Provisions (QAP), Procurement Specifications or any other specifications are called out by the drawings and/or the drawings list performance qualifications, the supplier will provide documentation to AM General with actual dimensional and test values where applicable and evidence of compliance to all requirements including any of the following as applicable.

4.3.13.1 Initial Production Approval (IPA)

Samples will be selected as initial production items in accordance with individual IPA requirements and will be subjected to examinations and tests by the supplier or an approved outside laboratory. Items tested shall be produced under manufacturing methods to be used in production. Initial production approval shall be accomplished to determine conformance to all requirements of drawing(s) and characteristics as specified by SQAP, QAP, or QAR.

4.3.13.2 Pre-Production Approval (PPA)

A sample(s) of parts produced using a new configuration must be inspected and tested as applicable before proceeding with the production run. Actual dimensions or quantitative data for all blueprint or test characteristics must be recorded, including environmental and dynamic testing. Inspection records must be submitted to AM General Quality Assurance before approval can be granted.

4.3.13.3 Control Tests (CT)

When Control Tests are specified, the supplier shall perform the required Control Tests as defined in the SQAP/QAR/QAP or drawings. A copy of the test report shall be submitted to AM General Quality Assurance for approval before parts representative of the Control Testing may be shipped to AM General.

4.3.14 Coating and Other Finish Requirements

Verification that all cleaning and coating requirements specified on drawings, specifications or other documentation must be supplied with the First Piece Sample Inspection Report in accordance with Supplement 4 of this document.

4.3.15 Welding Requirements

Welding procedures, machine and operator qualifications and minimum quality weld samples for all classes and types of welds shall be submitted to AM General Quality Assurance for approval by AM General and/or the Government in accordance with the AM General Supplier Weld Procedure Guidelines, Supplement 3 of this document.

4.3.16 Proof of compliance with the requirements for Regulated and Critical Safety Item (CSI) characteristics in 5.0 and fasteners in 6.0 of this document shall be submitted to AM General Quality Assurance with the First Piece Sample Inspection Report.

SUPPLEMENT 1 TO AM GENERAL FM-1261-1

SPECIFIC REQUIREMENTS FOR STANDARD HARDWARE DISTRIBUTORS

1.0 SCOPE

This section delineates the requirements for distributors of standard hardware.

1.1 Definition

Standard hardware includes bolts, nuts, rivets, screws, hydraulic fittings, capacitors, resistors, transistors, diodes, "O"ring packings, grommets, terminals, bearings, connectors, etc., manufactured to industrial or military standards (AN, MS, NAS, CVC, 202 Series, Catalogue items, etc.). Frequently, the manufacturers of standard hardware are qualified by an Agency of the U.S. Government and listed as a QPL supplier.

1.2 AM General's Policy

1.2.1 AM General accepts only material that has been purchased from the manufacturer; however purchases may be from:

- Manufacturer to distributor to AM General; or
- Distributor who purchases from a manufacturer then sells to another distributor who then sells to AM General.

In all cases, materials must meet the requirements of subsection 1.2.3 below as well as other requirements identified in this document.

1.2.2 AM General does not accept hardware that has been altered by a distributor of a manufacturer (when such items were originally manufactured by another organization/manufacturer) unless the remanufacturing plan has been approved in writing by AM General. When such authority is given, the certification shall refer to the authorizing document number/letter number.

1.2.3 AM General requires that the supplier retain all traceable records for material delivered to AM General as identified in the purchase order irrespective of the originating source.

1.2.4 AM General's requirements for handling nonconforming items for acceptance by AM General's materials review board (MRB) are identified in its Supplier Quality Guidelines, AM GENERAL FM 1261-1, and Section 1.3.

1.3 Distributors

1.3.1 A supplier is classified by AM General as an "approved distributor" when the manufacturer recognizes, in writing, the supplier as "its distributor" or AM General, in writing, recognizes the supplier as an approved distributor for a specific product or manufacturer.

1.3.2 A distributor shall control the quality of the product through stock control, storage and shipping procedures. The material in storage at the distributor's facility, or shipped to AM General, must be traceable to the manufacturer's lot or batch identification and

certification records.

- 1.3.3 A distributor must assure that material shipped to AM General does not contain components/items that are over age and/or components/items made obsolete by design revision.
- 1.3.4 A distributor must have one or more individuals designated as an inspector or Quality Manager who shall assure by appropriate quality control methods that the material packaged for shipment to AM General meets AM General requirements.
- 1.3.5 A distributor shall retain the manufacturer's records, certifications, etc., in a retrievable manner and make available such data to AM General when requested.
- 1.3.6 A distributor must recognize the right of AM General and the Government to conduct surveillance and evaluation of items at the producing facility. The distributor's purchase orders to manufacturers must reserve this right for AM General/Government. This right is a condition imposed in AM General's Supplementary Purchase Order Conditions.

1.4 Shipping Procedures For Manufacturers And Distributors

A distributor shall provide adequate packaging to assure that individual parts receive protection from damage or corrosion. High heat-treated parts (especially with external threads, splines, serrations, etc.) shall be protected to prevent nicks, scratches, abrasions or other surface damage.

1.5 Objective Evidence

- 1.5.1 The distributor is responsible for maintaining quality records of outgoing product quality for material shipped to AM General. The only materials for which a Certificate of Conformance (C of C) is required are grade 5 and higher bolts.
 - 1.5.1.1 The part name, number, revision level and quantity.
- 1.5.2 The distributor is responsible for providing to AM General copies of the chemical and physical property test reports, shear test reports, and certification or qualification reports when required by specification.
- 1.5.3 The distributor is responsible for providing to AM General a Certificate of Conformance (C of C) which includes AM General's P.O. Number, and incorporates the requirements of paragraph 1.5.4 below.
- 1.5.4 The distributor is responsible for providing to AM General the prime manufacturer's name with traceability identification to the manufacturer's lot or batch number. If the material is procured in bulk and repacked by the distributor, the certification shall identify the date repackaged as well as the manufacturer's data.

SUPPLEMENT 2 TO AM GENERAL FM-1261-1

FASTENER QUALITY ASSURANCE REQUIREMENTS

1.0 SCOPE

This Supplement delineates the requirements for threaded fasteners.

1.1 This Supplement establishes quality assurance requirements for all threaded steel fasteners of Grade 5 and higher (as defined by SAE-J429) and metric fasteners with strength designations of 8.8 and higher (as defined by SAE-J1199) that are to be used in items derived from either a Government or contractor owned Technical Data Package. It applies to fasteners received (i) from manufacturers, (ii) from distributors, or (iii) as part of a subassembly for use in both new and repair items.

1.2 Suppliers subject to this Supplement shall implement and maintain a fastener quality assurance program which:

1.2.1 Assures the homogeneity of fastener lots. A homogeneous fastener lot is defined as a lot in which all of the fasteners are of the same size, type, grade, plating and manufacturer.

1.2.2 Assures that individual fasteners are identified by a fastener manufacturer symbol (logo). The manufacturer's symbol (logo) shall be listed in MIL-HDBK 57, dated 29 Sep 89. (Defense Supply Center listing).

1.2.3 Provides objective quality evidence that the fasteners to be furnished to AM General meet all technical requirements.

1.3. To determine the conformance of the fastener lots with the homogeneity and identification requirements, a sample from each lot of fasteners will be taken in accordance with MIL-STD-105, dated 10 May 89, Inspection Level II, AQL 1.0, or equivalent, except that lots shall be accepted with zero (0) defects (c-0) and rejected with one or more defects. Each sample shall be examined for the following:

1.3.1 The grade and manufacturer symbol (logo) for each bolt in the lot sample shall be the same.

1.3.2 Threads shall be examined to assure conformity to requirements.

1.3.3 Plating (when specified) shall be examined to assure complete coverage.

1.4 Objective quality evidence that fasteners meet all technical requirements shall consist of either:

1.4.1 Favorable chemical, core hardness, plating and tensile test data provided by the manufacturer or supplier of a fastener lot which is directly traceable to that lot. Chemical tests shall include, as a minimum, percent by weight of the following

elements: carbon, manganese, phosphorus and sulfur; or

1.4.2 Favorable results of chemical and core hardness tests performed by the contractor or subcontractor on sample(s) taken from the lot. Sampling for chemical, plating and core hardness testing shall be in accordance with MIL-STD-105, Level S-2, AQL 1.0 or equivalent. Chemical tests shall include, as a minimum, percent by weight of the following elements: carbon, manganese, phosphorus and sulfur.

1.5. For fasteners to be used in item(s) derived from a Government Technical Data Package, Grade 8.1 or 8.2 fasteners are not acceptable substitutes for Grade 8 fasteners.

1.6. Commercial items, defined as an end item or component of an end item whose sales volume to the general public is greater than 50% of the items produced, will be deemed to meet the requirements of this Supplement if the supplier has a current supplier control policy with regard to fasteners which has been approved by AM General Quality Assurance.

NOTE: During maintenance or repair, the Government will use Grade 8, zinc plated bolts from Government stocks as replacements for any Grade 5 or Grade 8.2 bolt used in commercial items.

1.7 The supplier shall establish written procedures at receiving inspection to verify quality of fasteners, to include:

1.7.1 Review of purchase order-required documentation.

1.7.2 Identification and segregation of received material by homogeneous lots for inspection and test.

1.7.3 Segregation and control of material to preclude use until verification inspection and testing are performed. (NOTE: Verification of fasteners on subassemblies shall be accomplished by documentation review and inspection for manufacturer logo and bolt head markings. (Disassembly is not required.))

1.7.4 Selection of sample size for the Statement of Objective Quality Evidence for each lot, prescribed by the appropriate Appendix Table. The following acceptance criteria shall be utilized: (NOTE: Sample selection shall be randomly drawn from the widest dispersion of containers for each homogeneous lot.)

- Accept lot with 0 defects
- Reject lot with 1 defect

1.8 Establish methods to periodically audit suppliers to ensure and validate continued credibility.

1.9 Require verification of proper head logo and grade markings by supplier's source inspectors.

1.10 Ensure the use of an independent accredited laboratory or its equivalent whenever test/inspections are performed to gather objective quality evidence. Laboratory accreditation shall be accomplished by independent evaluation using criteria set forth in recognized industry/Government standard

MANUFACTURER'S IDENTIFICATION SYMBOL LISTING REQUIREMENT

1.0 DEFINITIONS

1.1 Manufacturer, as used in this Listing Requirement, means the actual source which substantially makes a product out of raw materials.

1.2 Manufacturer's Identification Symbol, as used in this Listing Requirement, means a unique marking or logo normally applied to thread steel fasteners during the manufacturing process that distinguishes such products from similar products of other manufacturers.

2.0 This Listing Requirement establishes requirements to advance the Government's objective that all threaded steel fasteners derived from a Government or contractor-owned technical data package (TDP), as further described herein, be identified by a manufacturer's identification symbol listed by the Defense Supply Center (DSCP).

3.0 This Listing Requirement applies to the following end items:

3.1 Where the Government TDP specifies the use of Steel Cap Screws (threaded steel fasteners) in accordance with Federal Specifications FF-S-85C, American National Standards Institute B 18.2.1-1981, and various Military Standard drawings which specify SAE Alloy Steel; or

3.2 In which threaded steel fasteners of a supplier or subcontractor design are employed pursuant to a supplier-owned TDP.

4.0 The supplier agrees to furnish to the Government end items which contain only threaded steel fasteners procured by a manufacturer whose identification symbol has been listed by DSCP. If the manufacturer's symbol has not been listed by DSCP, the manufacturer should submit its symbol to DCSP at the following address without delay for immediate listing.

This form can be found at http://www.dscp.dla.mil/gi/prod_services/logoreg.html or requested in writing or by phone at:

Defense Supply Center
ATTN: Maxine Curran, DSCP-ITA
700 Robbins Avenue, Bldg. 3B
Philadelphia, PA 19111-5092
Phone (215) 297-3963

5.0 The DSCP list of manufacturer's identification symbols include those manufacturers that were listed with the American Society of Mechanical Engineers (ASME) as of June 20, 1988. Manufacturers listed with ASME as of June 30, 1988 need not apply for listing by DSCP.

6.0 The supplier is responsible for ensuring that all hardware derived from a Government TDP meets the specifications of the TDP, and that all threaded fasteners employed in end items derived from either a Government-or contractor-owned TDP reflect a manufacturer's identification symbol listed by DSCP.

SUPPLEMENT 3 TO AM GENERAL FM-1261-1

**AM General, LLC
Supplier Weld Procedure Guidelines**

WELDING PROCEDURE AND WELDER/WELDING OPERATOR QUALIFICATION SUBMITTAL REQUIREMENTS

- **PRIOR TO PRODUCTION**, or when drawing or welding procedure revisions are made, ALL CLASSES and TYPES of welds shall be submitted to the AM General Supplier Quality Manager/Weld Quality Engineer for **APPROVAL**.
- First Article packages for each part number shall be submitted and shall include the following welding procedure and welder/welding operator qualification documentation and samples:
 - Cover sheet, including the signature of supplier's Quality or other Authorized Representative. The cover sheet shall note: part number(s), drawing and revision number(s), applicable qualification standard, and date of submittal. The cover sheet shall also include a space for AM General's Weld Quality Engineer's signature indicating acceptance of the Welding Procedure Specification.
 - Procedure Qualification Record (PQR).
 - Welding Procedure Specification (WPS). The WPS shall indicate the acceptable ranges for each essential variable of the procedure.
 - * It is preferred that this information be included on a single form, but it is permissible to submit separate forms for each.
 - Welder/Welding Operator Performance Qualification Record (WPQR) for the individual who welded the sample.
 - Sample(s) of each type of weld on the part. The sample(s) shall exhibit the minimum acceptable weld quality per the applicable Code such as AWS D1.1, AWS D1.2, MIL-STD-372, MIL-STD-1261, etc., and shall be prepared as specified below.
 - A written repair procedure.
 - A drawing of the part showing the removal location(s) for each sample.
 - A signature block for AM General's Weld Quality Engineer to indicate visual acceptance of the sample(s), and the date of that examination and acceptance.
 - Suppliers may use their own forms or those available from AM General's Weld Quality Engineer, as long as they contain all of the information specified in the applicable Code.
- Samples submitted for welding procedure approval by AM General's Weld Quality Engineer shall be prepared as follows:
 - Samples shall be removed from an actual production part. In cases where the cost of the part(s) is prohibitive, this requirement may be waived if prior approval is granted by AM General.
 - As noted above, a drawing showing the exact removal location shall accompany the sample.
 - Identification of each sample shall be clearly marked on the sample, on an attached tag or label, or be noted on an envelop or bag containing the sample.
 - Each sample shall include a full cross-section of the welded joint, plus at least 1/4" of adjacent base metal on each side, if possible.
 - The weld cross-section shall be polished and etched with a suitable etchant so that the weld is clearly visible.
 - Once prepared and etched, the sample shall be thoroughly dried and coated with a thin layer of clear lacquer or other suitable preservative that will both protect the etched cross-section and permit visual examination by AM General.

- It is recommended that suppliers be capable of preparing any required samples; however, sample removal, sectioning, preparation, and etching may be performed by a qualified outside source.
- **PRIOR TO PRODUCTION**, or when new welders/welding operators are added, Welder/Welding Operator Performance Qualification Records (WPQRs) shall be submitted for approval by AM General's Weld Quality Engineer.
- During AM General Supplier Technical Visits, Source Audits, or at any time when weld quality issues are identified by AM General, the suspect welding procedure(s) or welder(s)/welding operator(s) shall be requalified, as specified by AM General's Weld Quality Engineer, and a Welding Quality Audit will be performed.

EVALUATION OF WELDING PROCEDURE SAMPLES

- Samples submitted for AM General approval shall be weld cross-sections, as described above.
- Examination and acceptance of samples shall only be performed by qualified individuals, as determined by AM General – Supplier Quality Assurance.
- Unless otherwise stipulated, these weld samples shall be examined and interpreted according to the requirements below:
 - Steel samples shall be evaluated per the requirements of AWS D1.1, paragraph 4.8.4.1, Acceptance Criteria for Macroetch Test, which states: "For acceptable qualification, the test specimen, when inspected visually, shall conform to the following requirements:
 - 1) PJP (partial joint penetration) groove welds; the actual weld size shall be equal to or greater than the specified weld size, (E).
 - 2) Fillet welds shall have fusion to the root of the joint, but not necessarily beyond.
 - 3) Minimum leg size shall meet the specified fillet weld size.
 - 4) The PJP groove welds and fillet welds shall have the following:
 - a) no cracks
 - b) thorough fusion between adjacent layers of weld metal and between weld metal and base metal
 - c) weld profiles conforming to specified detail, but with none of the variations prohibited in 5.24
 - d) no undercut exceeding 1/32" [1mm]
 - Aluminum samples shall be evaluated per the requirements of AWS D1.2, paragraph 3.6.1.2, subsections 3.6.2 and/or 3.6.3, as applicable. Welds shall be deemed acceptable if they conform to the following:
 - 1) The surface of the weld shall be free from cracks.
 - 2) The edges [toes] of the weld shall blend smoothly with the base metal.
 - 3) Underfill [concavity] shall not exceed 0.01" [0.25mm].
 - 4) The leg lengths shall meet the requirements of the WPS.
 - 5) The weld shall exhibit complete fusion at the root and to the base metal.

PRODUCTION WELDING QUALITY CONTROL REQUIREMENTS

Once weldment suppliers have been approved by AM General, the following shall be controlled and documentation maintained and made available to AM General upon request:

- Anyone performing visual examination of production welds is required to be trained and qualified per AWS D1.1, subsection 6.1.4, including paragraph 6.1.4.1(3) (for those performing visual weld examination other than designated welding inspectors) and AWS D1.2, subsection 5.1.3, including paragraph 5.1.3.1(3) (for those performing visual weld examination other than designated welding inspectors). This training/qualification may be performed either in-house or through the use of some recognized visual welding inspector qualification program (such as the AWS Certified Welding Inspector (CWI) program). Welders are expected to perform 100% visual examination of their welds.
 - Records of this required training and qualification shall be maintained by the supplier and made available to AM General upon request.
- Those performing visual welding inspection shall also have their visual acuity checked at intervals of no less than 3 years per AWS D1.1, paragraph 6.1.4.4 and AWS D1.2, paragraph 5.1.3.4.
 - Records of these visual acuity examinations shall be maintained by the supplier and made available to AM General upon request.
- Shielding gas must be weld quality and show the dew point of the gas per AWS D1.1, paragraph 5.1.3.1 and AWS D1.2, Section 4.5. Dew point is a measurement of a gas' moisture content, expressed as a temperature---the lower that temperature, the drier the gas. By specifying "welding grade", supplier is specifying limits for both composition and dew point, and this information shall be made available to AM General upon request. Due to the propensity for porosity in aluminum welds, shielding gas moisture content is a more critical variable. Consequently, the gases for welding aluminum are specified to be drier (lower dew point) than those for welding steel.
 - Records shall be maintained which show that all shielding gases meet the dew point requirements of AWS D1.1 [welding grade, maximum dew point of -40°F (-40°C) {yes, the two scales are the same at this temperature}, have percentages of gases match that of the WPS] and AWS D1.2 [minimum purity of 99.995% and maximum dew point of -76°F (-60°C) for argon].
- Welders employed by or working on behalf of supplier shall remain qualified and continue to produce acceptable work product. Suppliers shall maintain documentation to certify that welders had indeed applied the process for which they were qualified within the 6-month Code limitation. AM General requires that its suppliers provide more specific proof of this continued qualification. The following are recommendations for satisfying this AM General requirement:
 - Query work records, payroll records, etc. to provide a weekly list of those welders qualified for work on AM General contracts
 - Perform simple welder checks by requiring a welder to produce a simple fillet-welded T-joint similar to Figure 4.36 or 4.38 of AWS D1.1 or Figure 3.32 of AWS D1.2.
 - Sample welds shall be visually examined and accepted per AWS D1.1, subsection 4.8.1 or AWS D1.2, subsection 3.6.3
 - Samples can be cut and etched
 - Evaluate per:
 - AWS D1.1, paragraph 4.8.4.1
 - AWS D1.2, subsection 3.6.3

- In combination, or in place of cutting and etching, perform a fillet break test as shown in Figure 4.34 of AWS D1.1.
 - Fillet break fracture surfaces shall be examined per:
 - AWS D1.1, paragraph 4.30.4.1 or subsection 4.31.2
 - AWS D1.2, paragraph 3.10.3.1
- To satisfy this AM General requirement, a suitable production control plan shall be developed, with the types and frequency of actual sampling specified. This documented production control plan shall be submitted to AM General Quality Assurance for approval.

SUPPLEMENT 4 TO AMG FM-1261-1

AM General Supplier Paint Procedure Guidelines

AM GENERAL PAINT PROCEDURE GUIDELINE

This requirement does not supersede the paint requirements on drawings.

1. MILITARY COATINGS:

- All paints must be QPL (Quality Products List) approved. The paint products are qualified under detailed specifications referenced in the following lists:

QPL-53022 (epoxy primer, MIL-P-53022B)

QPL-53084 (e-coat primer, MIL-P-53084)

QPL-53030 (water reducible, lead/chromate free, MIL-P-53030A)

QPL-22750 (high solids epoxy, MIL-PRF-22750)

QPL-46168 (CARC, MIL-C-46168D)

QPL-53039 (single component CARC, MIL-C-53039)

- Suppliers must review and verify the coating requirements for each current and future part by: the type of pretreatment, the types of coatings and the sources of these applications. If pre-treatment processes require TT-C-490D type I or V, the system must be documented AND must have government approval **PRIOR** to use on AMG parts. The procedure containing all the elements specified in paragraph 3.2 of TT-C-490D shall be submitted to AM General Quality Assurance for acceptance prior to forwarding to the procuring activity for approval.
 - If you have any questions about your pretreatment system, contact the AMG Quality Assurance Manager and your AMG Buyer.
- Should the pre-treatment system not require government approval (TT-C-490D, type II, III or IV or for any method), the system must be documented and tests must still be performed to verify that the system is properly cleaning and pre-treating the parts to be coated. These alternate pretreatment systems for ferrous substances must meet the performance tests specified in paragraphs 3.2, 3.5.7, 3.5.8, 4.2.7 and 4.2.8 of TT-C-490D.
- On type III systems, the use of vinyl wash primer (DOD-P15328) is prohibited due to its hexavalent chromium content and high VOC level.
- Prior to making any changes to chemical, processes or procedures, the supplier must notify AM General.
- The issue of specification for TT-C-490, Cleaning Methods of Ferrous Surfaces and Pretreatment of Organic Coatings, shall be Revision D.
- Process control verification tests must be completed on the pre-treatment/coating supplier's system per the specifications as required, or at a minimum of quarterly, if

not stated in the pre-treatment specification. Results must be retained by the supplier and available upon request by AM General.

- Ferrous and galvanized surfaces shall be cleaned and pretreated with a Type I, microcrystalline, zinc phosphate system per TT-C-490, Revision D.
- Corrosion resistance tests will be conducted on a monthly basis (two test coupons) after the process has been found to be in statistical control.
- Testing must be performed on the same substrate and the same thickness of primer minus topcoat used in production.
- Unless otherwise specified, MIL-P-53022 and MIL-P-53030 primers shall be salt spray tested for 336 hours.
- All electro-deposition primers shall be tested for 1000 hours.
- Test coupons shall be scraped with a one inch (approximate) metal blade such as a flexible putty knife between 24 and 168 hours after removal from the neutral salt spray cabinet for coupon evaluation.
- Any inorganic crystalline pretreatment is limited to a maximum build equivalent of 500 mg. per square foot to minimize chipping of the CARC system.
- If the TT-C-490D Type I procedures and physical system has not been previously approved by TACOM including an on site review, it must be documented and submitted for approval, and reviewed as specified in the specification.
- Re-qualification of the process will be required if the process is changed outside the limits defined in the TACOM letter of system acceptance provided to the application facility.
- Qualification of pretreatment systems for galvanized substrates shall be performed using Accelerated Corrosion Test protocol contained in GM9540P, Method B, rather than salt spray:
 - Test coupons with primer only shall be cured for seven days and scribed through the primer.
 - After 40 cycle test exposure, the test coupons shall be scraped at a 30 degree contact angle (approximate) with a one inch (approximate) metal blade, such as a flexible putty knife, both parallel and perpendicular to the scribe.
 - There shall be no more than 3mm of rust creep (zinc corrosion products), blistering or loss of paint adhesion from the scribe line and no more than 5 blisters in the field with none greater than 1mm.
 - This test shall be performed at two month intervals (two test coupons) to ensure that the process is in control.
 - An alternative test for verifying process control is GM9511P for 10 cycles.

2. COMMERCIAL FINISHES:

- Parts supplied by purchase order number prefixed by the letters “COM” requiring prime or topcoat paint application must meet the quality acceptance criteria determined by AM General Commercial Quality Assurance.