

**INCH-POUND**

MIL-DTL-6117L  
w/AMENDMENT 1  
26 January 2011  
SUPERSEDING  
MIL-DTL-6117L  
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## DETAIL SPECIFICATION

### WIRE ROPE ASSEMBLIES, AVIATION, SWAGED TYPE

This specification is approved for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers swaging terminals to wire rope to fabricate wire rope assemblies. It also provides the requirements, criteria, and provisions for qualification of wire rope assembly manufacturers for listing in a Qualified Manufacturers List (QML).

#### 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of the documents cited in sections 3 and 4 of this specification, whether or not they are listed.

#### 2.2 Government documents.

2.2.1 Specifications. The following specifications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

Comments, suggestions, or questions on this document should be addressed to Defense Logistics Agency Aviation VEB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5616, or e-mailed to [STDZNMGT@dla.mil](mailto:STDZNMGT@dla.mil). Since contact information can change, you may want to verify the currency of this address information using the ASSIST database at <https://assist.daps.dla.mil/>.

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DEPARTMENT OF DEFENSE SPECIFICATIONS

- MIL-DTL-781 - Terminal, Wire Rope Swaging, General Specification for
- MIL-DTL-5688 - Wire Rope Assemblies; Aircraft, Proof Testing and Prestretching of
- MIL-DTL-18375 - Wire Rope, Flexible, Corrosion-Resisting, Nonmagnetic, for Aircraft Control
- MS20667 - Terminal, Wire Rope, Swaging, Fork End
- MS20668 - Terminal, Wire Rope, Swaging, Eye End
- MS21260 - Terminal, Wire Rope, Swaging, Stud
- MIL-DTL-83420 - Wire Rope, Flexible, for Aircraft Control, General Specification for
- MIL-DTL-83420/1 - Wire Rope, Flexible, Type I, Composition A
- MIL-DTL-83420/2 - Wire Rope, Flexible, Type I, Composition B
- MIL-DTL-83420/3 - Wire Rope, Flexible, Type II (Jacketed), Composition A
- MIL-DTL-83420/4 - Wire Rope, Flexible, Type II (Jacketed), Composition B
- MIL-DTL-87161 - Wire Strand, Nonflexible, for Aircraft Application
- MIL-DTL-87218 - Cable, Lockclad, for Aircraft Control

(Copies of these documents are available online at <https://assist.daps.dla.mil> or from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other government documents. The following other government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

STANDARDIZATION DOCUMENT

- SD-6 - Provisions Governing Qualification

(Copies of this document are available online at <https://assist.daps.dla.mil> or from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AEROSPACE INDUSTRIES ASSOCIATION

- NAS494 - Terminal - Ball Type Cable

(Copies of this document are available online at <http://www.aia-aerospace.org/> or from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3901.)

SAE INTERNATIONAL

SAE AS10081 - Terminal Shank-Swaging, Dimensions for

(Copies of this document are available from <http://www.sae.org/> or from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Qualification. Wire rope assemblies furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable QML before contract award (see 4.2 and 6.3). Qualification test samples will be tested by a test facility located in the continental United States or Canada.

3.2 Materials. Wire rope shall conform to MIL-DTL-83420, MIL-DTL-18375, MIL-DTL-87161, or MIL-DTL-87218 (see 6.2). Terminals shall conform to MIL-DTL-781, SAE AS10081, and the applicable MS or NAS sheet (see 6.2). Special terminals not dimensionally conforming to detail specifications shall conform to SAE AS10081 and/or the applicable detail drawings (see 6.2).

3.3 Components. All wire rope assembly components having qualification requirements must be acquired from sources having their products listed in the applicable terminal and wire rope Qualified Products List (QPL).

3.4 Swaging. Wire rope assemblies shall be swaged in accordance with the appropriate specifications, SAE AS10081 and/or detail drawings, as applicable. Before swaging, the wire rope end shall be inserted to the full depth of the fitting bore and held in a manner that will prevent slippage. Swaging shall be accomplished by uniformly cold-working the terminal until its dimensions conform to the appropriate dimensions listed in the applicable specification or, in the case of special terminals, to the appropriate dimensions listed in SAE AS10081 and/or applicable drawings.

3.5 Breaking strength. The breaking strength of the wire rope assemblies shall not be less than the allowable minimum breaking strength (MBS) for the type, size, and composition of the wire rope to which the terminal is attached except as noted in 3.5.1 and 3.5.2.

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3.5.1 Lower terminal breaking strength. The breaking strength of wire rope assemblies employing terminals with breaking strengths lower than the wire rope shall not be less than the allowable MBS of the terminal.

3.5.2 Wire strand breaking strength. The breaking strength of wire rope assemblies employing MIL-DTL-87161 wire strand shall not be less than 80 percent of the allowable wire strand breaking strength.

3.6 Workmanship. Workmanship shall be such that, after swaging, terminals shall be uniform in quality and free from pits, voids, burrs, sharp edges, rust, laps, cracks, splits, manufacturing indentations or other physical imperfections.

3.7 Proof load test. All wire rope assemblies shall be subjected to a proof load test in accordance with MIL-DTL-5688. Unless otherwise specified, the breaking strength for applications using NAS494 terminals and/or wire rope other than MIL-DTL-83420, shall be 60 percent of the terminal MBS, or 60 percent of the wire rope MBS, or 60 percent of the wire rope assembly MBS, whichever is lower.

3.8 Slippage indicator. The junction of the swaged fitting and wire rope will be marked with a durable, permanent paint or similar media to assist in determining evidence of slippage. The color of the marking shall be as specified in the contract, order, or drawing. If no color is specified, a color that is clearly visible and contrasting with surrounding elements shall be used.

3.9 QML requirements. The manufacturer shall comply with the requirements for QML certification of wire rope assembly fabrication and inspection.

3.9.1 Quality management system (QMS) implementation. The manufacturer shall implement and maintain a QMS in accordance with the criteria and provisions contained in Appendix A.

3.9.2 QML qualification. Wire rope assemblies fabricated in accordance with this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable QML.

3.9.3 Qualifying activity on-site evaluation. The evaluation will involve a qualifying activity review of the manufacturer's quality manual prior to an on-site visit to the facility(s) where the wire rope assemblies are being fabricated. The manufacturer shall demonstrate to the qualifying activity that the QMS is being applied, on a routine basis, in the wire rope assembly process and all related support processes. Qualification wire rope assembly samples will be selected and tested in accordance with paragraph 4.2.

3.9.4 QML listing. A notification of qualification letter will be issued upon successful completion of the qualification process and the approval of the qualification documentation by the qualifying activity.

#### 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 Qualification inspection. The qualification inspection shall consist of all the tests and examinations of this specification.

4.2.1 Qualification inspection samples. Qualification testing samples shall consist of a wire rope assembly, 2 feet in length, for each of the following configurations:

- a. MIL-DTL-83420/1-002 wire rope with a MS21260 terminal and a MS20667 fork end terminal.
- b. MIL-DTL-83420/1-003 wire rope with a MS21260 terminal and a MS20668 eye end terminal.
- c. MIL-DTL-83420/2-004 wire rope with a MS21260 terminal and a MS20667 fork end terminal.
- d. MIL-DTL-83420/2-003 wire rope with a MS21260 terminal and a MS20668 eye end terminal.
- e. MIL-DTL-83420/3-002 wire rope with a MS21260 terminal and a MS20667 fork end terminal.
- f. MIL-DTL-83420/3-003 wire rope with a MS21260 terminal and a MS20668 eye end terminal.
- g. MIL-DTL-83420/4-003 wire rope with a MS21260 terminal and a MS20667 fork end terminal.
- h. MIL-DTL-83420/1-009 wire rope with a MS21260 terminal and a MS20667 fork end terminal.
- i. MIL-DTL-83420/1-010 wire rope with a MS21260 terminal and a MS20668 eye end terminal.
- j. MIL-DTL-83420/2-012 wire rope with a MS21260 terminal and a MS20667 fork end terminal.
- k. MIL-DTL-83420/2-013 wire rope with a MS21260 terminal and a MS20668 eye end terminal.

4.2.2 Qualification testing. Qualification testing shall be performed on two test samples of each configuration and consist of the:

- a. Examination of product (see 4.5.1).
- b. Proof load test (see 4.3.2.2).
- c. Breaking strength (see 4.6.1.1).

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4.2.3 Maintenance of qualification. At specified intervals determined by the qualifying activity, the manufacturer must be able to demonstrate that the company still has the capabilities and facilities necessary to produce the QML items in accordance with this specification and in accordance with the provisions governing qualification specified in SD-6.

4.3 Conformance inspection. The conformance inspection shall consist of:

- a. Examination of product (see 4.5.1).
- b. Proof load test (see 4.3.2.2).
- c. Breaking strength (see 4.6.1.1).

4.3.1 Inspection lot. An inspection lot of wire rope assemblies shall consist of the number of assemblies of the same materials and wire rope diameter produced consecutively by the same swaging machine, or series of progressive swaging machines, and submitted for inspection at the same time under one contract or order.

4.3.2 Sampling. Identical sample assemblies may be used for the examination of product and mechanical tests.

4.3.2.1 Mechanical tests. Assemblies to be inspected shall be chosen from the inspection lot by random sampling. One sample from each lot will be selected for mechanical test. For longer assemblies or lots of five assemblies or less, a representative sample of the same terminal and cable size approximately 2 feet long shall be made during the production run.

4.3.2.2 Proof load test. All wire rope assemblies shall be proof load tested in accordance with paragraph 3.7.

4.4 Certification. When specified in the contract or order, a certificate of conformance for compliant wire rope assemblies shall be forwarded to the Contracting Officer. Unless otherwise specified, the certificate of conformance will contain the following information:

- a. Manufacturer's name and address.
- b. Customer's name and address.
- c. Manufacturer's CAGE code.
- d. A list of components used in the fabrication of the wire rope assembly and the names and addresses of the companies supplying these components.
- e. Lot number and date of manufacture.
- f. Product (wire rope assembly) description.
- g. A statement certifying wire rope assembly conformance to this specification.
- h. The name and title of the company official approving the certificate of conformance.
- i. A clear written depiction of any exceptions to the specification requirements as stated in the contract or order.

4.5 Examinations.

4.5.1 Examination of product. Samples shall be examined to determine conformance to the applicable drawing and requirements not covered by the tests in 4.6.

4.6 Tests.

4.6.1 Mechanical tests.

4.6.1.1 Breaking strength. The wire rope assembly test sample shall be subjected to a load not less than that specified in paragraph 3.5. The manner in which the load shall be applied to the fitting end of the terminal shall be governed by the design of the fitting. Prior to application of the load, the assembly shall have a slippage indicator applied in accordance with 3.8. Breaking of the wire rope before reaching the specified load, any slippage of the wire rope in the terminals, and/or any signs of failure in the terminal shall be cause for rejection of the lot represented by the test sample.

5. PACKAGING.

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Although the swaged wire rope assemblies covered by this specification are typically intended for general aircraft use, they may also be used for other non-aerospace applications.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. MS or NAS part number of terminals, size and type of wire rope desired and length of the assembly, or the applicable detail drawing number (see 3.2).
- c. Packaging requirements (see 5.1).

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6.3 Qualification. With respect to products requiring qualification, awards will be made only for products that are, at the time of award of contract, qualified for inclusion in QML-6117 whether or not such products have actually been so listed by that date. The attention of contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Logistics Agency Aviation VEB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5616 or [STDZNMGT@dla.mil](mailto:STDZNMGT@dla.mil).

6.4 Subject term (key word) listing.

Proof load  
Swaging

6.5 Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

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QUALIFICATION CRITERIA AND PROVISIONS

A.1 SCOPE

A.1.1 Scope. This appendix is intended to provide the criteria and provisions for the Qualified Manufacturers List (QML) program for wire rope assemblies. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance.

A.1.2 Applicability. Defense Logistics Agency (DLA) Aviation has instituted a QML program for wire rope assemblies. The purpose of this program is to establish and maintain a list of pre-qualified sources for wire rope assemblies governed by MIL-DTL-6117. The criteria for qualification are tailored along the lines of SAE AS9100, "Quality Management Systems - Aerospace - Requirements", and best commercial business practices. This appendix contains the criteria and provisions for the program. The technical requirements and the administrative procedures of the program are contained in sections A.3 and A.4 of this document.

A.1.3 Participation in QML program. All companies that wish to participate in this program must have an assigned Commercial and Government Entity (CAGE) Code and become DLA Aviation qualified. CAGE Codes may be requested online from <http://www.ccr.gov/>, or call the Central Contractor Registration (CCR) Help Desk at (888) 227-2423. To become qualified, a candidate manufacturer must meet all of the requirements of MIL-DTL-6117 including the criteria and provision contained in this appendix. Qualification is valid for 2 years unless terminated or revoked. After the 2-year period of qualification has elapsed, reapplication will be required. Only QML listed companies will receive awards solicited under this program. The QML Program application forms, criteria, and provisions are published and maintained by the Product Development Directorate at DLA Aviation. Requests for copies may be addressed to:

Defense Logistics Agency Aviation VEB  
8000 Jefferson Davis Highway  
Richmond, VA 23297-5616

A.2 INTRODUCTION

A.2.1 Objective of QML. Qualification for placement on the QML, and the maintenance of QML status, requires the manufacturer demonstrate that they have in place, and use on a routine basis, a Quality Management System (QMS) that meets the criteria set forth in this document. The objective of the QML Program is to ensure that manufacturers routinely control their processes to provide consistent delivery of wire rope assemblies that conform to contract and specification requirements.

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A.2.2 Adherence to criteria and provisions. A manufacturer's adherence to the criteria and provisions in no way changes their responsibility to meet all of the specification and contractual requirements.

A.3 CRITERIA

A.3.1 Management responsibility.

A.3.1.1 Establishment of a QMS. The manufacturer shall be responsible for establishing, implementing, and maintaining an organizational QMS. The QMS shall be documented by written policies, procedures, processes, and instructions that meet the criteria for qualification. Further, the manufacturer's executive management shall ensure that the QMS is:

- a. Under the control of the company whose CAGE code is identified for the location specified on the application for qualification. Each location from which wire rope assemblies will be supplied must have a unique CAGE code, and must qualify under the QML.
- b. Applied consistently, on a day-to-day basis, regardless of customer.
- c. Continually measured, monitored and analyzed, and that any substantive revisions in the policies, procedures, processes or instructions of the QMS are implemented by formal revisions to the written policies, procedures, processes, and instructions.
- d. Implemented and applied on all levels and by all personnel throughout the company's business operations.
- e. Properly supported with sufficient resources and information necessary for effective operation and control of the QMS.

A.3.1.2 QMS policy statement. The manufacturer's executive management shall develop and document, a written and signed statement of policy regarding the QMS. This policy statement shall establish the resolve of the organization to provide quality products and to follow quality procedures. Executive management will ensure that the quality policy:

- a. Includes a commitment to comply with the requirements of the QMS and continually improve QMS effectiveness.
- b. Provides a structured process for establishing and reviewing quality objectives.
- c. Is communicated and understood within the organization.

A.3.1.3 QMS functions.

A.3.1.3.1 Independent function. The manufacturer's QMS organization shall be established and operated independently from the functions of producing, processing or selling the product. Those personnel performing QMS functions shall have the organizational freedom to resolve matters pertaining to quality. The QMS function shall ensure that QMS processes are established, implemented, and maintained; and provide reports to top management on performance and improvements.

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A.3.1.3.2 Delegation of QMS authority. When QMS authority is delegated to personnel who are outside the executive management of the organization, the delegation must empower those delegated to fully implement the organization's quality program. This delegation must include sufficient stature, authority, and organizational freedom to conduct the program.

A.3.2 QMS document requirements.

A.3.2.1 Establishment and maintenance of a QMS documentation system. The manufacturer shall establish and maintain a QMS documentation system that includes:

- a. A quality manual. The quality manual will include the scope of the QMS and the documented procedures established for the QMS.
- b. Documented procedures, statements of quality policy, and quality objectives.
- c. Quality system requirements.

A.3.2.2 Document control. A documented procedure will be established to define the QMS controls needed to:

- a. Approve, review, and update documents prior to use.
- b. Identify changes and the current revision status of documents.
- c. Ensure that applicable documents are available at points of use.

A.3.3 Purchasing.

A.3.3.1 Purchasing process. The manufacturer is responsible for the quality of all products purchased from suppliers, including Qualified Products List (QPL) products. The manufacturers will ensure that purchased products conform to specified purchase requirements, maintain a record of evaluation results and actions taken based on the evaluation. **The manufacturer must ensure that components listed on QPLs are purchased from the companies qualified for those components.** The manufacturer will maintain a register of approved suppliers that includes the scope of approval, periodically review supplier performance, define and take necessary actions with suppliers that do not meet requirements and assure that the function responsible for supplier approval can also disapprove the use of sources.

A.3.3.2 Purchasing information. Purchasing information will describe the product being purchased, product and process requirements, test, measurement and inspection requirements, quality system requirements, changes in product and/or process definition and required certifications including delineation of certification elements and test report requirements.

A.3.3.3 Product verification. Manufacturer shall have written procedures in-place and in-use, that ensure purchased product conform to specified purchase requirements. Verification procedures will include as a minimum:

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- a. Obtaining objective evidence of product quality, receipt inspection, and review of documentation.
- b. Inspection and audit of supplier's premises as required.
- c. Assurance that purchased product is not released for use until verification of all product and/or documentation requirements have been satisfied.
- d. Definition and documentation of verification delegation to the supplier.

A.3.3.4 Vendor selection system. A documented vendor selection system shall be in place that ensures only qualified and approved vendors, including packaging subcontractors, are solicited and awarded contracts.

A.3.4 Product traceability.

A.3.4.1 Product traceability. The manufacturer will identify the product by suitable means and maintain this identification throughout the entire fabrication process.

A.3.4.2 Material and end product traceability.

a. The manufacturer shall maintain a system of in-house traceability records that reflect a continuous documentation trail from the company that supplied raw material and/or components to the manufacturer regardless of the number of entities through which the materials or components have passed. The documentation trail will include reference to the manufacturer's customer purchase order for which the raw material and/or components are used to fabricate wire rope assemblies.

b. The manufacturer shall obtain from its source and retain on record a true copy of the original unaltered product certifications for the original materials and/or component at time of, or prior to, material receipt. Certified test reports must be available and provided to the customer upon request. These reports must be record-controlled by the manufacturer.

A.3.5 Lot control.

A.3.5.1 Lot identification and segregation. Lot identification and segregation shall be maintained and no comingling of wire rope assemblies shall be permitted. A manufacturer shall have in-place and in-use, a system that assures homogeneous grouping of wire rope assemblies; this system must confirm that the homogenous group (lot) is traceable to the components making up the wire rope assemblies. The manufacturer shall document and implement a system:

- a. that marks and identifies all wire rope assemblies by lot.
- b. that ensures lot identification is maintained throughout the process including storage, packaging, and shipment. Where lots have been subdivided, evidence shall exist to assure traceability. The system shall account for products with respect to type, quantity, location, and lot number. Stored inventory must agree with recorded data of the same inventory. Data required to isolate material to the specific lot must be record-controlled.

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c. that controls product turnover. This system shall manage product segregation within the inventory, when technical requirements change while the product is in storage.

d. that provides, upon request, to the customer, the approved manufacturer's certificate of conformance, test reports, and material certifications for each lot of product, at the time of product delivery.

e. that labels or tags each packaging unit to identify the contents; and the labels or tags shall be in compliance with the customer's requirements, applicable specification, and/or federal regulations.

A3.6 Process control.

A.3.6.1 Established process control system. Manufacturers must have an established process control system that includes the following:

- a. Development of control plans for key characteristics.
- b. Design, manufacture, and use of tooling compatible with variable measurement methods.
- c. Availability of product characteristic data, work instructions, monitoring and measuring devices, drawings, parts lists, and process flow charts.
- d. Accountability for all product manufactured including non-conforming material.
- e. Evidence that all manufacturing inspection and measurement operations have been performed as required.
- f. Control of process changes including authorization, documentation, change assessment, and customer notification as required.
- g. Validation of production equipment and tools including pre-production validation and verification using first sample product inspection and testing.
- h. Control of processes performed outside the manufacturer's facility.
- i. Control of service operations including collection and analysis of data and investigation of reported problems occurring after delivery.
- j. Control of technical data updating.
- k. Control of rework and/or repair schemes and processes.

A.3.7 Inspection of material.

A.3.7.1 Inspection and conformance verification procedures for materials. The manufacturer shall have in-place and in-use, written inspection and conformance verification procedures for all materials or products from receipt of the goods through delivery of the product.

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A.3.7.2 Receiving inspection for incoming products. The manufacturer's written inspection system shall include procedures that will ensure that incoming products are inspected upon receipt, and that conformance to contract and specification requirements will be verified. Inspection results shall be formally recorded and dated including authorizing initials or stamps. This inspection record shall be traceable to the material inspected and the individual who performed the inspection.

a. Certifications shall be checked 100 percent against manufacturer's purchase order (contract) requirements and verified against specification requirements prior to further processing or use.

b. Periodic random sample testing of material or product samples shall be performed, with the results recorded and maintained.

c. All non-conforming materials and/or products shall be clearly identified and segregated to ensure that non-conforming materials and/or products are not placed into the manufacturer's system for processing or distribution.

d. Receiving inspection, at a minimum, shall verify conformance to requirements through certification, examination, tests, inspections and/or measurements.

A.3.8 Test control.

A.3.8.1 Written instructions and procedures related to testing. The manufacturer shall have in-place and in-use, written instructions and procedures related to any testing required by contract or relevant specifications, when applicable.

a. Tests shall be performed by qualified and/or certified personnel, who shall use relevant specifications, appropriate test methods and instrumentation under prescribed environmental conditions.

b. Test results shall be evaluated, clearly documented, and traceable to the material and/or product lot tested.

c. Tests performed outside of the manufacturer's facility shall be performed by qualified test laboratories with the above criteria being applicable. Test laboratories shall be selected, approved, and monitored in accordance with paragraph A.3.3.4 relating to the vendor selection system.

A.3.9 Test and measurement equipment.

A.3.9.1 Control, maintenance, and calibration. The manufacturer shall have in-place and in-use, a system for the control, maintenance, and calibration of inspection and test equipment, including gages and other measuring devices. The manufacturer shall establish processes to ensure that inspections, measurements, and tests are carried out in a manner consistent with requirements.

A.3.9.2 Calibration. The manufacturer shall maintain a register of measurement, inspection, and testing devices and define the process used for calibration including details of

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equipment type, identification, location, frequency of calibration checks, check method, and acceptance criteria. Calibrations will be performed at defined intervals and traceable to international or national standards. If no such standards exist, the basis for calibration will be recorded. The manufacturer shall assure that environmental conditions are suitable for the calibrations, inspections, measurements, and tests performed. Records of calibration and verification results shall be maintained.

A.3.10 Non-conforming material and corrective action.

A.3.10.1 Non-conforming material. The manufacturer shall establish and maintain documented procedures to ensure that non-conforming product or material is prevented from entering or continuing in the production process. Accordingly, the manufacturer shall:

- a. Identify, document, and segregate non-conforming material.
- b. Provide a readily identifiable and adequate holding area for the segregation of non-conforming material. Non-conforming material must not be comingled with conforming material.
- c. Provide and apply effective controls to ensure that corrective action(s) are taken to preclude the recurrence of the circumstance which caused the non-conformance.

A.3.10.2 Corrective action.

- a. The manufacturer shall describe, document, and implement a corrective action system.
- b. Processes or procedures resulting in non-conformance shall be documented, recorded, reported to management, and promptly corrected.
- c. The manufacturer shall have a system in-place to notify customers of any defective wire rope assemblies. Provisions shall be in-place for defective product disposition.
- d. There shall be a system procedure which specifically delineates responsibilities such as discrepancy reports, tracking logs, investigation results, follow-up actions, and resolutions.

A.3.11 Preservation, storage, packaging, and shipping.

A.3.11.1 Preservation. The manufacturer shall preserve the conformity of product during internal processing and delivery to the intended destination. Preservation will include identification, handling, packaging, storage, and protection.

A.3.11.2 Storage. The manufacturer's system shall provide for control of the storage environment. A system shall be in-place and used to preclude deterioration of material or finished product.

A.3.11.3 Packaging. The manufacturer's system shall provide for the control of the packaging process to ensure compliance with specified requirements. In-place process controls

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must extend to any subcontracted and/or off-site packaging services while remaining under the authority, responsibility, and quality control of the manufacturer.

A.3.11.4 Shipping. The manufacturer's system must provide for shipment of the finished wire rope assemblies from the manufacturer's QML facility to the packager or the consignee. In exceptional circumstances, and upon written request, the Contracting Officer may grant a waiver of this requirement provided that the manufacturer continues to meet all of the criteria requirements of this QML Program. Moreover, the manufacturer must have written authorization from the Contracting Officer for each such waiver.

a. Manufacturer shall select carriers for transportation of wire rope assemblies in accordance with the criteria pertaining to its approved vendor selection system.

A.3.12 Records control.

A.3.12.1 Availability of records. The manufacturer shall have in-place and in-use a system by which pertinent records are established, identified, maintained, controlled and secured to ensure their integrity. All such records shall be legible, identifiable, and readily available at the manufacturer's facility that is QML qualified. If such records are maintained in electronic or computer media, they shall be retrievable and capable of being reduced to printed form at the manufacturer's facility that is QML qualified. All records shall be maintained for a minimum of 7 years and made available upon request from the customer.

A.3.12.2 Records maintenance. The manufacturer shall maintain the following categories of records as part of the quality records system:

- a. Production test reports.
- b. Raw material and component test reports and certifications.
- c. Accredited lab test reports.
- d. Inspection results and/or reports.
- e. Customer orders, contracts, delivery orders, and/or purchase orders.
- f. Non-conforming material reports and corrective actions, including recall actions, material disposition instructions, customer notifications, and responses.
- g. Calibration documentation.
- h. Audit documentation.
- i. Personnel qualification records.

A.3.12.3 Integrity of records. The manufacturer's records system shall include provisions and controls to ensure that the integrity of records is not compromised. Security measures are required to protect authenticity of material certifications and test reports, and to prevent the loss, deterioration, and unauthorized use, alteration, copying, counterfeiting, and distribution of such documents.

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A.3.13 Audits.

A.3.13.1 Self-audits. The manufacturer shall have in-place and in-use, a documented system for planned, periodic self-audits. This system shall be designed and executed to ensure and verify that the QMS is adequate and effective. Audits shall be conducted as often as appropriate based on the nature of manufacturer's products. At a minimum, such internal audits should be conducted annually.

A.3.13.2 Internal audits. Internal audits shall be performed by qualified personnel having job responsibilities that are independent from personnel having direct responsibility for the process being audited. Audit results shall be recorded and reviewed by management. The audit records shall indicate the date and scope of the audit, together with findings and corrective action taken. Corrective action pursuant to audit reports shall be fully documented.

A.3.13.3 External audits. Manufacturer's authorized distributors, vendors, and processors shall be audited in accordance with a documented QMS procedure. A list of authorized distributors, vendors, and processors will be maintained and made available for review upon request.

A.3.14 Personnel training.

A.3.14.1 Establishment and maintenance of training. Management shall establish and maintain documented procedures for identifying training needs and provide for the training of personnel. Personnel performing specific assigned tasks shall be qualified on the basis of relevant education, training and/or experience, as required. Appropriate records of training shall be maintained.

A.3.15 Wire rope assembly products.

A.3.15.1 Design and development. When required, the manufacturer will plan and control the design and development of wire rope assemblies. This process will include the review, verification, and validation appropriate to each design and development stage.

A.3.15.2 Delivered. The manufacturer shall verify that wire rope assemblies, prior to delivery, meet all contractual and specification requirements ordered by the customer.

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A.4 PROVISIONS

A.4.1 Qualification.

A.4.1.1 Program objective. The objective of this QML Program is to establish and maintain a list of pre-qualified manufacturers with established QMSs that employ on a day-to-day basis process and quality controls designed to ensure delivery of quality wire rope assemblies that meet customer specified requirements.

A.4.1.1.1 To obtain and maintain QML status, the manufacturer must comply with the criteria and provisions sections of this document (see A.3 and A.4).

A.4.1.1.2 Being listed as a QML manufacturer does not guarantee award of contracts to anyone.

A.4.2 General provisions.

A.4.2.1 Manufacturer. The manufacturer must:

a. Have in-place, maintain, and use a QMS that satisfies all of the criteria set forth in this document. A copy of manufacturer's current Quality Assurance (QA) manual, reflecting compliance with the criteria and provisions sections of this document (see A.3 and A.4), for QML qualification, must be available for review upon request. A notification must be provided for any substantive changes to the QMS and/or QA manual.

b. Maintain a single QMS and use a single QA manual for both its Government business and commercial business.

c. Possess a CAGE code.

d. Complete and submit an application for qualification. Qualification terms shall be three years at which time QML manufacturers will be requested to reapply for qualification.

A.4.3 Obligations.

A.4.3.1 Government. DLA Aviation will serve as the single Department of Defense (DoD) Agency focal point to consolidate findings and recommend corrective actions for QML problems. As the qualifying activity for this QML, DLA Aviation will:

- a. Process applications.
- b. Qualify and re-qualify manufacturers.
- c. Maintain the wire rope assembly QML.
- d. Conduct or coordinate site-surveys and audits.
- e. When appropriate, initiate QML removal actions.
- f. When appropriate, disseminate non-conforming information to users.
- g. Make awards only to QML listed companies.
- h. Provide access to a listing of approved manufacturers.

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- i. Notify QML manufacturers when re-qualification is required.
- j. Reserve the right to revert to the basic requirements contained in the original solicitation if the manufacturer should be disqualified or removed from the QML.

A.4.3.2 Manufacturer. The manufacturer shall assume responsibility to:

- a. Meet all contractual specifications and requirements. There are no exceptions or waivers unless provided in writing by the Contracting Officer.
- b. Report any discrepancies discovered on shipped wire rope assemblies and corrective actions taken.
- c. Maintain records as indicated in the section A.3.12 of this document, and make them available for examination by DLA Aviation or DLA Aviation's agent upon survey or audit.
- d. Permit DLA Aviation, or DLA Aviation's agent, to conduct site surveys and audits as required.
- e. Coordinate open contract actions with the appropriate DLA Aviation Contracting Officer should the manufacturer become disqualified from the QML prior to delivery. Moreover, the manufacturer must also coordinate open contract actions with the appropriate DLA Aviation Contracting Officer, if they are about to supply to DLA Aviation or DLA Aviation's customer, wire rope assemblies that were supplied to the manufacturer from a manufacturer that was removed from the QML subsequent to entering into the contract agreement with DLA Aviation. Wire rope assemblies owned by any manufacturer while disqualified (or unqualified) from the QML, or prior to approval to the QML is not acceptable for delivery under this program.

A.4.4 Application for qualification.

A.4.4.1 Application request. Applications for qualification can be obtained by writing or calling DLA Aviation (see A.1.3). Application packages sent to interested manufacturers will include the basic application form and a copy of the QML criteria and provisions. In order to participate in the QML Program, a manufacturer must have a CAGE code designation (see A.1.3).

A.4.4.2 Application processing. The candidate shall submit the completed application to DLA Aviation (see A.1.3). If applicable, the applicant will also submit written proof that they have been approved by the Design Control Activity to manufacture the wire rope assembly part(s).

A.4.4.3 Application revision. QML companies are responsible for notifying DLA Aviation when their product lines or facility locations have changed, new manufacturing or QMS processes have been implemented, the organizational structure impacting production and/or the QMS has changed or there has been a change in senior quality management. When requested by DLA Aviation, companies shall submit a revised signed application once changes have occurred.

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A.4.5 Site survey.

A.4.5.1 Requirement for site survey. When a manufacturer applies to be qualified under the QML Program, DLA Aviation will customarily require a site-survey of the facility. Site-surveys by DLA Aviation or DLA Aviation's agent, will be based on the criteria in section A.3. Surveys will include a review of the manufacturer's QMS and all of the systems and processes that the manufacturer is required to have in-place and in-use, under section A.3 of this document.

A.4.5.2 Third party survey/audits. Industry surveys/audits or certification by a third party ISO registrar, may be considered by DLA Aviation in the review of the manufacturer's application for qualification. Such surveys or audits may be used by DLA Aviation in lieu of, or in addition to, QML site-survey requirements.

A.4.6 Qualification results.

A.4.6.1 Notification of qualification. Upon completion of the evaluation process, DLA Aviation shall notify the manufacturer as to whether QML status has been attained or has been denied.

A.4.6.2 Qualification approval. If qualification status has been attained, a qualification approval letter shall be issued to the manufacturer along with a copy to the DLA Aviation buying office for wire rope assembly items. Unless QML status is terminated, or the manufacturer is otherwise disqualified, the term of qualification shall be three years from the date of the qualification approval letter. The letter notice typically will include the following:

- a. Designation of the QML Program under which manufacturer has been qualified.
- b. The CAGE code and address of the manufacturer's facility which has been qualified.
- c. The address for receipt by the manufacturer of correspondence if different from that in "b" above.

A.4.6.3 Qualification denial. When a manufacturer's application for qualification is denied, DLA Aviation will issue a denial of qualification letter to the manufacturer along with a copy to the DLA Aviation buying office. The letter shall cite the specific reasons for such denial.

A.4.7 Audits.

A.4.7.1 Audits. DLA Aviation may conduct annual audits of a manufacturer's facility to confirm adherence to QML criteria. Audits will be an on-going policy during the life of the QML Program. During audits, observation of inspection and testing will be performed. In some cases, the manufacturer may be requested to perform a specific inspection and/or test during the audit.

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A.4.7.1.1 The purpose of a facility audit is to ensure that the manufacturer has in-place and in daily use, a QMS that conforms to the requirements of the criteria and provisions of the DLA Aviation QML Program, as reflected in this document. An audit will involve the examination of applicable documents, processes, and procedures, as well as the various systems required for attainment of qualification.

A.4.8 QML removal/disapproval.

A.4.8.1 Reasons for removal. The success of the DLA Aviation QML Program is dependent upon the integrity of those manufacturers that participate in it. Continued participation in the program is, therefore, contingent upon the manufacturer's continuing compliance with the criteria and provisions upon which qualification was established. The manufacturer's failure to comply may be cause for initiation of removal. The following are some examples of reasons for removal from the QML:

- a. The product(s) furnished by the manufacturer under its contract(s) does not meet contract or specification requirements.
- b. Manufacturer no longer supplies the product(s) included in the DLA Aviation QML Program.
- c. Manufacturer has been removed as an approved manufacturer by the Design Control Activity.
- d. Manufacturer significantly changes its QMS or its facility location without prior notification to DLA Aviation
- e. Manufacturer fails an audit.
- f. Manufacturer denies access to DLA Aviation audit or survey personnel, or to other personnel authorized by DLA Aviation to conduct such audits or surveys.
- g. Manufacturer ships products from a location other than that for which it has been qualified or authorized.
- h. Qualification criteria and/or provisions are revised, and manufacturer fails or refuses to comply with revised criteria and/or provisions following opportunity to do so.
- i. Manufacturer is debarred, otherwise determined to be ineligible for awards of Government contracts, or is engaged in practices that indicate less than acceptable integrity or business ethics.
- j. Manufacturer requests that it be removed from the DLA Aviation QML.
- k. Manufacturer alters or modifies product furnished under a QML contract.

A.4.8.2 Procedures for removal. The following provisions apply to removal of a manufacturer from the QML:

- a. When removal of a manufacturer from the QML is proposed, and after DLA Aviation buying office notification, DLA Aviation will notify the manufacturer by certified mail, return receipt requested, and/or facsimile, citing specific reasons for the proposed removal. The manufacturer shall have 15 days to respond to the notification.

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b. Failure by the manufacturer to respond to the notice of contemplated removal letter within the 15 day period will result in immediate removal of manufacturer from the QML.

c. If manufacturer responds to the notice of contemplated removal letter within the 15 day period, DLA Aviation will evaluate the response, including manufacturer's proposed corrective action, if any, and will determine which of the following shall apply:

- (1) Removal from QML.
- (2) Retention on QML.
- (3) Further action, as appropriate.

d. Typically, there is no specific time duration for removal from the QML. The removal period will be based on the time necessary to implement and test corrective actions associated with the disqualification and verification actions by DLA Aviation to assure that actions taken will mitigate the cause for removal.

e. When DLA Aviation has removed a manufacturer from its QML, notice of such removal, and the reasons for the removal, may be given to other interested government activities. Also, if a manufacturer is removed from one QML Program at DLA Aviation, that manufacturer may be removed from all QML Programs at DLA Aviation. The DLA Aviation QML removals page will also reflect such removals to preclude participants from buying from an unauthorized source.

A.4.9.1 Re-qualification by renewal. Re-qualification is required upon the lapse of three years from the date of last qualification. To ensure that no gap in qualification status occurs, DLA Aviation will notify the manufacturer that they should request a qualification package from DLA Aviation at least 120 days prior to expiration of its current 2-year qualification period. Requirements for re-qualification shall be those QML criteria and provisions in effect at the time of application for re-qualification. Note: Failure to re-qualify may result in removal of a manufacturer from the QML.

A.4.9.2 Re-qualification subsequent to removal or qualification after disapproval. In the event that manufacturer's application for qualification is not approved, or if manufacturer's status as a QML concern is discontinued, qualification will not occur until DLA Aviation has determined that satisfactory evidence has been submitted which establishes that all deficiencies have been adequately corrected.

A.4.9.3 Reapplication subsequent to removal. Removal from the QML will require reapplication by the manufacturer.

A.4.10 Solicitation/award.

A.4.10.1 Eligibility. To be eligible for award under this QML Program, a company must be listed on the QML at the time of award.

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Custodians:

Army - CR  
Navy - AS  
Air Force - 99  
DLA - GS

Preparing Activity:

DLA - GS5

(Project 1640-2010-005)

Review Activities:

Army - MI  
Air Force - 71

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST database at <https://assist.daps.dla.mil/>.