

INCH-POUND

MIL-DTL-8783D
 3 February 2009
 SUPERSEDING
 MIL-DTL-8783C
 30 July 1999

DETAIL SPECIFICATION

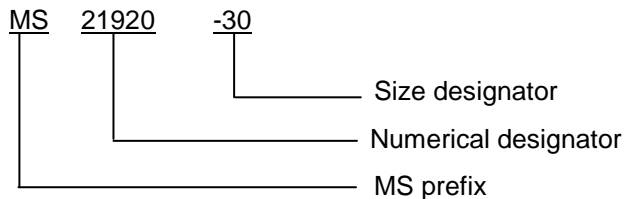
CLAMP, HOSE, FLAT BAND 500°F, GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification covers flat band, T-bolt latch clamps and flat band, quick-release latch clamps used in various aircraft installations of duct, hose and flex tubing.

1.2 Part or Identifying Number (PIN). The PIN consists of the letters MS, numerical designator, a dash, and size designator.



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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 documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks 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 Supply Center, Columbus, Attn: DSCC-VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to FluidFlow@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil>.

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DEPARTMENT OF DEFENSE STANDARD

MIL-STD-130 - Identification Marking of U.S. Military Property

DEPARTMENT OF DEFENSE SPECIFICATION

MIL-DTL-8783/1 - Clamp, Hose, Flat Band 500°F

(Copies of these documents are available online at <http://assist.daps.dla.mil> or from the Standardization Document 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.

AMERICAN WELDING SOCIETY (AWS)

AWS D17.2/D17.2M - Specification for Resistance Welding for Aerospace Applications

(Copies of these documents are available online at <http://www.aws.org> or from the American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126-5649)

AEROSPACE INDUSTRIES ASSOCIATION (AIA)

NASM7873 - Nut, Self-Locking, 1,200 Degrees Fahrenheit

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

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 17025 - General requirements for the competence of testing and calibration laboratories

(Copies of these documents are available online at <http://www.iso.ch> or from the International Organization for Standardization American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.)

NCSL INTERNATIONAL

NCSL Z540.3 - Requirements for the Calibration of Measuring and Test Equipment

(Copies of these documents are available online at <http://www.ncsli.org> or from NCSL International 2995 Wilderness Place, Suite 107 Boulder, Colorado 80301-5404)

SAE INTERNATIONAL

SAE-AMS2700 - Passivation of Corrosion Resistant Steels
SAE-AMS5504 - Steel, Corrosion-Resistant, Sheet and Strip 18Cr - 8Ni (SAE 30301) Cold Rolled, 3/4 Hard, 175 ksi (1207 MPa) Tensile Strength

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SAE-AMS5513	-	Steel, Corrosion Resistant, Sheet, Strip, and Plate 19Cr - 9.2Ni (SAE 30304) Solution Heat Treated
SAE-AMS5516	-	Steel, Corrosion-Resistant, Sheet, Strip, and Plate 18Cr - 9.0Ni (SAE 30302) Solution Heat Treated
SAE-AMS5518	-	Steel, Corrosion Resistant, Sheet and Strip 18Cr - 8Ni (SAE 30301) Cold Rolled, 150 ksi (1034 MPa) Tensile Strength
SAE-AMS5639	-	Steel, Corrosion-Resistant, Bars, Wire, Forgings, Tubing, and Rings 19Cr - 10Ni Solution Heat Treated
SAE-AMS5732	-	Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Tubing, and Rings 15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V Consumable Electrode Melted 1800 Degrees F (982 Degrees C) Solution and Precipitation Heat Treated
SAE-AMS5737	-	Steel, Corrosion and Heat-Resistant, Bars, Wire, Forgings, and Tubing 15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V Consumable Electrode Melted 1650 Degrees F (899 Degrees C) Solution and Precipitation Heat Treated
SAE-AMS5902	-	Steel, Corrosion-Resistant, Sheet and Strip 18Cr - 8Ni (SAE 30301) Cold Rolled, 3/4 Hard, 175 ksi (1207 MPa) Tensile Strength
SAE-AS7479	-	Bolts and Screws, Steel, UNS S66286 1650 Degrees F Solution Heat Treated Precipitation Heat Treated Before Roll Threaded
SAE-AS8879	-	Screw Threads - UNJ Profile, Inch

(Copies of these documents are available online at <http://www.sae.org> or from the SAE World Headquarters, 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 (except for related specification sheets), 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 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. The flat band hose clamps furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.5 and 6.3).

3.3 Materials. Materials shall be as identified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Recycled, recovered, or environmentally preferable material. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3.2 Clamp band. Clamp bands shall be corrosion resistant steel alloy 301, 1/2 hard in accordance with SAE-AMS5518.

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3.3.3 Tongue. The tongue shall be the same width, thickness, and material as the clamp band specified in 3.3.2.

3.3.4 Trunnion assembly. Trunnion assembly consisting of the body and cap shall be corrosion-resistant steel alloy 301 in accordance with SAE-AMS5902, alloy 302 in accordance with SAE-AMS5516, alloy 304 in accordance with SAE-AMS5513, alloy 305 in accordance with SAE-AMS5639, or alloy 410 in accordance with SAE-AMS5504 (trunnion body only).

3.3.5 T-Bolt. T-bolts shall be in accordance with SAE-AS7479. Materials for the T-bolts shall be corrosion-resistant steel alloy in accordance with SAE-AMS5732 or SAE-AMS5737. The bolts shall be capable of withstanding a tensile load of 3180 pounds (1442 kg) minimum, without permanent deformation or loss of function.

3.3.6 Nuts. Nuts shall be corrosion-resistant steel in accordance with NASM7873.

3.3.7 Threads. The class of threads shall be 3A and 3B, respectively, for the bolt and nut in accordance with SAE-AS8879.

3.3.8 Passivation. The hose clamp assembly or individual piece parts, excluding the nut, shall be passivated in accordance with SAE-AMS2700, method 2. A report shall be made available to the qualifying activity upon request.

3.4 Component parts. The latch of the quick-release type shall be positive locking but easily released when the nut is backed off. All component parts of quick-release clamps shall remain as an assembly during installation or removal. T-bolt type clamps may require removal of latch components, such as the nut.

3.5 Design and construction. Clamps shall be of a design to permit easy installation and removal in confined places. Design shall require the bolt-type element to be an integral load-carrying member. A permanently attached tongue shall be provided to insure that the clamp will exert a bearing pressure throughout the complete circumference.

3.5.1 Welding. Resistance spot weld (RSW) in accordance with American Welding Society AWS D17.2/D17.2M, class B.

3.6 Minimum adjustment range. A clamp for any given size shall have sufficient adjustment available in the assembled condition so that an applied torque of 25 ± 5 pound-inch (2.8 ± 0.6 Nm) will tighten it uniformly around the full periphery of solid rounds or steel tubes. The rounds and tubes shall have outside diameters to the maximum and minimum dimensions specified on MIL-DTL-8783/1, when tested as specified in 4.7.2.

3.7 Sizes and dimensions. The sizes and dimensions shall conform to MIL-DTL-8783/1. Envelope dimensions of the tightening device are applicable when the clamp is in the tightened positions on the minimum and maximum size solid round or tube.

3.8 Load Deflection. The maximum deflection shall be 0.15 inch (0.4 mm) when tested in accordance with 4.7.3.

3.9 Tensile load. The minimum tensile load of all sizes of clamps shall be 2250 pounds (1021 kg) when tested as specified in 4.7.4.

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3.10 Identification of product. Each clamp shall be marked with the part number in accordance with MIL-STD-130. The manufacturer's name or trademark shall be placed on the clamp, printed parallel to edges of the band. The markings shall consist of characters .063 inch to .188 inch (0.16 to 0.48 mm) high. Markings shall not cause disfigurement, damage, or expose to corrosion.

3.11 Workmanship. Clamps shall be uniform in quality and free from burrs, sharp edges, cracks, inclusions and other defects which may adversely affect its functioning and service life.

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained or identified by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with ISO 17025 and NCSL Z540.3 as applicable.

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

- a. Qualification inspection (see 4.4).
- b. Conformance inspection (see 4.5).

4.3 Responsibility for compliance. All items shall meet all requirements of sections 3, 4, and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the qualifying activity on sample units produced with equipment and procedures used in production.

4.4.1 Qualification inspection routine. Samples shall be subjected to qualification testing as specified in table I.

4.4.2 Samples for qualification. Samples for qualification shall be representative of the products proposed to be furnished to the Government. The qualification test samples shall consist of three clamps of the -41 or -41R size. Samples shall be identified by securely attached durable tags marked with the information as specified and shall be forwarded to the activity responsible for qualification (see 6.3).

Sample for qualification tests
CLAMP, HOSE, FLAT BAND, 500°F
PIN (see 1.2)
Manufacturer's PIN and CAGE Code
Name of Manufacturer
Submitted by (name) (date) for qualification tests in accordance with MIL-DTL-8783 under authorization (reference letter of authorization).

4.4.3 Failures. One or more failures shall be cause for refusal to grant qualification approval.

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TABLE I. Qualification inspection.

Title	Requirement paragraph	Inspection paragraph
Examination of product	3.7, 3.10, and 3.11	4.7.1
Minimum adjustment range	3.6	4.7.2
Load deflection <u>1/</u>	3.8	4.7.3
Band tensile load <u>1/</u>	3.9	4.7.4

1/ Destructive test.

4.5 Conformance inspection.

4.5.1 Inspection of product for delivery. Inspection of product for delivery shall consist of sampling tests.

4.5.1.1 Sampling inspection. Sampling inspection shall consist of the inspections specified in table II. These tests shall be performed on a production lot basis. Samples shall be selected to form an inspection sample (see 4.5.3).

TABLE II. Sampling inspection.

Title	Requirement paragraph	Inspection paragraph
Examination of product	3.7, 3.10, and 3.11	4.7.1
Minimum adjustment range	3.6	4.7.2

4.5.1.2 Sampling inspection defects. If one or more defects are found in the inspection sample, then the production lot shall be screened for that particular defect and defects removed. A second inspection sample shall be selected from the production lot and all sampling tests again performed. If one or more defects are found in the second inspection sample, the production lot shall be rejected and shall not be supplied to this specification.

4.5.2 Production lot. A production lot shall consist of clamps of the same size and type manufactured on the same production line(s) by means of the same production technique, materials, controls, and design during the same continuous production run.

4.5.3 Inspection sample. The inspection sample shall be product selected at random from the production lot without regard to quality and shall be the size specified in table III.

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TABLE III. Inspection sample.

Production lot of each size	Accept on zero sample size
1 to 8	All
9 to 90	8
91 to 150	12
151 to 280	19
281 to 500	21
501 to 1,200	27
1,201 to 3,200	35
3,201 to 10,000	38
10,001 to 35,000	46

4.5.4 Periodic inspection. Periodic inspection shall consist of the inspections specified in table IV and shall be made on three clamps which have been subjected to and passed the sampling tests. The following details shall apply:

- Periodic control tests shall be performed once every 26 calendar weeks, if there is a production run.
- Parts shall be as representative as possible of the production lots for the time period that they represent (for example, parts shall be from different lots, different production dates, etc.).
- Parts tested must be from actual production lots and are not to be built just for testing.
- Manufacturers are not required to do periodic control testing if there has been no production during the period covered by the testing.

TABLE IV. Periodic inspection. 1/

Title	Requirement paragraph	Inspection paragraph
Load deflection <u>1/</u>	3.8	4.7.3
Band tensile load <u>1/</u>	3.9	4.7.4

1/ If there are no reported failures after two consecutive 26 week intervals then periodic testing can be done at 24 months intervals. If there are no reported failures after the next 24 month interval, then periodic testing can be done at 36 month intervals.

4.5.4.1 Nonconformance. If a sample fails to pass any periodic control test, the manufacturer shall immediately notify the qualifying activity and cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which were manufactured under essentially the same conditions, with essentially the same materials and processes, and which are considered subject to the same failure. The following details shall apply:

- Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity has been taken.
- After the corrective action has been taken, periodic control tests shall be repeated on additional samples (all inspections, or the inspection which the original sample failed, at the option of the qualifying activity).

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- c. Sampling tests (and periodic control tests if applicable) inspection may be reinstituted; however, final acceptance shall be withheld until the periodic control test has shown that the corrective action was successful.
- d. In the event of failure after inspection, information concerning the failure and corrective action taken shall be furnished to the cognizant inspection activity and the qualifying activity.

4.5.4.2 Disposition of test specimens. Test specimens which have been subjected to periodic control tests shall not be delivered on a contract or purchase order.

4.6 Additional QPL test and reporting requirements.

4.6.1 Retention of qualification. To retain qualification, the contractor shall submit a test report to the qualifying activity at 12 month intervals. The qualifying activity shall establish the initial reporting date. Each report shall consist of a summary of test and inspection results required by this specification that were performed during the 12 month reporting interval. As a minimum, the report shall include the following:

- a. Number of lots produced and tested, including lot and sample sizes for each lot.
- b. Identify which tests were performed.
- c. Quantities passed.
- d. Quantities failed.
- e. All reworked sampling lots shall be accounted for and identified. A summary of corrective action taken shall be included.

4.6.2 Loss of product qualification.

4.6.2.1 Failure to meet test requirements. The manufacturer shall immediately notify the qualifying activity at any time during the 12-month reporting period when the qualified product fails to meet the test and inspection requirements of this specification. The manufacturer shall identify and indicate what corrective action will be taken to correct the problem. Failure to take corrective action acceptable to the qualifying activity may result in removal of the product from the QPL.

4.6.2.2 Failure to submit summary test data report. Failure to submit a report within 30 days after the end of the 12 month reporting period may result in loss of qualification for the product.

4.6.2.3 Change to manufacturing process, materials or equipment. The manufacturer shall notify the qualifying activity, in writing, of any changes in the manufacturing process, materials, or equipment used to manufacture a QPL product. Subsequently, the qualifying activity will notify the manufacturer, in writing, if a full re-qualification, partial re-qualification, or no additional testing is required as a result of these changes.

4.6.2.4 No production during reporting period (12 and 24 months). When no production occurs during the reporting period, a report shall be submitted to the qualifying activity certifying that the manufacturer still has the capability and facilities necessary to produce the QPL product. If there has been no production for a period of two years, the qualifying activity has the option of requiring the manufacturer to build parts to perform periodic control tests.

4.7 Tests.

4.7.1 Examination of product. Each clamp submitted for acceptance under contract shall be visually examined to determine conformance with the requirements of this specification not covered by test and with respect to workmanship and dimensions specified on the applicable specification sheet.

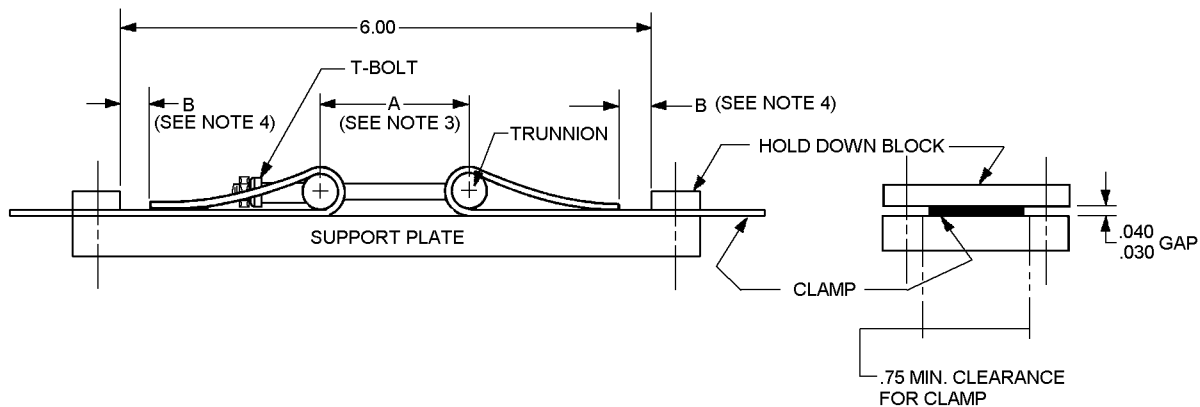
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4.7.2 Minimum adjustment range. Solid rounds or steel tubes having outside diameters equal to the minimum extended diameter, +1 percent -0, and maximum compressed diameter, +0, -1 percent, specified in MIL-DTL-8783/1, shall be used to measure the adjustment range. The following details shall apply:

- The clamp shall be tightened with an applied torque of 25 ± 5 pound-inch (2.8 ± 0.6 Nm) on the maximum size solid round or tube.
- It shall not be possible to insert a thickness (feeler) gage .028 inch (0.07 mm) thick by .312 inch (0.79 mm) wide between the clamp and the round or tube.
- The clamp shall be removed and installed in the same manner on the minimum size solid round or tube and the test repeated to determine conformance with 3.6.

4.7.3 Load deflection. Load deflection data shall be obtained by a straight tensile test on a clamp which has been cut apart in the band opposite the latching element. The following details shall apply:

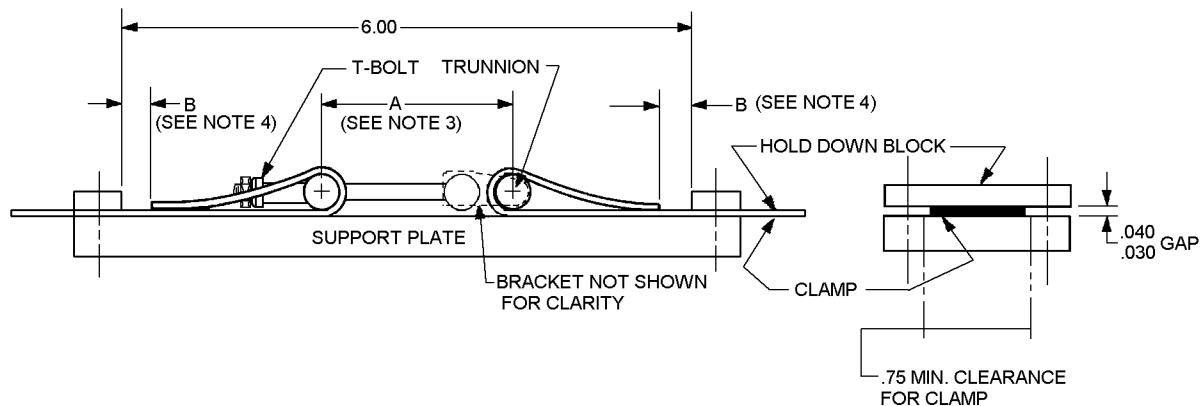
- The cut clamp shall be carefully straightened from the circular form to provide a straight test specimen.
- The distance between the T-bolt head and the trunnion shall be the same as when the clamp was tightened on the minimum size round or tube in accordance with 4.7.2.
- A gage length of 10 inches (25.4 cm) shall be used, and a supporting plate may be employed to maintain the clamp assembly in a straight line and to prevent possible malfunction of the latching element (see figure 1).
- The maximum allowable deflection between the loads of 150 pounds (68 kg) and 1500 pounds (680 kg) shall be as specified in 3.8.



INTEGRAL T-BOLT AND TRUNNION

FIGURE 1. Test setup for load deflection.

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SEPARATE T-BOLT AND TRUNNION

Inches	mm
.030	0.76
.040	1.02
.075	1.91
6.00	152.40

NOTES:

1. Dimensions in inches.
2. Metric equivalents are given for general information only.
3. A - This distance determined from assembly on min bar or tube in accordance with 4.7.2.
4. B - Center clamp on plate by making these dimensions equal within .06 inch (1.52 mm).

FIGURE 1. Test setup for load deflection - Continued.

4.7.4 Band tensile load. The tensile load test shall be conducted on the same or similar specimens used in the load deflection test (see 4.7.3). The tensile load shall be as specified in 3.9.

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 activity 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 which may be helpful, but is not mandatory.)

6.1 Intended use. These are military unique clamps that require strict adherence to military requirements. The clamps are for use in military aircraft installation in making duct or tube connections and in other applications requiring a flat metallic band with an adjustment feature. The clamps meet the strict temperature range of -65°F to 500°F (-54°C to 260°C), which complies with detailed military requirements. These clamps are not intended for use in pressurized lines carrying combustibles.

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6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Applicable specification sheet number, title, and date.
- c. Applicable specification sheet PIN.
- d. Packaging requirements (see 5.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No.8783 whether or not such products have actually been so listed by that date. The attention of the 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 Supply Center Columbus, P.O. Box 3990, ATTN: DSCC-VQ, Columbus, Ohio 43218-3990 or emailed to vqp.chief@dla.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <http://assist.daps.dla.mil>.

6.3.1 Provisions governing qualification (SD-6). Copies of "Provisions Governing Qualification" are available online at <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

6.4 MS21920 PIN's. Former military standard MS21920 has been canceled and superseded by MIL-DTL-8783/1. PIN's used in MS21920 have been retained in MIL-DTL-8783/1.

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website <http://www.epa.gov/osw/hazard/wastemin/priority.htm>. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

6.6 Subject term (Keyword) listing.

Duct
Quick release latch
T-Bolt latch
Trunnion
Tube

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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CONCLUDING MATERIAL

Custodians:

Army - AT
Navy - AS
Air Force - 99
DLA - CC

Preparing activity:
DLA - CC

(Project 4730-2008-105)

Review activities:

Army - AR, AV, MI
Navy - CG, MC, SA, SH
Air Force - 70, 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 Online data at <http://assist.daps.dla.mil>.