

MIL-S-5675B  
 26 January 1973  
 SUPERSEDING  
 MIL-S-5675A  
 4 April 1950

## MILITARY SPECIFICATION

### SHACKLES; CABLE, AIRCRAFT

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

#### 1. SCOPE

1.1 Scope. This specification establishes the requirements for aircraft cable shackles to be furnished in the grades identified herein.

1.2 Classification. Shackles shall be of the following grades, as specified by the procurement document.

Grade A Steel (Cadmium or zinc plated).  
 Grade B Steel, corrosion resisting  
 Grade C Nickel - copper - aluminum alloy

#### 2. APPLICABLE DOCUMENTS

- 2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of the specification to the extent specified.

#### SPECIFICATIONS

##### Federal

|            |  |
|------------|--|
| MM-P-530   | Plywood, Flat Panel                          |
| QQ-N-286   | Nickel - Copper - Aluminum Alloy,<br>Wrought |
| QQ-P-416   | Plating; Cadmium (Electrodeposited)          |
| QQ-Z-325   | Zinc Coating, Electrodeposited               |
| PPP-B-601  | Requirements For                             |
| PPF-B-636  | Box, Wood, Cleated - Plywood                 |
| PPT-B-1050 | Box, Fiberboard                              |
|            | Barrier Material, Waterproof Flexible        |

##### Military

|            |   |
|------------|---|
| MIL-P-116  | Preservation, Methods Of  |
| MIL-S-6758 | Steel, Chrome - Molybdenum (4130) Bars<br>And Reforging Stock (Aircraft Quality)          |
| MIL-S-7720 | Steel, Corrosion - Resistant (18-5)<br>Bars, Wire And Forging Stock (Aircraft<br>Quality) |
| MIL-S-8503 | Steel Bars, Chrome-Vanadium (6150)<br>(Aircraft Quality)                                  |

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## STANDARDS

## Federal

FED-STD-151

Metals; Test Methods

## Military

MIL-STD-105

Sampling Procedures And Tables For  
Inspection By Attributes

MIL-STD-129

Marking For Shipment And Storage

MIL-STD-1166

Cushioning, Anchoring, Bracing,  
Blocking And Waterproofing; With

Appropriate Test Methods

MS20115

Shackle - Wire Rope

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

## UNIFORM CLASSIFICATION COMMITTEE

## Uniform Freight Classification Rules

(Application for copies should be addressed to the Uniform Classification Committee, Room 202 Union Station, 516 W. Jackson Blvd., Chicago IL 60606.)

## 3. REQUIREMENTS

3.1 Materials. Shackles shall be forged from materials specified herein.

- \* 3.1.1 Grade A shackles. Grade A shackles shall be made from steel conforming to MIL-S-6750 or MIL-S-8503.

- \* 3.1.2 Grade B shackles. Grade B shackles shall be made from corrosion-resisting steel conforming to MIL-S-7720.

3.1.3 Grade C shackles. Grade C shackles shall be made from nickel-copper-aluminum alloy conforming to QQ-N-286.

- \* 3.2 Form and dimensions. The form and dimensions shall be as specified on MS20115.

- \* 3.3 Bend and tension. The shackle shall withstand the applicable load specified on MS20115 without cracks or failure when the shackle is bent as specified herein and then returned to its original shape.

3.4 Finish. Shackles shall be free from cracks, seams, flaws or other imperfections when viewed as specified.

- \* 3.4.1 Grade A shackles. Grade A shackles shall be cadmium plated in conformance with QQ-P-410, or zinc plated in accordance with QQ-Z-325.

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**3.4.2 Grades B and C shackles.** Grades B and C shackles shall be polished on all surfaces. Grades B and C shackles shall withstand exposure to salt spray as specified in 4.3.2.2 without showing any signs of corrosion. Superficial tarnish removable with a damp cloth shall not be cause for rejection, unless accompanied by pitting.

**3.4.2.1 Passivation.** Passivation of grade B shackles shall consist of immersion for 20 to 40 minutes at 52° to 57° Centigrade (C) (125° to 135° Fahrenheit (F)) in a solution containing, by volume, 20 percent of 40-42° baume (1.38-1.41 specific gravity) commercial nitric acid and 80 percent water. An alternate method which may be substituted for the above method consists of immersion for one to two hours at room temperature approximately 21°C (70°F) in a solution containing, by volume, 50 percent of 40-42° Baume (1.38-1.41 specific gravity) commercial nitric acid and 50 percent of water. The first method, however, is preferable.

**3.5 Workmanship.** The workmanship shall conform to high grade manufacturing practice for aircraft parts. Flashes or fins shall be trimmed off even with, but not below, the surface. Shackles shall be free from pipes, laps, cracks, seams, cold shuts, scale pits, and other injurious defects. Scales shall be removed by sand blasting or tumbling.

#### 4. QUALITY ASSURANCE PROVISIONS

- **4.1 Responsibility for inspection.** Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.
  - **4.1.1 Inspection lot.** All shackles of the same grade presented at one time shall be considered a lot for the purposes of acceptance inspection.
  - **4.1.2 Sampling for inspection.** A random sample of shackles shall be selected from each inspection lot offered for inspection of visual and dimensional characteristics in accordance with MIL-STD-105. Unless otherwise specified, use Inspection Level III for lots of 50 and under, and Inspection Level II for lots over 50. The AQL shall be 2.5 percent defective.
- 4.2 Examination of product.** All finished shackles shall be carefully examined to determine conformance with this specification with respect to workmanship, form and dimensions.
- **4.3 Sampling tests.** To insure quality and performance, selected sample shackles will be subjected to the tests specified below.
  - **4.3.1 Bend and tension test.** For this test, select a sample size using Special Inspection Level S-2 and an AQL of 0.25. The shackles being tested shall be opened by means of a wedge under gradual pressure, or otherwise, until the minimum opening is at least equal to the specified inside diameter of the

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shackle, without cracking. The shackle shall then be returned to its original shape and the required load shall be applied through a shackle or a U-bolt similar in shape and size to the thimble normally used with the shackle under test.

- 4.3.2 Finish. The surface condition of the entire sample size selected per 4.1.2 shall be examined under a five-time magnification for imperfections as listed in 3.5.

4.3.2.1 Grade A shackles. Plating thickness shall be tested in accordance with the applicable plating specification.

4.3.2.2 Grades B and C shackles. Grades B and C shackles shall be tested for corrosion resistance for a period of 200 hours in accordance with FED-STD-151.

#### 4.4 Rejection and retest.

4.4.1 Failure under bend and tension test shall be cause for the rejection of the entire lot represented, except that grade C shackles may be given another heat treatment and the new specimens subjected to the test. Where failure is definitely ascribed to faulty material no retest shall be permitted.

- 4.4.2 If any sample shackle fails to conform to the plating or corrosion requirements, three additional shackles shall be selected from the lot. The failure of any of the additional three samples shall be cause for rejection of the entire lot represented. The inspector may, at his discretion, permit the manufacturer to strip and replat the entire lot of the Grade A shackles rejected. In this event, the inspector shall witness testing of twice as many shackles from the replated lot as were originally selected as samples from the same lot.

4.5 Inspection of the preservation, packaging, packing and marking for shipment and storage. Sample items or packs and the inspection of the preservation, packaging, packing and marking for shipment and storage shall be in accordance with the requirements of Section 5, or the documents specified therein.

#### 5. PREPARATION FOR DELIVERY

- 5.1 Preservation and packaging. Preservation and packaging shall be level A or C as specified (see 6.2).
- 5.1.1 Level A.
- 5.1.1.1 Cleaning and drying. Shackles shall be cleaned in accordance with MIL-P-116, process C-1, and dried in accordance with MIL-P-116, any applicable procedure.
- 5.1.1.2 Preservation. Shackles in the unit quantities specified below shall be afforded preservation in accordance with MIL-F-116, method III, without the use of a preservative compound.

| <u>MIL-115 Dash Number</u> | <u>Quantity Per Unit Pack (QUP)</u> |
|----------------------------|-------------------------------------|
| -2 thru -4                 | 50                                  |
| -5 thru -7                 | 30                                  |
| -8 thru -12                | 20                                  |

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- 5.1.1.3 Unit packaging. Shackles, preserved as specified in 5.1.1.2 and in unit quantities shown above, shall be packaged in a fiberboard box conforming to PPP-B-636. Unless otherwise specified, the unit container shall be class domestic when overpacking for shipment is required. When the unit container is also the shipping container, it shall be class weather resistant. Closure shall be in accordance with the appendix of PPP-B-636.

5.1.2 Level C. The shackles shall be preserved and packaged to afford adequate protection against corrosion, deterioration and physical damage during shipment from the supply source to the first receiving activity. This level may conform to the supplier's commercial practice when such meets the requirements of this level.

- 5.2 Packing. Packing shall be level A, B or C as specified (see 6.2).

- 5.2.1 Level A. The shackles, preserved and packaged as specified in 5.1, shall be packed for shipment in shipping containers conforming to PPP-B-601, overseas type, style optional. Plywood shall be in accordance with NN-P-530. Closure and/or strapping shall be in accordance with the appendix to the container specification. A waterproof case liner of material conforming to PPP-B-1055 shall be provided.

- 5.2.2 Level B. Level B packing shall be the same as level A except the shipping container shall conform to PPP-B-601, domestic type, style optional, and no case liner is required.

- 5.2.3 Level C. The shackles, preserved and packaged as specified in 5.1, shall be packed to insure carrier acceptance and safe delivery at destination. Containers shall conform to the Uniform Freight Classification Rules and regulations of other carriers as applicable to the mode of transportation. This may conform to the supplier's commercial practice when such meets the requirements of this level.

- 5.3 Physical protection. Interior cushioning, anchoring, blocking or bracing shall be in accordance with MIL-STD-1186.

- 5.4 Marking. In addition to any special marking required by the contract or order, unit packages and shipping containers shall be marked in accordance with the requirements of MIL-STD-129.

## 6. NOTES

6.1 Intended use. Shackles are intended for use with wire thimbles in assembling spliced cable terminals.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. HS part number and grade required (see 1.2).
- c. Applicable levels of preservation, packaging, and packing (see 5.1 and 5.2).

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- u.3 The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. 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 and relationship to the last previous issue.

Custodians:

Air Force - 62  
Navy - AS

Review Activities:

Navy - AS  
LSA - IS

Preparing Activity:

Air Force - 82

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