MIL-P-27235A
27 November 1968
SUPERSEDING
MIL-P-27235
15 June 1959

MILITARY SPECIFICATION

PINS, STRAIGHT, HEADED (CLEVIS PINS)

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

1. SCOPE

1.1 Scope. This specification covers solid, metal, cylindrical, headed straight pins, which are commonly referred to as clevis pins (see 6.1).

1.2 Classification. Clevis pins shall be of the following types and sizes, as specified (see 6.2).

1.2.1 Types.

Type I - Carbon steel
Type II - Corrosion-resisting steel
Type III - Brass

1.2.2 Sizes. Sizes shall be in accordance with MS35810.

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 herein.

SPECIFICATIONS

Federal

QQ-B-626 - Brass, Leaded and Non-Leaded: Rod, Shapes, Forgings and Flat Products with Finished Edges (Bar, Flat Wire and Strip)

QQ-P-35 - Passivation Treatments for Austenitic, Ferritic and Martensitic Corrosion-Resisting Steel (Fastening Devices)
QQ-P-416 - Plating, Cadmium (Electrodeposited)
QQ-Z-325 - Zinc Coating, Electrodeposited, Requirements for

Military

MIL-H-3982 - Hardware (Fasteners and Related Items), Packaging and Packing for Shipment and Storage of

STANDARDS

Federal

Fed. Std. No. 66 - Steel: Chemical Composition and Hardenability
Fed. Test Method Std. No. 151 - Metals: Test Methods

Military

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-109 - Quality Assurance Terms and Definitions
MIL-STD-129 - Marking for Shipment and Storage
MS35810 - Pin, Straight, Headed (Clevis Pin) Steel, Cadmium or Zinc Plated

(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.

American Society for Testing and Materials

ASTM E18 - Methods of Test for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

(Application for copies should be addressed to American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103.)

3. REQUIREMENTS

3.1 Material. Clevis pins shall be manufactured from the following materials, as specified (see 6.2).

3.1.1 Carbon steel. Type I clevis pins shall be SAE 1010, 1111 or equivalent in accordance with FED. STD. NO. 66. These steels shall have a minimum ultimate shear strength of 41,000 p.s.i.

3.1.2 Corrosion-resisting steel. Unless otherwise specified (see 6.2), type II clevis pins shall be AISI 416 or 430F in accordance with FED. STD. NO. 66. These steels shall have a minimum ultimate shear strength of 67,000 p.s.i.

3.1.3 Brass. Unless otherwise specified (see 6.2), type III clevis pins shall be Composition 21 or 22 in accordance with QQ-B-626, and shall have a minimum ultimate shear strength of 40,000 p.s.i.

3.2 Hardness.

3.2.1 Type I. Type I clevis pins shall be cyanide hardened to Rockwell 30N 70 minimum to a depth of .005 inch minimum.

3.2.2 Types II and III. Unless otherwise specified (see 6.2), Types II and III clevis pins shall not be heat-treated.

3.3 Protective finish.

3.3.1 Type I. Type I clevis pins shall be cadmium plated or zinc coated, as specified (see 6.2).

3.3.1.1 Cadmium plating. Cadmium plating shall be in accordance with type II, class 3 of QQ-P-416.

3.3.1.2 Zinc coating. Zinc coating shall be in accordance with type II, class 3 of QQ-Z-325.

3.3.2 Type II. Unless otherwise specified (see 6.2), type II clevis pins shall be passivated in accordance with QQ-P-35.

3.3.3 Type III. Type III clevis pins shall be uncoated.

3.4 Shear. The shear strength of clevis pins shall be not less than the minimum shear strength values specified in 3.1 or MS35810, as applicable.

3.5 Design and dimensions. Unless otherwise specified (see 6.2), the design and dimensions of clevis pins shall be in accordance with MS35810. Unless otherwise specified, dimensions and tolerances shall apply after plating or coating.

3.6 Marking. Trade marks or other markings may be applied to the pins, provided they do not interfere with dimensions or the intended use of the pins.

3.7 Workmanship. Clevis pins shall be smooth, free from burrs, sharp edges, gouges, porosity, cracks, scale, dirt or other defects which may adversely affect their intended use.

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 Quality assurance terms and definitions. Quality assurance terms and definitions used herein are in accordance with MIL-STD-109.

4.2 Inspection provisions.

4.2.1 Lot. A lot shall consist of clevis pins of the same type, finish and size, manufactured from the same heat under the same conditions and offered for acceptance at one time.

4.2.2 Sampling.

4.2.2.1 Sampling for examination. A random sample of pins shall be selected from each lot in accordance with Inspection Level II of MIL-STD-105, using the Acceptable Quality Levels (AQL's) specified in Table I.

4.2.2.2 Sampling for test. A random sample of pins shall be selected from each lot in accordance with Inspection Level S-1 of MIL-STD-105, using an AQL of 0.65.

4.2.2.3 Sampling for passivation test. Sampling for passivation test shall be in accordance with QQ-P-35.

4.2.2.4 Sampling for packaging and packing. Sampling for examination and test of preservation, packaging, packing and marking shall be in accordance with MIL-H-3982.

4.3 Examination.

4.3.1 Visual and dimensional. Each pin taken as specified in 4.2.2.1 shall be examined to determine conformance with this specification. Examination shall be conducted in accordance with Table I. Any pin in the sample containing one or more defects shall be rejected, and if the number of defective pins in any sample exceeds the acceptance number for that sample, the lot represented by the sample shall be rejected.

Table I

Classification of Defects

Categories	Defects	Inspection Method
Major	AQL = 0.65	
101	Pin diameter (3.5)	SIE*
102	Under head to centerline of drilled hole (length) (3.5)	
Minor	AQL = 6.5	
201	Head diameter (3.5)	SIE
202	Head height (3.5)	SIE
203	Under head to end (shank) (3.5)	SIE
204	Overall length (3.5)	SIE
205	Shank chamfer diameter (3.5)	SIE
206	Head chamfer length (3.5)	SIE
207	Hole size (3.5)	Gage
208	Protective finish missing or incomplete (3.3)	Visual
209	Evidence of rust, pitting or spotting after passivation test (4.4.4)	Visual

* SIE - Standard Inspection Equipment

4.3.2 Packaging and packing. Examination and test of preservation, packaging, packing and marking shall be in accordance with MIL-H-3982.

4.4 Tests.

4.4.1 Chemical analysis. Pins taken as specified in 4.2.2.2 shall be subjected to a chemical analysis to determine conformance to 3.1.1, 3.1.2 or 3.1.3, as applicable. The test shall be conducted in accordance with Method 111.2 of Fed. Test Method Std. No. 151. A manufacturer's material certificate may be accepted in lieu of this test.

4.4.2 Hardness. Pins taken as specified in 4.2.2.2 shall be subjected to a hardness test to determine conformance to 3.2. The test shall be conducted in accordance with ASTM E18.

4.4.3 Shear strength. Pins taken as specified in 4.2.2.2 shall be subjected to a shear strength test to determine conformance to 3.4. The pin shall be placed in a hole that passes through a shear block and a plunger within the block. The maximum clearance between the shearing planes of the block and the plunger shall be 0.005 inch. The block and plunger shall be constructed so that the shear planes are normal to the longitudinal axis of the pin being tested. The block and plunger shall be made of hardened steel or shall have steel inserts with a minimum shearing-surface hardness of Rockwell C65. The clearance or interference between the pin and pinhole of the block and plunger shall be within the following limits:

Pin size (Inch)	Max. clearance (Inch)	Max. interference (Inch)
1/16 to 3/16	0.0003	0.0002
1/4 to 7/16	0.0004	0.0003
1/2 to 5/8	0.0005	0.0003
3/4 to 1	0.0006	0.0004

The pin to be tested shall be assembled to the block and plunger, with the two ends of the pin at least one pin diameter away from the shear planes. For pins covered by MS35810, the load applied to the plunger shall be as shown on the standard for minimum double shear. For other pins, the load applied to the plunger shall be calculated from the minimum ultimate shear specified in 3.1.1, 3.1.2 or 3.1.3, as applicable. If fracture occurs in the pin under the applied shear load, the pin shall be considered defective. Pins too short to be tested in double shear shall be tested by applying the test to two pins simultaneously in single shear. Pins shall be tested in full size (diameter) whenever practicable. If it is not practical to

test the full size pin, a test specimen shall be cut from the pin and machined to the diametrical dimensions of a smaller size pin, and tested as above.

4.4.3.1 Alternate shear test. If so desired by the supplier, pins may be tested in single shear provided that all requirements, other than double shear, of 4.4.3 are met.

4.4.4 Passivation. Each pin selected as specified in 4.2.2.3 shall be subjected to a passivation test conducted in accordance with QQ-P-35.

4.5 Rejection and resubmission. Rejection and resubmission of lots shall be in accordance with MIL-STD-105.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging and packing. The pins shall be preserved and packaged level A or C and packed level A, B or C in accordance with MIL-H-3982. The levels of protection shall be as specified in the contract or order (see 6.2).

5.2 Marking. Unless otherwise specified (see 6.2), interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. Clevis pins are intended for use in equipment for fastening clevises and eyes.

6.2 Ordering data. Procurement documents should specify the following:

a. Title, number and date of this specification.
b. Type, size and finish required.
c. Military Standard (MS) part number, if applicable.
d. Levels of preservation, packaging and packing required (5.1).
e. Special marking, if required.

Custodians:
Army - WC
Navy - None
Air Force - 82

Preparing activity:
Army - WC

Project No. 5315-0184

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).

SPECIFICATION

ORGANIZATION (Of submitter) | CITY AND STATE

CONTRACT NO. | QUANTITY OF ITEMS PROCURED | DOLLAR AMOUNT $

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO IF "YES", IN WHAT WAY?

4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)

SUBMITTED BY (Printed or typed name and activity) | DATE

DD FORM 1 APR 63 1426 REPLACES NAVSHIPS FORM 4863, WHICH IS OBSOLETE PLATE NO. 15419