

MIL-P-16610B
25 April 1973
SUPERSEDING
MIL-P-16610A
21 September 1965

MILITARY SPECIFICATION

PIN, TAPERED, PLAIN

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

1. SCOPE

1.1 Scope. This specification covers carbon, alloy and corrosion-resisting steel taper pins.

1.2 Classification. Taper pins shall be of the sizes specified on MS24692.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitations for bid or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS:

Federal

- QQ-P-35 - Passivation Treatments for Corrosion-Resisting Steel
- QQ-P-416 - Plating, Cadmium (Electrodeposited)
- PPP-H-1581 - Hardware (Fasteners and Related Items), Packaging and Packing for Shipment and Storage of.

Military

- MIL-C-81562 - Coating, Cadmium or Zinc (Mechanically Deposited)

STANDARDS

Federal

- FED-STD-No. 66 - Steel: Chemical Composition and Hardenability

Military

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MS24692 - Pin, Tapered, Plain

FSC 5315

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(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, this issue in effect on date of invitations for bid or request for proposal, shall apply.

American National Standards Institute (ANSI) Standard:

ANSI B46.1 - Surface Texture

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.)

American Society for Testing and Materials (ASTM) Standard:

ASTM E8 - Tension Testing of Metallic Materials

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

3. REQUIREMENTS

3.1 Material.

3.1.1 Carbon steel. Carbon steel shall be in accordance with the compositions specified in Fed. Std. No. 66 and shall have a minimum ultimate tensile strength of 55,000 PSI.

3.1.2 Alloy steel. Alloy steel shall be in accordance with the compositions specified in Fed. Std. No. 66 and shall have a minimum ultimate tensile strength of 106,000 PSI.

3.1.3 Corrosion-resisting steel. Corrosion-resisting steel shall be in accordance with the compositions specified in Fed. Std. No. 66 and shall have a minimum ultimate tensile strength of 70,000 PSI.

3.2 Protective finishes.

3.2.1 Cadmium. When specified (see 6.2), carbon and alloy steel pins shall be cadmium plated in accordance with QQ-P-416, Type II, Class 2 or cadmium coated in accordance with MIL-C-81562, Type II, Class 2. (Cadmium plating in accordance with QQ-P-416, Type II, Class 3 may be furnished until 25 April 1975.)

3.2.2 Passivation. Corrosion-resisting steel pins shall be passivated in accordance with QQ-P-35.

3.3 Dimensions. Pins shall be in accordance with the dimensions and construction specified on MS24692.

3.3.1 Concavity and convexity. The total amount of concavity or convexity over the pin length shall not exceed the limits specified below:

<u>Pin length (Inch)</u>	<u>Concavity and Convexity Limits (Inch)</u>
2.000 and under	.001
Over 2.000 thru 4.000	.002
Over 4.000	.004

3.4 Surface roughness. Roughness height values shall be as specified on MS24692 and shall be in accordance with ANSI B46.1.

3.5 Shear strength. Pins shall withstand the shear loads specified on MS24692 with no evidence of cracking or fracture.

3.6 Bending. Pins shall withstand cold bending thru 180° around a diameter equal to one-half their mean diameter with no evidence of cracking or fracture.

3.7 Workmanship. Pins shall be free from burrs, seams, scratches, nicks and any other defects which may affect their serviceability.

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.

4.2 Inspection provisions.

4.2.1 Lot. A lot shall consist of all pins of the same size, material and finish, produced under essentially the same conditions and offered for acceptance at one time.

4.2.2 Sampling for examination. A random sample of pins shall be taken from each lot in accordance with MIL-STD-105, Inspection Level II. The Acceptable Quality Level (AQL) shall be as specified in Table I.

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4.2.3 Sampling for test. A random sample of pins shall be taken from each lot in accordance with MIL-STD-105, Inspection Level S-2. The AQL for each test shall be 1.5 percent defective.

4.2.4 Sampling for protective finish. Sampling for test of protective finish shall be in accordance with the applicable specification in 3.2.

4.2.5 Sampling for packaging and packing. Sampling for examination and test of preservation, packaging, packing and marking shall be in accordance with PPP-II-1581.

4.3 Examination. Each pin taken as specified in 4.2.2 shall be examined to verify 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 individual category exceeds the acceptance number for that category, the lot represented by the sample shall be rejected.

TABLE I

Classification of Defects

<u>Categories</u>	<u>Defects</u>	<u>Inspection Method</u>
Critical	None defined	
Major	AQL = 1.5 percent defective	
101	Diameter (3.3)	SIE*
102	Length (3.3)	SIE
103	Concavity and convexity (3.3.1)	SIE
Minor	AQL = 4.0 percent defective	
201	Protective finish, missing or incomplete (3.2)	Visual
202	End radius (3.3)	SIE
203	Surface roughness (3.4)	SIE
204	Workmanship (3.7)	Visual

*SIE = Standard Inspection Equipment

4.4 Tests.

4.4.1 Shear test. Each pin taken as specified in 4.2.3 shall be subjected to a shear strength test to verify conformance with 3.5. The shear strength test shall be made using a suitable fixture that meets the following requirements: The shear plane shall be .79L measured from the large diameter end. The maximum clearance between the loading member and supported member shall

be 0.005 inch. The shearing surfaces of the test fixture shall have a minimum hardness of Rockwell C58. The test plates shall have a minimum total thickness of two times the outside diameter of the pin.

4.4.2 Bend test. Each pin taken as specified in 4.2.3 shall be cold bent at the middle of the length to an angle of 180° around a diameter equal to one-half the mean diameter of the pin, to verify conformance with 3.6.

4.4.3 Tensile strength test. When specified (see 6.2), two samples of the same material used in the manufacture of the pins in the offered lot, shall be tensile strength tested in accordance with ASTM E8 to verify conformance with 3.1.

4.5 Protective finish test. Test for protective finishes shall be conducted in accordance with the applicable specification of 3.2.

4.6 Packaging and packing test. Examination and test of preservation, packaging, packing and marking shall be in accordance with PPP-H-1581.

4.7 Material certificate. The supplier shall furnish a material certificate covering the chemical composition of the material used in the manufacture of the pins.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging and packing. Unless otherwise specified, preservation and packaging shall be in accordance with levels A or C and packing shall be in accordance with levels A, B or C of PPP-H-1581, as specified (see 6.2).

5.2 Marking. Marking of unit packages and shipping containers shall be in accordance with PPP-H-1581.

6. NOTES

6.1 Intended use. Taper pins covered by this specification are intended to be used to position and hold two or more mating parts in alignment.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Size required (1.2).
- c. Material required (3.1).
- d. Cadmium plating, when required (3.2.1).
- e. Applicable MS part number.
- f. Tensile strength test, when required (4.4.3).
- g. Selection of applicable level of packaging and packing (5.1).

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Custodians:

Army - WC
Navy - OS
Air Force - 82

Reviewer Activities:

Army - AV, MU
Navy - None
Air Force - None
DSA - IS

Preparing Activity:

Army - WC

Project No. 5315-0215

User Activities:

Army - AT, MI
Navy - AS, MC
Air Force - None

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SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 22-R255
<p>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. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.</p>		
SPECIFICATION		
ORGANIZATION		
CITY AND STATE		CONTRACT NUMBER
MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> 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? <input type="checkbox"/> YES <input type="checkbox"/> 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 - Optional)		DATE

To detach this form, cut along this line.

DD FORM 1426
1 JAN 66

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.