FF-P-386D
March 10, 1971
SUPERSEDING
Fed. Spec. FF-P-386C
December 12, 1968

FEDERAL SPECIFICATION

PINS, COTTER (SPLIT)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers split cotter pins.

1.2 Classification.

1.2.1 Types and classes. The cotter pins shall be of the following types and classes, as specified:

Type A - Brass.
Type B - Steel.

Class 1 - Phosphate coated.
Class 2 - Zinc coated.
Class 3 - Cadmium plated.
Class 4 - Uncoated.

Type C - Chromium-nickel corrosion-resisting steel.
Type D - Nickel-copper alloy.

2. APPLICABLE DOCUMENTS

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

Federal Specifications:

QQ-B-613 - Brass, Leaded and Nonleaded: Flat Products (Plate, Bar, Sheet, and Strip).
QQ-N-281 - Nickel-Copper-Alloy Bar, Plate, Rod, Sheet, Strip, Wire, Forgings, and Structural and Special Shaped Sections.
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.

Federal Standards:

Fed. Std. No. 66 - Steel: Chemical Composition and Hardenability.
Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).
Fed. Test Method Std. No. 151 - Metals; Test Methods.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The index, which included cumulative monthly supplements as issued, is for sale on a subscriptive basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other product specifications required by activities outside of the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Ft. Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standard and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Specifications:

MIL-F-495 - Finish, Chemical, Black, for Copper Alloys.
MIL-H-3982 - Hardware (Fasteners and Related Items), Packaging and Packing for Shipment and Storage of.
MIL-P-16232 - Phosphate Coatings, Heavy, Manganese or Zinc Base (for Ferrous Metals).
MIL-C-81562 - Coating, Cadmium and Zinc (Mechanically Deposited).

Military Standards:

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.
MIL-STD-1312 - Fasteners, Test Methods.
MS24665 - Pin, Cotter (Split).

(Copies of Military Specifications and Standards required by contractors 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 National Standards Institute Inc. (ANSI) Standard:

B5.20-1958 - Machine Pins (Dowel, Taper, Clevis, Grooved, Cotter).

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

American Society for Testing and Materials (ASTM) Standards:

B134 - Brass Wire.
E30 - Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron, and Wrought Iron.

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

(Technical soceity and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Material. Unless otherwise specified (see 6.2), the cotter pins shall be made of materials specified in 3.1.1 through 3.1.4.

3.1.1 Brass. Unless otherwise specified (see 6.2), type A cotter pins shall conform to the requirements of QQ-B-613, composition 268, or ASTM B134, alloy 260, cartridge brass.

3.1.2 Steel. Type B cotter pins shall conform to the requirements of Fed. Std. No. 66, identification numbers AISI C1008, C1010, C1012, C1015, C1017, C1018, or C1020; or of steel having the following chemical composition:

	Percent, maximum
Carbon	0.15
Manganese	.75
Phosphorous	.04
Sulphur	.05

3.1.3 Corrosion resisting steel. Type C cotter pins shall conform to the requirements of Fed. Std. No. 66, identification numbers 302 or 304.

3.1.4 Nickel-copper alloy (monel). Type D cotter pins shall conform to the requirements of QQ-N-281, class A.

3.2 Protective finish. When specified in the contract or order (see 6.2), cotter pins shall be uncoated, plated, coated, or treated as indicated in 3.2.1 through 3.2.6. All type B cotter pins, except class 4, shall be formed of coated wire. Sheared ends need not be coated.

3.2.1 Black chemical finish. Type A cotter pins shall have a black chemical finish in accordance with MIL-F-495.

3.2.2 Phosphate coating. Type B, class 1 cotter pins shall be phosphate coated in accordance with MIL-P-16232, type Z, class 3.

3.2.3 Zinc plating. Type B, class 2 cotter pins shall be zinc plated in accordance with QQ-Z-325, type II, class 3, or MIL-C-81562, type II, class 3.

3.2.4 Cadmium plating. Type B, class 3 cotter pins shall be cadmium plated in accordance with QQ-P-416, type II, class 3, or MIL-C-81562, type II, class 3.

3.2.5 Uncoated. Type B, class 4 cotter pins shall be uncoated steel. Type D cotter pins shall be uncoated alloy.

3.2.6 Passivation. Type C cotter pins shall be passivated in accordance with QQ-P-35 or as specified in the applicable document.

3.3 Hardness. Type C (corrosion resisting steel) cotter pins conforming to Fed. Std. No. 66 identification numbers 302 or 304 shall have a hardness in conformance with table I.

TABLE I. Hardness of type C, split cotter pins

Nominal pin diameter (inch)	Maximum hardness	
	Vickers (10 Kg load)	Rockwell 15-N
1/16 and less	200 to 350	65 to 78
5/64 and 3/32	170 to 245	60 to 70
7/64 and larger	140 to 220	55 to 67

3.4 Design and dimensions. The cotter pins shall be a one piece all metal unit and shall be formed from half round wire. Unless otherwise specified, (see 6.2) design, dimensions, and tolerances shall be in agreement with MS24665, ANSI B5.20-1958 and figure 1 and table II of this specification.

3.5 Workmanship. Cotter pins shall be uniform in quality and temper and shall be free from pits, rust, scale, laps, cracks, seams, or any other defects which may impair their serviceability. The ends of the prong shall not be open.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsiblity 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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 that supplies and services conform to prescribed requirements.

4.2 Inspection terms and definitions. Inspection terms and definitions shall be as defined in MIL-STD-109.

4.3 Acceptance tests. Test methods for acceptance will consist of examination and testing in accordance with MIL-STD-105.

4.4 Sampling for lot acceptance.

4.4.1 Inspection lot. A lot shall consist of any quantity of cotter pins of the same type, finish, and size (diameter and length), produced under essentially the same conditions and presented at any one time for inspection in connection with the same contract or order.

4.4.2 Sampling for visual and dimensional examination. A random sample of cotter pins shall be selected from each inspection lot in accordance with MIL-STD-105, inspection level S-4. The Acceptable Quality Level (AQL) shall be as stated in table III.

TABLE II Lengths of split cotter pins

Nominal diameter inch	* Dimension L (see Figure 1)																			
	1/4	5/16	3/8	7/16	1/2	3/4	1	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2	2-3/4	3	3-1/2	4	4-1/4	5	6
1/32-0.031	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
3/64-0.047	X	-	-	-	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
1/16-0 062	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
**5/64-0.078	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
3/32-0.094	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
7/64-0 109	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
1/8- 0.125	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
9/64-0 141	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
5/32-0 156	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
3/16-0 188	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
**7/32-0.219	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	-	-	-
1/4- 0 250	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5/16-0 312	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3/8- 0 375	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X
**7/16-0.438	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X
1/2- 0 500											X	X	X	X	X	X	X	X	X	X
5/8- 0.625															X	X	X	X	X	X
**3/4- 0 750															X	X	X	X	X	X

* Length tolerance shall be ±0 03 up to one inch, ±0 06 one inch and longer
** Not a preferred size Do not use for new design
Lengths 5/16, 3/8, and 7/16 shall be in CRES only

4.4.3 Sampling for tests.

4.4.3.1 Sampling for hardness tests. Samples shall be drawn from each lot of type C cotter pins in accordance with MIL-STD-105, inspection level S-2. The AQL shall be 2.5 percent defective.

4.4.3.2 Sampling for protective finish. Sampling for test of protective finishes shall be in accordance with the applicable specification.

4.4.3.3 Sampling for chemical analysis. For determining the chemical composition, a sample size of 3 to 5 ounces of cotter pins shall be drawn from each lot presented for acceptance, or as otherwise stated in 4.6.3.

4.4.3.4 Sampling for packaging and packing. Samples for Inspection of Packaging and Packing shall be in accordance with MIL-H-3982.

4.5 Examination of product.

4.5.1 Visual and dimensional examination. Sample cotter pins shall be examined to verify compliance with the requirements of this specification as stated in 4.5.3.

4.5.2 Gaging. Unless otherwise specified (see 6.2) the supplier shall make available the necessary gages and measuring instruments. Gaging of cotter pins shall be in accordance wiht ANSI B5.20.

4.5.3 Classification of defects. The AQL and classification of defects for cotter pins shall be as specified in table III.

TABLE III. Classification of defects

Categories	Defects	Inspection method
Critical	None defined	
Major:	AQL = 2.5 percent	
101	Material not as specified (3.1)	Chemical Analysis
102	Protective finish, when required (3.2)	Visual
103	Design and dimensions (3.4)	Measure
104	Hardness (3.3)	Measure
Minor:	AQL = 4.0 percent	
201	Length of pin (3.4)	Measure
202	Workmanship (3.5)	Visual
203	Coating of dirt or other foreign substance (3.5)	Visual

4.5.4 Preservation, packaging, packing and marking. The preservation, packaging, packing, and marking shall be examined or tested in accordance with MIL-H-3982 or Fed. Std. No. 123 as applicable, and as otherwise directed by the procurement document (see 6.2).

4.6 Tests.

4.6.1 Hardness. When applicable (see 3.3), type C cotter pins shall be tested in accordance with test No. 6 of MIL-STD-1312.

4.6.2 Protective coating. Protective coating and plating tests shall be conducted in accordance with the applicable specifications shown in 3.2.1 through 3.2.6.

4.6.3 Chemical analysis. Unless otherwise specified by the procuring agency (see 4.4.3.3) chemical analysis shall be made in accordance with ASTM E30 or method 111.2 of Fed. Test Method Std. No. 151. The sample shall be analyszed by a Government approved laboratory. When permitted by the procuring agency (see 6.2) the metal manufacturer's certificate or conformance showing the chemical composition is acceptable.

4.7 Rejection and reinspection criteria.

4.7.1 Failures in examination. Rejection and resubmission of lots shall be accomplished in accordance with MIL-STD-105.

4.7.2 Failure in hardness test. If one or more cotter pins of the sample fail, another like sample shall be taken and tested. If any specimen of the second sample fails to meet the requirements, the lot represented shall be rejected. After reworking the lot (by heat treatment, if applicable), the lot may be resubmitted.

4.7.3 Failures in the tests for the protective surface finishes. Rejected lots may be reprocessed in accordance with pertinent coating specification (see 3.2), and resubmitted.

4.7.4 Chemical analysis. Any variation between the chemical composition of the sample and the applicable material specification (see 3.1) shall be cause for rejection of the lot. Lots that fail in chemical analysis may not be resubmitted.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging and packing. The cotter pins shall be preserved, packaged, and packed in accordance with MIL-H-3982, except for Military shipments, fiberboard boxes shall not be used for level A packing. The level of preservation and packaging shall be level A or C, and the level of packing shall be level A, B, or C and shall be as specified (see 6.2).

5.2 Marking.

5.2.1 Civil agencies. In addition to any special markings required by the contract or order, interior packages and exterior shipping containers shall be marked in accordance with the requirements of MIL-H-3982 and Fed. Std. No. 123.

5.2.2 Military agency. In addition to any special markings required by the contract or order, interior packages and exterior shipping containers shall be marked in accordance with the requirements of MIL-H-3982 or MIL-STD-129.

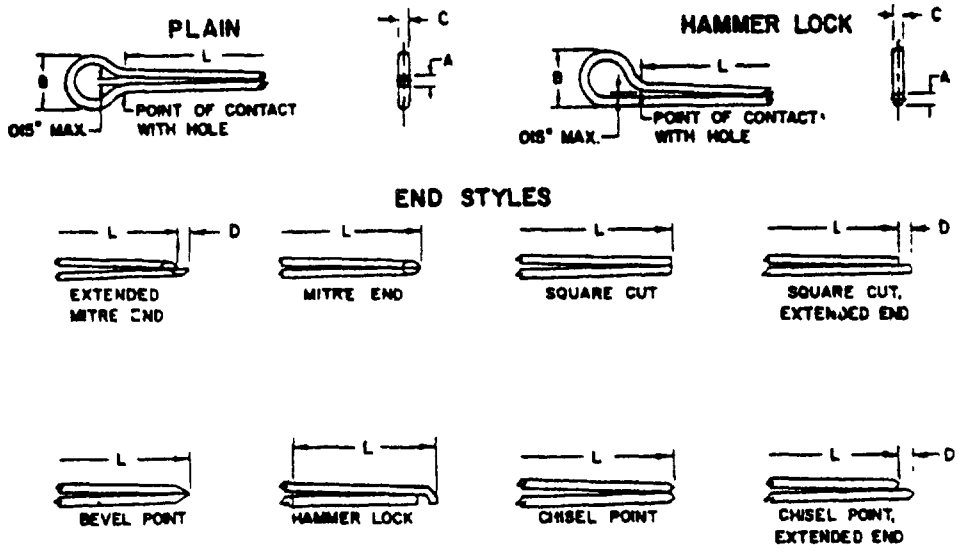
6. NOTES

6.1 Intended use. Cotter pins specified herein are intended for use as fastening or safety devices.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

a. Title, number, and date of this specification.
b. Title, MS number and part number and part number of applicable military standard.
c. Type and class required (see 1.2.1).
d. Material, condition and composition required (see 3.1).
e. Type of brass required if other than as specified (see 3.1.1).
f. Protective finish, when required (see 3.2).
g. When type C cotter pins shall be hardened (see 3.3).
h. Size and length required (see 3.4).
i. Style of pin and end required (see 3.4).
j. Availability of gages, when required (see 4.5.2).
k. If certificate of conformance is acceptable for chemical analysis (see 4.6.3).
l. Selection of applicable levels of preservation, packaging, packing required (see 5.1).

6.3 Military procurement. Items procured under this specification for military use are to be limited to the varieties delineated within this specification and on the applicable military standard (see 3.4). Personnel of the military departments are requested to refer to these documents for guidance.



DIAMETER DIMENSIONS

NOMINAL SIZE OR BASIC PIN DIAMETER		A TOTAL SHANK DIAMETER MAX	A TOTAL SHANK DIAMETER MIN	B HEAD DIAMETER MIN	C WIRE WIDTH MAX	C WIRE WIDTH MIN	D EXTENDED PRONG LENGTH	RECOMMENDED HOLE SIZE
1/32	0.031	0 032	0.028	0.06	0 032	0.022	0.01	0 047
3/64	.047	.048	.044	.09	.048	.035	.02	.062
1/16	.062	.060	.056	.12	.060	.044	.03	.078
*5/64	.078	.076	.072	.16	.076	.057	.04	.094
3/32	.094	.090	.086	.19	.090	.069	.04	.109
7/64	.109	.104	.100	.22	.104	.080	.05	.125
1/8	.125	.120	.116	.25	.120	093	.06	.141
9/64	.141	.134	.130	.28	.134	.104	.06	.156
5/32	.156	.150	.146	.31	.150	.116	.07	.172
3/16	.188	.176	.172	.38	.176	.137	.09	.203
*7/32	.219	.207	.202	.44	.207	.161	.10	.234
1/4	.250	.225	.220	.50	.225	.176	.11	.266
5/16	.312	.280	.275	.62	.280	.220	.14	.312
3/8	.375	.335	.329	.75	.335	.263	.16	.375
*7/16	.438	.406	.400	.88	.406	.320	.20	.438
1/2	.500	.473	.467	1.00	.473	.373	.23	.500
5/8	.625	.598	590	1.25	.598	472	.30	.625
*3/4	.750	.723	.715	1.50	.723	.572	.36	.750

Figure 1 SPLIT COTTER PINS.

* Not a preferred size. Do not use for new design.

MILITARY CUSTODIANS:

Army - WC
Navy - OS
Air Force - 82

Review activities:

Army - AT, CE, GL, MU
Navy - YD
Air Force - None
DSA-IS

User activities:

Army - EL, ME, MI
Navy - AS, MC, SH
Air Force - None
NSA

Preparing activity:

Army - WC

CIVIL AGENCIES INTEREST

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SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No 22-R255

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

SPECIFICATION

FF-P-386D Pins, Cotter (Split)

ORGANIZATION

CITY AND STATE

CONTRACT NUMBER

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 a form and place both in an envelope addressed to preparing activity)

SUBMITTED BY (Printed or typed name and activity - Optional)

DATE

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FEDERAL SPECIFICATION

PINS, COTTER (SPLIT)

This amendment, which forms a part of Federal Specification FF-P-386D, dated March 10, 1971, was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

PAGE 1

Paragraph 2.1: Add the following Federal Specification:

"PPP-H-1581 - Hardware (Fasteners and Related Items), Packaging and Packing for Shipment and Storage of".

PAGE 2

Paragraph 2.1: Delete "MIL-H-3982" and title.

PAGE 3

Paragraph 3.2: Delete the following:

"All type B cotter pins, except class 4, shall be formed of coated wire. Sheared ends need not be coated."

PAGE 5

Paragraph 4.5.4: Delete "MIL-H-3982" and substitute "PPP-H-1581".

Paragraph 5.1: Delete "MIL-H-3982" and substitute "PPP-H-1581".

Paragraph 5.2.1: Delete "MIL-H-3982" and substitute "PPP-H-1581".

PAGE 6

Paragraph 5.2.2: Delete "MIL-H-3982" and substitute "PPP-H-1581".

Figure 1: Under D - Extended Prong Length, add "MIN".

MILITARY CUSTODIANS:

Army - WC
Navy - OS
Air Force - 82

Preparing activity:

Army - WC

Project No. 5315-0212

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