

MIL-P-20700A
17 March 1965
~~SUPERSEDING~~
MIL-P-20700
30 August 1957

MILITARY SPECIFICATION

PIN, GROOVED, HEADLESS, LONGITUDINAL GROOVE

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

1. SCOPE

1.1 This specification covers headless grooved pins having longitudinal grooves (see 6.1).

1.2 Classification.

1.2.1 Types and grades. Headless grooved pins covered by this specification shall be of the following types and grades (see figure 1):

Type A - Taper groove, full length
Type B - Taper groove, half length
Type C - Straight groove, full length
Type D - Taper groove, reverse taper
Type E - Taper, half length, center groove
Type F - Straight groove (hopper feeding)

Grade A - Carbon steel
Grade B - Corrosion-resisting steel
Grade C - Brass

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.

FSC 5315

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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-W-321 - Wire, Brass
- QQ-Z-325 - Zinc Coating, Electrodeposited, Requirements for

Military

- MIL-F-495 - Finish, Chemical, Black, for Copper Alloys
- MIL-H-3982 - Packaging and Packing for Shipment and Storage of Hardware (Fasteners and Related Items)
- MIL-I-17214- Indicator, Permeability: Low-Mu (Go-No Go)

STANDARDS

Federal

- Fed. Std. No. 66 - Steel, Chemical Composition and Hardenability

Military

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

(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 document forms 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 Standards Association
Standard ASA B5.20 - Machine Pins

(Applications for copies should be addressed to the American Standards Association, Inc., 10 East 40th Street, New York, New York 10016.)

3. REQUIREMENTS

3.1 Materials.

3.1.1 Grade A. Material for Grade A grooved pins shall be cold drawn carbon steel wire or cold finished bar. The steel shall conform to one of the B1100 or C1200 series of Fed. Std. 66 and have a minimum shear strength of 64,000 pounds per square inch (PSI).

3.1.2 Grade B. Material for Grade B grooved pins shall be cold drawn corrosion resisting wire or cold finished bar. The steel shall conform to one of the 300 series of Fed. Std. No. 66 and have a minimum shear strength of 90,000 PSI. When specified (see 6.2), pins shall have a magnetic permeability of not more than 2.0 (Air=1.0) at a field strength of H=200 oersteds when tested in accordance with 4.4.3.

3.1.3 Grade C. Material for Grade C grooved pins shall be cold drawn half-hard brass wire conforming to the requirements of QQ-W-321 or half-hard brass bar conforming to the requirements of QQ-B-626. Brass shall have a minimum shear strength of 40,000 PSI.

3.2 Dimensions and tolerances. Dimensions and tolerances for all types of pins shall conform to ASA B5.20 and shall apply after protective finishes (see 6.3).

3.3 Protective finishes.

3.3.1 Cadmium finish. Unless otherwise specified (see 6.2), Grade A steel grooved pins shall be cadmium plated in accordance with QQ-P-416, Type II, class 3.

3.3.2 Zinc finish. When specified (see 6.2), grade A steel grooved pins may be zinc coated in accordance with QQ-Z-325, Type II, class 3.

3.3.3 Passivation. Grade B steel grooved pins shall be passivated in accordance with QQ-P-35 (see 6.2).

3.3.4 Chemical finish (black oxide). Unless otherwise specified (see 6.2), Grade C brass grooved pins shall receive a black chemical finish in accordance with MIL-F-495.

3.4 Workmanship. Pins shall be free of all hanging burrs and slivers which might become dislodged with usage.

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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, 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 supplies and services conform to prescribed requirements.

4.2 Sampling.

4.2.1 Inspection lot. A lot shall consist of all pins of the same type, grade, and protective finish offered for delivery at any one time.

4.2.2 Sampling for visual and dimensional examination. A random sample of grooved pins shall be taken from each lot in accordance with MIL-STD-105, Inspection Level II. The Acceptable Quality Level (AQL) shall be as indicated in Table I. The AQL shall apply to each individual defect, not to a group of defects.

4.2.3 Sampling for shear test. Sampling for shear test of pins shall be in accordance with Level S-2 of MIL-STD-105. The AQL shall be 1.5 percent defective.

4.2.4 Sampling for protective finish test. Sampling for tests of protective finishes shall be in accordance with the applicable specifications referenced in 3.3.1 through 3.3.4.

4.2.5 Sampling for magnetic permeability test. When a magnetic permeability test is specified for Grade B steel pins (see 6.2), sampling shall be in accordance with Inspection Level S4 of MIL-STD-105 with an AQL of 2.5 percent defective.

4.2.6 Sampling for packaging and packing. Sampling for packaging and packing shall be in accordance with MIL-H-3982.

4.3 Examination.

4.3.1 Visual and dimensional. Each grooved 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.

TABLE I - Classification of Defects

<u>Categories</u>	<u>Defects</u>	<u>Inspection Method</u>
Critical	None defined	
Major	AQL = 2.5 percent	
101	Expanded diameter of pin	gage
102	Nominal diameter of pin	SIE *
103	Grooves missing or wrong type of grooves	Visual
Minor	AQL = 4.0 percent	
201	Crown height of pin	SIE
202	Length of pin	SIE
203	Protective finish missing (see 4.4.2 for test)	Visual
204	Workmanship	Visual

* Standard Inspection Equipment.

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

4.4.1 Shear strength test. Each grooved pin taken as specified in 4.2.3 shall be tested for shear strength in accordance with 4.4.1.2.

4.4.1.1 Shear test fixture. The shear test shall be made by means of a suitable fixture which meets the following requirements. The shear plane shall be at least one pin diameter away from the end of the pin. Clearance between the loading and supporting members shall be .005 inch maximum. Hardness of the loading and supporting members shall be Rockwell C55 minimum. The holes for the pins shall have sharp edges and shall be of the same size as the major diameter of the pins specified in ASA B5.20.

4.4.1.2 Shear test method. Grooved pins shall be tested by either the single or double shear method and shall have the minimum shear strength as shown on Table II. The minimum double shear pounds shall be twice the minimum single shear pounds.

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TABLE II - Shear Strength

Nominal Size (Diameter in inches)

M A T E R I A L	3/64	1/64	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2
	Minimum Single Shear-pounds												
CS	110	200	310	440	790	1230	1770	2400	3140	4910	7070	9,620	12,600
CRES	150	270	430	620	1100	1720	2480	3380	4420	6900	9940	13,500	17,600
BR	70	120	190	270	490	760	1100	1500	1960	3070	4420	6,010	7,850

4.4.2 Protective finish test. Test of protective finishes shall be conducted in accordance with the applicable specifications referenced in 3.3.1 through 3.3.4.

4.4.3 Magnetic permeability test. When specified (see 6.2), Grade B pins taken in accordance with 4.2.5 shall be tested for compliance to the magnetic permeability requirements of 3.1.2. Test shall be conducted in accordance with MIL-I-17214.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, packing and marking shall be in accordance with MIL-H-3982.

5.2 Level. Level of protection shall be as specified by the procuring activity in the contract or order (see 6.2).

6. NOTES

6.1 Intended use. Grooved pins are intended for use in such applications where ordinary straight and tapered pins might be used with press fits, but where use of grooved pins affords greater economy or strength.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Type and grade of pin (see 1.2.1).
- c. Length and nominal diameter of pin (see 3.2).
- d. Protective finish, when required, if other than specified (see 3.3.1 thru 3.3.4).
- e. Level of protection (see 5.2).
- f. Magnetic permeability test of Grade B steel pins, when required (see 3.1.2).

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6.3 Military procurement. Items procured under this specification for Military use should be limited to the variety shown on the applicable Military Standards listed in the DOD Index of Specifications and Standards. Personnel of the Military Departments are requested to refer to those standards for guidance.

Custodians:

Army - WC
Navy - WP
Air Force - 69

Preparing Activity:

Army - WC
Project No. 5315-0062

Review Activities:

Army - MI, MO, MU, WC
Navy - SH, WP
Air Force - 69
DSA - IS

User Activities:

Navy - MC, YD
NSA

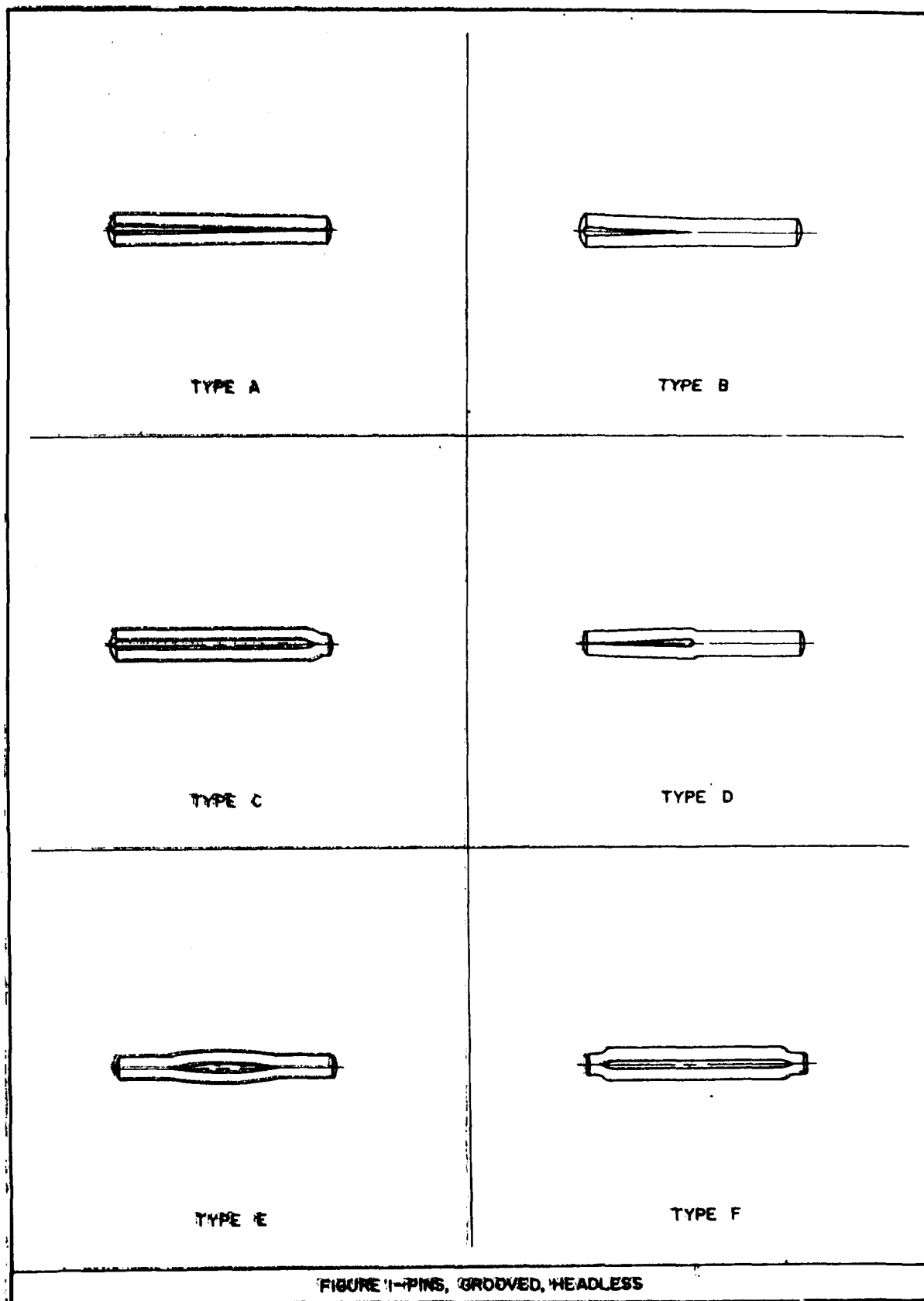


FIGURE 1—PINS, GROOVED, HEADLESS

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.		
SPECIFICATION		
ORGANIZATION		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
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)		DATE

To detach this form, cut along this line

DD FORM 1426
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REPLACES NAVSHIPS FORM 4863, WHICH IS OBSOLETE