

MIL-R-12605 A(WC)
21 July 1972
SUPERSEDING
MIL-R-12605 (ORD)
1 April 1953

MILITARY SPECIFICATION

RIFLE, 57MM, M18A1

1. SCOPE

1.1 This specification covers one type of firearm intended for use primarily as a lightweight, recoilless, manually portable antipersonnel weapon.

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

Military

- MIL-C-12166 - Copper Rod for Crusher Cylinders or Pressure Cylinders
- MIL-C-13931 - Cannons, General Specification for
- MIL-I-45607 - Inspection Equipment Acquisition, Maintenance and Disposition of

STANDARDS

Military

- MIL-STD-109 - Quality Assurance Terms and Definitions

PUBLICATIONS

U. S. Army Weapons Command

- EPL 7305619 - Engineering Parts List for Rifle, Recoilless, 57MM: M18A1
- DL 7305619 - Index of Inspection Equipment Lists for Rifle, Recoilless, 57MM: M18A1

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Master LSQAP 7305619 - Master Index of Supplementary Quality Assurance Provisions for Rifle, Recoilless 57MM: M18A1
PDS P8403387 - Packaging Data Sheet, Rifle, Recoilless, 57MM: M18A1

(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.)

3. REQUIREMENTS

3.1 First article. When specified in the contract, the contractor shall submit a first article. Unless otherwise specified (see 6.1.1), the first article shall be included in the pilot pack (see 5.1).

3.2 Material and construction. The recoilless rifle shall conform to this specification, MIL-C-13931, and the drawings and specifications listed in Engineering Parts List 7305619.

3.3 Mechanical requirements.

3.3.1 The shoulder of the tube shall show uniform bearing on the front face of the chamber when these members are screwed together using the torque requirements specified on the barrel assembly drawing.

3.4 Corrosion-resistant finish. Corrosion-resistant finish shall be applied to parts and assemblies as specified on the drawings.

3.5 Painting. Paint shall be applied only where and as specified.

3.6 Functioning. All parts shall function without interference, erratic movement or malfunction.

3.6.1 Headspace. Headspace shall be defined as the clearance between the primer cup of a standard round of basic dimensions, fully seated in the tube, and the front face of the firing pin bushing when the breech is closed. The measurements from the inner front face of the throat ring rearward to the front face of the firing pin bushing shall be not greater than 0.007 inch.

3.6.2 Firing pin indentation. The firing pin indentation in uncompressed copper pressure cylinders shall be measured with a fixture providing headspace as shown below. Minimum indentations shall be as indicated below. The copper pressure cylinders used shall be 0.2255 + .0010 inch in diameter and 0.400 + .005 inch in length.

<u>Headspace</u> <u>(inch)</u>	<u>Indent</u> <u>(inch)</u>
0.000	0.033
0.030	0.024

3.7 Performance

3.7.1 High pressure resistance. The rifle shall be capable of withstanding a chamber pressure of 113 ± 4 percent of the 6500 pounds per square inch upper pressure limit at 70°F when tested as specified in 4.5.2.3.

3.7.2 Material soundness. After proof firing, all parts shall be free of cracks and fractures and shall comply with any soundness requirements specified on the applicable drawings.

3.7.3 Bore enlargement. Enlargement of bore diameters across lands after proof firing shall not exceed 0.002 inch from actual diameters.

3.8 Workmanship. Workmanship shall be in accordance with applicable requirements of MIL-C-13931.

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 that supplies and services conform to prescribed requirements.

4.2 Quality assurance terms and definitions. Quality assurance terms and definitions shall be as specified in MIL-STD-109.

4.3 Classification of inspection. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.4)
- b. Quality conformance inspection (see 4.5)

4.4 First article inspection. A first article shall be submitted for inspection in accordance with the contract requirements. The first article shall be representative of the production processes to be used during

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quantity production. The first article shall be subjected to the quality conformance inspections specified herein and such other inspection as is necessary to determine compliance with the requirements of the contract.

4.5 Quality conformance inspection.

4.5.1 Examinations.

4.5.1.1 Inspection provisions. The rifles shall be inspected for conformance to requirements of this specification, MIL-C-13931, SQAPs listed in Master LSQAP 7305619 for rifles, and SQAP-APPENDIX-WVT.

4.5.1.2 Bearing Surfaces: Three rifles from each inspection lot or one month's production, whichever is smaller, shall be inspected for uniform bearing of tube shoulder on the front face of the chamber, when these members are screwed together using the torque requirements specified on the barrel assembly drawings. Prussian blue or equivalent will be used for proof of contact uniformity. After inspection, the proofing medium will be removed from components by means of an approved cleaning solvent. Failure to meet the uniform bearing requirement shall be cause for rejection.

4.5.1.3 Corrosion resistant finish. Each rifle shall be inspected visually for compliance with corrosion-resistant finish requirements on the drawings. Failure to comply shall be cause for rejection.

4.5.1.4 Painting. Each rifle shall be inspected visually for compliance with paint requirements on the drawings. Failure to comply shall be cause for rejection.

4.5.1.5 Workmanship. Workmanship shall be examined in accordance with MIL-C-13931.

4.5.1.6 Final examination. Final examination of each rifle shall be completed after testing and prior to preservation and packaging to determine compliance with this specification, MIL-C-13931, and the contract.

4.5.1.7 Inspection of preparation for delivery.

4.5.1.7.1 Examination. The classification of defects and the AQLs associated with individual defects for examination of the preparation for delivery are as follows:

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<u>Category</u>	<u>Defect</u>	<u>AQL</u>	<u>Insp. Method</u>
<u>Major</u>			
101	Illegible or incorrect marking	1.0	Visual
102	Improper level of preservation, packaging or packing	1.0	Visual
103	Inadequate cleaning or drying	1.5	Visual
104	Improper preservative application	1.5	Visual
105	Missing or improper cushioning	1.5	Visual
106	Improper blocking and bracing	1.5	Visual/Manual
107	Improper closure or strapping of containers	1.5	Visual/Manual
<u>Minor</u>			
201	Workmanship	4.0	Visual

4.5.1.8 Inspection approval stamp. The application of the inspection approval stamp shall be as specified in MIL-C-13931.

4.5.2 Tests.

4.5.2.1 Functioning. Each rifle shall be operated manually without interference, erratic movement or malfunction. Any evidence of the above characteristics will be cause for rejection.

4.5.2.2 Firing pin indentation. The indentation of the firing pin of each rifle shall be checked by means of a crusher-cylinder conforming to MIL-C-12166. The cylinder shall be 0.2255 + .0010 inch in diameter and 0.400 + .005 inch in length. The cylinder shall be placed in the fixture shown on the applicable inspection-equipment drawing. The fixture shall be placed in the rifle chamber, the breech closed, and the loader's safety set in the "FIRE" position. The rifle shall then be fired by depressing the grip-safety and the trigger. The indentation of the cylinder shall be measured. Rifles showing less than the specified indentation, shall be rejected. (See 3.6.1 and 3.6.2).

4.5.2.3 Performance. The rifles shall be subjected to performance testing to assure compliance with 3.7 by a government activity in accordance with procedures specified by the engineering and quality assurance elements of the procuring activity.

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4.5.2.3.1 Inspection at the proving ground. Except as specified herein, the rifles shall be inspected in accordance with the applicable requirements of MIL-C-13931.

4.5.2.3.1.1 Terms used in the proof firing.

a. A "standard weight projectile" weighs 2.75 pounds plus or minus 0.05 pounds.

b. A "Standard pressure round" shall use a "Standard weight projectile". The round shall be loaded to produce a muzzle velocity of 1200 feet per second, and an average, rearward, recoil momentum for "Standard" rounds (Table I) not to exceed 3.0 pound-second with a chamber pressure less than the weapon upper pressure limit at 70°F (UPL) of 6500 psi.

c. A "specific pressure round" shall use a "standard weight projectile" and the round shall be loaded to develop 113 ± 4 percent of the upper pressure limit at 70°F (UPL) of 6500 psi or 7350 ± 260 psi.

4.5.2.3.1.2 Proof firing. Each rifle shall be proof fired in accordance with Table I, all rounds being fired at zero elevation plus or minus 5°, and in the order shown.

TABLE I

<u>Round Number</u>	<u>Number of Rounds</u>	<u>Type of Round</u>
1	1	Specific (113 ± 4 percent UPL)
2 to 4	3*	Standard (100 percent UPL)

*Additional standard rounds may be fired when in the judgment of the test director the result of the preceding round is questionable or inconclusive. Not more than 6 additional rounds shall be fired before bore diameter measurements. Weather conditions, barometric pressure, and relative humidity at the time of proof firing shall be recorded.

4.5.2.3.1.3 Muzzle Velocity. Velocity checks shall be made on 1 in every 24 rifles and when a change occurs in the lot of proof ammunition.

4.5.2.3.1.4 Bore enlargement. Bore diameters shall be measured with a star gage, an air gage, or other approved gage after proof firing no more than 10 rounds. Enlargement greater than the allowable shall be cause for rejection of the rifle.

4.5.2.3.1.5 Mount. The rifles shall be fired on a mount from which recoil momentum may be determined from the following relationship of momentum and deflection.

$$M = \frac{Wd}{12g} \sqrt{\frac{g}{L}} = \frac{Wd}{12g} \times \frac{2}{T}$$

Where: M = recoil momentum of assembly (lb-sec)
 W = weight of suspended assembly (lb)
 d = horizontal deflection of suspended assembly (in)
 L = effective length of pendulum suspension (ft.)
 g = acceleration of gravity (ft/sec²)
 T = period of suspended assembly (sec.)
 (time of one complete cycle of oscillation)

4.5.2.3.1.6 Recoil Momentum. The recoil momentum shall be determined for each rifle, actually proof fired, in accordance with Para. 4.5.2.3.1.5.

4.5.2.3.1.7 Inspection after proof firing. The rifles shall be inspected in accordance with applicable requirements of MIL-C-13931. After performance testing all parts shall be magnetic-particle tested in accordance with applicable drawings and specifications. All components and sub-assemblies shall be visually examined. Cracks and fractures shall be cause for rejection of affected Part(s) in compliance with 3.7.2.

4.5.3 Inspection equipment. Data lists containing equipment used in the inspection of parts, subassemblies, and assemblies are listed in DL 7305619 for rifles.

4.5.3.1 Acquisition, maintenance, and disposition. Unless otherwise specified (see 6.1.1), responsibility for acquisition, maintenance, and disposition of acceptance inspection and test equipment prescribed in the List of Inspection Equipment DL 7305619 for rifles, and for all other inspection equipment required to perform inspection prescribed by applicable specifications, shall be in accordance with MIL-I-45607.

4.5.3.2 Accuracy of standard measuring equipment. When commercial and modified commercial inspection and test equipment is used, it shall be capable of repetitive measurements to an accuracy of 10 percent of the total tolerance of the characteristic being inspected.

5. PREPARATION FOR DELIVERY

5.1 Pilot pack. On each contract, a pilot pack shall be forwarded in accordance with 3.1. Pilot packs for the rifle shall be packaged to the level of packaging specified in the contract and packed level C in accordance with the requirements of Packaging Data Sheet P403387.

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5.2 Preservation, packaging, and marking. The rifle shall be unit packaged, packed, and marked in accordance with the requirements of Packaging Data Sheet P8403387.

5.3 Repair parts. Repair parts shall be unit packaged, packed, and marked in accordance with the requirements of the applicable packaging data sheet (see 6.1.1).

6. NOTES

6.1 Ordering data. Procurement documents should specify the following:

6.1.1 Procurement requirements.

a. Title, number, and date of this specification

b. Requirements for submission of and shipping instructions for first article (see 3.1 and 4.4) and pilot pack (see 3.1 and 5.1).

(1) The contract should designate the examinations and tests to be performed by the contractor and the examinations and tests to be performed by the Government.

(2) The contract should specify the sample size (i.e., the number of units) of the first article sample.

(3) The contract should designate the inspection and test data that is required to be furnished the Government when the contractor is required to perform either or both examinations and tests.

(4) The contract should designate at whose expense a retest may be performed.

(5) The contract should specify that the acceptable first article sample shall be delivered in accordance with the terms of the contract, or

(6) Any additional or extended examinations and tests beyond the scope of this specification shall be specified and identified as a separate item of the contract.

c. Serial numbers for the rifles.

d. List of inspection equipment, responsibility for acquisition, maintenance, and disposition thereof, if other than as specified (see 4.5.3)

- e. Extent of supplier's responsibility for Government-furnished equipment.
- f. Selection of applicable levels of preservation, packaging, and packing (see 5.2)
- g. Packaging instructions for repair parts (see 5.3)
- h. Applicable acceptance test procedures and frequency of testing (see 4.5.1 and 4.5.2).
- i. The contract shall specify under what conditions simulated firing may be performed, the test equipment available, and the procedures to be followed.

6.1.2 Contract data requirements. Monthly reports of the results of final examination and performance testing shall be specified for delivery on DD Form 1423 in the contract.

6.2 When warranted, the contract should specify the application of MIL-Q-9858 or MIL-I-45208, as appropriate, on the Management Control Systems Summary List, DD Form 1660.

6.3 Unless otherwise specified, the contract should specify the application of MIL-I-45607 and MIL-C-45662 on the Management Control Systems Summary List, DD Form 1660.

Custodian:
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Preparing activity:
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Project No. 1010-A096

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 56

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.