

MIL-C-46936B(MU)
 5 March 1971

 SUPERSEDING
 MIL-C-46936A(MU)
 15 October 1964

MILITARY SPECIFICATION
 CARTRIDGE, 5.56MM, TEST, HIGH PRESSURE, M197

1. SCOPE

1.1 This specification covers a cartridge for proof testing 5.56mm Weapons.

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 this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-I-45607

- Inspection Equipment, Supply and Maintenance of

STANDARDS

Military

MIL-STD-105

- Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-109

- Quality Assurance Terms and Definitions

MIL-STD-636

- Visual Inspection Standards for Small Arms Ammunition Through Caliber .50

MIL-STD-644

- Visual Inspection Standards and Inspection Procedures for Inspection of Packaging, Packing and Marking of Small Arms Ammunition

MIL-STD-1168

- Lot Numbering of Ammunition

DRAWINGS

Munitions Command

D10533839

- Cartridge, 5.56mm, Test, High Pressure, M197

F10534017

- Packing and Marking, Cartridges, 5.56mm, Test, High Pressure, M197; Cartons, Box, Ammunition, M2A1; Box Wirebound

(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.)

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PUBLICATIONS

Munitions Command

AMSMU-P715-501FA1 - Ammunition Ballistic Test Methods, Test Procedures for 5.56mm Cartridges

3. REQUIREMENTS

3.1 General - The cartridge shall comply with Drawing D10533839, referenced specifications and the following:

3.2 Bullet extraction - The force required to extract the bullet from the cartridge case shall be not less than 35 pounds.

3.3 Residual stress - The cartridge case shall not split when subjected to a one percent mercurous nitrate solution for fifteen (15) minutes.

3.4 Waterproof - The cartridge shall not release more than 1 bubble of air when subjected to a pressure differential of 5 psi for 15 seconds.

3.5 Chamber pressure - The average chamber pressure of the sample cartridges, conditioned at 68° to 72° Fahrenheit (F), shall be 70,000 psi, plus or minus 3000 psi when fired in the vertical (down) position. The standard deviation of the pressures shall not exceed 3500 psi.

3.6 Function and casualty - The cartridge shall function without casualty.

3.7 Workmanship - The requirements for workmanship are as specified on the applicable drawings, referenced specifications and the following:

3.7.1 Metal defects - The cartridge shall be free of folds, wrinkles, deep draw scratches, scaly metal, dents and other defects.

3.7.2 Foreign matter - The cartridge shall be free of corrosion, stains, discolorations, dirt, oil and smears of lacquer.

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,

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4.1 (Cont'd)

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 - Reference shall be made to MIL-STD-109 for definition of quality assurance terms.

4.2 First article sample

4.2.1 Initial production sample - At the beginning of regular production, a sample shall be submitted in accordance with contract requirements and shall consist of 300 cartridges. The sample shall be manufactured using the same materials, equipment, processes and procedures as will be used in regular production. All parts and materials, including packaging and packing shall be the same as used for regular production and shall be obtained from the same source of supply.

4.2.1.1 Examination and test - After inspection and provisional acceptance at source, the sample shall be inspected for all requirements of the drawings and specifications at a government laboratory or such other facility specified in the contract.

4.2.1.2 Initial production sample failure - Failure of the sample to comply with the requirements of the drawings and specifications shall result in sample disapproval. Determination as to acceptability of any initial production sample shall be based upon results of initial tests only, and no second tests shall be permitted on that initial production sample.

4.3 Inspection provisions

4.3.1 Lot

4.3.1.1 Submission of product - The product shall be submitted in accordance with MIL-STD-105.

4.3.1.2 Lot identification - Each lot of ammunition shall be identified as to type, caliber and model, as well as with a lot number in accordance with MIL-STD-1168. Each lot shall be further identified by a Federal Stock Number assigned by the procuring activity.

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4.3.2 Examination - Examination for major and minor defects shall be performed on a class basis in accordance with the classification of defects, Table I, using applicable sampling plans and acceptance criteria of MIL-STD-105. The AQL for Major Class shall be 0.25 percent and the AQL for the Minor Class shall be 1.50 percent.

4.3.2.1 Classification of defects - The classification of defects shall be as specified in Table I.

Table I

No.	Defect and Method of Inspection	Major	Minor
	Visual 1/		
	Cartridge		
1	Discolored, dirty, oily, smeared		X
2	Corroded or stained, if etched		X
	Case		
4	Round head		X
5	Dent		X
6	Split case 2/	X	
7	Perforated case	X	
8	Draw scratch		X
10	Beveled underside of head		X
11	Case mouth not crimped in cannellure		X
12	Scaly metal		X
13	No chamfer on head (rim)		X
14	Fold		X
15	Wrinkle		X
16	Buckle		X
17	Bulge		X
18	Illegible or missing head stamp		X
19	Defective head		X
20	Defective mouth		X
21	No visible evidence of mouth anneal	X	
21A	Coating missing	X	
	Bullet		
24	Split bullet jacket		X
25	Loose bullet	X	
26	Missing cannellure		X
27	Scaly metal		X
31	Defective cannellure		X

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No.	Defect and Method of Inspection	Major	Minor
	Primer		
32	No primer	X	
33	Cocked primer	X	
34	Inverted primer	X	
35	Loose primer	X	
36	Nicked or dented primer		X
37	No waterproofing material (primer pocket joint)		X
38	Defective crimp		X
	Gaging		
39	Total length	X	
40	Cartridge profile failure (requiring more than 10 lbs dead weight to insert in profile and alignment gage)	X	
41	Diameter of extractor groove		X
43	Diameter of head		X
44	Thickness of head		X
45	Length to shoulder datum	X	
46	Depth of primer	X	
	Weighing		
47	Weight, min	X	

1/ Refer to MIL-STD-636 (NATO Caliber 7.62MM Section) for visual defect standards for defects 1 through 38 with the exception of defect No. 21A. In the event of conflict between Table 1 of this specification and MIL-STD-636 as to defect classification, the classification specified in Table 1 shall apply.

2/ A split in any location and with or without evidence of propellant loss, shall be classed as a major defect.

4.3.3 Tests - The tests listed in Table II shall be conducted in accordance with the methods and procedures specified in 4.4.

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4.3.3.1 Test samples - The quantities for the various tests shall be as specified in Table II. Only cartridges having met the visual, dimensional and weight requirements shall be used in the ballistic tests and shall have been selected in such a manner that the sample is representative of the entire lot. The cartridges shall be thoroughly mixed before being divided into samples for the various tests.

Table II

Test	Number of Ctgs	Requirement Para.
Bullet extraction <u>1/</u>	25	3.2
Residual stress (mercurous nitrate) <u>2/</u>	50	3.3
Waterproof <u>3/</u>	20	3.4
Chamber pressure <u>4/</u>	25	3.5
Function & Casualty <u>5/</u>	--	3.6

- 1/ Failure of two or more cartridges to comply with the applicable requirement shall be cause for rejection of the lot. If one cartridge fails in the first test, a second sample consisting of double the number of cartridges in the first sample may be tested. If any failing cartridges are found in the second sample, the lot shall be rejected.
- 2/ The occurrence of splits in two or more cartridges shall be cause for rejection of the lot. If one cartridge fails in the first test, a second sample consisting of double the number of cartridges in the first sample may be tested. If any failing cartridges are found in the second sample, the lot shall be rejected.
- 3/ Failure of six or more cartridges to comply with the applicable requirement shall be cause for rejection of the lot. If more than two but less than six cartridges fail in the initial test, a second sample consisting of double the number of cartridges in the first sample shall be tested. The lot shall be rejected if in the combined first and second sample, six or more cartridges fail to comply with the applicable requirement.
- 4/ Failure of the cartridges to comply with the applicable requirement shall be cause for rejection of the lot subject to testing of a second sample consisting of double the quantity of cartridges used in the first test. Failure of the cartridges in the second sample to comply with the applicable requirement shall be cause for rejection of the lot.

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- 5/ Observation for function and casualty shall be made during firing of the chamber pressure test. The lot shall be rejected when firing defects exceed the acceptance number for the cumulative sample in Table III. If the number of defects found in the first test exceeds the acceptance number for the first sample, but is equal to or less than the acceptance number for the cumulative sample, a second sample consisting of double the quantity of cartridges specified for the chamber pressure test shall be fired. If the total number of defects in the combined first and second sample exceeds the acceptance number for the cumulative sample, the lot shall be rejected. If, in testing a second sample, defects other than those for which the second sample is being tested should occur to the extent that they exceed the acceptance number for the cumulative sample, the lot shall be rejected.

4.3.3.2 Firing defects - Firing defects and acceptance numbers shall be as specified in Table III.

Table III

Defects	Acceptance	
	First Sample	Cumulative (1st & 2nd Sample)
1. Misfire	1	2
2. Bullet remaining in bore 1/	0	-
3. Primer casualties		
a. Loose primer - primer falls out of pocket on retraction of bolt	3	7
b. Blown primer - primer not in pocket after firing and both head of cartridge case and pocket enlarged and distorted (determined visually)	0	1
4. Case casualties		
a. Split (Longitudinal)	1	2
b. Complete rupture (circumferential)	0	1
c. Partial rupture (circumferential)	1	2

1/ No second sample permitted. Lot shall be rejected.

4.3.4 Packaging, packing and marking inspection - During or immediately prior to the packaging operation, 100% examination of the cartridges shall be performed to ascertain that the cartridge type conforms to the drawing. Occurrence of any type other than high pressure test shall be classed as a major defect. All nonconforming cartridges shall be rejected. Inspection for packaging, packing and marking shall be in accordance with MIL-STD-644 as applicable to the drawing.

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4.3.5 Inspection equipment - Except as otherwise provided for by the contract, the contractor shall supply and maintain inspection equipment in accordance with the applicable requirements of MIL-I-45607. Simulated assessment of reference cartridges shall be made in accordance with AMSMU-P715-501FA1.

4.4 Test methods and procedures

4.4.1 Bullet extraction - The test shall be conducted in accordance with AMSMU-P715-501FA1. The rate of travel of the test head shall be not less than three nor more than six inches per minute.

4.4.2 Residual stress (mercurous nitrate) - The test shall be conducted in accordance with AMSMU-P715-501FA1.

4.4.3 Waterproof - The test shall be conducted in accordance with AMSMU-P715-501FA1. The container shall be evacuated to a pressure of 5 pounds per square inch below atmosphere pressure and held for 15 seconds.

4.4.4 Chamber pressure - The test shall be conducted in accordance with AMSMU-P715-501FA1, with the following exceptions:

a. The test fixture shall be mounted so that the chamber pressure barrel assembly will be firing in a vertical (down) position.

b. Container of sand, capable of stopping and containing fired bullets, may be placed directly under the muzzle of the chamber pressure barrel assembly. Velocity measurements are not required.

c. Local safety regulations shall be exercised. Safety shield shall be used by the Proof Technician during all tests.

4.4.5 Function and casualty - The test shall be conducted simultaneously with the chamber pressure test. When testing of a second sample is required, the test shall be conducted in accordance with the procedure prescribed for the chamber pressure test in AMSMU-P715-501FA1 and Para. 4.4.4 above, using the long piston and procedure in accordance with 4.4.5.1 for fouling shots. All reference pertaining to obtaining chamber pressure data shall be disregarded.

4.4.5.1 Five warming (fouling) shots shall be fired. To fire the warming (fouling) shots, it shall be necessary to seat the appropriate pistons in their respective holes, (the long piston in the chamber-pressure piston hole and the port-pressure piston in the port-pressure piston hole). The pistons are placed in the piston holes and the anvils screwed down on the head of the pistons until the pistons have reached their correct final positions. Before each warming (fouling) shot is fired, the anvils should be checked to assure that they are in a snug position on the head of the pistons.

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4.4.6 Defect penalty - If, in the chamber pressure test, a firing defect prevents the obtaining of a reliable result for the characteristic being tested, an additional shot shall be fired. The chamber pressure test shall not be penalized, but the acceptance or initial production sample shall be penalized for such defects in accordance with Table III.

5. PREPARATION FOR DELIVERY

5.1 Packing, Level A - (Worldwide shipment) The cartridges shall be packed in accordance with Drawing F10534017.

5.2 Marking and labeling - Packing boxes shall be marked and labeled in accordance with the applicable drawing cited in 5.1.

6. NOTES

6.1 Ordering data - Invitations for bids or request for proposal and contracts or orders will specify the following:

6.1.1 Title, number and date of this specification.

6.1.2 Type and level of packing.

6.1.3 Provision for the supply, maintenance and disposition of mandatory ballistic test equipment for acceptance inspection purposes.

6.1.4 Provision for the submission of acceptance inspection reports containing final inspection results for each lot of ammunition presented to the Government.

6.1.5 Requirement for the contractor to provide and maintain an inspection system in accordance with MIL-I-45208, Inspection System Requirements.

6.2 Hazard notice - The cartridge described herein and certain of its components are flammable and/or explosive and consequently present hazards in manufacture, handling, storage and shipment. The contractor should recognize these hazards and take appropriate measures to guard and protect against fire, explosion, adverse environment, corrosive atmosphere, rough handling and electrically induced incidents.

Custodian:

Army - MU

Preparing activity:

Army - MU

Project No. 1305-A667

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

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