

INCH-POUND

MIL-C-60616C(AR)

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SUPERSEDING

MIL-C-60616B(AR)

9 October 1984

## MILITARY SPECIFICATION

CARTRIDGE, 5.56MM, BLANK: M200

This specification is approved for use by the US Army Armament, Munitions and Chemical Command, and is available for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers the 5.56mm Blank, M200 Cartridge for use in 5.56mm weapons for saluting and training.

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

## SPECIFICATIONS

## MILITARY

MIL-A-2550	-Ammunition, General Specification for
MIL-I-45208	-Inspection System Requirements
MIL-I-45607	-Inspection Equipment, Acquisition, Maintenance and Disposition of
MIL-A-48078	-Ammunition, Standard Quality Assurance Provisions, General Specification for

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document, should be addressed to: Commander U.S. Army ARDEC, ATTN: SMCAR-BAC-S, Picatinny Arsenal, New Jersey 07806-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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## STANDARDS

## MILITARY

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

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from Military Specifications and Standards, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings, and publications.

The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those cited in the solicitation.

## DRAWINGS

U.S. Army Armament Research, Development and Engineering Center (ARDEC)

## PRODUCT AND PACKAGING DRAWINGS

7643674	-Classification of Cartridge Case Defects
10542379	-Cartridge, 5.56mm, Blank: M200
12551963	-Packing and Marking for Box Wirebound for Cartridge 5.56mm

## INSPECTION EQUIPMENT DRAWINGS

IEL10542379	-List of Inspection Equipment for Cartridge, 5.56mm Blank: M200
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## PUBLICATIONS

SCATP-5.56mm	-Ammunition Ballistic Acceptance Test Methods, Test Procedures for 5.56mm Cartridges
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SCATP-5.56mm      -Small Caliber Ammunition Test  
 (Heavy Bullet)      Procedures 5.56mm (Heavy Bullet)  
                          Cartridges

(Copies of specifications, standards, handbooks, drawings, publications, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Cartridge. The cartridge shall comply with all requirements specified on drawing 10542379, all associated drawings and with all requirements specified in applicable specifications and standards.

3.2 Material. Materials shall be in accordance with the applicable drawings and specifications.

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

3.4 Fouling. The fouling produced by the firing of 500 blank cartridges shall not cause a change in the cyclic rate by more than 15 percent from the first to the last burst and shall not cause an increase in cyclic rate such that the last burst exceeds the cyclic rate specified below:

<u>Weapon</u>	<u>BFA</u>	<u>Last Burst Not to Exceed</u>
M16 or M16A1 Rifle	M15A2	920

3.5 Function and casualty. The blank cartridges shall function without casualty within the temperature range -25°F through +125°F in the M16, M16A1 and M16A2 Rifles and the M249 Machine Gun.

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3.6 Cyclic rate. The blank cartridge shall operate the weapons specified below within the limits indicated:

<u>Weapon</u>	<u>BFA</u>	<u>Min Cyclic Rate</u>	<u>Max Cyclic Rate</u>
M16 or M16A1 Rifle	M15A2	550	920
M249 Machine Gun	M15A2	650	950

Note: There is no cyclic rate requirement for this cartridge in the M16A2 rifle.

3.7 Noise level. The noise level produced by blank test cartridges shall be not less than 100 decibels when the noise level of 5.56mm Ball, M193 production cartridges fired under identical conditions and using the same equipment, except for the use of the M15A2 blank firing attachment, is 120-130 decibels.

3.8 Waterproof. The blank cartridge shall not release more than one bubble of air when subjected to a pressure of 2 pounds per square inch (PSI) below atmospheric pressure and held at that pressure for 15 seconds.

3.9 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.4).

3.10 Workmanship. The requirements for workmanship shall be as specified on the applicable drawings, referenced specifications and in accordance with the following:

a. Metal defects. The cartridge shall be free of metal defects which includes, but is not limited to: folds, wrinkles, scratches, scaly metal, dents, perforations, and other discontinuities.

b. Foreign matter. The cartridge shall be free of corrosion, stains, discolorations, dirt, and smears of lacquer or mouth waterproofing compound.

c. Cleaning. Cleaning methods used shall not be injurious to any part, nor shall the parts be contaminated by any cleaning agent.

d. Contamination of explosive components. Extreme care shall be exercised to avoid contamination of primers and propellant by oil, grease, or other foreign matter.

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## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 this specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspections set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as a part of manufacturing operation, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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

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

4.3 Inspection equipment. In accordance with MIL-A-48078 (Inspection equipment) and MIL-A-2550 (Test and measuring equipment).

4.4 First article inspection.

4.4.1 First article sample. The sample shall be manufactured using the same materials, equipment, processes and procedures as will be used in regular production. All parts and materials shall be the same as used for regular production and shall be obtained from the same source of supply. The contractor shall submit a first article sample, as designated by the Contracting Officer, for evaluation in accordance with the provisions of 4.4.2. The first article sample shall consist of not less than 5510 blank cartridges.

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4.4.2 Inspections to be performed. All inspections listed in Table I apply. First article components and assemblies may be subjected by the Government to any or all of the examinations and tests specified in Table I and to any or all of the requirements of the applicable drawings.

4.4.3 Rejection of first article sample. The first article sample shall be rejected if any of the criteria specified in 4.4.2 is not met. MIL-A-48078 shall apply.

TABLE I. First article inspection.**CLASSIFICATION OF DEFECTS & TESTS**

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PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER 10542379
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	NEXT HIGHER ASSEMBLY N/A
					PARAGRAPH REFERENCE / INSPECTION METHOD
	<u>Cartridge inspection</u>		<u>Acc-Rej</u>		
	Major class	5510	35 - 36	3.1	4.5.6.1
	Minor class	5510	137-138	3.1	4.5.6.1
	<u>Cartridge tests</u>				
	Residual stress	50	0 - 2	3.3	4.8.1
		150	1 - 2		
	Waterproof	20	4 - 9	3.8	4.8.6
		60	8 - 9		
	<u>Ballistic tests</u>				
	All tests, sample requirements and acceptance criteria of Tables II, III, and IV shall apply.	--	--	--	4.8

NOTES: Retest sample size numbers represent a cumulative sample (1st and 2nd samples combined).

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4.5 Quality conformance inspection.

4.5.1 Lot formation. In accordance with MIL-A-48078.

4.5.2 Lot submission. The product shall be submitted in accordance with MIL-STD-105.

4.5.3 Component parts. Unless otherwise specified, component lots shall be homogeneous and of a size convenient to the contractor and inspected, tested and accepted by the contractor. The cartridge lot shall not contain:

a. Cartridge cases from more than one process and manufacturer.

b. Primers from more than one lot interfix number from more than one manufacturer.

c. Propellant from more than two lots or from more than one manufacturer.

4.5.4 Lot identification. Each lot of ammunition shall be identified as to type, caliber and model, as well as a lot number in accordance with MIL-STD-1168.

4.5.5 Inspections to be performed. Each lot shall be subjected to the inspections specified in:

a. 4.5.6.1 Examination for defects - Cartridge inspections,

b. 4.5.6.2 Examination for defects - Cartridge tests,

c. Table II - Ballistic test samples, and

d. 4.6 Packaging, packing and marking inspection.

4.5.6 Examination for defects. Examination for major and minor defects shall be performed on a class basis using applicable sampling plans and acceptance criteria of MIL-STD-105 and the acceptable quality level (AQL) specified in 4.5.6.1. All non-conforming cartridges shall be rejected.



## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF CHARACTERISTICS

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PARAGRAPH	TITLE	SHEET 1 OF 2		DRAWING NUMBER 10542379
4.5.6.1	Examination for defects-cartridge inspections			NEXT HIGHER ASSEMBLY Not Applicable
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
Critical	None defined			
Major	(Class AQL: 0.65%)			
101.	Cartridge profile failure (requiring more than 10 pounds dead weight to insert in profile and alignment gage)			
102.	Diameter of extractor groove, max		3.1	Gage
103.	Diameter of head, Max		3.1	Gage
104.	Length of shoulder datum		3.1	Gage
105.	Depth of primer		3.1	Gage
106.	Round head (4)		3.1	Gage
107.	Split (6) 2/		3.10	Visual
108.	Perforation (7)		3.10	Visual
109.	Beveled underside of head (10)		3.1	Visual
110.	Primer missing (32)		3.1	Visual
111.	Primer cocked (33)		3.1	Visual
112.	Primer inverted		3.1	Visual
113.	Primer loose (35)		3.1	Visual
114.	Identification knurl missing		3.1	Visual
115.	Mouth waterproofing missing		3.1	Visual
NOTES: 1/ Numbers after defect descriptions refer to visual defect standards in MIL-STD-636 (NATO Caliber 6.62-mm Section.)  2/ A split shall be classed as a major defect regardless of location or occurrence of loss of propellant.				

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF CHARACTERISTICS

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PARAGRAPH	TITLE	SHEET 1 OF 2		DRAWING NUMBER 10542379
4.5.6.1	Examination for defects-cartridge inspections			NEXT HIGHER ASSEMBLY Not Applicable
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
116.	Inadequate crimp (must prevent loss of propellant)		3.1	Visual
117.	Cartridge overall weight, max		3.1	Gage
Minor	(Class AQL: 2.50%)			
201.	Total length		3.1	Gage
202.	Diameter of extractor groove, min		3.1	Gage
203.	Diameter of head, min		3.1	Gage
204.	Diameter of head, Max		3.1	Gage
205.	Discolored, dirty, oily, smeared (1)		3.10	Visual
206.	Corroded or stained, if etched (2)		3.10	Visual
207.	Dent (5)		3.10	Visual
208.	Draw scratch (8)		3.10	Visual
209.	Scaly metal (12)		3.10	Visual
210.	Chamfer on head (rim) missing (13)		3.1	Visual
211.	Fold (14)		3.10	Visual
212.	Illegible or missing head stamp (18)		3.1	Visual
213.	Defective head (19)		3.1	Visual
214.	Nicked or dented primer (36)		3.1	Visual
215.	Waterproofing material (Primer procket joint) missing (37)		3.1	Visual
216.	Defective primer crimp (38)		3.1	Visual
NOTES:				

**CLASSIFICATION OF DEFECTS & TESTS**

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<b>PARAGRAPH</b>	<b>TITLE</b>	<b>SHEET 1 OF 1</b>			<b>DRAWING NUMBER</b> 10542379
4.5.6.2	Examination for defects - cartridge tests				<b>NEXT HIGHER ASSEMBLY</b> Not Applicable
<b>CATEGORY</b>	<b>EXAMINATION OR TEST</b>	<b>NO. OF SAMPLE UNITS</b>	<b>AQL OR 100%</b>	<b>REQUIREMENT PARAGRAPH</b>	<b>PARAGRAPH REFERENCE / INSPECTION METHOD</b>
	Residual stress (mercurous nitrate)	50	Acc-Rej 0 - 2	3.3	4.8.1
		150	1 - 2		
	Waterproof	20	4 - 9	3.8	4.8.6
		60	8 - 9		
<b>NOTES:</b>  Retest sample size numbers represent a cumulative sample (1st and 2nd samples combined).					

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Table II. Ballistic test samples.

-----Temperature-----				Requirement Paragraph
Ambient	-25°F		+125°F	
Fouling <u>1/</u> <u>2/</u>				3.4
M16 or M16A1 Rifle	1000			
Function & Casualty <u>3/</u>				3.5
M16 or M16A1 Rifle	180	120	120	
M249 Machine Gun	400	200	200	
M16A2 Rifle	120	60	60	
Cyclic Rate <u>4/</u>				3.6
Noise Level <u>1/</u>	20			3.7

1/ This test shall be conducted on the first article sample only. Failure to meet the requirement shall be cause for rejection.

2/ Two weapons shall be tested, each firing 500 rounds.

3/ Two weapons of each type shall be used with an equal number of rounds fired in each. The lot shall be rejected when function and casualty defects plus firing defects observed in all other firing tests exceed the acceptance number for the cumulative sample in Table IV. 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 specified under the function and casualty test shall be fired. This procedure shall apply regardless of the weapon or weapons in which the firing defects occurred in the first tests. 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.

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4/ The cyclic rate of fire shall be recorded during the function and casualty test. The lot shall be rejected subject to a second sample if:

a. The average rate of fire for any weapon type at any of the test temperatures is outside the limits specified in paragraph 3.6.

or:

b. Any individual burst is outside the limits specified in Table III.

The second sample shall consist of double the number of cartridges in the first sample and shall be fired in four different weapons of the type in which the failure occurred (not to include the weapons used in the initial test). The lot shall be rejected if:

a. The grand average of the rates recorded for any weapon type in the first and second samples, at any test temperature, is outside the limits specified in paragraph 3.6.

or:

b. Any two individual bursts in a weapon type in the retest are outside the limits specified in Table III.

Table III. Individual burst cyclic rate limits.

<u>Weapon Type</u>	<u>BFA</u>	<u>Min</u>	<u>Max</u>
M16 or M16A1 Rifle	M15A2	550	920
M249 Machine Gun	M15A2	600	1020

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Table IV. Firing defects and acceptance criteria.

<u>Defects</u>	<u>Acceptance Numbers</u>			
	<u>(1st Sample)</u>		<u>Cumulative (1st &amp; 2nd Sample)</u>	
	M16 M16A1 & M16A2 <u>(Combined)</u>	M249 SAWS	M16 or M16A1 & M16A2 <u>(Combined)</u>	M249 SAWS
1. Primer				
a. Escape of gas through or around primer cup	15	10	40	26
b. Blown primer or primer falls out of pocket on retraction of bolt	0	0	1	1
2. Case				
a. Splits, neck, shoulder or mouth	15	16	40	40
b. Splits, body	6	6	15	16
c. Splits, through head	1	1	2	2
d. Complete rupture	0	0	1	1
e. Partial rupture	6	7	15	16
f. Detached metal <u>1/</u>	0	0	1	1
3. Weapon stoppage <u>2/</u>	15	16	40	40
4. Misfire	4	5	12	12

1/ Any particle of metal which becomes separated from the case between the mouth and the juncture of the shoulder and neck shall be classified as detached metal.

2/ All stoppages attributable to the ammunition, with the exception of misfire or complete rupture, observed in all tests shall be included.

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4.6 Packaging, packing and marking inspection. During or immediately prior to the packaging operation, 100% examination of the cartridge shall be performed to ascertain that the cartridge type conforms to the drawing. All non-conforming cartridges shall be rejected. Inspection for packaging, packing and marking shall be in accordance with MIL-STD-644 as applicable to the drawing.

4.7 Inspection equipment. The examination and tests shall be made using equipment listed in IEL 10542379. Unless otherwise specified, acquisition, maintenance and disposition of inspection equipment shall be in accordance with MIL-I-45607 and MIL-I-45208.

4.8 Methods of inspection.

4.8.1 Residual stress (mercurous nitrate). The test shall be conducted in accordance with Appendix "A".

4.8.2 Fouling. The test shall be conducted in accordance with Appendix "B".

4.8.3 Function and casualty. The test shall be conducted in accordance with Appendix "C".

4.8.4 Cyclic rate. The cyclic rate shall be determined during the function and casualty test, Appendix "C". The cyclic rate of each magazine or belt fired full automatic (long burst) shall be recorded.

4.8.5 Noise level. The test shall be conducted in accordance with Appendix "D".

4.8.6 Waterproof. The test shall be conducted in accordance with SCATP 5.56mm.

4.8.7 Defect penalty. In any ballistic test, except function and casualty, in which the occurrence of a firing defect prevents the obtaining of a reliable result of the characteristic being tested, an additional shot shall be fired. That particular test shall not be penalized, but the lot acceptance or first article sample shall be penalized for such defects in accordance with Table IV, firing defects and acceptance criteria.

5. PACKING

5.1 Packing - level A (worldwide shipment). The cartridge shall be packed in accordance with Drawing 12551963 as required by the contract.

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

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The cartridges covered by this specification are intended for use in the M16, M16A1 and M16A2 rifles, the M231 sub-machine gun and the M249 machine gun.

6.2 Acquisition requirements. See MIL-A-48078.

6.3 Submission of inspection equipment designs for approval. Submit inspection equipment designs as required to Commander, ARDEC, ATTN: AMSMC-QAF-I(D), Picatinny Arsenal, NJ 07806-5000. This address will be specified on the Contract Data Requirements List, DD Form 1423 in the contract. Unless otherwise specified, data item DI-R-1714 will apply.

6.4 Hazard notice. The cartridge described herein and some of its components are flammable or explosive and consequently present hazards in manufacture, handling, storage and shipment. The contractor should recognize these hazards and take appropriate measures to prevent fire, explosion, adverse environment, rough handling, corrosive atmosphere, and electrically induced incidents. Such measures shall include the employment of any effective safety program that addresses the inherent hazards associated with the cartridge.

6.5 Drawings. Drawings listed in Section 2 of this specification under the heading US Army Armament Research, Development and Engineering Center (ARDEC) may also include drawings prepared by and identified as US Army Armament Research and Development Center (ARDC), US Army Armament Research and Development Command (ARRADCOM), Edgewood Arsenal, Frankford Arsenal, Rock Island Arsenal or Picatinny Arsenal drawings. Technical data originally prepared by these activities is now under the cognizance of ARDEC.

6.6 Submission of test data. In addition to the normal distribution of records, when the cartridge is procured by the US Army, one (1) copy of all ballistic data and the ammunition data card for each lot should be forwarded to: Commander, ARDEC, ATTN: AMSMC-QAF-S(D), Picatinny Arsenal, NJ 07806-5000.



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6.7 Submission of detailed inspection plan for review. The detailed inspection plan for the cartridge should be submitted to

Commander, ARDEC, ATTN: AMSMC-QAF(D), Picatinny Arsenal, NJ 07806-5000. Submission should be 30 days after specification is made contractual. All changes to the plan should be submitted to the above address for review prior to implementation.

6.8 Subject term (key-word) listing.

Military specification

M200

Cartridge, 5.56mm, Blank

Ammunition

6.9 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:  
Army-AR

Preparing Activity  
Army-AR

Project (1305-AB14)

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APPENDIX A

Residual Stress (Mercurous Nitrate) Test Procedure

10.0 SCOPE

10.1 Scope This test is a visual means of determining if stresses exist in brass cartridge cases that may cause the cases to split under conditions of storage or during service usage.

20.0 APPLICABLE DOCUMENTS - This section is not applicable to this appendix.

30.0 EQUIPMENT

30.1 Equipment - Equipment listed in Mercurous Nitrate section of the appropriate Inspection Equipment List shall be used.

40.0 MANDATORY SAFETY REQUIREMENTS

40.1 Mandatory safety requirements - The following safety requirements are mandatory:

- a. Food shall not be stored or eaten in the vicinity in which these tests are conducted.
- b. Acid resistant apron and gloves or the equivalent shall be worn by each test technician.
- c. Face shields shall be worn at all times during the pouring or mixing of acids and water. Safety glasses shall be worn during other phases of this test.
- d. Asbestos or heat insulating gloves shall be worn during the heat volatilization phase of the test to facilitate handling.
- e. During the entire period of volatilization the oven door shall be closed.
- f. Extreme care shall be exercised in the mixing of acid with water; this shall be accomplished by pouring the acid into the water.

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g. The test shall be conducted under a canopy or hood having a forced draft ventilation system to remove the noxious fumes. The disposition of tested components shall be governed by local regulations.

## 50.0 TEST PROCEDURES

50.1.1 Nitric-Acid solution. Four hundred millileters of nitric acid (of specific gravity 1.42) are dissolved in five hundred milliliters of distilled water at room temperature. To this solution, distilled water is added to bring the volume of the resulting solution to one liter. (The resultant specific gravity will be 1.25).

50.1.2 Mercurous nitrate solution. Ten (10) grams of mercurous nitrate and ten (10) milliliters of nitric acid (of specific gravity 1.42) are dissolved in four hundred milliliters of distilled water at room temperature. To this solution, distilled water is added to bring the volume of this resulting solution to one liter.

## 50.2 Test of cartridge cases

50.2.1 Orientation. When submerged, the cartridges are in a vertical position, with the head of the case down. The depth of each solution is adjusted until it completely covers the mouth of the case.

50.2.2 Method. First, the test cartridges are submerged in the nitric acid solution. After thirty (30) seconds the cartridges are withdrawn, rinsed in water and the excess water removed. The cartridges are then submerged for fifteen (15) minutes in the mercurous nitrate solution. Upon removal, the surface of the cartridge case shall be examined under a magnification (10 to 15 diameters) for splits and cracks. All splits and cracks found are to be reported.

NOTE: A split is defined as a separation of the metal entirely through the wall of the cartridge case. A crack is a surface condition and represents a separation of the metal partially through the wall of the cartridge case. Cracks are not considered to be splits.

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60.0 RECORDING OF DATA

60.1 Record the following:

- a. All splits shall be reported.
- b. All cracks shall be reported for information

only.

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APPENDIX B

Fouling Test Procedure

10.0 SCOPE

10.1 Scope To determine whether or not the test cartridges produce an excessive amount of fouling of the barrel, muzzle attachment or gas cylinders of weapons which would prevent the normal functioning of the weapon, causing a change in cyclic rate greater than the limit specified.

20.0 Applicable Documents This section is not applicable to this appendix.

30.0 EQUIPMENT

30.1 Equipment Use Equipment listed in the Fouling Test section of the appropriate Inspection Equipment List shall be used.

30.2 Cyclic rate timer. Suitable recording instrument that will permit measurements within + 2% of the true rate of fire.

40.0 TEST PROCEDURE

40.1 Pre-firing (Preparation for test) The following procedure shall be used:

a. The barrel of the weapon to be used shall be thoroughly cleaned and carefully examined, using a borescope. The condition of the barrel shall be recorded. The bolt carrier group and gas tube shall be clean.

b. A weapon containing a blank firing attachment (Torqued to 50 in-lb, min.) is assembled in the test fixture on the mount. The weapon shall be at ambient temperature prior to firing a burst.

c. The test cartridges shall be examined for obvious defects prior to loading in magazines.

40.2 During firing. The following procedure shall be used:

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a. The cartridges shall be fired in the automatic mode as prescribed below. The weapons shall be cooled to ambient temperature at the prescribed points in the test.

Firing Sequence

3-30 Rd Bursts; record rate of fire of first burst  
Cool Weapon, Tighten BFA  
3-30 Rd Bursts  
Cool Weapon, Tighten BFA  
3-30 Rd Bursts  
Cool Weapon, Tighten BFA  
3-30 Rd Bursts  
Cool Weapon, Tighten BFA  
3-30 Rd Bursts  
Cool Weapon, Tighten BFA  
1-20 Rd Bursts  
1-30 Rd Bursts; records rate of fire.

50.0 RECORDING OF DATA

50.1 Record the following:

- a. The cyclic rate of fire of the first and last bursts.
- b. The percentage of decrease or increase in cyclic rate between the first and last bursts.
- c. Any unusual occurrences in gun function or appearance of fired cases shall be noted.
- d. Test weapon data
  1. Weapon number.
  2. Total number of cartridges fired in weapon.
  3. Total number of cartridges fired with blank firing attachment.

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## APPENDIX C

Function and Casualty Test Procedure

## 10.0 SCOPE

10.1 Scope The purpose of Function and Casualty tests is to demonstrate, by firing in weapons of representative types, whether or not the ammunition undergoing acceptance can be expected to perform satisfactorily, under conditions of field usage, in the service weapons for which it has been designed.

Casualties and malfunctions can be caused either by the ammunition or by the weapon in which it is fired, so that, to a certain extent, these two factors are interdependent. A faulty or poorly adjusted weapon can cause casualties in normal ammunition, but if the weapon is in proper condition when casualties are encountered, then the fault lies with the ammunition.

20.0 APPLICABLE DOCUMENTS This section is not applicable to this appendix.

30.0 Equipment

30.1 Equipment Equipment listed in the Function and Casualty section of the appropriate Inspection Equipment List shall be used.

30.2.2 Cyclic-rate timer. Use a suitable recording instrument that will permit measurements within + 2% of the true rate of fire.

## 40.0 TEST PROCEDURE

40.1 Pre-firing (Preparation for test)

a. Weapons shall be of the latest design or most recent issue. The use of weapons or parts of earlier design is sometimes permitted for special purposes.

b. The weapon containing a blank firing attachment (torqued to 50in-lb, min.) is assembled in the test fixture on the mount. Weapons shall be at ambient temperature prior to the test. A spacer, such as a modified washer, may be used to improve the fit of the M15A2 BFA on the M249 MG.

c. The test cartridges to be linked or loaded into the applicable magazines shall be examined for obvious defects.

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If visual defects are found, the defective cartridge(s) shall be replaced and the defects shall be noted on the test sheet form.

d. After the cartridges have been linked or loaded into magazines, they shall be conditioned at the required temperatures for not less than one hour and fired at that temperature.

e. The controlled temperature containers must reach specified temperature before placing the ammunition in respective containers.

f. The cyclic rate shall be as prescribed in the specification. No burst of less than 20 Rds for the M16A1 Rifle or 40 rounds for the M249 machine gun shall be considered for record cyclic rates.

#### 40.2 During firing

a. Weapons shall be cooled to ambient temperature after firing 100 cartridges or between tests, whichever occurs first. All BFA's should be tightened following each 30 round magazine or 50 round belt.

b. Upon completion of storage, high or low temperature, the cartridges shall be placed in an insulated box which has also been conditioned at the specified temperature. The insulated box containing the cartridges is then placed at a point convenient to the technician. The cartridges are removed from the insulated box and fired.

c. The procedure for firing each of the weapons shall be the same insofar as possible.

d. When firing the rifles each 30 round magazine shall be loaded with 30 cartridges. The magazine shall be inserted into the weapon and the cartridges fired full automatic (3-round burst for the M16A2 rifle) and the magazine removed. A time interval of not more than one-half minute shall be allowed between magazines. The next magazine of cartridges shall be inserted and fired semi-automatic. The mode of firing shall continue to alternate until the test is complete.

e. Function and Casualty for the M249 machine gun shall be fired with linked cartridges. All firing shall be done with the gas regulator set in the adverse position. Linked



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ammunition shall be in a 50 round belt loaded into a magazine (feed box). The magazine shall be attached to the weapon and the gun charged. The cartridges shall be fired in a 50 round burst. The next magazine shall be attached and the weapon charged. The cartridges shall be fired in short (5 to 7 round) bursts. The method of firing each belt shall continue to be alternated until the test is complete. The weapon shall be allowed to cool to ambient temperature after firing each 100 round belt.

f. Fired cases shall be visually examined by the technician for possible case casualties.

## 50.0 RECORDING OF DATA

50.1 Record the following:

a. Casualties shall be reported in accordance with the terminology specified in the applicable specification.

b. Misfires shall be recorded and the cause described.

c. The function and casualty test requires careful attention and alertness, and any unusual occurrence in gun function or appearance of fired cases shall be noted.

d. Failures of gun parts shall be shown on the ammunition report.

e. Weapon

1. Serial number
2. Total number of cartridges fired in weapon
3. Total number of cartridges fired in Blank Firing

Attachment

4. Headspace measurement  
5. Cyclic rate of all bursts fired full automatic, in the M249 MG and M16 & M16A1 Rifles.

50.2 OPERATIONAL NOTES

50.2.1 Stoppage In the event any stoppage occurs during firing of the test, a detailed check shall be made to determine whether the ammunition or the equipment is at fault. If the stoppage was caused by a misfire, the check of the weapon shall include measurement of the firing-pin protrusion and firing-pin indent. To assist in determining whether ammunition or equipment is responsible for a stoppage, it is good practice to test the weapon in question using ammunition of known characteristics, and

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to test the ammunition in question by firing in another weapon of the same type. If it is established that some faulty condition of the weapon is responsible for the stoppage, then the test shall be disregarded, the weapon shall be corrected or replaced, and the tests shall be refired.

50.2.2 Misfire If a misfire is encountered, the weapon is examined carefully to determine if the cause is attributable to the gun. In any ballistic acceptance test where a misfire occurs, a second attempt to fire a primer is not made. It is mandatory that a period of at least five (5) minutes elapse after the misfire occurs before the action of the weapon is opened, whereupon the misfired cartridge is carefully removed in accordance with existing safety regulations, and preserved for further examination. All handling and examinations of misfired cartridges shall be conducted with due regard for the hazards involved. The weapon in which a misfire occurs shall be thoroughly checked; it shall be disassembled and all component parts critically scrutinized. Results of such examinations shall be included on the test report as a matter of information.

50.2.3 Misfired cartridge Laboratory examination of the misfired cartridges shall be made to determine the specific cause. The result of the investigation is to be included on the test report.

50.2.4 Firing defects upon completion of firing, all cartridge cases from the test ammunition shall be carefully examined for firing defects. If any defect is found, a detailed check of the equipment shall be made to determine whether the ammunition or the equipment is at fault. If it is established that a faulty weapon is responsible for the firing defect, then the test shall be disregarded, the weapon shall be corrected or replaced, and the tests shall be refired. If it cannot be established that the weapon or other equipment is at fault, then the firing defects shall be charged against the ammunition.

## 60.0 DEFINITIONS

60.1 Misfire. Failure of a cartridge to fire after initiating action is taken. There are two general categories of misfires:

- a. The primer fails to fire when struck by the firing pin.
- b. The propellant does not ignite when the primer fires normally.

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60.2 Perforated primer. A perforated primer is one in which the indent in the primer cup, made by the firing pin, is entirely perforated. It can be identified by a visible hole through the primer, or if the perforation be minute, by discoloration of the indent caused by gas burning.

60.3 Primer leak. Discoloration caused by gas leakage around the junction between the primer cup and the primer pocket wall.

60.4 Loose primer. Looseness, but not so as to permit the fired primer to fall from the primer pocket after the cartridge is fired.

60.5 Blown primer, or a primer which falls out of the primer pocket. A blown primer is a primer which, when the cartridge is fired, is separated completely from the head of the cartridge case, and both the head of the case and the pocket are enlarged and deformed. A primer which falls out of the primer pocket is in the same category as a blown primer but the distortion to the primer pocket is less obvious.

60.6 Ruptured case. A circumferential separation of the case wall produced by firing. Ruptures are divided into two categories, partial and complete. A partial is one which extends less than 360 around the case. A complete rupture is one which extends entirely around the case, separating the case into two parts. Ruptures are designated according to position, as indicated on Drawing 7643674.

60.7 Split case. A longitudinal separation of the metal in the case wall produced by firing. Splits shall be classified as prescribed by the cartridge specification.

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APPENDIX D

Noise Level Test Procedure

10.0 SCOPE

10.1 Scope. To determine if the noise level is comparable to that recorded with bullet-type cartridges.

20.0 APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

30.0 EQUIPMENT

30.1 Equipment. Equipment listed in the Noise Level section of the appropriate Inspection Equipment List shall be used.

40.0 TEST PROCEDURE

40.1 Pre-firing (Preparation for test).

- a. Weapon shall be of latest design or most recent issue.
- b. The weapon shall be assembled in the test fixture on the mount.
- c. The test cartridges shall be examined for obvious defects. If visual defects are found, the defective cartridge(s) shall be replaced and the defects noted on the test sheet form.
- d. Both control and test cartridges, in the quantity prescribed in the item specification, shall be loaded into their respective magazines.
- e. A noise level meter is set up out side the firing room with the microphone placed inside the firing room.

40.2 During firing.

a. The microphone, which is attached to the Noise Level meter, shall be placed in such a location in the firing room that the noise level produced by a burst of bullet type cartridges, 5.56mm, Ball, M193, is 120-130 decibels. This may entail firing more than one burst of ball-type ammunition, with the microphone being moved to a new location for each burst being fired, until the results comply with the specification. When firing the test cartridges, it is imperative that the microphone remain in the same position as was used to obtain the specified level for the ball-type cartridges.

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- b. An observer is stationed at the Noise Level meter.
- c. The magazine containing the ball-type cartridges shall be inserted into the weapon and fired full automatic. The weapon shall be allowed to cool to ambient temperature before attaching the Blank Firing Adapter. Once the BFA is in place, the magazine containing the blank cartridges shall be inserted into the weapon and fired full automatic.
- d. The fired cases shall be visually examined for case casualties.

50.0 RECORDING OF DATA

50.1 Record the following:

- a. Noise level of Ball and Blank cartridges.
- b. Firing defects categorized in accordance with paragraph 4.5.6.2., Table III.
- c. Test weapon data:
  - 1. Serial number
  - 2. Total number of cartridges fired in the weapon
  - 3. Headspace measurement

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APPENDIX E

Weapon Unit Guide

10.0 SCOPE

10.1 Scope. This appendix covers inspection, maintenance and cleaning procedures for weapons.

20.0 APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

30.0 WEAPONS.

Weapons used for official acceptance tests shall be inspected, maintained and cleaned in accordance with the practices outlined in SCATP 5.56, Section 1 (for M16 and M16A1 rifles) and SCATP 5.56 (Heavy Bullet), Section 1 (for M16A2 rifle and M249 machine gun).

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

<b>I RECOMMEND A CHANGE:</b>		<b>1. DOCUMENT NUMBER</b> MIL-C-60616C (AR)	<b>2. DOCUMENT DATE (YYMMDD)</b> 4 May 1990
<b>3. DOCUMENT TITLE</b> CARTRIDGE, 5.56MM, BLANK: M200			
<b>4. NATURE OF CHANGE</b> (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)			
<b>5. REASON FOR RECOMMENDATION</b>			
<b>6. SUBMITTER</b>			
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