

INCH-POUND

MIL-C-63989C (AR)  
AMENDMENT 4  
30 January 2001  
SUPERSEDING  
AMENDMENT 3  
15 October 1999

MILITARY SPECIFICATION

CARTRIDGE 5.56mm, BALL, M855

MIL-C-63989C was inactivated after 15 September 1996 For New Design.

This amendment forms a part of MIL-C-63989C (AR), dated 15 February 1994, and is approved for use by the US Army Armament, Research, Development and Engineering Center, and is available for use by all Departments and Agencies of the Department of Defense.

PAGE 4

3.6 Delete in its entirety and substitute the following:

"3.6 Velocity. The average velocity of the cartridges when conditioned at 70 degrees plus or minus 2 degrees Fahrenheit(F) shall be 3,020 feet per second(fps) plus or minus 40 fps at 78 feet from the muzzle of the weapon. The standard deviation of the velocity shall not exceed 40 fps."

3.7 Delete in its entirety and substitute the following:

"3.7 Chamber pressure. The average chamber pressure of the sample cartridges, conditioned at 70 degrees plus or minus 2 degrees F, shall not exceed 58,700 psi. Neither the chamber pressure of an individual sample test cartridge nor the average chamber pressure plus three standard deviations of chamber pressure shall not exceed 64,700 psi."

3.8 Delete in its entirety and substitute the following:

"3.8 Port pressure. The mean port pressure minus three standard deviations shall not be less than 15,300 psi for sample cartridges conditioned to 70 degrees plus or minus 2 degrees F."

PAGE 5

3.10.2 Delete in its entirety and substitute the following:

"3.10.2 Chamber pressure. The average chamber pressure shall not vary from the average chamber pressure of the sample test cartridges conditioned at 70 degrees plus or minus 2 degrees F by more than 7,000 psi. The average chamber pressure of the sample cartridges of the same lot conditioned at 125 degrees plus or minus 2 degrees F shall not exceed 63,700 psi. Any decrease in pressure is acceptable."

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3.10.3 Port pressure. The average port pressure shall not vary by more than 2,000 psi from the average port pressure of the sample test cartridges of the same lot conditioned at 70 degrees plus or minus 2 degrees F, and shall not be less than 14,600 psi."

PAGE 9

Table I Delete "sheet 1 of 4" and substitute "sheet 1 of 5".

Delete the following:

"Diameter	25	0-1	3.2	Standard Measurement Test Equipment (SMTE)
Base thickness	25	0-1	3.2	SMTE
Base thickness variation	25	0-1	3.2	SMTE
Wall thickness at chamber	25	0-1	3.2	SMTE
Weight	25	0-1	3.2	SMTE"

Add the following:

"Variation in wall thickness(see note 4 on Dwg. 9349678/9392530)	25
0-1 3.2 Standard Measurement Test Equipment(SMTE)"	

Add sheet 2 of 5 included as page 3 (see attached classification of Characteristics sheet).

PAGE 10

Table I Delete "sheet 2 of 4" and substitute "sheet 3 of 5".

PAGE 11

Table I Delete "sheet 3 of 4" and substitute "sheet 4 of 5".

PAGE 12

Table I Delete "sheet 4 of 4" and substitute "sheet 5 of 5".

Under Examination or Test Column, delete "Critical" and substitute "Critical/Special".

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TABLE I First article inspection  
CLASSIFICATION OF CHARACTERISITICS

Title: Jacket

Sheet 2 of 5

Drawing Number  
9349657/9392529

Next Higher Assembly  
9349678/9392530

Examination or Test	Conformance Criteria	Requirement Paragraph	Inspection Method Reference
Weight	25 0-1	3.2	SMTE

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PAGE 13

4.5.6 Delete the last sentence and substitute the following:

"If a visual critical or special defect is found in a sample either just prior to a firing test or after a firing test (and the defect is not due to the firing), the lot shall be rejected."

PAGE 15

Delete page 15 in its entirety and substitute new page 15 included as page 5.

PAGE 17

4.5.6.1 Characteristic 215 Delete: "No waterproofing material (primer pocket joint) (37)" and substitute: "Insufficient/smeared waterproofing material (primer pocket joint) (37)".

Characteristic 218 Delete "Missing or improper color of bullet tip" and substitute "Missing or improper bullet tip ID (see note 4)".

Note 4 A cartridge is acceptable if it is missing up to 10% of the required bullet identification prior to linking, clipping or insertion into cartons; up to 40% following any necessary handling or orientation and after linking or clipping, or insertion into cartons."

Add the following characteristics:

"220	Draw scratch (8)	Level II	3.1	Visual"
"221	Workmanship	Level II	3.1	Visual"

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QUALITY CONFORMANCE INSPECTION  
CLASSIFICATION OF CHARACTERISITICS

Paragraph 4.5.6.1	Title: Cartridge, 5.56mm, Ball: M885 (Inspection)	Sheet 1 of 3	Drawing Number 9342868	
Classification	Examination or Test	Conformance Criteria	Requirement Paragraph	Inspection Method Reference
CRITICAL				
1.	Perforated case (7)	100%	3.1	Gage
2.	Case split in K,L or M location (6)	100%	3.1	Gage
3.	Weight, min 1/	100%	3.1	see note 2/
4.	Case split I,S or J location when it is determined that there is a potential for loss of propellant (6).	100%	3.1	Gage
SPECIAL				
a.	Primer missing (32)	100%	3.1	Visual
b.	Primer cocked (33)	100%	3.1	Visual
c.	Primer inverted (34)	100%	3.1	Visual
MAJOR				
101.	Total length	Level I	3.1	Gage
102.	Case split in I,S or J location when it is determined that there is no potential for loss of propellant (6)	100%	3.1	Gage
103.	Corrosion or stain with etching (2)	Level I	3.1	Visual
104.	Chamfer missing on head (rim) (13)	Level I	3.1	Visual

NOTE:

1/ Each lightweight cartridge shall be disassembled and the propellant weighed. Any cartridge containing less than 13 grains of propellant shall be classed as a critical defect. Any cartridge containing 13 grains or more of propellant shall be classed as a major defect.

2/ One hundred percent examination for weight may be either by weighing or by measuring for propellant fill; method used must be capable of detecting a cartridge containing less than 13 grains of propellant.

3/ Refer to MIL-STD-636 (NATO Caliber 7.62 Section) for visual defect standards for defects 1 through 38. Inspection for visual defects may be performed employing an automated inspection system that has been approved by the Government.

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PAGE 19

Table III Under Test column, add "3/" after CETME L5.56.

PAGE 20

Table III Note 2 Change the first sentence to read:

"The acceptance and retest numbers of Table IV shall be applied to the M249 results (all temperatures combined) and the M16A2 results (all temperatures combined) individually except where noted to combine them."

PAGE 22

\* Table IV Under "3a. Perforation of firing pin indent in primer cup" Delete the following:

"(1) M249 Machine Gun 0 see 3/ 1" and substitute  
 "(1) M249 Machine Gun 22 28 (see 3/) 40"

3c Delete in its entirety and substitute the following:

"c. Escape of gas around primer cup	First Sample		Retest
	Accept	Reject	Accept
(1) Total number of all leakers			
M16A2 Rifle	8	16	22
M249 Machine gun	17	35	67
(2) Number of leakers that cover 50% or more of the periphery			
M16A2 Rifle	3	7	9
M249 Machine gun	3	7	9"

Add the following new defect at the end of the Table:

"7. Total defects for both M16 Rifle and M249 Machine gun combined	35	75	140"
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PAGE 23

Note 3 Delete in its entirety and substitute the following:

"If defects in excess of the acceptance number in Table IV are noted in the first sample, a second sample consisting of double the quantity of cartridges specified under function and casualty in Table III shall be fired in both weapons. Prior to the testing of the second sample, the firing pin of the specific weapon in which the defect occurred shall be replaced with a new firing pin. If the cumulative number of defects from both the first and second sample exceeds the cumulative acceptance number in Table IV, the lot shall be rejected."

PAGE 24

4.5.9 Delete first sentence in its entirety and substitute the following:

"The inspection equipment required to perform the inspections specified herein is identified in the "Inspection Method Reference" column of the

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Classification of characteristics in Table I, 4.5.6.1 and 4.5.6.2."

PAGE 25

6.3 Delete "Commander, U.S. Army ARDEC, ATTN: SMCAR-QAF-I, Picatinny Arsenal, N.J. 07806-5000" and substitute "Commander, U.S. Army TACOM-ARDEC, ATTN: AMSTA-AR-QAC-C, Picatinny Arsenal, N.J. 07806-5000."

PAGE 26

6.6 Delete "Commander, ARDEC, ATTN: SMCAR-QAF-S, Picatinny Arsenal, N.J. 07806-5000" and substitute "Commander, U.S. Army TACOM-ARDEC, ATTN: AMSTA-AR-QAC-C, Picatinny Arsenal, N.J. 07806-5000."

The margins of this amendment are marked with an asterisk or vertical lines to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

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