

MIL-C-63239B(AR)  
5 November 1984  
SUPERSEDING  
MIL-C-63239A(AR)  
25 May 1982

## MILITARY SPECIFICATION

### CARTRIDGE, 40MM, PRACTICE, M781 METAL PARTS AND LOADING, ASSEMBLING AND PACKAGING

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 This specification covers requirements, quality assurance provisions, packaging, the fabrication, manufacture of one type of cartridge designated as Cartridge, 40MM, Practice, M781.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specification and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitations, form a part of this specification to the extent specified herein.

#### SPECIFICATIONS

##### MILITARY

MIL-P-116	-	Preservation - Packaging, Methods of
MIL-C-5541	-	Chemical Conversion Coatings and Aluminum and Aluminum Alloys
MIL-P-20444	-	Primer, M42

FSC 1310

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, US Army Armament Research and Development Center, Attn. DRSMC-QA, Dover, New Jersey 07801 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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MIL-A-48078	-	Ammunition, Standard Quality Assurance Provisions, General Specification for
MIL-T-12879	-	Treatment, Chemical Prepaint and Corrosion Inhibitive for Zinc Surfaces

## STANDARDS

## MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes
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2.1.2 Other Government documents, drawings and publications.  
The following other Government documents form a part of this specification to the extent specified herein:

## DRAWING (SEE 6.10)

## U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT CENTER (ARDC)

## PRODUCT AND PACKING DRAWINGS

9209204	-	Box, Ammo, Metal for Cartridge, 40MM, White Star, Cluster or Smoke Canopy or Parachute or Practice
9209205	-	Box, Wirebound, Packing, Ammunition for Cartridge, 40MM, White Star, Cluster or Smoke Canopy or Parachute or Practice
9322240	-	Cartridge, 40MM, Practice, M781
9325894	-	Box, Fiber, Packing Ammunition for Cartridge, 40MM (Inner)
9325896	-	Box, Wirebound, Packing, Ammunition for Cartridge, 40MM (Outer)

## INSPECTION EQUIPMENT DRAWINGS

8827889	-	Chamber Gage
8827890	-	Alignment Check
8827895	-	Limit Checks
9202770	-	Chamber Gage (Alternate)
9202783	-	Alignment Check (Alternate)

## CODE OF FEDERAL REGULATIONS

TITLE 49	-	Transportation, Parts 100-199
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(The Code of Federal Regulations is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Orders should specify, "49 CFR 100-199 (latest revision)").

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

## AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM B 117	-	Standard Method of Salt Spray (Fog) Testing
ASTM E 10	-	Method of Tests for Brinell Hardness of Metallic Materials

(Application for copies should be addressed to: American Society for Testing and Materials, 1916 Race Street Philadelphia, PA. 19103.)

2.1.3 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 shall take precedence.

## 3. REQUIREMENTS

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

3.2 Cartridge. The cartridge shall comply with all requirements specified on Drawing (Dwg.) 9322240, all associated drawings, and with all requirements in applicable specifications.

3.3 Primer functioning. The primer shall function without evidence of squibbing or hangfire. Paragraph 6.6 of MIL-P-20444 contains definitions of functioning failures (when applicable).

3.4 Functioning. The cartridge shall function satisfactorily and the projectile shall have a mean velocity of 247 plus or minus (+) 7 feet-per-second (f.p.s.) and a standard deviation not exceeding 4.5 f.p.s.

3.4.1 Hot temperature (105° + 5°F). The cartridge shall function satisfactorily with no cracked cartridge case wall extending into extraction groove. Mean velocity and standard deviation shall be taken for informational purposes only

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3.4.2 Ambient temperature ( $70^{\circ} + 5^{\circ}\text{F}$ ). The cartridge shall comply with the requirements of 3.4 with no cracked cartridge case wall extending into extraction groove.

3.4.3 Cold temperature ( $-5^{\circ} + 5^{\circ}\text{F}$ ). The cartridge shall function satisfactorily with no cracked cartridge case wall extending into extraction groove. Mean velocity and standard deviation shall be taken for informational purposes.

3.5 Production control check on loaded M212 cartridge cases. There shall be no evidence of a primer malfunction.

3.6 Firing test (cartridge case loading assembly M212). The cartridge case loading assembly shall function and the projectile shall have a mean velocity of  $247 \pm 7$  feet-per-second.

3.6.1 Hot temperature ( $125^{\circ} + 5^{\circ}\text{F}$ ). The cartridge case loading assembly shall function with no cracked cartridge case wall extending into extraction groove. Mean velocity shall be taken for informational purposes only.

3.6.2 Ambient temperature ( $70^{\circ} + 5^{\circ}\text{F}$ ). The cartridge case loading assembly shall comply with the requirements of 3.6 with no cracked cartridge case wall extending into extraction groove.

3.6.3 Cold temperature ( $-5^{\circ} + 5^{\circ}\text{F}$ ). The cartridge case loading assembly shall function with no cracked cartridge case wall extending into extraction groove. Mean velocity shall be taken for informational purposes only.

3.7 First article inspection. This specification contains technical provisions for first article inspection. Requirements for the submission of first article samples by the contractor shall be as specified in the contract. (See 4.3 and 6.1 )

3.8 Workmanship. All parts and assemblies shall be fabricated, loaded and assembled in a thorough, workmanlike manner. They shall be free of burrs, sharp edges, cracks, dirt, grease, rust, and other foreign matter. The cleaning method used shall not be injurious to any parts, nor shall the parts be contaminated by the cleaning agents. Exterior surface coatings shall be continuous; however, a few light scratches not exposing base material may be permitted. All required marking and stamping shall be neat and sharply defined.

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## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection and standard quality assurance provisions. Unless otherwise specified herein or in the contract, the provisions of MIL-A-48078 shall apply and are hereby made a part of this detail specification.

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

- a. First Article Inspection (See 4.3)
- b. Quality Conformance Inspection (See 4.4)

4.3 First article inspection.

4.3.1 Submission. The contractor shall submit a first article as designated by the Contracting Officer for evaluation in accordance with the provisions of 4.3.2. The first article sample shall consist of the following items in sample quantities as indicated.

<u>Part Description</u>	<u>Drawings</u>	<u>Quantity</u>
Windshield	9322236	25
Body and Band Assembly (when applicable)	9354247	25
Body (when applicable)	9352746	25
Rotating Band (when applicable)	9352745	25
Body Assembly (when applicable)	9310344	25
Body Assembly (when applicable)	9381595	25
Body (when applicable)	9381596	25
Insert (when applicable)	9381597	25
Windshield (when applicable)	9381598	25
Cartridge Case Loading Assembly, M212	9322239	300 (50 Hot) (200 Ambient) (50 Cold)

4.3.2 Inspections to be performed. See MIL-A-48078 and Table I herein.

4.3.3 Rejection. See MIL-A-48078 and the following:

4.3.3.1 Firing test (cartridge case loading assembly, M212).

a. Any primer blow back in any phase (as evidenced by perforation of the cup and extrusion of the primer around firing pin causing difficulty in opening weapon).

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b. Mean velocity fails to meet the applicable requirement (ambient only, informational in hot and cold phase).

c. Any primer misfires in any phase.

d. Thirty (30) or more cartridge cases cannot be ejected from the launcher by spring operation of the extractor.

e. One (1) or more cartridge cases cannot be ejected from the launcher by hand operation of the extractor.

f. Any cracked cartridge case wall extending into extraction groove in any temperature phase.

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

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PARAGRAPH	TITLE		SHEET 1 OF 2		DRAWING NUMBER SEE BELOW
	Cartridge and Components				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
7	<u>Windshield (Dwg. 9322236)</u> <u>Examination for defects</u>	25			4.4.2.1
	<u>Cartridge Case Loading Assembly, M212</u> <u>(Dwg. 9322239)</u>				
	<u>Firing Test</u>	300			
	Hot (105° + 5°F)	50	4.3.3.1	3.6.1	4.5.8
	Ambient (70° + 5°F)	200	4.3.3.1	3.6.2	4.5.8
	Cold (-5° + 5°F)	50	4.3.3.1	3.6.3	4.5.8
	<u>Rotating Band (Dwg. 9352745)</u> <u>(when applicable)</u>				
	<u>Examination for defects</u>	25			4.4.2.2
	<u>Body (Dwg. 9352746) (when applicable)</u> <u>Examination for defects</u>	25			4.4.2.3
	<u>Body and Band Assembly (Dwg. 9354247)</u> <u>(when applicable)</u>				
	<u>Examination for defects</u>	25			4.4.2.4
	<u>Body Assembly (Dwg. 9381595)</u> <u>(when applicable)</u>				
	<u>Examination for defects</u>	25			4.4.2.8
NOTES:					

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

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PARAGRAPH	TITLE  Cartridge and Components		SHEET 2 of 2		DRAWING NUMBER SEE BELOW
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
	<u>Body (Dwg. 9381596) (when applicable)</u> Examination for defects Salt spray	25 5			4.4.2.6 4.5.6
	<u>Insert (Dwg. 9381597) (when applicable)</u> Examination for defects	25			4.4.2.7
	<u>Windshield (Dwg. 9381598) (when applicable)</u> Examination for defects	25			4.4.2.9
	<u>Body Assembly (Dwg. 9310344) (when applicable)</u> Examination for defects Salt Spray	25 5			4.4.2.11 4.5.6
NOTES:					



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4.4 Quality conformance inspection.

4.4.1 Inspection lot formation. Inspection lots shall comply with the lot formation provisions of MIL-A-48078. Each inspection lot shall contain:

a. Cartridge cases from one interfix lot number from one manufacturer.

b. Projectile parts from one interfix lot number from one manufacturer.

c. Primers from one lot number from one manufacturer.

d. Propellant from one lot number from one manufacturer.

e. Loaded cartridge case assemblies from one interfix lot number from one manufacturer.

4.4.2 Examination. See MIL-A-48078.

a. Sampling plans. Unless otherwise specified in the Classification of Defects and Test Tables, sampling plans for major and minor defects shall be in accordance with MIL-STD-105, Inspection Level II.

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER 9322236
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	NEXT HIGHER ASSEMBLY 9354248 or 9310345
					PARAGRAPH REFERENCE /INSPECTION METHOD
4.4.2.1	Windshield				
<u>Critical</u>	None defined	See 4.5.1			
<u>Major</u>					
101.	Outside diameter		0.40%	3.2	Gage
102.	Diameter large cavity		0.40%	3.2	Gage
103.	Large wall thickness		0.40%	3.2	Gage
104.	Wall thickness, from bottom of large cavity		0.40%	3.2	Gage
<u>Minor</u>					
201.	Concentricity of large cavity with outside diameter		0.65%	3.2	Gage
202.	Evidence of poor workmanship		0.65%	3.8	Visual
NOTES:					

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DRSMC-0A (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION  
**CLASSIFICATION OF DEFECTS & TESTS**

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<b>PARAGRAPH</b>	<b>TITLE</b>		<b>SHEET 1 OF 1</b>		<b>DRAWING NUMBER</b> 9352745
4.4.2.2	Rotating Band (when applicable)				<b>NEXT HIGHER ASSEMBLY</b> 9354247
<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>
<u>CRITICAL</u>	None defined				
<u>MAJOR</u>		See 4.5.1			
101.	Width of band		0.40%	3.2	Gage
<u>MINOR</u>		See 4.5.1			
201.	Smallest outside diameter		0.65%	3.2	Gage
202.	Serrations missing		0.65%	3.2	Visual
203.	Evidence of poor workmanship		0.65%	3.8	Visual
<b>NOTES:</b>					

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH 4.4.2.3	TITLE Body (when applicable)		SHEET 1 OF 1		DRAWING NUMBER 9352746
					NEXT HIGHER ASSEMBLY 9354247
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>CRITICAL</u>	None defined				
<u>MAJOR</u>		See 4.5.2			
101.	Diameter of cartridge case groove		0.40%	3.2	Gage
102.	Rear diameter		0.40%	3.2	Gage
<u>MINOR</u>		See 4.5.2			
201.	Serrations missing		0.65%	3.2	Visual
202.	Evidence of poor workmanship		0.65%	3.8	Visual
NOTES:					

NRSMC-0A (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH 4.4.2.4	TITLE Band and Body Assembly (when applicable)		SHEET 1 OF 1		DRAWING NUMBER 9354247
					NEXT HIGHER ASSEMBLY 9354248
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>CRITICAL</u>	None defined				
<u>MAJOR</u>					
101.	Diameter of rotating bands		0.40%	3.2	Gage
102.	Forward diameter of rotating bands		0.40%	3.2	Gage
103.	Position of rear diameter of body with rotating band		0.40%	3.2	Gage
104.	Diameter between rotating bands		0.40%	3.2	Gage
<u>MINOR</u>					
201.	Total length		0.65%	3.2	Gage
202.	Crimp of rotating band not fully 360°		0.65%	3.2	Visual
203.	Evidence of poor workmanship		0.65%	3.8	Visual
NOTES:					

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH	TITLE			SHEET 1 OF 1		DRAWING NUMBER 9354248
4.4.2.5	Projectile Assembly (when applicable)					NEXT HIGHER ASSEMBLY 9322240
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD	
<u>Critical</u>	None defined					
<u>Major</u>						
101.	Total weight of projectile incorrect (when applicable)		0.40%	3.2	Balance	
<u>Minor</u>						
201.	Windshield not fully seated to rotating band		0.65%	3.2	Visual	
202.	Windshield loose		0.65%	3.2	Visual	
203.	Evidence of poor workmanship		0.65%	3.8	Visual	
NOTES:						

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH 4.4.2.6	TITLE Body		SHEET 1 OF 1		DRAWING NUMBER 9381596
					NEXT HIGHER ASSEMBLY 9381595
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>Critical</u>	None defined				
<u>Major</u>					
101.	Salt spray	Note 1		3.2	4.5.6
102.	Runout of inside diameter with rotating bands	See 4.4.2	0.40%	3.2	Gage
<u>Minor</u>					
201.	Diameter of cavity		0.65%	3.2	Gage
202.	Width of bands		0.65%	3.2	Gage
203.	Total length		0.65%	3.2	Gage
204.	Evidence of poor workmanship		0.65%	3.2	Visual
205.	Diameter of insert cavity		0.65%	3.2	Gage
<b>NOTES:</b> 1. Sampling and rejection shall be in accordance with MIL-T-12879.					

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PARAGRAPH 4.4.2.7	TITLE Insert		SHEET 1 of 1		DRAWING NUMBER 9381597
					NEXT HIGHER ASSEMBLY 9381595
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>CRITICAL</u>	None defined				
<u>MAJOR</u>	None defined				
<u>MINOR</u>					
201.	Diameter		0.65%	3.2	Gage
202.	Evidence of poor workmanship		0.65%	3.8	Visual
NOTES:					



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**CLASSIFICATION OF DEFECTS & TESTS**

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<b>PARAGRAPH</b> 4.4.2.8	<b>TITLE</b> Body Assembly (when applicable)		<b>SHEET</b> 1 <b>OF</b> 1		<b>DRAWING NUMBER</b> 9381595 <b>NEXT HIGHER ASSEMBLY</b> 9381594 <b>PARAGRAPH REFERENCE / INSPECTION METHOD</b>
<b>CATEGORY</b>	<b>EXAMINATION OR TEST</b>	<b>NO. OF SAMPLE UNITS</b>	<b>AQL OR 100%</b>	<b>REQUIREMENT PARAGRAPH</b>	
<u>CRITICAL</u>	None defined				
<u>MAJOR</u>					
101.	Diameter forward of rotating bands		0.40%	3.2	Gage
102.	Diameter of rear of rotating bands		0.40%	3.2	Gage
103.	Diameter of rotating bands		0.40%	3.2	Gage
104.	Diameter between rotating bands		0.40%	3.2	Gage
105.	Diameter of cartridge case snap groove		0.40%	3.2	Gage
106.	Diameter of windshield snap groove		0.40%	3.2	Gage
<u>MINOR</u>					
201.	Stake missing or inadequate		0.65%	3.2	Visual
202.	Evidence of poor workmanship		0.65%	3.8	Visual
<b>NOTES:</b>					

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## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER 9381598
4.4.2.9	Windshield				NEXT HIGHER ASSEMBLY 9381594
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>Critical</u>	None defined				
<u>Major</u>					
101.	Outside diameter	4.5.1	0.40%	3.2	Gage
102.	Diameter large cavity	4.5.1	0.40%	3.2	Gage
103.	Wall thickness through bottom	4.5.1	0.40%	3.2	Gage
104.	Wall thickness from bottom of cavity	4.5.1	0.40%	3.2	Gage
105.	Diameter of inside lip	4.5.1	0.40%	3.2	Gage
<u>Minor</u>					
201.	Runout of large cavity with outside diameter		0.65%	3.2	Gage
202.	Evidence of poor workmanship		0.65%	3.8	Visual
NOTES:					

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<b>PARAGRAPH</b> 4.4.2.10	<b>TITLE</b> Projectile Assembly (when applicable)		SHEET 1 OF 1		<b>DRAWING NUMBER</b> 9381594  <b>NEXT HIGHER ASSEMBLY</b> 9322240
<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>
<u>Critical</u>	None defined				
<u>Major</u>					
101.	Total weight of projectile incorrect (when applicable)		0.40%	3.2	Balance
102.	Windshield loose		0.40%	3.2	Manual-Visual
<u>Minor</u>					
201.	Windshield not fully seated to rotating band		0.65%	3.2	Visual
202.	Evidence of poor workmanship		0.65%	3.8	Visual
<b>NOTES:</b>					

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PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.11	Body Assembly (when applicable)				9310344
					NEXT HIGHER ASSEMBLY 9310345
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>CRITICAL</u>	None defined				
<u>MAJOR</u>					
101.	Diameter forward of rotating bands	Note 1	0.40%	3.2	Gage
102.	Diameter rear of rotating bands		0.40%	3.2	Gage
103.	Diameter of rotating bands		0.40%	3.2	Gage
104.	Diameter between rotating bands		0.40%	3.2	Gage
105.	Diameter of cartridge case snap groove		0.40%	3.2	Gage
106.	Salt spray			3.2	4.5.6
<u>MINOR</u>					
201.	Location of rotating bands		0.65%	3.2	Gage
202.	Evidence of poor workmanship		0.65%	3.8	Visual

## NOTES:

1. Sampling and rejection shall be in accordance with MIL-T-12879.

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<b>PARAGRAPH</b>	<b>TITLE</b>	<b>SHEET</b> 1 <b>OF</b> 1		<b>DRAWING NUMBER</b> 9310345 <b>NEXT HIGHER ASSEMBLY</b> 9322240	
<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>
<u>Critical</u>	None defined				
<u>Major</u>					
101.	Total weight of projectile incorrect (when applicable)		0.40%	3.2	Balance
102.	Windshield loose		0.40%	3.2	Manual-Visual
<u>Minor</u>					
201.	Evidence of poor workmanship		0.65%	3.8	Visual
<b>NOTES:</b>					

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PARAGRAPH 4.4.2.13	TITLE .38 Caliber loaded case assembly		SHEET 1 of 1		DRAWING NUMBER 9322238
					NEXT HIGHER ASSEMBLY 9322239
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>Critical</u>					
1.	Primer above flush		100%	3.2	Gage
<u>Major</u>					
101.	Primer more than .003 below surface of case		0.40%	3.2	Gage
102.	Propellant weight	4.4. 3.1		--	3.2 4.4.3.1, 6.9
102.	Propellant weight (alternate method)	4.4. 3.2		--	3.2 4.4.3.2, 6.9
<u>Minor</u>					
201.	Total length		0.65%	3.2	Gage
202.	Evidence of poor workmanship		0.65%	3.8	Visual
NOTES:					

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<b>PARAGRAPH</b>	<b>TITLE</b>				<b>DRAWING NUMBER</b>
4.4.2.14	Cartridge Case Loading Assembly			SHEET 1 OF 1	9322239
					<b>NEXT HIGHER ASSEMBLY</b>
					9322240
<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>
<u>Critical</u>	None defined				
<u>MAJOR</u>					
101.	.38 Caliber case assembly above outer surface of case		0.40%	3.2	Gage
102.	.38 Caliber case assembly more than .008 below outer surface of case		0.40%	3.2	Gage
103.	Production control check	4.4. 3.5	--	3.5	4.4.3.5 and 4.5.3
<u>MINOR</u>					
201.	Lacquer missing		0.65%	3.2	Visual
202.	Marking misleading or unidentifiable		0.65%	3.2	Visual
203.	Evidence of poor workmanship		0.65%	3.8	Visual
<b>NOTES:</b>					

QUALITY CONFORMANCE INSPECTION  
**CLASSIFICATION OF DEFECTS & TESTS**

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<b>PARAGRAPH</b>	<b>TITLE</b>		<b>SHEET</b> 1 of 1		<b>DRAWING NUMBER</b> 9322240
					<b>NEXT HIGHER ASSEMBLY</b> --
<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>
<u>Critical</u>					
1.	Chamber gage failure (after complete cure)		100%	3.2	8827889, 8827890, 8827895, 9202770, 9202783
<u>Major</u>					
101.	Projectile assembly loose		0.40%	3.2	Manual
102.	Functioning (Hot, Ambient, Cold)	4.4. 3.6 4.4. 3.7		3.4	4.4.3.6, 4.4.3.7 and 4.5.10
103.	Total weight (when applicable)		0.40%	3.2	Balance
<u>Minor</u>					
201.	Total length		0.65%	3.2	Gage
202.	Marking misleading or unidentifiable		0.65%	3.2	Visual
203.	Evidence of poor workmanship		0.65%	3.8	Visual
204.	Gap		0.65%	3.2	Visual
205.	Cartridge case not fully seated to rotating band (when applicable)		0.65%	3.2	Visual
<b>NOTES:</b>					

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DRSMC-0A (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.



## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER 9325894
4.4.2.16	Unsealed fiber box				NEXT HIGHER ASSEMBLY --
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>Critical</u>	None defined				
<u>Major</u>					
101.	Improper number of cartridges		0.40%	3.2	Visual
102.	Separator missing		0.40%	3.2	Visual
<u>Minor</u>	None defined				
NOTES:					

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH 4.4.2.17	TITLE Sealed Fiber Box, Prior to Sealing Bag		SHEET 1 OF 1		DRAWING NUMBER 9325894
					NEXT HIGHER ASSEMBLY --
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>Critical</u>	None defined				
<u>Major</u>					
101.	Heat seal test of packing seals (after sealing bag)	<u>1/</u>	<u>1/</u>	3.2	4.5.4
102.	Container damaged		0.40%	3.2	Visual
103.	Corners not blunted		0.40%	3.2	Visual
<u>Minor</u>					
201	Contents loose		0.65%	3.2	Manual
202	Marking misleading or unidentifiable		0.65%	3.2	Visual
<b>NOTES:</b> <u>1/</u> Sampling and rejection shall be in accordance with MIL-P-116.					

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DRSMC-0A (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION**CLASSIFICATION OF DEFECTS & TESTS**

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<b>PARAGRAPH</b> 4.4.2.18	<b>TITLE</b> Unsealed wooden box, packing box		<b>SHEET</b> 1 <b>OF</b> 1		<b>DRAWING NUMBER</b> 9325896
<b>CATEGORY</b>	<b>EXAMINATION OR TEST</b>	<b>NO. OF SAMPLE UNITS</b>	<b>AQL OR 100%</b>	<b>REQUIREMENT PARAGRAPH</b>	<b>NEXT HIGHER ASSEMBLY</b>  <b>PARAGRAPH REFERENCE /INSPECTION METHOD</b>
<u>Critical</u>  <u>Major</u>  101.  102.  103.	None defined   Marking of bag misleading or unidentifiable Bag torn or perforated Bag improperly sealed		0.65% 0.65% 0.65%	3.2 3.2 3.2	Visual Visual Visual
<b>NOTES:</b>					

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH	TITLE	SHEET 1 OF 1			DRAWING NUMBER
4.4.2.19	Sealed Wooden Box, Packing Box				9325896
					NEXT HIGHER ASSEMBLY
					--
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>Critical</u>	None defined				
<u>Major</u>					
101.	Box damaged		0.40%	3.2	Visual
<u>Minor</u>					
201.	Contents loose		0.65%	3.2	Manual
202.	Car seal missing or improperly positioned		0.65%	3.2	Visual
203.	Marking misleading or unidentifiable		0.65%	3.2	Visual
NOTES:					

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH 4.4.2.20	TITLE Unsealed Metal Box (when applicable)		SHEET 1 OF 1		DRAWING NUMBER 9209204
					NEXT HIGHER ASSEMBLY --
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE / INSPECTION METHOD
<u>Critical</u>	None defined				
<u>Major</u>					
101	Incorrect number of cartridges		0.40%	3.2	Visual
102	Desiccant bags missing		0.40%	3.2	Visual
103	Rubber gasket damaged or improperly assembled		0.40%	3.2	Visual
<u>Minor</u>					
201	Fillers missing		0.65%	3.2	Visual
202	Tube missing		0.65%	3.2	Visual
NOTES:					

## QUALITY CONFORMANCE INSPECTION

## CLASSIFICATION OF DEFECTS &amp; TESTS

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PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER 9209204
4.4.2.13	Sealed Metal Box (when applicable)				NEXT HIGHER ASSEMBLY --
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
<u>Critical</u>	None defined				
<u>Major</u>					
101	Air pressure	1/	1/	3.2	4.5.9
<u>Minor</u>					
201	Marking misleading or unidentifiable		0.65%	3.2	Visual
202	Contents loose		0.65%	3.2	Manual
<b>NOTES:</b> 1/ One (1) packed, sealed box shall be selected from each twenty (20) boxes packed. If one (1) box fails, the quantity represented by the sample shall be rejected.					

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**CLASSIFICATION OF DEFECTS & TESTS**

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<b>PARAGRAPH</b> 4.4.2.22	<b>TITLE</b> Sealed Wooden Packing Box (when applicable)		<b>SHEET 1 OF 1</b>		<b>DRAWING NUMBER</b> 9209205 <b>NEXT HIGHER ASSEMBLY</b> -- <b>PARAGRAPH REFERENCE / INSPECTION METHOD</b>
<b>CATEGORY</b>	<b>EXAMINATION OR TEST</b>	<b>NO. OF SAMPLE UNITS</b>	<b>AQL OR 100%</b>	<b>REQUIREMENT PARAGRAPH</b>	
<u>Critical</u>	None defined				
<u>Major</u>	None defined				
<u>Minor</u>					
201	Marking misleading or unidentifiable		0.65%	3.2	Visual
202	Contents loose		0.65%	3.2	Visual
203	Dot marking missing		0.65%	3.2	Visual
<b>NOTES:</b>					

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4.4.3 Testing

4.4.3.1 Propellant weight of .38 cal. case assembly. The propellant weight shall be determined and then check weighed 100 percent. The check weighing shall be accomplished independently of the original weighing or determination using a different balance from what used to make the original weighing and if performed manually, shall be performed by another operator. Any charge which fails to comply with the requirement specified on Dwg. 9322238 shall be classed defective and removed from the lot.

4.4.3.2 Propellant weight of .38 cal. case assembly, alternate method. At the start of production, three hundred eighty (380) consecutive samples per station per machine shall be selected and weighed 100 percent. If all samples comply with the drawing requirement, five (5) samples, per station, per every two (2) hours production shall be selected and the average weight of the five (5) samples must meet the assessed mean propellant weight within  $\pm 4$  milligrams. If the average weight fails the requirement, correction shall be made and three hundred eighty (380) consecutive samples weighed from that station. If all meet the applicable drawing requirement, the sampling every two (2) hours will be resumed.

4.4.3.3 Check test for deterioration of primers (See MIL-P-20444) (when applicable). If the total time between original acceptance of any lot and the assembly of that lot into the cartridge case exceeds two (2) years, or if the primers have been subjected to adverse conditions, however brief, at anytime since previous tests, the primer lot shall be subjected to and must satisfactorily pass the check test for deterioration specified in MIL-P-20444. This test shall be performed by the contractor on primers selected by the Government at the facility assembling the primer into the cartridge case (See 6.6)

4.4.3.4 Primer functioning (See 3.3). Sampling shall be in accordance with Paragraph 4.2.3.2.2 of MIL-P-20444, except that the sample size shall be eight-hundred (800) primers from each lot. If one or more primers fail to comply with the applicable requirement, the lot shall be rejected. Primers not originally purchased to this requirement shall be tested for the requirement of Paragraph 3.3 (when applicable).

4.4.3.5 Production control check on loaded M212 cartridge case assembly. Five (5) loaded 38 cal case assemblies shall be randomly selected from every two (2) hours production from each primer assembly machine. The loaded .38 cal case assembly produced by each primer assembly machine shall be kept segregated and identified. They shall not be used until this test has been performed. If any sample fails to comply with the applicable requirement, the two hours production represented by the sample shall be rejected.



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4.4.3.6 Functioning. Beginning with the first lot produced and continuing until three (3) consecutive lots have been accepted, the Government inspector shall select tow-hundred and sixteen (216) cartridges from each lot for this test. The cartridges shall be fired using three (3) randomly selected M203 Grenade Launchers, seventy-two (72) cartridges per launcher.

4.4.3.6.1 Hot temperature ( $105^{\circ} + 5^{\circ}\text{F}$ ). Thirty-six (36) samples shall be subjected to this test.

4.4.3.6.2 Ambient temperature ( $70^{\circ} + 5^{\circ}\text{F}$ ). One-hundred and forty four (144) samples shall be subjected to this test.

4.4.3.6.3 Cold temperature ( $-5^{\circ} + 5^{\circ}\text{F}$ ). Thirty-six (36) samples shall be subjected to this test.

4.4.3.6.4 Rejection. The lot shall be rejected if:

a. Twelve (12) or more fail to function at initial impact or functions prior to initial impact. (No emission of dye shall be classed as a low order failure and be placed in a dud category).

b. Any primer blows back in any temperature phase (as evidenced by perforation of the cup or extrusion of primer around firing pin causing difficulty in opening weapon).

c. Mean velocity or standard deviation fail to meet the applicable requirement (ambient phase only, informational in hot and cold phase).

d. Any primer misfires in any temperature phase.

e. (1) Thirty (30) or more cartridge cases cannot be ejected from the launcher by spring operation of the extractor.

(2) One (1) or more cartridge cases cannot be ejected from the launcher by hand operation of the extractor.

f. Any projectile sticks in the gun bore in any temperature phase or fails to attain 60 percent of the mean uncorrected velocity of the lot sample. (A projectile on which a velocity reading was not obtained due to low velocity shall be considered a failure).

g. Three (3) or more primers show any evidence of gas leakage (discoloration of cartridge case base)

h. Any cracked cartridge case wall extending into extraction groove in any temperature phase.

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If the launcher is suspected of being the cause of rejection for the mean velocity and standard deviation phase, sufficient cartridges from a controlled lot shall be fired from the same approved launcher. If there is significant difference in the standard deviation and mean velocity of the control lot from that previously obtained for control rounds, then a new approved launcher shall be obtained and the lot of ammunition retested. If all cartridges function properly on original test, then only the velocity will be considered on retest. If there is no significant difference in the standard deviation or mean velocity of the control lot, then the lot shall be rejected.

4.4.3.7 Functioning, regular production. After three (3) consecutive lots have met the criteria of 4.4.3.6.4, the Government inspector shall select one-hundred and eight (108) cartridges from each lot for this test. The cartridges shall be fired using three (3) randomly selected M203 Grenade Launchers, thirty-six (36) cartridges per launcher.

4.4.3.7.1 Hot temperature (105 + 5 degrees F). Eighteen (18) cartridges shall be subjected to this test.

4.4.3.7.2 Ambient temperature (70 + 5 degrees F). Seventy-two (72) cartridges shall be subjected to this test.

\* 4.4.3.7.3 Cold temperature (-5 + 5 degrees F). Eighteen (18) cartridges shall be subjected to this test.

4.4.3.7.4 Rejection. The lot shall be rejected if:

a. Four (4) or more fail to function at initial impact or functions prior to initial impact. (No emission of dye shall be classified as a low order failure and be placed in a dud category.

b. Any primer blows back in any temperature phase (as evidenced by perforation of the cup or extrusion of primer around firing pin causing difficulty in opening weapon).

c. Mean velocity or standard deviation fail to meet the applicable requirement in ambient phase only. (Informational in hot and cold phase).

d. Any primer misfires in any temperature phase.

e. (1) Five (5) or more cartridge cases cannot be ejected from the launcher by spring operation of the extractor.

(2) One (1) or more cartridge cases cannot be ejected from the launcher by hand operation of the extractor

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f. Any projectile sticks in the gun bore in any temperature phase or fails to attain 60 percent of the mean uncorrected velocity of the lot sample. (A projectile on which a velocity reading was not obtained due to low velocity shall be considered a failure).

g. Three (3) or more primers show any evidence of gas leakage (discoloration of cartridge case base)

h. Any cracked cartridge case wall extending into extraction groove in any temperature phase.

If the launcher is suspected of being the cause of rejection for the mean velocity and standard deviation phase, sufficient cartridges from a controlled lot shall be fired from the same approved launcher. If there is significant difference in the standard deviation and mean velocity of the control lot from that previously obtained for control rounds, then a new approved launcher shall be obtained and the lot of ammunition retested. If all cartridges function properly on original test, then only the velocity will be considered on retest. If there is no significant difference in the standard deviation or mean velocity of the control lot, then the lot shall be rejected.

4.4.4 Inspection equipment. The inspection equipment required to perform the examinations and tests prescribed herein is described in the Paragraph Reference/Inspection Method Column in the tables starting with paragraph 4.4.2.1. The contractor shall submit for approval, inspection equipment designs in accordance with terms of the contract See Section 6 of MIL-A-48078 and 6.3 herein.

#### 4.5 Test methods and procedures.

4.5.1 Dimensional control of molded or plastic parts. In place of the normal sampling and inspections associated with the Classification of Defects, and after a curing time for the parts has been approved (See Note 1) a sample of three (3) parts (as molded) from each cavity shall be fully inspected dimensionally to qualify a new or reworked cavity for use in production. The molded parts shall carry the individual cavity identification. As a control of each cavity during production, the above quantity of parts from each cavity shall be inspected for at least the defects listed in paragraph 4.4.2.2 after continuous production of each 5,000 parts or at the end of each week, whichever occurs first. Of the three (3) samples, one (1) sample shall be the last part produced. If any defective parts are found during qualification of the cavity, the cavity producing the defective part will not be used in production. If any defective parts are found when inspection is performed for the control of the cavity, the cavity producing the defective part shall be removed from production

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Further, that portion of production since the last control check shall be returned to the contractor for inspection for each separate type of defect according to MIL-STD-105, using an AQL of 0.40 percent for each major defect and an AQL of 0.65 percent for each minor defect. All cavities removed from production because of some fault, may, after reworking, be returned to production providing they pass the qualification test above. The contractor may request a change of inspection frequency providing he presents objective evidence to the Contracting Officer to substantiate the request. Contractor designs of gages and test equipment required to perform the inspections listed herein shall be forwarded to Commander, ARDC, Dover, NJ 07801-5001, ATTN: AMSMC-QAF-I(D), for approval prior to manufacture of equipment. The noted sub-paragraphs identify those items and minimum inspections subjected to the requirements of this paragraph.

NOTE 1: In establishing a curing time, dimensionally check ten (10) parts from each cavity at periodic intervals (e.g. every 30, 60, etc mins) until dimensional stability is attained. The curing time will be from the time the part comes out of the mold until dimensional stability is attained. The inspection data used in determining the curing time shall be sent to ARDC, Dover, NJ 07801-5001, ATTN: AMSMC-QAF-S(D). If there is a change in material, or in the cycle time, or if a cavity is reworked, or a new cavity is used, a new curing time shall be established and approved.

4.5.2 Dimensional control of cast parts. In place of the normal sampling associated with the Classification of Defects, and with the approval of the Contracting Officer, a sample of at least ten (10) parts (as cast) from each cavity shall be dimensionally inspected to qualify a new or reworked cavity for use in production. In addition, a random sample of five (5) parts from each cavity after production of 5000 consecutive parts from the cavity shall be selected for dimensional inspection as a control of the cavity during production. Individual cavity identification must be provided.

If any defective parts are found during qualification of the cavity, the cavity producing the defective parts shall not be used in production. If any defective parts are found when inspection is performed for control of the cavity, the cavity producing the defective parts shall be removed from production. Further, that portion of production since the last control check shall be returned to the contractor for corrective action.

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All cavities formerly removed from production because of some fault, may, after reworking, be returned to production providing they pass the qualification test specified above. The contractor may request a change of inspection frequency providing he presents objective evidence to substantiate the request to the Contracting Officer.

4.5.3 Production control check on loaded M212 cartridge case assembly. The loaded .38 cal case assembly shall be assembled to the M212 cartridge case and the assembly fired from an approved launcher placed on an approved mount. Any other method approved by the procuring agency may be used for this test. Observation shall be made for primer functioning. This test is a destructive test. Parts so tested shall not be returned to the lot.

NOTE: No projectile is required for this test.

4.5.4 Primer functioning. Each primer of the 800 samples shall be tested as specified in MIL-P-20444, Paragraph 4.3.2.2 (when applicable).

4.5.5 Heat seal test of packing seals. This test shall be performed in accordance with specification MIL-P-116.

4.5.6 Salt spray. This test shall be conducted in accordance with ASTM B 117 for 48 hours using 5% salt solution.

4.5.7 Hardness. This test shall be conducted in accordance with ASTM E10.

4.5.8 Firing test, (cartridge case loading assembly, M212).

4.5.8.1 Hot temperature (105°F + 5°F). The sample loaded cartridge case assembly shall be assembled to a projectile for which it is standard, packed in their regular fiber box shipping containers and conditioned for a minimum of eight (8) hours at 105 + 5 degrees F. The cartridges shall be taken from the conditioning chamber, removed from the packing containers, then fired within fifteen (15) minutes after being removed from the temperature conditioning from an approved M203 launcher placed on an approved mount to impact at 200 meters minimum from the launcher onto a six inch thick loose gravel pad. The gravel used shall have 1/2 inch maximum stone size. Observation shall be made for the applicable requirement.



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4.5.8.2 Ambient temperature ( $70^{\circ} + 5^{\circ}\text{F}$ ). The sample loaded cartridge case assembly shall be assembled to a projectile for which it is standard, packed in their regular fiber box shipping containers and conditioned for a minimum of eight (8) hours at  $70 + 5$  degrees F. The cartridges shall be taken from the conditioning chamber, removed from the packing containers, then fired within fifteen (15) minutes after being removed from the temperature conditioning from an approved M203 launcher placed on an approved mount to impact at 200 meters minimum from the launcher onto a six inch thick loose gravel pad. The gravel used shall have 1/2 inch maximum stone size. Observation shall be made for the applicable requirement.

4.5.8.3 Cold temperature ( $-5^{\circ} + 5^{\circ}\text{F}$ ). The sample loaded cartridge case assembly shall be assembled to a projectile for which it is standard, packed in their regular fiber box shipping containers and conditioned for a minimum of eight (8) hours at  $-5 + 5$  degrees F. The cartridges shall be taken from the conditioning chamber, removed from the packing containers, then fired within fifteen (15) minutes after being removed from the temperature conditioning from an approved M203 launcher placed on an approved mount to impact at 200 meters minimum from the launcher onto a six inch thick loose gravel pad. The gravel used shall have 1/2 inch maximum stone size. Observation shall be made for the applicable requirement.

The velocity shall be measured at 20 feet from the muzzle of the launcher using two sets of screens, each set of screens having an electronic counter. One set of screen shall be placed 14 and 26 feet from the launcher and the other set 15 and 25 feet from the launcher.

NOTE: To insure that the chronographs are read properly, the ratio of the two times shall not differ from 1.200 by more than plus or minus (+) 0.005. If the ratio differs from 1.200 by more than + 0.005, the velocity results for that round shall be discarded and excluded from the calculation of mean velocity.

4.5.9 Air pressure of packed sealed metal box (when applicable). The sealed metal box shall be placed in an approved fixture and a measured quantity of air shall be applied to produce the required air pressure. Observation shall be made for leakage. This test is a non-destructive test. Boxes so tested may be returned to the lot.

4.5.10 Functioning. The cartridges being tested shall be temperature conditioned as specified in 4.5.8.1, 4.5.8.2, 4.5.8.3 for a minimum of eight (8) hours, taken from the conditioning chamber, removed from the packing containers and fired within

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fifteen (15) minutes after being removed from the temperature conditioning from an approved M203 launcher placed on an approved mount to impact at 200 meters minimum from the launcher onto a six inch thick loose gravel pad. The gravel pad used shall have a 1/2 inch maximum stone size.

The velocity shall be measured at twenty (20) feet from the muzzle of the launcher, using two sets of screens, each set of screens having an electronic counter. One set of screens shall be placed 14 and 26 feet from the launcher and the other set 15 and 25 feet from the launcher. NOTE: To insure that the chronographs are read properly, the ratio of the two times shall not differ from 1.200 by more than plus or minus 0.005. If the ratio differs from 1.200 by more than plus or minus 0.0005, the velocity results for that round shall be discarded and excluded from the calculation of mean velocity and standard deviation (no more than four (4) rounds in a sample size of 72 or eight (8) rounds in a sample size of 144 may be disregarded). If the applicable number of improper ratios is exceeded, additional rounds must be fired. Observation shall be made and results recorded for functioning, mean velocity and standard deviation. The average of all rounds fired per sample (except above noted improper ratio(s)) shall meet the requirements of 3.4 (see 6.7).

4.5.10.1 Test validity. If, for any reason, proving ground considers that the test conditions have detrimentally affected the test results, the test shall be declared invalid and a new test shall be performed with additional samples.

## 5. PACKAGING

### 5.1 Preservation and packaging.

5.1.1 Level A. Preservation and packaging shall be in accordance with Dwg. 9325894 or 9209204 as applicable.

### 5.2 Packing.

5.2.1 Level A. The cartridge shall be packed in accordance with Dwg. 9325896 or 9209205 as applicable.

5.3 Marking. Marking shall be in accordance with Dwg. 9325894 and 9325896 or 9209204 and 9209205 as applicable and Code of Federal Regulations, Title 49, Parts 100-199.

5.4 Unitization. Unitization shall be prescribed by the procuring agency as specified in the contract or order.

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5.5 Shipping. When components from more than one lot are shipped as a carload, each lot shall be kept separate, and the division between lots clearly indicated to prevent mixing of the lots in transit.

## 6. NOTES

6.1 Intended use. This specification covers the metal parts and assembling and packing for Cartridge, 40MM, Practice, M781.

6.2 Ordering data. See MIL-A-48078.

6.3 Submission of inspection equipment designs for approval. See MIL-A-48078(AR). Submit equipment designs as required to Commander, ARDC, ATTN: AMSMC-QAF-I (D), Dover, NJ 07801-5001. Request letter of submittal state contractor, contract number, specification number, item nomenclature and classification of defects or test paragraph.

6.4 Submission of results of contractor-conducted examinations and tests. Unless otherwise specified by the Contracting Officer, the contractor shall forward requested records of examination or tests to Commander, ARDC, ATTN: AMSMC-QAF-S (D)

6.5 Submission of test data. In addition to the normal distribution of records, when the cartridges are procured by AMCCOM (R), one copy of all ballistic data and ammunition data cards shall be forwarded to: Commander, ARDC, ATTN: AMSMC-QAF-S (D) Dover, NJ 07801-5001.

6.6 Cost of check test. The Contracting Officer will arrange for the contractor to be reimbursed for the expense incurred in the performance of the check test for deterioration of the primer assemblies. The tests shall be conducted at government expense without cost to the contractor who loaded the primer assemblies into the cartridge and shall not constitute a basis for rejection against either contractor except where deterioration has occurred as a direct result of carelessness in handling, storage, etc., permitted while the primer assembly lot was under the jurisdiction of either contractor (when applicable).

6.7 Standard deviation shall be calculated from the following formula.

$$S = \sqrt{\frac{\sum (X - \bar{X})^2}{n-1}}$$



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where:  $X$  = each individual value

$\bar{X}$  = sample arithmetic mean  $\frac{\sum X}{n}$

$n$  = sample size

$(X - \bar{X})$  = the sum of the squares of the differences between the sample mean and each individual value.

6.7.1 For a faster and easier method of arriving at the standard deviation formula, the following alternate method may be used:

$$S = \sqrt{\frac{n \sum x^2}{n} - \frac{(\sum x)^2}{(n-1)}}$$

6.8 Combining of proving ground tests. When the contractor for the cartridge is also the contractor for one or more of the components thereof, the proving ground tests of the contractor may be combined with the proving ground tests of the cartridge, to save expense, upon agreement between the procuring activity and the contractor. In cases where the cartridge specification does not cover all of the proving ground tests specified for the component, the additional tests specified in the component specification shall be conducted.

6.9 If any cal case assembly prior to insertion of the primer is suspected of containing an underweight or overweight propellant charge, based on visual inspection it will be removed from the lot and weighed on suitable scales. Any assembly found with less than 75 percent or more than 125 percent of the assessed propellant load will be classified as a critical defect and removed from the lot. Any assembly found to have a propellant weight out of drawing tolerance but within +25 percent of the assessed propellant load will be classified as a major defect and removed from the lot.

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

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6.11 Proving ground test summary:

<u>TEST</u>	<u>SAMPLE SIZE</u>	<u>REQUIREMENTS</u>
<u>Firing test</u>	300	See 3.6
(1) First Article		
a. Hot	50	See 3.6.1 & 4.3.3.1
b. Ambient	200	See 3.6.2 & 4.3.3.1
c. Cold	50	See 3.6.3 & 4.3.3.1
<u>Functioning</u>		
(1) First 3 lots	216	See 3.4
a. Hot	36	See 3.4.1 & 4.4.3.6.4
b. Ambient	144	See 3.4.2 & 4.4.3.6.4
c. Cold	36	See 3.4.3 & 4.4.3.6.4
(2) Regular Production	108	See 3.4
a. Hot	18	See 3.4.1 & 4.4.3.7.4
b. Ambient	72	See 3.4.2 & 4.4.3.7.4
c. Cold	18	See 3.4.3 & 4.4.3.7.4

6.12 First article. When a first article inspection is required, the contracting officer should include specific instructions in acquisition documents regarding arrangement for examinations, test approval of the documents for first article.

6.13 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 1310-A356)

## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER MIL-C-63239B		2. DOCUMENT TITLE CARTRIDGE, 40MM, PRACTICE, M781 METAL PARTS & LAP	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one) <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____	
b. ADDRESS (Street, City, State, ZIP Code)			
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) – Optional		b. WORK TELEPHONE NUMBER (Include Area Code) – Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) – Optional		8. DATE OF SUBMISSION (YYMMDD)	