

INCH-POUND

MIL-C-71139 (AR)  
04 January 1994

## MILITARY SPECIFICATION

CARTRIDGE, 25MM, HIGH EXPLOSIVE INCENDIARY  
TRACER, SELF-DESTRUCT, M792

This specification is approved for use by the U.S. 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 requirements, examinations and tests for one type of percussion primed cartridge for use in 25mm guns (see 6.1).

## 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 document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

## SPECIFICATIONS

## MILITARY

MIL-A-2550	-	Ammunition, General Specification for
MIL-A-48078	-	Ammunition, Standard Quality Assurance Provisions, General Specification for
MIL-P-71136	-	Process Specification Ammunition, 25mm, Packaging, Packing and Marking

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 Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 1305

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## STANDARDS

## MILITARY

- MIL-STD-109 - Quality Assurance Terms and Definitions
- MIL-STD-414 - Sampling Procedures and Tables for Inspections by Variables for Percent Defectives
- MIL-STD-644 - Visual Inspection Standards and Inspection Procedures for Inspection of Packaging, Packing and Marking of Small Arms Ammunition
- MIL-STD-651 - Visual Inspection Standards for 20mm Ammunition and Components
- MIL-STD-1168 - Lot Number of Ammunition

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the DODSSP - Customer Service, Standardization Documents Order Desk, 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 document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

## DRAWINGS (see 6.5)

## U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER (ARDEC)

- 5167214 - Shipping and Storage Container, 25mm, Ammo, Belted with M28 Links Assembly
- 9391400 - Interface Control Drawing, Max. Profile and Alignment, Cartridge, M792, M793 and HPT
- 12013230 - Cartridge, 25mm, High-Explosive Incendiary with Tracer, M792
- 12013668 - Container, Shipping and Storage, Plastic, Linked 25mm Ammunition
- 12013671 - Shipping Container-Linked 25mm Ammunition (50 Rds)
- 12013674 - Shipping Container, Unlinked 25mm Ammunition (80 Rds)
- 12929427 - Packing and Marking for Container, Ammo PA125, for Linked 25mm Ammunition

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## PUBLICATIONS

## FIGHTING VEHICLE SYSTEMS

## AS12013566 - 25mm Ammunition Ballistic Test Methods

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

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained. (See contract provisions for additional precedence criteria.)

## 3. REQUIREMENTS

3.1 General. The cartridge shall be in accordance with Drawing (Dwg.) 12013230, referenced specifications, publications, and other requirements specified herein.

3.2 Manufacturing process. All parts and assemblies shall be manufactured by a process approved by the contracting officer, and no deviations from that process shall be made without his prior approval (see 6.7).

3.3 First article. When specified in the contract or purchase order (see 6.2), a sample shall be subjected to first article inspection in accordance with the technical provisions herein (see 4.3 and 6.4).

3.4 Projectile extraction. The tensile force necessary to extract the projectile from the cartridge case shall be as specified by Dwg. 12013230 (see 4.6.1).

3.5 Projectile torque. The projectile shall withstand the minimum torque as specified by Dwg. 12013230 (see 4.6.3).

3.6 Velocity. The average muzzle velocity of the sample cartridges, conditioned at 18°C to 24°C, shall be  $1100 \pm 25$  meters per second (mps). The sample standard deviation shall not exceed 13 mps (see 4.6.4).

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3.7 Pressure. The average peak chamber pressure of the sample cartridges conditioned at 18° to 24°C, plus 0.72 standard deviation of peak chamber pressure, shall not exceed 402 megapascals (MPa). The average peak chamber pressure of the cartridges, when functioning at any individual temperature from -54° to 62°C, plus five standard deviations of peak chamber pressure, shall not exceed 496 MPa. (Pressure shall be measured with a piezoelectric type pressure transducer or equivalent (see 4.6.4).)

3.8 Waterproofness. The average velocity (wet) of projectiles of the sample cartridges, conditioned at 18° to 24°C, shall not vary from the average velocity (dry) by more than 30.5 meters per second. The action time of the (wet) cartridges shall not exceed 6.0 milliseconds (ms) (see 4.6.4).

3.9 Accuracy. The standard deviation of impacts in both the horizontal and the vertical directions of the sample cartridge projectiles shall not exceed 0.77 milliradians when the sample cartridges are conditioned at 18° to 24°C (see 4.6.5).

3.10 Action time. The action time of the sample cartridges shall not exceed 6.0 milliseconds at any cartridge temperature from -54° to 62°C (see 4.6.6).

3.11 Projectile trace. The projectile shall exhibit a visible trace when viewed against a dark background, for a minimum time of 3.5 seconds (sec) from the gun muzzle at any cartridge temperature from -32° to 52°C (see 4.6.7).

3.12 Projectile function.

3.12.1 Projectile impact function. The projectile shall function upon impact or within one meter of a target of 0.063 inch nominal thickness aluminum plate 2024T3 at 0° ± 10° obliquity, at a distance of 150 to 250 meters at any cartridge temperature from -46°C to +62°C (see 4.6.8).

3.12.2 Projectile self-destruct function. The projectile shall function after 6.2 seconds and prior to impact at any temperature from -46°C to +62°C (see 4.6.8).

3.13 Function and casualty. The cartridge, at 20° ± 10°C shall function without firing defects and casualties (see 4.6.9).

3.14 Workmanship. All parts and assemblies shall be fabricated, loaded, and assembled in a thorough workmanship manner. They shall be free of burrs, sharp edges, cracks, scratches, dents, folds, wrinkles, buckles, dirt, grease, oil,

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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, light scratches not exposing base material may be permitted. All required marking and stamping shall be neat and clearly defined.

#### 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 ensure 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 inspection 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, 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.

4.1.2 General provisions. Unless otherwise specified herein, the provisions of MIL-A-48078 apply and form a part of this specification. Reference shall be made to MIL-STD-109 to define quality assurance terms used herein.

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).

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4.3 First article inspection.

4.3.1 Submission. Prior to production, a sample shall be submitted in accordance with contract requirements and shall consist of 840 cartridges, 125 primed cases and 125 traced projectiles (see 6.3). The sample shall be manufactured using similar equipment, processes and procedures as will be used in production. Identification shall be in accordance with MIL-STD-1168.

4.3.2 Inspections to be performed. The tests listed in Table I shall be performed on the first article sample in accordance with the test methods prescribed in 4.6. Except as otherwise specified, tests shall be conducted with samples at  $20^{\circ} \pm 10^{\circ}\text{C}$ . Approval will be based upon examination of the complete sample for visual and dimensional characteristics listed in 4.4.2 and tests listed in Table I.

4.3.3 Rejection. If any assembly, component or test specimen fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of an assembly, component or test specimen to comply with any of the requirements. In the event of rejection, the Government reserves the right to require the contractor to take corrective action and submit a new First Article quantity.

TABLE I. First article inspection.  
**CLASSIFICATION OF CHARACTERISTICS**

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PARAGRAPH	TITLE	SHEET 1 OF 2		DRAWING NUMBER
	Cartridge, 25mm, High Explosive Incendiary Tracer, Self-destruct, M792			NEXT HIGHER ASSEMBLY
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
	<u>Projectile charged</u>	<u>Acc-Rej</u>		
	Examination for defects	125 0-1	3.1	4.4.2.1
	<u>Case, cartridge, primed</u>			
	Examination for defects	125 0-1	3.1	4.4.2.2
	<u>Cartridge, 25mm, M792</u> (Dwg. 12013230)			
	Examination for defects	125 0-1	3.1	4.4.2.3
	Projectile extraction	32 1-2	3.4	4.6.1
	Propellant contamination	32 0-1	3.14	4.6.2
	Projectile torque	32 1-2	3.5	4.6.3
	Pressure <u>3</u> /	135 0-1	3.7	4.6.4
	Velocity <u>1</u> /	45 0-1	3.6	4.6.4
	Action time <u>3</u> /	135 0-1	3.10	4.6.6
	Waterproofness <u>1</u> /	50 0-1	3.8	4.6.4
	Accuracy <u>1</u> /	40 0-1	3.9	4.6.5
NOTES:				

TABLE I. First article inspection.  
**CLASSIFICATION OF CHARACTERISTICS**

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PARAGRAPH	TITLE	SHEET 2 OF 2		DRAWING NUMBER
	Cartridge, 25mm, High Explosive Incendiary Tracer, Self-destruct, M792			NEXT HIGHER ASSEMBLY
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
	<u>Projectile trace</u>	<u>Acc-Rei</u>	3.11	4.6.7
	-32 deg $\pm$ 3 deg C	50 4-5		
	+20 deg $\pm$ 10 deg C	50 3-4		
	+52 deg $\pm$ 3 deg C	50 4-5		
	<u>Projectile function</u>			
	IMPACT FUNCTION			
	-32 deg C $\pm$ 3 deg C	11 2-3 <u>4/</u>	3.12.1	4.6.8
	+21 deg C $\pm$ 10 deg C	11 2-3		
	+52 deg C $\pm$ 3 deg C	11 2-3		
	-46 deg C $\pm$ 3 deg C	11 3-4		
	+62 deg C $\pm$ 3 deg C	11 3-4		
	SELF DESTRUCT FUNCTION	17 4-5 <u>4/</u>	3.12.2	4.6.8
	-32 deg C $\pm$ 3 deg C	17 4-5		
	+21 deg C $\pm$ 10 deg C	17 4-5		
	+52 deg C $\pm$ 3 deg C	17 4-5		
	-46 deg C $\pm$ 3 deg C	17 4-5		
	+62 deg C $\pm$ 3 deg C			
	FUNCTION/CASUALTY	200 --- <u>2/</u>	3.13	4.6.9

## NOTES:

- 1/ Ammunition shall be conditioned at 18 deg to 24 deg C.
- 2/ The sample shall be rejected if malfunctions or firing casualties in excess of the "acc" number on Table III occur.
- 3/ Forty-five cartridges each shall be conditioned at -54 deg  $\pm$  3 deg C, 21 deg  $\pm$  3 deg C, and +62 deg  $\pm$  3 deg C.
- 4/ When the applicable "Acc" number is exceeded the lot is suspended (see paragraph 4.5.4.3).



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4.4 Quality conformance inspection.

4.4.1 Inspection lot formation. The term "inspection lot" is defined as a homogeneous collection of units of product from which a representative sample is drawn or which is inspected 100 percent to determine conformance with applicable requirements. Units of product selected for inspection shall represent only the inspection lot from which they are drawn and shall not be construed to represent any prior or subsequent quantities presented for inspection. Homogeneity shall be considered to exist provided the inspection lot has been produced by one manufacturer, in one unchanged process, using the same materials and methods, in accordance with the same drawings, same drawing revisions, same specifications and same specification revisions. All material submitted for inspection in accordance with this specification shall comply with the homogeneity criteria specified herein, regardless of the type of inspection procedure which is being applied to determine conformance with requirements.

4.4.1.1 Lot identification. Each cartridge and each packed ammunition lot shall be identified in accordance with applicable drawings and MIL-STD-1168, supplemented as directed by the procuring activity. Each packed lot shall further be identified by a national stock number assigned by the procuring activity.

4.4.1.2 Lot. A lot shall consist of:

- a. Cartridges loaded by one manufacturer, in one unchanged process, in accordance with the same drawings and drawing revisions, and the same specification and specification revision.
- b. Like parts and assemblies (cases; primers; projectiles; tracer and ignition systems) having one manufacturer's symbol and one interfix number.
- c. Fuzes from one lot.
- d. Propellant from one lot.

4.4.2 Examinations and tests.

a. Classification of characteristics. Quality conformance examinations and tests are specified in the following Classification of Characteristics paragraphs. The contractor's quality program or detailed inspection system shall provide assurance of compliance of all characteristics with the applicable drawing and specification requirements utilizing as a minimum the conformance criteria specified. When cited herein, attributes sampling

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inspection shall be conducted in accordance with Table II below, using the inspection levels stated in the Classification of Characteristics paragraphs.

**TABLE II. Attributes sample inspection.**

<u>Lot Size</u>	<u>Inspection Levels</u>		
	<u>II</u>	<u>IV</u>	<u>V</u>
2 to 8	*	*	5
9 to 15	*	8	5
16 to 25	*	8	5
26 to 50	*	8	5
51 to 90	50	8	7
91 to 150	50	12	11
151 to 280	50	19	13
281 to 500	50	21	16
501 to 1200	75	27	19
1201 to 3200	116	35	23
3201 to 10000	116	38	29
10001 to 35000	135	46	35
35001 to 150000	170	56	40
150001 to 500000	200	64	40
500001 and over	244	64	40

Numbers under inspection levels indicate sample size; asterisks (\*) indicate one hundred percent inspection. If sample size exceeds lot size, perform one hundred percent inspection. Accept on zero and reject on one or more for all inspection levels.

b. Alternative quality conformance provisions. Unless otherwise specified herein or provided for in the contract, alternative quality conformance procedures, methods or equipment, such as statistical process control, tool control, other types of sampling plans, etc., may be used by the contractor when they provide, as a minimum, the level of quality assurance required by the provisions herein. Prior to applying such alternative procedures, methods or equipment, the contractor shall describe them in a written proposal submitted to the Government for evaluation (see 6.9). When required, the contractor shall demonstrate that the effectiveness of each proposed alternative is equal to or better than the specified quality conformance provisions(s) herein. In case of dispute as to whether the

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contractor's proposed alternative(s) provides equivalent assurance, the provisions of this specification shall apply. All approved alternative provisions shall be specifically incorporated into the contractor's quality program or inspection system, as applicable.

QUALITY CONFORMANCE INSPECTION  
**CLASSIFICATION OF CHARACTERISTICS**

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PARAGRAPH	TITLE	SHEET 1 OF 1		DRAWING NUMBER
4.4.2.1	Charged Body, Projectile			NEXT HIGHER ASSEMBLY
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
<u>CRITICAL</u>				
1.	HEI charge depth	100%	3.1	Gage
<u>MAJOR</u>				
101.	Improper trace closure, if applicable	Level II	3.1	Visual/Gage
102.	Workmanship	Level V	3.14	Visual
NOTES:				

QUALITY CONFORMANCE INSPECTION  
**CLASSIFICATION OF CHARACTERISTICS**

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PARAGRAPH	TITLE	SHEET 1 OF 1		DRAWING NUMBER
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
4.4.2.2	Case, Cartridge, Primed			
<u>CRITICAL</u>				
1.	Verify ignition system is properly assembled	100%	3.1	Visual/Gage
<u>MAJOR</u>				
101.	Depth of primer seating	Level II	3.1	Gage
<u>MINOR</u>				
201.	Waterproof missing around primer	Level IV	3.1	Visual
202.	Primer crimp missing	Level IV	3.1	Visual
203.	Workmanship	Level V	3.14	Visual
NOTES:				

QUALITY CONFORMANCE INSPECTION  
**CLASSIFICATION OF CHARACTERISTICS**

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PARAGRAPH	TITLE	SHEET 1 OF 2		DRAWING NUMBER 12013230
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	NEXT HIGHER ASSEMBLY
				INSPECTION METHOD REFERENCE
4.4.2.3	Cartridge			
<u>CRITICAL</u>				
1.	Split or perforated case	100%	3.1	Visual 1/
2.	Crack or split in projectile	100%	3.1	Visual 1/
3.	Crimp missing (case/projectile)	100%	3.1	Visual 1/
4.	Low propellant charge	100%	3.1	Gage
<u>MAJOR</u>				
101.	Cocked, loose, missing or inverted primer	Level II	3.1	Manual/Visual
102.	Overall length, max.	Level II	3.1	Gage
103.	Improper or incomplete crimp (case/projectile)	Level II	3.1	Visual 1/
104.	Profile and alignment, max	Level II	3.1	Gage 2/
105.	Corrosion	Level II	3.1	Visual 1/
106.	Head configuration improper	Level II	3.1	Visual 1/
107.	Metal slivers on head face	Level II	3.1	Visual 1/
108.	Missing, cracked, split or dented fuze nose cap	Level II	3.1	Visual 1/
109.	Fuze loose	Level II	3.1	Gage 3/
NOTES: 1/ MIL-STD-651 shall apply in defining and evaluating cartridge visual defects. 2/ A dead weight load of 60 pounds max. may be used to insert the cartridge into the gage. Gage shall meet the requirements of drawing 9391400. 3/ When the fuze turns with respect to the projectile body upon application of the required torque in a counterclockwise direction, the cartridge shall be classed defective.				

QUALITY CONFORMANCE INSPECTION  
**CLASSIFICATION OF CHARACTERISTICS**

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PARAGRAPH 4.4.2.3	TITLE Cartridge	SHEET 2 OF 2		DRAWING NUMBER 12013230
CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	NEXT HIGHER ASSEMBLY
				INSPECTION METHOD REFERENCE
<u>MINOR</u>				
201.	Marking incorrect, incomplete, illegible or missing	Level IV	3.1	Visual 1/
202.	Scratch, dent, buckle, bulge, wrinkle or fold in case	Level IV	3.1	Visual 1/
203.	Rotating band damaged	Level IV	3.1	Visual 1/
204.	Incorrect type cartridge or components	Level IV	3.1	Visual 1/
205.	Gap between fuze and projectile body	Level IV	3.1	Visual 1/
206.	Workmanship	Level V	3.14	Visual 1/
NOTES: 1/ MIL-STD-651 shall apply in defining and evaluating cartridge visual defects.				

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4.4.3 Testing. The tests listed in Table III shall be performed on each lot in compliance with the test methods prescribed in 4.6. For acceptance, the results of each test shall apply with the applicable requirements. Unless otherwise indicated, tests shall be conducted with samples at  $20^{\circ} \pm 10^{\circ}\text{C}$ . Sample size and acceptance criteria for each test shall be as specified. Only cartridges having met the visual and dimensional requirements and having been selected in such a manner that the sample is representative of the entire lot shall be used in the tests. The selected cartridges shall be thoroughly mixed before being divided into samples for the various tests. The combining of test is permitted (see 6.10).



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TABLE III. Quality conformance inspection.

Test <u>1</u> /	Sample Size Prod. Lot	Requirements Paragraph	Test Paragraph
Projectile extraction <u>2</u> /	20	3.4	4.6.1
Propellant contamination <u>3</u> /	20	3.14	4.6.2
Projectile torque <u>4</u> /	20	3.5	4.6.3
Velocity <u>5</u> / <u>12</u> /	20	3.6	4.6.4
Pressure <u>6</u> / -54° ± 3°C +21° ± 3°C +62° ± 3°C	20 20 20	3.7	4.6.4
Waterproofness <u>7</u> / <u>12</u> /	20	3.8	4.6.4
Accuracy <u>8</u> / <u>12</u> /	40	3.9	4.6.5
Action time <u>9</u> / -54° ± 3°C +21° ± 3°C +62° ± 3°C	20 20 20	3.10	4.6.6
Projectile trace <u>10</u> / -32° ± 3°C +21° ± 3°C +52° ± 3°C	12 12 12	3.11	4.6.7
Projectile function IMPACT FUNCTION -32° ± 3°C +21° ± 10°C +52° ± 3°C SELF-DESTRUCT FUNCTION -32° ± 3°C +21° ± 10°C +52° ± 3°C	9 <u>13</u> / 9 9 12 <u>14</u> / 12 12	3.12 3.12.1  3.12.2	4.6.8
Function and casualty <u>11</u> /	200	3.13	4.6.9

See Pages 18, 19 and 20 for notes.

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**NOTES:**

1/ The lot shall be rejected if in any firing test, one or more of the following malfunctions, or the casualties of Table IV occur.

- a. Premature function of the projectile (see 6.10).
- b. Projectile remaining in bore.
- c. Metal parts separation, except rotating band separation (see Note 4/ of Table IV).
- d. Accept or reject criteria for firing casualties are shown in Table IV.

Except as otherwise specified and in the function and casualty test where the occurrence of a firing defect listed in Table III prevents the obtaining of a reliable result for the characteristics being tested, an additional shot shall be fired.

2/ Projectile extraction.

- a. Failure of 2 or more sample cartridges to comply with minimum requirements shall cause rejection of the lot. If 1 cartridge of the sample fails to comply with the minimum requirement, a second sample of 20 cartridges shall be tested. The lot shall be rejected if 2 or more cartridges of the combined samples fail to comply with the minimum requirement.
- b. Failure of 4 or more cartridges to comply with the maximum requirement shall cause rejection of the lot. If more than 1, but less than 4 cartridges fail to comply with the maximum requirement, a second sample of 20 cartridges shall be tested. The lot shall be rejected if 5 or more cartridges of the combined samples fail to comply with the maximum requirement.

3/ Propellant contamination. The presence of foreign matter in the propellant of any of the test cartridges will cause rejection of the lot (see 4.6.2).

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- 4/ Projectile torque. Failure of 2 or more of the sample cartridges to comply with the specified torque requirement shall cause rejection of the lot. If 1 cartridge of the sample fails to comply, a second sample of 20 cartridges shall be tested. The lot shall be rejected if 2 or more cartridges of the combined sample fail to comply with the applicable requirements.
- 5/ Velocity. If the sample fails to comply with either or both requirements, a second sample of 40 cartridges shall be tested for the failing parameter(s) (average, standard deviation). The lot shall be rejected if the second sample fails to comply with the applicable requirements (see 6.11).
- 6/ Pressure. If the sample fails to comply with the requirements, a second sample of 40 cartridges shall be tested. The lot shall be rejected if the second sample fails to comply with the applicable requirements.
- 7/ Waterproofness. If the average velocity (wet) of the sample fails to comply with the applicable requirement, a second sample of 40 cartridges shall be tested. The lot shall be rejected if the average velocity (wet) differs by more than 30.5 mps from the average velocity (dry) of 40 additional sample cartridges fired to establish a new base for comparison. The lot shall not be penalized for failure of the last named sample cartridges to comply with the requirements of 3.8. If any sample cartridge fails to meet action time requirement, the lot shall be rejected.
- 8/ Accuracy. If the accuracy of the sample cartridges exceeds the applicable requirement, a second sample of 80 cartridges shall be tested. The lot shall be rejected if the accuracy exceeds the applicable requirements.
- 9/ Action time. If any sample cartridge fails to meet requirements for action time, the lot shall be rejected.
- 10/ Projectile trace. Failures are summed for the three tests. Failure of 6 or more sample cartridges to comply with applicable requirements shall cause rejection of the lot. If more than 3 but less than 6 fail to comply, a second sample of 36 cartridges shall be tested. The lot shall be rejected if 8 or more cartridges of the combined sample fail to comply with the minimum requirements.

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- 11/ Function and casualty. The lot shall be rejected if any malfunction or firing casualty of Table IV occurs in number(s) of equal to or greater than the applicable "rej" number. Except as otherwise provided, if malfunctions or casualties occur in excess of the applicable "acc" number, but less than the applicable "rej" number, a second sample of 400 cartridges shall be selected. The lot shall be rejected if in the combined samples, malfunctions or casualties occur in numbers equal to or greater than the applicable "rej" number.
- 12/ Ammunition shall be conditioned at 18° to 24°C.
- 13/ Failures are summed for the three tests. Failure of 3 or more sample cartridges shall reject the lot. If 2 failures occur, a second sample of 27 cartridges shall be tested. The lot is rejected if 4 or more of the combined samples fail.
- 14/ Failures are summed for the three tests. Failure of 6 or more sample cartridges shall reject the lot if 3, 4, or 5 failures occur, a second sample of 36 cartridges shall be tested. The lot is rejected if 6 or more of the combined samples fail.

4.4.3.1 Firing defects and casualties. Firing defects and associated criteria shall be as specified in Table IV. For the defect definitions, see AS12013566.

4.4.3.2 Unlisted firing defects. The lot shall be suspended and referred to the contracting officer for disposition, if a malfunction or casualty not covered by this specification occurring in any firing test, indicates that the product is unsuited for the purpose intended.

4.4.3.3 Variable inspection plan. A variables inspection plan from MIL-STD-414, Table B-3, shall be used to determine lot acceptability, applying the method calculation as shown in example B-3. Failure of the sample to meet the acceptability criterion shall be the cause of rejection of the lot.

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TABLE IV. Firing defects.

	ACC	REJ
Cartridge:		
Misfire	0	2
Failure to chamber	0	1
Failure to extract	0	1
Projectile remaining in bore	0	1
Premature projectile function	0	1
		(see 6.10)
Primer:		
Primer leak	9	25
Primer perforation	1	6
Loose primer	0	1
Blown primer	0	1
Case:		
Longitudinal split <u>1</u> /		
H or S	10	31
G or J	4	11
K, L or M	0	1
Circumferential rupture (partial) <u>1</u> /		
S, J or K	4	11
G or L	2	7
Circumferential rupture (complete) <u>1</u> /	0	1
Detached metal <u>2</u> /	0	1
Projectile:		
Rotating band separation <u>3</u> /	0	3
Complete or partial separation		
Metal parts separation <u>4</u> /	0	1

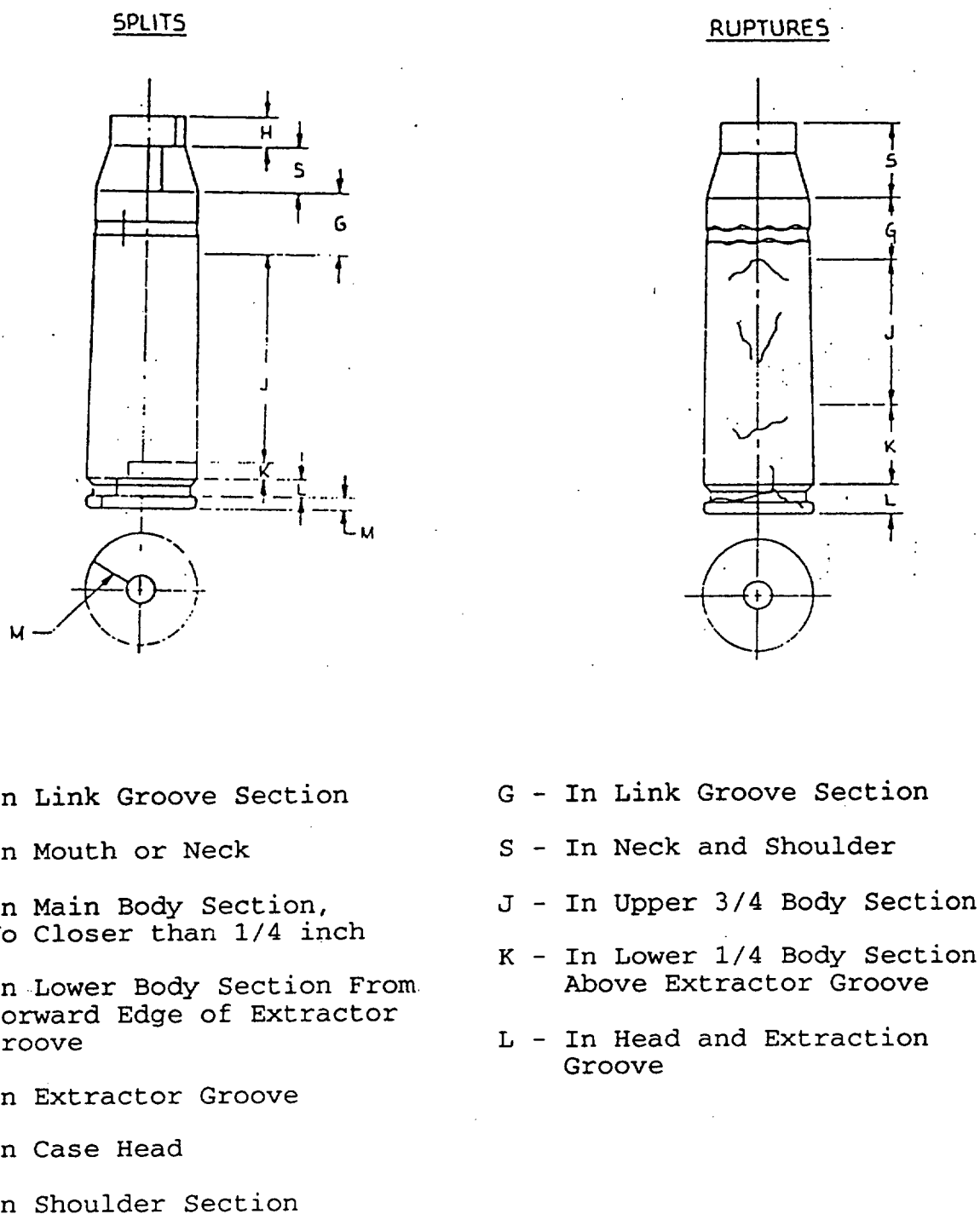
Refer to next page for Notes.

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**NOTES:**

- 1/ See Figure 1 for classifying splits and rupture in fired cartridge cases. If a longitudinal split or circumferential rupture (partial) extends into two or more defined areas, only the most severe defect criterion of Table IV for the areas involved, shall apply. If a rupture results in separation of the cartridge case into two or more portions, the defect shall be classified as a complete circumferential rupture.
- 2/ Metal sheared or missing from the fired cartridge case exterior, such as rim or neck shears, shall be classed as a defect. The lot shall not be penalized from shavings of metal from the interior wall of the neck in the crimped area.
- 3/ For classification as a defect, there must be evidence either by recovery of the band, or portion thereof, or by hole(s) in the fragmentation screen(s). The lot shall not be penalized for normal band fringing.
- 4/ Separation or breakup of projectile part(s), as evidenced by recovering of the part(s) or fragment(s) or hole(s) in the fragmentation screen(s), shall be classed as a defect. The lot shall not be penalized for evidence of any individual fragment with a weight of less than 0.10 grams.

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FIGURE 1. Classification of defects for case, cartridge, 25mm.

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4.4.4 Packaging, packing and marking inspection. MIL-P-71136 shall be used for inspection of packaging, packing and marking as applicable to Dwg. 12929427 and 5167214. MIL-STD-644 shall be used as a guide for inspection of packaging, packing and marking as applicable to Dwg. 12013671 and Dwg. 12013674. AS12013734 shall be used for inspection of packaging, packing and marking as applicable to Dwg. 12013668.

4.5 Inspection equipment. Inspection equipment required to perform examinations and tests prescribed herein shall conform to the provisions of MIL-A-2550.

4.6 Methods of inspection.

4.6.1 Projectile extraction. The method of test shall be as prescribed in AS12013566.

4.6.2 Propellant contamination. The propellant from each of the cartridges tested for projectile extraction will be examined visually for contamination, as prescribed in AS12013566.

4.6.3 Projectile torque. Each cartridge of the test sample shall be marked with a light scratch extending axially across the rotating band onto the case neck. Torque, to the specified requirement, shall be applied slowly to the projectile. Movement of the projectile with respect to the cartridge case detectable by misalignment in the scratch mark, shall be recorded.

4.6.4 Velocity, pressure and waterproofness. The methods of test shall be as prescribed in AS12013566. Statistics necessary for testing of results against acceptance criteria shall be computed (see 6.11). A correction factor of 0.46 m/s per meter shall be applied to the recorded velocity at the measured range to obtain muzzle velocity.

4.6.5 Accuracy. The method of test and measurement of targets shall be as prescribed in AS12013566. The specified range may be shortened to a minimum range of 100 meters.

4.6.6 Action time. The method of test shall be as prescribed in AS12013566.

4.6.7 Projectile trace. The method of test shall be as prescribed in AS12013566. Visual observation(s) or photographic witness of trace characteristics shall be made from suitable position(s).



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4.6.8 Projectile function. The method of tests shall be as prescribed in AS12013566. The aluminum target shall be located as required from the gun muzzle normal to the line of fire. Observation of projectile functioning shall be made from a suitable position (see 3.12).

4.6.9 Function and casualty. The method of test shall be as prescribed in AS12013566. The test sample shall be assembled in belts and fired in bursts of  $25 \pm 5$  rounds in a 25mm gun at a rate of  $200 \pm 50$  rounds per minute. The weapon barrel shall be at ambient temperature at beginning of test and cooled to ambient after each 100 rounds.

4.6.10 Defective weapon. If any test cartridge firing defect is found to have been caused by a defective test weapon, the firing defect shall not be valid for lot penalty. In such cases, the defective test weapon shall be corrected or replaced and the test repeated in whole or in part, as indicated. If such firing defect is not found to have been caused by the defective weapon, it shall be valid for lot penalty.

## 5. PACKAGING

5.1 Packing, level A. The type of ammunition pack shall be in accordance with instructions from the procuring agency. Linked ammunition shall be packed in accordance with Dwg. 12929427 and MIL-P-71136, 12013671, 12013674, 12013668, 5167214.

5.2 Marking. Marking on the packed container shall be in accordance with Dwg. 12929427, 12013671, 5167214, 12013674, 12013668 or 5167214, as appropriate.

## 6. NOTES

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

6.1 Intended use. These cartridges are intended for use in 25mm automatic weapons.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of this specification.
- b. Place of inspection, if not place of manufacture.

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- c. Issue of DODISS to be cited in the solicitation, and, if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- d. When first article is required (see 3.3, 4.3 and 6.4).
- e. Detailed packing and marking instructions (see 5.1 and 5.2).
- f. Provisions for the supply, maintenance, and disposition of Government-furnished inspection equipment for acceptance inspection purposes.
- g. Provisions for the submission and approval of the manufacturing process changes (see 3.2).
- h. Provisions for the inclusion of MIL-STD-1167, Ammunition Data Cards, on DD Form 1423, Contract Data Requirements List.

6.3 Submission of contractor inspection equipment designs for approval. Submit copies of designs as required to: Commander, U.S. Army ARDEC, ATTN: SMCAR-QAF-I, Picatinny Arsenal, NJ 07806-5000. This address will be specified on the Contract Data Requirements List, DD Form 1423 in the contract.

6.4 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a first article sample, a first production item, or a standard production item from the contractor's current inventory and the number of items to be tested as specified in 4.3. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should be provided that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has bidders offering such product, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

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

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6.6 Intermediate point inspection. The classification of defects identifies the defect characteristics (among other things) for acceptance inspection. It may be necessary to modify the sequence of inspection stations to best suit the manufacturing process. Inspection for characteristics which will be hidden or altered by subsequent processing operations (including unrelated operations) should be scheduled to prevent premature acceptance or rejection, which could be detrimental to the attainment of optimum product quality in the end item.

6.7 Process deviation. A process deviation is defined as a change in the approved basic method of manufacture, or an operational change which may alter the metallurgical or physical properties of the item.

6.8 Subject term (key word) listing.

Bradley Fighting Vehicle  
M242 Machine Gun

6.9 Submission of alternative quality conformance provisions. All contractor proposed alternative quality conformance provisions will be submitted to the Government for evaluation/approval as directed by the contracting activity.

6.10 Combining tests. Tests may be performed concurrently on the sample cartridge provided that the test results are not affected by this procedure to minimize testing costs.

6.11 Computations. Standard deviation. Where computation of a sample standard deviation is specified for determination of lot acceptance, the method of computation will be:

$$S = \sqrt{\frac{\sum (X_i - \bar{X})^2}{(n-1)}} \quad \text{or equivalent}$$

Where:  $X_i$  = each individual value  
 $\bar{X}$  = sample arithmetic mean  
 $n$  = sample size

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6.12 Premature functioning. If defined as the occurrence of any of the following:

- a. Any function within the weapon.
- b. Any function within one meter of the weapon.
- c. Any functions within 10 meters of uninterrupted flight from the weapon.

Custodian:  
Army-AR

Preparing activity:  
Army-AR

(Project 1305-AE74)

# 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>		1. DOCUMENT NUMBER MIL-C-71139 (AR)	2. DOCUMENT DATE (YYMMDD) 940104
3. DOCUMENT TITLE CARTRIDGE, 25MM HIGH EXPLOSIVE INCENDIARY TRACER, SELF-DESTRUCT, M792			
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets if needed.)			
5. REASON FOR RECOMMENDATION			
6. SUBMITTER			
a. NAME (Last, First, Middle Initial)		b. ORGANIZATION	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (if applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME U.S. ARMY ARDEC STANDARDIZATION OFFICE		b. TELEPHONE (Include Area Code) (1) Commercial 201-724-6675 (2) AUTOVON DSN-880-6675	
c. ADDRESS (Include Zip Code) ATTN: SMACA-BAC-S PICATINNY ARSENAL, NJ 07806-5000		IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	