

MIL-C-70508(AR)
7 February 1985

MILITARY SPECIFICATION

CARTRIDGE, 9MM, BALL, NATO, XM882

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

1. SCOPE

1.1 Scope. This specification covers Cartridge, 9MM, Ball, NATO, XM882 intended for use in 9MM weapons.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified, 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 solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-A-48078	-	Ammunition, Standard Quality Assurance Provisions, General Specification for
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STANDARDS

MILITARY

MIL-STD-105	-	Sampling Procedures and Table for Inspections by Attributes
MIL-STD-636	-	Visual Inspection Standards for Small Arms Ammunition Through Caliber .50

FSC 1305

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-STD-644	-	Visual Inspection Standards and Inspection Procedures for Inspection of Packaging, Packing and Marking of Small Arms Ammunition
DOD-STD-1468	-	Small Caliber Ammunition Test Procedures, 9MM Cartridges

2.1.2 Other Government documents, drawings, and publications.
The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

DRAWINGS

US Army Armament Research and Development Center

9345211	-	Cartridge, 9MM, Ball, NATO, XM882
7643674	-	Classification of Cartridge Case Defects for Small Arms Ammunition
9354344	-	Packaging and Marking, Cartridges, 9MM, Ball, NATO, XM882, Cartons, Box Ammunition, M2A1, Box Wirebound
LI9345211	-	Index of Inspection Equipment Lists

Copies of specifications, standards, drawings, 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.

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 First article inspection. When specified, a sample shall be subjected to first article inspection. (See 4.3) Unless otherwise specified, the first article shall include the pilot pack.

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

3.3. Parts. The parts shall comply with all requirements specified on Dwg. 9345211, all associated drawings, and with all requirements specified in applicable specifications.

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3.4 Bullet extraction. The average force necessary to extract the bullet from the cartridge case shall be not less than 80 lbs, nor shall any individual extraction force be less than 60 lbs.

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

3.6 Velocity. The average velocity of the cartridges when conditioned at $21^{\circ} \pm 2^{\circ}$ Centigrade (C) shall be 385 meters per second (m/sec) plus or minus 15 m/sec at a point 16 meters from the muzzle. The standard deviation of the velocities shall not exceed 9 m/sec. When conditioned and fired at the following temperatures the average velocity at each temperature shall not vary by more than plus or minus 30 m/sec from the average velocity obtained at 21°C .

$$-54^{\circ} \pm 2^{\circ}\text{C}$$

$$52^{\circ} \pm 2^{\circ}\text{C}$$

3.7 Chamber pressure. The corrected average peak chamber pressure of the cartridge at the case mouth position shall not exceed 215 Megapascals (MPa) and no individual peak pressure shall exceed 250 MPa. When conditioned and fired at the following temperatures, the uncorrected average peak chamber pressure at each temperature shall not vary by more than plus or minus 65 MPa from the uncorrected average pressure obtained at 21°C .

$$-54^{\circ}\text{C} \pm 2^{\circ}\text{C}$$

$$52^{\circ}\text{C} \pm 2^{\circ}\text{C}$$

3.8 Accuracy. The average mean radius of all ten round targets fired at a range of 50 meters from the muzzle shall not exceed 3.8 centimeters.

3.9 Function and casualty. The cartridge shall function all specified weapons without casualty at ambient temperatures, at minus $54^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and at plus $52^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

3.10 Waterproof. The cartridge, when placed under water and subjected to a positive pressure of 25 lb/in² and subsequently fired for velocity, shall have an average velocity that does not vary by more than plus or minus 23 meters per second from the average velocity obtained in paragraph 3.6 above. In addition, all such cartridges shall fire, with all bullets clearing the bore.

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3.11 Primer sensitivity. The energy imparted by a 55 + 0.5 gram steel ball falling 12.0 inches shall initiate all primers. The energy imparted by a 55 + 0.5 gram steel ball falling three inches shall not cause initiation of the primer.

3.12 Compressive force resistance. When subjected to a compressive force of 75 pounds, the overall cartridge length of each cartridge shall not be less than 1.140 inches.

3.13 Oil resistance. After exposure to oil, the average velocity of the cartridges shall not deviate by more than plus or minus 23 m/sec from the average velocity obtained in 3.6.

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

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

3.14.2 Foreign matter. The cartridge shall be free of corrosion, stains, discoloration, dirt, oil, and smears of lacquer.

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 sample as designated by the Contracting Officer for evaluation in accordance with the provisions of 4.3.2. The sample shall be manufactured using the same methods and processes proposed for use in manufacturing the production cartridges. The first article sample shall consist of the following items in sample quantities as indicated.

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<u>PART DESCRIPTION</u>	<u>DRAWING</u>	<u>QUANTITY</u>
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Cartridge, 9MM, Ball, NATO, XM882	9345211	5,000
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4.3.2 Inspections to be performed. See MIL-A-48078 and Table I herein.

4.3.3 Rejection. See MIL-A-48078.

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

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PARAGRAPH	TITLE Cartridge, 9MM, Ball, NATO, XM882			SHEET 1 OF 1		DRAWING NUMBER 9345211
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	NEXT HIGHER ASSEMBLY PARAGRAPH REFERENCE / INSPECTION METHOD	
	Examination for defects	*		3.3	4.4.2.1	
	Bullet extraction	20		3.4	4.5.2	
	Residual stress	50		3.5	4.5.3	
	Velocity	90		3.6	4.5.4	
	Chamber pressure	***		3.7	4.5.5	
	Accuracy	100		3.8	4.5.6	
	Function & casualty	3,240		3.9	4.5.7	
	Waterproof	20		3.10	4.5.8	
	Primer sensitivity	**		3.11	4.5.1	
	Compressive force	20		3.12	4.5.9	
	Oil resistance	20		3.13	4.5.10	
NOTES: * All first article sample units shall be subjected to Examination for Defects prior to test. ** See Table II *** Velocity and chamber pressure tests shall be conducted concurrently.						

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4.4 Quality conformance inspection.

4.4.1 Quality conformance inspection. Inspection lots shall comply with the lot formation provisions of MIL-A-48078. In addition, each inspection lot shall contain:

- a. Primer from one lot and one manufacturer.
- b. Propellant from one lot and 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. Specified AQL's for major and minor defects shall be applied on a class basis.

QUALITY CONFORMANCE INSPECTION

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CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE	SHEET 1 OF 3			DRAWING NUMBER
4.4.2.1	Cartridge, 9MM, Ball NATO, XM882				9345211
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE / INSPECTION METHOD
<u>CRITICAL:</u>					
1.	Split case in K, L, or M location (See Dwg. 7643674)		100%	3.3	Visual
2.	Perforated Case		100%	3.3	Visual
3.	No primer		100%	3.3	Visual
4.	Cocked primer		100%	3.3	Visual
5.	Inverted primer		100%	3.3	Visual
<u>MAJOR:</u>			0.25%		
101.	Cartridge, corroded or stained, if etched			3.3	Visual
102.	Case, round head			3.3	Visual
103.	Split case in I or J location (See Dwg. 7643674)			3.3	Visual
104.	Case, beveled underside of head			3.3	Visual
105.	No radius on head (rim)			3.3	Visual
106.	Split bullet jacket			3.3	Visual
107.	Loose bullet			3.3	Visual
108.	Loose primer			3.3	Visual
109.	Total length of cartridge, incorrect			3.3	Gage
110.	Cartridge profile failure (requiring more than 20 lbs. dead weight to insert in profile & alignment gage)			3.3	Gage
NOTE: Refer to MIL-STD-636 for visual defects. In the event of conflict between paragraphs of this specification and MIL-STD-636 as to defect classification, the classification specified herein shall apply.					

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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PARAGRAPH	TITLE		2 SHEET OF 3		DRAWING NUMBER 9345211
4.4.2.1	Cartridge, 9MM, Ball NATO, XM882				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
111.	Diameter of extractor groove, incorrect			3.3	Gage
112.	Diameter of head, incorrect			3.3	Gage
113.	Thickness of head, incorrect			3.3	Gage
114.	Depth of primer, incorrect			3.3	Gage
115.	Case length, incorrect			3.3	Gage
MINOR:			1.5%		
201.	Cartridge, discolored, dirty, oily smeared			3.3	Visual
202.	Case dent			3.3	Visual
203.	Case draw scratch			3.3	Visual
204.	Case scratch			3.3	Visual
205.	Case scaly metal			3.3	Visual
206.	Case fold			3.3	Visual
207.	Case wrinkle			3.3	Visual
208.	Case buckle			3.3	Visual
209.	Case bulge			3.3	Visual
210.	Illegible or missing head stamp			3.3	Visual
211.	Defective head			3.3	Visual
212.	Defective mouth			3.3	Visual
213.	Bullet dent			3.3	Visual
214.	Bullet scratch			3.3	Visual
215.	Scaly metal (bullet)			3.3	Visual
216.	Upset (crooked) point (bullet)			3.3	Visual
NOTE: Refer to MIL-STD-636 for visual defects. In the event of conflict between paragraphs of this specification and MIL-STD-636 as to defect classification, the classification specified herein shall apply.					

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

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PARAGRAPH 4.4.2.1	TITLE Cartridge, 9MM, Ball NATO, XM882		3 SHEET OF 3		DRAWING NUMBER 9345211
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE / INSPECTION METHOD
217.	Flat point (bullet)			3.3	Visual
218.	Nicked or dented primer			3.3	Visual
219.	No waterproofing material (primer pocket joint)			3.3	Visual
220.	Workmanship			3.12	Visual
NOTES: Refer to MIL-STD-636 for visual defects. In the event of conflict between paragraphs of this specification and MIL-STD-636 as to defect classification, the classification specified herein shall apply.					

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

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4.4.3 Tests. The tests listed in Table II shall be conducted in accordance with the methods and procedures specified in 4.5.

4.4.3.1 Test samples. The quantities for the various tests shall be as specified in Table II. The test samples shall be selected from lots that have met the visual and dimensional inspection requirement.

TABLE II. Tests.

<u>TEST</u>	Number of Cartridge		
	<u>-54°C</u>	<u>Ambient</u>	<u>+52°C</u>
Primer sensitivity 1/		1/	
Bullet extraction 2/		20	
Residual stress 2/		50	
Velocity 2/, 4/	30	30	30
Chamber pressure 2/, 4/	(30)	(30)	(30)
Accuracy 2/		100	
Function & Casualty 3/			
Submachine guns (per weapon type)	180	360	180
Pistols (per weapon type)	90	180	90
Waterproof 2/		20	
Compressive force 2/		20	
Oil resistance 2/		20	

1/ This test shall be performed prior to all other tests cited in Table II. Test sample shall consist of number of cartridges required to perform a complete run-down test wherein 50 primers are tested at each height. If the average critical height (H) plus five standard deviations (5 sigma) exceeds the all fire requirement or if the average critical height minus two standard deviations (2 sigma) is less than the no fire requirement, the lot shall be rejected, subject to performance of a second complete run-down test wherein 100 primers are tested at each height. Failure of the second sample to comply with the above criteria shall be cause for rejection of the lot.

2/ Failure of the cartridges to comply with the applicable requirement shall be cause for rejection of the lot, subject to testing of a second sample consisting of double the quantity of cartridges used in the first test. Failure of the cartridges in the second sample to comply with the applicable requirement shall be cause for rejection of the lot.

3/ Function and casualty defects shall not exceed the acceptance percentages specified in Table III. The number of cartridges specified at ambient temperature shall be equally divided between horizontal and 80° depressed weapon firings. Failure of the

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cartridges to comply with the function and casualty requirements shall be cause for rejection of the lot, subject to testing of a second sample consisting of double the quantity of cartridges used in the first test. Failure of the cartridges in the combined first and second sample to comply with the requirements of Table III shall be cause for rejection of the lot.

4/ Velocity and chamber pressure tests shall be conducted concurrently.

4.4.3.2 Firing defects. Firing defects and acceptance percentages shall be as specified in Table III.

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

4.4.5 Inspection equipment. The inspection equipment required to perform the examination and test 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 the terms of the contract. See Section 6 of MIL-A-48078 and 6.2 herein.

4.4.5.1 Index of inspection equipment list. The examination tests shall be made using equipment listed on LI9345211.

TABLE III. Firing defects.

<u>DEFECTS</u>	<u>ACCEPTANCE PERCENTAGES</u>
(a) Misfire	0.00
(b) Bullet remaining in bore (1)	0.00
(c) Perforation in firing pin indent in primer cup	1.00
(d) Escape of gas around primer cap	
(i) more than 50% of periphery	0.50
(ii) less than 50% of periphery	1.00
(e) Blown primer (2)	0.00
(f) Loose primer which falls out of pocket	0.00
(g) Loose primer which does not fall out of pocket	0.50

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(h)	Case split (longitudinal)	
(i)	Mouth (defined as the length of bullet intrusion)	2.00
(ii)	Body	0.20
(iii)	Through the head	0.00
(j)	Case rupture (circumferential)	
(i)	Partial rupture	0.10
(ii)	Complete rupture	0.00
(k)	Failure to extract	0.00
(l)	Gun stoppage applicable solely to ammunition	0.00
(m)	Bullet stripping	0.00
(n)	Double tapping	0.50
(o)	Other defects (each kind)	0.05
(p)	Total of all defects	3.50

(1) No re-test permitted. Lot shall be rejected.

(2) Primer not in pocket after firing and both head of cartridge case and pocket enlarged and distorted.

4.5 Test methods and procedures.

4.5.1 Primer sensitivity. The test shall be conducted in accordance with DOD-STD-I468.

4.5.2 Bullet extraction. The test shall be conducted in accordance with DOD-STD-I468.

4.5.3 Residual stress (mercurous nitrate). The test shall be conducted in accordance with DOD-STD-I468.

4.5.4 Velocity. The test shall be conducted in accordance with DOD-STD-I468.

4.5.5 Chamber pressure. The test shall be conducted in accordance with DOD-STD-I468.

4.5.6 Accuracy. The test shall be conducted utilizing two test barrels in accordance with DOD-STD-I468.

4.5.7 Function and casualty. The test shall be conducted in accordance with DOD-STD-I468 utilizing the weapons listed below. The total quantity of rounds specified in Table II for function and casualty testing shall be fired in each weapon type. Two weapons of each type are required, with one half the total rounds to be fired in each weapon.

a. Pistol, 9MM, automatic, M9 (US)

b. Pistol, 9MM, High Power, Browning (Belgium)

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- c. Pistol, 9MM, P38, Walther (FRG)
- d. Gun, Submachine, C1 (Canada)
- e. Gun, Submachine, Model 4 (Italy)
- f. Gun, Submachine; Model 1949 (France)

4.5.7.1 NATO weapons. NATO weapons (weapons b. through f. listed above) are not required for function and casualty testing until the XM882 cartridge is NATO qualified.

4.5.8 Waterproof. The test shall be conducted in accordance with DOD-STD-1468, Type I Test.

4.5.9 Compressive force resistance. The test shall be conducted in accordance with DOD-STD-1468.

4.5.10 Oil resistance. The test shall be conducted in accordance with DOD-STD-1468.

4.5.11 Defect penalty. In any ballistic test, except function and casualty, in which the occurrence of a firing defect listed in Table III prevents the obtaining of a reliable result for the characteristic being tested, an additional shot shall be fired. That particular test shall not be penalized, but the total ballistic sample shall be penalized for such defects in accordance with Table III.

4.5.12 Test validity. If for any reason the 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. PREPARATION FOR DELIVERY

5.1 Packing. Level A (World Wide Shipment). The cartridges shall be packed in accordance with Drawing 9354344.

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

6. NOTES

6.1 Ordering data. Procurement documents shall be in accordance with MIL-A-48078 and shall include the following:

- a. Provisions for the supply, maintenance and disposition of mandatory ballistic test equipment for acceptance inspection purposes.

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

6.2 Submission of inspection equipment designs for approval.
See MIL-A-48078. Submit equipment designs as required to Commander, AMCCOM, Dover, NJ 07801-5001, ATTN: AMSMC-QAF-I(D).

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

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(Project No. 1305-AB26)

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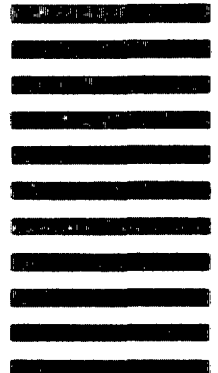
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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-C-70508		2. DOCUMENT TITLE CARTRIDGE, 9MM, BALL, NATO, XM882	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify): _____	
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)	

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