

MIL-C-1217A**20 SEPTEMBER 1950****SUPERSEDING****MIL-C-1217****25 August 1949****MILITARY SPECIFICATION****CARTRIDGE, ARMOR-PIERCING, CALIBER .30, M2**

This specification was approved by the Departments of the Army, the Navy, and the Air Force for use of procurement services of the respective Departments.

1. SCOPE

1.1 Scope.—This specification covers cartridges intended for firing in machine guns and rifles against armored targets.

1.2 Classification.—Cartridges shall be of the following classes, as specified (see 6.1):

Grade A.

Grade B.

2. APPLICABLE SPECIFICATIONS, OTHER PUBLICATIONS, AND DRAWINGS

2.1 Specifications.—The following specifications and specifications referenced on drawings in 2.3, of the issue in effect on date of invitation for bids, form a part of this specification:

MILITARY SPECIFICATION

JAN-A-625—Ammunition, Small Arms, General Specifications for.

U. S. ARMY SPECIFICATIONS

94-40645 —Marking, Exterior, Domestic and Export Shipment by Contractors.

100-2 —Standard Specification for Marking Shipments by Contractors.

(Army.—Copies of specifications should be obtained from the procuring agency or as directed by that agency. Both the title and identifying number or symbol should be stipulated when requesting copies.)

(Navy.—Copies of Military and U. S. Army specifications may be obtained upon application to the

Bureau of Supplies and Accounts, Navy Department, Washington 25, D. C., except that activities of the Armed Forces should make application to the Commanding Officer, Naval Supply Center, Norfolk 11, Va. Both the title and identifying number or symbol should be stipulated when requesting copies.)

(Air Force.—Copies of Military and U. S. Army specifications may be obtained upon application to the Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Both the title and identifying number or symbol should be stipulated when requesting copies.)

2.2 Other publications. — The following publications, of the issue in effect on date of invitation for bids, form a part of this specification:

U. S. ARMY ORDNANCE CORPS PUBLICATIONS

ORD-M608-PM—Vol. III—Manual of Test Methods for Small Arms Ammunition.

ORD-SIP-S315 —Visual Inspection Standards for Small Arms Ammunition.

MILITARY STANDARD

JAN-STD-105 —Sampling Inspection Tables for Inspection by Attributes.

(Copies of publications should be obtained from the procuring agency or as directed by that agency. Both the title and identifying number or symbol should be stipulated when requesting copies.)

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BUREAU OF SUPPLIES AND ACCOUNTS PUBLICATION

Navy Shipment Marking Handbook.

(Copies of the Navy Shipment Marking Handbook may be obtained upon application to the Bureau of Supplies and Accounts, Department of the Navy, Washington 25, D. C., except that activities of the Armed Forces should make application to the Commanding Officer, Naval Supply Center, Norfolk 11, Va.)

2.3 Drawings.—The following drawings and drawings referenced thereon, of the issue in effect on date of invitation for bids, form a part of this specification:

U. S. ARMY ORDNANCE CORPS DRAWINGS

27-79-41—Cartridge, Armor-Piercing, Caliber .30, M2, List of Drawings, Specifications, and Inspection for Acceptance.

B7643674—Classification of Cartridge Case Defects.

(Copies of drawings should be obtained from the procuring agency or as directed by that agency. Both the title and identifying number or symbol should be stipulated when requesting copies.)

3. REQUIREMENTS

3.1 Design and construction.

3.1.1 General.—General requirements shall conform to Specification JAN-A-625.

3.1.2 Material.—Material shall conform to Specification JAN-A-625.

3.1.3 Physical. — Physical requirements shall conform to applicable specifications and drawings; and the defects shall not exceed that specified in table I. The acceptable quality levels of the ammunition with respect to visual, dimensional, and weight defects shall be in accordance with inspection level III, table I of Standard JAN-STD-105, as follows:

Defect	Grade A	Grade B
	Percent	Percent
Critical	0	0
Major	0.12-0.17	0.22-0.32
Minor	0.32-0.65	1.22-2.20

3.1.4 Workmanship.—Workmanship shall conform to Specification JAN-A-625.

TABLE I.—Defect classification.

No.	Defect	Critical	Major	Minor	Major or minor
	<i>Visual</i>				
	Cartridge:				
1	Discolored, dirty, oily, smeared (waterproofing)			x	
2	Corroded		x		
	Case:				
3	Round head		x		
4	Dent				x
5	Split case		x		
6	Perforated case	x			
7	Draw scratch				x
8	Scratch			x	
9	Beveled underside of head		x		
10	Case mouth not crimped in cannelure		x		
11	Scaly metal				x
12	No chamfer on head (rim)		x		
13	Fold			x	
14	Wrinkle			x	
15	Buckle			x	

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TABLE I.—Defect classification—continued.

No.	Defect	Critical	Major	Minor	Major or minor
<i>Visual—(Continued)</i>					
16	Bulge			x	
17	Defective head			x	
18	Defective mouth			x	
19	No oxide film (mouth anneal)		x		
	Bullet:				
20	Dent			x	
21	Scratch			x	
22	Split bullet jacket		x		
23	Loose bullet		x		
24	Missing cannellure		x		
25	Scaly metal				x
26	Upset (crooked) point			x	
27	Exposed steel (clad jacket)			x	
28	Defective cannellure			x	
	Blunt point			x	
	Primer:				
29	No primer	x			
30	Cocked primer	x			
31	Inverted primer	x			
32	Loose primer		x		
33	Nicked or dented primer			x	
34	No waterproofing (primer pocket joint)			x	
35	Defective Crimp			x	
<i>Gaging</i>					
	Cartridge:		x		
	Long overall length		x		
	Short overall length		x		
	Cartridge profile failure (requiring more than 20 pounds dead weight to insert in profile and alignment gage) ¹		x		
	Case:				
	Large extractor groove diameter		x		
	Small extractor groove diameter			x	
	Large diameter head		x		
	Small diameter head		x		
	Thick head		x		
	Thin head		x		
	Long head to shoulder		x		
	Short head to shoulder		x		
	Primer:				
	High primer		x		
	Low primer		x		
<i>Weighing</i>					
	Complete round:				
	Cartridge weighing less than minimum shown on complete round drawing ²			x	

NOTE.—For photographs of visual defects Nos. 1-35 refer to Publication ORD-SIP-S315.

¹ Each failing cartridge shall be clipped with seven cartridges containing no defects in such a manner that the failing cartridge will be the initial one chambered. The clipped cartridges shall then be loaded into a rifle, U. S., caliber .30, M1, with mini-

um chamber and 1.942-inch headspace. When the test cartridge fails to chamber completely, it shall be counted as a critical defective.

² Each lightweight cartridge shall be broken down and the powder weighed. Each such cartridge found to contain less than 25 grains of powder shall be counted as a critical defective.

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3.2 Bulletin extraction.—The force necessary to extract the bullet from the assembled cartridge shall be in no case less than 45 pounds.

3.3 Mercury cracking. — Cartridge cases shall not crack when tested as specified in 4.3.

3.4 Velocity.—The basic velocity shall be 2,715 feet per second at 78 feet from the muzzle. The average velocity of cartridges shall not vary from the basic velocity by more than 30 feet per second. The standard deviation of the individual velocities from the average velocity shall not exceed 28 feet per second.

3.5 Waterproof.—The average velocity of cartridges submerged in water as specified in 4.5 shall not vary from the average velocity of the same lot by more than 100 feet per second.

3.6 Pressure.—The average chamber pressure produced by firing cartridges shall not exceed 54,000 p.s.i.

3.7 Accuracy.—The average of the mean radii of hits on all targets obtained at 600 yards when fired as specified in 4.7 shall be not greater than 10 inches.

3.8 Penetration.—The average depth of penetration of bullets fired at a range of 100 yards shall be not less than 0.42 inch in homogeneous, $\frac{7}{8}$ -inch thick, armor plate.

3.9 Function and casualty.—Function and casualty firing defects plus all other firing defects shall not exceed the limits specified in table II.

3.10 The hangfire time of the group of cartridges fired as specified in 4.10 shall not exceed 1.4 milliseconds for grade A cartridges nor 2.5 milliseconds for grade B cartridges.

3.11 Case extraction.—The average net extraction force necessary to extract a fired case from the rifle shall not exceed 15 pounds.

3.12 Stripping.—The results obtained from

the stripping test (see 4.12) shall not exceed the limits specified in table II.

TABLE II.—*Defects and limits permitted in a sample.*

Defects	Grade A	Grade B
	Percent	Percent
Misfire ¹		0.1
Bullet remaining in bore	0	0
Hangfire	0	0
Primer leak:		
a. Perforation in firing pin indent in primer cup:		
(1) In rifle	2.5	2.5
(2) In machine gun	2.5	2.5
(3) In automatic rifle:		
a Browning, cal. .30, M1918 or M1918A2 ²		
b Cal. .30, M1	1.0	1.5
b. Escape of gas through primer cup other than a above	0.5	0.5
c. Loose primer ³	0	0.2
d. Blown primer ⁴	0	0
Case casualty:		
a. Longitudinal split ⁵		
(1) neck and shoulder (i and s)	2.5	2.5
(2) body (j)	0.5	0.5
(3) body (k)	0	0
(4) to head (l)	0	0
(5) through head (m)	0	0
b. Circumferential rupture ⁵		
(1) partial, shoulder or body (s, j, or k)	0.4	0.4
(2) partial, head (l)	0	0
(3) complete	0	0
Failure to extract, including sheared rim	0	0
Failure to chamber	0	0.5
Gun stoppage (short cartridge)	0	0.5
Bullet stripping before striking terminal or target	1.0	1.0

NOTE.—The number of defects permitted shall be calculated as specified in Specification JAN-A-625.

¹ For grade A, this allowance shall remain at one and shall not be proportionate to the number of cartridges in a sample.

² No limit specified. Results of firing to be reported.

³ Primer falls out of pocket on retraction of bolt after firing.

⁴ Primer not in pocket after firing and both head of cartridge case and pocket enlarged and distorted (determined visually).

⁵ For location of defects indicated by small letters in parentheses, see Drawing B7643674.

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4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 General procedures and inspection.

4.1.1 *Sampling.*—

4.1.1.1 *Lot.*—Unless otherwise specified, a lot shall consist of the number of cartridges produced in one day at the particular plant or unit concerned. However, where a day's production is relatively small, a lot may include the production of two or more consecutive days but not more than 2,000,000 cartridges. The number of cartridges in a probational lot shall not exceed 500,000.

4.1.1.2 *Inspection lot.*—The contractor shall submit a lot for visual inspection, gaging, and weighing by inspection lots. Sampling of such inspection lots with respect to visual inspection, gaging, and weighing shall be in accordance with inspection level III of Standard JAN-STD-105.

4.1.1.3 *Size of sample.*—Acceptance samples for inspection shall be selected in accordance with Specification JAN-A-625. The number for the various acceptance tests shall be as specified in table III of this specification.

4.1.2 *Inspection and test, general.*—

4.1.2.1 *Place.*—After the cartridges have been inspected visually, gaged, and weighed by the contractor for the defects specified in table I, the visual inspection, gaging, weighing, and tests for acceptance by the inspector shall be made in accordance with Specification JAN-A-625; and, unless otherwise specified, shall be made at the place of manufacture.

4.1.2.2 *Firing defects.*—In any ballistic test, except function and casualty, in which a misfire occurs, a bullet remains in a bore, or a bullet bursts before reaching the target, an additional shot shall be fired. That particular test shall not be penalized but the ammunition sample shall be penalized for such defects in accordance with table II.

TABLE III.—Acceptance samples—first test

Test	Number of cartridges
Bullet extraction	50
Mercury cracking	50
Velocity firing	20
Waterproof firing	20
Pressure firing	20
Accuracy firing	90
Penetration firing	20
Function and casualty firing:	
Gun, machine, Browning, caliber .30, M1917A1	500
Gun, machine, Browning, caliber .30, M1919A4	300
Gun, machine, Browning, caliber .30, M1919A5 or M1919A6	300
Rifle, U. S., caliber .30 M1909A3	100
Rifle, U. S. caliber .30 M1	104
Rifle, automatic, Browning, caliber .30, M1918A2	200
Hangfire firing	600
Extraction	50
Stripping (when required)	100

NOTE.—A retest shall consist of double the number of cartridges for first test.

4.1.2.3 *Defective small arms.*—When any firing defect is found to have been caused by the small arm used, such firing defect shall not be counted against the ammunition but the small arm shall be corrected or replaced and the test repeated. This applies also in any retest of ammunition.

4.1.2.4 *Headspace.*—The headspace of all weapons shall be measured prior to heating the gun by firing in accordance with method and gages specified in subsection 7-11 of Publication ORD-M608-PM. This applies also in any retest of ammunition.

4.1.2.5 *Retests.*—Retests shall be made in accordance with Specification JAN-A-625 and subsections 7-11 and 7-12 of Publication ORD-M608-PM.

4.1.3 *Inspection.*—Each cartridge of the acceptance sample shall be inspected, gaged, and weighed for all defects specified in table I.

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4.2 Bullet extraction test.—The bullet extraction test shall be conducted in accordance with Specification JAN-A-625.

4.3 Mercury cracking test.—Mercury cracking test shall be conducted in accordance with Specification JAN-A-625.

4.4 Velocity firing test.—Cartridges shall be fired in a weapon conforming to Drawing C-64160B, held in rest conforming to Drawing 49-6-42. The headspace of the weapon shall be 1.940 to 1.943 inches, inclusive. The method of test shall be in accordance with Specification JAN-A-625 and subsection 7-13 of Publication ORD-M608-PM.

4.5 Waterproof firing test. — Cartridges shall be handled and fired in accordance with Specification JAN-A-625 and subsection 7-13 of Publication ORD-M608-PM.

4.6 Pressure firing test.—Cartridges shall be fired in a weapon conforming to Drawing D7692873, held in rest conforming to Drawing 49-6-42. The headspace of this gage shall be 1.940 to 1.943 inches, inclusive. The method of test shall be in accordance with Specification JAN-A-625 and section 7-11 of Publication ORD-M608-PM.

4.7 Accuracy firing test.—Cartridges shall be fired in a weapon conforming to Drawing D7692088, held in rest conforming to Drawing 49-6-40. The headspace of the rifle shall be 1.940 to 1.943 inches, inclusive. The method of test shall be in accordance with Specification JAN-A-625 and subsection 7-14 of Publication ORD-M608-PM.

4.8 Penetration firing test. — Cartridges shall be fired from a weapon conforming to Drawing D7692088, held in rest conforming to Drawing 49-6-40. The headspace of the rifle shall be 1.940 to 1.943 inches, inclusive. The method of test shall be in accordance with Specification JAN-A-625 and subsection 7-17 of Publication ORD-M608-PM. The velocity of each shot shall be recorded. The weapon used shall be such that the average velocity shall not vary from the corrected

velocity obtained as specified in 4.4 by more than 35 feet per second. At the discretion of the procuring agency, the penetration test may be waived provided the lot contains only cores which have been furnished by the Government under the applicable specification.

4.9 Function and casualty firing test.—The cartridges shall be fired for function and casualty from guns listed on Drawing 27-79-41 and as specified below. Machine guns may be fired with tripod or held in rest conforming to Drawing FD 14711. Rifles may be fired from shoulder or held in rest conforming to Drawing 49-6-6. In these firings the gun shall be at room temperature at the beginning of test and cooled between bursts. The method of test shall be in accordance with subsection 7-15 of Publication ORD-M608-PM.

a. Gun, machine, Browning, caliber .30, M1917A1, with headspace of 1.946 to 1.950 inches, inclusive, fired in bursts of 250 cartridges.

b. Gun, machine, Browning, caliber .30, M1919A4, with headspace of 1.946 to 1.950 inches, inclusive, fired in bursts of 100 cartridges.

c. Gun, machine Browning, caliber .30, M1919A5 or M1919A6, with headspace of 1.946 to 1.950 inches, inclusive, fired in bursts of 100 cartridges.

d. Rifle, U. S., caliber .30, M1903A3, with headspace of 1.946 to 1.947 inches, inclusive, firing five cartridges (one clip), rapid fire with intervals of not more than $\frac{1}{2}$ minute between clips (no cooling).

e. Rifle, automatic, Browning, caliber .30 M1918A2, with headspace of 1.945 to 1.950 inches, inclusive, fired in bursts of 20 cartridges (one magazine) with intervals of not more than $\frac{1}{2}$ minute between magazines (no cooling).

f. Rifle, U. S. caliber .30, M1, with headspace of 1.942 to 1.946 inches, inclusive, firing eight cartridges (one clip), rapid fire, with intervals of $\frac{1}{2}$ minute between clips (no cooling).

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4.10 Hangfire firing test.—The cartridges shall be fired in gun, machine, Browning, caliber .30, M2ACFT, held in rest conforming to Drawing 51-74-4, in bursts of 75 cartridges. The headspace of the weapon used shall be 1.946 to 1.950 inches, inclusive. The method of test shall be in accordance with subsection 7-16 of Publication ORD-M608-PM.

4.11 Case extraction test.—The cartridges shall be fired from rifle, U. S. caliber .30, M1903A3, held in rest conforming to Drawing 49-6-6, with headspace of 1.946 to 1.947 inches, inclusive. The method of test shall be in accordance with subsection 7-20 of Publication ORD-M608-PM.

4.12 Stripping test.—Any strips or tumblers, or both, occurring in the accuracy, velocity, or pressure tests shall be counted; and, when as many as 1 percent of all the shots fired strip or tumble, or both, a test for stripping shall be made as follows: Fire the cartridges from rifle, U. S. caliber .30, M1903A3, conforming to Drawing 49-6-40, against paper screens placed 10 feet and 50 feet in front of the muzzle of the gun. For this test, the rifle shall have been fired previously between 4,000 and 6,000 times. The headspace shall be from 1.940 to 1.946 inches, inclusive.

5. PREPARATION FOR DELIVERY

5.1 Packaging.—Cartridges shall be packaged in accordance with applicable drawings.

5.2 Packing. — The cartridges shall be packed in accordance with applicable drawings.

5.3 Marking.—In addition to any special marking required by drawings or by contract or order, shipping containers for the Army shall be marked in accordance with Specification 100-2; for the Navy, in accordance with the Navy Shipment Marking Handbook; and for the Air Force, in accordance with Specification 94-40645.

6. NOTES

6.1 Ordering data. — Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Grade required (see 1.2).
- c. Whether the penetration test shall be made (see 4.8).
- d. Whether domestic or overseas packing is required (see 5.2).
- e. Place of inspection (see 4.1.2.1).
- f. Marking shipping containers (see 5.3).

Notice.—This specification, together with specifications and drawings pertaining to it and bearing a "Notice" of similar restrictions, is intended for use only in connection with procurement by the United States Government and shall not be reproduced either wholly or in part, except when authorized in connection with Government procurement, nor be used for any other purpose except when specifically authorized by the Chief of Ordnance.

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