

MIL-M-13703D(AR)

20 July 1984

SUPERSEDING

MIL-M-13703C (AR)

28 April 1967

MILITARY SPECIFICATION

MARKER, LOCATION, MARINE, DYE, AN-M59

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 scope. This specification covers the parts and the loading, assembling and packing for one type of Marker, Location, Marine, Dye, AN-M59.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS

FEDERAL

RR-S-366 - Sieves: Standard Testing

MILITARY

MIL-I-45208 - Inspection System Requirement
MIL-A-48078 - Ammunition, Standard Quality Assurance Provisions, General Specification For

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

FSC 1370

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

MIL-M-13703D(AR)

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

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

9224949	- Bag, Marker
9224950	- Marker, Marine, Location, Dye AN-M59
9224974	- Box, Packing, Ammunition for Marker, Marine, Location, Dye AN-MS9
9224975	- Box, Packing, Ammunition for Marker, Marine, Location, Dye AN-M59

(Copies of specifications, standards, handbooks, 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.)

2.1.3 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 Materials. Materials shall be in accordance with applicable drawings and specifications.

3.2 Assembly. The marker shall comply with all requirements specified on Drawings (dwgs.) 9224949 and 9224950 and with all requirements specified in applicable specifications.

3.3 Filler.

3.3.1 Sodium salt of fluorescein. The filler shall contain a minimum of ~~86~~ percent sodium salt of fluorescein, when tested as specified in 4.5.1.1.

3.3.2 Moisture content. The moisture content at the time of loading at the loading station, shall not exceed 2 percent, when tested as specified in 4.5.1.2.

3.3.3 Solubility. The filler shall be 100 percent soluble in water when tested as specified in 4.5.1.2.

MIL-M-13703D(AR)

3.3.4 Color. A salt water solution shall be yellow-green color, when tested as specified in 4.5.1.4.

3.3.5 Particle size. One hundred percent of the filler shall pass through a Us. Standard No. 40 sieve, when tested as specified in 4.5.1.5.

3.4 Temperature humidity test. The filler shall not cake or lump when tested as specified in 4.5.2.

3.5 Drop test.

3.5.1 Five foot drop test. The marker (dwg. 9224950) contained in the barrier bag shall not rupture when dropped from a height of five (5) feet, when tested as specified in 4.5.3.1.

3.5.2 Fifty foot drop test. The marker (dwg. 9224950) shall burst and produce a minimum opening of four (4) inches when dropped from a height of fifty (50) feet when tested as specified in 4.5.3.2.

3.6 Workmanship. All components and filler shall be free of dirt, grease and other foreign materials.

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 following types of inspection shall be conducted on this item:

- a. First Article Inspection
- b. Quality Conformance Inspection

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 provisions of 4.3.2 and 4.3.3. The first article sample shall consist of the following items and sample quantities as indicated in Table I:

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

4.3.3 Rejection. See MIL-A-48078.

TABLE I. First article inspection

CLASSIFICATION OF DEFECTS & TESTS

MIL-M-13703D (AR)

PARAGRAPH	TITLE	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	SHEET		DRAWING NUMBER
				1	1 OF	
	Marker, Location, Marine, Dye, AN-M59					See Below
						NEXT HIGHER ASSEMBLY
CATEGORY					REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
	Marker Assembly (Prior to Loading) (Dwg. 9224950) Examination for defects Filler		20 20		3.2 3.3	4.4.2.1 4.5.1
	Marker Assembly (Dwg. 9224950) Examination for defects Temperature humidity Drop test		20 10 20		3.2 3.4 3.5	4.4.2.2 4.5.2 4.5.3
	Bag, Small (Dwg. 9224974) Examination for defects		20		3.2	4.4.2.3
	Box (Prior to Sealing) (Dwg. 9224974) Examination for defects		20		3.2	4.4.2.4
	Box (Dwg. 9224974) Examination for defects		20		3.2	4.4.2.5
	Box, Packing (Dwg. 9224975) Examination for defects		1 Box 30 markers		3.2	4.4.2.6

NOTES

MIL-M-13703D (AR)

4.4 Quality conformance inspection.

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

a. parts of one kind from one manufacturer.

b. Fillers shall be produced by one manufacturer under one continuous set of operating conditions and which consists of one or more batches that have been subjected to the same unit chemical or physical mixing process intended to make the final product homogeneous.

4.4.2 Examination, See MIL-A-48078.

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

QUALITY CONFORMANCE INSPECTION

MIL-M-13703D (AR)

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE	SHEET 1 1 OF 1		DRAWING NUMBER 9224950	
4.4.2.1	Assembly (Prior to Loading)			NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	NO OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE / INSPECTION METHOD
<u>Critical</u> Major 101 Minor 201	None defined				
	Weight of filler		0.40%	3.2	Scale (Note 1)
	Poor workmanship		1.0%	3.6	Visual

NOTES:

1. The scale shall be calibrated to plus or minus 1/4 of an ounce.

MIL-M-13703D (AR)

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE	SHEET 1 OF 1		DRAWING NUMBER
4.2.2.2	Assembly			9224950
		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>	Holes in bag		0.40%	Visual
101	Heat seal improper		0.40%	Visual
102	Filler missing		0.40%	Visual
103				
<u>Minor</u>	Loose powder on bag		0.65%	Visual
201	poor workmanship		1.0%	Visual
202				
<u>Notes:</u>				

CLASSIFICATION OF DEFECTS & TESTS

MIL-M-13703D (AR)

PARAGRAPH	TITLE	SHEET 1 of 1		DRAWING NUMBER	
4.2.2.3	Bag, Small			9224974	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 improper		0.40%	3.2	Visual
102	Notches missing or improperly located		0.40%	3.2	Visual
103	Width of heat seals incorrect		0.40%	3.2	SME
104	Size of notches incorrect		0.40%	3.2	SME
105	Waterproofness of small bag destroyed by rupture, puncture or separation of seal		0.40%	3.2	Visual
106	Temperature humidity	10	0-1	3.4	4.5.2
107	Five (5) foot drop test	20	0-1	3.5.1	4.5.3.1
108	Fifty (50) foot drop test	20	0-1	3.5.2	4.5.3.2
<u>Minor</u>					
201	Printing incorrect, misleading or illegible		0.65%	3.2	Visual
202	Print sizes incorrect		0.65%	3.2	SME
203	Printing improperly located		0.65%	3.2	Visual
204	Loose powder on bag		0.65%	3.2	Visual
205	Heat seal of small bag located so that subsequent seals cannot be made		0.65%	3.2	Visual
206	Poor workmanship		1.0%	3.6	Visual

note:

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

MIL-M-13703D (AR)

PARAGRAPH	TITLE	SHEET 1 of 1		DRAWING NUMBER	
4.2.2.4	Box (Prior to Sealing)			9224974	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> 101 102	Any packing components missing Improper number of markers		0.40% 0.40%	3.2 3.2	Visual Visual
<u>Minor</u> 201	Poor workmanship		1.0%	3.6	Visual

NOTE:

CLASSIFICATION OF DEFECTS & TESTS

MIL-M-13703D (AR)

PARAGRAPH	TITLE	SHEET 1 of 1		DRAWING NUMBER	
4.2.2.5	Box			9224974	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				
Major 101	Waterproofness of large bag destroyed by rupture, puncture or separation of seal		0.40%	3.2	Visual
Minor 201	Box improperly sealed		0.65%	3.2	Visual
202	Marking misleading or unidentifiable		0.65%	3.2	Visual
203	Heat seal of large bag located so that subsequent seals cannot be made		0.65%	3.2	Visual
204	Poor workmanship		1.0%	3.6	Visual
NOTE					

MIL-M-13703D (AR)

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE	SHEET 1 OF 1		DRAWING NUMBER	
4.2.2.6	Box Packing			9224975	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>	None defined				
<u>Minor</u>	Strapping missing, broken or loose		0.65%	3.2	Visual/Manual
201	Board broken or split		0.65%	3.2	Visual
202	Marking misleading or unidentifiable		0.65%	3.2	Visual
203					
NOTE:					

MIL-M-13703D(AR)

4.4.3 Testing.

4.4.3.1 Filler (See 3.3.1), Major Defect. Two random samples of 250 g. shall be selected from each batch of filler used in the loading of markers. (A fifty g. sample shall be selected at the time of loading at the loading station for the moisture content (see 3.3.2). If any sample fails to comply with the requirements the filler shall be rejected and any marker loads shall be rejected.

Test

Sodium salt of fluorescein

Moisture

Volubility

Color

Particle size

4.5 Methods of inspection.4.5.1 Filler.

4.5.1.1 Sodium salt of fluorescein. A one (1) g. portion of the sample shall be accurately weighed, and dissolved in a beaker containing 200 ml of distilled water. The solution shall be heated to boiling, then 10 percent hydrochloric acid shall be added, a few drops at a time, with constant stirring until the solution gives a distinct acid end point with congo red paper. (The acid shall be added while the solution is boiling, to prevent the formation of the more soluble, yellow form of fluorescein.) The solution shall be allowed to cool to room temperature, then quantitatively filtered into a tared Gooch crucible, using 75 mL of distilled water to transfer and wash the the precipitate into the crucible, and then dried for 1 hour, in an oven at $100 \pm 5^{\circ}\text{C}$. The percentage of soluble sodium salt of fluorescein shall be calculated as follows:

Percentage of soluble sodium salt of fluorescein = $\frac{\text{Wt of precipitate}}{113}$

4.5.1.2 Moisture. Approximately a five (5) g. Portion of the sample shall be accurately weighted in a tared weighing dish. The dish shall be heated for 4 hours in an oven at $100 \pm 5^{\circ}\text{C}$. Cooled in a desiccator and weighed. The moisture content shall be calculated as follows:

$$\text{Percent moisture} = \frac{A \times 100}{B}$$

where:

A = loss of weight, g

B = weight of sample, g

MIL-M-13703D(AR)

4.5.1.3 Volubility. A five (5) g portion of the sample shall be accurately weighed and placed in a beaker. Wash the sample with four 200 mL of distilled water. Each washing shall be filtered through a tared filtering crucible and with the fourth washing transfer any undissolved material into the crucible. The crucible and residue shall be washed with distilled water. The crucible shall be dried for 1 hour in an oven at $100 \pm 5^{\circ}\text{C}$, cooled in a desiccator and weighed and examined visually—for the presence of insoluble material.

4.5.1.4 Color. Twenty (20) mL of distilled water shall be placed in a beaker and 0.5 g. of sodium chloride added and 0.1 g. of sample. The solution shall be examined visually for color.

4.5.1.5 Particle size. A hundred (100) g. portion of the sample shall be placed on a U.S. Standard Number 40 sieve complying with Specification RR-S-366. The material shall be brushed with a camel's hair brush until no more material passes through the sieve. Observation shall be made for particles remaining on the sieve.

4.5.2 Temperature humidity. The loaded markers shall be stored at $50 \pm 5^{\circ}\text{C}$ and 100 percent RH, in a suitable enclosure for 7 days. The markers shall be removed, the cases broken, and the filler examined for evidence of caking or lumping. (Destructive Test).

4.5.3 Drop tests.

4.5.3.1 Five foot drop test. The marker in the barrier bag shall be lifted to a height of five feet and then dropped onto a steel or concrete surface. The bag shall not burst or rupture. (Destructive Test)

4.5.3.2 Fifty foot drop test. The marker without the barrier bag shall be lifted to a height of fifty (50) feet and then dropped onto a steel or concrete surface. The bag shall burst and the opening shall be measured with a ruler. (Destructive Test)

5. PACKAGING

5.1 Level A. The marker AN-M59 shall be packaged in accordance with dwg. 9224974 and dwg. 9224975.

5.2 Marking. Markings shall be in accordance with dwg. 9224974 and 9224975.

MIL-M-13703D (AR)

6. NOTES

6.1 Intended use. The components covered by this specification are intended for use on the Marker, Location, Marine, Dye, AN-M59. This marker is used to mark reference points on water. The slick produced can be seen at a range of 10 miles, from an altitude of 3000 feet.

6.2 Ordering data. See MIL-A-48078.

6.3 Submission of inspection equipment for design approvals. See MIL-A-48078. Submit designs as required to Commander, US Army Armament, Munitions and Chemical Command, ATTN: DRSMC-QAT-I(D), Dover, NJ 07801.

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

6.5 Equivalent test methods. The test methods given in this specification are the official methods to be used. The contractor may request using other methods providing that the proposed method is equivalent (accuracy and precision) to the method given in this specification. Prior approval of the Contracting Officer is required for use of equivalent test methods. A description of the proposed method should be submitted through the Contracting Officer to: Commander, ARDC, ATTN: DRSMC-QAR-R(D), Dover, NJ 07801. This description should include, but not be limited to, the procedures used, the accuracy and precision and drawings of any special equipment required (see MIL-I-45208, paragraph 3.10).

6.6 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:
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(Project 1370-A163)

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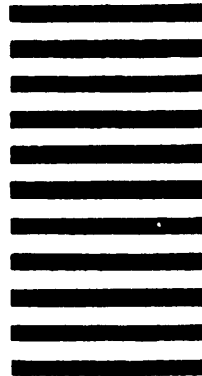
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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-M-13703D		2. DOCUMENT TITLE MARKER, LOCATION, MARINE, DYE, AN-M59	
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:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
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