

MIL-L-10287B
22 October 1976
SUPERSEDING
MIL-L-10287A
19 August 1953

MILITARY SPECIFICATION
LACQUER, CELLULOSE NITRATE,
FOR IDENTIFICATION OF SMALL
ARMS AMMUNITION

This specification is approved for use by all Departments and Agencies of Department of Defense.

1. SCOPE

1.1 Scope. This specification covers a lacquer used in the manufacture of small arms ammunition for identification purposes and in the assembly of small arms ammunition primers.

1.2 Classification. This specification covers one grade and two types of lacquer as follows:

- Type I - Opaque.
- Type II - Transparent.

2. APPLICABLE SPECIFICATIONS AND STANDARDS

2.1 Issues of documents. The following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

FSC 8010

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Army Materials and Mechanics Research Center, Watertown, MA 02172 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MIL-L-10287B

SPECIFICATIONS

FEDERAL

- TT-E-751 - Ethyl Acetate, Technical.
- TT-T-266 - Thinner; Dope and Lacquer (Cellulose-Nitrate).
- PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials, Packaging, Packing and Marking of.

STANDARDS

FEDERAL

- FED. TEST METHOD STD. NO. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.
- FED. STD. NO. 595 - Colors.

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the Contracting Officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 2369 - Test for Volatile Content of Paints.
- D 2698 - Determination of Pigment Content of Solvent Type Paints by High Speed Centrifuging.

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

SOUTHERN CALIFORNIA AIR POLLUTION CONTROL DISTRICT

Rule 442 - Use of Solvents

(Application for copies should be addressed to: Southern California Air Pollution Control District, 9420 Telstar Avenue, El Monte, CA 91731.)

3. REQUIREMENTS

3.1 Color. The color shall be as specified in the contract or order, and of a shade conforming to FED. STD. No. 595.

3.2 Vehicle.

3.2.1 Volatile. The volatile portion of the lacquer shall be certified by the manufacturer as meeting Southern California APCD Rule 442. The volatile portion shall contain no benzene, methanol, chlorinated, or other known toxic substances.

3.2.2 Nonvolatile vehicle. The nonvolatile vehicle shall consist of cellulose nitrate, modifying resins, and plasticizers.

3.3 Pigment. The pigments shall be lightfast and opaque. Extenders of any type shall not be used.

3.4 Quantitative requirements. The lacquer shall conform to the quantitative requirements specified in Table I and 3.4.1 or 3.4.2.

TABLE I. Quantitative Requirements

Characteristics	Requirements	
	Minimum	Maximum
Total solids, percent by weight of lacquer:		
Type I		
Black.	32	-
All other colors	35	-
Type II	30	-
Pigment, percent, by weight of lacquer:		
Type I		
Black.	2	-
All other colors	5	-
Drying time, set to touch, in minutes.	--	4

3.4.1 Viscosity. The viscosity of the lacquer, when thinned with thinner conforming to TT-T-266 (Composition L) shall be 45 ± 5 centipoises. The solids of the reduced lacquer shall be minimum of 15 percent.

3.4.2 Viscosity for use in primers. The viscosity of the lacquer, when thinned with thinner conforming to TT-E-751, shall be 18 ± 2 centipoises. The solids of the reduced lacquer shall be a minimum of 7 percent.

3.5 Qualitative requirements.

3.5.1 Storage and dip tank stability. The lacquer shall not settle or liver in the container or in production machines.

3.5.2 Dilution stability. When thinned to a viscosity of 45 ± 5 centipoises and modified as specified in 3.4.1 or to a viscosity of 18 ± 2 centipoises and modified as specified in 3.4.2, there shall be no precipitation or separation of any ingredient in the reduced lacquer when examined visually.

3.5.3 Dipping properties. The lacquer shall be suitable for application by machine dipping.

3.5.4 Adhesion. The lacquer shall adhere tightly to gilding metal. When tested with a knife, the film shall not flake and the cut shall show beveled edges.

3.5.5 Flexibility. When tested as specified in 4.3.5, the lacquer shall show no cracking or flaking at the bend.

3.5.6 Heat resistance. A film of the lacquer, prepared and tested as specified in 4.3.6, shall not soften or flow when heated for one hour in an oven at $95^{\circ} - 100^{\circ}\text{C}$.

3.5.7 Water resistance. A film of the lacquer, prepared and tested as specified in 4.3.7 shall show no marked dulling, fading, softening or other defects when examined two hours after removal from the water.

3.5.8 Blushing. The lacquer shall have sufficient resistance to the precipitation action of high humidity to prevent the formation of streaks and discoloration.

3.5.9 Compatibility. The pigment shall be well ground to prevent undue settling or caking. The lacquer shall be compatible with thinner conforming to TT-T-266 (Composition L) in all respects.

3.5.10 Point identification Type I. The lacquer, when applied to the points of bullets as specified in 4.3.9, shall give good hiding, excellent adhesion, no ball of lacquer on bullet tip and no evidence of chipping or peeling during subsequent handling and inspection of cartridges.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Sampling, inspection and testing. Unless otherwise specified, sampling, inspection and testing shall be in accordance with Method 1031 of Fed Test Method Std. No. 141.

4.3 Testing. All tests shall be made in accordance with the requirements of FED. TEST METHOD STD. No. 141 except as indicated otherwise in the following paragraphs.

4.3.1 Preparation of test panels. Panels, 3 by 6 inches in size, of 28 to 32 gage gilding metal (90 percent copper, 10 percent zinc) shall be lightly buffed with steel wool and solvent cleaned. The panels shall then be dipped into lacquer, thinned and modified in accordance with 3.4.1, withdrawn at a uniform rate of 2 inches per minute, and allowed to air dry 48 hours before testing.

4.3.2 Tests. The following tests shall be conducted in accordance with FED. TEST METHOD STD. No. 141, or ASTM as below:

<u>Tests</u>	<u>Method</u>	
	FED. TEST METHOD STD. No. 141	ASTM
Total solids	--	D 2369
Pigment content	--	D 2698
Drying time	4061*	--
Condition in container	3011	--
Adhesion (knife test)	6304	--
Dipping properties	4341	--
Dilution stability	4203	--

*Dip a panel in the lacquer reduced to a viscosity of 45 ± 5 centipoises and withdraw at uniform rate of 2 inches per minute.

4.3.3 Dilution stability. Reduce a small quantity of the lacquer as in 3.4.1 and as in 3.4.2 allow to stand for four hours in closed containers and examine for precipitation or separation of ingredients to a noticeable degree.

4.3.4 Adhesion. Prepare a test panel as specified in 4.3.1 and test with a sharp knife in accordance with Method 6304 of FED. TEST METHOD STD. No. 141.

4.3.5 Flexibility. Prepare a test panel as specified in 4.3.1 and bend rapidly over a 3/8-inch mandrel. Examine with a 5 power glass for evidence of film failure.

4.3.6 Heat resistance. Prepare a test panel as specified in 4.3.1 and stand in a nearly vertical position in an oven at $95^{\circ} - 100^{\circ}\text{C}$. Remove after one hour and examine for evidence of softening and flowing.

4.3.7 Water resistance. Prepare a test panel as specified in 4.3.1 and immerse halfway in distilled water at 77°F . After 18 hours immersion, remove the panel from the water, allow to condition for two hours, and examine for evidence of film failure.

4.3.8 Blushing. Prepare a test panel as specified in 4.3.1 and allow to air dry in a humidity cabinet at $77^{\circ} \pm 3^{\circ}\text{F}$, and 92 percent ± 2 percent relative humidity. Examine after one hour for evidence of streaking and discoloration.

4.3.9 Point identification test. The lacquer shall be reduced as specified in 3.4.1 and applied to gilding metal bullet points by machine dipping. After application, the lacquer shall show good hiding without the formation of a bead on the bullet tip by draining. The machine drying time cycle shall be five minutes at which time the lacquer shall be dry to handle without marring. After 24 hours drying, the lacquer shall show excellent adhesion to gilding metal bullet points during subsequent handling and inspection of cartridges.

5. PACKAGING

5.1 Packing. The lacquer shall be furnished in containers of the capacity specified in the contract or order (see 6.2). The containers shall comply with applicable regulations of the Interstate Commerce Commission. Unless otherwise specified, packaging and packing shall conform to PPP-P-1892.

5.2 Marking. Marking shall be in accordance with MIL-STD-129. In addition, each package and container shall be marked to show the proportions of lacquer and thinner recommended for use by the manufacturer.

6. NOTES

6.1 Intended use. This lacquer is used in both the manufacture of small arms ammunition for identification purposes and is applied over gilding metal, and in the assembly of small arms ammunition primers.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Size of container required and whether preparation for domestic or overseas shipment is required (see 5.1).
- (c) Color (see 3.1).
- (d) Place of inspection (see 4.3.2).

(e) Certification requirement of conformance with Southern California APCD Rule 442 (see 3.2.1).

Custodian:

Army - MR
Air Force - 11

Preparing activity:

Army - MR
Project 8010-0604

Review activities:

Army - MU, ME
DSA - IS

User activities:

Navy - OS
Air Force - 26

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

VENDOR

USER

MANUFACTURER

OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

B. 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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NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification 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.

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