

MIL-M-43803

14 August 1972

MILITARY SPECIFICATION

MARKINGS, INKED OR PAINTED, OPAQUE, ON NONPOROUS SURFACES

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

1. SCOPE

1.1 Scope. - This specification covers the performance requirements of inked or painted markings on nonporous surfaces, such as metals, glass, stone, plastic, or painted surfaces, in their applied and dried condition (see 6.1).

2. APPLICABLE DOCUMENTS

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

SPECIFICATION

FEDERAL

VV-G-101 - Gasoline; Motor, United States Government.

STANDARDS

FEDERAL

FED-STD-141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.

FED-STD-595 - Colors.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

FSC 7510

MIL-M-43803

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, Washington.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

3. REQUIREMENTS

3.1 Material.- The material for making markings shall be an ink or paint, and may be of any type, such as solvent thinned, solventless aerosol dispensed, carrier supported, hot melt application, brush, roller, spray, mimeo, or machine application, or electrostatic application which will comply with the requirements of this specification.

3.2 Application.- The markings shall be applied on clean and dry surfaces that shall be free of dirt, oil, grease, water, corrosion, or other foreign matter.

3.3 Color.- The color of the markings shall be as specified (see 6.2), and shall approximate the specified color listed in table I, when tested as specified in 4.2.2.

TABLE I.- Marking colors

Color ^{1/}	Color No.
White	37875
Black	37038
Gray	36231
Red	31136
Yellow	33538
Green	34108
Blue (dark)	35044
Blue (light)	35109
Orange	32246
Maroon	30111

^{1/} The color number is covered by FED-STD-595.

MIL-M-43803

3.4 Gloss.— The specular gloss shall be 30 maximum when tested as specified in 4.2.3.

3.5 Condition and appearance.— Markings shall be in their fully dried, cured, or set condition at the time the marked item is presented for acceptance by the Government. Markings shall be smooth, uniform, unsmearred in appearance and free of conspicuously ragged edges. There shall be no bleeding of color from markings to substrate or vice versa, or if present, shall be insufficient to cause a mottled or streaky appearance, or shall not extend more than 1/64 inch from edges of the marking. Markings shall show no lifting, wrinkling, or other visible effect on the substrate surface.

3.6 Toughness.— Markings shall not powder or flake, nor shall the cut edge show the jaggedness characteristic of brittle films when tested by knifeblade as specified in 4.2.4.

3.7 Resistance to smearing.— Markings shall not smear when tested as specified in 4.2.5.

3.8 Resistance to water.— The markings shall be legible, retain their characteristic color, not smear upon vigorous rubbing, nor blister, crack or peel when tested as specified in 4.2.6.

3.9 Resistance to gasoline.— Markings shall remain clear and sharp without streaking or blurring and shall show no appreciable color difference when tested as specified in 4.2.7.

3.10 Resistance to weathering.— Markings shall show no cracking, checking, flaking, and no more than a slight color change when tested as specified in 4.2.8.

3.11 Other properties.— The other properties shall be as may be required in the end item specification (see 6.2).

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection.— Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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.

MIL-M-43803

4.2 Test methods.

4.2.1 Tests shall be conducted as specified herein. The number of determinations which shall be conducted on each sample unit shall be as specified in the applicable test method. Sampling for determining the number of sample units to be tested as well as designation of the sample unit shall be as specified in the end item specification. Test specimens, derived from other than the end item shall be marked by the same method of application and under same conditions as used to mark the end item. Results shall be reported as specified in the applicable test method. Sufficient time shall be allowed for drying, curing, or setting of the markings, before conduct of tests.

4.2.2 Color.- The color of the applied and dried markings shall be visually compared in hue and lightness or darkness with a color chip of the specified color and in accordance with Method 4250 of FED-STD-141 except that the test area shall be the marked portion of the end-item and viewing shall be as nearly normal to the surfaces being compared as permitted by the shape of the end-item.

4.2.3 Gloss.- The gloss shall be determined by either of the following methods:

4.2.3.1 Test of ink material.- The gloss test shall be conducted in accordance with Method 6101 of FED-STD-141, except that the test panel may be of the same material as the end-item marking area, and the film shall be applied by the same method as the markings on the end-item.

4.2.3.2 Visual test of markings.- The gloss test shall be determined by visual comparison of the markings on the end-item and gloss reference panels prepared to have the specified color at the maximum permissible gloss of 30 when tested as specified in Method 6101 of FED-STD-141. In the visual examination, the two surfaces shall be adjacent and in the same plane, and they shall be viewed from several angles of view and illumination.

4.2.4 Toughness.- The markings shall be tested by knifeblade in accordance with Method 6304 of FED-STD-141, and observed for tendency to powder or flake, or to yield a jagged cut.

4.2.5 Resistance to smearing.- Rub the markings vigorously for 10 strokes with approximately 80 X 80 weave cotton sheeting and examine the markings for smearing. One determination shall be made on each sample unit. Results shall be reported as "pass or fail".

4.2.6 Resistance to water.- The marked area shall be immersed in distilled water at room temperature (70 to 90°F) for 4 hours. If immersion is not feasible, the marked area shall be kept fully wetted for the same time and at the same temperature by suitable alternate means, such as contact with dripping wet cloths or sponges. Air dry for 1 hour under standard conditions, then examine for legibility, color change, blistering, cracking and peeling. Rub the markings vigorously as in the Resistance to Smearing Test and examine the markings for smearing. One determination shall be made on each sample unit. Results shall be reported as "pass or fail".

MIL-M-43803

4.2.7 Resistance to gasoline.- The markings shall be wetted alternately with gasoline conforming to VV-G-101 and distilled water, five times for each liquid, and allowing complete evaporation of each wetting. Twenty four hours later, the markings shall be examined with the aid of untested companion panels for changes in clarity, sharpness, color, and for appearance of burring and streaking. One determination shall be made on each sample unit. Results shall be reported as "pass or fail".

4.2.8 Resistance to weathering.- A portion of the marked area shall be exposed to accelerated weathering in accordance with Method 6151 or 6152 of FED-STD-141 for 100 hours. Alternatively, the test specimens may be a separately prepared panel of the same material as the end item area to be marked and the markings shall be applied by the same method and materials as the markings on the end item. The exposed markings shall then be examined for checking, cracking, flaking, and change of color, with the aid of an unexposed marked specimen.

5. PREPARATION FOR DELIVERY

5.1 Preparation for delivery is not applicable to this specification.

6. NOTES

6.1 Intended use.- The nonglossy weather resistant markings covered by this specification are for use on metal, glass, stone, plastic or painted and other nonporous surfaces of end-items and containers. The requirements for the markings ensure a level of performance approximating that required by TT-I-558. Referencing this specification in end-item specifications in lieu of TT-I-558 will give latitude to manufacturers of the end-items in the selection of marking inks and paints, and, thereby, in selection of the application method as well. Thus, inks, paints, and applicators may be selected from a wide assortment of commercial marking practices, including, but not restricted to stencil brush, machine printing, carrier supported inks, hot melt printing, and electrostatic printing.

6.1.1 Physical requirements for markings, for example, content, sizes of letters, arrangement, and location, should be given in the end-item specification.

6.2 Ordering data.- Procurement documents for end-items with markings in accordance with this specification shall include the following information:

- (a) Title, number, and date of this specification.
- (b) Color required (see 3.3).
- (c) Other required properties and tests, if any (see 3.11).

MIL-M-43803

Custodians:

Army - GL
Air Force - 84

Review activity:

Army - ME

User activity:

Army - WC

Preparing activity:

Army - GL

Project No. 7510-0246

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 22-R255
<p>INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.</p>		
<p>SPECIFICATION Markings, Inked or Painted, Opaque, on Nonporous Surfaces MIL-M-43803</p>		
<p>ORGANIZATION</p>		
<p>CITY AND STATE</p>		<p>CONTRACT NUMBER</p>
<p>MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT</p>		
<p>1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.</p>		
<p>B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</p>		
<p>2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID</p>		
<p>3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO (If "yes", in what way?)</p>		
<p>4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional pages, attach to form and place both in an envelope addressed to preparing activity)</p>		
<p>SUBMITTED BY (Printed or typed name and activity - Optional)</p>		<p>DATE</p>

DD FORM 1426
1 JAN 66

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.

FOLD

DEPARTMENT OF THE ARMY
U. S. Army Natick Laboratories
Natick, Massachusetts 01760

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commanding General
U. S. Army Natick Laboratories
ATTN: AMGRES-EQS
Natick, Massachusetts 01760

FOLD