MIL-V-12276D(MR)
4 January 1971
SUPERSEDING
MIL-C-12276C(MR
8 September 1965

MILITARY SPECIFICATION

VARNISH, PHENOLIC, BAKING

1. SCOPE

1.1 Scope. This specification covers three types of heat hardening phenolic varnishes suitable for use as a coating for cartridge cases and as a lining for munitions and other containers. It provides for an additional composition suitable for use under Air Pollution Regulations.

1.2 Classification. The varnish covered by this specification shall be of the following compositions, types, and classes as specified (see 6.2 and 6.6).

Compositions

Composition G - General use
Composition L - Limited use (see 6.6).

Type I - For use on cartridge cases

Class A - For spray applications.
Class B - For dip applications.

Type II - For use in lining munitions and chemical containers.

Type III - For use on cartridge cases under special conditions (see 6.1).

Class A - For spray applications
Class B - For dip applications
Class C - For roller, curtain or similar coating applications

FSC 8010

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

FEDERAL

L-T-90 - Tape, Pressure-Sensitive, Adhesive (Cellophane and Cellulose Acetate)
O-C-303 - Chromium Trioxide, Technical
O-O-670 - Orthophosphoric (Phosphoric) Acid, Technical
P-S-651 - Sodium Orthosilicate, Technical
TT-P-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking of

MILITARY

MIL-C-10578 - Corrosion Removing and Metal Conditioning Compound (Phosphoric Acid Base)

STANDARDS

FEDERAL

Fed. Test Method Std. No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing

3. REQUIREMENTS

3.1 Materials.

3.1.1 Type I varnish shall be based on a straight thermosetting phenol-formaldehyde varnish free from rosin or rosin derivatives, but may include the use of other materials to improve the leveling, flexibility and adhesion of the coating.

3.1.2 Type II varnish shall be a straight thermosetting phenol-formaldehyde varnish free from added plasticizers, rosin or rosin derivatives.

3.1.3 Type III varnish shall be based on a mixture of bisphenol epoxide and phenol-formaldehyde resins. It may include other materials to improve the leveling of coating.

3.2 Solvents.

3.2.1 Thinner. A thinner shall be supplied with the varnish so that the varnish can be reduced to the proper usable viscosity prior to application. The varnish and thinner delivered as a lot shall be furnished in quantities proportional to the ratio recommended by the manufacturer to produce the specified film thickness after baking.

3.2.1.1 Type I and II varnish, when diluted with supplied thinner to a viscosity of 30 centipoises at 75° ± 2°F, shall have a minimum solids content of 29 percent.

3.2.1.2 Type III varnish, when diluted with supplied thinner to a viscosity of 30 centipoises at 75° ± 2°F, shall have a minimum solids content of 24 percent.

3.2.2 Compositions G and L. The solvent, used with the resin and the solvent supplied as the thinner, shall be of such a nature that they will not constitute an undue hazard to personnel in application of the varnish. Evidence to this effect shall be subject to review by departmental medical authority.

3.2.3 Composition L. The solvent used with the resin and the solvent supplied as the thinner shall meet the requirements listed below, when tested as described in 4.4.5.

(a) Aromatic compounds with eight or more carbon atoms except ethyl benzene: 8 percent maximum.
(b) Ethyl benzene and toluene: 20 percent maximum.
(c) Solvents with an olefinic or cyclo-olefinic type of unsaturation: negative test.
(d) Ethyl benzene and ketones: 20 percent maximum
(e) Total of a + b + d: 20 percent maximum

3.3 Color.

3.3.1 Types I and III. Types I and III materials shall be clear or the natural color of the varnish. There shall be no pigment added. The use of soluble organic dyes is permissible.

DIGITIZED BOTTOM OF [illegible] 3.3.2 For Type I [illegible] Type V

3.3.2 Type II. No color requirements applicable. Material may be clear or pigmented.

3.4 Solids content. The minimum solids content for types I and III varnish, as received, and then tested in accordance with 4.4.4, shall be 35 percent.

3.5 Absence of film defects. The varnish shall produce a smooth, continuous film with no visible pinholes, craters, or blisters when tested as specified in 4.4.2.

3.6 Film adhesion and flexibility. The dried film on metal shall be tough, elastic and shall not chip, flake, scale, or show poor adhesion to SAE 1010 steel panels when tested as specified in 4.4.3.

3.7 Resistance to chemicals and solvents. The varnish when applied to steel panels as specified in 4.4.1.1 and baked as prescribed in each of the three schedules listed in 4.4.1.2 shall not be softened or otherwise deteriorated when immersed in toluene, glacial acetic acid, ammonium hydroxide, ethyl alcohol or ether and tested as specified in 4.4.6. In addition, type II varnish shall not be softened, blistered, or otherwise deteriorated by boiling bis-(beta chloroethyl) ether when tested as specified in 4.4.6.

3.8 Corrosion resistance. There shall be no rusting of the panels, nor peeling or undercutting of the coating when subjected to salt spray test for 250 hours as specified in 4.4.7.

3.9 Abrasion resistance.

3.9.1 Types I and III materials. When tested as specified in 4.4.8, the maximum weight of coating removed by 500 cycles shall not exceed 8 milligrams and the coating shall not be abraded through to the metal.

3.9.2 Type II material. The diameter of the area abraded through to the steel when tested as specified in 4.4.8 shall not exceed 4 millimeters.

3.10 Impact resistance. Panels coated with type III varnish shall not flake, crack or lift when tested as specified in 4.4.9. This requirement does not apply to types I and II.

3.11 Thermoplasticity. The finish shall not soften or stick when tested at 600°F as specified in 4.4.10.

3.12 Viscosity. Types I and III varnishes shall have a minimum viscosity of 40 centipoises at 75° ± 2°F as received. The viscosity shall be determined as specified in 4.4.11.

3.13 Shelf life. When tested as specified in 4.4.12, there shall be no more than a 15 percent change in viscosity after 90 hours at 140°F nor separation of any component.

3.14 Workmanship. The ingredients of the varnish shall be thoroughly mixed to form a homogeneous product free of visual dirt, grit, water, or other foreign materials. The unpigmented varnish shall have no sediment or solid particles.

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 specified requirements.

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

4.3 Classification of tests. Testing under this specification shall be for the purpose of acceptance of individual lots and shall consist of tests for all requirements specified herein.

4.4 Test procedures.

4.4.1 Preparation of test panels. Test panels of cold rolled SAE 1010 steel of the sizes required for the applicable test shall be cleaned and pretreated in accordance with the following schedule:

(a) Degrease in trichloroethylene at room temperature.
(b) Dip for 5 minutes in alkaline cleaner solution (4 to 6 oz/gal.) at temperature of 190°F min. The alkaline cleaner shall comply with P-S-651, type II, to which shall be added 3.5 percent min. by weight of Nacconal NR or equal (see 6.5).
(c) Rinse in water at temperature of 160°-180°F.
(d) Dip in 20 percent by weight phosphoric acid complying with MIL-C-10578, type V, for 1 minute at 170°-190°F.
(e) Rinse in water 160°-180°F.
(f) Dip in solution maintained at a pH value of from 2.0 to 5.0 by the addition of a sufficient amount of chromic acid which shall comply with the requirements of O-C-303 (approximately .08 ounces per gallon) or a mixture of phosphoric acid which shall comply with the requirements of O-O-670 and chromic acid (approximately .04 ounces of each per gallon).

4.4.1.1 Film thickness. The types I and III coatings shall be applied by spray, dip, or other methods according to class in such a manner that the thickness of the film after baking shall be not less than 0.0004 inch nor more than 0.0006 inch, except as specified in 4.4.2. Type II coatings shall be applied by either dip, spray, or other methods in such a manner that the thickness of the film after baking shall be not less than 0.0004 inch nor more than 0.0006 inch for clear coatings and not less than 0.0010 inch nor more than 0.0015 inch for pigmented films. The panels shall be coated in an atmosphere as free as possible from dirt, dust or laboratory fumes.

(1) Qualitative identification of styrene-acrylates: Dissolve a portion

4.4.1.2 Three sets of coated panels shall be prepared and baked in accordance with the following schedules:

(a) For the length of time and the temperature normally recommended by the finish manufacturer. (All tests).
(b) For the same length of time but at a temperature of 25 degrees Fahrenheit lower than (a) above. (All tests except 4.4.2 and 4.4.9).
(c) For the same length of time but at a temperature 25 degrees Fahrenheit higher than (a) above. (All tests except 4.4.2 and 4.4.9).

4.4.2 Absence of film defects. Two test panels, 4 by 6 by .025 inches in size, prepared as specified in 4.4.1, shall be spray coated or dipcoated to a dry film thickness of 0.0005 plus or minus 0.0001 inch for types I and III materials. The thickness of type II coatings shall be in accordance with 4.4.1.1. The panels shall be prebaked at $212^{\circ} \pm 4^{\circ}F$ for 20 minutes and then baked according to the manufacturer's recommended baking schedule. The panels shall be examined visually for defects specified in 3.5.

4.4.3 Film adhesion and flexibility. Test panels, 4 by 6 by 0.0125 inches in size, shall be prepared and coated as specified in 4.4.1 and 4.4.1.1. A minimum of two coated panels for each of the three schedules specified in 4.4.1.2 shall be tested for film adhesion and flexibility by rapidly bending each coated panel around a mandrel 0.50 plus or minus 0.01 inch in diameter for type I material, 1.00 plus or minus 0.01 inch in diameter for type II material and 0.125 plus or minus 0.005 inch in diameter for type III material. The film shall be examined for compliance with 3.6. A strip of transparent, pressure-sensitive, adhesive cellophane tape conforming to L-T-90 shall then be pressed down on the bend in the coated panel and stripped off. None of the phenolic coating shall be lifted off by the adhesive tape.

4.4.4 Solids content. Weigh to the nearest milligram a small disposable aluminum dish approximately 2 inches in diameter, that has been provided with a tared aluminum cover. (These aluminum dishes may be obtained from Fisher Scientific Co., catalog number 8-732). Weigh into the dish a very small sample of the varnish that does not exceed 0.3 gram in weight. Dissolve in 2 ml. of reagent grade toluene and dry the dish for 30 minutes in a gravity convection oven at 105° ± 2°C. Determinations shall be run in duplicate. Upon cooling, reweigh to the nearest 0.1 milligram and calculate the percent total solids:

$$\text{Percent solids} = \frac{\text{weight of residue}}{\text{weight of sample}} \times 100$$

4.4.5 Solvent analysis for composition L.

4.4.5.1 Separation of volatile portion. Pour about 15 grams of the varnish into a 50 ml. distilling flask. Add 10 ml. of tricresyl phosphate and several anti-bumping stones or Berl saddles. Fit a release valve into the mouth of the flask and attach a delivery tube to the side arm, extending into a receiver. The receiver consists of a test tube (20 x 150mm) with side arm for attaching to a vacuum pump. The glass delivery tube should reach 1-1/2 inches from the bottom of the tube. Immerse the receiver in a dry ice-acetone bath. Preheat a silicone oil bath to 160°C. Raise the oil bath until the oil reaches the sample level. Reduce the pressure slowly to 10 mm of mercury. After all the solvent has distilled, carefully release the vacuum using the valve that is connected to the distilling flask. Reserve the collected distillate for the aromatic solvent determination and the test for ketone, olefinic and cyclo-olefinic compounds.

4.4.5.2 Determination of aromatic hydrocarbons.

4.4.5.2.1 Qualitative test for aromatic hydrocarbons. Place 5 ml. of the distillate in a 10 ml. glass stoppered graduate. Add 5 ml. of 86 percent sulfuric acid slowly while the graduate is being cooled with tap water. After the acid has been added, shake vigorously for 2 minutes, then allow the layers to separate. If there is no separation of layers, it can be assumed that no aromatic hydrocarbons are present. If there is an upper layer, determine the aromatic hydrocarbons quantitatively as described in 4.4.5.2.2.

4.4.5.2.2 Quantitative determination of aromatic hydrocarbons.

Apparatus: A gas chromatograph equipped with a thermal conductivity detector.

Column preparation: Two lengths of 1/4 inch copper tubing, 6-ft. and 18-ft. long, are packed with 35 percent N, N-Bis (2-cyanoethyl) formamide on 60- to 80-mesh Chromosorb P.

Operating conditions:	6-ft.	18-ft.
Detector cell temperature, °C	300	300
Detector cell current, ma.	150	150
Injection port temperature, °C	300	300
Helium flow at exit, cc/minute	175	110
Column temperature, °C	125	70

4.4.5.2.2.1 Aromatic and oxygenated solvents - procedure A. Install the 6-ft. column and follow the operating conditions described above. Inject about 3 micro-liters of the isolated distillate and scan the chromatogram. The aliphatic solvents will emerge within 1 minute and the complete chromatogram should develop in about 5 minutes. From the position of the peaks observed on the chromatogram, select an internal standard that will be free of interference, such as cyclopentanol or cyclohexanol. Add 0.6 ml. of internal standard to 3 ml. of the distillate, analyze according to the above procedure. Peaks emerging after 1 minute are aromatic solvents along with any oxygenated solvents that may be present. Calculate the percent of aromatic and oxygenated solvents as follows:

$$\text{Percent aromatic and oxygenated solvents, v/v} = \frac{20^{*} \times A}{1.02^{**} \times B}$$

where A = area of aromatic and oxygenated solvents.
B = area of internal standard
* - is percent of internal standard added
** - is correction factor if cyclopentanol is used. If another internal standard is used, calibrate to determine the correction factor.

NOTE: If the above determination exceeds 8 percent, continue with the following procedure.

4.4.5.2.2.2 Total aromatic content - procedure B. Proceed as in the qualitative test for aromatic hydrocarbons (see 4.4.5.2.1). Remove as much of the top layer as possible and wash it with distilled water. Carefully pipet 3 ml. of the washed solvent into a small flask followed by 0.6 ml. of the internal standard. Mix and analyze according to procedure A. Calculate the percent of aromatics after acid treatment in the same manner as in procedure A and the percent of total aromatic solvents as follows:

$$\text{Percent total aromatic solvents, v/v} = \frac{B \times (100 - A)}{100 - B}$$

where A = percent of aromatic and oxygenated solvents from procedure A
B = percent of aromatic solvents after acid treatment

NOTE: If the total aromatic content of the solvent is between 8 percent and 20 percent, continue with the following procedure.

4.4.5.2.2.3 Toluene and ethyl benzene - procedure C. Install the 18-ft. column and follow the operating conditions described for that column. Add 0.3 ml. of high purity benzene to the 3 ml. sample used in procedure A. If the results of procedures A and B indicated the presence of oxygenated solvents, treat this sample with 85 percent sulfuric acid (use 3 ml. acid) as described in procedure B. Inject about 3 micro-liters of sample and allow the chromatograph to develop until all the xylene isomers appear. Purge the column by raising the column temperature to 120°C. After the high boiling materials emerge, reset the column temperature to 70°C. Calculate the percent of toluene and ethylbenzene as follows:

$$\text{Percent toluene, v/v} = \frac{(\text{area of toluene peak})(1.017)^{*}\ (10)^{**}}{(\text{area of benzene peak})}$$

$$\text{Percent ethylbenzene, v/v} = \frac{(\text{area of ethylbenzene peak})(1.054)^{*}\ (10)^{**}}{(\text{area of benzene peak})}$$

where * = the correction factor for the detector response.
** = the percentage of internal standard added.

NOTE: Sensitivity of the instrument should be adjusted to keep peaks from running off the scale. Appropriate corrections must be made for changes in sensitivity when computing the peak areas.

4.4.5.3 Test for olefinic or cyclo-olefinic compounds. Take 2 test tubes and place 2 drops of the distillate in each. Dissolve the first sample in 1 ml. of carbon tetrachloride and add 1 drop of 1 percent bromine in carbon tetrachloride. Shake and allow to set for 5 minutes. A positive test is indicated by the complete absence of yellow color when observed against a white background. Dissolve the second sample in 1 ml. of acetone and add 1 drop of 1 percent permanganate solution (1 gram of potassium permanganate crystals in 95 mls. of acetone and 5 mls. of water). Shake and allow to set for 2 minutes. A positive test is indicated by the decoloration of the purple solution. The solvent is considered to fail the test for olefinic and cyclo-olefinic compounds if either of the above tests is positive (see 3.2.3 and 6.7).

4.4.5.4 Test for ketones.

4.4.5.4.1 Reagent. Two grams of 2,4-dinitrophenylhydrazine plus 4 mls. of concentrated sulfuric acid plus 30 mls. methanol (add slowly plus 10 mls. water).

4.4.5.4.2 Procedure. Pipette 1 ml. of reagent into a 20 by 170 mm test tube. Add 10 drops of distillate (see 4.4.5.1) and shake for 30 seconds. A yellow precipitate or cloud in the reagent layer indicates the presence of ketones. Run a blank using one milliliter or reagent and 10 drops of mineral spirits.

4.4.6 Resistance to chemicals and solvents. Test panels, 1 by 2-1/2 by 0.025 inches in size, shall be prepared and coated as specified in 4.4.1 and 4.4.1.1. A minimum of one coated panel for each of the three schedules specified in 4.4.1.2 shall be tested separately for resistance to the following chemicals and solvents by immersion. A separate panel shall be used for each individual test.

Boiling toluene	1 hour
Glacial acetic acid	1 hour at room temperature
Ammonium hydroxide (10 percent by weight)	1 hour at room temperature
Ethyl alcohol	1 hour at room temperature
Ethyl ether	1 hour at room temperature
Boiling bis-(beta chloroethyl) ether	2 hours (type II varnish only)

Coated panels which are to be immersed in acetic acid and ammonium hydroxide shall have their edges protected by dipping in molten paraffin prior to immersion. The paraffin shall not extend more than 1/8 inch onto the coated area of the panels.

At the end of the specified test period, the film of the varnish shall not have softened, blistered or otherwise deteriorated. (In the immersion in boiling bis-(beta chloroethyl) ether, moderate discoloration shall not be considered as deterioration.)

4.4.7 Corrosion resistance. Test panels, 4 by 6 by 0.025 inches in sizes, shall be prepared and coated as specified in 4.4.1 and 4.4.1.1. A minimum of two coated panels for each of the three baking schedules specified in 4.4.1.2 shall be tested for corrosion resistance by scribing each panel along the two diagonals for a distance of 5 inches using a razor blade. The scribe marks shall completely penetrate the varnish film. Expose the panels for 48 hours to 5 percent salt spray in accordance with method 6061 of Fed. Test Method Std. No. 141. At the end of the test period, examine the panels visually for evidence of peeling or undercutting of the coating at the scribe marks or signs of rusting at points other than within 1/8 inch distance from the scribe marks or edges of the panels.

4.4.8 Abrasion resistance.

4.4.8.1 Types I and III. A minimum of two panels, 4 by 4 by .025 inches in size, for each of the three baking schedules specified in 4.4.1.2 shall be used. The panels shall be prepared and coated as specified in 4.4.1 and 4.4.1.1. The test shall be conducted in accordance with method 6192 of Fed. Test Method Std. No. 141 except that CS-10 calibrase wheels with 1000 gram load shall be used.

4.4.8.2 Type II. A minimum of two panels, 4 by 6 by .025 inches in size, for each of the three baking schedules specified in 4.4.1.2 shall be used. The panels shall be prepared and coated as specified in 4.4.1 and 4.4.1.1. The test shall be conducted in accordance with method 6191 of Fed. Test Method Std. No. 141 except that 5 liters of sand shall be used.

4.4.9 Impact resistance (type III only). Two test panels, 4 by 6 inches by 0.025 inch in size, shall be prepared and coated as specified in 4.4.1 and 4.4.1.1 and baked in accordance with 4.4.1.2(a). The coated panels shall be tested for impact resistance with an impact tester device similar to the Parlin-duPont or the Gardner Impact Tester (see 6.4). The impacting tool shall be of hard steel and shall have a rounded end with a 1/4 inch radius. The anvil shall have a 5/8 inch diameter hole placed so that the

impacting tool will strike exactly in the center of the hole. The coated panel shall be placed over the anvil hole with the test surface facing downward or away from the impacting tool. A 30 inch pound impact shall be made on the panel. The film shall be examined on the convex surface for compliance with 3.10. A strip of transparent, pressure-sensitive adhesive cellophane tape conforming to L-T-90 shall be pressed down on the convex area of the impacted surface and then stripped off. None of the coating shall be lifted by the adhesive tape.

4.4.10 Thermoplasticity. Two test panels, free from defects, 4 by 6 by 0.025 inches in size, and two panels 1 by 2-1/2 by 0.025 inches in size for each baking schedule specified in 4.4.1.2, shall be used. Panels shall be prepared and coated as specified in 4.4.1 and 4.4.1.1. The edges of the 1 by 2-1/2 inch coated panels shall be broken down to the bare metal so that all burrs and varnish beads are completely removed. The test panels shall be placed film to film in an oven at 600° ± 10°F. These panels, with the smaller panel uppermost in each case, shall rest on a smooth flat steel plate previously brought to oven temperature. The steel plate shall be a minimum of 4 by 6 by 1/4 inches in size. To assure that the weights and steel plates have been brought to oven temperature, they shall be placed in the oven maintained at 600° ± 10°F for one hour prior to use. As soon as the test panels and plates have been placed in the oven, a 2-kilogram weight, previously brought to oven temperature, shall be placed on each of the smaller panels. Keep the panels in oven maintained at 600° ± 10°F for 15 minutes. Remove the weights from the panels and immediately reverse the position of the panels so that the larger panels are uppermost. The smaller panels shall immediately fall away from the larger panels.

4.4.11 Viscosity. The viscosity shall be determined by the Brookfield Viscosimeter, Model LVF, using the No. 1 spindle at 30 RPM at a temperature of 75° ± 2°F, or similar method.

4.4.12 Shelf life. A tall, wide mouth 8 oz. bottle of a kind which will pass the guard of a Brookfield Viscosimeter shall be filled with the varnish to within 1/8 inch of the top. Record the viscosity, then place the covered bottle in the oven at 140° ± 3°F for 90 hours. Remove bottle, allow to cool and again determine the viscosity.

$$\text{Percent change in viscosity} = \frac{(V_2 - V_1)\ 100}{V_1}$$

where V_1 = original viscosity
V_2 = viscosity after 90 hours at 140°F

4.5 Preparation for shipment. Examination of the packing and marking for shipment shall be made for conformance to the requirements of section 5.

4.6 Rejection.

4.6.1 Test failures. A lot shall be rejected for failure to meet any of the test requirements when tested in accordance with 4.4.

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing and marking shall be in accordance with TT-P-143. In addition, all containers shall be marked with (1) type and class of varnish, (2) batch number, (3) instructions as to thinning and viscosity for application, (4) baking cycles, and (5) date of manufacture.

6. NOTES

6.1 Intended use. Types I and III varnishes covered by this specification are intended for use as finishes on steel cartridges cases to protect them from atmospheric corrosion. Classes A and B of type I and classes A, B and C of type III may be used depending upon the type of equipment used to produce the finish on the cartridge cases. Type I is intended for use where the metal is not deformed or fabricated after coating. Type III is intended for use where the metal is deformed or fabricated after it is coated. Type II varnish covered by this specification is intended for use as a protective finish for lining munitions, chemical and other containers requiring special protection.

6.2 Ordering data. Purchasers should exercise any desired options offered herein and procurement documents should specify the following:

(a) Title, number, and date of this specification.
(b) Type and class required (see 1.2).
(c) Size containers (see 5.1).
(d) Level of packaging and packing required (see 5.1).
(e) The varnish should be purchased by volume, the unit being one U. S. liquid gallon of 231 cubic inches at 68°F (20°C).

6.3 The requirements for packaging and for packing and marking for shipment (see 5.1) specified herein apply to direct shipment to Government activities and apply also, where specified, to contracts or orders between the manufacturer and the Government prime contractor.

6.4 Recommended impacting devices.

Gardner-Variable Impact Tester or
Parlin-duPont Impact Tester
(Reference: Physical & Chemical, Examination of Paints, Varnishes, Lacquers, and Colors, Henry A. Gardner and G. G. Sward, Twelfth Ed. (1962) p. 146.

6.5 Nacconal NR, Sodium alkyl aryl sulfonate, is manufactured by National Aniline Div., Allied Chemical Corp., New York, N. Y. (see 4.4.1).

6.6 Composition L varnish should be specified for use in areas with regulations controlling the emission of solvents into the atmosphere.

6.7 The test for olefinic and cyclo-olefinic compounds will not be positive for solvents containing less than 1 percent of these compounds.

Custodian:
Army - MR

Preparing activity:
Army - MR

Review activities:
Army - MR, MU, MD

Project No. 8010-A002

User activities:
Army - MU

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

OMB Approval
No. 22-R255

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NAME OF ORGANIZATION AND ADDRESS

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

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3. IS THE DOCUMENT RESTRICTIVE?

☐ YES ☐ NO *(If "Yes", in what way?)*

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SUBMITTED BY *(Printed or typed name and address - Optional)*

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DATE

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