

MIL-E-51454
12 October 1979

MILITARY SPECIFICATION

ETHYL ALCOHOL (ETHANOL)

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

1. SCOPE

1.1 Scope. This specification covers four types of ethyl alcohol (ethanol).

1.2 Classification. Ethyl alcohol shall be the following types and grades as specified (see 6.1):

Type I - Pharmaceutical.

Grade A - Anhydrous, no less than 99.8 percent by volume.

Grade B - 94.9 to 96.0 percent by volume [meets requirements for United States Pharmacopeia (U.S.P) alcohol].

Type II - Denatured (standard formulas designated by the Bureau of Alcohol, Tobacco, and Firearms).

Type III - Proprietary solvents (standard formulas designated by the Bureau of Alcohol, Tobacco, and Firearms).

Type IV - Special industrial solvents (restricted sale, standard formulas designated by the Bureau of Alcohol, Tobacco, and Firearms).

FSC 6810

: 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 :
: Command, ATTN: DRDAR-TSC-S, Aberdeen Proving Ground, MD 21010 by us- :
: ing the self-addressed Standardization Document Improvement Proposal :
: (DD Form 1426) appearing at the end of this document or by letter. :
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2. APPLICABLE DOCUMENTS

2.1 Issues of documents. 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

- NN-P-71 - Pallets, Material Handling, Wood, Stringer Construction, 2-Way and 4-Way (Partial).
- QQ-S-781 - Strapping, Steel, and Seals.
- TT-E-485 - Enamel, Semi-Gloss, Rust-Inhibiting.
- TT-W-572 - Wood Preservative: Water-Repellent.
- PPP-B-585 - Boxes, Wood, Wirebound.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-C-96 - Cans, Metal, 28 Gage and Lighter.
- PPP-C-186 - Containers, Packaging and Packing for Drugs, Chemicals and Pharmaceuticals.
- PPP-C-300 - Chemicals, Liquid: Packaging and Packing Of.
- PPP-C-1337 - Container, Composite (Steel Drum with Polyethylene Insert).
- PPP-D-729 - Drums, Shipping and Storage, Steel, 55-Gallon (208 Liters).
- PPP-F-320 - Fiberboard, Corrugated and Solid, Sheet Stock (Container Grade) and Cut Shapes.
- PPP-P-704 - Pails, Metal: (Shipping, Steel, 1 through 12 Gallons).

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-147 - Palletized Unit Loads for 40" by 48" Pallets.
- MIL-STD-1188 - Commercial Packaging of Supplies and Equipment.

(Copies of specifications, standards, drawings and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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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) STANDARDS

- D891 - Specific Gravity of Industrial Aromatic Hydrocarbons and Related Materials.
- D1193 - Reagent Water.
- D1209 - Color of Clear Liquids (Platinum - Cobalt Scale).
- D1363 - Permanganate Time of Acetone and Methanol.
- D1613 - Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products.

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

US PHARMACOPEIAL CONVENTION, INC. PUBLICATION

The United States Pharmacopeia

(Application for copies should be addressed to the Mack Publishing Company, Easton, PA 18042).

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies).

CODE OF FEDERAL REGULATIONS (CFR)

- 16 CFR 1500 - Consumer Product Safety Commission Regulations Relating to Hazardous Substances and Articles; Administration and Enforcement Regulations.
- 27 CFR 211 - Bureau of Alcohol, Tobacco, and Firearms Regulations Relating to the Distribution and Use of Denatured Alcohol and Rum.
- 27 CFR 212 - Bureau of Alcohol, Tobacco, and Firearms Regulations Relating to Formulas for Denatured Alcohol and Rum.
- 49 CFR 171 to 179 - Department of Transportation Hazardous Materials Regulations.

(The Code of Federal Regulations is available from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402. Orders for the above publications should cite the applicable CFR part number.)

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3. REQUIREMENTS

3.1 Type I.

3.1.1 Sediment and suspended matter. Type I ethyl alcohol shall be free of sediment and suspended matter when tested as specified in 4.2.4.1.

3.1.2 Color. Type I ethyl alcohol shall be no darker than APHA No. 10 when tested as specified in 4.2.4.2.

3.1.3 Chemical and physical requirements. Type I ethyl alcohol shall conform to the chemical and physical requirements of table I when tested as specified therein.

3.2 Type II. Type II ethyl alcohol shall be made from alcohol which conforms to the requirements of type I, prior to denaturing. In addition, it shall be one of the formulas contained in 27 CFR 212, Formulas for Denatured Alcohol and Rum. Unless otherwise specified in the contract or order (see 6.1) type II denatured alcohol shall conform to Formula No. 3-A. The contractor shall provide evidence that this requirement has been met.

3.3 Type III. Type III ethyl alcohol shall consist of type II, Specially Denatured Alcohol Formula No. I (27 CFR 212.16), further modified in accordance with formulas in 27 CFR 211.170, or under such rulings or regulations as may be hereinafter promulgated by the Bureau of Alcohol, Tobacco, and Firearms. The contractor shall provide evidence that this requirement has been met.

3.4 Type IV. Type IV ethyl alcohol shall consist of Specially Denatured Alcohol No. 1 (27 CFR 212.16) or Formula No. 3-A (27 CFR 212.19), further modified in accordance with the formulas in 27 CFR 211.180, or under such rulings or regulations as may be hereinafter promulgated by the Bureau of Alcohol, Tobacco, and Firearms. The contractor shall provide evidence that this requirement has been met.

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.

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TABLE I. Chemical and physical requirements for type I ethyl alcohol

Requirements	Type I		Test paragraph
	Grade A	Grade B	
Assay, percent by volume ethyl alcohol	99.8 to 100.0	94.9 to 96.0	4.2.4.3
Acidity as acetic acid, maximum percent by weight	0.003	0.003	4.2.4.4
Nonvolatile residue, grams per 100 milliliters maximum	0.003	0.003	4.2.4.5
Solubility in water	pass	pass	4.2.4.6
Methyl alcohol (limit about 0.1 percent by weight)	pass	pass	4.2.4.7
Fusel oil	pass	pass	4.2.4.8
Substances reducing permanganate (aldehydes and organic impurities), minimum minutes	30	50	4.2.4.9
Acetone, other ketones, isopropyl alcohol, and tertiary butyl alcohol	pass	pass	4.2.4.10

4.2 Quality conformance inspection.

4.2.1 Lotting. A lot shall consist of the ethyl alcohol of the same type and grade produced by one manufacturer, at one plant, from the same materials, and under essentially the same manufacturing conditions provided the operation is continuous. In the event the process is a batch operation, each batch shall constitute a lot (see 6.2).

4.2.2 Sampling.

4.2.2.1 For examination of packaging. Sampling shall be conducted in accordance with MIL-STD-105, inspection level S-2, using an AQL of 4.0 percent defective.

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4.2.2.2 For type I ethyl alcohol tests. From each lot, two containers shall be taken at random. From each of the two containers, approximately one quart (0.95 liters) of alcohol shall be taken and placed in separate, clean, dry, metal or glass containers, sealed, and marked. Lots made up of 1-quart (0.95 liters) or smaller containers shall be sampled by selecting at random a sufficient number of containers to obtain approximately 2 quarts (1.9 liters) of alcohol. They shall be marked and sealed. Do not seal the sample with wax, and if cork stoppers are used, cover the corks with tin foil. Portions shall be withdrawn from the containers in such a way that the upper layer, which is liable to dilution if the container has not been properly closed, and the bottom layer, which may contain sediment, will be about equally represented in the portion taken from each container.

4.2.2.3 For container leakage test. Sampling shall be conducted in accordance with MIL-STD-105, inspection level S-4, using an AQL of 2.5 percent defective.

4.2.3 Inspection procedure.

4.2.3.1 For examination of packaging. The sample unit shall be one filled unit or shipping container, as applicable, ready for shipment. Sample unit and shipping containers shall be examined for the following defects using an AQL of 4.0 percent defective:

- (a) Contents per container not as specified
- (b) Container not as specified
- (c) Container closure not as specified
- (d) Container damaged or leaking
- (e) Unit pack interior dirty, rusty or contaminated
- (f) Fiberboard pads and partitions missing or not as specified (where required)
- (g) Interior or exterior coating missing or not as specified (where required)
- (h) Unitization not as specified
- (i) Marking incorrect, missing, or illegible

4.2.3.2 For type I ethyl alcohol tests. Each sample specimen taken in 4.2.2.2 shall be tested as specified in 4.2.4. Failure of any test by either specimen shall be cause for rejection of the lot represented.

4.2.3.3 For container leakage test. The sample containers selected in 4.2.2.3 shall be tested as specified in 4.2.5 using an AQL of 2.5 percent defective.

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4.2.4 Tests. Water in accordance with ASTM D1193 and reagent grade chemicals shall be used throughout the tests. Where applicable, blank determinations shall be run and corrections applied where significant. Tests shall be conducted as follows:

4.2.4.1 Sediment and suspended matter. Visually examine the specimen for evidence of sediment and suspended matter.

4.2.4.2 Color. Determine the color of the specimen in accordance with ASTM D1209.

4.2.4.3 Assay. Determine the specific gravity of the specimen at 15.6°C/15.6°C in accordance with ASTM D891. The specific gravity for type I, grade A ethyl alcohol shall be 0.7936 to 0.7946. The specific gravity for type I, grade B ethyl alcohol shall be 0.8118 to 0.8162.

4.2.4.4 Acidity. Determine the acidity of the specimen in accordance with ASTM D1613.

4.2.4.5 Nonvolatile residue. Evaporate 50 milliliters (ml) of the specimen in a weighed platinum or porcelain dish, using a water bath. Dry for one-half hour in an oven at approximately 105°C, cool in a desiccator, and weigh. To determine the nonvolatile residue, multiply the increase in weight in grams (g) of the dish by 2.

4.2.4.6 Solubility in water. Mix 15 ml of the specimen with 45 ml of water in a color comparison tube and allow to stand for 1 hour. Compare the mixture with an equal volume of water by transmitted light. The mixture shall be equal in clarity to the water.

4.2.4.7 Methyl alcohol.

(a) Potassium permanganate solution. Prepare 100 ml of an aqueous solution containing 15 ml of 85-percent phosphoric acid and 3 g of potassium permanganate. Renew reagent every 4 weeks.

(b) Chromotropic acid solution. Prepare a 5 percent aqueous solution of 4,5-dihydroxy-2,7-naphthalene-disulfonic acid or its sodium salt.

(c) Procedure. Dilute a portion of the specimen with water until the ethyl alcohol content is about 5 to 6 percent by weight. Pipet 2 ml of the potassium permanganate solution prepared in (a) into a 50-ml volumetric flask, chill in an ice bath, add 1 ml of the diluted specimen, and allow to oxidize for 30 minutes in the ice bath. Decolorize the oxidized sample with a small amount of dry sodium bisulfite; add 1 ml

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of the chromotropic acid solution prepared in (b); rotate the flask with a swirling motion, at the same time adding by pipet 15 ml of concentrated sulfuric acid. Place the flask containing the solution in hot water (60° to 75°C) for 15 minutes. Remove the flask, cool the contents to room temperature and make up to 50 ml with water. Compare the color of the sample with that of a standard control sample (95 percent ethyl alcohol containing 0.1 percent by weight methyl alcohol) which has been carried through the same procedure. The specimen passes the test if the depth of the color is less than that of the standard. The presence of methyl alcohol is indicated by a purple color and its absence by a colorless to light straw colored solution.

4.2.4.8 Fusel oil. Mix 10 ml of the specimen with 5 ml of water and 1 ml of Glycerin, U.S.P. Allow to evaporate spontaneously from clean, odorless, absorbent paper. The specimen shall be considered as having passed the test if no foreign odor is perceptible when the last traces of alcohol leave the paper.

4.2.4.9 Substances reducing potassium permanganate (aldehydes and organic impurities). Determine the permanganate time of the specimen in accordance with ASTM D1363.

4.2.4.10 Acetone, other ketones, isopropyl alcohol and tertiary butyl alcohol. To 1 ml of the specimen, add 3 ml of water and 10 ml of mercuric sulfate test solution (Deniges Reagent) prepared by mixing 5 g of yellow mercuric oxide with 40 ml of water, adding 20 ml of concentrated sulfuric acid while stirring slowly, and adding 40 ml of water and stirring until complete solution is obtained. Heat on a bath of boiling water. The specimen shall be considered as having passed the test if no precipitate appears within 3 minutes.

4.2.5 Container leakage test. Place the sample container in each of the following positions and leave it in each position for a period of 15 minutes:

- (a) upright
- (b) upside down
- (c) on one side (or one quadrant)
- (d) on one end (or second quadrant)
- (e) on other side (or fourth quadrant)

Examine the container after each period for any evidence of leakage.

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5. PACKAGING

5.1 Unit packing. Ethyl alcohol shall be unit packed level A, B or commercial as specified (see 6.2) in accordance with Department of Transportation (DOT) regulations.

5.1.1 Level A. Ethyl alcohol shall be unit packed level A in a 1-pint (pt) (0.47 liter) or 1-, 5- or 54-gallon (gal) (3.8, 19, or 200 liter) quantity as specified (see 6.2).

5.1.1.1 One pt (0.47 liter) quantity. A quantity of 16 (+ 1/8 or -0) fluid ounces (fl oz) [473 (+5 or -0) ml] of ethyl alcohol shall be unit packed in a nominal 1-pt (0.47 liter) capacity glass bottle. The glass bottle shall conform to PPP-C-186, group A, class 1, type of glass optional, style 1, light penetration grade optional with matching screw-cap closure A, B, P, or R. The closure shall be furnished with an aluminum or tin foil facing on a resilient liner. The liner material shall neither affect nor be affected by the ethyl alcohol. The closure shall be closed to a torque within a range of 2.03 to 2.26 newton meters (N·m), [18 to 20 pound inches (lb in.)] and shall then be secured to the neck of the bottle with outer seal A of PPP-C-186. There shall be no evidence of leakage when the bottle is tested for leakage as specified in 4.2.5. When specified, unit pack bottles of alcohol shall be protected in enclosure a or b of PPP-C-300 (see 6.2).

5.1.1.2 One-gal (3.8 liter) quantity. A quantity of 3.8 (+ 0.038 or -0) liters [1 US gal (+ 1.3 or -0 fl oz)] of ethyl alcohol shall be unit packed in a glass bottle or tin-plate metal can as specified (see 6.2), having a nominal capacity of 3.8 liters (1 US gal). The requirements for the glass bottle and enclosure shall be the same as those for the 1-pt (0.47 liter) quantity, except for capacity and the following closure requirement: The closure shall be closed to a torque within a range of 2.26 to 2.82 N·m (20 to 25 lb in.). The can shall conform to PPP-C-96 type V, class 4, oblong, formed from commercial designation electrolytic tinplate number 100. The closure assembly shall be as specified for the bottle above except that the inner seal specified in the appendix to PPP-C-96 shall be required. There shall be no evidence of leakage when the bottle or can is tested as specified in 4.2.5. The can exterior shall be coated plan B with side seam coating of TT-E-485 enamel as specified in PPP-C-96.

5.1.1.3 Five-gal (19 liter) quantity. A quantity of 19 (+ 0.2 or -0) liters [5 US gal (+ 6-1/2 or -0) fl oz] of ethyl alcohol shall be unit packed in a nominal 19 liter (5 US gal) steel shipping pail or steel shipping drum with polyethylene insert as specified (see 6.2). The steel

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shipping pail shall conform to PPP-P-704, type I, class 4 with a flexible spout closure as specified therein. The entire interior surface of the pail shall be covered with two coats of baked-on clear phenolic resin compatible with the contents. The steel shipping drum with polyethylene insert shall conform to PPP-C-1337, type II, class 1. Closure shall be designed against or shall be furnished with a device to prevent their back-off. Either an inner or outer seal for the closure shall be furnished. There shall be no evidence of leakage from the containers when they are tested as specified in 4.2.5.

5.1.1.4 Fifty-four gal (204 liter) quantity. A quantity of 204 (+ 2 or -0) liters [54 (+ 1/2 or -0) US gal] of ethyl alcohol shall be unit packed in a nominal 208 liter (55 US gal) steel drum or steel drum with polyethylene insert as specified (see 6.2). The steel drum shall conform to PPP-D-729, type I or to DOT Specification 17C except that the exterior coating shall be as specified in PPP-D-729. All drums shall be furnished with closures having a hexagonal swaged into the head of the drum. The interior surface shall be coated as specified above for the pail. The closing torque for steel drum closures shall be within a range of 20 to 23 N·m (15 to 17 lb ft) for the 3/4 in. (2 centimeter) plug and 40.7 to 44.7 N·m (30 to 33 lb ft) for the 2 in. (5 centimeter) plug using gaskets of polyethylene or other material at least as effective in this service for preventing leakage. The closures for the steel drum with polyethylene inserts shall be closed to a torque within the range as recommended by the manufacturer of the container. Cap seals shall be provided which are leak proof without the benefit of the closure plug. There shall be no evidence of leakage from the drums when they are tested as specified in 4.2.5.

5.1.2 Level B. Ethyl alcohol shall be unit packed level B in a 1-pt (0.47 liter), 1-, 5- or 54-US gal (3.8-, 19-, or 204-liter) quantity as specified (see 6.2).

5.1.2.1 One-pint (0.47 liter) quantity. A 1-pt (0.47 liter) quantity of ethyl alcohol shall be unit packed level B as specified for the level A 1-gal quantity, except that as an alternative, a bottle formed from polyethylene shall be permitted. The alternative bottle shall meet or exceed all requirements of the DOT Specification 2E bottle, and it shall be closed to a torque within a range as recommended by the bottle manufacturer.

5.1.2.2 One-gal (3.8 liter) quantity. A 1-gal (3.8 liter) quantity of ethyl alcohol shall be unit packed level B, in the manner as specified for the level A 1-gal (3.8 liter) quantity, except that as an alternative, a bottle formed from polyethylene shall be permitted. The alternative bottle shall meet or exceed all requirements of the DOT Specification 2E bottle, and it shall be closed to a torque within a range as recommended by the bottle manufacturer.

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5.1.2.3 Five-gal (19 liter) quantity. A 5-gal (19 liter) quantity of ethyl alcohol shall be unit packed level B, in the manner as specified for the level A 5-gal quantity, except that the unit pack consisting of a steel drum with polyethylene insert shall conform to PPP-C-1337, type I, class 1.

5.1.2.4 Fifty-four gal (204 liter) quantity. A 54-gal (204 liter) quantity of ethyl alcohol shall be unit packed level B, in the same manner as specified for the level A unit pack of 54 gal (204 liters).

5.1.3 Commercial. Ethyl alcohol shall be unit packed in the quantity as specified (see 6.2), in accordance with MIL-STD-1188.

5.2 Packing. Ethyl alcohol shall be packed for shipment level A, B or commercial as specified (see 6.2).

5.2.1 Level A.

5.2.1.1 One-pt (0.47 liter) quantity. Twenty-four 1-pt (0.47 liter) bottles of ethyl alcohol shall be packed upright in a close-fitting box. The box shall conform to PPP-B-585, class 3, style optional for a type 2 load not exceeding 85 lb (39 kg); to PPP-B-601, type overseas, style A, B, or I, grade A for a type 2 load not exceeding 75 lb (34 kg); or to PPP-B-621, class 2, style 4, grade A for a type 2 load not exceeding 100 lbs (45.4 kg). Each bottle shall be placed in a close-fitting cell formed by full box-height partitions made from fiberboard. Top and bottom pads shall be furnished. All inside faces of the box shall be lined with two thicknesses of pads. Pads shall be added as needed to prevent motion of contents. Liner pads and partitions shall be formed from fiberboard conforming to grade V3c of PPP-F-320. The wood components of the PPP-B-585 box shall be preserved with preservative conforming to composition A of TT-W-572. Each box shall be closed and reinforced as specified in the applicable box specification.

5.2.1.2 One-gal (3.8 liter) quantity. Four 1-gal (3.8 liter) quantity unit packs of alcohol shall be packed upright for shipment in a close-fitting box as specified for the 1-pt (0.47 liter) bottles in 5.2.1.1.

5.2.1.3 Five-gal (19 liter) quantity. The 5-gal (19 liter) quantity unit pack of 5.1.1.3 shall require no further protection for shipment.

5.2.1.4 Fifty-four gal (204 liter) quantity. The 54-gal (204 liter) quantity unit pack of 5.1.1.4 shall require no further protection for shipment.

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5.2.2 Level B.

5.2.2.1 One-pt (0.47 liter) quantity. Twenty-four bottles of ethyl alcohol shall be packed for level B protection in the same manner as specified for their level A protection except that the box shall conform to PPP-B-636, grade V3c, style RSC-L for a type 2 load of 90 lb (40.8 kg) and no reinforcement of the closed box shall be required.

5.2.2.2 One-gal (3.8 liter) quantity. Four 1-gal (3.8 liter) quantity unit packs of 5.1.2.2 shall be packed as specified in 5.2.1.2, except that the box shall conform to PPP-B-636, style RSC-L, grade V3c, and reinforcement of the closed box shall not be required.

5.2.2.3 Five-gal (19 liter) quantity. The 5-gal (19 liter) quantity unit pack of 5.1.2.3 shall require no further protection for shipment.

5.2.2.4 Fifty-four gal (204 liter) quantity. The 54-gal (204 liter) quantity unit pack of 5.1.2.4 shall require no further protection for shipment.

5.2.3 Commercial. Ethyl alcohol shall be commercially packed in accordance with MIL-STD-1188.

5.3 Unitization.

5.3.1 Levels A and B.

5.3.1.1 One-pt (0.47 liter) quantity. Levels A and B packs of 1-pt (0.47 liter) quantities shall be unitized in accordance with MIL-STD-147, load type I using the soft wood pallet conforming to NN-P-71, type IV.

5.3.1.2 One-gal (3.8 liter) quantity. Levels A and B packs of 1-gal (3.8 liter) quantities shall be unitized as specified for the 1-pt (0.47 liter) quantity pack.

5.3.1.3 Five-gal (19 liter) quantity. Levels A and B packs of the 5-gal (19 liter) quantity shall be unitized in accordance with MIL-STD-147, load type III, using the soft-wood pallet conforming to NN-P-71, type IV.

5.3.1.4 Fifty-four-gal (204 liter) quantity. Levels A and B packs of 54-gal (204 liter) quantities shall be unitized in multiples of three drums on a pallet conforming to type IV of NN-P-71 and secured with 3/4 inch (19 millimeter) steel strapping conforming to finish A of QQ-S-781 applied girthwise or with shrink-film bonding, as applicable.

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5.4 Marking and labeling.

5.4.1 Marking. Unit packs, packs, and unitized loads of ethyl alcohol of all levels of protection shall be marked in accordance with DOT regulations. Levels A and B unit packs, packs, and unitized loads shall be marked in accordance with MIL-STD-129. Commercial unit packs and packs shall be marked in accordance with MIL-STD-1188. All unit packs and packs shall be marked to show lot or batch number, date of manufacture, and type, grade and formula number of the ethyl alcohol.

5.4.2 Labeling. Unit packs, packs, and unitized loads shall be labeled in accordance with DOT regulations, 27 CFR 211, 16 CFR 1500, and as specified herein.

5.4.2.1 Precautionary labeling. The ethyl alcohol containers shall bear the precautionary labeling, by type of ethyl alcohol, as specified.

(a) Type II denatured alcohol, type III proprietary solvent and type IV special industrial solvent. Type II denatured alcohol, type III proprietary solvent and type IV special industrial solvent shall have a poison label securely affixed, printed in bold type with red ink, to show the skull and crossbones symbol and the following information:

POISON

Contains methyl alcohol.
Cannot be made nonpoisonous.
Use only in well-ventilated area.
Keep away from heat and open flame.
Avoid contact with eyes.

FIRST AID TREATMENT

If swallowed: Call a physician immediately. Have victim lie down with head tilted back and keep warm. Cover eyes to exclude light. Begin mouth to mouth breathing if victim has difficulty breathing. If victim is conscious, give plenty of water or milk and induce vomiting by placing finger at back of victim's throat or use 1 ounce (30 ml) of syrup of ipecac. Do not induce vomiting if the victim is unconscious or semiconscious, or in convulsions, or has a heart condition. If splashed in eyes; immediately flush with water for at least 15 minutes. Get medical attention!

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(b) Type II denatured alcohol. Labels of type II denatured alcohol containers shall be marked to show the formula number in accordance with 27 CFR 212, Formulas for Denatured Alcohol. Each unit pack of Completely Denatured Alcohol, containing 5-gal (19 liters) or less, shall have a label securely affixed thereto bearing the following information printed in plain, legible letters, red on a white background: "Completely Denatured Alcohol. Completely Denatured Alcohol contains ingredients which render the product wholly unfit for beverage purposes. If taken internally, it will cause serious consequences to health."

(c) Type III proprietary solvent and type IV special industrial solvents. Labels of type III proprietary solvent and type IV special industrial solvent shall conform to the requirements of the Bureau of Alcohol, Tobacco, and Firearms.

6. NOTES

6.1 Ordering data. Procurement documents should specify the following:

- (a) Number, title and date of this specification.
- (b) Type and grade required (see 1.2).
- (c) Unit quantity required (see 5.1.1, 5.1.2, and 5.1.3).
- (d) Level of unit packing and packing required (see 5.1 and 5.2).
- (e) If unit packed 1-pint (0.47 liter) bottles are to be protected in enclosure a or b of PPP-C-300 (see 5.1.1.1).
- (f) Unit container required (see 5.1.1.2, 5.1.1.3, and 5.1.1.4).
- (g) Denatured formula, if a special one is needed. NOTE: If the procurement officer desires a definite denaturant formula as specified in 27 CFR 212, Formulas for Denatured Alcohol, he should so specify.

6.2 Batch. A batch is defined as that quantity of material which has been manufactured by some unit chemical process or subjected to some physical mixing operation intended to make the final product substantially uniform.

Custodians:

Army - EA
Navy - SH
Air Force - 68

Preparing activity:

Army - EA
Project Number 6810-B141

Review activities:

Army - ME, SM
Navy - OS
DLA - GS
Misc - DS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS: This form is provided to solicit beneficial comments which may improve this document and enhance its use. DoD contractors, government activities, manufacturers, vendors, or other prospective users of the document are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity. A response will be provided to the submitter, when name and address is provided, within 30 days indicating that the 1426 was received and when any appropriate action on it will be completed.

NOTE: This form shall not be used to submit requests for 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.

DOCUMENT IDENTIFIER (Number) AND TITLE

MIL-E-51454 Ethyl Alcohol (Ethanol)

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

☐ VENDOR ☐ USER ☐ MANUFACTURER

1. ☐ HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? ☐ IS ANY PART OF IT TOO RIGID, RESTRICTIVE, LOOSE OR AMBIGUOUS? PLEASE EXPLAIN BELOW.

A. GIVE PARAGRAPH NUMBER AND WORDING

B. RECOMMENDED WORDING CHANGE

C. REASON FOR RECOMMENDED CHANGE(S)

2. REMARKS

SUBMITTED BY (Printed or typed name and address — Optional)

TELEPHONE NO.

DATE