

**TT-E-751c**

**April 13, 1967**

**SUPERSEDING**

**Int. Fed. Spec. TT-E-00751b (Army-GL)**

**November 30, 1965 and**

**Fed. Spec. TT-E-751a**

**July 9, 1957**

## FEDERAL SPECIFICATION

### ETHYL ACETATE, TECHNICAL

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

#### 1. SCOPE

1.1 This specification covers technical grade ethyl acetate (see 6.1 and 6.3).

#### 2. APPLICABLE DOCUMENTS

2.1 Specifications and standards. The following specifications and standards, 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.

##### Federal Specifications:

PPP-C-96 —Cans, Metal, 28 Gage Lighter.

PPP-D-729—Drums: Metal, 55-gallon (for Shipment of Noncorrosive Material).

PPP-P-704—Pails, Metal: (Shipping, Steel, 1 Through 12 Gallon).

##### Federal Standards:

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

Fed. Std. No. 123—Making For Domestic Shipment (Civilian Agencies).

(Activities outside the Federal Government may obtain copies of Federal Specifications, 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.

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

(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.)

##### Military Standards:

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

MIL-STD-129—Marking for Shipment and Storage.

(Copies of Military 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.

**FSC 6810**

**TT-E-751c****American Society for Testing and Materials (ASTM) Standards:**

D 1209—Test for Color of Clear Liquids (Platinum-Cobalt Scale).

D 1364—Test for Water in Volatile Solvents (Fischer Reagent Titration Method).

D 1617—Test for Ester Value of Lacquer Solvents and Thinners.

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

(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.)

**3. REQUIREMENTS**

3.1 Chemical and physical requirements. The ethyl acetate shall conform to the requirements specified in table I, when tested as specified in 4.3.2.

TABLE I. Requirements

Characteristic	Requirement	
	Minimum	Maximum
Ester content (as ethyl acetate), percent by weight.	85.0	88.0
Specific gravity, 20°/20° C.	0.883	0.888
Acidity (free acid as acetic acid), percent by weight.	----	0.01 <sup>1</sup>
Nonvolatile matter, grams per 100 ml.	----	0.005
Water content, percent by weight.	----	0.20 <sup>2</sup>
Distillation range at 760 mm.		
Initial boiling point, °C.	70	----
Dry point, °C.	----	80
Color, platinum-cobalt (APHA) scale.	----	10

<sup>1</sup> This is equivalent to 0.093 mg. of KOH per gram of sample.

<sup>2</sup> This quantitative water limit insures that the material is miscible without turbidity with 19 volumes of 99 percent heptane at 20°C.

**3.2 Qualitative requirements.**

3.2.1 Appearance. The ethyl acetate shall be clear and free from sediment and suspended matter.

3.2.2 Odor. The material shall have the characteristic "banana oil" odor of ethyl acetate and shall leave no residual odor, when tested as specified in 4.3.2.

3.3 Labeling. In addition to the applicable statutes and regulations, each unit container shall be clearly marked with the following minimum precautionary information:

**WARNING: FLAMMABLE**

Keep away from heat and open flame.

Keep container closed.

Use with adequate ventilation.

Avoid prolonged breathing of vapor.

Avoid prolonged or repeated contact with skin.

**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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 that supplies and services conform to prescribed requirements.

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4.2. Inspection. Sampling for inspection shall be performed in accordance with MIL-STD-105, except where otherwise indicated. For purposes of sampling, an inspection lot for examinations and tests shall consist of all the product made from the same raw materials by the same methods and submitted for inspection at one time.

4.2.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected and tested in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase documents.

#### 4.3 Inspection of the end item.

4.3.1 Examination of the end item. The end item shall be examined for the defects in the applicable subparagraphs at the inspection levels and acceptable quality levels (AQLs) set forth in 4.3.1.4. The lot size, for purpose of determining the sample size in accordance with MIL-STD-105, shall be expressed in unit containers of the specified capacity for the examinations in 4.3.1.1 and 4.3.1.2, and in units of shipping containers in 4.3.1.3.

4.3.1.1 Examination of the product for appearance and odor. The sample unit shall be one filled unit container.

Examine	Defect
Appearance	Any foreign material; not clear, homogeneous liquid.
Odor	Not characteristic "banana oil" odor.

4.3.1.2 Examination of the end item container for net contents. The sample unit for this examination shall be one unit container. A minimum of five sample units (or the entire lot whichever is smaller) shall be randomly selected from the lot and examined for volumetric contents. The average value shall not be less than the amount specified in the purchase document.

4.3.1.3 Examination of preparation for delivery. An examination shall be made to determine that packaging, packing, and marking shall comply with the requirements of section 5. The sample unit for this examination shall be one shipping container, fully packed, selected just prior to the closing operation. Shipping containers fully prepared for delivery shall be examined for closure defects.

Examine	Defect
Packaging	Not level specified. Materials and construction not as specified. Evidence of leakage.
Packing	Not level specified. Materials and construction not as specified. Any nonconforming component; component missing, damaged, or otherwise not serviceable. Any bulged, distorted, or broken container.
Count	Less than specified number of packages per shipping container.
Markings (interior or exterior, as applicable)	Omitted, illegible, incorrect, incomplete; not in accordance with contract requirements.

4.3.1.4 Inspection levels and AQLs for examinations. The inspection levels, for determining the sample size, and the AQLs, expressed as defects per 100 units, shall be as follows:

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Examination paragraph	Inspection level	AQL
4.3.1.1	S-4	2.5
4.3.1.2	S-2	--
4.3.1.3	S-2	4.0

4.3.2 Testing of the end item. The methods of testing specified in Fed. Test Method Std. No. 141, wherever applicable and as listed in table II, shall be followed for each lot. The lot size shall be expressed in gallons of ethyl acetate. The sample unit for testing shall be a one quart composite obtained by combining equal portions from samples selected at random throughout the lot in the frequency indicated below. The composite shall be placed in a clean, dry, sealed quart container. Care shall be exercised to prevent contamination or alteration of the ethyl acetate during the sampling, compositing, storage, and testing. All test reports shall contain the individual values utilized in expressing the final results. The lot shall be unacceptable if the composite fails to meet any test requirement specified.

Lot size (gallons)	Sample frequency
800 or less	2
801 up to and including 22,000	3
22,001 or more	5

TABLE II. Instructions for testing of the end item

Characteristic	Specification reference		Require- ments applicable to	Number determina- tions per unit	Results reported as
	Require- ment	Test method	Comp. samp.		
Ester content (as ethyl acetate)	Table I	4.4.1	X	2	Average of 2 determinations to nearest 0.1 percent.
Specific gravity, 20°/20° C.	Table I	4.4.2	X	2	Average of 2 determinations to nearest 0.001 unit.
Acidity (free acid as acetic acid)	Table I	5252 <sup>1</sup>	X	2	Average of 2 determinations to nearest 0.01 mg.
Nonvolatile matter	Table I	4.4.3	X	2	Average of 2 determinations to nearest 0.001 g.
Water content	Table I	4.4.4	X	2	Average of 2 determinations to nearest 0.01 percent.
Distillation range at 760 mm. <sup>2</sup>	Table I	4301 <sup>1</sup>	X	1	Pass or fail.
Color, platinum-cobalt (APHA) scale	Table I	4.4.5	X	1	Pass or fail.
Odor	3.2.2	4401 <sup>1</sup>	X	1	Pass or fail.

<sup>1</sup> Tests shall be performed in accordance with Fed. Test Method Std. No. 141.

<sup>2</sup> "Dry point" is the temperature observed on the distillation thermometer when the last drop of liquid leaves the bottom of the flask. Disregard any liquid on the side of the flask.

#### 4.4 Test methods.

4.4.1 Ester content. The ester content, as ethyl acetate, shall be determined in accordance with ASTM D 1617.

4.4.2 Specific gravity. The specific gravity of the sample at 20°/20° C. (68°/68° F.) shall be determined by any convenient method that is accurate to the third decimal place.

4.4.3 Nonvolatile matter. Dry a 150-ml. evaporating dish in an oven at  $105^{\circ} \pm 5^{\circ}$  C. and cool in a desiccator. Repeat until the weight is constant or within 0.1 mg. of the last weighing. Pipet 100 ml. of the sample into the conditioned evaporating dish and evaporate over a steam bath or hotplate almost to dryness. The dish and residue shall be heated in an oven at  $105^{\circ} \pm 5^{\circ}$  C. for 1 hour, then cooled in a desiccator and weighed. Return the dish and contents to the oven for 30 minutes, cool, and reweigh. Repeat, if necessary, until the weight is constant or within 0.1 mg. of the last weighing. The difference in weight shall be reported as grams of nonvolatile matter per 100 milliliters of sample.

4.4.4 Water content. The water content of the ethyl acetate shall be determined in accordance with ASTM D 1364.

4.4.5 Color. The color of the ethyl acetate shall be determined in accordance with ASTM D 1209.

### 5. PREPARATION FOR DELIVERY

#### 5.1 Packaging.

5.1.1 Level A. The ethyl acetate shall be furnished in 1-quart cans, 1-gallon cans, 5-gallon pails, or 55-gallon drums, as specified (see 6.2).

5.1.1.1 One-quart and one-gallon cans. One-quart and one-gallon cans shall conform to type V, class 4 or 5 of PPP-C-96. Inner seals shall be furnished on all cans. The cans shall be made of 0.50 pound electrolytic tin-plate.

5.1.1.2 Five-gallon pails. Five-gallon pails shall conform to type I of PPP-P-704. Screwcap closures and inner seals shall be furnished on all pails.

5.1.1.3 Fifty-five-gallon drums. Fifty-five-gallon closed top drums shall conform to PPP-D-729. Exterior coating of drums is required.

5.1.2 Level C. Packaging shall be in accordance with the manufacturer's commercial practice.

#### 5.2 Packing.

5.2.1 Levels A and B. One-quart and one-gallon cans shall be packed in accordance with the appendix of PPP-C-96 for the applicable level of shipment. Five-gallon pails and fifty-five-gallon drums will require no further packing.

5.2.2 Level C. Ethyl acetate shall be packed in a manner to insure acceptance and safe delivery at destination at the lowest applicable rate. Containers shall be in accordance with rules or regulations of carriers applicable to the mode of transportation.

#### 5.3 Marking.

5.3.1 Civil agencies. In addition to the labeling specified in 3.3 and any special marking required by the contract or order, each unit and shipping container shall be marked in accordance with Fed. Std. No. 123.

5.3.2 Military agencies. In addition to the labeling specified in 3.3 and any special marking required by the contract or order, each unit and shipping container shall be marked in accordance with MIL-STD-129.

### 6. NOTES

6.1 Intended use. The ethyl acetate covered by this specification is intended for use as an ingredient in cellulose lacquers and lacquer thinners (see 6.3).

6.1.1 Military use. Items procured under this specification for military use are to be limited to the variety shown on the applicable military standard or military supply standard. Personnel of the military departments are requested to refer to those documents for guidance.

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6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Selection of applicable levels of packaging and packing (see 5.1 and 5.2).
- (c) Size of container required (see 5.1).

6.3 Toxicity. Ethyl acetate is irritating to mucous surfaces particularly the eyes, gums, and respiratory passages, and is a mild narcotic. Therefore, a recommended maximum allowable concentration of ethyl acetate is 400 parts per million. Repeated and chronic exposures to this fluid should not be allowed.

**MILITARY INTEREST:**Custodians:

Army—GL  
Navy—SH  
Air Force—68

Review activities:

Army—GL, MU, SM, MD  
Navy—SH  
Air Force—68

User activity:

Navy—WP

Preparing activity:

Army—GL

**CIVIL AGENCY INTEREST:**Interested activities:

AGR  
COM  
GSA-FSS  
GPO  
INT  
JUS  
VA

Review and user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS.

U.S. Government Printing Office: 1967

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 5 cents each.

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SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
<b>INSTRUCTIONS</b>		
<p>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.</p>		
<b>SPECIFICATION</b> <div style="text-align: center; margin-top: 10px;">Ethyl Acetate, Technical - TT-E-751c</div>		
<b>ORGANIZATION</b>	<b>CITY AND STATE</b>	
<b>CONTRACT NO.</b>	<b>QUANTITY OF ITEMS PROCURED</b>	<b>DOLLAR AMOUNT</b> \$
<b>MATERIAL PROCURED UNDER A</b> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT           <input type="checkbox"/> SUBCONTRACT         </div>		
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<div style="margin-left: 40px;">B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</div> <div style="height: 150px; border: 1px solid black; margin-top: 10px;"></div>		
<b>2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID</b> <div style="height: 50px; border: 1px solid black; margin-top: 10px;"></div>		
<b>3. IS THE SPECIFICATION RESTRICTIVE?</b> <div style="margin-left: 40px; margin-top: 5px;"> <input type="checkbox"/> YES    <input type="checkbox"/> NO    IF "YES", IN WHAT WAY?         </div> <div style="height: 50px; border: 1px solid black; margin-top: 10px;"></div>		
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