

TT-N-97C
 January 6, 1976
 SUPERSEDING
 Fed. Spec. TT-N-97B
 May 28, 1962

FEDERAL SPECIFICATION

NAPHTHA; AROMATIC

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers aromatic petroleum naphtha for use in the manufacture of paint.

1.2 Classification. The naphtha shall be of the following types according to boiling range and of the following grades according to aromaticity (solvent power):

Type I - 88 to 140°C (190 to 284°F) boiling range.

Grade A - High aromaticity.

Grade B - Low aromaticity.

Type II - 129 to 191°C (264 to 376°F) boiling range.

Type III - 171 to 218°C (340 to 424°F) boiling range.

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.

Federal Specification:

PPP-B-636 - Boxes, Shipping, Fiberboard.

Federal Standards:

Fed. Std. No. 123 - Marking for Shipment (Civil Agencies).

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

Fed. Test Method No. 141/4261 - Appearance of Transparent Liquids.

Fed. Test Method No. 141/4491 - Spot Test (Thinners and Solvents).

(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, DC 20402.

(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, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle WA.

(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.)

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Military Standards:

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
 MIL-STD-290 - Packaging, Packing and Marking of Petroleum and Related Products.

(Copies of Military Specifications and Standards required by suppliers 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 a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM) Standards:

- D 56 - Flash Point by Tag Closed Tester.
 D 130 - Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test.
 D 156 - Saybolt Color of Petroleum Products (Saybolt Chromometer Method).
 D 484 - Hydrocarbon Dry Cleaning Solvents.
 D 611 - Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents.
 D 847 - Acidity of Benzene, Toluene, Xylenes, Solvent Naphthas, and Similar Industrial Aromatic Hydrocarbons.
 D 891 - Specific Gravity of Industrial Aromatic Hydrocarbons and Related Materials.
 D 1078 - Distillation Range of Volatile Organic Liquids.
 D 1093 - Acidity of Distillation Residues or Hydrocarbon Liquids.
 D 1296 - Odor of Volatile Solvents and Diluents.
 D 1353 - Nonvolatile Matter in Volatile Solvents for Use in Paints, Varnish, Lacquer, and Related Products.
 D 1476 - Heptane Miscibility of Lacquer Solvents.

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

Laws and Regulations:

49 CFR 171-178 Hazardous Materials Regulations

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.)

3. REQUIREMENTS

3.1 Materials. The naphtha shall consist entirely of hydrocarbons.

3.2 Quantitative requirements. The naphtha shall meet the requirements specified in table I when tested as specified in 4.4.3.

TABLE I. Quantitative requirements.

Characteristics	Requirements							
	Type I		Type II		Type III			
	Grade A	Grade B	Grade A	Grade B	Grade A	Grade B	Grade A	Grade B
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Specific gravity at 20°/20°C	0.810	0.871	0.770	0.845	0.825	0.875	0.855	0.980
Flash point	-----	-----	-----	-----	27°C (81°F)	-----	50°C (122°F)	-----
Aniline point	-----	-----	-----	32°C (90°F)	-----	-----	-----	-----
Mixed aniline point	-----	27°C (81°F)	-----	-----	-----	28°C (82°F)	-----	34°C (93°F)
Distillation at 760 mm pressure								
Initial boiling point	88°C (190°F)	-----	88°C (190°F)	-----	129°C (264°F)	-----	171°C (340°F)	-----

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TABLE I. Quantitative requirements (con't)

Characteristics	Requirements							
	Type I		Grade B		Type II		Type III	
	Grade A	Grade B	Grade B	Grade B	Grade B	Grade B	Grade B	Grade B
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
50 percent (by volume)	100°C (212°F)	116°C (241°F)	100°C (212°F)	116°C (241°F)	143°C (289°F)	168°C (334°F)	182°C (360°F)	200°C (392°F)
End point	-----	140°C (284°F)	-----	140°C (284°F)	-----	191°C (376°F)	-----	218°C (424°F)
Color, Saybolt Number	+25	----	+25	----	+21	----	+18	----
Nonvolatile matter (gram/100 ml)	-----	0.2	----	0.2	-----	0.2	-----	0.2

3.3 Qualitative requirements.

3.3.1 Appearance. When tested as specified in 4.4.3, the naphtha shall be free from turbidity, suspended matter, and sediment.

3.3.2 Odor. When tested as specified in 4.4.3, the naphtha shall have an odor characteristic of that of aromatic naphtha and shall have only a faint aromatic residual.

3.3.3 Copper corrosion. When tested as specified in 4.4.3, the naphtha shall produce no more than a slight tarnish (Classification 1) on the copper strip.

3.3.4 Doctor test. When tested as specified in 4.4.3, the naphtha shall produce no black precipitate and no discoloration and shall not noticeably mask the yellow color of the sulfur film.

3.3.5 Spot test. When tested as specified in 4.4.3, the naphtha shall show no evidence of stain or residual oiliness.

3.3.6 Water test. When tested as specified in 4.4.3, the naphtha shall remain clear and produce no turbidity.

3.3.7 Acidity. When tested as specified in 4.4.3, the naphtha shall show no evidence of acidity.

3.3.8 Residue. When tested as specified in 4.4.3, the residue of the naphtha shall contain no mineral acid.

3.3.9 Stability. When tested as specified in 4.4.3, the naphtha shall show no change in color, appearance, odor, or acidity as specified in 3.2, 3.3.1, 3.3.2, and 3.3.7, respectively.

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 that supplies and services conform to prescribed requirements.

4.2 Lot. For the purposes of sampling, a lot of the naphtha shall consist of a manufacturer's batch. A batch is defined as the end product of all raw materials mixed, blended, or processed in a single operation.

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4.3 Examination.

4.3.1 Examination of filled containers. A random sample of filled containers shall be selected in accordance with MIL-STD-105 at inspection level I and acceptable quality level (AQL) of 2.5 percent defective to verify compliance with this specification regarding fill, closure, and marking and other requirements not involving tests. Each sample filled container shall be examined for defects of construction of the container and the closure, for evidence of leakage, and for unsatisfactory markings; each filled container shall also be gaged to determine the amount to contents. Any container in the sample having one or more defects or under required fill shall be rejected, and if the number of defective containers in any sample exceeds the acceptance number for the appropriate sampling plan of MIL-STD-105, the lot represented by the sample shall be rejected.

4.3.2 Examination of preparation for delivery requirements. An examination shall be made to determine compliance with the requirements of section 5. Defects shall be scored as specified in table II. Sampling shall be in accordance with MIL-STD-105. The sample unit shall be one container fully prepared for delivery. The lot shall be the number of containers offered for delivery at one time. The inspection level shall be S-2 with an AQL of 4.0 percent defective.

TABLE II. Examination of preparation for delivery

Examine	Defects
Container	Not as specified.
Content	Not as specified.
Markings	Omitted; incorrect; illegible; improper size, location, sequence or method of application.
Material	Component missing or damaged.
Workmanship	Bulging or distortion of containers. Cushioning inadequate or improper. Inadequate closure.

4.4 Testing of the end item.

4.4.1 Sampling for testing. For the purposes of sampling, the lot shall be expressed in units of gallons of naphtha. The sample unit for testing shall be one quart of naphtha randomly selected from containers in the lot. The naphtha shall be placed in separate clean, dry metal or glass containers, sealed, and marked and forwarded to the testing laboratories. The sample size shall be as follows:

<u>Lot Size (gallons)</u>	<u>Sample size</u>
800 or less	2
801 up to and including 22,000	3
22,001 and more	5

Tests shall be performed on a sample unit basis. All test reports shall contain the individual values utilized in expressing the final result. The lot shall be unacceptable if one or more sample unit fails to meet any test requirement specified.

4.4.2 Standard test conditions. Unless otherwise specified, all test specimens shall be prepared and tested in a room having a temperature of $23^{\circ}\pm 1^{\circ}\text{C}$ ($73^{\circ}\pm 2^{\circ}\text{F}$) and a relative humidity of 50 ± 5 percent.

4.4.3 Test methods. All tests shall be conducted in accordance with the method specified in table III to determine compliance with the requirements of 3.2 and 3.3.

TABLE III. Test methods

Test	Methods		
	ASTM Standard	Fed. Test Method Std. No. 141	Paragraph reference
Specific gravity	D 891		4.4.3.1
Flash point	D 56		
Aniline point	D 611		
Mixed aniline point	D 611		
Distillation	D 1078		
Color	D 156		
Nonvolatile matter	D 1353		
Appearance		4261	
Odor	D 1296		4.4.3.2
Copper corrosion	D 130		4.4.3.3
Doctor Test	D 484		
Spot test		4491	
Water test	D 1476		4.4.3.4
Acidity	D 847		
Residue	D 1093		
Stability			4.4.3.5

4.4.3.1 Specific gravity. The specific gravity of the naphtha shall be determined at 20°/20°C.

4.4.3.2 Odor. The residual odor of the naphtha shall be determined after the filter paper has been allowed to dry at standard conditions (see 4.4.2) for 24 hours.

4.4.3.3 Copper corrosion. The temperature of the naphtha and the time of immersion of the copper stripe shall be as specified below for the different types of naphtha.

Naphtha	Temperature	Time
Type I (Grades A and B)	50°C (122°F)	3 hours
Types II and III	100°C (212°F)	3 hours

4.4.3.4 Water test. The ratio of the volume of heptane to the volume of naphtha shall be 19 to 1.

4.4.3.5 Stability.

4.4.3.5.1 Apparatus. The apparatus shall consist of a glass container such as an 8-ounce oil bottle, a suitable metal bomb to hold the glass container at the required pressures, and a water or a steam bath.

4.4.3.5.2 Procedure. Approximately 200 milliliters of naphtha shall be placed in the glass container and the glass container placed in the metal bomb. A cap of glass or other oxygen-resistant material shall be placed loosely over the mouth of the glass container, and the bomb shall be closed. The bomb shall be charged with oxygen to a pressure of 95 to 100 pounds per square inch. The pressure shall be released to the air. The charging and release operations shall be repeated. The bomb shall be charged with oxygen a third time to a pressure of 98 to 100 pounds per square inch and tested for leaks. If no leaks are found, the charged bomb shall be placed in the water or steam bath maintained at 98° to 100°C (208° to 212°F) for a period of 4 hours plus or minus 5 minutes. After the 4 hours, the bomb shall be removed from the bath and cooled in cold water. After the bomb has cooled, the pressure shall be released and the glass container shall be removed. The naphtha shall be tested to determine compliance with the requirements of 3.3.9.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A, B, or C, as specified (see 6.2).

5.1.1 Civil agencies. The naphtha of one type and grade shall be furnished in 1-quart or 1-gallon quantity, as specified (see 6.2) in metal or plastic containers conforming to 49 CFR 171 through 178, as applicable.

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5.1.2 Military agencies. The packaging shall be in accordance with MIL-STD-290.

5.2 Packing. Packing shall be level A, B, or C, as specified (see 6.2).

5.2.1 Civil agencies. Twelve one-quart or six one-gallon containers shall be packed in a box conforming to 49 CFR 171 through 178, as applicable. For items not regulated, the box shall conform to PPP-B-636, class weather resistant for level A, class domestic for level B and C with the special requirements for each glass. Boxes with plastic containers shall be 1/8 or 3/8 inch higher than the bottles and shall have dividers, partitions or separators the full height of the box. The box shall be closed, waterproofed and banded in accordance with the appendix to PPP-B-636. Level B and C do not require waterproofing and banding but shall be closed in accordance with Method II.

5.2.2 Military agencies. Packing shall be in accordance with MIL-STD-290.

5.3 Marking.

5.3.1 Civil agencies. In addition to 5.3.3 and any special marking required by the procurement documents, marking of the unit and shipping container shall be in accordance with Fed. Std. No. 123.

5.3.2 Military agencies. Marking shall be in accordance with MIL-STD-290.

5.3.3 Precautionary marking. In addition to markings specified in 5.3.1 each unit container shall bear a label printed in bold type and securely affixed to the unit container as follows:

Caution:
 DANGER - HARMFUL OR FATAL IF SWALLOWED
 Contains aromatic naphtha.
 Avoid frequent or prolonged contact with skin.
 Use in a well ventilated area.
 If swallowed, do not induce vomiting.
 Call physician immediately.
 Keep out of the reach of children.
 Keep away from heat or open flame.
 FLAMMABLE VAPOR HARMFUL

DO NOT USE IN OFFICE WORK OR IN BUILDING MAINTENANCE.

6. NOTES

6.1 Intended use. The naphtha is intended for use in the manufacture of paints and the formulation of other industrial products.

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) Type and grade required (see 1.2).
- (c) Size of container required (see 5.1).
- (d) Levels of packaging and packing required (see 5.1 and 5.2).

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6.3 Aromatic petroleum naphtha should be purchased by volume, the unit being a U.S. gallon of 231 cubic inches at 20°C (68°F). The volume may be determined by dividing the net weight, in pounds, by the weight per gallon. To obtain the weight per gallon, multiply the specific gravity at 20°/20°C (68°/68°F) by 8.322. One gallon of naphtha at 20°C weighs 6.53 to 7.36 pounds, depending upon the type and grade.

MILITARY CUSTODIANS:

Navy - AS
Air Force - 68

Coordinating activity:

Navy - AS

User activities:

Army - MI
Navy - MC, OS
DSA - GS

Preparing activity:

GSA-FSS

CIVIL AGENCY COORDINATING ACTIVITIES:

NASA - JFK
VA - DNS -

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