

METRIC

MIL-A-10450D  
6 May 1983  
 SUPERSEDING  
 MIL-A-10450C  
 8 September 1969

MILITARY SPECIFICATION  
 ANILINE, TECHNICAL (METRIC)

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

1. SCOPE

1.1 Scope. This specification covers one technical grade of aniline  
 ( $C_6H_5NH_2$ ).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified,  
 the following specifications, standards, and handbooks of the issue listed in  
 that issue of the Department of Defense Index of Specifications and Standards  
 (DoDISS) specified in the solicitation form a part of this specification to the  
 extent specified herein.

SPECIFICATIONS

FEDERAL

PPP-D-729 - Drums, Shipping and Storage, Steel, 55-Gallon (208 Liters)

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: Beneficial comments (recommendations, additions, deletions) and any perti- :  
 : nent 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 using the self-addressed :  
 : Standardization Document Improvement Proposal (DD Form 1426) appearing at :  
 : the end of this document or by letter. :  
 :

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FSC 6810

MIL-A-10450D

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-129 - Marking for Shipment and Storage

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

CODE OF FEDERAL REGULATIONS (CFR)

- 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 publication should cite "49 CFR 171 to 179.")

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting 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. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

ASTM STANDARDS

- D95 - Water in Petroleum Products and Bituminous Materials by Distillation
- D941 - Density and Relative Density (Specific Gravity) of Liquids by Lipkin Bicapillary Pycnometer
- D1193 - Reagent Water

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

## MIL-A-10450D

## 3. REQUIREMENTS

3.1 Chemical and physical characteristics. Aniline shall conform to the chemical and physical characteristics of table I when tested as specified therein.

TABLE I. Chemical and physical characteristics

Characteristic	Minimum	Maximum	Test paragraph
Purity (as aniline), percent by weight	99.5	----	4.2.4.1
Moisture, percent by weight	----	0.25	4.2.4.2
Specific gravity at 25°/4°C	1.015	1.019	4.2.4.3
Nitrobenzene	----	To pass	4.2.4.4
		test	

## 4. QUALITY ASSURANCE PROVISIONS

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

4.2 Quality conformance inspection.

4.2.1 Lotting. A lot shall consist of the aniline 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 6.3).

4.2.2 Sampling.

4.2.2.1 For examination of packaging. Sampling shall be conducted in accordance with MIL-STD-105.

4.2.2.2 For aniline test. See 6.5 for sampling and testing precautions. Sampling shall be conducted in accordance with table II. A representative specimen of approximately 1 liter shall be removed from each sample container and placed in a suitable clean, dry container labeled to identify the lot and container from which it was taken.

MIL-A-10450D

TABLE II. Sampling for aniline test

<u>Number of containers in batch or lot</u>	<u>Number of sample containers</u>
3 to 150	3
151 to 1,200	5
1,201 to 7,000	8
7,001 to 20,000	10
Over 20,000	20

4.2.2.3 For container leakage test. Sampling shall be conducted in accordance with MIL-STD-105.

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 1.5 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) Marking incorrect, missing, or illegible

4.2.3.2 For aniline test. Each sample specimen taken in 4.2.2.2 shall be tested as specified in 4.2.4. Failure of any test by any specimen shall be cause for rejection of the lot represented.

4.2.3.3 For container leakage test. The sample unit shall be one container. The sample containers selected in 4.2.2.3 shall be tested as specified in 4.2.5 using an AQL of 1.5 percent defective.

4.2.4 Aniline tests. See 6.5 for sampling and testing precautions. 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 Purity. Using a weighing pipet or medicine dropper, weigh to the nearest milligram (mg) approximately 0.4 to 0.5 gram (g) of specimen into a 250-milliliter (mL) beaker containing 100 mL of glacial acetic acid. Place a stirring magnet into the beaker and place the beaker on a magnetic stirrer. Titrate potentiometrically using glass-saturated calomel electrodes with 0.1N perchloric acid to an equivalence point of 525 millivolts. Calculate the percent by weight aniline as follows:

## MIL-A-10450D

$$\text{Percent aniline} = \frac{9.312 AB}{W}$$

where: A = Milliliters of perchloric acid used,  
 B = Normality of perchloric acid, and  
 W = Weight of specimen, in grams.

4.2.4.2 Moisture. Determine percent moisture in accordance with ASTM D95 except use 75 mL of commercial toluene, which has been dried over calcium chloride and then redistilled, as the diluent.

4.2.4.3 Specific gravity. Determine specific gravity in accordance with ASTM D941 except determine at temperatures of 25°/4°C.

4.2.4.4 Nitrobenzene.

(a) Solution A. Place 10 mL of methanol in a 25-mL glass-stoppered cylinder.

(b) Solution B. Place 10 mL of methanol in a 25-mL glass-stoppered cylinder and add 1 mL of a methanol solution containing 0.10 mg of nitrobenzene per milliliter.

(c) Procedure. Place the cylinders containing solutions A and B into a beaker of water which is at or below room temperature. Add 10 mL of the specimen and 2.5 mL of concentrated hydrochloric acid to each cylinder. Stir each solution well and bring to room temperature. Using a medicine dropper, transfer a portion of solution A to a polarographic cell and deaerate with nitrogen. Record the polarogram from -0.2 to -0.7 volt (versus saturated calomel electrode) with a current sensitivity of 0.02 microampere per millimeter. Repeat this procedure with solution B. The diffusion current in solution A shall not exceed the difference in diffusion current between solution A and solution B.

4.2.5 Container leakage test. Place the container in each of the following positions, and leave it in each 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.

## 5. PACKAGING

5.1 Unit packing. Aniline shall be unit packed level A or C as specified (see 6.2).

## MIL-A-10450D

5.1.1 Level A. A quantity of 205 (+2 or -0) kilograms of aniline shall be unit packed in a clean, dry, corrosion free steel drum conforming to Department of Transportation (DOT) Specification 17C. The drum shall have the openings in the head of the drum. The exterior of the drum shall be finished as specified for the type II drum of PPP-D-729. The closures shall be closed to a torque within the range specified by the drum manufacturer. A tamper-deterrent dust cap shall be secured over each opening after closing. There shall be no evidence of leakage when tested as specified in 4.2.5.

5.1.2 Level C. A quantity of aniline as specified (see 6.2), shall be unit packed level C in accordance with DOT regulations in a DOT 17C steel drum.

5.2 Packing. Aniline, unit packed as specified in 5.1, shall require no further protection for shipment.

5.3 Unitization. Aniline, packed as specified in 5.2, shall not require unitization.

5.4 Marking. Containers shall be marked in accordance with MIL-STD-129, DOT regulations, any other regulatory requirements, and shall be marked to show the lot or batch number and date of manufacture of the aniline. In addition, each container shall be marked with the DOT "Poison" label and shall be durably and legibly marked as follows:

## HAZARDS:

Highly toxic by ingestion.  
Highly toxic by inhalation.  
Toxic by absorption.

DANGER! MAY BE FATAL IF SWALLOWED OR INHALED.  
HARMFUL IF ABSORBED THROUGH SKIN.

Do not breathe vapor.  
Avoid contact with eyes, skin, and clothing.  
Keep container closed.  
Use only with adequate ventilation.  
Wash thoroughly after handling.  
Toxic vapors are generated when heated.

## POISON

Call a physician.

FIRST AID: If swallowed and victim is conscious, induce vomiting by giving victim large amounts of water. Encourage self-induction of vomiting by having victim touch the back of his throat. Repeat until vomitus is clear. Never give anything by mouth to an unconscious person.

## MIL-A-10450D

If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse (discard contaminated shoes).

## 6. NOTES

6.1 Intended use. Aniline is intended for use as a chemical intermediate.

6.2 Ordering data. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification,
- (b) Level of unit packing required (see 5.1), and
- (c) Quantity per level C unit pack required (see 5.1.2).

6.3 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.

6.4 Significant places. For the purpose of determining conformance with this specification, an observed or calculated value should be rounded off "to the nearest unit" in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding-off method of ASTM E29.

6.5 Sampling and testing precautions. This specification covers inspection of chemical material which is potentially hazardous to personnel. All applicable safety rules, regulations, and procedures must be followed in the handling and processing of this material.

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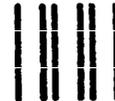


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