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400 Commonwealth Dr., Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 3180E

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Superseding AMS 3180D

TOLUENE, INDUSTRIAL GRADE

1. SCOPE:

- 1.1 Form: This specification covers, industrial-grade toluene in the form of a liquid.
- 1.2 Application: Primarily as a solvent or thinner for various enamels and primers and may be used in the manufacture of organic protective coatings.
- 1.3 Safety - Hazardous Materials: While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

1.3.1 Precaution: Toluene is highly flammable. Inhalation of its vapors and lengthy or repeated contact with skin should be avoided (See 5.2).

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 2825 - Material Safety Data Sheets

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2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

- ASTM D847 - Acidity of Benzene, Toluene, Xylenes, Solvent Naphthas, and Similar Industrial Aromatic Hydrocarbons
- ASTM D849 - Copper Corrosion of Industrial Aromatic Hydrocarbons
- ASTM D853 - Hydrogen Sulfide and Sulfur Dioxide Content (Qualitative) of Industrial Aromatic Hydrocarbons
- ASTM D891 - Specific Gravity of Liquid Industrial Chemicals
- ASTM D1078 - Distillation Range of Volatile Organic Liquids
- ASTM D1209 - Color of Clear Liquids (Platinum - Cobalt Scale)
- ASTM D4057 - Manual Sampling of Petroleum and Petroleum Products

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-290 - Packaging of Petroleum and Related Products

3. TECHNICAL REQUIREMENTS:

3.1 Properties: Toluene shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable:

- | | | | |
|---------|--|---|------------|
| 3.1.1 | <u>Specific Gravity at 20/20°C (68/68°F):</u> | 0.860 - 0.870 | ASTM D891 |
| 3.1.2 | <u>Distillation:</u> | | ASTM D1078 |
| | Initial Boiling Point at 760 mm pressure, minimum | 109°C (228°F) | |
| | Dry Point at 760 mm pressure, maximum | 113°C (235°F) | |
| | Total Distillate, by volume, minimum | 97 | |
| | Aromatic Hydrocarbons, by volume, minimum | 96 | |
| 3.1.2.1 | The distillation range of any specific sample shall be not more than 2°C (4°F) from initial boiling point to dry point, which range shall include 110°C (230°F). | | |
| 3.1.3 | <u>Copper Corrosion:</u> | No corrosion | ASTM D849 |
| 3.1.4 | <u>Acidity:</u> | No free acid | ASTM D847 |
| 3.1.5 | <u>Sulfur:</u> | No free H ₂ S or SO ₂ | ASTM D853 |
| 3.1.6 | <u>Color:</u> | Not darker than No. 20 | ASTM D1209 |

3.2 Quality: Toluene, as received by purchaser, shall be clear and free
∅ suspended solids, undissolved water, and sediment when examined by transmitted light.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the toluene shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the toluene conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each lot.

4.3 Sampling: Shall be in accordance with ASTM D4057.

4.4 Reports: The vendor of toluene shall furnish with each shipment a report
∅ showing the results of tests to determine conformance to the acceptance test requirement and stating that the solvent conforms to other technical requirements of this specification. This report shall include the purchase order number, AMS 3180E, vendor's identification, lot number, and quantity.

4.4.1 A material safety data sheet conforming to AMS 2825, or equivalent, shall be supplied to each purchaser prior to, or concurrent with, the first shipment of the toluene for production use. Each request for modification of toluene formulation shall be accompanied by a revised data sheet for the proposed formulation.

4.5 Resampling and Retesting: If any sample used in the above tests fails to meet the specified requirements, disposition of the toluene may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the toluene represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging:

5.1.1 Toluene shall be packaged in containers of a size and type agreed upon by purchaser and vendor.

5.1.2 Each container shall be legibly marked with not less than AMS 3180E, purchase order number, lot number, manufacturer's identification, quantity, and precautionary data (See 5.2).

- 5.1.3 Containers of toluene shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the toluene to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.
- 5.1.4 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-290, Levels A, B, or commercial, as specified in the request for procurement. Commercial packaging as in 5.1.1 and 5.1.3 will be acceptable if it meets the commercial level of MIL-STD-290.
- 5.2 Precautionary Marking: Shipping containers shall be marked in accordance with Department of Transportation regulations including the "Flammable Liquid" red label. Each unit, intermediate, and shipping container shall be durably and legibly labeled as follows:
- TOLUENE
WARNING
FLAMMABLE VAPOR
VAPOR HARMFUL
- Keep away from heat, sparks, and open flame
Keep container closed
Use only with adequate ventilation
Avoid prolonged breathing of vapor
Avoid prolonged or repeated contact with skin
6. ACKNOWLEDGMENT: A vendor shall mention this specification and its revision letter in all quotations and when acknowledging purchase orders.
7. REJECTIONS: Toluene not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.
8. NOTES:
- 8.1 Marginal Indicia: The phi (\emptyset) symbol is used to indicate technical changes from the previous issue of this specification.
- 8.2 For direct U.S. Military procurement, purchase documents should specify not less than the following:
- Title, number, and date of this specification
Size and type of container desired
Quantity of product desired
Applicable level of packaging (See 5.1.4)
- 8.3 Similar Specifications: Federal TT-T-548 is listed for information only and shall not be construed as an acceptable alternate unless all requirements of this AMS are met.