



Society of Automotive Engineers, Inc.  
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

# AEROSPACE MATERIAL SPECIFICATION

AMS 3022

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Revised

## REFERENCE FLUID FOR TESTING HYDROCARBON FUEL RESISTANT MATERIALS 10% Aromatic Content

1. **SCOPE:** This specification covers a hydrocarbon fluid mixture for use as a reference fuel test fluid to evaluate the ability of polymeric compounds to conform to designated requirements after immersion in the fluid at a specific temperature for a specified time, as required by an applicable specification.
2. **APPLICABLE DOCUMENTS:** The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.
  - 2.1 **SAE Publications:** Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.
    - 2.1.1 **Aerospace Material Specifications:**
      - AMS 2350 - Standards and Test Methods
      - AMS 2825 - Material Safety Data Sheets
  - 2.2 **ASTM Publications:** Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103
    - ASTM D270 - Sampling Petroleum and Petroleum Products
    - ASTM D362 - Industrial Grade Toluene
    - Annex A2.8 - Part 47, Annual Book of ASTM Standards
  - 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-794 - Parts and Equipment, Procedures for Packaging and Packing of
3. **TECHNICAL REQUIREMENTS:**
  - 3.1 **Material:** The test fluid shall consist of a mixture of  $90\% \pm 0.5$  iso-octane and  $10\% \pm 0.5$  toluene by volume.
    - 3.1.1 The iso-octane shall conform to Annex A2.8 to Part 47 of the Annual Book of ASTM Standards.
    - 3.1.2 The toluene shall conform to ASTM D362.
  - 3.3 **Quality:** The fluid shall be free from water, sediment, and suspended matter. The odor shall not be nauseating or irritating. No substance of known dangerous toxicity under normal conditions of handling and use shall be present.

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade or their use by governmental agencies is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

#### 4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of fluid 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 4.5. Purchaser reserves the right to sample and to perform such confirmatory testing as he deems necessary to ensure that the fluid conforms to the requirements of this specification.

#### 4.2 Classification of Tests:

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

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed on the initial shipment of fluid to a purchaser, when a change in material or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test fluid shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be in accordance with ASTM D270, unless otherwise specified. The number of specimens for each test shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1 A lot shall be all fluid from one batch or tank submitted for vendor's inspection at one time and shall not exceed 5000 gal (18,900 L). A lot may be packaged in smaller quantities as specified in 5.1.1 as long as the basic lot identification is maintained.

4.3.2 When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3 and the report of 4.6.1 shall state that such plan was used.

#### 4.4 Approval:

4.4.1 Sample fluid shall be approved by purchaser before fluid for production use is supplied, unless such approval be waived. Results of tests on production fluid shall be essentially equivalent to those on the approved sample fluid.

4.4.2 Vendor shall use ingredients, manufacturing procedures, and methods of routine inspection on production fluid which are essentially the same as those used on the approved sample fluid. If any change is necessary in ingredients or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients and processing and, when requested, sample fluid. Production fluid made by the revised procedure shall not be shipped prior to receipt of reapproval.

#### 4.5 Reports:

4.5.1 The vendor of fluid shall furnish with each shipment three copies of a report showing the results of tests on each lot to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, AMS 3022, lot number, and quantity.

4.5.2 A material safety data sheet conforming to AMS 2825 shall be supplied to each purchaser prior to, or concurrent with, the report of preproduction test results or, if preproduction testing be waived by purchaser, concurrent with the first shipment of fluid for production use. Each request for modification of formulation shall be accompanied by a revised data sheet for the proposed formulation.