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400 Commonwealth Drive, Warrendale, PA 15096-0001

# AEROSPACE MATERIAL SPECIFICATION

**SAE**

**AMS 3160G**

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Superseding AMS 3160F

Submitted for recognition as an American National Standard

## SOLVENT, PETROLEUM

### 1. SCOPE:

#### 1.1 Form:

This specification covers a petroleum-base solvent in the form of a liquid.

#### 1.2 Application:

This solvent has been used typically as a cleaner to remove oil and oil-bonded contaminants from metal surfaces, but usage is not limited to such applications.

#### 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.

### 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 publications shall be the issue in effect on the date of the purchase order.

#### 2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2825 Material Safety Data Sheets

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

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## 2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

- ASTM D 56 Flash Point by Tag Closed Tester
- ASTM D 86 Distillation of Petroleum Products
- ASTM D 93 Flash Point by Pensky-Martens Closed Tester
- ASTM D 130 Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test
- ASTM D 156 Saybolt Color of Petroleum Products (Saybolt Chronometer Method)
- ASTM D 235 Mineral Spirits (Petroleum Spirits) (Hydrocarbon Drycleaning Solvent)
- ASTM D 445 Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
- ASTM D 611 Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents
- ASTM D 847 Acidity of Benzene, Toluene, Xylenes, Solvent Naphthas, and Similar Industrial Aromatic Hydrocarbons
- ASTM D 1133 Kauri-Butanol Value of Hydrocarbon Solvents
- ASTM D 1209 Color of Clear Liquids (Platinum-Cobalt Scale)
- ASTM D 1298 Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- ASTM D 1319 Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption
- ASTM D 3257 Aromatics in Mineral Spirits by Gas Chromatography
- ASTM D 4057 Manual Sampling of Petroleum and Petroleum Products

## 2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-290 Packaging of Petroleum and Related Products

## 3. TECHNICAL REQUIREMENTS:

### 3.1 Material:

Shall consist of a refined, straight-run distillate from crude petroleum without the admixture of benzol, ether, alcohols, chlorinated hydrocarbons, and other compounds not occurring naturally in crude petroleum.

- 3.1.1 (R) Olefins: Solvent shall contain not more than 5% by volume of olefinic or cyclo-olefinic hydrocarbons, determined in accordance with ASTM D 1319 or ASTM D 3257. In case of dispute, ASTM D 1319 shall be the referee method.
- 3.1.2 (R) Aromatics: Solvent shall contain less than 8% by volume of aromatic compounds, determined in accordance with ASTM D 1319 or ASTM D 3257. In case of dispute, ASTM D 1319 shall be the referee method.

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## 3.2 Properties:

(R)

Solvent shall conform to the following requirements:

- 3.2.1 Flash Point: Not lower than 60 °C (140 °F), determined in accordance with (R) ASTM D 93, except where other methods are prescribed by law for the determination of minimum flash point. ASTM D 56 may be used as an alternative with the same limits provided the flash point is below 93 °C (199 °F). This method will give slightly lower values. In case of dispute, ASTM D 93 shall be used as the referee method.
- 3.2.2 Color: Not darker than +25 on the Saybolt Scale or 25 on the Pt-Co Scale, (R) determined in accordance with ASTM D 156 or ASTM D 1209. In case of dispute, ASTM D 156 shall be the referee method.
- 3.2.3 Distillation Points: Shall be as shown in Table 1, determined in (R) accordance with ASTM D 86 and Table 1.

TABLE 1 - Distillation Points

Points	
Initial boiling point, minimum	177 °C (351 °F)
50% recovered, maximum	196 °C (385 °F)
Dry point, maximum	213 °C (415 °F)
Residue, maximum	1.5% by volume

- 3.2.4 Aniline Point: Within 57 to 74 °C (135 to 165 °F), determined in (R) accordance with ASTM D 611.
- 3.2.5 Kauri-Butanol Value: Within 29 - 45, determined in accordance with (R) ASTM D 1133.
- 3.2.6 API Gravity: Within 41 to 56 degrees, determined in accordance with (R) ASTM D 1298.
- 3.2.7 Viscosity: Shall be determined at 40 °C (104 °F) in accordance with (R) ASTM D 445 and reported.
- 3.2.8 Corrosion Number: Number 1, determined in accordance with ASTM D 130, under prescribed conditions for 3 hours at 100 °C (212 °F).
- 3.2.9 Acidity: Neutral, determined in accordance with ASTM D 847.
- 3.2.10 Doctor Test: Negative, determined in accordance with ASTM D 235.

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### 3.3 Quality:

Solvent, as received by purchaser, shall be clear and free from suspended solids, undissolved water, free acid, alkali, inorganic compounds, and other foreign compounds known to be toxic or to cause harmful physiological or dermal effects. The odor of the solvent shall be neither rancid nor objectionable and shall be typical of a "sweet" refined naphtha.

## 4. QUALITY ASSURANCE PROVISIONS:

### 4.1 Responsibility for Inspection:

(R)

The vendor of solvent shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the solvent conforms to the requirements of this specification.

### 4.2 Classification of Tests:

(R)

Tests for all technical requirements are acceptance tests and preproduction tests and shall be performed prior to or on the initial shipment of solvent to a purchaser, on each lot, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

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

### 4.3 Sampling and Testing:

(R)

Shall be in accordance with all applicable requirements of ASTM D 4057 or other procedure acceptable to purchaser; a lot shall be all solvent from a single refinery batch offered for delivery at one time.

### 4.4 Approval:

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

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