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AEROSPACE MATERIAL SPECIFICATION

AMS 3034A

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AVIATION FUEL, GRADE 108/135

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 4-21-83. It is recommended that this specification not be specified for new designs.

This cover sheet should be attached to the "A" revision of the subject specification.

This specification is under the jurisdiction of AMS Committee "B".

AEROSPACE
MATERIAL SPECIFICATIONS

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AMS 3034A
Superseding AMS 3034
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AVIATION FUEL
Grade 108/135

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. GRADE: The fuel shall be the one grade known as Aviation Grade 108/135.

3. APPLICATION: Primarily for use in aircraft engines requiring Grade 108/135 fuel.

4. TECHNICAL REQUIREMENTS:

4.1 General: Except as otherwise specified herein, the fuel shall consist of a blend of refined hydrocarbons derived from crude petroleum, natural gasoline, or blends thereof with other aliphatic and/or aromatic hydrocarbons.

4.2 Properties: Fuel shall conform to the following requirements as determined by the methods specified. When ASTM methods are specified for determining conformance, tests shall be conducted in accordance Ø with the issue of the ASTM method listed in the latest issue of AMS 2350. If multiple determinations are made, average results shall be reported.

4.2.1 Knock Rating:

4.2.1.1 Knock Rating, Lean: The lean mixture knock rating of the fuel shall be not lower than that of iso-octane (or approved reference fuel) to which has been added 0.22 ml tetraethyl lead per U.S. Ø gallon when determined in accordance with ASTM D614, or with ASTM D357 using an appropriate correlation factor; in case of dispute, the rating shall be determined in accordance with ASTM D614.

4.2.1.2 Knock Rating, Rich: The rich mixture knock rating of the fuel shall be not lower than that of iso-octane (or approved reference fuel) to which has been added 1.68 ml tetraethyl lead per U.S. gallon when determined in accordance with ASTM D909. The rich mixture knock rating of the fuel shall be determined at the fuel-air ratio at which the maximum indicated mean effective pressure for iso-octane (or approved reference fuel) plus 1.68 ml tetraethyl lead per U.S. gallon is obtained.

4.2.2 Color: The color shall be brown. The finished fuel blend shall contain per gallon a maximum of 4.7 mg of blue dye, essentially an alkyl substituted anthraquinone, plus a maximum of 2.7 mg of red dye, Ø Red-0, 2, 3' -dimethylazobenzene-4' -azo-B-Naphthol (Color Index No. 26105), plus a maximum of 6.0 mg of orange dye, essentially benzene-azo-1-naphthol-2 (Color Index No. 12055).

4.2.2.1 Color Comparison: Color comparison shall be made by any suitable apparatus or by visual examination using identical transparent containers for the fuel sample and for the brown color standards for maximum intensity and minimum intensity agreed upon by purchaser and vendor. Samples of standards which have been exposed to light for more than 24 hr shall not be used for this test.

4.2.3 Lead: The lead content per U.S. gallon of fuel shall not exceed 3.0 ml of tetraethyl lead in the form of an antiknock mixture containing not less than 61% by weight of tetraethyl lead and sufficient ethylene dibromide to provide two bromine atoms per atom of lead. The balance shall contain no added ingredients other than kerosene, an approved inhibitor, and blue dye, as specified herein.

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4.2.4 Distillation: The results of distillation of the fuel in accordance with ASTM D86 shall be as follows:

Thermometer Reading F	Thermometer Reading C	Percent Evaporated
140	60	10 max
158	70	10 min
221	105	50 min
212 - 257	100 - 125	90
338 max	170 max	100

The residue after distillation shall be not greater than 1.5% and the distillation loss shall be not greater than 1.5%.

4.2.4.1 Ø The sum of the individual thermometer readings of the 10% and 50% evaporated points shall be not less than 307 F (153 C).

4.2.5 Acidity: The aqueous extract of the distillation residue shall show no pink or red color when tested in accordance with ASTM D1093.

4.2.6 Ø Sulfur: The sulfur content shall not exceed 0.05% by weight when determined in accordance with ASTM D1266.

4.2.7 Corrosiveness, Bomb Method: Shall be no worse than No. 1 comparison standard when tested in accordance with ASTM D130.

Ø 4.2.8 Potential Gum Content:

4.2.8.1 Five Hour Test: The accelerated aging test with 5 hr induction time at 212 F (100 C), starting with 100 psi oxygen pressure, shall be conducted in the ASTM bomb according to ASTM D873. The gum residue after the foregoing accelerated aging test shall not exceed 6 mg per 100 ml and the total weight of visible lead precipitate shall not exceed 3 mg per 100 milliliters.

4.2.8.2 Sixteen Hour Test: If mutually agreed upon by purchaser and vendor, aviation gasoline may be required to meet a 16 hr accelerated aging gum test in accordance with ASTM D873 instead of the 5 hr aging gum test. In such fuel, the permissible gum inhibitors shall not exceed 8.4 lb per 1000 bbl (42 gal per barrel). For this 16 hr accelerated aging test, the gum residue shall not exceed 10 mg per 100 ml and the total weight of visible lead precipitate shall not exceed 4 mg per 100 milliliters.

4.2.9 Vapor Pressure, Reid Method: The vapor pressure shall not exceed 7.0 psi when determined in accordance with ASTM D323.

4.2.10 Ø Freezing Point: The freezing point shall be not higher than -72 F (-58 C) when determined in accordance with ASTM D2386.

4.2.11 Water Tolerance: The volume of the aqueous layer shall not increase or decrease by more than 2 ml when tested in accordance with ASTM D1094.

4.2.12 Net Heat of Combustion: The net heat of combustion shall be not less than 18,800 Btu per lb when determined in accordance with the following procedure:

4.2.12.1 Gross Heat of Combustion: The heat of combustion at constant volume shall be determined in an oxygen-bomb calorimeter. Any suitable procedure may be employed provided its accuracy is recognized by the purchasing or receiving agency as being equal or superior to that of ASTM D240 suitably modified for use with volatile liquids.