SURFACE VEHICLE STANDARD

J1696	APR2017

Issued 1994-04
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Superseding J1696 JUN1997

Standard Fuel Filter Test Fluid

RATIONALE

This standard was updated to address conductivity readings of the current test fluid.

FOREWORD

This test fluid conforms essentially to ISO 4113.

1. SCOPE

This SAE Standard defines the requirements for fluid to be used in the SAE Fuel Filter Test Procedures.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J905 Fuel Filter Test Methods

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org

ASTM D56 Test Method for Flash Point by Tag Closed Tester

ASTM D86 Method for Distillation of Petroleum Products

ASTM D129 Test method for Sulfur in Petroleum Products (General Bomb Method)

ASTM D130 Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test

ASTM D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

ASTM D665A Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water

ASTM D892 Test Method for Foaming Characteristics of Lubricating Oils

ASTM D1298 Test Method for Density, Relative Density (Specific Gravity or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method)

ASTM D1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)

ASTM D2140 Test Method for Carbon-Type Composition of Insulating Oils of Petroleum Origin

ASTM D2273 Test Method for Trace Sediment in Lubricating Oils

ASTM D2500 Test Method for Cloud Point of Petroleum Oils

ASTM D2624 Test Method for Electrical Conductivity to Aviation and Distillate Fuels Containing a Static Dissipator Additive

2.1.3 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 2049 Petroleum products - Determination of colour

ISO 2160 Petroleum products - Corrosiveness to copper - Copper strip test

ISO 2719 Petroleum products and lubricants - Determination of flash point - Pensky-Martens closed cup method

ISO 3015 Petroleum oils - Determination of cloud point

ISO 3104 Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity

ISO 3405 Petroleum products - Determination of distillation characteristics

ISO 3675 Crude petroleum and liquid petroleum products - Laboratory determination of density or relative density - Hydrometer method

ISO 4113 Road vehicles - Calibration fluid for diesel injection equipment

2.1.4 FTSM Publication

Available from NIST, Room 205, Building 202, Gaithersburg, MD 20899.

FTSM 5322.1 Corrosiveness of Oil on Bi-Metallic Coupling

2.1.5 IP Publication

Available from Institute of Petroleum, 61 New Cavendish Street, London, England W1M 8AR.

IP 306/82 Oxidation Stability of a Straight Mineral Oil

3. PROPERTY REQUIREMENTS

The filter test fluid shall be formulated from solvent refined petroleum stocks and blended with additives required to meet the specifications shown in Table 1. Figure 1 shows the typical viscosity versus temperature range of SAE J1696 APR94 test fluid.

The filter test fluid shall also meet fuel injection equipment manufacturer specifications and requirements.

4. PERFORMANCE CHARACTERISTICS APPROVAL

The following fluid performance characteristics must be approved by a panel of users selected by the SAE Filter Test Methods Standards Committee:

4.1 0.8 μm Membrane Filterability

A panel judgment of slow filtration rates, relatable to additive removal or contamination, would constitute grounds for rejection.

4.2 SAE Filterability

A panel judgment of filter performance, which deviates measurably from previously qualified batches of fluid, would constitute grounds for rejection.

4.3 Odor

A panel judgment of objectionable odor, generated during any portion of SAE testing would constitute grounds for rejection.

5. TEST CODES

SAE J1696 APR94 "Standard Fuel Filter Test Fluid" is used in the SAE J905 Test Code.

6. SOURCE INFORMATION

Approved June 1997, Filter Test Fluid SAE J1696 JUN97 is available by contacting Rock Valley Oil & Chemical Co., 1911 Windsor Road, Rockford, Illinois 60111. Phone: 815-654-2400. FAX: 815-654-2428. Other sources will be published as they are approved and become available.

This test fluid has generally been called Viscor L-4264-V-96.

Table 1 - Fuel filter test fluid

Property	Specification Limit	Test
Density		ISO 3675
Specific Gravity	0.815 – 0.830/15.5 °C	ASTM D1298
Flash Point	71 °C min	ISO 2719 ASTM D56
Viscosity:		ISO 3104 ASTM D445
cSt @ 20 °C		
cSt @ 37.8 °C		
cSt @ 40 °C[1]	2.40 – 2.85	
cSt @ 100 °C		
Distillation	5% max vol 210 °C	ISO 3405 ASTM D86
Oxidation Stability		
Catalyzed-48 h)		IP 306/82
Total Sludge		
Total Acidity after		
Oxidation[2]		
Cloud Point	0 °C	ISO 3015 ASTM D2500
Rust Protection		
(Polished panels 50 h)		ASTM D1748
Corrosion Tests		
Ferrous Metal	Pass 24 h	ASTM D665A
Copper	Pass 1A Class	ISO 2160 ASTM D130
Galvanic Corrosion		FTSM 5322.1
Sulfur	0.4% max	ASTM D129
Trace Sediment	0.01% max	ASTM D2273
(incl. water)		
Aromatic components		ASTM D2140
Foaming Tendency	50 mL max	ASTM D892
(After 5 min blowing)		
(After 2 min settling)	0 mL	ASTM D892
Electrical Conductivity using Emcee Model 1152 meter	1500 pS/m minimum	ASTM D2624
Color	2.5 max	ISO 2049 ASTM D1500

[1] It is recommended that the calibration fluid be renewed when the viscosity increases above 3.0 cSt (mm^2/s) at 40 °C or 3.1 cSt (mm^2/s) at 37.8 °C.

[2] Sum of volatile and soluble acidity.