A Program of ASTM International

Test Monitoring Center

@ Carnegie Mellon University
6555 Penn Avenue, Pittsburgh, PA 15206, USA

http://astmtmc.cmu.edu
412-365-1000

Sequence VG Information Letter 18-1
Sequence No. 47
March 9, 2018

ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: Sequence VG Mailing List

SUBJECT: Fuel Specification and Analysis Schedule Revision

During the February 27, 2018 Sequence V Surveillance Panel conference call, the panel agreed to revise the current fuel specification in the test method to include items that are currently on the certificate of analysis supplied by the fuel producer. Table 3 has been revised to show all the parameters and identify also the parameters to be analyzed on a quarterly basis. Section 8.2.4.1 has been revised to refer to Table 3 and Section 8.2.6 and subsections have been revised to refer to the quarterly analysis in table 3. Table 3 also now lists some additional analytical methods so the referenced documents section has been updated to reflect these additions. These changes are effective with the issuance of this information letter.

Ron Romano
FCSD, Service Product Development, SEO
Ford Motor Company

Frank M. Farber
Director
ASTM Test Monitoring Center

Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/gas/sequencev/procedure_and_ils/vgil18-1-47.pdf

Distribution: Email

(Revises Test Method D6593-17)

2.1 *ASTM Standards:* [4]
Delete D287, D323, D873, D1298, D2622
Add the following standards:

D130 Standard Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test
D240 Standard Test Method for Heat of Combustion of Liquid Hydrocarbon fuels by Bomb Calorimeter
D1319 Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Absorption
D2699 Standard Test Method for Research Octane Number of Spark-Ignition Engine Fuel
D2700 Standard Test Method for Motor Octane Number of Spark-Ignition Engine Fuel
D3231 Standard Test Method for Phosphorus in Gasoline
D3343 Standard Test Method for Estimation of Hydrogen Content in Aviation Fuels
D4052 Standard Test Method for Density, Relative Density, and API Gravity of Liquids by digital Density Method
D4815 Standard Test Method for MTBE, ETBE, TAME, DIPE, tertiary-Amyl Alcohol and C_1 to C_4 Alcohols in Gasoline by Gas Chromatography
D5191 Standard Test Method for Vapor Pressure of Petroleum Products (mini method)
D5291 Standard Test Method for Instrumental determination of Carbon, Hydrogen and Nitrogen in Petroleum Products and Lubricants
D5453 Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel and engine Oil by Ultraviolet Fluorescence
D5769 Standard Test Method for Determination of Benzene, Toluene, and Total Aromatics by Gas Chromatography/Mass Spectrometry
D6550 Standard Test Method for Determination of Olefin content of Gasolines by Supercritical-Fluid Chromatography

Revise 8.2.4.1 as follows:

8.2.4.1 Before initial blending, analyze typical samples of the fuel blend components, compare the data with predetermined physical specifications given in Table 3. Blend a small amount of fuel mixture, analyze, and compare to predetermined specifications. The ASTM Test Monitoring Center (TMC) confirms the acceptability of the fuel mixture analytical data and authorizes blending of the entire batch for engine testing. After the entire batch is blended, the TMC confirms the acceptability of the analytical data of the entire fuel batch, and authorizes the engine test fuel approval program.

Revise 8.2.6 as follows:

8.2.6 *Laboratory Storage Tank Fuel Analysis*—Quarterly analyze the contents of each fuel storage tank that contains fuel used for calibrated Sequence VG tests. Analyze fuel in run tanks, those with a direct feed line to test engines, every month. Laboratories should take composite samples using Table 1 in Practice D4057, as a guideline.

Add New 8.2.6.1

8.2.6.1 The fuel supplier shall have the capability to analyze the fuel samples using the test methods specified in Table 3 and this section. Upon receipt of all fuel samples required in 8.2.6 from the laboratories, the fuel supplier shall perform the analyses under quarterly measurements in Table 3, report the results to the submitting laboratory, and tabulate the results in a database. The fuel supplier shall provide an adequate supply of fuel sample containers with packaging and pre-addressed return labels to each Sequence VG laboratory.

Renumber current 8.2.6.1 - 8.2.6.3 as 8.2.6.2 – 8.2.6.4.

Renumber current 8.2.6.2 as follows:

8.2.6.3 The fuel supplier shall also issue a quarterly analysis of the fuel from the main storage tank, which should represent normal aging. The analysis shall include the quarterly parameters in Table 3.

Revise Table 3 as follows:

TABLE 3 VG Fuel Analysis

NOTE 1—Appearance, water, lead, and oxidation stability are analyzed on an absolute basis.

Measurement	Units	Method	Limits	Quarterly
Distillation Initial Boiling Point	°C	ASTM D86	22.2 - 35.0	✓
Distillation 5 % Volume			Report	
Distillation 10 % Volume			48.9 - 57.2	✓
Distillation 20 % Volume				
Distillation 30 % Volume				
Distillation 40 % Volume				
Distillation 50 % Volume			98.9 – 115.2	✓
Distillation 60 % Volume				
Distillation 70 % Volume				
Distillation 80 % Volume				
Distillation 90 % Volume			162.8 – 176.7	✓
Distillation 95 % Volume				
Distillation End Point			196.1 – 212.8	✓
Distillation Recovery	volume %		Report	
Distillation Residue	volume %		2.0 Max	
Distillation Loss	volume %		Report	
API Gravity	°API	ASTM D4052	56.5 – 61.2	✓
Specific Gravity	unitless	ASTM D4052	Report	
Reid Vapor Pressure	kPa	ASTM D5191	60.7 – 63.4	✓
Carbon	mass fraction	ASTM D5291	0.8580 – 0.8690	
Hydrogen	mass fraction	ASTM D5291	Report	
Carbon	mass fraction	ASTM D3343	Report	
Oxygen	mass %	ASTM D4815	0.05 maximum	
Sulfur	mg/kg	ASTM D5453	100 maximum	
Lead	mg/L	ASTM D3237	2.6 maximum	✓
Phosphorous	mg/L	ASTM D3231	1.3 maximum	
Composition, aromatics	volume %	ASTM D1319	35.0 maximum	
Composition, aromatics	volume %	ASTM D5769	report	
Composition, olefins	volume %	ASTM D1319	10 maximum	
Composition, olefins	volume %	ASTM D6550	report	
Composition, saturates	volume %	ASTM D1319	Report	
Oxidation Stability	minutes	ASTM D525	1440 minimum	✓
Copper Corrosion	unitless	ASTM D130	1 maximum	
Solvent Washed Gum Content	mg/100 mL	ASTM D381	3 maximum	✓
Research Octane Number	unitless	ASTM D2699	96.0 – 98.0	
Motor Octane Number	unitless	ASTM D2700	Report	
Anti-Knock Index (R+M)/2	unitless	ASTM D2700	Report	
Sensitivity	unitless	ASTM D2700	7.5 minimum	
Appearance	unit less	N/A	clear and bright	✓
Net Heat of Combustion	Btu/lb	ASTM D240	Report	
Additive, Ethyl antioxidant	ptb	calculated	Report	