Designation: D2226 – 93 (Reapproved 2012)

Standard Classification for Various Types of Petroleum Oils for Rubber Compounding Use[1]

This standard is issued under the fixed designation D2226; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This classification is intended to establish classification and test methods for certain types of oil used in extending and processing styrene-butadiene rubbers (SBR) and butadiene rubbers (BR). Its purpose is for classification only and not for specification.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D88 Test Method for Saybolt Viscosity

D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester

D97 Test Method for Pour Point of Petroleum Products

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

D611 Test Methods for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents

D972 Test Method for Evaporation Loss of Lubricating Greases and Oils

D974 Test Method for Acid and Base Number by Color-Indicator Titration

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

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

D2007 Test Method for Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method

D2008 Test Method for Ultraviolet Absorbance and Absorptivity of Petroleum Products

D2501 Test Method for Calculation of Viscosity-Gravity Constant (VGC) of Petroleum Oils

D2887 Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography

2.2 *International Institute of Synthetic Rubber Producers:*

The Synthetic Rubber Manual, 12th Ed., 1992[3]

3. Significance and Use

3.1 The composition of the oil in rubber compounds has a large effect on the characteristics and use of the compounds. This classification divides the oils into broad categories for descriptive purposes.

4. Numbering System

4.1 The description and numbers of polymers and latices including oil extended polymers outlined are in a brochure issued and updated by the International Institute of Synthetic Rubber Producers, Inc. Notes of explanation to cover differences in nomenclature or variations in classifications from ASTM practices are incorporated as necessary.

5. Basis of Classification

5.1 Classification of petroleum oils as used for extending and processing styrene-butadiene rubbers (SBR) and butadiene rubbers (BR) is given in Table 1. Classification is based on results obtained in accordance with Test Method D2007 and Test Method D2501.

6. Test Methods

6.1 The types of petroleum oils listed in Table 1 may be further characterized by testing in accordance with Test Methods D88, D92, D97, D445, D611, D972, D974, D1298, D1500, D2008, and D2887.

[1] This classification is under the jurisdiction of ASTM Committee D11 on Rubber and is the direct responsibility of Subcommittee D11.20 on Compounding Materials and Procedures.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from International Institute of Synthetic Rubber Producers, Inc., 2077 S. Gessner Rd., Suite 133, Houston, TX 77063.

TABLE 1 Classification of Oil Types

Types	Asphaltenes, max, %[A]	Polar Compounds, max, %	Saturated Hydrocarbons, %
101	0.75	25	20 max
102	0.5	12	20.1 to 35
103	0.3	6	35.1 to 65
104[B]	0.1	1	65 min

[A] Pentane-insoluble materials as determined by Test Method D2007.
[B] Type 104 oils are further classified into two subtypes 104A and 104B for SBR polymers only. Type 104B oils are those that have a viscosity-gravity constant of 0.820 maximum (Test Method D2501). Type 104A oils are those that have a viscosity-gravity constant greater than 0.820 (Test Method D2501). It is recognized that certain Type 104 oils may not be satisfactorily classified for polymers other than SBR by this subclassification.

7. Keywords

7.1 extending oils; petroleum oils; processing oils