This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D153 – 84 (Reapproved 2020)

Standard Test Methods for Specific Gravity of Pigments[1]

This standard is issued under the fixed designation D153; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods cover three procedures for determining the specific gravity of pigments, as follows:

Test Method A—For Routine Testing of Several Samples Simultaneously.

Test Method B—For Tests Requiring Greater Accuracy than Test Method A.

Test Method C—For Rapid and Accurate Testing of Single Samples.

1.2 The specific gravity value obtained by these procedures may be used with the weight of a dry pigment to determine the volume occupied by the pigment in a coating formulation.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Sections 5, 11, and 15.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1193 Specification for Reagent Water

3. Purity of Reagents

3.1 *Purity of Water*—Reference to water shall be understood to mean reagent water as defined by Type II of Specification D1193.

TEST METHOD A—FOR ROUTINE TESTING OF SEVERAL SAMPLES SIMULTANEOUSLY

4. Apparatus and Materials

4.1 *Pycnometer*—A pycnometer (Note 1) having a 50-mL capacity.

NOTE 1—The Weld type with the cap seal on the outside of the neck of the bottle is preferred because there is less danger of trapping air just under the capillary tube than with types having the ground glass seal on the inside of the neck.

4.2 *Water Bath,* maintained at 25 ± 0.5°C and equipped with a stirring device.

4.3 *Manometer,* open- or closed-tube (see Part *f* of the apparatus for Test Method C), made of glass tubing 6 mm in diameter, fitted with rubber pressure tubing attached to a T-joint leading to the desiccator and the pump. For the open-tube type 860 mm of mercury shall be used. The difference in levels of the mercury in the manometer when the system is in operation, subtracted from the barometer reading taken at the same time, shall be considered the absolute pressure of the system in millimetres of mercury.

4.4 *Desiccator,* glass, constructed with heavy walls to withstand a vacuum of one atmosphere, and with an opening at the side.

4.5 *Vacuum Pumps*—A laboratory water vacuum-type pump (Note 2), to remove the greater portion of air in the desiccator, and an oil vacuum-type pump, motor-driven, and capable of reducing the absolute pressure of the system to 3 mm.

NOTE 2—The water vacuum pump may be omitted if the rate of evacuation with the oil pump can be controlled so as to avoid a rapid ebullition of entrapped air and possible loss of specimen.

4.6 *Thermometer,* having a range from 0 to 60°C, and graduated in 0.1°C divisions.

4.7 *Weighing Bottle,* wide-mouth cylindrical glass (about 30 mm in height and 70 mm in diameter), provided with a ground-glass stopper.

[1] These test methods are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.31 on Pigment Specifications.

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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.

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