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: D2863 – 19

Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)[1]

This standard is issued under the fixed designation D2863; 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 This fire-test-response standard describes a procedure for measuring the minimum concentration of oxygen, expressed as percent volume, that will just support flaming combustion in a flowing mixture of oxygen and nitrogen.

1.2 This test method provides three testing procedures. Procedure A involves top surface ignition, Procedure B involves propagating ignition, and Procedure C is a short procedure involving the comparison with a specified minimum value of the oxygen index.

1.3 Test specimens used for this test method are prepared into one of six types of specimens (see Table 1).

1.4 This test method provides for testing materials that are structurally self-supporting in the form of vertical bars or sheet up to 10.5-mm thick. Such materials are solid, laminated or cellular materials characterized by an apparent density greater than 15 kg/m^3.

1.5 This test method also provides for testing flexible sheet or film materials, while supported vertically.

1.6 This test method is also suitable, in some cases, for cellular materials having an apparent density of less than 15 kg/m^3.

NOTE 1—Although this test method has been found applicable for testing some other materials, the precision of the test method has not been determined for these materials, or for specimen geometries and test conditions outside those recommended herein.

1.7 This test method measures and describes the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.

1.8 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.9 *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.* Specific hazards statement are given in Section 10.

1.10 *Fire testing is inherently hazardous. Adequate safeguards for personnel and property shall be employed in conducting these tests.*

NOTE 2—This test method and ISO 4589-2 are technically equivalent when using the gas measurement and control device described in 6.3.1, with direct oxygen concentration measurement.

1.11 *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]

D618 Practice for Conditioning Plastics for Testing
D883 Terminology Relating to Plastics
D1071 Test Methods for Volumetric Measurement of Gaseous Fuel Samples
D1622 Test Method for Apparent Density of Rigid Cellular Plastics
D4802 Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet
D4968 Practice for Annual Review of Test Methods and Specifications for Plastics
E176 Terminology of Fire Standards
E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
E456 Terminology Relating to Quality and Statistics
E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

[1] This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.30 on Thermal Properties.

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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.

*A Summary of Changes section appears at the end of this standard

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