



Standard Test Method for Measuring Liquid and Solid Material Fire Limits in Gaseous Oxidants¹

This standard is issued under the fixed designation G 125; 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 test method covers a procedure for measuring the threshold-limit conditions to allow equilibrium of combustion of materials in various oxidant gases under specific test conditions of pressure, temperature, flow condition, fire-propagation directions, and various other geometrical features of common systems.

1.2 This test method is patterned after Test Method D 2863-95 and incorporates its procedure for measuring the limit as a function of oxidant concentration for the most commonly used test conditions. Sections 8, 9, 10, 11, 13, and 14 for the basic oxidant limit (oxygen index) procedure are quoted directly from Test Method D 2863-95. Oxygen index data reported in accordance with Test Method D 2863-95 are acceptable substitutes for data collected with this standard under similar conditions.

1.3 This test method has been found applicable to testing and ranking various forms of materials. It has also found limited usefulness for surmising the prospect that materials will prove “oxygen compatible” in actual systems. However, its results do not necessarily apply to any condition that does not faithfully reproduce the conditions during test. The fire limit is a measurement of a behavioral property and not a physical property. Uses of these data are addressed in Guides G 63 and G 94.

NOTE 1—Although this test method has been found applicable for testing a range of materials in a range of oxidants with a range of diluents, the accuracy has not been determined for many of these combinations and conditions of specimen geometry, outside those of the basic procedure as applied to plastics.

NOTE 2—Test Method D 2863-95 has been revised and the revised Test Method has been issued as D 2863-97. The major changes involve sample dimensions, burning criteria and the method for determining the oxygen index. The aim of the revisions was to align Test Method D 2863 with ISO 4589-2. Six laboratories conducted comparison round robin testing on self-supporting plastics and cellular materials using D 2863-95 and D 2863-97. The results indicate that there is no difference between the means provided by the two methods at the 95 % confidence level. No

comparison tests were conducted on thin films. The majority of ASTM Committee G4 favors maintaining the D 2863-95 as the backbone of G 125 until comprehensive comparison data become available.

1.4 One very specific set of test conditions for measuring the fire limits of metals in oxygen has been codified in Test Method G 124. Test Method G 124 measures the minimum pressure limit in oxygen for its own set of test conditions. Its details are not reproduced in this standard. A substantial database is available for this procedure, although it is much smaller than the database for Test Method D 2863-95.

NOTE 3—**Warning:** During the course of combustion, gases, vapors, aerosols, fumes or any combination of these are evolved which may be hazardous.

NOTE 4—**Precaution:** Adequate precautions should be taken to protect the operator.

1.5 The values stated in SI units are to be regarded as the standard.

1.6 *This basic standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to directly describe or appraise the fire hazard or fire risk of materials, products or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use. The standard has more applicability in this regard at predicting the fire behavior of materials and components that are close in size to the test condition, than for systems that are much different (for example: comparing a test rod to a valve seat rather than comparing a test rod to a house or a particle)*

1.7 *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:

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing²

¹ This test method is under the jurisdiction of ASTM Committee G04 on Compatibility and Sensitivity of Materials in Oxygen-Enriched Atmospheres and is the direct responsibility of Subcommittee G4.01 on Test Methods. Portions have been adopted from Test Method D 2863 – 95 that is under the jurisdiction of ASTM Committee D20 on Plastics.

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² Annual Book of ASTM Standards, Vol 08.01.