



Standard Test Method for Determining the Combustion Behavior of Metallic Materials in Oxygen-Enriched Atmospheres¹

This standard is issued under the fixed designation G124; 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 test apparatus and techniques to determine the minimum test gas pressure and sample temperature that supports self-sustained burning and the regression rate of the melting surface of a standardized sample of a metallic material that has been ignited using a promoter.

1.2 The data obtained from this test method are dependent on the precise test sample configuration and provide a basis for comparing the burning characteristics of metallic materials. No criteria are implied for relating these data for the suitability of a material's use in any actual system.

1.3 Requirements for apparatus suitable for this test method are given, as well as an example. The example is not required to be used.

1.4 This test method is for gaseous oxygen or any mixture of oxygen with inert diluents that will support burning, at any pressure or temperature within the capabilities of the apparatus used.

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

1.6 *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

[G63 Guide for Evaluating Nonmetallic Materials for Oxygen Service](#)

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 G04.01 on Test Methods.

Current edition approved Nov. 1, 2010. Published November 2010. Originally approved in 1994. Last previous edition approved in 2003 as G124 – 95 (2003). DOI: 10.1520/G0124-10.

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.

[G88 Guide for Designing Systems for Oxygen Service](#)

[G93 Practice for Cleaning Methods and Cleanliness Levels for Material and Equipment Used in Oxygen-Enriched Environments](#)

[G94 Guide for Evaluating Metals for Oxygen Service](#)

3. Terminology

3.1 Definitions:

3.1.1 *burn length, n*—the burn length is the length of the sample that has been consumed by combustion.

3.1.1.1 *Discussion*—The burn length is determined by subtracting the post-test sample length from the pretest sample length (which does not include the promoter length or region used by the test sample support.)

3.1.2 *flammable material, n*—a material is defined in this standard as flammable if a standard rod sample burns more than 3 cm (1.2 in.) above the promoter (**1, 2**).³

3.1.3 *highest no-burn pressure, n*—the maximum gas pressure (at a specified oxygen concentration and fixed sample temperature) at which a material does not burn more than 3 cm (1.2 in.) above the promoter in a minimum of five tests.

3.1.4 *highest no-burn temperature, n*—the maximum sample temperature (at a specified oxygen concentration and pressure) at which a material does not burn more than 3 cm (1.2 in.) above the promoter in a minimum of 5 tests.

3.1.5 *igniter, n*—a material used to ignite the promoter that can burn under an electrical influence, such as a small-diameter wire.

3.1.6 *lowest burn pressure, n*—the minimum gas pressure (at a specified oxygen concentration and fixed sample temperature) at which a material burns more than 3 cm (1.2 in.) above the promoter for one or more tests specimens.

3.1.7 *lowest burn temperature, n*—the minimum sample temperature (at a specified oxygen concentration and pressure) at which a material burns more than 3 cm (1.2 in.) above the promoter for one or more tests specimens.

³ The boldface numbers in parentheses refer to a list of references at the end of this standard.