



Standard Test Method for Determining Ignition Sensitivity of Materials to Mechanical Impact in Ambient Liquid Oxygen and Pressurized Liquid and Gaseous Oxygen Environments¹

This standard is issued under the fixed designation G86; 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 method² describes test equipment and techniques to determine the impact sensitivity of materials in oxygen under two different conditions: (1) in ambient pressure liquid oxygen (LOX) or (2) under pressure-controlled conditions in LOX or gaseous oxygen (GOX). It is applicable to materials for use in LOX or GOX systems at pressures from ambient to 68.9 MPa (0 to 10 000 psig). The test method described herein addresses testing with pure oxygen environments; however, other oxygen-enriched fluids may be substituted throughout this document.

1.2 This test method provides a means for ranking nonmetallic materials as defined in Guide G63 for use in liquid and gaseous oxygen systems and may not be directly applicable to the determination of the sensitivity of the materials in an end-use configuration. This test method may be used to provide batch-to batch acceptance data. This test method may provide a means for evaluating metallic materials in oxygen-enriched atmospheres also; however, Guide G94 should be consulted for preferred testing methods.

1.3 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 and health practices and determine the applicability of regulatory limitations prior to use. See also Section 9.*

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 G04.01 on Test Methods.

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² NASA Handbook 8060.1B, *Pressurized Liquid and Gaseous Oxygen Mechanical Impact Test*, Sept. 1981, pp. 4-72.

2. Referenced Documents

2.1 ASTM Standards:³

D1193 Specification for Reagent Water

D4080 Specification for Trichloroethylene, Technical and Vapor-Degreasing Grade

G63 Guide for Evaluating Nonmetallic Materials for Oxygen Service

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

2.2 Military Document:⁴

MIL-D-16791 Detergent, General Purpose (Liquid, Non-ionic), Type One

2.3 American Chemical Society:⁵

Trichloroethylene, Reagent Grade

2.4 Compressed Gas Association:⁶

G-4 Oxygen

G-4.1 Cleaning Equipment for Oxygen Service

G-4.3 Oxygen, Gaseous, Type I B

G-4.3 Oxygen, Liquid, Type II B

G-10.1 Nitrogen, Gaseous, Type I B

G-10.1 Nitrogen, Liquid, Type II B

2.5 NASA Standard:⁷

NSS 1740.15 Safety Standard for Oxygen and Oxygen Systems

³ 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.

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

⁵ Available from American Chemical Society (ACS), 1155 Sixteenth Street, NW Washington, DC 20036, <http://www.acs.org>.

⁶ Available from Compressed Gas Association (CGA), 4221 Walney Rd., 5th Floor, Chantilly, VA 20151-2923, <http://www.cganet.com>.

⁷ Available from National Aeronautics and Space Administration (NASA), NASA Headquarters, Suite 1M32, Washington, DC 20546.