



Standard Guide for Studying Fire Incidents in Oxygen Systems¹

This standard is issued under the fixed designation G 145; 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 guide covers procedures and material for examining fires in oxygen systems for the purposes of identifying potential causes and preventing recurrence.

1.2 This guide is not comprehensive and is not intended for forensic use. The analysis of oxygen fire incidents is not a science, and definitive causes have not been established for some events.

1.3 The procedures and analyses in this guide have been found useful for interpreting fire events, for helping identify potential causes, and for excluding other potential causes. The inclusion or omission of any analytical strategy is not intended to suggest either applicability or inapplicability of that method in any actual incident study. Indeed, some material in this guide is considered useful, and therefore worthy of inclusion and consideration in a study, but not necessarily of demonstrated validity.

NOTE 1—Although this guide has been found applicable for assisting qualified technical personnel to analyze incidents, each incident is unique and must be approached as a unique event. Therefore, the selection of specific tactics and the sequence of application of those tactics must be conscious decisions of those studying the event.

NOTE 2—The incident may require the formation of a team to provide the necessary expertise and experience to conduct the study. The personnel analyzing an incident, or at least one member of the team, should know the process under study and the equipment installation.

1.4 **Warning**—During combustion, gases, vapors, aerosols, fumes, or combination thereof, are evolved, which may be present and may be hazardous to people. **Caution**—Adequate precautions should be taken to protect those conducting a study.

1.5 *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:

- E 620 Practice for Reporting Opinions of Technical Experts²
- E 678 Practice for Evaluation of Technical Data²
- E 860 Practice for Examining and Testing Items That Are or May Become Involved in Products Liability Litigation²
- E 1020 Practice for Reporting Incidents²
- E 1138 Terminology of Technical Aspects of Products Liability Litigation²
- E 1188 Practice for Collection and Preservation of Information and Physical Items by a Technical Investigator²
- E 1459 Guide for Physical Evidence Labeling and Related Documentation²
- E 1492 Practice for Receiving, Documenting, Storing, and Retrieving Evidence in a Forensic Science Laboratory²
- G 63 Guide for Evaluating Nonmetallic Materials for Oxygen Service³
- G 88 Guide for Designing Systems for Oxygen Service³
- G 93 Practice for Cleaning Methods for Material and Equipment Used in Oxygen-Enriched Environments³
- G 94 Guide for Evaluating Metals for Oxygen Service³
- G 114 Practice for Aging Oxygen-Service Materials Prior to Flammability Testing³
- G 124 Test Method for Determining the Combustion Behavior of Metallic Materials in Oxygen-Enriched Atmospheres³
- G 128 Guide for Control of Hazards and Risks in Oxygen-Enriched Systems³
- 2.2 *ASTM Adjunct:*
Video: *Oxygen Safety*⁴
- 2.3 *Compressed Gas Association (CGA) Standards:*⁵
 - G-4.4 Industrial Practices for Gaseous Oxygen Transmission and Distribution Piping Systems
 - G-4.8 Safe Use of Aluminum Structured Packing for Oxygen Distillation
- 2.4 *National Fire Protection Association (NFPA) Standard:*⁶
 - NFPA 53 Fire Hazards in Oxygen Enriched Atmospheres

² Annual Book of ASTM Standards, Vol 14.02.

³ Annual Book of ASTM Standards, Vol 14.04.

⁴ Available from ASTM Customer Service, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Request PCN 12-700880-31.

⁵ Available from Compressed Gas Association, 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202.

⁶ Available from National Fire Protection Association, 1 Batterymarch Park, Box 9101, Quincy, MA 02269-9101.

¹ This guide is under the jurisdiction of ASTM Committee G4 on Compatibility and Sensitivity of Materials in Oxygen-Enriched Atmospheres and is the direct responsibility of Subcommittee G04.02 on Practices.

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