



Designation: F1870 – 22

Standard Guide for Selection of Fire Test Methods for the Assessment of Upholstered Furnishings in Detention and Correctional Facilities¹

This standard is issued under the fixed designation F1870; 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 is a fire-test-response guide.

1.2 This guide is intended to provide guidance for the selection of test methods that are applicable to determining fire-test-response characteristics of upholstered furniture items contained within a detention cell.

1.3 This guide is intended for use by those interested in assessing the fire properties of the upholstery products and their component materials or composites, within cells and other areas (such as isolation lounges) of detention and correctional occupancies.

1.4 This guide includes standard test methods promulgated by ASTM, NFPA, Underwriters Laboratories, trade associations and government agencies and other proposed test methods. It does not include industrial materials specification tests. The guide indicates some means by which modifications of standard test methods lead to potential achievement of certain testing goals.

1.5 The values stated in SI units are to be regarded as standard; see [IEEE/ASTM SI 10](#) for further details. The units given in parentheses are for information only. Some individual standards referenced use inch-pound units for referee decisions.

1.6 This guide contains four types of test methods, namely: (1) generic small-scale methods, (2) specific applications of small-scale test methods to particular products or composites of products, associated with upholstery items, (3) real-scale test methods where actual upholstery products are exposed to heat or flame, and (4) guides explaining the concepts involved with room-scale testing.

1.7 The main fire-test-response characteristics investigated in this guide are: ignitability, ease of extinction, flame spread, heat release, smoke obscuration and toxic potency of smoke.

¹ This guide is under the jurisdiction of ASTM Committee F33 on Detention and Correctional Facilities and is the direct responsibility of Subcommittee F33.05 on Furnishings and Equipment.

Current edition approved June 1, 2022. Published June 2022. Originally approved in 1999. Last previous edition approved in 2016 as F1870 – 16. DOI: 10.1520/F1870-22.

1.8 This guide 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.

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

1.10 *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.*

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

[D123 Terminology Relating to Textiles](#)

[D1929 Test Method for Determining Ignition Temperature of Plastics](#)

[D2863 Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics \(Oxygen Index\)](#)

[D3675 Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source](#)

[E162 Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source](#)

[E176 Terminology of Fire Standards](#)

[E603 Guide for Room Fire Experiments](#)

[E662 Test Method for Specific Optical Density of Smoke Generated by Solid Materials](#)

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.

- E906** Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using a Thermopile Method
- E1321** Test Method for Determining Material Ignition and Flame Spread Properties
- E1352** Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies
- E1353** Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture
- E1354** Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- E1474** Test Method for Determining the Heat Release Rate of Upholstered Furniture and Mattress Components or Composites Using a Bench Scale Oxygen Consumption Calorimeter
- E1537** Test Method for Fire Testing of Upholstered Furniture
- E1546** Guide for Development of Fire-Hazard-Assessment Standards
- E1590** Test Method for Fire Testing of Mattresses
- E1678** Test Method for Measuring Smoke Toxicity for Use in Fire Hazard Analysis
- E2187** Test Method for Measuring the Ignition Strength of Cigarettes
- E2257** Test Method for Room Fire Test of Wall and Ceiling Materials and Assemblies
- E3020** Practice for Ignition Sources
- F1534** Test Method for Determining Changes in Fire-Test-Response Characteristics of Cushioning Materials After Water Leaching
- F1550** Test Method for Determination of Fire-Test-Response Characteristics of Components or Composites of Mattresses or Furniture for Use in Correctional Facilities after Exposure to Vandalism, by Employing a Bench Scale Oxygen Consumption Calorimeter
- IEEE/ASTM SI 10** International System of Units (SI): The Modern Metric System

2.2 BSI Standards:³

- BS 5852** Standard Methods of test for assessment of the ignitability of upholstered seating by smouldering and flaming ignition sources
- BS 6807** Standard Methods of test for assessment of ignitability of mattresses, upholstered divans and upholstered bed bases with flaming types of primary and secondary sources of ignition
- BS 7177** Standard Specification for resistance to ignition of mattresses, mattress pads, divans and bed bases

2.3 California Standards:⁴

- California Technical Bulletin 116** (CA TB 116) (January 1980), “Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Upholstered Furniture”

- California Technical Bulletin 117–1980** (CA TB 117) (January 1980), “Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture”

- California Technical Bulletin 117–2013** (CA TB 117-2013), Requirements, Test Procedure and Apparatus for Testing the Smoler Resistance of Materials Used in Upholstered Furniture

- California Technical Bulletin 121** (CA TB 121) (April 1980), Flammability Test Procedure for Mattresses for Use in Public Occupancies

- California Technical Bulletin 129** (CA TB 129) (October 1992), Flammability Test Procedure for Mattresses for Use in Public Buildings

- California Technical Bulletin 133** (CA TB 133) (January 1991), Flammability Test Procedure for Seating Furniture for Use in Public Occupancies

2.4 CPSC Standards:⁵

- CFR Part 1610** Standard for the Flammability of Clothing Textiles (General Wearing Apparel)

- CFR Part 1632** Standard for the Flammability of Mattresses and Mattress Pads (formerly DOC FF4-72, 40 FR 59940)

2.5 Federal Standards:⁶

- Americans with Disabilities Act**

- FED STD 191A** Textile Test Method 5830 (July 20, 1978)

2.6 International Code Council Codes:⁷

- International Building Code**

- International Fire Code**

2.7 ISO Standards:⁸

- ISO 3261** Fire Tests–Vocabulary

- ISO 4880** Burning Behaviour of Textiles and Textile Products–Vocabulary

- ISO 5659-2** Determination of Specific Optical Density by a Single-Chamber Test

- ISO 9705** Full Scale Room Fire Test for Surface Products

- ISO 13943** Fire Safety: Vocabulary

2.8 NFPA Standards:⁹

- NFPA 101** Life Safety Code

- NFPA 258** Recommended Practice for Determining Smoke Generation of Solid Materials (withdrawn)

- NFPA 260** Methods of Test and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture

- NFPA 261** Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes

- NFPA 265** Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Wall Coverings

⁵ Available from US Consumer Product Safety Commission, Washington, DC, 20207.

⁶ Available from General Services Administration, Specifications Activity, Printed Materials Supply Division, Building 197, Naval Weapons Plant, Washington, DC, 20407.

⁷ Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

⁸ Available from International Organization for Standardization (ISO), 1 rue de Varembe, Case postale 56, CH-1211, Geneva 20, Switzerland.

⁹ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101.

³ Available from British Standards Institution (BSI), 389 Chiswick High Rd., London W4 4AL, U.K., <http://www.bsigroup.com>.

⁴ Available from California Bureau of Home Furnishings and Thermal Insulation, State of California, Department of Consumer Affairs, 3485 Orange Grove Avenue, North Highlands, CA, 95660-5595.