Designation: E 1895 – 04

An American National Standard

Standard Guide for Determining Uses and Limitations of Deterministic Fire Models[1]

This standard is issued under the fixed designation E 1895; 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 provides a methodology for the systematic evaluation of fire models, which may be used in fire hazard analyses.

1.2 This guide provides a means of identifying both general and specific limitations of fire models for specific applications.

1.3 This guide is intended to assist model developers, model users, and authorities having jurisdiction in assuming the responsible use of fire models.

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.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

E 176 Terminology of Fire Standards

E 603 Guide for Room Fire Experiments

E 1355 Guide for Evaluating the Predictive Capability of Fire Models

E 1472 Guide for Documenting Computer Software for Fire Models

E 1474 Test Method for Determining the Heat Release Rate of Upholstered Furniture and Mattress Components of Composites Using a Bench Scale Oxygen Consumption Calorimeter

E 1546 Guide for Development of Fire-Hazard-Assessment Standards

E 1591 Guide for Data for Fire Models

2.2 *Other Documents:*

An Updated International Survey of Computer Models for Fire and Smoke[3]

NIST Handbook 146, Technical Reference Guide for the Hazard I Fire Hazard Assessment[4]

Technical Reference Guide for FPE Tool, Version 3.2, NISTIR 5486[4]

The SFPE Handbook of Fire Protection Engineering, 3rd Edition, Section 3, Chapter 15[5]

3. Terminology

3.1 *Definitions*—Definitions used in this guide are in accordance with Terminologies in E 176, unless otherwise indicated.

4. Significance and Use

4.1 This guide provides recommendations for fire model users and authorities having jurisdiction in establishing the limitations of fire models in fire risk and fire hazard assessments. The guide also makes recommendations for fire model developers to identify appropriate uses and limitations of their model.

4.2 This guide is intended to assist in evaluating the appropriate use of fire models in fire assessment. These types of assessments are employed in product development, as well as in design and construction. Further guidance can be found in Guide E 1546.

4.3 This guide is not intended to address all or limit any methods of evaluating proper use of a fire model. It does address the use of fire models in fire hazard assessment. Other uses of fire models include post-fire analysis, research, education, and litigation.

4.4 The primary emphasis of this guide is both zone models and computational fluid dynamics models of compartment fires. However, other types of mathematical models need similar evaluations of their prediction capabilities.

5. Guidance for Model Users

5.1 A model user's first step should be to define the scope of the intended fire risk or fire hazard assessment, or both, and then determine if fire modeling is an appropriate tool to provide information for the decision making process.

[1] This guide is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the direct responsibility of Subcommittee E05.33 on Fire Safety Engineering.

Current edition approved February 1, 2004. Published March 2004. Originally approved in 1997. Last previous edition approved in 1997 as E 1895 - 97.

[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.

[3] Stephen Olenick and Douglas Carpenter, *SFPE Journal for Fire Protection Engineering*, 2002. Also see www.firemodelsurvey.com.

[4] Available from National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161.

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