



Standard Practice for Thermal Qualification of Type B Packages for Radioactive Material¹

This standard is issued under the fixed designation E 2230; 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 practice defines detailed methods for thermal qualification of “Type B” radioactive materials packages under Title 10, Code of Federal Regulations, Part 71 (10CFR71) in the United States or, under International Atomic Energy Agency Regulation TS-R-1. Under these regulations, packages transporting what are designated to be Type B quantities of radioactive material shall be demonstrated to be capable of withstanding a sequence of hypothetical accidents without significant release of contents.

1.2 *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.*

1.3 *This standard is used to measure and describe 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.*

2. Referenced Documents

2.1 ASTM Standards:

E 176 Terminology of Fire Standards²

IEEE/ASTM SI-10 International System of Units (SI) The Modernized Metric System

2.2 Federal Standard:

Title 10, Code of Federal Regulations, Part 71 (10CFR71), *Packaging and Transportation of Radioactive Material*, United States Government Printing Office, 2000

2.3 Nuclear Regulatory Commission Standards:

Standard Format and Content of Part 71 Applications for Approval of Packaging of Type B Large Quantity and Fissile Radioactive Material, Regulatory Guide

7.9, United States Nuclear Regulatory Commission, United States Government Printing Office, 1986.

Standard Review Plan for Transportation of Radioactive Materials, NUREG-1609, United States Nuclear Regulatory Commission, United States Government Printing Office, May 1999

2.4 International Atomic Energy Agency Standards:

Regulations for the Safe Transport of Radioactive Material, No. TS-R-1, (IAEA ST-1 Revised) International Atomic Energy Agency, Vienna, Austria, 1996

Regulations for the Safe Transport of Radioactive Material, No. ST-2, (IAEA ST-2) International Atomic Energy Agency, Vienna, Austria, 1996

2.5 *American Society of Mechanical Engineers Standard: Quality Assurance Program Requirements for Nuclear Facilities*, NQA-1, American Society of Mechanical Engineers, New York, 2001

2.6 *International Organization for Standards (ISO) Standard:*

ISO 9000:2000, *Quality Management Systems—Fundamentals and Vocabulary*, International Organization for Standards (ISO), Geneva, Switzerland, 2000

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method refer to the terminology contained in Terminology E 176 and ISO 13943. In case of conflict, the definitions given in Terminology E 176 shall prevail.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *hypothetical accident conditions, n*—a series of accident environments, defined by regulation, that a Type B package must survive without significant loss of contents.

3.2.2 *insolation, n*—solar energy incident on the surface of a package.

3.2.3 *normal conditions of transport, n*—a range of conditions, defined by regulation, that a package must withstand during normal usage.

3.2.4 *regulatory hydrocarbon fire, n*—a fire environment, one of the hypothetical accident conditions, defined by regulation, that a package shall survive for 30 min without significant release of contents.

¹ This practice is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the direct responsibility of Subcommittee E05.13 on Large Scale Fire Tests.

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² *Annual Book of ASTM Standards*, Vol 04.07.