



Examination Standard for Class 1 Interior Wall and Ceiling Materials or Systems for Smoke Sensitive Occupancies

Class Number 4882

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Foreword

This standard is intended to verify that the products and services described will meet stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of this standard is to present the criteria for examination of various types of products and services.

Examination in accordance with this standard shall demonstrate compliance and verify that quality control in manufacturing shall ensure a consistent and reliable product.

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1. INTRODUCTION

1.1 Purpose

- 1.1.1 This standard states testing and certification requirements for Class 1 interior wall and ceiling materials or systems for smoke sensitive occupancies.
- 1.1.2 testing and certification criteria may include, but are not limited to, performance requirements, marking requirements, examination of manufacturing facility(ies), audit of quality assurance procedures, and a follow-up program.

1.2 Scope

- 1.2.1 This standard applies to interior wall and ceiling materials or systems used in cleanrooms, pharmaceutical manufacturing and storage areas, food preparation and storage areas and similar occupancies or other occupancies which are susceptible to smoke damage. Wall and ceiling materials or systems which are categorized for use in cleanrooms meet the requirements of Examination Standard for FM Approvals Cleanroom Materials Flammability Test Protocol, Class Number 4910 and American National Standard for Clean Room Materials Flammability Test Protocol ANSI/FM Approvals 4910 in addition to the other requirements of this standard. These materials or systems produce low levels of smoke. Wall and ceiling materials which meet the requirements of this Standard and which are categorized for use in pharmaceutical manufacturing and storage areas, food preparation and storage areas and similar occupancies produce somewhat higher levels of smoke (when compared to those materials or systems which were evaluated for cleanrooms) but produce less smoke than materials and systems evaluated to the Examination Standard for Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, Class Number 4880 or Examination Standard for Class 1 Exterior Wall Systems, Class Number 4881.

1.3 Basis for Requirements

- 1.3.1 The requirements of this standard are based on experience, research and testing, , Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials, Class Number 4880, Examination Standard for FM Approvals Cleanroom Materials Flammability Test Protocol, Class Number 4910 and American National Standard for Clean Room Materials Flammability Test Protocol ANSI/FM Approvals 4910. The advice of manufacturers, users, trade associations and loss control specialists was also considered.
- 1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of interior wall and ceiling materials or systems used in smoke sensitive occupancies for the purpose of obtaining certification. Interior wall and ceiling materials or systems used in smoke sensitive occupancies having characteristics not anticipated by this standard may be certified if performance equal, or superior, to that required by this standard is demonstrated.

1.4 Basis for Certification

Certification is based upon satisfactory evaluation of the product and the manufacturer in the following major areas:

- 1.4.1 Examination and tests on production samples shall be performed to evaluate
- The suitability of the product;
 - The performance of the product as specified by the manufacturer and required for certification; and as far as practical;
 - The durability and reliability of the product.

- 1.4.2 An examination of the manufacturing facilities and audit of quality control procedures is made to evaluate the manufacturer's ability to consistently produce the product which is examined and tested and the marking procedures used to identify the product. Subsequent surveillance may be required by the certification agency in accordance with the certification scheme to ensure ongoing compliance.

1.5 Basis for Continued Certification

The basis for continual certification may include, but is not limited to, the following based upon the certification scheme and requirements of the certification agency:

- production or availability of the product as currently certified;
- the continued use of acceptable quality assurance procedures;
- satisfactory field experience;
- compliance with the terms stipulated by the certification;
- satisfactory re-examination of production samples for continued conformity to requirements; and
- satisfactory Surveillance Audits conducted as part of the certification agencies product surveillance program.

1.6 Effective Date

The effective date of this certification standard mandates that all products tested for certification after the effective date shall satisfy the requirements of this standard.

The effective date of this Standard is eighteen (18) months after the publication date of the standard for compliance with all requirements.

1.7 System of Units

Units of measurement used in this standard are International System (SI) units. These are followed by their arithmetic equivalents in United States (U.S.) customary units, enclosed in parentheses. The first value stated shall be regarded as the requirement. The converted equivalent value may be approximate. Conversion of SI units is in accordance with ANSI/IEEE/ASTM SI 10.

1.8 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the cited edition applies.

American National Standard for Evaluating the Fire Performance of Insulated Building Panel Assemblies and Interior Finish Materials ANSI FM 4880

American National Standard for Clean Room Materials Flammability Test Protocol ANSI/FM Approvals 4910.

ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA, 19428

ASTM E84, Test Method for Surface Burning Characteristics of Building Materials,

ASTM C167, Standard Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations.

ASTM C303, Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation.

ASTM D482, Standard Test Method for Ash from Petroleum Products

ASTM D792, Standard Test Method for Specific Gravity (Relative Density) and Density of Plastics by Displacement

ASTM D1505, Test Method for Density of Plastics by the Density-Gradient Technique

ASTM D1622, Standard Test Method for Apparent Density of Rigid Cellular Plastics

ASTM D1929, Test Method for Determining Ignition Temperature of Plastics

ASTM E2058, Standard Test Methods for Measurement of Synthetic Polymer Material Flammability Using a Fire Propagation Apparatus (FPA)

ISO 1716: Reaction-To-Fire Tests for Building Products - Determination of the Heat of Combustion, International Organization for Standardization, Geneva, Switzerland.

1.9 Terms and Definitions

For purposes of this standard, the following terms apply:

Average Smoke Emission Rate ($\dot{G}_{smoke}$) - Total smoke emitted in mg divided by the time period during which smoke is emitted in s.

Convective Flame Spread Parameter (FSP_C) - $FSP_C = Q_C / (TRP \cdot A)$ where Q_C is the 5 second average peak convective heat release rate and TRP is the thermal response parameter determined per ASTM E2058 and A is the area of the combustion sample used to determine Q_C .

Critical Heat Flux (CHF) - the maximum heat flux at or below which there is no ignition.

Fire Propagation Index (FPI) - ratio of the one-third power of the radiative fraction of the chemical heat release rate per unit of width of a sample to the ignition resistance of the sample, defined as the Thermal Response Parameter (TRP). It is an indicator of the propensity of the material to support fire propagation.

Ignition Zone - the area of the surface of a material heated by an outside source resulting in ignition.

Inert Faced - Faced with a material which is considered noncombustible (steel, aluminum, gypsum wall board, cement board, masonry).

PCHRR - peak chemical heat release rate.

Smoke Development Index - Smoke Yield (y_s) multiplied by Fire Propagation Index (FPI). It is an indicator of the potential for smoke contamination during fire propagation.

Smoke Sensitive Occupancy – an occupancy which is susceptible to property loss due to smoke infiltration or contamination.

Smoke Yield (y_s) - ratio of the total mass of smoke released to the total mass of the material vaporized.

Thermal Response Parameter (TRP) - indicator of the ignition resistance or the thermal inertia of a material.

Thermosetting - capable of becoming permanently rigid when heated or cured.

Thermoplastic - capable of softening when heated and of hardening again when cooled.