



Approval Standard for Class 1 Exterior Wall Systems

Class Number 4881

November 2016

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Foreword

The FM Approvals certification mark is intended to verify that the products and services described will meet FM Approvals' stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of Approval Standards is to present the criteria for FM Approval of various types of products and services, as guidance for FM Approvals personnel, manufacturers, users and authorities having jurisdiction.

Products submitted for certification by FM Approvals shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing shall ensure a consistently uniform and reliable product. Approval Standards strive to be performance-oriented. They are intended to facilitate technological development.

For examining equipment, materials and services, Approval Standards:

- a) must be useful to the ends of property conservation by preventing, limiting or not causing damage under the conditions stated by the Approval listing; and
- b) must be readily identifiable.

Continuance of Approval and listing depends on compliance with the Approval Agreement, satisfactory performance in the field, on successful re-examinations of equipment, materials, and services as appropriate, and on periodic follow-up audits of the manufacturing facility.

FM Approvals LLC reserves the right in its sole judgment to change or revise its standards, criteria, methods, or procedures.

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1 INTRODUCTION

1.1 Purpose

- 1.1.1 This standard states Approval requirements for exterior wall systems which are subjected to natural hazards and weather conditions (e.g. wind, hail, and windblown debris).
- 1.1.2 All exterior wall systems shall be FM Approved with a Class 1 fire rating. Therefore, FM Approval of Class 4880, *Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials*, is a prerequisite for all exterior wall systems.

1.2 Scope

- 1.2.1 This standard sets the performance requirements for exterior wall panel systems that are exposed to natural hazards such as wind, hail, and windborne debris. Exterior wall panel systems include, but are not limited to, wall panels constructed of metal, plastic, mineral wool, composite, or glass fiber.
- 1.2.2 Exterior wall panels systems shall be FM Approved with specific installation requirements and ratings including a:
- wind zone category,
 - wind pressure rating, and
 - hail resistance rating.
- 1.2.3 Exterior wall systems shall be FM Approved with specific building installation requirements, including, but not limited to:
- the support thickness and yield strength of the supports,
 - the support spacing use in the building construction, and
 - the fasteners, fastening accessories, and fastening scheme of the panels to the supports.
- 1.2.4 Any component which may be used in the installation of an exterior wall panel system such as fasteners, clips, or any other accessories, are considered part of the scope of the product and must be evaluated as part of the system. At the discretion of FM Approvals, any component that may affect the test performance must be included in the test sample construction.
- 1.2.5 Since environmental conditions can vary by location, this standard is not intended to determine the suitability of the use of a product at a particular location.
- 1.2.6 This standard shall not be used to qualify metal composite materials (MCM), cavity walls, fenestration products such as doors, windows and storm shutters, exterior insulated finish systems (EIFS), or other exterior wall coating systems.

1.3 Basis for Requirements

- 1.3.1 The requirements of this standard are based on experience, research and testing and/or the standards of FM Approvals and other national and international organizations. The advice of manufacturers, users, trade associations and loss control specialists was also considered.
- 1.3.2 Meeting the requirements qualifies the wall assembly as an FM Approved exterior wall system. Requirements prohibit component substitution without prior authorization by FM Approvals.

- 1.3.3 The requirements of this standard reflect tests and practices used to examine characteristics of exterior wall systems for the purpose of obtaining Approval. Exterior wall systems having characteristics not anticipated by this standard may be FM Approved if performance equal or superior to that required by this standard is demonstrated, or if the intent of the standard is met. Alternatively, exterior wall systems that meet all the requirements identified in this standard may not be FM Approved if other conditions that adversely affect performance exist or if the intent of this standard is not met.

1.4 Basis for Approval

Approval 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 are performed to evaluate:

- the suitability of the product for its intended end use as an exterior wall system;
- the performance of the product as required by FM Approvals; and, as far as practical;
- the durability and reliability of the product when used as an FM Approved exterior wall system.

- 1.4.2 An examination of the manufacturing facilities for completed assemblies and components and audit of quality control procedures are made to evaluate the manufacturer's ability to consistently produce the products which are examined and tested, and the marking procedures used to identify the products. These examinations are conducted at a minimum frequency of annually as part of FM Approvals' Surveillance Audit Program.

1.5 Basis for Continued Approval

Continued Approval is based upon:

- production or availability of the product as currently Approved;
- the continued use of acceptable quality control procedures;
- satisfactory field experience;
- compliance with the terms stipulated in the Approval Report and Master Agreement;
- re-examination of production samples for continued conformity to requirements; and
- satisfactory examinations conducted at least annually as part of FM Approvals' Surveillance Audit Program.

Also, as a condition of retaining Approval, manufacturers may not change a product or service without prior authorization by FM Approvals.

1.6 Effective Date

The effective date of an Approval Standard mandates that all products tested for Approval after the effective date shall satisfy the requirements of that standard. Products FM Approved under a previous edition shall comply with the new version by the effective date or else forfeit Approval.

Exterior wall systems FM Approved prior to the effective date of this standard, and which were FM Approved with a wind pressure ratio of 1.4 or 2.0, are still Approved and do not require a re-examination. However, the outward pressure (-P) shall meet the minimum and/or maximum pressure ratings list in Section 2.3 for the listed Wind Zone.

The effective date of this standard is upon publication for compliance with all requirements with the

exception of the Marking Requirements. The effective date of compliance of the Marking Requirements is March 1, 2017.

1.7 System of Units

Units of measurement used in this Standard are United States (U.S.) customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. The first value stated shall be regarded as the requirement. The converted equivalent value may be approximate. Appendix A lists the selected units and conversions to SI units for measures appearing in this standard. Conversion of U.S. customary units is in accordance with the American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)/American Society for Testing Materials (ASTM) SI 10, "American National Standard for Metric Practice."

1.8 Applicable Documents

The following are standards, test methods and practices referenced in this standard:

1.8.1 *American Society for Testing and Materials (ASTM) International*

ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E 1233-00, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential

ASTM E 1886-13a, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials

ASTM E 1996-03, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes

1.8.2 *FM Approvals, 1151 Boston-Providence Turnpike, Norwood Massachusetts 02062*

Approval Standard 4470, Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction

Approval Standard 4471, Class 1 Panel Roofs

Approval Standard 4880, Class 1 Fire Rating of Building Panels or Interior Finish Materials

Specification Test Standard 4473, Specification Test Standard for Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls

Test Procedure Class 4881: Fastener Withdrawal Test

Test Procedure Class 4881: Delamination Test

Test Procedure Class 4881: Hail Resistance Rating

Test Procedure Class 4881: Pull Through Test

Test Procedure Class 4881: Windborne Debris Test