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American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures

ANSI FM 4474-2020

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Foreword

NOTE: This foreword is introductory only and is not part of American National Standard FM 4474.

This standard is intended to verify that the product as described will meet minimum specific stated conditions of performance, safety and quality, useful in determining the potential suitability for end-use conditions of these products. It describes minimum performance requirements for materials that are intended for use in roof assemblies by evaluating the ability of the materials and, in turn, the system components to withstand simulated wind uplift resistance.

This American National Standard has been developed according to the essential requirements of due process for standards development of the American National Standards Institute (ANSI). FM Approvals is an ANSI-accredited standards developer (ASD).

ANSI/FM 4474 was originally published in March 2004, re-affirmed in January 2011 and revised in December 2020.

Approval of an American National Standard requires verification by ANSI that the principles of openness and due process have been followed and that a consensus of those directly and materially affected by the standard has been achieved. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution. Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached.

The American National Standards Institute does not develop standards nor will it in any circumstances give an interpretation of any American National Standard. Requests for interpretations of this test standard should be addressed to FM Approvals.

ANSI regulations require that this American National Standard shall be revised, reaffirmed or withdrawn within five years of the date of publication.

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1. INTRODUCTION

1.1 Purpose

This standard states the test requirements for evaluating the simulated wind uplift resistance of roof assemblies by using static positive and/or negative differential pressures. The standard applies to all components as assembled in the roof system.

1.2 Scope

1.2.1 Roof components, incorporated in complete roof assemblies, are exposed to various wind conditions. This standard presents test methods to evaluate the simulated wind uplift resistance of the completed roof assembly by using static positive and/or negative differential pressures.

1.2.2 This standard applies to a complete roof assembly. Weatherability, leakage, hail, fire resistance, corrosion resistance of fasteners and aggregate blow-off potential are not a part of this evaluation.

1.2.3 The performance of a roof assembly depends in part on all components in the roof system and on how they interact. It is therefore necessary to evaluate the roof assembly as a whole when measuring the potential for its wind resistance classification.

1.2.4 This standard is intended to evaluate only those hazards investigated, and is not intended to determine suitability for the end use of a product.

1.2.5 This standard is intended to be used to determine the simulated wind uplift resistance of the following types of roof assemblies:

- assemblies that utilize mechanical fasteners, adhesives, hot asphalt, heat welding, self adhesive components or combination thereof, to secure insulations, base sheets, cap sheets, exterior coverings and other components, in single or multi-layered constructions, to one another and to the roof deck;
- assemblies that utilize structural concrete, lightweight insulating concrete, cementitious wood fiber or gypsum roof decks having a minimum thickness of 2 in. (51 mm);
- assemblies that utilize fiber reinforced cementitious roof decks having a minimum thickness of 3/4 in. (19 mm);
- assemblies that utilize steel, wood or fiber reinforced plastic roof decks ;
- standing/lap seam metal roof systems.

1.2.6 This standard is not intended to be used to evaluate loose laid ballasted roof assemblies.

1.3 Basis for Requirements

The requirements of this standard are based on experience, research and testing and/or the standards of other organizations. The advice of manufacturers, users, trade associations and loss control specialists was also considered.

1.4 System of Units

Units of measurement are U.S. customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. Appendix A lists some of the selected units used in testing these products; conversions to SI units are included. Conversion of U.S. customary units is in accordance with ANSI/IEEE/ASTM SI 10-97, Standard for Use of the International System of Units (SI): The Modern Metric System.