



Examination Standard for Skylights

Class Number 4431

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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 skylights. Skylights are also referred to as roof lights. For purposes of this standard, skylights and roof lights shall be considered as the same product and shall be referred to as skylights.
- 1.1.2 Testing and certification criteria shall include, but are not limited to, performance requirements, marking requirements, examination of manufacturing facility(ies), an audit of quality assurance procedures, and a surveillance program.

1.2 Scope

- 1.2.1 This standard sets the performance requirements for skylights under simulated laboratory conditions. They shall be examined for their ability to limit fire propagation on the topside and/or through the assembly, wind resistance, hail resistance, windborne debris and UV exposure. The standard also examines the ability of the skylights to withstand the effects of temporary live loads such as those imposed by foot traffic and snow.
- 1.2.2 Skylights are normally installed in the plane of the roof but they can be installed in numerous orientations and configurations including what are commonly referred to as north lights or saw tooth applications.
- 1.2.3 This standard is intended to qualify skylights when their slope is less than or equal to 45° from the horizontal. This standard does not qualify skylights when installed vertically in a north light or saw tooth configuration. When oriented vertically, as would be the case in a north light or saw tooth configuration, the skylight shall be considered as an exterior wall panel. For the certification requirements of exterior wall panels, see FM 4881, *Examination Standard for Class 1 Exterior Wall Systems*.
- 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 the product.
- 1.2.5 This standard does not qualify automatic heat and smoke vents. For the certification requirements of heat and smoke vents, see FM 4430, *Examination Standard for Heat and Smoke Vents*.

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 other organizations. The advice of manufacturers, users, trade associations, jurisdictions and/or loss control specialists was also considered.
- 1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of skylights for the purpose of obtaining certification. Skylights 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 may be 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 agency's 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 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. Conversion of U.S. customary 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 Institute (ANSI)

- ANSI/IEEE/ASTM SI 10, *American National Standard for Metric Practice*
- ANSI/FM 4473, *Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls*
- ANSI/FM 4474, *Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures*

American Society for Testing and Materials (ASTM International)

- ASTM E108, *Standard Test Method for Fire Tests of Roof Coverings*

FM Approvals LLC (FM)

- FM 4350, *Examination Standard for Windstorm Resistant Fenestrations*
- FM 4430, *Examination Standard for Heat and Smoke Vents*
- FM 4470, *Examination Standard for 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*
- FM 4880, *Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials*
- FM 4881, *Examination Standard for Class 1 Exterior Wall Systems*

1.9 Terms and Definitions

For purposes of this standard, the following terms apply:

Cracking – to break in such a way that a fine split or splits appear but the section does not come apart.

Heat and Smoke Vent – an operable opening in a roof designed to operate either automatically or manually in the event of a fire to allow heat and smoke to escape the building.

Light Band – for purposes of this standard, a light band is identical to a wall light.

North Light – see Saw Tooth.

Roof Light – for purposes of this standard, a roof light is identical to a skylight.

Saw Tooth – a type of skylight that is normally installed facing north and has a vertical component and a sloped component. For purposes of this standard, the vertical component of this type of arrangement will be considered a skylight.

Thermoplastic – materials that soften when heated and harden when cooled. This process is reversible provided that the material is not heated sufficiently to decompose. Examples are polyvinyl chloride (PVC), expanded or extruded polystyrene (EPS), polycarbonate, polyethylene terephthalate (PET), polymethyl methacrylate (PMMA), polypropylene and polyethylene.

Thermoset – materials that cure or set irreversibly when heated during manufacture. Examples are polyurethane, polyisocyanurate, fiberglass reinforced plastic (FRP), phenolic foam, melamine and unsaturated polyester (UP).