ONLINE CERTIFICATIONS DIRECTORY

TEVT.GuideInfo
Roof Covering Materials

View Listings Page Bottom

Roof Covering Materials

Guide Information for Roofing Materials and Systems

GENERAL

This category covers roof covering materials which consist of two basic types: (1) roofing systems, generally involving the assembly of several components and may require special equipment to apply the materials involved, and (2) prepared materials, which can be applied directly to a roof deck in accordance with the manufacturer's instructions provided with the product. These coverings are intended for the protection of roof decks from external fire exposure and have not been evaluated for performance when exposed to a fire from an internal source, i.e., directed onto the underside of the roof deck assembly.

As indicated in the individual Classifications or Listings, specific materials have been supplementally fire tested in accordance with the requirements of the indicated nationally recognized codes and standards.

The weatherability of these roof covering materials has not been investigated.

Authorities Having Jurisdiction should be consulted as to which class of roof coverings will be acceptable in each location.

CLASSES

Class A includes roof coverings which are effective against severe fire exposure. Under such exposure, roof coverings of this class are not readily flammable and do not carry or communicate fire, afford a fairly high degree of fire protection to the roof deck, do not slip from position, possess no flying brand hazard, and do not require frequent repairs in order to maintain their fire resisting properties.

Class B includes roof coverings which are effective against moderate fire exposure. Under such exposure, roof coverings of this class are not readily flammable and do not readily carry or communicate fire, afford a moderate degree of fire protection to the roof deck, do not slip from position, and possess no flying brand hazard, but may require infrequent repairs in order to maintain their fire resisting properties.

Class C includes roof coverings which are effective against light fire exposure. Under such exposure, roof coverings of this class are not readily flammable and do not readily carry or communicate fire, afford some degree of fire protection to the roof deck, do not slip from position, possess no flying brand hazard, and may require occasional repairs or renewals in order to maintain their fire resisting properties.

Roofing systems provide Class A, B or C coverings over combustible and/or noncombustible (steel, concrete or poured gypsum) decks. Prepared roof covering materials provide Class A, B or C coverings over combustible decks. Combustible decks consist of the following types:

(A) Minimum 3/4 in. thick sheathing boards.

(B) Minimum 3/8 in. (for Prepared) or 15/32 in. (for Roofing Systems) thick plywood.

(C) Minimum 5/16 in. thick plywood with all joints blocked with solid lumber.

(D) Minimum 3/8 in. (for Prepared) or 7/16 in. (for Roofing Systems) thick non-veneer APA rated sheathing (oriented strandboard panels, structural particleboard panels, composite panels or waferboard panels).

RELATED PRODUCTS

Roofing systems are composed of materials shown under the various generic system types described in Roofing Systems (TGFU) or in Roofing Systems, Uplift Resistance (TGIK), and assembled as indicated to provide Class A, B or C fire resistant coverings or uplift resistant coverings, respectively.

Prepared roof coverings shown in Prepared Roof Covering Materials (TFWZ) and applied in accordance with detailed instructions included in the packages of materials provide Class A, B or C fire resistant coverings and wind resistant coverings as indicated on the Listing Mark applied to each package.

Prepared roof covering materials investigated for impact resistance are covered under Roof Covering Materials, Impact Resistance (TGAM).

Products intended for use as an accessory for a prepared roof covering system are covered under Prepared Roofing Accessories (TGDY).

For roof deck assemblies investigated for performance under internal fire exposures, see Roof Deck Constructions (TGKX).

Ridge vents (see TGEW) installed in accordance with the detailed instructions included with the product provide Class A, B or C fire resistance as indicated in the Classification Mark applied to each product.

When indicated in the individual Listings, the wind resistance of prepared roof coverings has been evaluated for wind velocities in excess of that specified in UL 997.

ADDITIONAL INFORMATION

For additional information, see Roofing Materials and Systems (AARM).

REQUIREMENTS

The basic standards used to investigate products in this category are ANSI/UL 790, "Tests for Fire Resistance of Roof Covering Materials" (ASTM E108 and NFPA 256) , UL 997, "Wind Resistance of Prepared Roof Covering Materials" (ASTM D3161) , UL 2218, "Impact Resistance of Prepared Roof Covering Materials" and UL 1897, "Uplift Tests for Roof Covering Systems."

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Questions? Notice of Disclaimer Page Top

ONLINE CERTIFICATIONS DIRECTORY

TFWZ2.GuideInfo
Prepared Roof Covering Materials

View Listings Page Bottom

[Roof Covering Materials] Prepared Roof Covering Materials

See General Information for Roof Covering Materials - Component

The materials covered under this category are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. THE FINAL ACCEPTANCE OF THE MATERIAL IS DEPENDENT UPON ITS INSTALLATION AND USE IN COMPLETE EQUIPMENT SUBMITTED TO UNDERWRITERS LABORATORIES INC.

USE

This category covers materials intended for use as components of complete products submitted for investigation as prepared roof covering materials.

CONDITIONS OF ACCEPTABILITY

Unless specified otherwise in the individual Recognitions, consideration is to be given to the conduct of surface burning characteristics tests in accordance with UL 790 when these materials are employed in the end-use products.

ADDITIONAL INFORMATION

For additional information, see Roof Covering Materials (TEVT2).

REQUIREMENTS

The basic standard used to investigate end products in this category is UL 790, "Standard Test Methods for Fire Tests of Roof Coverings." These Recognitions typically consist of material identification through formulation, various chemical tests, and/or various physical tests.

UL MARKING

Materials Recognized under UL's Component Recognition Program are identified by markings consisting of the manufacturer's identification and catalog, model or other product designation. In addition, materials which are

produced under the UL Component Recognition Program will also bear the Recognized Component Mark  .

The Listing or Classification Mark of Underwriters Laboratories Inc. is not authorized for use on, or in connection with, Recognized Components. Only those components which actually bear the "Marking" should be considered as being covered under the Component Recognition Program.

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Questions? Notice of Disclaimer Page Top

ONLINE CERTIFICATIONS DIRECTORY

TGKX.GuideInfo
Roof Deck Constructions

View Listings Page Bottom

Roof Deck Constructions

Guide Information for Roofing Materials and Systems

Roof deck constructions illustrated and described in this category are identified by a construction number and evaluated as to the spread of fire on the underside and/or resistance to uplift forces.

FIRE CLASSIFIED

Fire Classified Constructions are evaluated by either the large-scale fire test, or other test procedures having fire exposure conditions related to the large-scale fire test, described in the Standard for Fire Test of Roof Deck Constructions, ANSI/UL 1256.

These Fire-Classifications are not related to Fire ratings under either the Surface Burning Characteristics or the Fire Resistance Classification. The Surface Burning Characteristics is a comparative evaluation of materials (occasionally with facings or backing) with respect to flame spread and smoke developed. The Fire Resistance Classification is the time rating of an assembly with respect to resistance to flame passage, heat transfer and maintenance of structural integrity.

Roof deck constructions which are Fire-Classified consist of assemblies of materials as illustrated and described in this category, classified on the basis of specific requirements for maximum flame spread on the underside of the assembly within definite time limits. These constructions differ from materials classified with respect to Surface Burning Characteristics in that in the latter, materials are assigned comparative numerical values. They also differ from assemblies classified with respect to Fire Resistance, since temperature transmission through roof deck constructions and structural performance under load are not measured nor are time ratings assigned.

A fire investigation of a roof deck construction primarily determines whether the contribution to an igniting fire by any or all of the materials in the assembly is at a sufficient rate to cause propagation of flame on the underside, in excess of the established limits.

As indicated in individual Classifications, specific materials have been supplementally fire tested in accordance with the requirements of the indicated National Codes and Standards.

Authorities having jurisdiction are to be consulted as to which type of roof deck construction is acceptable for specific locations before installation.

UPLIFT RESISTANCE CLASSIFIED

Roof Deck Constructions Classified for Uplift Resistance have been investigated for damageability from both external and internal pressures on the deck associated with high velocity winds. Uplift Classifications are derived from tests conducted in accordance with the Standard for "Tests For Uplift Resistance of Roof Assemblies" , UL 580. The UL 580 test method subjects a 10 ft by 10 ft test sample to various static and oscillating air pressures to index performance under uplift loads imposed on roof decks.

The magnitude of the wind velocity across a roof deck and the resulting uplift pressures on a roof deck are dependent upon many factors such as wind gusts, the shape of the roof deck, edge configuration and the landscape surrounding the roof deck installation. A method to calculate the uplift pressures on roof decks is contained in the American Society of Civil Engineers (ASCE) Standard 7-95, Minimum Design Loads for Buildings and Other Structures.

The nominal static uplift pressure, the oscillating uplift pressures and the maximum static uplift pressure for each Class are:

Class	Nom Static Uplift Pressure psf	Range of Oscillating Pressure psf	Max Static Uplift Pressure psf
15	15	11 to 21	23
30	30	22 to 42	45
60	60	44 to 83	75
90	90	66 to 90	105

The static pressures are maintained for a 5 min period and the oscillating pressures are applied at a 10 plus or minus 2 s frequency and are maintained for a 60 min period for each Class. An assembly rated Class 60 has successfully withstood pressures imposed during Class 30 and Class 60 tests. An assembly rated Class 90 has successfully withstood pressures imposed during Class 30, Class 60 and Class 90 tests.

The test method provides a comparative measure of uplift resistance of roof deck constructions. The test evaluates the roof deck or roof deck assembly and its attachment to supports as well as the attachment of the roof covering, if used. **For uplift resistance related exclusively to the securement of the roof covering to a specified type of roof deck see Classifications under Roofing Systems, Uplift Resistance (TGIK).** Supporting structural members are evaluated only with respect to spacing and physical properties such as gauge, yield strength, grade and species of lumber and related factors, which could affect fastener attachment and necessary resistance to uplift forces. Secondary supports (beams, purlins, joists, bulb tees, lateral bracing, etc.), connections of the assembly to the main structural members (girders, columns, etc.) and construction details along the edges of the roof and around openings in the roof (skylights, chimneys, etc.) have not been evaluated unless specified in the construction. Constructions including skylights have been evaluated with single width skylight panels flanked on each side by a metal panel. Constructions including eaves/soffit have been evaluated for resistance to uplift pressures on the underside only.

Roof deck constructions consist of two groups. Construction illustrations and descriptions, beginning with Construction No. 1 include assemblies using metallic decks and constructions beginning with NM501 include assemblies using nonmetallic decks.

The specifications for the materials and their assembly are important details in limiting the flame spread on the underside of roof deck constructions or in resisting damage from high velocity winds. UL's Classification and Follow-Up Service is available for those materials so designated in the constructions described. The classifications of these materials are shown under Roof Deck Construction Materials (TGYV).

Metal Deck Assemblies

The metal deck assemblies illustrated are identified by a Construction Number.

Certain foam plastic insulation board products are acceptable for use in lieu of compressible fiberglass insulation in all roof deck constructions Classified for Wind uplift resistance in which the Metal Roof Deck Panels (TJPV) are directly fastened to structural members by means of self-drilling or self-tapping screws, or similar products. Refer to the Foamed Plastic (TJBX) category for information pertaining to the installation requirements.

Nonmetallic Deck Assemblies

The nonmetallic deck assemblies illustrated are identified by a construction number.

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Questions? Notice of Disclaimer Page Top