



# Class A, B, and C Roof Ratings

Helpful hints for achieving code compliance



*Questions often arise about the construction needed to achieve a Class A, B, or C fire rating for a roof assembly. The information needed to achieve code compliant installations is included below.*

## What are these ratings?

The UL 790 (ASTM E 108) *Standard Test Methods for Fire Tests of Roof Coverings* covers the fire resistance performance of roof coverings exposed to simulated fire sources originating from outside a building on which the coverings are installed. They are applicable to roof coverings intended for installation on either combustible or non-combustible decks.

This standard includes three classes of fire exposure:

- Class A roof coverings, which are effective against severe fire test exposures
- Class B roof coverings, which are effective against moderate fire test exposures
- Class C roof coverings, which are effective against light fire test exposures.

Under such exposures, the roof coverings afford a degree of fire protection to the roof deck, do not slip from position, and are not expected to produce flying brands.

## What ratings are required by codes?

There are several requirements for roof covering fire classifications in model codes and city and county ordinances. These requirements are dependent on the type of building construction and the location of the building. Some jurisdictions, due to the history of fire incidents or because of their location, have increased the minimum fire classification requirements in the IBC.

For example, the IBC requires roof coverings on Type IA, IB, and IIA buildings to have a minimum Class B rating. In comparison, buildings required by the International Wildland-Urban Interface Code to be provided with Class 1 ignition-resistant construction are required to include Class A roof assemblies. It is up to the designer to determine the minimum roof assembly fire classification for a given building, based on locally enforced requirements.

## Can ratings be interchanged?

To obtain a UL 790 fire classification, roof assemblies are required to pass a series of exterior fire exposure tests – the Class A tests are more severe than the Class B tests, which are more severe than the Class C tests. Accordingly, Class A roof assemblies are suitable for use where Class A, Class B or Class C roofs are required, and Class B roof assemblies are suitable for use where Class B or Class C roofs are required. Unrated roof assemblies are not suitable for use in any applications requiring a Class A, B or C rating, except when specified in a code.



## Where can these roof certifications be found?

UL has a wide range of roof related certifications, but only the following categories include products evaluated for Class A, B, and C ratings:

- Roofing Systems (TGFU)
- Prepared Roof-covering Materials (TFWZ)
- Prepared Roof-covering Materials, Formed or Molded Metal, Fiber-Cement, Plastic or
- Fire-retardant-treated Wood (TFXX)
- Prepared Roofing Accessories (TGDY)
- Building-integrated Photovoltaic Modules and Panels (QHZK)

Information on these product categories and the manufacturers' certifications can be found in the UL Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database).

## How are these systems to be constructed to achieve the desired rating?

Let's focus on two of the above categories to answer this question, since the other categories have similar installation considerations.

**Prepared roof-covering materials** include products such as asphalt or glass-fiber shingles. These materials are intended to be installed on combustible decks (3/4-inch thick wood sheathing boards or 3/4-inch thick plywood unless otherwise indicated in the installation instructions).

If the installation instructions specifies a 1/2-inch thick (minimum) plywood, then 15/32-inch thick plywood or 3/8-inch thick (minimum) nonveneer PS-2 rated sheathing (oriented strandboard panels, structural particleboard panels, composite panels or waferboard panels) are suitable alternatives when a certified underlayment is utilized between the sheathing and the prepared roof covering.

**Roofing systems** consist of a combination of materials intended to be installed on combustible or noncombustible decks in accordance with detailed



instructions included with the packages, and as described in the UL certification.

The details for the manufacturers' system typically include the following information:

- The UL 790 classification (e.g. Class A, B, or C)
- The deck construction supporting the roofing system (combustible or noncombustible)
- Any restrictions on the roof incline
- Required (or optional if so indicated) barrier boards, ply sheets, and surfacing.

The Guide Information for Roofing systems describes specific details for permissible combustible or noncombustible deck constructions.

The roofing system category covers a wide range of roofing systems, including those with metal panels, hot asphalt or coal tar felt, fluid-applied coatings, single-ply membrane, spray-applied foam and coating, and photovoltaic modules among others.

## What documentation should be consulted to determine construction details and ratings?

Many architects and contractors attach the UL certification and product category guide information from the UL Online Certifications Directory [www.ul.com/database](http://www.ul.com/database) to their plan review packages, along with the manufacturer's instructions. It is also helpful to have this information available at the job site for reference by the contractors and code authorities inspecting the installation.