



FM Approvals

FM Global is a group of property/casualty insurers who have joined together to form one of the world's leading industrial insurers. The members of FM Global actively practice and promote the concept of loss prevention.

FM Global is a loss control service organization with headquarters in Norwood, Massachusetts and with district offices strategically located throughout the United States and Canada. The FM Global Research Campus is located in West Glocester, Rhode Island.

The main objective of FM Global is to help policy holders protect their properties from damage by fire, wind, explosion, boiler pressure vessel, machinery accidents and many other insured perils.

One of the ways that FM Global accomplishes its objective is by approval testing and listing of building components. FM Approvals is the business unit of FM Global that evaluates building components for use on facilities insured by the FM Global organization. FM Approvals maintains a Web-based reference tool called RoofNav, which lists all approved roof systems including roof coverings, roof insulations, and roof decks.

FM Approved, roof assemblies must conform to one or more Approval Standards, which include Approval Standards 4450 for *Class 1 Insulated Steel Deck Roofs*, Approval Standard 4470 for *Class 1 Roof Covers*, Approval Standard 4471 for *Class 1 Panel Roof* or Approval Classification Standard No. 4435 for *Roof Flashing*, 4451 for *Steel Roof Decking* or 4454 for *Lightweight Insulating Concrete Roof Deck*.

All roof assemblies listed as FM Approved have been evaluated for performance criteria that includes interior fire exposure, exterior fire exposure, wind uplift resistance, corrosion resistance for roof fasteners, accelerated weathering, hail damage resistance, leakage resistance and foot traffic resistance. All of these performance criteria must be met to be considered for approval as a roof assembly.

In addition to meeting the performance criteria stated in the above Approval Standards, an examination of the manufacturing facilities and an audit of quality control procedures is made to evaluate the manufacturer's ability to produce the product that is examined and tested, and the marking procedures used to identify the product. These examinations are repeated as part of the FM Approved product follow-up Quality Audit Program.

Conventional roof decks such as concrete, cement fiber, steel, and wood possess distinct limitations which must be understood and adequately controlled. When these limitations are not exceeded, the roof deck will be fire safe and rigid while maintaining a strong bond to the insulation or roof covering. FM approved roof decks are placed in one of two categories: Non-combustible or Class I Fire Rated. Additionally, they must meet 1-60 Windstorm requirements as a minimum.

Non-combustible Rating: This rating indicates that the roof deck will not burn or contribute fuel to a fire while preventing the passage of heat through the deck for an extended period of time. Typical decks such as concrete (including lightweight insulating concrete), gypsum, and asbestos cement, having a minimum thickness of 2 inches, are considered non-combustible. These decks can be used with any combination of insulation, vapor retarder, hot asphalt adhesive, and roof covering without the need for fire protection to the deck.

Class I Rating: Applies to those assemblies that burn slowly when subjected to an interior building fire and when their fuel contribution is reduced to acceptable limits by selecting a proper combination of deck materials. Class I decks may be steel, fire retardant treated wood, structural cement fiber, gypsum, or lightweight concrete.

These assemblies with roof coverings conform to Windstorm Resistance Classifications. Siplast Lightweight Insulating Concrete is listed in RoofNav and can be found by searching by the specific product name, assembly description, or by RoofNav assembly number.

FM Global Loss Prevention Data Sheets 1-28 "Design Wind Loads" and 1-29 "Roof Deck Securement and Above Deck Roof Components" discuss wind loading on buildings and roof systems. Wind maps and wind loading charts for use in determination of wind design requirements are part of the information in these data sheets. RoofNav also contains a Web-based calculator that will determine design pressures based on various building parameters.

Recover Roof Construction

Recover roof construction over existing FM Global Approved Roof: Proper precautions must be taken to prepare the surface by removing gravel and repairing blisters or other openings prior to application of new insulation and cover. When the additional insulation or the new roof cover is secured to the existing roof construction with adhesive, the wind uplift rating (Class 1-60, 1-75, 1-90, 1-105, etc.) is determined by the least wind resistant construction (usually the old roof). When the additional insulation or the new roof cover is mechanically attached through the existing roof construction and into the structural deck, the wind uplift rating (Class 1-60, 1-75, 1-90, 1-105, etc.) is determined by the recover application. The addition of a new roof cover with or without additional insulation will not upgrade an existing Class 2 roof assembly to Class 1. The building owner or his agent must confirm that the installer has indeed supplied the thickness of liquid cover required in the listing. The fire rating of the existing steel deck roof is assumed to be Class 2 requiring automatic sprinkler protection under the roof if the original roof assembly is not fire tested and listed by FM Approvals.

**Lightweight Insulating Concrete Roof Decks, Noncombustible and Class 1 Fire Rated
(Class 1-60 Minimum Windstorm Rated)**

Lightweight insulating concrete decks are poured in place as a slurry over corrugated steel-form or structural concrete deck. The corrugated steel-form deck is fastened as indicated in the Approval listing.

Approved lightweight concrete is a mixture of Portland cement and water with various aggregate and/or preformed foam and an air-entraining agent. The lightweight concrete shall be installed by a licensed applicator. Reinforcing mesh or galvanized steel-welded wire mesh is recommended in seismic areas.

Noncombustible Constructions: Require 1.) a minimum 2-inch (51 mm) thickness of lightweight concrete directly above the top of the corrugations of the steel-forming, unless otherwise noted, or 2.) a minimum 1/8-inch (3 mm) thickness of lightweight concrete above a structural concrete deck or a structural concrete deck with existing BUR cover in place, unless otherwise noted.

Insulation boards may be placed in the wet concrete, followed by additional concrete which must be placed before the bottom layer sets up. Unless otherwise noted, a minimum 2-inch (51 mm) thickness of lightweight concrete is required above any rigid insulation board.

Class 1 Fire Rated Constructions: Requires a minimum 1/8-inch (3 mm) thickness of lightweight concrete applied above the top of the corrugations of the steel form deck, unless otherwise noted. Insulation boards may then be placed in the wet concrete, followed by additional concrete which must be placed before the bottom layer sets up. A minimum 2-inch (51 mm) thickness of lightweight concrete is required above any rigid insulation boards, unless otherwise noted.

RoofNav is the only method by which updated FM assemblies may be obtained. When submitting roof constructions for FM Global insured projects the assemblies must have a valid RoofNav assembly number. Contact Siplast Technical Services for specific RoofNav Listings.