

Technical Bulletin

Owens Corning™ Fiberglas™ Building Insulation and Commercial & Industrial Products must comply with required fire code requirements. The following are the main fire tests with a general overview that is needed for model building codes and specification compliance:

ASTM E84 titled: Standard Test Method for Surface Burning Characteristics of Building Materials

- Test Duration – 10-min.
- Sample size – 24-in. by 24-ft. Sample is placed in the ceiling position with the surface to be evaluated facing downwards.
- Test Results – Two output measurements:
 - *Flame Spread Index* - obtained by the maximum distance traveled down the sample surface and the time that the maximum distance occurred.
 - *Smoke Developed Index* - measured by a photo cell looking at total smoke developed through-out the test.
 - Final Results are obtained through calculations based on data obtained from the test.
- ASTM E84 produces the test results commonly referred to in the model building codes and specifications as Class A or Class I ratings of Flame Spread 25.

○ Note: ASTM E84 test method itself does not define or make reference to classifications such as Class A or Class I. All classifications terms are used by and defined by the building codes and specifications.

- In certain applications referenced in the building codes, higher flame spreads are permitted.
- Smoke Developed Index maximum requirements are either 50 Index, or 450 Index depending on product application.
- The commonly used terms *Fire Hazard Classification* (FHC) and *Surface Burning Characteristics* are defined by and are in reference to the results per ASTM E84.
- Also known as UL 723. This designation is used by and only by Underwriters Laboratories for file listing and labeling of products. All other fire test laboratories use ASTM E84.

ASTM E136 titled: Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

- Test conducted under specified laboratory conditions for determining combustion characteristics of building materials.
- When the term “*Non-combustible or Non-combustibility*” is used in reference to products in

the building codes and specification, ASTM E136 is the test method performed to define compliance.

- Note: ASTM E136 test method does not define or use the words “*Non-combustible or Non-combustibility*”. These terms are used by and defined by the building codes and specifications.
- Final result from ASTM E136 is Pass or Fail. There is no numeric value given.
- Test is only for unfaced fiberglass batts and blankets. Does not apply to faced (laminated) or coated materials.

ASTM E970 titled: Standard Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source

- Used for testing loose-fill insulation and unfaced batt insulation.
- The specimen is horizontally mounted in test pans as the top exposed surface of the attic floor. Test specimen/ pan size: 250 mm x 1000 mm x 50 mm thickness (10-in. x 40-in. x 2-in. thickness).
- Test results defined as - “*Critical Radiant Flux*” reported as “*W/cm²*” (Watts per centimeter squared).
- The test method is designed to provide a basis for estimating one aspect of the fire exposure behavior to exposed insulation installed on the floors of building

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attics. The test environment is intended to simulate conditions that have been observed and defined in full-scale attic experiments.

- The test is conducted with an air-gas radiant energy panel applying graded heat onto the top surface of the insulation test specimen. After a 2-min. exposure, a flaming ignition source is applied to the hot end of the test specimen and the maximum distance the flame travels down the 1000 mm (40-in.) length is measured as *critical radiant flux*.
- Test result: All exposed attic insulation must have a *Critical Radiant Flux – Greater than or equal to 0.12 W/cm²*.

ASTM E119 titled: Standard Test Method for Fire Tests of Building Construction and Materials

- ASTM E119 test results are stated as *“Hourly”* performance or exposure and expressed as *“1-hour (or 1-h) rated assembly”*, *“2-hour (or 2-h) rated assembly”*, etc. (*h = hour*).
- The terms *“Fire Resistance, Fire Resistance Assembly, Fire Resistance Rating, and*

Rated Assembly” are used in the building codes and specification in reference to the assembly hourly performance per ASTM E119.

- Additionally, Wall Assemblies are tested to be rated either *“Load Bearing”* or *“Non-Load Bearing”*.
- Listed Assemblies are those that have been tested for performance and documented by design in Fire Resistance Directory’s by fire test laboratories; i.e. UL. These listing describe in detail how the selected assembly must be constructed to obtain the desired performance rating. No variations for the described construction are permitted.
- ASTM E119 is intended to evaluate the duration for which the types of building elements contain in a fire, retain their structural integrity. It is applicable to assemblies of masonry units and to composite assemblies of structural materials for buildings, including bearing and other walls and partitions, columns, girders, beams, slabs, and composite

slab and beam assemblies for floors and roofs. It is also applicable to other assemblies and structural units that constitute permanent integral parts of a finished building.

- The term *“assembly”* means that it contains all components that will be used in the construction of the wall or floor/ceiling; i.e. wood or metal studs; insulation; gypsum wallboard; nails; screws; etc. Typical assembly sizes:
 - Wall – 10-ft. by 10-ft.
 - Floor/Ceiling – 14-ft. by 14-ft.
- ASTM E119 exposes a specimen/assembly to a standard fire controlled time-temperature curve throughout a specified time period.
 - The reference *“time-temperature curve”* means: at a set time during the test, the furnace shall be at this temperature.
 - Example:
 - 5-min = 1000°F;
 - 10-min. = 1300°F;
 - 1-hour = 1700°F

Please contact 419-248-6557 for additional information. Email: gettech@owenscorning.com

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