

# Fire Code Terminology Related to Fire Tests

## Background

Minnesota fire and building codes use terminology that often sounds like the same thing. For instance, terms such as non-combustible, fire resistant, fire retardant, flame retardant, and fireproof sound like they mean pretty much the same thing — but they don't. This information sheet will help explain the differences and also describe the test methods that apply to each term.

## Terms Related to Building Construction

- **Combustible** means that the material will ignite and burn. Examples of combustible materials are wood, paper, plastics, fabrics, etc. Combustible materials are very common in building construction, furnishings, and furniture. It is impossible to make a combustible material non-combustible by applying after-market chemicals or treatments.
- **Non-combustible** means that the material will not ignite, burn or release flammable vapors when exposed to fire or heat. Examples of non-combustible materials include steel, masonry, ceramics and certain insulating materials (such as fiberglass or mineral wool insulation). Gypsum wallboard is considered by the codes to be non-combustible although it does have a thick paper backing that is combustible. Most non-combustible materials have a Class A flame spread rating allowing them to be used for walls and ceilings in a building.
- **Fire resistant** or **fire resistance-rated** refers to the fire ratings of the building's floors, wall, and ceilings. Fire resistant or fire resistance-rated walls are intended to contain a fire inside that compartment and prevent it from spreading for a period of time. Examples would include a two-hour fire resistance-rated wall or a 20-minute fire-rated door.
- **Fire retardant** or **fire retardant-treated** refers to chemicals, coatings, and treatments used to make combustible building materials resistant to charring and decomposition when exposed to fire. Examples include "fire retardant plywood" or "fire retardant-treated lumber." Fire retardant-treated lumber can only be accomplished in a factory setting; there are no after-market products that can give lumber a "fire retardant-treated" listing. The addition of fire retardant materials does not make an item non-combustible.
- **Flame spread rating** (or **flame spread index**) refers to how fire spreads across a material's surface. It is used to provide a Class A, B, or C flame spread rating on materials used on walls or ceilings. Chemicals can be applied that will reduce the flame spread rating of a material.
- **Fireproof** is an old, outdated term intended to denote that something would not burn. Unfortunately, history has shown us that many "fireproof" buildings burned so this term has fallen out of favor. The building construction materials themselves are rarely the items involved in the initial fire ignition. Almost always, it is the building's contents that are the first items ignited and they are almost always combustible, which means they are capable of burning.



# Minnesota Department of Public Safety State Fire Marshal Division

## Terms Related to Decorations, Furnishings and Trim

**Flame resistant, fire retardant, flame retardant or ignition resistant** means to apply chemicals or treatments that make decorations, textiles and films resistant to charring and decomposition. These treatments are commonly used for clothing, curtains, drapes, upholstered furniture and fabrics. For synthetic materials (such as plastics, foams and certain clothing and textile products) the flame resistance is added during the manufacturing process (often using a halogenated element such as Chlorine, Fluorine or Bromine). For natural materials, such as wood, paper, cotton or wool, chemicals can be applied in the field that will increase their resistance to flames and ignition. Caution must be exercised since many fabric materials are now synthetic-based (Nylon, Rayon, Polyester, etc.) and after-market flame resistance products will not work when applied to these materials.

## Tests Related to Construction Materials, Decorations or Furnishings

The fire and building codes specify certain tests for the materials used in building construction, interior finishes, decorations and furnishings. The codes often require that materials be subjected to fire-testing by a third-party testing laboratory and be "listed" (in some cases, as an assembly). The following is a summary of the testing or listing criteria. It is very important to note that these testing and listing criteria are not interchangeable. For example, a flame spread rating should not be used where a fire resistance rating is required by the codes.

For specific criteria about these tests and how they are performed, please refer to other sources of information.

To determine:	Test standard:	Comments:
Fire resistance ratings of walls, doors, floors, and ceilings	ASTM E119	Also known as UL263. Full scale fire test to determine the fire resistance rating of an assembly (in minutes or hours) using standardized time / temperature curve.
Flame spread ratings for ceiling or wall materials (not for foam or plastic materials)	ASTM E-84	Also known as the Steiner Tunnel Test. It measures propagation of flame over the surface of a material.
Fire growth and spread for foam, plastic and synthetic materials	NFPA 286 / NFPA 265	Full scale room fire test. NFPA 286 is used for textile wall or ceiling materials, high-density polypropylene (HDPE), polypropylene (PP), expanded vinyl, foam plastics and site-fabricated stretch systems. NFPA 265 is intended for textile materials (such as office cubicles) or expanded vinyl wall coverings.
Resistance to flame spread across a thin material (intended for a small, match-size ignition source)	NFPA 701	Used for decorative materials. Test for natural or synthetic materials (cloth, film, vegetation) to determine if the material will resist or retard charring and decomposition when exposed to flames.
Fire-stopping (reduce fire/smoke spread through gaps and small openings in fire resistance-rated construction)	ASTM E648	Provides F-rating (flame passage) and T-rating (temperature rise).

