



## Building Construction: Part 3: Fire-Resistive Assemblies

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**Learning Objective:** The student shall be able to explain the term “assembly” as it pertains to fire resistive construction.

When all or parts of a building are required to be fire-resistive or have fire resistance, the model building codes typically require that the fire protection be achieved by some sort of fire-resistant rated “assembly.”\* What is an “assembly?”

An assembly is a combination of materials put together in a specific way that achieves the fire resistance rating required in the building code. For example, today’s illustration shows only part of an assembly: gypsum wallboard applied to a steel stud. In order to achieve a minimum fire resistance rating, both sides of the steel stud would have to be covered with fire-rated gypsum wallboard. Fire-resistance ratings apply only to assemblies in their entirety.

There is a large variety of assemblies that can be constructed to satisfy code requirements. Assemblies may include combustible or noncombustible materials, as demonstrated in those cases where wood framing is protected by layers of fire-rated gypsum wallboard on both sides of the framing. Fire-resistance ratings of various assemblies are assigned after the assembly has been subjected to rigorous live-fire testing under controlled laboratory conditions. (See Coffee Break Training 2007-34 “Fire-Resistance Ratings for Structural Building Elements.”)



The gypsum-wallboard covered steel stud is only part of a fire-resistive rated assembly.

The term *assembly* applies to a variety of building components that may exist in a building: fire door assemblies, fire wall and penetration assemblies, fire window assemblies, floor/ceiling assemblies, roof assemblies, fire-resistant joint system assemblies, horizontal assemblies, and through-penetration firestop system assemblies are just a few. Whenever the word *assembly* appears in the codes, remember that it means a **combination of materials must be put together in a specific way.**

For additional information, refer to NFPA™ 220, *Standard on Types of Building Construction*, International Building Code® Chapter 6, or NFPA 5000™, *Building Construction and Safety Code*®, Chapter 7.

\*In some cases, automatic fire sprinkler systems may be installed to substitute for fire-resistant construction.

