

# Calculating Fire Resistance Ratings Using the Component Additive Method (CAM)

One method for deriving fire resistance ratings while avoiding expensive fire testing of countless assembly variations is the “Component Additive Method.” Also known as CAM, this methodology was developed in the 1960s and has since become familiar and acceptable to many code officials.

## How CAM Works

Review of existing fire testing reports resulted in CAM’s “10 Rules” methodology, which combines the resistance ratings of individual components to obtain the fire resistance rating of the assembly.

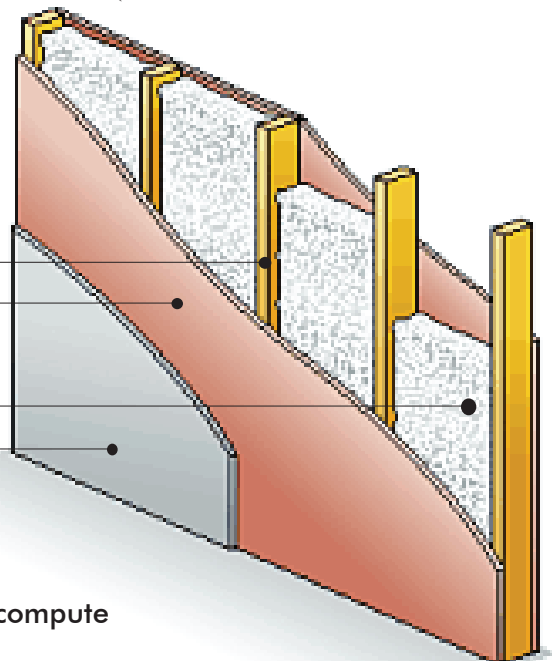
## Substitution of Values for Untreated Wood

Though values commonly cited for wood components in listed assemblies are typically for untreated wood, it is not normally acceptable to use untreated wood in buildings that require noncombustible construction. Therefore, in many instances, Dricon® FRT wood can be substituted to meet the requirements specified by the CAM, or in specific assemblies described in popular industry sources, such as the Gypsum Association’s Fire Resistance Design Manual and the U.S. Department of Agriculture’s Wood Handbook.

## Using CAM to Compute an Hourly Rating

The following illustrates how the CAM method is used to calculate an hourly rating in an assembly using: 5/8” Dricon FRT plywood, 2x4 studs 16” on center, and rockwool or slag mineral wool batts. (Note: Listed values for untreated wood are applied to Dricon FRT wood in this example.) This example, and use of CAM calculations in general, depends on acceptance by code officials with applicable authority. Check with appropriate agency before beginning construction.

Component	Time/Min.
Dricon® studs 16” on center	20
5/8” Dricon® plywood — interior	15
Rockwool or slag mineral wool batts weighing not less than 1/4 lb./sq. ft. of wall surface	15
1/2” gypsum board	15
<b>Assembly Total</b>	<b>1 hr. 5 min.</b>



By adding the values shown in the Tables below, you can compute the fire resistance rating of an assembly.

### Time Assigned to Protective Membranes

Description of Finish	Time/Min.
3/8” Douglas Fir plywood, phenolic bonded	5
1/2” Douglas Fir plywood, phenolic bonded	10
5/8” Douglas Fir plywood, phenolic bonded	15
3/8” gypsum board	10
1/2” gypsum board	15
5/8” gypsum board	20
1/2” Type X gypsum board	25
5/8” Type X gypsum board	40
Double 3/8” gypsum board	25
1/2” + 3/8” gypsum board	35
Double 1/2” gypsum board	40

### Time Assigned to Wood Frame Components

Description of Frames	Time/Min.
Wood studs, 16” on center	20
Wood joists, 16” on center	10
Wood roof and floor truss assemblies, 24” on center	5

### Time Assigned for Additional Protection

Description of Additional Protection	Time/Min.
Wood stud walls: Rockwool or slag mineral wool batts weighing not less than 1/4 lb./sq. ft. of wall surface	15
Non load bearing wood stud walls: Glass fiber batts weighing not less than 1/4 lb./sq. ft. of wall surface	5