

# 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.

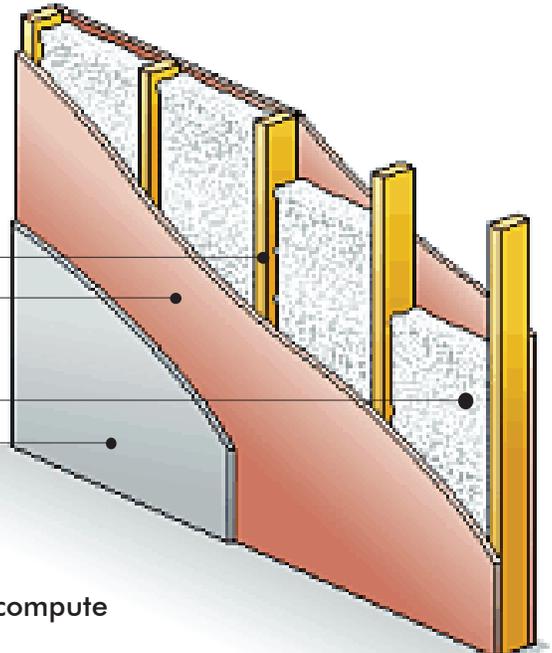
## Substitution of Values for Untreated Wood

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         |