



**ADVANCED  
FIBER TECHNOLOGY**

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# Fire Walls

To facilitate the fire wall design process, numerous associations publish wall design configurations meeting various fire criteria. Examples of these publications are GA-600-2003 Fire Resistance Design Manual published by the Gypsum Association, Fire Resistance 2003 by Underwriters Laboratories Inc. and others. By containing common wall configurations, this saves the architect and/or engineer time in selecting the wall assembly to meet the needs compared to the calculation time under provisions of the IBC. This does not mean that alternative approaches to evaluating and selecting materials for fire wall construction cannot be considered.

The following is contained in the 2003 INTERNATIONAL BUILDING CODE (IBC) and 2004 SUPPLEMENTS pertaining to fire resistance in wood framing 16 inch O.C.

## **SECTION 703: FIRE RESISTANCE RATINGS AND FIRE TESTS**

### **703.3 Alternative method for determining fire resistance**

The application of any of the alternative methods listed in this section shall be based upon fire exposure and acceptance criteria specified in ASTM E119. The required fire resistance of a building element shall be permitted to be established by any of the following methods or procedures;

1. Fire-resistance designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated building elements as prescribed in Section 720.
3. Calculations in accordance with Section 721.

Advanced Fiber Technology uses "Section 721.6 Wood Assemblies" to calculate the fire resistance when using our cellulose insulation in 1-hour rated assemblies. The criteria for calculating the fire resistance is:

#### **721.6.2.1 Fire-resistance rating of wood frame assemblies**

The fire-resistance rating of a wood frame assembly is equal to the sum of the time assigned to the membrane on the fire-exposed side, the time assigned to the framing members and the time assigned for additive contribution by other protective measures such as insulation. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly.

#### **721.6.2.2 Time assigned to membranes**

Table 721.6.2(1) indicates the time assigned to membranes on the fire-exposed side.

The following are select building materials from Table 721.6.2(1) and apply only to framing members 16" O.C. If you want a copy of the complete table, please contact us. Specific installation instructions for the wallboard are contained in the IBC.

**Table 721.6.2(1): TIME ASSIGNED TO WALLBOARD MEMBRANES**

<u>Description of Finish</u>	<u>Time (Minutes)</u>
½-inch gypsum wallboard	15
5/8-inch gypsum wallboard	30
½-inch Type X gypsum wallboard	25
5/8-inch Type X gypsum wallboard	40
Double ½-inch gypsum wallboard	40

**Table 721.6.2(2): TIME ASSIGNED FOR CONTRIBUTION FOR WOOD FRAME**

<u>Description of Finish</u>	<u>Time (Minutes)</u>
Wood studs 16 inches O.C.	20
Wood floor & roof joists 16 inches O.C.	10

- a) This table does not apply to studs or joists spaced more than 16 inches o.c.
- b) All studs shall be nominal 2x4 and all joists shall have a nominal thickness of at least 2 inches.
- c) Allowable spans for joists shall be determined in accordance with Sections 2308.8, 2308.10.2, and 2308.10.3.



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**Table 721.6.2(5) TIME ASSIGNED FOR ADDITIONAL PROTECTION**

<u>Description of Finish</u>	<u>Time (Minutes)</u>
Add to the fire resistance rating of wood studs if the spaces between the studs are completely filled with glass fiber mineral wool batts weighing not less than 2 pounds per cubic foot (0.6 pound per square foot of wall surface) or rockwool or slag material wool batts weighing not less than 3.3 pounds per cubic foot (1 pound per square foot of wall space), or cellulose insulation having a nominal density of not less than 2.6 pounds per cubic foot.	15

As an example using the IBC calculation method and IBC time assigned values contained in Table 721.6.2(1), Table 721.6.2(2), and Table 721.6.2(5), one could calculate the fire resistance for the following wall configuration.

**Example 1:**

a) 1/2-inch Type X gypsum wallboard	25 minutes - Table 721.6.2(1)
b) Wood Studs 16 inches O.C.	20 minutes - Table 721.6.2(2)
Subtotal	45 minutes
c.) Additional Protection - 2.6 pcf or greater installed cellulose insulation	15 minutes - Table 721.6.2(5)
Total Fire Resistance	60 minutes

\* From GA-600-2003 Fire Resistance Design Manual

**Summary:**

The International Building Code recognizes the fire resistance superiority of cellulose insulation compared to standard light density fiberglass batts or foam insulation. An additional 15 minutes of protection is provided by cellulose insulation while 0 minutes are permitted for light density fiberglass batts and foam insulation.