

## Fire Retardant Wood and the 2018 International Building Code

The International Building Code (IBC) defines the specifications for manufacturing and using fire-retardant-treated wood in construction. The code outlines the qualifications for fire retardant treatment, the testing required to confirm the protection, required strength adjustments and required fasteners for use.

The following excerpts are references for fire-retardant-treated wood taken from the 2018 International Building Code:

### Chapter 23 - Wood (from the 2018 International Building Code - IBC)

#### Section 2303 Standards of Quality

##### Section 2303.2 Fire-retardant-treated wood

Fire-retardant-treated wood is any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84 or UL 723, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. Additionally, the flame front shall not progress more than 10 1/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.

##### 2303.2.1 Pressure process

For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) (345 kPa).

##### 2303.2.2 Other means during manufacture

For wood products produced by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product. The use of paints, coating, stains or other surface treatments is not an approved method of protection as required in this section.

##### 2303.2.3 Testing

For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section 2303.2. Wood structural panels shall be permitted to test only the front and back faces.

##### 2303.2.4 Labeling

Fire-retardant-treated lumber and wood structural panels shall be labeled. The label shall contain the following items:

1. The identification mark of an approved agency in accordance with Section 1703.5.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.

5. Flame spread and smoke-developed index.
6. Method of drying after treatment.
7. Conformance with appropriate standards in accordance with Sections 2303.2.5 through 2303.2.8.
8. For fire-retardant-treated wood exposed to weather, damp or wet locations, include the words "No increase in the listed classification when subjected to the Standard Rain Test" (ASTM D2898).

##### 2303.2.5 Strength adjustments

Design values for untreated lumber and wood structural panels, as specified in Section 2303.1, shall be adjusted for fire-retardant treated wood. Adjustments to design values shall be based on an approved method of investigation that takes into consideration the effects of the anticipated temperature and humidity to which the fire-retardant-treated wood will be subjected, the type of treatment and redrying procedures.

##### 2303.2.5.1 Wood structural panels

The effect of treatment and the method of redrying after treatment, and exposure to high temperatures and high humidities on the flexure properties of fire-retardant-treated softwood plywood shall be determined in accordance with ASTM D5516. The test data developed by ASTM D5516 shall be used to develop adjustment factors, maximum loads and spans, or both, for untreated plywood design values in accordance with ASTM D6305. Each manufacturer shall publish the allowable maximum loads and spans for service as floor and roof sheathing for its treatment.

##### 2303.2.5.2 Lumber

For each species of wood that is treated, the effects of treatment, the method of redrying after treatment and exposure to high temperatures and high humidities on the allowable design properties of fire-retardant-treated lumber shall be determined in accordance with ASTM D5664. The test data developed by ASTM D5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with ASTM D6841. Each manufacturer shall publish the modification factors for service at temperatures of not less than 80°F (27°C) and for roof framing. The roof framing modification factors shall take into consideration the climatological location.

*(cont. on page 2)*

### 2303.2.6 Exposure to weather, damp or wet locations

Where fire-retardant-treated wood is exposed to weather, or damp or wet locations, it shall be identified as “Exterior” to indicate there is no increase in the listed flame spread index as defined in Section 2303.2 when subjected to ASTM D2898.

### 2303.2.7 Interior applications

Interior fire-retardant treated wood shall have moisture content of not over 28 percent when tested in accordance with ASTM D3201 procedures at 92-percent relative humidity. Interior fire retardant-treated wood shall be tested in accordance with Section 2303.2.5.1 or 2303.2.5.2. Interior fire-retardant treated wood designated as Type A shall be tested in accordance with the provisions of this section.

### 2303.2.8 Moisture content

Fire-retardant-treated wood shall be dried to a moisture content of 19 percent or less for lumber and 15 percent or less for wood structural panels before use. For wood kiln-dried after treatment (KDAT), the kiln temperatures shall not exceed those used in kiln drying the lumber and plywood submitted for the tests described in Section 2303.2.5.1 for plywood and 2303.2.5.2 for lumber.

### 2303.2.9 Type I and II construction applications

See Section 603.1 for limitations on the use of fire-retardant-treated wood in buildings of Type I or II construction.

## Section 2304 General Construction Requirements

### 2304.10.5 Connections and fasteners in contact with preservative-treated and fire-retardant-treated wood

Fasteners, including nuts and washers, and connectors in contact with preservative-treated and fire-retardant-treated wood shall be in accordance with Sections 2304.10.5.1 through 2304.10.5.4. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A153. Stainless steel driven fasteners shall be in accordance with the material requirements of ASTM F1667.

#### 2304.10.5.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations

Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Staples shall be of stainless steel. Fasteners other than nails, staples, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B695, Class 55 minimum.

#### 2304.10.5.4 Fasteners for fire-retardant-treated wood used in interior applications

Fasteners, including nuts and washers, for fire-retardant-treated wood used in interior locations shall be in accordance with the manufacturer’s recommendations. In the absence of manufacturer’s recommendations, Section 2304.10.5.3 shall apply.

## Code Compliant Fire Retardant Wood Stamps

### Interior Fire Retardants



- |                         |   |
|-------------------------|---|
| 1 FR product name/logo  | 5 Approved inspection agency name or logo   |
| 2 Treating manufacturer | 6 Flame spread/smoke developed index rating |
| 3 Wood species          | 7 Referenced standard                       |
| 4 Drying method         |   |

### Exterior Fire Retardants



- |   |   |
|---|---|
| 1 FR product name/logo                    | 6 Flame spread/smoke developed index rating |
| 2 Treating manufacturer                   | 7 Referenced standard                       |
| 3 Wood species                            | 8 Referenced rain test                      |
| 4 Drying method                           |   |
| 5 Approved inspection agency name or logo |   |