



THE STANDARD FOR FIRE RETARDANT TREATED WOOD

Performance Formulation Solutions, LLC

Innovators of high performance fire retardant products





FlameTech™ Fire Retardant

You demand quality. You demand reliability. You demand a product that has the same relentless standards as you do. And that's why you choose FlameTech™ fire retardant from Performance Formulation Solutions.

With Flametech™, you get superior fire-retardant wood, building pros and specifiers can rely on. It meets the highest available standard carrying UL's FR-S designation and is fully code compliant.

Flametech™ fire-retardant chemical pressure treated wood products are backed by a 50-Year Limited Warranty against structural failure.

FIRE PERFORMANCE

FlameTech™ fire-retardant was developed by Performance Formulation Solutions and tested at Underwriters Laboratories ("UL"). UL engineers and fire-safety professionals determined the process parameters and quality standards necessary to receive their highest category designation of "FR-S," signifying minimal flame-spread and smoke development. When used in critical structures - like yours - FlameTech™ FR provides a system that will reduce fuel contribution and heat release to slow the spread of flames while also minimizing potentially deadly smoke development.

Class A Rated Fire Retardant Treated Wood Products

Certified and Listed with Accredited Testing Agencies

FlameTech™ fire retardant lumber and plywood products have been tested, certified and listed with ICC ESR-4056 QAI Laboratories (Listing B-1093-1), InterTek Laboratories (Listing 720035), InterTek CCRR 1088 and Underwriters Laboratories (Listing BUGV.r39579 & BPVV.r39580), all of which are prominent, internationally accredited testing agencies.

Ongoing Independent Third Party Inspections

Timber Product Inspection (TPI) provides ongoing random follow-up inspections to assure compliance with AWPA standards for fire retardant treatment and the required quality control metrics for fire retardant chemical, physical treating parameters and kiln drying. This monitoring program is in addition to the QAI, UL and Intertek follow-up requirements for listing.

Building Code Compliant

All FlameTech™ fire retardant lumber and plywood meets the requirements for FRTW listed in ICC AC66 and as such are compliant with major building codes. FlameTech™ treated wood products are compliant with 2018, 2015, 2012, 2009 and 2021 International Building Code® (IBC and IRC).

Always check with applicable building codes to determine what specific criteria are required for any given locality or job.

American Wood Protection Association (AWPA) Compliance

FlameTech™ Fire Retardant wood products comply with AWPA UC-1 and UCFA use category system. FlameTech™ treatment process meets the AWPA T1 standard and FlameTech™ chemical has been analyzed by Timber Products Inspection (TPI) to determine that the chemical components meet AWPA P-50 protocol.

STRUCTURAL DURABILITY

The structural durability of FlameTech™ FR treated lumber and plywood has been verified by certified engineers according to the latest and most stringent versions of ASTM strength durability standards.

FlameTech™ FR treated lumber and plywood have been tested by independent accredited laboratories, following industry standards ASTM D5516, to develop strength design factors for various use conditions.



Strength Testing

FlameTech™ Fire Retardant lumber products have been tested for strength using the ASTM D-5664 standard. FlameTech™ Fire Retardant plywood products have been tested for strength using ASTM D-5516 standard. These test results provided by Timber Products Inspection (TPI). The results of these tests have been reviewed by ICC ES, QAI Laboratories and Intertek Laboratories. The resulting strength reduction factors were determined by ASTM D-6841 for the lumber and ASTM D-6305 for the plywood.

Maximum Loads and Spans for FlameTech™ Fire Retardant Treated Plywood at Surface Temperatures up to 170°F (77°C) ^{1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12}

Panel/ Sheathing Thickness	Span Rating for Untreated Roof/Sub Floor Sheathing	FlameTech™ Roof Sheathing				FlameTech™ Wall or Sub Floor
		Maximum Span (Inches)	Total Allowable Loads (psf)			Span (Inches)
			Climate Zone			
			1A	1B	2	
15/32, 1/2	32/16	24	29	42	60	16
19/32, 5/8	40/20	24	49	72	103	20
		32	28	41	58	20
23/32, 3/4	48/24	32	40	59	84	24
		48	18	26	37	24

SI Unit Conversions: 1 in = 25.4 mm 1 psf = 48 N/m²

¹All loads are based on two-span condition with strength axis perpendicular to supports.

²Panel edge supports shall be required for roof sheathing. Panel edge clips when used shall be installed as follows: One midway between supports for 24-inch and 32-inch spans, two at 1/3-points between supports for 48-inch spans. Clips must be manufactured for the plywood thickness.

³Fastener size and spacing shall be as required in accordance with the IBC or IRC for untreated plywood of the same thickness.

⁴For low-sloped or flat roofs with membrane or built-up roof have a perm rating less than 0.2; use rigid insulation having a minimum R-Value of 4.0 between the sheathing and the roofing or use the next thicker panel than the tabulated for the span and load (example; 19/32 for 24; 23/32 for 32); and use a continuous ceiling air barrier and vapor retarder with a perm rating of less than 0.2 on the bottom of the roof framing above the ceiling.

⁵FlameTech™ fire-retardant-treated plywood must not be used as roof sheathing if a radiant shield is used beneath the roof sheathing.

⁶The total allowable load is the sum of the live load and dead loads at maximum span. For allowable live loads, subtract dead (assumed to be 8 psf) from the total loads listed.

⁷The 15/32 and 1/2-inch plywood is limited to 4-ply. 19/32 and 5/8-inch plywood is limited to performance rated 4-ply and 5-ply. 23/32 and 3/4-inch plywood is limited to performance rated 5-ply and 7-ply.

⁸Uniform load deflection limitations 1/180 of span under live load plus dead load and 1/240 under live load only.

⁹Subfloor is limited to 100 psf Maximum load.

¹¹Climate Zone definitions:

Zone 1 - Minimum design roof live load or maximum ground snow load ≤ 20 psf (960 Pa)

Zone 1A - Southwest Arizona, Southeast Nevada (Area bounded by Las Vegas-Yuma-Phoenix-Tucson)

Zone 1B - All other qualifying areas of the United States

Zone 2 - Maximum ground snow load > 20 psf (960 Pa)

¹²For other load conditions, contact manufacturer

Strength Design Factors for FlameTech™ Fire Retardant Treated Lumber Compared to Untreated Lumber Applicable at Surface Temperatures up to 100°F (33°C)

Strength Design Factors	Species		
	Southern Pine	Douglas Fir	Spruce-Pine-Fir
Bending MOR, [F _b]	0.92	1.00	0.96
Bending MOE, [E]	1.00	0.99	0.93
Tension Parallel to Grain, [F _t]	0.98	1.00	0.99
Shear Parallel to Grain, [F _v]	0.95	1.00	1.00
Compression Parallel to Grain, [F _c]	0.96	0.96	0.99
Compression Perpendicular to Grain, [F _c ⊥]	0.95	0.95	0.95
Fasteners/Connectors	0.90	0.90	0.90

Strength Design Factors for FlameTech™ Fire Retardant Treated Lumber Compared to Untreated Lumber Applicable at Surface Temperatures up to 150°F (66°C)^{1,2}

Strength Design Factors	Species								
	Southern Pine			Douglas Fir			Spruce-Pine-Fir		
	Climate Zone			Climate Zone			Climate Zone		
	1A	1B	2	1A	1B	2	1A	1B	2
Bending MOR, [F _b]	0.90	0.92	0.92	1.00	1.00	1.00	0.91	0.93	0.95
Bending MOE, [E]	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96
Tension Parallel to Grain, [F _t]	0.89	0.93	0.98	1.00	1.00	1.00	0.95	0.97	0.99
Shear Parallel to Grain, [F _v]	0.89	0.93	0.98	1.00	1.00	1.00	0.95	0.97	0.99
Compression Parallel to Grain, [F _c]	0.87	0.91	0.96	0.98	0.98	0.98	0.92	0.94	0.96
Fasteners/Connectors	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

¹Climate Zone definitions:

Zone 1 - Minimum design roof live load or maximum ground snow load ≤ 20 psf (960 Pa)

Zone 1A - Southwest Arizona, Southeast Nevada (Area bounded by Las Vegas-Yuma-Phoenix-Tucson)

Zone 1B - All other qualifying areas of the United States

Zone 2 - Maximum ground snow load > 20 psf (960 Pa)

²Duration of load adjustments for snow load, 7-day (construction) loads, and wind loads as given in the *National Design Specification for Wood Construction*® (NDS) also apply.

Applications

FlameTech fire-retardant treated wood is typically permitted for interior, above ground applications such as: roof systems, studs, flooring, joists, sill plates (when not in direct contact with the ground), blocking and furring, and other interior applications. The specifier and/or end user is responsible to review the test data on FlameTech FR brand fire-retardant treated wood to determine if it is acceptable for the intended end use.

Typical Applications Include

Partition Walls	1 & 2 Hour Wall Assemblies
Beams & Purlins	Roof Trusses
Blocking & Furring	Rafters
Platforms	Plywood Roof Sheathing
Stages	Floor & Roof Joists
Wall Sheathing & Paneling	Mezzanines
Millwork & Trim	Sill Plates
Backing for Electrical Panels	Steps

Testing and Approvals

ASTM International (ASTM):

- ASTM D3201** – Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Base Products
- ASTM D5516** – Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures
- ASTM D5664** – Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber
- ASTM D6305** – Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire Retardant Treated Plywood Roof Sheathing
- ASTM D6841** – Standard Practice for Calculating Treatment Adjustment Factors for Fire Retardant Treated Lumber
- ASTM E84** – Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM 2768** – Extended Duration Surface Burning Characteristics of Building Materials
- ASTM E119** – Fire Tests of Building Construction and Materials

American Wood-Protection Association (AWPA):

- AWPA E12** – Standard Method of Determining the Corrosion of Metal in contact with wood
- AWPA P50** – Standard for Fire Retardant FR-2 (FR-2)
- AWPA T1** – Use Category System: Processing and Treatment Standard
- AWPA U1** – Use Category System: User Specifications for Treated Wood

Certification Agencies

- Intertek** – **ASTM E84/ASTM E2768** – Intertek SpecDirect ID – 37150
- Intertek** – **ASTM E119** – FRCT/FRWT 120-1, FRCT/FRWT 120-2, FRCT/FRCT/FRWT 60-1, FRWT 60-2, FRCT/FRWT 60-3, and FRCT/FRWT 60-4
- QAI** – **ASTM E84/ASTM E2768** – B1093-1
- UL** – **723** – Lumber BUGV.r39579 and Plywood BPVV.r39580

Code Compliance Research Reports

- CCRR-1088** (Intertek) – FlameTech™ Fire Retardant Treated Wood
- LARR 26119** (Los Angeles Research Report) – FlameTech™ Fire-Retardant - Treated Wood
- ICC ESR** – 4056

Use and Handling

FlameTech™ treated FRTW products have the same workability as untreated lumber products, requiring only the same tools and precautions used with regular wood products.

Keep the following guide lines in mind when using and handling FlameTech™ FRTW products.

- FlameTech™ wood should not be installed where it will be exposed to precipitation, direct moisture, or regular condensation.
- FlameTech™ wood must never be installed or used in contact with the ground.
- When Storing FlameTech™ products, the material must be kept off the ground and covered to protect it from moisture and precipitation.
- The use of galvanized fasteners is required with FlameTech™ treated wood products.
- When painting or staining follow the paint or stain manufacture's recommendations. Make sure the surface is clean and dry before application.
- When using FlameTech™ FRTW products it is important to utilize the design vane adjustments listed in the guide.

Cutting to length, drilling and diagonal cuts, as well as light sanding are allowed. Exposed areas are not required to be field coated. Ripping dimensional lumber is not allowed.

- Cutting of Lumber to length (cross-cutting and end cuts) are allowed. Holes and joints are also allowed.
- Ripping of lumber along the length, such as ripping a 2x4 in to a 2x2 is not allowed. The cutting of a stair stringer is not allowed to be done after the lumber is treated as the effect is similar to ripping.
- Milling of the lumber is not allowed. All milling and planing must be done before treatment.
- Cutting of plywood is allowed in any direction without restriction.
- Light sanding of lumber and plywood is allowed to remove raised grain or to prepare for finishing,
- Shaping or resurfacing must be done before treatment.
- End Coating of any approved cut is not required.

Personal Health and Safety

- Wear gloves to protect against splinters
- Wear a dust mask to reduce the inhalation of wood dust
- Wear appropriate eye protection
- Wash hands with mild soap and water after working with FlameTech™ FRTW

Warranty: FlameTech™ Fire Retardant plywood and lumber are covered by a limited 50 Year Warranty made available upon request.

1 hr Exterior Load Bearing Wall

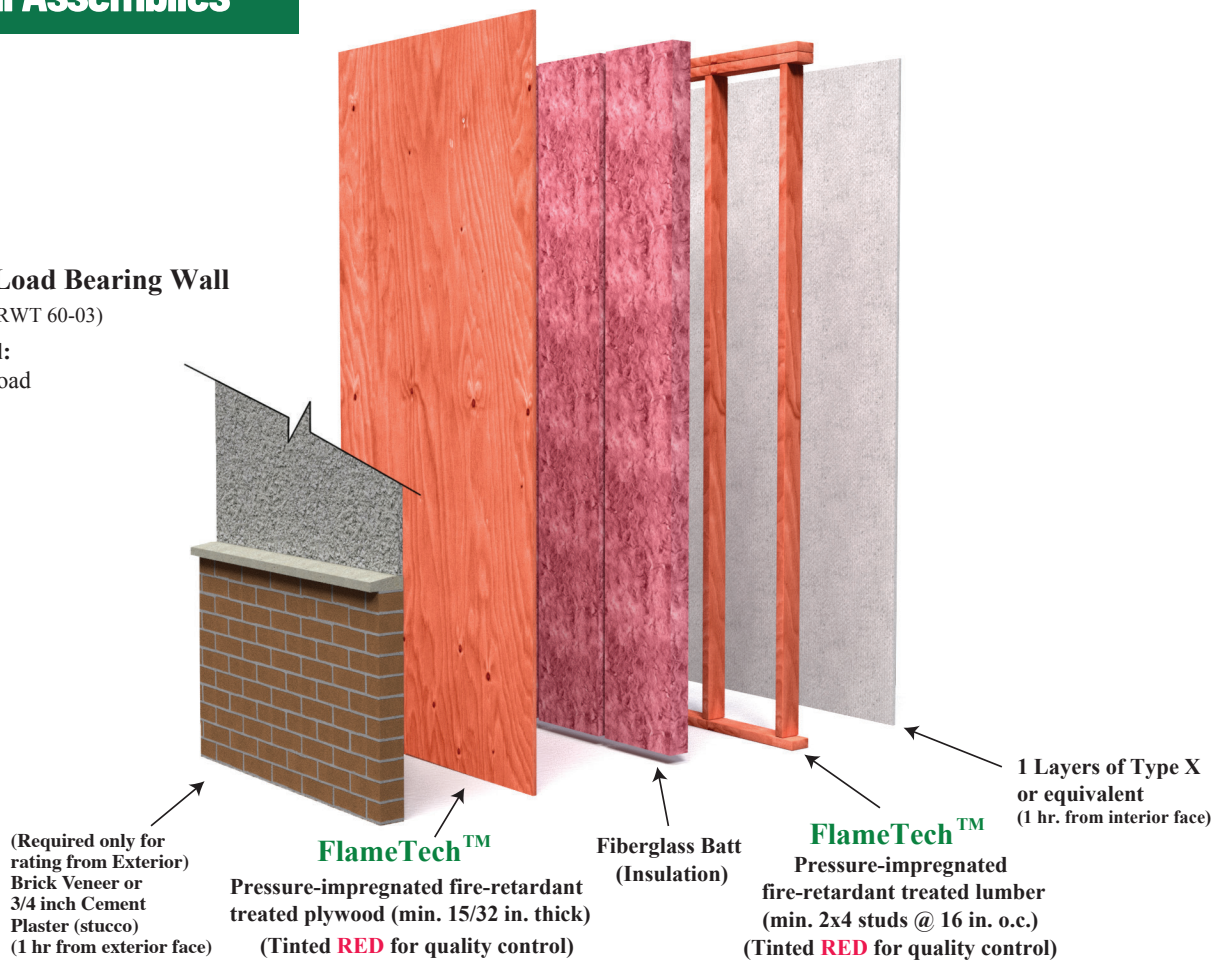
(Design No. FRCT/FRWT 60-03)

Max. Tested Load:

100% of Design Load

Fire Ratings:

- 1 hr from interior
- 1 hr from exterior



1 hr Exterior Load Bearing Wall

(Design No. FRCT/FRWT 60-04)

Max. Tested Load:

100% of Design Load

Fire Ratings:

- 1 hr from interior



2 hr Exterior Load Bearing Wall

(Design No. FRCT/FRWT 120-01)

Max. Tested Load:
100% of Design Load

Fire Ratings:
•2 hr from interior



FlameTech™
Pressure-impregnated fire-retardant treated plywood (min. 15/32 in. thick)
(Tinted **RED** for quality control)

Fiberglass Batt (Insulation)

FlameTech™
Pressure-impregnated fire-retardant treated lumber (min. 2x4 studs @ 16 in. o.c.)
(Tinted **RED** for quality control)

2 Layers of Firecode® Type C, or equivalent (2 hr. from interior face)

2 hr Exterior Load Bearing Wall

(Design No. FRCT/FRWT 120-02)

Max. Tested Load:
100% of Design Load

Fire Ratings:
•2 hr from interior
•1 hr from exterior



(Required only for rating from Exterior)
Brick Veneer or 3/4 inch Cement Plaster (stucco)

FlameTech™
Pressure-impregnated fire-retardant treated plywood (min. 15/32 in. thick)
(Tinted **RED** for quality control)

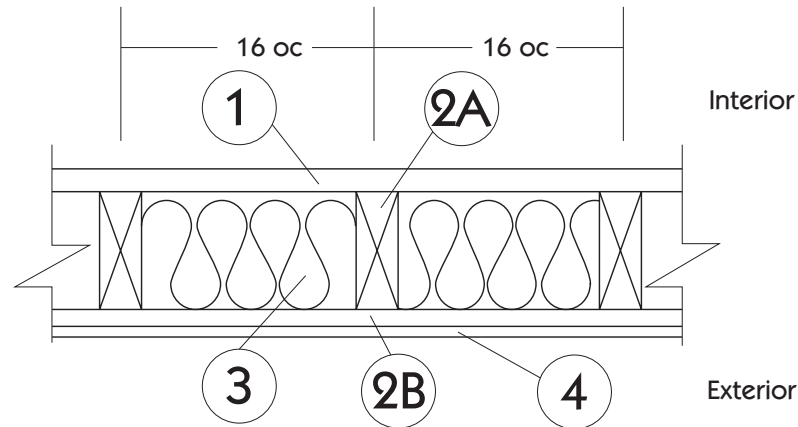
Fiberglass Batt (Insulation)

FlameTech™
Pressure-impregnated fire-retardant treated lumber (min. 2x4 studs @ 16 in. o.c.)
(Tinted **RED** for quality control)

2 Layers of Firecode® Type C, or equivalent (2 hr. from interior face)

Performance Formulation Solutions, LLC
 Design No. FRCT/FRWT 60-03
 Fire Retardant Wood
 FlameTech™ Lumber and Plywood
 ASTM E119

Rating: 1 Hour Load Bearing (Interior Only, 2015 NDS - F_c 0.96 for FRWT)



1. GYPSUM BOARD (Interior): One layer Type X, complying with ASTM C1396 min. 5/8 in. thick, 4 ft. wide applied vertically, fastened to framing. Joints covered with paper tape and joint compound. Fasteners covered with joint compound. Min. #6 x1-5/8 in. long Type S or W screws, spaced max. 6 in. on center (oc).

2. CERTIFIED MANUFACTURER: Fire Retardant Performance Formulation Solutions, LLC

CERTIFIED PRODUCT: FlameTech™

2A. CERTIFIED MODEL: FlameTech™ Lumber

FlameTech Lumber is min. 2x4 in. nominal wood studs, spaced max. 16 in. oc, or 2x6 in. nominal wood studs spaced 24 in. oc, double top plates and single bottom plate fastened together with 16d common nails (3-1/2 in. x 0.162 in.), 16d box nails (3-1/2 in. x 0.135 in.), or 12d ring nails (3-1/4 in. x 0.135 in.).

2B. CERTIFIED MODEL (Exterior): FlameTech Plywood,

FlameTech Plywood, min. 15/32 in. thick, is applied vertically over the specified framing with min. 2-3/8 in. long, 0.113 in. diameter nails, spaced max 8 in. oc around the perimeter and max. 12 in. oc in the field. Horizontal joints must be blocked.

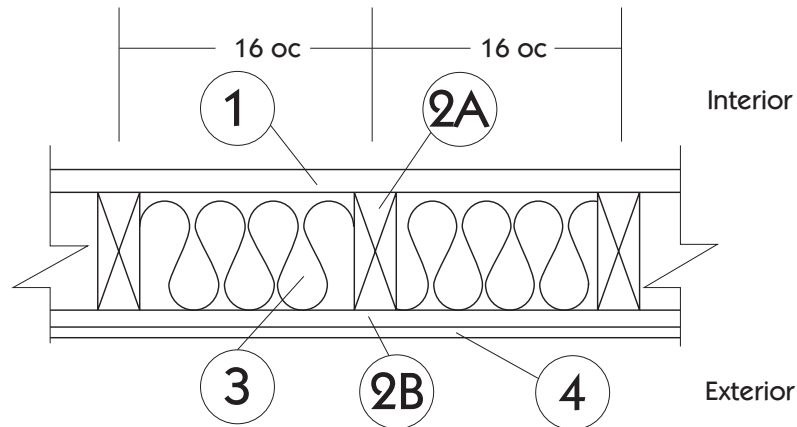
3. INSULATION: Fiberglass batt insulation min. 3-1/2 in. thick R-13 friction fit between the studs. If 2x6 in. nominal wood studs are used, fiberglass batt insulation shall be minimum 5-1/2 in. thick.

4. EXTERIOR FACINGS: Materials installed in accordance with manufacturer's installation instructions:

- 3/4 in. thick cement plaster (1:4 ratio of cement to sand for scratch coat and 1:5 ratio for brown coat)
- Nominal 2.7 in. thick solid brick fastened using min. 22 GA wall ties
- Nominal 2.3 in. thick hollow brick fastened using min. 22 GA wall tiles

Performance Formulation Solutions, LLC
Design No. FRCT/FRWT 60-04
Fire Retardant Wood
FlameTech™ Lumber and Plywood
ASTM E119

Rating: 1 Hour Load Bearing (Rated from Interior and Exterior, 2015 NDS - F_c 0.96 for FRWT)



- 1. GYPSUM BOARD (Interior):** One layer Type X, complying with ASTM C1396, min. 5/8 in. thick, 4 ft. wide applied vertically, fastened to framing. Joints covered with paper tape and joint compound. Fasteners covered with paper tape and joint compound. Min. #6 x1-5/8 in. long Type S or W screws, spaced max. 6 in. on center (oc).

- 2. CERTIFIED MANUFACTURER:** Fire Retardant Performance Forulation Solutions, LLC

CERTIFIED PRODUCT: FlameTech™

2A. CERTIFIED MODEL: FlameTech™ Lumber

FlameTech Lumber is min. 2x4 in. nominal wood studs, spaced max. 16 in. oc, or 2x6 in. nominal wood studs spaced 24 in. oc, double top plates and single bottom plate fastened together with 16d common nails (3-1/2 in. x 0.162 in.), 16d box nails (3-1/2 in. x 0.135 in.), or 12d ring nails (3-1/4 in. x 0.135 in.).

- 2B. CERTIFIED MODEL (Exterior):** FlameTech Plywood,

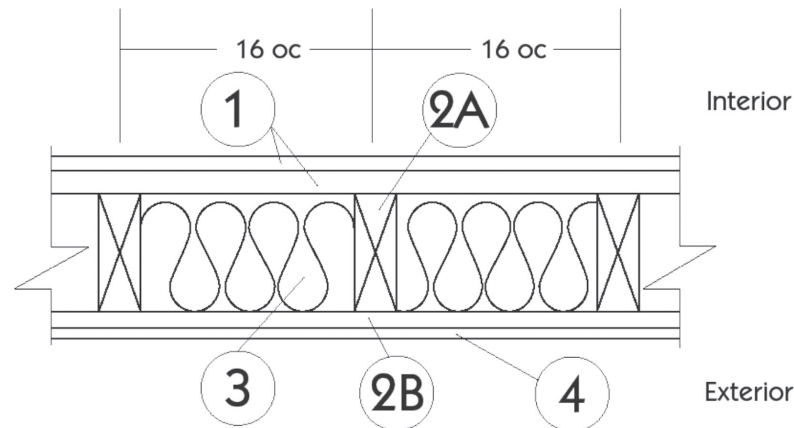
FlameTech Plywood, min. 15/32 in. thick, is applied vertically over the specified framing with min. 2-3/8 in. long, 0.113 in. diameter nails, spaced max 8 in. oc around the perimeter and max. 12 in. oc in the field. Horizontal joints must be blocked.

- 3. INSULATION:** Fiberglass batt insulation min. 3-1/2 in. thick R-13 friction fit between the studs. If 2x6 in. nominal wood studs are used, fiberglass batt insulation shall be minimum 5-1/2 in. thick.

- 4. EXTERIOR FACINGS (Optional):** Materials installed in accordance with manufacturer's installation instructions:

- Masonry brick veneer or concrete
- Portland cement or synthetic stucco systems with self-furring metal lath or adhesive base coat
- Hardwood, wood structural panel, plywood or fiber-cement siding
- Metal siding
- Vinyl siding – exterior plastic

Performance Formulation Solutions, LLC
 Design No. FRCT/FRWT 120-01
 Fire Retardant Wood
 FlameTech™ Lumber and Plywood
 ASTM E119
 Rating: 2 Hour, Load Bearing (2015 NDS - F_c 0.96 for FRWT)
 Rated from one side (Interior Side Only)



1. GYPSUM BOARD (Interior):

Two layers USG Firecode® C Core complying with ASTM C1396, or equivalent, min. 5/8 in. thick, 4 ft. wide applied vertically, fastened to framing. Face layer joints staggered with base layer and covered with paper tape and joint compound.

FASTENERS: (Not Shown):

- A. FACE LAYER – Min. #6 x 2 in. long Type S or W screws spaced max. 8 in. oc and heads covered with joint compound.
- B. BASE LAYER – Min. #6 x 1-5/8 in. long Type S or W screws, spaced max. 6 in. oc.

2. CERTIFIED MANUFACTURER: Fire Retardant Performance Formulation Solutions, LLC

CERTIFIED PRODUCT: FlameTech™

2A. CERTIFIED MODEL: FlameTech™ Lumber

FlameTech Lumber is min. 2x4 in. nominal wood studs, spaced max. 16 in. oc, or 2x6 in. nominal wood studs spaced 24 in. oc, double top plates and single bottom plate fastened together with 16d common nails (3-1/2 in. x 0.162 in.), 16d box nails (3-1/2 in. x 0.135 in.), or 12d ring nails (3-1/4 in. x 0.135 in.).

2B. CERTIFIED MODEL (Exterior):
 FlameTech Plywood

FlameTech Plywood, min. 15/32 in. thick, is applied vertically over the specified framing with min. 2-3/8 in. long, 0.113 in. diameter nails, spaced max 8 in. oc around the perimeter and max. 12 in. oc in the field. Horizontal joints must be blocked.

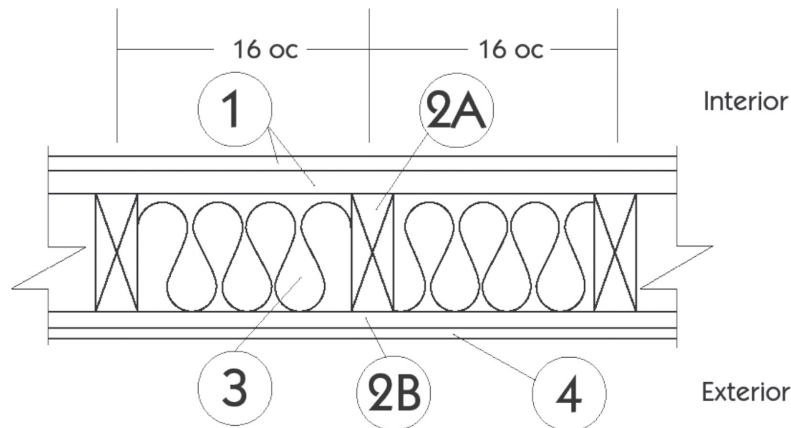
3. INSULATION: Fiberglass batt insulation min. 3-1/2 in. thick R-13 friction fit between the studs. If 2x6 in. nominal wood studs are used, fiberglass batt insulation shall be min. 5-1/2 in. thick.

4. EXTERIOR FACINGS (Optional): Materials installed in accordance with manufacturer's installation instructions:

- Masonry brick veneer or concrete
- Portland cement or synthetic stucco systems with self-furring metal lath or adhesive base coat
- Hardboard, wood structural panel, plywood or fiber-cement siding
- Metal siding
- Vinyl siding – exterior plastic

Performance Formulation Solutions, LLC
Design No. FRCT/FRWT 120-02
Fire Retardant Wood
FlameTech™ Lumber and Plywood
ASTM E119

Rating: 2 Hour Load Bearing from the Interior and 1 Hour Load Bearing from the Exterior
(2015 NDS - F_c 0.96 for FRWT)



1. GYPSUM BOARD (Interior):

Two layers USG Firecode® C Core, complying with ASTM C1396, or equivalent, min. 5/8 in. thick, 4 ft. wide applied vertically, fastened to framing. Face layer joints staggered with base layer and covered with paper tape and joint compound.

FASTENERS: (Not Shown):

- A. FACE LAYER – Min. #6 x 2 in. long Type S or W screws spaced max. 8 in. on center (oc) and heads covered with joint compound.
- B. BASE LAYER – Min. #6 x 1-5/8 in. long Type S or W screws, spaced max. 6 in. oc.

2. CERTIFIED MANUFACTURER: Fire Retardant Performance Formulation Solutions, LLC

CERTIFIED PRODUCT: FlameTech™

2A. CERTIFIED MODEL: FlameTech™ Lumber

FlameTech Lumber is min. 2x4 in. nominal wood studs, spaced max. 16 in. oc, double top plates and single bottom plate fastened together with 16d common nails (3-1/2 in. x 0.162 in.), 16d box nails (3-1/2 in. x 0.135 in.), or 12d ring nails (3-1/4 in. x 0.135 in.).

2B. CERTIFIED MODEL (Exterior):
FlameTech Plywood

FlameTech Plywood, min. 15/32 in. thick, is applied vertically over the specified framing with min. 2-3/8 in. long, 0.113 in. diameter nails, spaced max 8 in. oc around the perimeter and max. 12 in. oc in the field. Horizontal joints must be blocked.

3. INSULATION: Fiberglass batt insulation min. 3-1/2 in. thick R-13 friction fit between the studs. If 2x6 in. nominal wood studs are used, fiberglass batt insulation shall be minimum 5-1/2 in. thick.

4. EXTERIOR FACINGS: Materials installed in accordance with manufacturer's installation instructions:

- 3/4 in. thick cement plaster (1:4 ratio of cement to sand for scratch coat and 1:5 ratio for brown coat)
- Nominal 2.7 in. thick solid brick fastened using min. 22 GA wall ties
- Nominal 2.3 in. thick hollow brick fastened using min. 22 GA wall tiles



THE STANDARD FOR FIRE RETARDANT TREATED WOOD

Performance Formulation Solutions, LLC

Innovators of high performance fire retardant products

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Technical and design information is available at www.flametechnspects.com