



## 1 General Information

Underwriters Laboratories is a not-for-profit product safety testing and certification organization. Established in 1894, UL has positioned itself as a world leader among third party certification organizations.

With respect to the Roofing Industry, UL holds a preeminent position in the testing and evaluation of roofing materials and systems for fire resistance and fire hazard characteristics. The results of their testing are published annually in the UL Roofing Materials and Systems Directory (UL Blue Book).

## 2 Classification

Underwriters Laboratories testing and evaluation involves the entire roof assembly, not just the individual membranes or components. The assembly includes the type of decking, incline, insulation, fasteners, adhesives and the membrane roof cover. When a given assembly passes the applicable criteria, the entire assembly becomes classified. Although the membranes and individual components become eligible to display the UL Label, they are only classified with respect to their relationship to one another. Substitutions within the assembly may invalidate the rating or classification.

UL labels or logos printed within a manufacturer's sales literature do not guarantee that the product(s) delivered to the job site conform to the standards of those actually tested. The only way to guarantee that the delivered products conform to those actually tested is to require that all products carry the UL Classification on the packaging.

## 3 Follow-Up

Products that bear the UL Classification or Label provide the only means of assuring that the product is manufactured under the UL Follow-Up Service program. The UL Follow-Up Service is designed to serve as a check on the means manufacturers exercise to provide continued quality and compliance with UL requirements. UL Follow-Up Service field representatives make unannounced factory visits to observe

the manufacturing process and retrieve samples for the evaluation of classified or recognized products. If examination of the manufacturing process or testing of the samples disclose features that do not comply with the criteria or formulations established within the manufacturer's follow-up procedures, the manufacturer must make appropriate corrections or remove the UL Mark from the product.

## 4 UL 790

The UL 790 Tests for Fire Resistance of Roof Covering Materials is the principle standard employed in the evaluation of roofing materials. Testing to determine a roof covering's fire classification is conducted under ANSI/UL 790 and is intended to measure the roof covering material's fire-resistance characteristics against fire originating from outside a building or structure.

The following is a summary of Underwriters Laboratories Test Methods and Classification Requirements. The information consists of excerpts from UL Publications regarding the UL 790 Test Protocol and the 1998 UL Roofing Materials and Systems Directory (Blue Book).

## 5 UL 790 External Fire Classifications (Class A, B, C.)

**Class A:** Includes roof coverings which are effective against severe fire exposures. Under such exposures roof coverings of this class are not readily flammable and do not readily carry or communicate fire; afford a fairly high degree of fire protection to the roof deck; do not slip from position; pose no flying brand hazard; and do not require frequent repairs in order to maintain their fire resisting properties.

**Class B:** Includes roof coverings which are effective against moderate fire exposures. Under such exposures roof coverings of this class are not readily flammable and do not readily carry or communicate fire; afford a moderate degree of fire protection to the roof deck; do not slip from position; pose no flying brand hazard; but may require infrequent repairs in order to maintain their fire resisting properties.

Although Underwriters Laboratories currently offers a Class C rating, it has little relevance in the design and specification of single-ply roofing. The testing for single-ply roof systems encompasses Intermittent Flame, Spread of Flame and Burning Brand Tests.

### Intermittent Flame:

Intermittent Flame tests measure the reduction of the roofing material's ability to resist flame penetration, when flame is inconsistent in nature. 3<sup>1</sup>/<sub>3</sub> ft. wide by 4<sup>1</sup>/<sub>3</sub> ft. long plywood test decks with the roof coverings in place are positioned at a given slope and subjected to a 1400° F flame along the width of the test deck, fanned by a 12 mph. air current. The flame is extended approximately two feet beyond the upper edge of the test deck and is applied intermittently, two minutes on and two minutes off, for a total of fifteen cycles. In order to obtain an "A" rating, two roof assembly samples must withstand the 15 cycles and there must be no sustained flame on the underside of the test deck, no production of flaming brands and no displacement of portions of the test assembly. For a Class B, the test assembly is subjected to 8 cycles.

### Spread of Flame:

Spread of Flame tests measure the reduction of the roofing material's ability to resist the propagation of flame spread. 3<sup>1</sup>/<sub>3</sub> ft. wide by 10 ft. long plywood test decks with the roof coverings in place are positioned at a given slope and tested using the same flame parameters, but the flame is applied continuously for ten minutes or until the actual flaming of the material being tested recedes from the point of maximum flame spread, which must not exceed 6 ft. for Class A or 8 ft. for Class B.

### Burning Brand:

Burning Brand tests measure the roofing assembly's resistance to flame penetration caused by an ignited object falling on the roof. 3<sup>1</sup>/<sub>3</sub> ft. wide by 4<sup>1</sup>/<sub>3</sub> ft. long plywood test decks with the roof coverings in place are set up in the same manner as the intermittent flame test. Flaming grids of kiln-dried Douglas fir, 12 in. x 12 in. by 2<sup>1</sup>/<sub>4</sub> in. weighing approximately 4<sup>1</sup>/<sub>2</sub> pounds for Class A, and 6 in. x 6 in. by 2<sup>1</sup>/<sub>4</sub> in. weighing approximately one pound for Class B, are

placed on the roof covering, fanned by a 12 mph. wind and allowed to burn freely. The test is concluded when the brand is consumed and all evidence of flame, glow, and smoke has disappeared from both the exposed surface of the roof covering and the underside of the test deck or until failure occurs. The criteria for passing is the same as in the case of the intermittent flame exposure.

### Construction Types

**Non-Combustible (N/C):** Deck constructions of metal, concrete or poured gypsum. *Only Spread of Flame testing required.*

**Combustible (C):** Deck constructions of wood, <sup>3</sup>/<sub>4</sub> inch thick sheathing boards or minimum thickness plywood recommended by the roofing manufacturer. *Spread of Flame, Intermittent Flame and Burning Brand are required.*

Classifications are applicable either for new construction, re-covering or re-roofing purposes. (Re-covering is defined as the process of covering an existing roofing system with a new roofing system. Re-roofing is defined as removing an existing roof system and replacing it with a new system.) For re-covering situations, UL Classified un-insulated new construction assemblies are not intended for installation over existing UL Classified insulated assemblies unless specifically Classified under Maintenance and Repair Systems.

Systems Classified under Maintenance and Repair are specifically limited for installation (re-cover) over existing roofing systems as specified. They may not meet Classification requirements without being used in conjunction with the existing roofing system(s). Re-covering can also be accomplished with Classified new construction roofing systems where compatibility has been determined by either specific testing, empirical data or by known performance properties of similar materials to the test methods.

**The following are some general guidelines in determining the suitability of a new construction roofing system as a recover system.**

**Non-Combustible Deck Construction:**

Insulated roof systems may be utilized over any type of existing roof system and maintain its new construction rating when the roof deck is non-combustible.

**Combustible Deck Construction:**

Insulated roof systems classified for use over combustible deck can be used over any type of existing roof system and maintain its new construction rating.

Insulated roof systems classified for use over non-combustible deck may be used over any type of Class A, B or C existing roof systems. The resultant Class will be the lesser rating of the existing system or the new construction (re-cover) system.

"ISO95+GL," R-Max "Multi-Max" or "Themarroof Plus," Apache "Pyrox," Atlas "ACFoam II" or "ACFoam III" or Johns Manville Corp. "E'NRGY-2," any thickness or combination, mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Barrier Board (Optional):** Min. 1/4 in. thick GP Gypsum "Dens Deck," mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Membrane:** "FiberTite" or "FiberTite-XI" fully adhered with "FTR-190" adhesive applied at 1 gal./ 60-75 sq. ft. or "FiberTite-FB" fully adhered with "FTR-290" adhesive at 1 gal./100 sq. ft.

**6 Seaman Corp. FiberTite Listings**

The following are the most recent Seaman Corporation FiberTite listings. The listings are always subject to additions and changes. All listings and assemblies should be confirmed in the most current edition of the Underwriters Laboratories Roofing Materials and Systems Directory.

**SEAMAN CORP., WOOSTER OH 44691 R100117 (N)**

**SINGLE-PLY MEMBRANE SYSTEM**

*Unless otherwise indicated, the roof insulation and membrane are mechanically fastened.*

**CLASS A - BALLASTED**

**1. Deck:** NC **Incline:** 2

**Insulation:** One or more layers of the following or combinations of the following: (any thickness - except restricted to 2 in. max when polystyrene is used alone): Polystyrene, polyisocyanurate, polyisocyanurate/perlite composite, perlite, and fiber-board loosely laid.

**Membrane:** "FiberTite" or "FiberTite-XI" (EIP), loosely laid.  
Surfacing: River Bottom Stone (3/4 to 1 1/2 in. diameter) at 1000 lbs./sq. or min. 10 lb./sq. ft. concrete blocks.

**CLASS A - FULLY ADHERED**

**1. Deck:** NC **Incline:** 2

**Insulation (Optional):** Celotex "Hy-Therm AP," Firestone

**2. Deck:** NC **Incline:** 2

**Substrate:** Cellular lightweight concrete or structural concrete.

**Membrane:** "FiberTite-FB" fully adhered with "FTR-290" adhesive at 1 gal./100 sq. ft.

**3. Deck:** NC **Incline:** 2

**Substrate:** Cellular, aggregate (perlite), or vermiculite lightweight concrete or gypsum concrete.

**Vapor Barrier (Optional):** Celotex "Hydrostop," loosely laid or mechanically fastened.

**Insulation (Optional):** Celotex "Hy-Therm AP," Firestone "ISO95+GL," R-Max "Multi-Max" or "Themarroof Plus," Apache "Pyrox," Atlas "ACFoam II" or "ACFoam III" or Johns Manville Corp. "E'NRGY-2," any thickness or combination, mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Barrier Board (Optional):** Min. 1/4 in. thick G-P Gypsum "Dens Deck," mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Membrane:** "FiberTite" or "FiberTite-XI" fully adhered with "FTR-190" adhesive applied at 1 gal./ 60-75 sq. ft. or "FiberTite-FB" fully adhered with "FTR-290" adhesive at 1 gal./100 sq. ft.

**4. Deck:** C-15 / 32 **Incline:** 2

**Barrier Board:** Min. 1/4 in. thick G-P Gypsum "Dens Deck," loosely laid or mechanically fastened with joints offset 6 in.

**Vapor Barrier (Optional):** Polyethylene, kraft paper or Celotex "Hydrostop," loosely laid.



**Insulation (Optional):** Celotex "Hy-Therm AP," Firestone "ISO95+GL," R-Max "Multi-Max" or "Thermarof Plus," Apache "Pyrox," Atlas "ACFoam II" or "ACFoam III" or Johns Manville Corp. "ENRGY-2," any thickness or combination, mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Membrane:** "FiberTite" or "FiberTite-XI" fully adhered with "FTR-190" adhesive applied at 1 gal./60-75 sq. ft. or "FiberTite-FB" fully adhered with "FTR-290" adhesive at 1 gal./100 sq. ft.

**5. Deck:** C-15 / 32 **Incline:** No Limitation

**Insulation (Optional):** Any UL Classified (except EPS), any thickness or combination, loosely laid or mechanically fastened.

**Barrier Board:** Min. 1/4 in. thick G-P Gypsum "Dens Deck," mechanically fastened, or adhered in "Insta-Stik" or hot asphalt to mechanically attached insulation (if present).

**Membrane:** "FiberTite" or "FiberTite-XI" fully adhered with "FTR-190" adhesive applied at 1 gal./60-75 sq. ft. or "FiberTite-FB" fully adhered with "FTR-290" adhesive at 1 gal./100 sq. ft.

**6. Deck:** NC **Incline:** 1/2

**Substrate:** Cellular, aggregate (perlite), or vermiculite lightweight concrete or gypsum concrete.

**Vapor Barrier:** Celotex "Hydrostop," loosely laid or mechanically fastened.

**Insulation (Optional):** Celotex "Hy-Therm AP," Firestone "ISO95+GL," R-Max "Multi-Max" or "Thermarof Plus," Apache "Pyrox," Atlas "ACFoam II" or "ACFoam III" or Johns Manville Corp. "ENRGY-2," any thickness or combination, mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Barrier Board (Optional):** Min. 1/4 in. thick GP "Dens Deck," mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Membrane:** "FiberTite-FB" fully adhered with hot asphalt.

**CLASS A - MECHANICALLY FASTENED**

**1. Deck:** NC **Incline:** No Limitation

**Insulation (Optional):** Apache "Pyrox" or "Whiteline," Atlas Roofing Corp. "AC Foam II" or

Johns Manville Corp. "ENRGY 2" polyisocyanurate insulation, wood fiberboard, perlite, glass fiber, any thickness or combination.

**Slip Sheet:** Roctex "Rocroof," loosely laid.

**Membrane:** "FiberTite" or "FiberTite-XI" (EIP).

**2. Deck:** NC **Incline:** 2

**Insulation:** Apache "Pyrox" or "Whiteline," Atlas Roofing Corp. "AC Foam II" or Johns Manville Corp. "ENRGY 2" polyisocyanurate (2 in. max), Celotex "Energy Lok" or "Hy-Therm AP" polyisocyanurate (1 in. min), Johns Manville Corp. "Fesco Foam" polyisocyanurate/perlite composite (2 in. max), GAF "GAFTEMP Permalite" perlite (2 in. max), Johns Manville Corp. "Fesco Board" perlite (2 in. max), Celotex "Regular and High Density Fiberboard" wood fiberboard, glass fiber, any combination.

**Membrane:** "FiberTite" or "FiberTite-XI" (EIP).

**3. Deck:** NC **Incline:** 1/4

**Insulation:** Apache "Pyrox" or "Whiteline," Atlas Roofing Corp. "AC Foam II" or Johns Manville Corp. "ENRGY 2" polyisocyanurate (any thickness), Johns Manville Corp. "Ultragard SP" polyisocyanurate (3 in. max), Celotex "Energy Lok" or "Hy-Therm AP" polyisocyanurate (1 in. min), Johns Manville Corp. "Fesco Foam" polyisocyanurate/perlite composite (3 in. max), GAF "GAFTEMP Composite" polyisocyanurate/fiberboard composite (3 in. max), Johns Manville Corp. "Fesco Board" perlite (3 in. max), Celotex "Celo-Therm" perlite (3 in. max), GAF "GAFTEMP Permalite" perlite (3 in. max), Celotex "Regular and High Density Fiberboard" wood fiberboard, glass fiber, any combination.

**Membrane:** "FiberTite" or "FiberTite-XI" (EIP).

**4. Deck:** NC **Incline:** 1

**Insulating Concrete:** Cellular, gypsum, vermiculite, perlite or structural concrete.

**Barrier Board or Slip Sheet (Optional):** 1/4 in. G-P Gypsum "Dens Deck" Overlayment Board, Atlas Roofing "FR-10" or Roctex "Rocroof."

Membrane: "FiberTite" or "FiberTite-XI" (EIP).

5. Deck: NC Incline: 1  
Insulation: Polystyrene, any thickness, covered with min. 1 in. wood fiberboard, min. 3/4 in. perlite.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP).

6. Deck: C -15/32 Incline: No Limitation  
Insulation (Optional): Polyisocyanurate, polystyrene, wood fiberboard, perlite, glass fiber, any thickness or combination.  
Barrier Board: 1/4 in. G-P Gypsum "Dens Deck" Overlayment Board with all joints staggered a min of 6 in. from plywood joints, mechanically fastened.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP).

7. Deck: C -15/32 Incline: 2  
Base Sheet: Type G2, mechanically attached.  
Slip Sheet: Roctex "Rocroof," loosely laid.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP).

**CLASS B - MECHANICALLY FASTENED**

1. Deck: NC Incline: No Limitation  
Insulation (Optional): Any UL Classified polystyrene, wood fiber, glass fiber or perlite, any thickness or combination.  
Slip Sheet: Roctex "Rocroof," loosely laid.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP).

2. Deck: C -15/32 Incline: 1  
Barrier Board: 5/8 in. gypsum board with 6 in. off-set joints from plywood deck.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP).

3. Deck: C3T&G Incline: 1  
Barrier Board: 5/8 in. gypsum board.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP).

4. Deck: C -15/32 Incline: 1/2  
Slip Sheet: Roctex "Rocroof," loosely laid.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP).

**MAINTENANCE AND REPAIR SYSTEMS**

**CLASS A**

1. Deck: NC Incline: No Limitation  
Existing Roof Systems: Class A, B or C cap sheet or smooth surfaced BUR roof, insulated or un-insulated and/or single-ply membrane (EPDM, PVC or CPE).  
Slip Sheet: One ply Atlas Roofing "FR-50" or two plies of Atlas Energy Products "FR-10" or one ply of Roctex "Rocroof" mechanically fastened.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP), mechanically fastened.

2. Deck: NC Incline: 1/2  
Existing Roof System: Class A, B or C cap sheet or smooth surfaced BUR roof, insulated or un-insulated and/or single-ply membrane (EPDM, PVC or CPE).

**Insulation:**

- a. Any UL Classified polystyrene insulation (tapered or uniform thickness), any thickness, covered with 1 inch perlite, 1 inch wood fiber, Atlas Energy Products "FR-10" or Roctex "Rocroof."
- b. Apache "Pyrox" or "Whiteline," Atlas Roofing Corp. "A1," "AC Foam II" or Johns Manville Corp. "ENRG'Y 2" polyisocyanurate insulation, any thickness.
- c. Wood fiber or perlite.

Membrane: "FiberTite" or "FiberTite-XI" (EIP), mechanically fastened.

3. Deck: C -15/32 Incline: No Limitation  
Existing Roof Systems: Class A, B or C cap sheet or smooth surfaced BUR roof, insulated or un-insulated and/or single-ply membrane (EPDM, PVC or CPE).  
Barrier Board: 1/4 in. G-P Gypsum "Dens Deck" Overlayment Board mechanically fastened.  
Membrane: "FiberTite" or "FiberTite-XI" (EIP), mechanically fastened.

4. Deck: C -15/32 Incline: 2  
Existing Roof Systems: Class A gravel surfaced BUR (gravel maintained).

**Insulation:**

- a. Any UL Classified polystyrene insulation (tapered or uniform thickness), any thickness, covered with 1 inch perlite.
- b. Apache "Pyrox" or "Whiteline," Atlas Roofing Corp. "AC Foam II" or Johns Manville Corp. "E'NRG'Y 2" polyisocyanurate insulation, any thickness.
- c. Perlite.

**Membrane:** "FiberTite" or "FiberTite-XT" (EIP), mechanically fastened.

**5. Deck:** NC**Incline:** 2

**Existing Roof System:** Class A, B, or C, to retain the existing Classification insulated or non-insulated cap sheet, smooth surface BUR or single-ply membrane.

**Insulation:** Celotex "Hy-Therm AP," Firestone "ISO95+GL," R-Max "Multi-Max" or "Therमारoof Plus," Apache "Pyrox," Atlas "ACFoam II" or "ACFoam III" or Johns Manville Corp. "E'NRG'Y-2," any thickness or combination, mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Barrier Board (Optional):** Min. 1/4 in. thick G-P Gypsum "Dens Deck," mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Membrane:** "FiberTite" or "FiberTite-XT" fully adhered with "FTR-190" adhesive applied at 1 gal./60-75 sq. ft. or "FiberTite-FB" fully adhered with "FTR-290" adhesive at 1 gal./100 sq. ft.

**6. Deck:** C-15/32**Incline:** 2

**Existing Roof System:** Class A, B or C, to retain the existing Classification insulated or non-insulated cap sheet, smooth surface BUR or single-ply membrane.

**Insulation:** Celotex "Hy-Therm AP," Firestone "ISO95+GL," R-Max "Multi-Max" or "Therमारoof Plus," Apache "Pyrox," Atlas "ACFoam II" or "ACFoam III" or Johns Manville Corp. "E'NRG'Y-2," any thickness or combination, mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Barrier Board (Optional):** Min. 1/4 in. thick G-P Gypsum "Dens Deck," mechanically fastened or adhered in "Insta-Stik" or hot asphalt.

**Membrane:** "FiberTite" or "FiberTite-XT" fully adhered with "FTR-190" adhesive applied at 1 gal./60-75 sq. ft. or "FiberTite-FB" fully adhered with "FTR-290" adhesive at 1 gal./100 sq. ft.