

FIRESTONE EPDM CODE APPROVAL GUIDE

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“The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes.”

I. EXTERNAL FIRE RATINGS

All regional building codes and most local building code officials require that roofing systems meet minimum performance requirements when exposed to an external fire source. The accepted method for measuring external fire resistance is ASTM E-108. This test standard, and closely related standards such as Underwriters Laboratories UL 790 and Uniform Building Code Standard 15-2, are used to determine the ability of a roof assembly to hinder the horizontal spread and/or vertical penetration of an external fire source.

Non-combustible Roof Decks (Steel, Concrete, Poured Gypsum) require testing for horizontal spread of flame only.

Combustible Roof Decks (Wood, Plywood, OSB, Tectum) require testing for both horizontal spread of flame and vertical penetration of flame.

ASTM E-108, UL 790 and UBC 15-2, all classified roof covering assemblies fall into one of the following three categories:

Class A: "...includes roof coverings which are effective against severe fire exposures..." *

Class B: "...includes roof coverings which are effective against moderate fire exposures..." *

Class C: "...includes roof coverings which are effective against light fire exposures..." *

For insulated assemblies over non-combustible roof decks, any classified roofing assembly may be installed over a new roof deck, an existing roof deck or over an existing roofing assembly. Underwriters Laboratories states that "any classified roofing system may be applied over a pre-existing roof system (A, B, C, verifiable or not) **of the same deck type** and establish for that roof the classification of the new system". Also, an assembly classified over a combustible deck may be installed over an existing non-combustible deck and establish for the assembly the rating of the new system. A non-combustible deck rated assembly **must** be tested and classified over a combustible deck in order to obtain the desired classification of the new assembly. Total insulation thickness of combined existing and new roofing systems may not exceed the total maximum allowable for the new roofing system, and non-insulated systems are not intended for use over insulated systems.

The class of roof covering assembly required by each regional building code depends upon many factors, including the use and location of the building and the type of construction. The local building authority should always be consulted as to what the roof assembly classification will need to be for each project.

It should be noted that these classifications apply to the **roofing assembly**, and **NOT the roofing membrane**. A roofing membrane that is classified as part of a Class A assembly when installed over a particular insulation may not qualify as part of a Class A assembly with another insulation or at a higher slope.

The column titled "UL Item Number" in the following listings has been added as a service to those who have the UL Roofing Materials and Systems Directory. It identifies the UL listing from which our Code Approval Guide listing derives (e.g. "A,,FA,23 means Class **A**, **F**ully **A**dhered System, listing number **23**: "B,MA,04" means Class **B**, **M**echanically **A**tached System, listing number **04**, etc.).

- From Underwriters Laboratories Roofing Materials and Systems Directory, January 2006, page 1

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

UL CLASS A, B, C

SYSTEM: BALLASTED OR PROTECTED MEMBRANE
MEMBRANE: ANY RUBBERGARD® EPDM (UN-REINFORCED OR REINFORCED)
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
2	A	C/NC	<p>Deck:</p> <p>Insulation: Any one or combination of the following at minimum thickness indicated (no maximum thickness): minimum thickness is for fully supported insulation. Metal deck flute width may require an increase in this this thickness. Consult insulation manufacturer on flute spanability</p> <ul style="list-style-type: none"> a) 1" ISO 95+ GL b) 1" Foamular 150 or 250 c) 1" EPS d) 1" Polyurethane e) 1" Polyisocyanurate f) 1/2" Firestone "FiberTop B, C, E or S" g) 1/2" Dow SM, TG, Grayboard h) Lt. Wt. Insulating concrete <p>Membrane: Any Firestone EPDM membrane (un-reinforced or reinforced)</p> <p>Ballast: River bottom stone (3/4 to 1-1/2 inch in diameter) at 1000 lb/sq</p> <p>As an option, the Firestone Protection Mat may be installed either beneath or directly above the membrane. A thermal barrier is required below polystyrene insulation by the building codes when the polystyrene is placed over metal decks. An insulation separator is required over ltwt insulating concrete.</p> <p style="text-align: center;">PROTECTED MEMBRANE (IRMA) SYSTEMS ONLY:</p>	1	A,BA,01 A,BA,12
2	A	C/NC	<p>Deck:</p> <p>Insulation: Any one or combination of the above insulation</p> <p>Membrane: Any Firestone EPDM membrane (un-reinforced or reinforced)</p> <p>Insulation: (no maximum thickness):</p> <ul style="list-style-type: none"> a) 1" Foamular 404 b) 1" Dow RM, PD or Styrorib c) 2" LightGuard, 3" max. (2) <p>Ballast: River bottom stone (3/4 to 1-1/2 inch in diameter) at 1000 lb/sq Foamular, Dow RM, PD, or Styrorib require the placement of Firestone Protection Mat over the insulation immediately prior to placing the ballast LightGauard does not require the use of ballast</p>	1	A,BA,02

1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004)
MEMBRANE: PLATINUM
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3-1/2	A	C/NC	Deck: Insulation: (optional) any thickness a) Firestone ISO 95+ GL Coverboard: min. 1/4" Georgia-Pacific Dens-Deck Membrane: Platinum (adhered w/BA-2004 only)	1	A, FA,144
2-1/2	A	NC	Deck:	1,2	A,FA,145
2-1/2	A	C(2)	Insulation : any thickness a) Firestone "HailGard" Membrane: Platinum (adhered w/BA-2004 only)		
1/2	A	NC	Deck:	1,2	A,FA,143
1/2	A	C(2)	Insulation: any thickness a) Firestone ISO 95+ GL Membrane: Platinum (adhered w/BA-2004 only)		

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating 1/2" gypsum board or 1/4" Georgia-Pacific "Dens-Deck" directly on the combustible deck.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004)
MEMBRANE: PLATINUM (w/PC-100 ACRYLIC)
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
NL	A	NC	Deck: Insulation: (optional) any thickness a) Firestone ISO 95+ GL Coverboard: min. ¼” Georgia-Pacific Dens-Deck Membrane: Platinum (adhered w/BA-2004 only) Surfacing: AcryliTop PC-100 @ 1 gal/sq	1	A, FA,147
NL	A	NC	Deck:	1,2	A,FA,148
NL	A	C(2)	Insulation : any thickness a) Firestone “HailGard” Membrane: Platinum (adhered w/BA-2004 only) Surfacing: AcryliTop PC-100 @ 1 gal/sq		
2	A	NC	Deck:	1,2	A,FA,146
2	A	C(2)	Insulation: any thickness a) Firestone ISO 95+ GL Membrane: Platinum (adhered w/BA-2004 only) Surfacing: AcryliTop PC-100 @ 1 gal/sq		

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustibile deck by incorporating ½” gypsum board or ¼” Georgia-Pacific “Dens-Deck” directly on the combustibile deck.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045 or .060 STANDARD RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
NL	C	C/NC	Deck: Insulation: (optional) any thickness a) ISO 95+ GL b) any UL Classified (except polystyrene) Barrier board: ¼", 3/8", ½" or 5/8" Georgia-Pacific "Dens-Deck" Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA	1,4	C,FA,07
1 ½	A	C/NC	Deck: Insulation: (optional) any thickness a) ISO 95+ GL b) Any UL Classified insulation Cover board: min. ¼" Georgia-Pacific "Dens-Deck" Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA	1,2,3	A,FA,30 A,FA,20
¼	A	NC	Adhered directly to: structural concrete Insulation: (opt) min. ½" FiberTop B, C, E or S Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA	1,4	A,FA,16
¼	A	NC	Deck:	1,2,3,4,5	A,FA,01
¼	A	C(2)	Insulation: (optional) any thickness a) ISO 95+ GL b) Any UL Classified insulation (polystyrene may not be used on a combustible deck) Cover board: min. ½" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA		A,FA,22 A,FA,35
¼	C	NC	Deck:	1,2,3,4,5	C,FA,03
¼	C	C(2)	Insulation: min . 1" thickness a) "ISO 95+ GL" b) Multi-Max c) ACFoam II d) NRG 1A, 1G, 2A, 2G Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA		C,FA,05 C,FA,06 C,FA,11 C,FA,12

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045 or .060 STANDARD RUBBERGARD® w/PC-100 ACRYLIC
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3 ½	A	C/NC	Deck: Insulation: (optional) a) ISO 95+ GL b) any UL Classified insulation Cover board: min. ¼" Georgia-Pacific "Dens-Deck" Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA Surfacing: AcryliTop PC-100 @ 1gal/sq	1,2,3,5	A,FA,29 A,FA,66
2	A	NC	Deck:	1,2	A,FA,06
2	A	C(2)	Insulation: (optional) max. 3 ¼" a) Wood Fiber b) Glass Fiber c) Perlite Cover board: min. ½" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA Surfacing: AcryliTop PC-100 @ 1gal/sq		
1	A	NC	Deck:	1,2,5	A,FA,19
1	A	C(2)	Insulation: Any thickness a) "ISO 95+ GL" b) Multi-Max c) AC Foam II Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA Surfacing: AcryliTop PC-100 @ 1gal/sq		A,FA,40
1	A	NC	Deck:	1,2,3	A,FA,03
1	A	C(2)	Insulation: (optional) any thickness, any combination a) ISO 95+ GL b) any UL Classified insulation Cover board: min. ½" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA Surfacing: AcryliTop PC-100 @ 1gal/sq		A,FA,36

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045 or .060 STANDARD RUBBERGARD® w/PC-100 ACRYLIC
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
½	A	NC	Deck:		
½	A	C(2)	Insulation: any thickness a) Firestone "ISO 95+ GL" b) AC Foam II Membrane: .090 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA Surfacing: AcryliTop PC-100 @ 1gal/sq	1,2,5	A,FA,24
3	B	NC	Deck:		
3	B	C(2)	Insulation: ½" to 2" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 Standard RubberGard EPDM, adhered w/BA-2004 or WBBA Surfacing: AcryliTop PC-100 @ 1gal/sq	1,2	B,FA,01 B,FA,09

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045 or .060 LS-FR RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3/4	A	NC	Deck:	1,2,3,4	A, FA,88
3/4	A	C(2)	Insulation: (optional) any thickness a) Firestone "ISO 95+ GL" b) Any UL Classified insulation Cover board: min. 1/2" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 LS-FR RubberGard EPDM, adhered w/BA-2004 or WBBA		
1/2	A	NC	Deck:	1,2,4	A,FA,89
1/2	A	C(2)	Insulation: any thickness a) Firestone "ISO 95+ GL" Membrane: .045 or .060 LS-FR RubberGard EPDM, adhered w/BA-2004 or WBBA		
1/2	A	C	Deck: Slip sheet: Two layers of "VersaShield Underlayment", VersaShield FB-1S" or VersaShield FB-2S Insulation: ISO 95+ GL, any thickness, (MA) Membrane: .045 or .060 LS-FR RubberGard EPDM, adhered w/BA-2004 or WBBA	4	A,FA,139 A,FA,140
1/4	A	NC	Deck:	1,2,4,5	A,FA 87
1/4	A	C(2)	Insulation: any thickness a) AC Foam II b) MultiMax FA c) E'NRG' 2 d) Pyrox Membrane: .045 or .060 LS-FR RubberGard EPDM, adhered w/BA-2004 or WBBA		
1/4	B	C	Deck: Base Sheet: One or more layers of "MB Base Sheet" Insulation: a) min 1-1/2" ISO 95+ GL b) min. 1" FiberTop B, C, E, S c) min. 1/2" FiberTop B, C, E, S over min. 1" ISO 95+ GL Membrane: .045 or .060 LS-FR RubberGard EPDM, adhered w/BA-2004 or WBBA	4	B,FA,35

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating 1/2" gypsum board or 1/4" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045 or .060 LS-FR RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
¼	B	C	Deck: Insulation: a) min. 1” FiberTop B, C, E, S b) min. 1/2” FiberTop B, C, E, S over min. 1-1/2” ISO 95+ GL Membrane: .045 or .060 LS-FR RubberGard EPDM, adhered w/BA-2004 or WBBA	1,4	B,FA,38

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½” gypsum board or ¼” Georgia-Pacific “Dens-Deck” directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045 or .060 FIRE RETARDANT RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3-1/2	A	NC	Deck: Insulation: Any UL Classified, any thickness Coverboard: min. ¼” Georgia-Pacific “Dens-Deck” Membrane: .045 or .060 FR RubberGard EPDM, adhered w/BA-2004 or WBBA	1,3,4,5	A,FA,29
2-1/4	A	NC	Deck: Insulation: Polystyrene (expanded or extruded) Coverboard: min ½” FiberTop B, C, E or S Membrane: .045 or .060 FR RubberGard EPDM, adhered w/BA-2004 or WBBA	1,3,4	A,FA,14
2	A	NC	Deck: Insulation: (optional) any thickness a) any UL Classified insulation Cover board: min. ½” Firestone “FiberTop B, C, E or S” Membrane: .045 or .060 FR RubberGard EPDM, adhered w/BA-2004 or WBBA	1,3,4	A,FA,15 A,FA,13
1	A	NC	Deck: Insulation: Any Thickness a) “ISO 95+ GL” b) AC Foam II c) AC Foam Membrane: .045 or .060 FR RubberGard EPDM, adhered w/BA-2004 or WBBA	1,4,5	A,FA,08 A,FA,10
¾	A	NC	Deck Insulation: Any thickness a) Apache Pyrox b) E’NRG’Y II Membrane: .045 or .060 FR RubberGard EPDM, adhered w/BA-2004 or WBBA	1,4,5	A,FA, 09 A,FA,11
½	A	NC	Deck: Insulation: Any thickness a) E’NRG’Y 2G Membrane: .045 or .060 FR RubberGard EPDM, adhered w/BA-2004 or WBBA	1,4,5	A,FA,47 A,FA,17

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½” gypsum board or ¼” Georgia-Pacific “Dens-Deck” directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045, .060 or .075 RUBBERGARD® MAX
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
NL	C	C/NC	Deck: Insulation: (optional) any thickness a) ISO 95+ GL Barrier board: min. ¼" Georgia-Pacific "Dens-Deck" Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA	1,4	C,FA,07*
1 ½	A	C/NC	Deck: Insulation: (optional) any thickness a) ISO 95+ GL b) any UL Classified insulation Cover board: min. ¼" Georgia-Pacific "Dens-Deck" Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA	1,2,3,4,5	A,FA,30* A,FA,20*
1 ¼	A	NC	Deck:	1,2,3,4,5	A,FA,127
1 ¼	A	C(2)	Insulation: (optional) any thickness a) ISO 95+ GL b) any UL Classified insulation [EPS may only be used on combustible decks w/1/2" gypsum at a max. ¼:12 slope; A,FA,35] Cover board: min. ½" Firestone "FiberTop B, C, E or S" Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA		
1 ¼	A	NC	Adhered directly to: Structural concrete Insulation: (opt) min. ½" FiberTop B, C, E or S Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA	3,5	A,FA,124
½	A	NC	Deck:	1,2,4	A,FA,126
½	A	C(2)	Insulation: Any thickness a) "ISO 95+ GL" Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA		

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: .045, .060 or .075 RUBBERGARD® MAX
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
½	A	C	Deck: Slip Sheet: Two layers of “VersaShield Underlayment, “VersaShield FB-1S” or “VersaShield FB-2S”, (MA) Insulation: any thickness a) ISO 95+ GL, (MA) Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA	4	A,FA,139 A,FA,140
¼	A	NC C(2)	Deck: Insulation: Any thickness: a) NRG 2G b) AC Foam II c) Multi-Max Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA	1,2,4,5	A,FA,125 A,FA,128 A,FA,132 A,FA,133
½	B	C	Deck: Base Sheet: One or more layers of “MB Base Sheet”, (MA) Insulation: a) min 1-1/2” ISO 95+ GL b) min. 1” FiberTop B, C, E, S c) min. 1/2” FiberTop B, C, E, S over min. 1” ISO 95+ GL Membrane: .045, .060 or .075 RubberGard MAX EPDM, adhered w/BA-2004 or WBBA	4	B,FA,34
½	B	C	Deck: Insulation: a) min. 1” FiberTop B, C, E, S b) min. 1/2” FiberTop B, C, E, S over min. 1-1/2” ISO 95+ GL Membrane: .045, .060 or .075 RubberGard MAX EPDM adhered w/BA-2004 or WBBA	4	B,FA,37

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½” gypsum board or ¼” Georgia-Pacific “Dens-Deck” directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

“The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes.”

UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004)
MEMBRANE: .045 or .060 RUBBERGARD® MAX FR
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
NL	A	NC	Deck:	1,2,4	A,FA,103
NL	A	C(2)	Insulation: (opt) any thickness a) ISO 95+ GL b) any UL Classified insulation Cover board: a) min. ½” Firestone “FiberTop B, C, E, S” b) min. ¼” Georgia-Pacific “Dens-Deck” c) min. 7/16” plywood or OSB Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/BA-2004		A,FA,107
3	A	NC	Deck:	1,2,4,5	A,FA,105
3	A	C(2)	Insulation: Any thickness a) “ISO 95+ GL” Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/BA-2004		A,FA,109
1-1/2	A	C	Deck: Slip Sheet: Two layers of “VersaShield Underlayment” or “VersaShield FB-2S”, (MA) Insulation: any thickness a) ISO 95+ GL, (MA) Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/BA-2004	4	A,FA,139
¾	A	C	Deck: Slip Sheet: Two layers of “VersaShield FB-1S”, (MA) Insulation: any thickness a) ISO 95+ GL, (MA) Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/BA-2004	4	A,FA,140

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½” gypsum board or ¼” Georgia-Pacific “Dens-Deck” directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/BA-2004)
MEMBRANE: .045 or .060 RUBBERGARD® MAX FR
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
1	B	C	Deck: Base Sheet: One or more layers of "MB Base Sheet", (MA) a) min 1-1/2" ISO 95+ GL b) min. 1" FiberTop B, C, E, S c) min. 1/2" FiberTop B, C, E, S over min. 1" ISO 95+ GL Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/BA-2004	4	B,FA,36
1	B	C	Deck: Insulation: a) min. 1" FiberTop B, C, E, S b) min. 1/2" FiberTop B, C, E, S over min. 1-1/2" ISO 95+ GL Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/BA-2004	4	B,FA,39

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating 1/2" gypsum board or 1/4" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/WBBA)
MEMBRANE: .045 or .060 RUBBERGARD® MAX FR
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3	A	NC	Deck:	1,2,4	A,FA,104 A,FA,108
3	A	C(2)	Insulation: (opt) any thickness a) ISO 95+ GL b) any UL Classified insulation Cover board: a) min. ½" Firestone "FiberTop B, C, E, S" b) min. ¼" Georgia-Pacific "Dens-Deck" b) min. 7/16" plywood or OSB over any UL Classified insulation Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/WBBA		
2-1/2	A	NC	Deck:	1,2,4	A,FA,106 A,FA,110
2-1/2	A	C(2)	Insulation: Any thickness a) "ISO 95+ GL" Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/WBBA		
1-1/2	A	C	Deck: Slip Sheet: Two layers of "VersaShield Underlayment" or "VersaShield FB-2S", (MA) Insulation: any thickness a) ISO 95+ GL, (MA) Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/WBBA	4	A,FA,139
¾	A	C	Deck: Slip Sheet: Two layers of "VersaShield FB-1S", (MA) Insulation: any thickness a) ISO 95+ GL, (MA) Membrane: .045 or .060 RubberGard MAX FR EPDM, adhered w/WBBA	4	A,FA,140

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: FULLY ADHERED (w/WBBA)
MEMBRANE: .045 or .060 RUBBERGARD® MAX FR
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Table with 6 columns: Max Slope, Class, Deck, Insulation Assembly, Remarks, UL Item No. It contains two rows of assembly specifications for Class B, Deck C.

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating 1/2" gypsum board or 1/4" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 STANDARD RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
1 ½	A	C/NC	Deck: Insulation: (optional) any thickness a) Any UL Classified insulation Cover board: min. ¼" Georgia-Pacific "Dens-Deck" Membrane: .045 or .060 Standard RubberGard EPDM, mechanically attached	1,3,4	A,MA,15 A,MA,22
¼	A	NC	Deck:	1,2,3	A,MA,02
¼	A	C(2)	Insulation: (optional) Min. ½" FiberTop B,C, E, S Membrane: .045 or .060 Standard RubberGard EPDM, mechanically attached		
¼	A	NC	Deck:	1,2,3,4	A,MA,19
¼	A	C(2)	Insulation: (optional) any thickness a) Any UL Classified insulation Cover board: min. ½" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 Standard RubberGard EPDM, mechanically attached		A,MA,29
¼	C	NC	Deck:	1,2,4	C,MA,03
¼	C	C(2)	Insulation: min. 1" thickness a) "ISO 95+ GL" b) Multi-Max c) AC Foam II d) NRG 2A, 2G Membrane: .045 or .060 Standard RubberGard EPDM, mechanically attached		C,MA,04 C,MA,05 C,MA,08 C,MA,09
½	A	C	Deck" Slip Sheet: 2 or more layers of Atlas "FR 50" Membrane: .045 or .060 Standard RubberGard EPDM, mechanically attached	4	A,MA,75
½	B	C	Deck: Slip Sheet: One or more layers of Atlas "FR 50" Membrane: .045 or .060 Standard RubberGard EPDM, mechanically attached	4	B, MA,05

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 STANDARD RUBBERGARD® w/PC-100 ACRYLIC
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3 ½	A	C/NC	Deck: Insulation: (optional) any UL Classified insulation Cover board: ¼" min. Georgia-Pacific "Dens-Deck" Membrane: .045 or .060 Standard RubberGard, mechanically attached Surfacing: AcryliTop PC-100 @ 1 gal/sq.	1,3	A,MA,21 A,MA,56
2 1-1/2	A A	NC C(2)	Deck: Insulation: (optional) max. 3 ¼" a) Wood Fiber b) Glass Fiber c) Perlite Cover board: min. ½" Firestone "FiberTop B C, E or S" Membrane: .045 or .060 Standard RubberGard, mechanically attached Surfacing: AcryliTop PC-100 @ 1 gal/sq.	1,2	A,MA,06 A,MA,27
1 1	A A	NC C(2)	Deck: Insulation: Any thickness a) "ISO 95+ GL" b) Multi-Max c) AC Foam II Membrane: .045 or .060 Standard RubberGard, mechanically attached Surfacing: AcryliTop PC-100 @ 1 gal/sq.	1,2	A,MA,14 A,MA,28
1 1	A A	NC C(2)	Deck: Insulation: (optional) any thickness, any combination a) any UL Classified insulation Cover board: min. ½" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 Standard RubberGard, mechanically attached Surfacing: AcryliTop PC-100 @ 1 gal/sq.	1,2,3	A,MA,03 A,MA,25
3 3	B B	NC C(2)	Deck: Insulation: ½" to 2" Firestone "FiberTop C or E" Membrane: .045 or .060 Standard RubberGard, mechanically attached Surfacing: AcryliTop PC-100 @ 1 gal/sq.	1,2	B,MA,01

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- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 LS-FR RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3/4	A	NC	Deck:	1,2,3,4	A, MA,65
3/4	A	C(2)	Insulation: (optional) any thickness a) Firestone "ISO 95+ GL" b) Any UL Classified insulation Cover board: min. 1/2" Firestone "FiberTop B, C, E or S" Membrane: .045 or .060 LS-FR RubberGard, mechanically attached		
1/2	A	NC	Deck:	1,2,4	A,MA,63
1/2	A	C(2)	Insulation: (optional) any thickness a) Firestone "ISO 95+ GL" Membrane: .045 or .060 LS-FR RubberGard, mechanically attached		
1/4	A	NC	Deck:	1,2,4	A,MA,64
1/4	A	C(2)	Insulation: any thickness a) AC Foam II b) MultiMax FA c) E'NRG' 2 d) Pyrox Membrane: .045 or .060 LS-FR RubberGard, mechanically attached		
1/2	A	C	Deck: Slip Sheet: Two or more layers of Atlas "FR 50" Membrane: .045 or .060 LS-FR RubberGard, mechanically attached	4	A,MA,75
1/2	A	C	Deck: Slip Sheet: two layers with preliminary attachment a) "VersaShield Underlayment" b) "VersaShield FB-2S" Insulation: (optional) ISO 95+ GL any thickness Membrane: .045 or .060 LS-FR RubberGard, mechanically attached	4	A,MA,88 A,MA,89
1/2	A	C	Deck: Slip Sheet: two layers of "VersaShield FB-1S" with preliminary attachment Insulation: (optional) ISO 95+ GL any thickness, preliminary attachment Membrane: .045 or .060 LS-FR RubberGard, mechanically attached	4	A,MA,90

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating 1/2" gypsum board or 1/4" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 LS-FR RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
¼	B	C	Deck: Slip Sheet: One or more layers of "MB Base Sheet" Insulation: a) min 1-1/2" ISO 95+ GL b) min. 1" FiberTop B, C, E, S c) min. 1/2" FiberTop B, C, E, S over min. 1" ISO 95+ GL Membrane: .045 or .060 LS-FR RubberGard, mechanically attached	4	B,MA,10
¼	B	C	Deck: Insulation: One of the following directly applied to the deck a) min. 1" FiberTop B, C, E, S b) min. 1/2" FiberTop B, C, E, S over min. 1-1/2" ISO 95+ GL Membrane: .045 or .060 LS-FR RubberGard, mechanically attached	4	B, MA,13
½	B	C	Deck: Slip Sheet: One or more layers of Atlas "FR 50" Membrane: .045 or .060 LS-FR RubberGard, mechanically attached	4	B,MA,05
½	B	C	Deck: Slip Sheet: one layer with preliminary attachment a) "VersaShield Underlayment" b) "VersaShield FB-2S" Membrane: .045 or .060 LS-FR RubberGard, mechanically attached	4	B,MA,15
½	A,B,C	C	Existing Roof System: Class A, B, or C BUR (smooth surface or cap sheet), to retain Existing Classification, cover with: Slip Sheet: "VersaShield Underlayment", one layer Membrane: .045 or .060 LS-FR RubberGard, mechanically attached		MR,02

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 FIRE RETARDANT RUBBERGARD®
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3-1/2	A	NC	Deck: Insulation: (opt) any thickness a) any UL Classified insulation Cover board: min. ¼" Georgia-Pacific "Dens-Deck" Membrane: .045 or .060 Fire Retardant RubberGard, mechanically attached	1,4	A,MA,21
2 ¼	A	NC	Deck: Insulation: any thickness polystyrene (expanded or extruded) Cover board: min. ½" FiberTop B, C, E or S Membrane: .045 or .060 Fire Retardant RubberGard, mechanically attached	1,4	A,MA,08
2	A	NC	Deck: Insulation: (optional) any thickness a) any UL Classified insulation Cover board: min. ½" Firestone "FiberTop B, C,E or S" Membrane: .045 or .060 Fire Retardant RubberGard, mechanically attached	1,4	A,MA,12
1	A	NC	Deck: Insulation: any thickness a) "ISO 95+ GL" b) AC Foam II Membrane: .045 or .060 Fire Retardant RubberGard, mechanically attached	1,4	A,MA,10
¾	A	NC	Deck: Insulation: any thickness a) Apache Pyrox Membrane: .045 or .060 Fire Retardant RubberGard, mechanically attached	1,4	A,MA,17

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045, .060 or .075 RUBBERGARD® MAX
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
1 ½	A	C/NC	Deck: Insulation: (optional) any thickness a) any UL Classified insulation Cover board: ¼" min. Georgia-Pacific "Dens-Deck" Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	1,3,4	A,MA,15*
1 ¼ 1 ¼	A A	NC C(2)	Deck: Insulation: (optional) any thickness a) any UL Classified insulation Cover board: ½" min. Firestone "FiberTop B, C, E or S" Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	1,2,3,4	A,MA,81
1 ¼	A	NC	Deck: Structural concrete Insulation (optional) min ½" FiberTop B, C, E or S Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	1,2,4	A,MA,78
½ ½	A A	NC C(2)	Deck: Insulation: any thickness a) "ISO 95+ GL" Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	1,2,4	A,MA,80
½	A	C	Deck: Slip Sheet: two layers of "VersaShield Underlayment", "VersaShield FB-2S" or "VersaShield FB-1S" Insulation: (optional) any thickness a) ISO 95+ GL Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	4	A,MA,88 A,MA,89 A,MA,90
½	A	C	Deck: Slip Sheet: Two or more layers of Atlas "FR 50", mechanically attached Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	4	A,MA,75

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½" gypsum board or ¼" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

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UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045, .060 or .075 RUBBERGARD® MAX
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
½	B	C	Deck: Slip Sheet: One or more layers of “MB Base Sheet” Insulation: a) min 1-1/2” ISO 95+ GL b) min. 1” FiberTop B, C, E, S c) min. 1/2” FiberTop B, C, E, S over min. 1” ISO 95+ GL Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	4	B,MA,09
½	B	C	Deck: Insulation: a) min. 1” FiberTop B, C, E, S b) min. 1/2” FiberTop B, C, E, S over min. 1-1/2” ISO 95+ GL Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	4	B,MA,12
½	B	C	Deck: Slip Sheet: One or more layers of Atlas “FR 50” Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	4	B,MA,05
½	B	C	Deck: Slip Sheet: one or more layers with preliminary attachment a) “VersaShield Underlayment” b) “VersaShield FB-2S” Membrane: .045, .060, .075 RubberGard MAX, mechanically attached	4	B,MA15
½	A,B,C	C	Existing Roof System: Class A, B, or C BUR (smooth surface or cap sheet), to retain Existing Classification, cover with: Slip Sheet: “VersaShield Underlayment”, one layer Membrane: .045, .060, .075 RubberGard MAX, mechanically attached		MR,02

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½” gypsum board or ¼” Georgia-Pacific “Dens-Deck” directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

“The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes.”

UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 RUBBERGARD® MAX FR
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
4	A	NC	Deck:	1,2,3	A,MA,71
4	A	C(2)	Insulation: a) any UL Classified insulation Coverboard: a) min. ½” Firestone “FiberTop B, C, E, S”, b) min. ¼” Georgia-Pacific “Dens-Deck” c) min. 7/16” plywood or OSB Membrane: .045 , .060 RubberGard MAX FR, mechanically attached		
2-1/2	A	NC	Deck:	1	A,MA,70
2-1/2	A	C(4)	Insulation: Any thickness a) “ISO 95+ GL” Membrane: .045 , .060 RubberGard MAX FR, mechanically attached		
2	A	C	Deck: Slip Sheet: two layers a) “VersaShield Underlayment”, b) “VersaShield FB-2S” Insulation: (optional) any thickness Insulation: any thickness a) ISO 95+ GL Membrane: .045, .060, .075 RubberGard MAX FR, mechanically attached	4	A,MA,89
1-1/2	A	C	Deck: Slip Sheet: two layers a) “VersaShield Underlayment”, b) “VersaShield FB-2S” Membrane: .045, .060, .075 RubberGard MAX FR, mechanically attached	4	A,MA,88

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating ½” gypsum board or ¼” Georgia-Pacific “Dens-Deck” directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

“The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes.”

UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 RUBBERGARD® MAX FR
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
3/4	A	C	Deck: Slip Sheet: two layers a) "VersaShield FB-1S" Insulation: (optional) any thickness a) ISO 95+ GL Membrane: .045, .060, .075 RubberGard MAX FR, mechanically attached	4	A,MA,90
1/2	A	C	Deck: Slip Sheet: Two or more layers of Atlas "FR 50" Membrane: .045 , .060 RubberGard MAX FR, mechanically attached	4	A,MA,75
1	B	C	Deck: Slip Sheet: One or more layers of "MB Base Sheet" Insulation: a) min 1-1/2" ISO 95+ GL b) min. 1" FiberTop B, C, E, S c) min. 1/2" FiberTop B, C, E, S over min. 1" ISO 95+ GL Membrane: .045 , .060 RubberGard MAX FR, mechanically attached	4	B,MA,11
1	B	C	Deck: Insulation: a) min. 1" FiberTop B, C, E, S b) min. 1/2" FiberTop B, C, E, S over min. 1-1/2" ISO 95+ GL Membrane: .045 , .060 RubberGard MAX FR, mechanically attached	4	B,MA,14
1/2	B	C	Deck: Slip Sheet: One or more layers of Atlas "FR 50" Membrane: .045 , .060 RubberGard MAX FR, mechanically attached	4	B,MA,05

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating 1/2" gypsum board or 1/4" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

UL CLASS A, B, C

SYSTEM: MECHANICALLY ATTACHED
MEMBRANE: .045 or .060 RUBBERGARD® MAX FR
CONSTRUCTION: NEW, RETROFIT OR TEAR-OFF

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
1-1/2	A,B,C	C	Existing Roof System: Class A, B, or C BUR (smooth surface or cap sheet), to retain Existing Classification, cover with: Slip Sheet: "VersaShield Underlayment", one layer Membrane: .045 , .060 RubberGard MAX FR, mechanically attached		MR,02

- 1) I.S.O.FIX, I.S.O.Spray, I.S.O. Twin Pack or hot asphalt may be used to attach insulation to deck and/or insulation to insulation or coverboards and maintain the above rating shown. Consult Firestone Technical for acceptable combinations for warranty purposes.
- 2) UL Classification can be maintained, at the slope indicated, over a combustible deck by incorporating 1/2" gypsum board or 1/4" Georgia-Pacific "Dens-Deck" directly on the combustible deck.
- 3) When polystyrene is placed over metal decks most building codes require a thermal barrier to be placed beneath the polystyrene
- 4) PC-100 Acrylic Coating may be added as an option and retain the rating shown at the slope indicated.
- 5) Consult the insulation manufacturer for suitability of the insulation for use with fully adhered systems.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

II. INTERNAL FIRE RATINGS

In order to determine the resistance of a building to internal sources of fire, Underwriters Laboratories has conducted extensive testing and classification of wall, floor/ceiling and roof/ceiling assemblies. UL classified assemblies are rated according to the time in hours the assembly will contain a fire and still maintain structural integrity. Testing is conducted in accordance with UL Standard 263 (ASTM E-119), which is recognized by all major building codes.

Roof/Ceiling Assemblies are listed in the UL Fire Resistance Directory - Vol. 1 under the prefix "P" and are classified by hourly fire rating according to the type of protection used to contain a fire:

ASSEMBLY	PROTECTION USED
P000 - P099	Concealed grid suspended ceiling
P200 - P299	Exposed grid suspended ceiling
P400 - P499	Metal lathe (plaster) ceiling
P500 - P599	Gypsum board ceiling
P600 - P699	Miscellaneous fireproofing
P700 - P799	Spray-Applied Resistive Material
P800 - P899	Spray-Applied Resistive Material
P900 - P999	Unprotected concrete or composite decks

It should be noted that the roof membrane forms only a small part of the total roof/ceiling assembly. In order for a structure to qualify for a particular "P" Assembly or Roof Deck Construction, all materials used to construct the assembly (including roof decking, ceiling materials, light fixtures, duct work and structural support members) must be UL classified and installed as described in the appropriate UL Directories.

The insulations listed with each of the following "P" Assemblies are not, in most cases, the only UL accepted insulations for that assembly. Consult the UL Fire Resistance Directory - Vol. 1 for "P" Assembly information and the UL Roofing Materials and Systems Directory for Roof Deck Construction information, or call Firestone Technical Services for additional accepted insulations.

UL has indicated on page 8 of the 2006 Fire Resistance Directory - Vol. 1 that "Class A, B or C roof coverings consisting of hot mopped or cold applied bituminous materials or a roof covering material Classified under 'Roofing Membranes' (CHCI) may be applied directly to the concrete or wood surface of floor designs being used as roofs without a reduction of fire resistance ratings." They further state on page 8 that "Roof insulation is to be carefully controlled relative to manufacturer, type and thickness as specified. Less than the specified thickness could result in higher temperatures on the roof covering while a greater thickness of insulation could cause earlier structural failure. Classified polystyrene insulation, with a density of 5 pcf or less, may be placed on concrete floors or structural concrete roofs without reducing the assembly rating. When ...polyisocyanurate insulation are used over concrete in D 900 Series Designs, the unrestrained beam rating shall be increase by a minimum of ½ hour."

Roof Deck Constructions are listed in the UL Roofing Materials and Systems Directory and are rated according to the interior flame spread of the assembly as compared to the flame spread of a typical built-up roof installed over a metal deck (UL 1256). Roof Deck Constructions may also be classified according to wind uplift performance. The fire rating of a UL Roof Deck Construction is similar to the Factory Mutual Class I internal fire (calorimeter) rating and they are deemed equivalent by the Model Building Code Agencies.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

UL ROOF DECK CONSTRUCTIONS AND "P" ASSEMBLIES

DECK CONSTRUCTIONS

Firestone EPDM Roofing Systems are Classified for use in the following Deck Construction (tested to UL 1256).

1, 2, 9, 14, 120, 123, 158, 200, 219, 237, 260, 276, 289, 292, 325, 374, 411, 412, 413, 419, 421, 440, 441, 444, 457, and 458

Consult Roof Deck Constructions (TGKX) in the UL Roofing Materials and Systems Directory, your regional technical coordinator or the Firestone Codes Department for an acceptable insulation for use in these constructions.

"P" ASSEMBLIES

Firestone's EPDM Roofing Systems are Classified for use in the following Hourly Roof / Ceiling Designs ("P" Designs).

P211, P214, P215, P216, P224, P 225, P227, P229, P230, P231, P232, P235, P237, P241, P242, P246, P251, P259, P405, P406, P407, P410, P411, P505, P507, P508, P509, P510, P511, P 513, P514, P519, P701, P708, P709, P710, P711, P712, P713, P717, P718, P719, P720, P722, P 723, P724, P725, P726, P727, P728, P729, P730, P731, P732, P733, P734, P735, P736, P737, P738, P739, P801, P802, P803, P804, P805, P810, P811, P812, P813, P814, P815, P816, P817, P818, P819, P822, P823, P825, P826, P827, P902, P903, P904, P905, P906 P907, P908, P909, P910, P911, P912, P913, P914, P915, P916 P917, P918, P919, P920, P921, P922, P923, P924, P925, P926, P927, P928, P929, P930, P931.

Consult Fire Resistance Ratings (BXUV) in the UL Fire Resistance Directory, your regional technical coordinator or the Firestone Codes Department for an acceptable insulation, thickness and additional requirements.

Note: The accepted insulation must be used in a UL Class A, B or C rated roofing assembly. UL acceptable system (e.g. adhering EPDM to Perlite or Fiberglass) listed for "P" design may not be approved for installation and warranty by Firestone. Contact Firestone Specifications and/or your Firestone Regional Technical Coordinator concerning acceptance. Please refer to Pages 3 through 27 of this Approval Guide to determine the appropriate insulation/membrane assembly.

UPLIFT RATINGS

FACTORY MUTUAL UPLIFT RATINGS

Although Factory Mutual Class 1 Approvals cover a wide range of testing of roofing products, including tests for fire resistance, corrosion resistance, fuel contribution and hail damage, Factory Mutual Approvals are known best for the uplift resistance, 1-60, 1-90, etc. afforded by an FM Approved roofing assembly:

FM 1-60 assemblies have been tested to withstand 60 psf air pressure applied for a period of one minute as well as one minute at the 30 and 45 psf levels.

FM 1-90 assemblies have been tested to withstand 90 psf air pressure applied for a period of one minute as well as one minute at the 30, 45, 60 and 75 psf levels.

Higher uplift ratings are possible based on the deck type and its attachment, fastener density and row spacing where applicable.

When Factory Mutual 1-60 or 1-90 uplift ratings are specified, additional insulation attachment and reduced perimeter and corner batten (in-seam plate or batten for Reinforced Systems) spacing will/may be required. Consult the current edition of Factory Mutual Loss Prevention Data Sheets 1-28 and 1-29 for instructions for determining the required corner and perimeter dimensions and reduced spacing and increased fastener densities.

BALLASTED SYSTEMS

Although Factory Mutual tests and rates only fully adhered and mechanically attached systems, Factory Mutual does accept the use of Ballasted Roof Systems on a job-to-job basis for FM insured clients. According to Mr. Edward J. Ward, Construction Standards Manager for Factory Mutual Research, "... the Factory Mutual system windstorm loss experience has been extremely favorable for single ply ballasted roof systems. When these roofs are installed in accordance with (Factory Mutual) Loss Prevention Data Sheet 1-29, they are equally acceptable to Factory Mutual approved roofs."

Page 45-47 of this Approval Guide provides a summary of FM's current guideline for ballasted roof systems.

FM UPLIFT ASSEMBLIES

SYSTEM: FULLY ADHERED (w/BA-2004)
MEMBRANE: PLATINUM
DECK: STEEL OR CONCRETE
CONSTRUCTION: NEW OR TEAR-OFF

<u>Insulation</u>	<u>Thickness</u>	<u>Notes</u>
ISO 95+ GL	1.5" to 12"	1,2
Georgia-Pacific "Dens-Deck" "Hailgard"	min. 1/4" min. 2.0"	1,2 1,2

Exterior Fire Ratings*

Table for systems adhered with BA-2004 Based Bonding Adhesive

Insulation	Platinum	Platinum / PC-100
ISO 95+ GL	A at max. 1/2:12	A at max. 1-1/2:12
Dens-Deck (coverboard)	A at max. 3:12	A at max. 4-1/2:12
Hailgard (as top layer)	A at max. 2:12	A at max. 4-1/2:12

* Exterior fire rating can be maintained over FM Approved Wood Decks (up to and including a maximum slope of 2:12) when min. 1/4" Georgia-Pacific "Dens-Deck" is placed directly on the Wood Deck under the insulation.

Insulation type and thickness	Fastener density	Uplift rating
Min. 1.5" ISO 95+ GL	12 AP/HD per 4 x 8 /insulation plate	1-90
Min. 1.5" ISO 95+ GL	18 AP/HD per 4 x 8 /insulation plate	1-120
Min. 2.0" ISO 95+ GL	8 AP/HD per 4 x 8 /insulation plate	1-90
1/4" and 3/8" Dens-Deck	15 AP/HD per 4 x 8 /insulation plate	1-90 (coverboard, recover or concrete deck only)
1/4" and 3/8" Dens-Deck Prime	12 AP/HD per 4 x 8 /insulation plate	1-90 (coverboard, recover or concrete deck only)
Min. 2.0" HailGard	16 AP/HD per 4 x 8 /insulation plate	1-150
7/16" OSB or 15/32" plywood (BA-2004 only)	16 AP/HD per 4 x 8 /insulation plate	1-150
Min. 2.0" Hailgard (BA-2004 only)	12 Hailgard fasteners per 4 x 8	1-90
7/16" OSB or 15/32" plywood (BA-2004 only)	12 Hailgard fasteners per 4 x 8	1-90
Min. 2.0" Hailgard (BA-2004 only)	20 Hailgard fasteners per 4 x 8	1-105
7/16" OSB or 15/32" plywood (BA-2004 only)	20 Hailgard fasteners per 4 x 8	1-105

- (1) See pages 34-39 for Firestone insulation fastening patterns.
- (2) For 1-60 and 1-75 assemblies, insulation fastener density must be increased by 50% but not less than 1 per 2 sq. ft. in the perimeters and 100% but not less than 1 per 1 sq. ft. in the corners. For 1-90 and above must meet the pressures state in Table 1 of PDS 1-29 (2006) Example: field – 90 psf, perimeters – 150 psf, corners – 225 psf. Perimeter / corners are determined as 10% of the buildings lesser plan dimension or 40 % of the roof height, whichever is least, but not less than 3 feet.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

FM UPLIFT ASSEMBLIES

SYSTEM: FULLY ADHERED (w/BA-2004 or WBBA)
MEMBRANE: STANDARD, LS-FR, FIRE RETARDANT RUBBERGARD®
DECK: STEEL OR CONCRETE
CONSTRUCTION: NEW OR TEAR-OFF

Note:

<u>Insulation</u>	<u>Thickness</u>	<u>Notes</u>
ISO 95+ GL	1.0" to 12"	1,2,5
AC Foam II	1.4" to 12.5"	2,3,5
Multi-Max FA	1.5" to 4.0"	2,3,5
E'NRG'Y-2	1.4" to 12"	2,3,5
Hy-Therm AP	1.5" to 12"	2,3,5
Apache Pyrox	1.4" to 12"	2,3,5
Firestone FiberTop C, S	min. 1/2"	1,2,6
Firestone FiberTop B, E	min. 1/2"	1,2,6
Firestone FiberTop C, E, S	min. 1"	1,2,6
Georgia-Pacific "Dens-Deck"	min. 1/4"	1,2,6
Georgia-Pacific "Dens-Deck"	min. 1/2"	1,2,6
1/2" Firestone FiberTop C, S over EPS	1" to 6" (EPS)	1,2,4
1" Firestone FiberTop B, C, E, S over EPS	1" to 6" (EPS)	1,2,4
1/2" Firestone FiberTop B, E over EPS	1" to 6" (EPS)	1,2,4
OSB / plywood	7/16" (OSB), 15/32" Plywood	1,2,5

Exterior Fire Ratings*

Table for systems adhered with BA-2004 or Water Based Bonding Adhesive

Insulation	Standard EPDM	STD / PC-100	LS-FR	LS-FR / PC-100	FR EPDM
ISO's listed	C at max. 1/4:12	A at max. 3/4:12	A at max. 1/2:12	A at max. 3/4:12	A at max. 3/4:12
FiberTop	A at max. 1/4:12	A at max. 1:12	A at max 1:12	A at max. 1:12	A at max 1- 1/2:12
Dens-Deck	A at max. 1/4:12	A at max. 1:12	A at max 1:12	A at max. 1:12	A at max 1- 1/2:12
OSB/Plywood	A at max. 1/4:12	A at max. 1:12	A at max 1:12	A at max. 1:12	A at max 1- 1/2:12

* Exterior fire rating can be maintained over FM Approved Wood Decks (up to and including a maximum slope of 2:12) when min. 1/4" Georgia-Pacific "Dens-Deck" is placed directly on the Wood Deck under the insulation.

- (1) See pages 34-39 for Firestone insulation fastening patterns.
- (2) For 1-60 and 1-75 assemblies, insulation fastener density must be increased by 50% but not less than 1 per 2 sq. ft. in the perimeters and 100% but not less than 1 per 1 sq. ft. in the corners. For 1-90 and above must meet the pressures state in Table 1 of PDS 1-29 (2006) Example: field – 90 psf, perimeters – 150 psf, corners – 225 psf. Perimeter / corners are determined as 10% of the buildings lesser plan dimension or 40 % of the roof height, whichever is least, but not less than 3 feet.
- (3) Consult manufacturer for approved fasteners and fastening pattern and suitability of insulation with fully adhered system.
- (4) Polystyrene are those manufactured from ARCO, BASF, Hunstman, Dow (max. 10-1/2") and UC Industries (max. 4"), see specific polystyrene manufacturers FM Approval for Installation requirements; 5/8" Type X gypsum, 1/2" Dens-Deck" or 3/4" perlite thermal barrier required over steel decks (see manufacturers Approval listing for specifics).
- (5) As an option, this insulation (single or multiple layers) may be attached to new concrete deck with a 20-25 lb. /sq. flood coat of Type III asphalt. Optional, min. 1/2 inch FiberTop woodfiber may be adhered to the insulation with asphalt.
- (6) Acceptable uplift rating for use over structural concrete, recover applications or as top layer in a multi-layer assembly on steel decks, but may not be used by itself on a steel deck.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

FM UPLIFT ASSEMBLIES

SYSTEM: FULLY ADHERED
MEMBRANE: RUBBERGARD® MAX or MAX FR
DECK: STEEL OR CONCRETE
CONSTRUCTION: NEW OR TEAR-OFF

Note:

<u>Insulation</u>	<u>Thickness</u>	<u>Notes</u>
ISO 95+ GL	1.0" to 12"	1,2,5
AC Foam II	1.4" to 12.5"	2,3,5
Multi-Max FA	1.5" to 4.0"	2,3,5
E'NRG'Y-2	1.4" to 12"	2,3,5
Hy-Therm AP	1.5" to 12"	2,3,5
Apache Pyrox	1.4" to 12"	2,3,5
Firestone FiberTop C, S	1/2"	1,2,6
Firestone FiberTop B, E	1/2"	1,2,6
Firestone FiberTop C, E, S	1"	1,2,6
Georgia-Pacific "Dens-Deck"	1/4"	1,2,6
Georgia-Pacific "Dens-Deck"	1/2"	1,2,6
1/2" Firestone FiberTop C, S over EPS	1" to 6" (EPS)	1,2,4,6
1" Firestone FiberTop B, C, E, S over EPS	1" to 6" (EPS)	1,2,4,6
1/2" Firestone FiberTop B, E over EPS	1" to 6" (EPS)	1,2,4,6
OSB / plywood	7/16" (OSB), 15/32" Plywood	1,2,6

External Fire Ratings*

Table for systems adhered with BA-2004 or Water Based Bonding Adhesive

Insulation	MAX (w/BA-2004 or WBBA)	MAX FR (w/BA-2004)	MAX FR(w/WBBA)
ISO	A at max. ¼:12	A at max. 2-1/2:12	A at max. 2:12
WFB	A at max. ½:12	A at max. 4:12	A at max. 2-1/2:12
Dens-Deck	A at max. ½:12	A at max. 4:12	A at max. 2-1/2:12
OSB / Plywood	A at max. ½:12	A at max. 4:12	A at max. 2-1/2:12

* Exterior fire rating can be maintained over FM Approved Wood Decks (up to and including a maximum slope of 2:12) when min. ¼" Georgia-Pacific "Dens-Deck" is placed directly on the Wood Deck under the insulation.

- (1) See pages 34-39 for Firestone insulation fastening pattern.
- (2) For 1-60 and 1-75 assemblies, insulation fastener density must be increased by 50% but not less than 1 per 2 sq. ft. in the perimeters and 100% but not less than 1 per 1 sq. ft. in the corners. For 1-90 and above must meet the pressures state in Table 1 of PDS 1-29 (2006) Example: field – 90 psf, perimeters – 150 psf, corners – 225 psf. Perimeter / corners are determined as 10% of the buildings lesser plan dimension or 40 % of the roof height, whichever is least, but not less than 3 feet.
- (3) Consult manufacturer for approved fasteners and fastening pattern and suitability of insulation with fully adhered system.
- (4) Polystyrene are those manufactured from ARCO, BASF, Hunstman, Dow (max. 10-1/2") and UC Industries (max. 4"), see specific polystyrene manufacturers FM Approval for Installation requirements; 5/8" Type X gypsum, 1/2" Dens-Deck" or 3/4" perlite thermal barrier required over steel decks (see manufacturers Approval listing for specifics).
- (5) As an option, this insulation (single or multiple layers) may be attached to new concrete deck with a 20-25 lb. /sq. flood coat of Type III asphalt. Optional, min. ½ inch FiberTop woodfiber may be adhered to the insulation with asphalt.
- (6) Acceptable uplift rating for use over structural concrete, recover applications or as top layer in a multi-layer assembly on steel decks, but may not be used by itself on a steel deck.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

**FACTORY MUTUAL APPROVED
FIRESTONE FULLY ADHERED SYSTEMS
and
FASTENING PATTERNS INSULATIONS**

1. Minimum 22 gauge steel deck.
- 2.

Note: For 1-60 and 1-75 assemblies, insulation fastener density must be increased by 50% but not less than 1 per 2 sq. ft. in the perimeters and 100% but not less than 1 per 1 sq. ft. in the corners. For 1-90 and above must meet the pressures state in Table 1 of PDS 1-29 (2006) Example: field – 90 psf, perimeters – 150 psf, corners – 225 psf.

- a) Uplift rating based on thickness of the mechanically attached insulation layer, fastener density and bonding adhesive used (see charts/diagrams below for ratings and requirements).
- b) I.S.O.Spray or Asphalt attached second (and succeeding) layer(s) of ISO 95+ GL - Nail-one, mop-one application.

The bottom layer of ISO 95+GL must be the minimum thickness to provide the required uplift rating. This first layer is attached with Firestone AP or HD fastener/metal plates at the density required to achieve the proposed uplift rating requested (1-60, 1-75, 1-90, or 1-120) for that minimum thickness. Fastener/plate density to be increased in the perimeters and corners as required. A second layer of ISO 95+ GL (minimum 0.5 inch thickness), either tapered or flat, is adhered to the first layer with I.S.O.Spray or hot asphalt (minimum 20-25 lbs/sq.). Additional layers, tapered or flat, may be I.S.O.Spray or asphalt attached to the previous layer up to a total thickness of 12 inches of ISO 95+ GL. Optional, a layer of ½” FiberTop wood Fiberboard (maximum 1-90 rating) may be set in I.S.O.Spray or hot moped to the top layer of ISO 95+ GL.

- c) I.S.O.FIX
 - a. Min. 1.5” ISO 95+ GL (flat or tapered) attached with 1 AP or HD fastener/plate per 2 sq. ft. Optional second layer of ISO 95+ GL (flat or tapered) is secured to the first layer of insulation with I.S.O.FIX with ¾” to 1” beads 12” o.c. Optional third layer of ISO 95+ GL (flat or tapered) can be set in I.S.O.FIX . Total insulation thickness – 12”. An optional layer of ¼” Dens-Deck OR ½” FiberTop Wood Fiberboard can be attached to the top layer of ISO 95+ GL, any Approved Firestone EPDM adhered with BA-2004, achieves 1-90.
 - d) For Non-Firestone insulations contact the manufacturer for the uplift ratings proper fastener type and density.

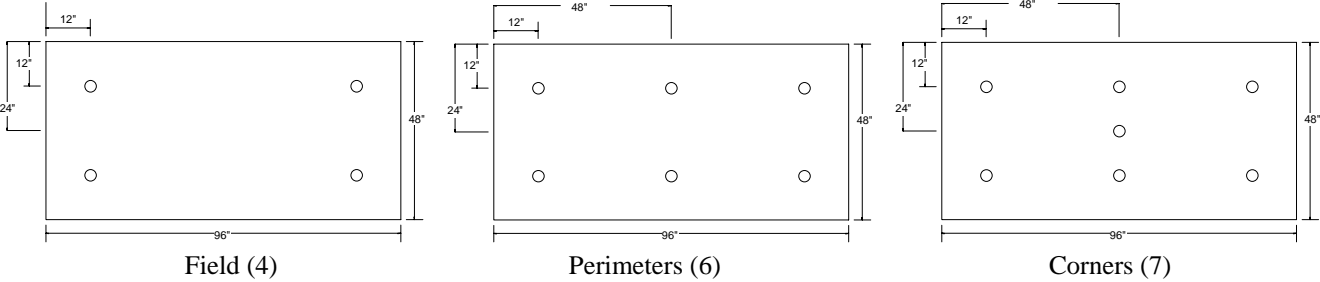
Any Approved Firestone EPDM (Standard, LS-FR, FR, MAX, MAX FR or Platinum) roof cover may be fully adhered to the top layer of insulation and meet the uplift performance of the mechanically attached layer based on its attachment and thickness requirements.

Insulation type and thickness	Fastener density	Uplift rating
Min. 1.0" ISO 95+ GL	12 AP/HD per 4 x 8 /insulation plate	1-75 (coverboard, recover or concrete deck only)
Min. 1.5" ISO 95+ GL	10 AP/HD per 4 x 8 /insulation plate	1-60
Min. 1.5" ISO 95+ GL	12 AP/HD per 4 x 8 /insulation plate	1-90
Min. 1.5" ISO 95+ GL	18 AP/HD per 4 x 8 /insulation plate	1-120
Min. 2.0" ISO 95+ GL	8 AP/HD per 4 x 8 /insulation plate	1-90
Min. 7/16" OSB or 15/32"plywood	16 AP/HD per 4 x 8 /insulation plate	1-150 (coverboard, recover or concrete deck only)
Min. 7/16" OSB or 15/32"plywood	12 Hailgard fasteners per 4 x 8	1-90 (coverboard, recover or concrete deck only)
Min. 7/16" OSB or 15/32"plywood	20 Hailgard fasteners per 4 x 8	1-105 (coverboard, recover or concrete deck only)
Min. 1/2" FiberTop B, E	16 AP/HD per 4 x 8 /insulation plate	1-90 (coverboard, recover or concrete deck only)
Min. 1/2" FiberTop C, S	16 AP/HD per 4 x 8 /insulation plate	1-60 (coverboard, recover or concrete deck only)
1/4" and 3/8" Dens-Deck	15 AP/HD per 4 x 8 /insulation plate	1-90 (coverboard, recover or concrete deck only)
1/4" and 3/8" Dens-Deck Prime	12 AP/HD per 4 x 8 /insulation plate	1-90 (coverboard, recover or concrete deck only)
Min. 2.0" HailGard	16 AP/HD per 4 x 8 /insulation plate	1-150
Min. 2.0" HailGard	12 Hailgard fasteners per 4 x 8	1-90
Min. 2.0" HailGard	20 Hailgard fasteners per 4 x 8	1-105

Fastener / Plate Density Chart
for 4 x 8 boards

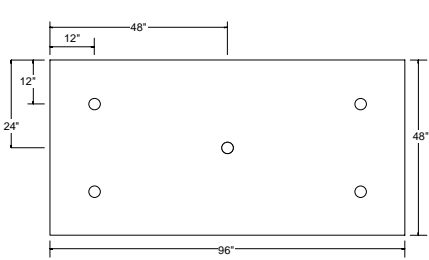
Field	Perimeters	Corners		Field	Perimeters	Corners
4	6	7		15	23	27
5	8	9		16	24	28
6	9	11		17	26	30
7	11	13		18	27	32
8	12	14		19	29	34
9	14	16		20	30	35
10	15	18		21	32	37
11	17	20		22	33	39
12	18	21		23	35	41
13	20	23		24	36	42
14	21	25				

Fastener Patterns

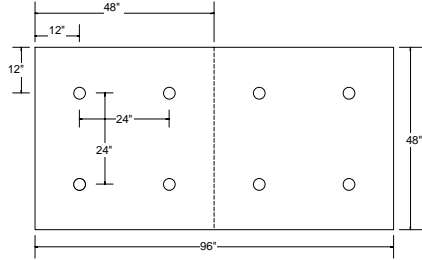


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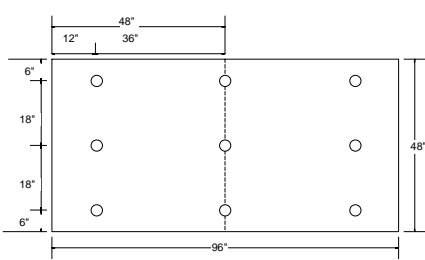
Fastener Patterns



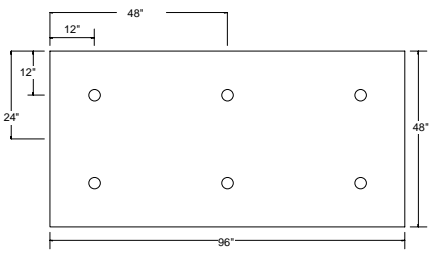
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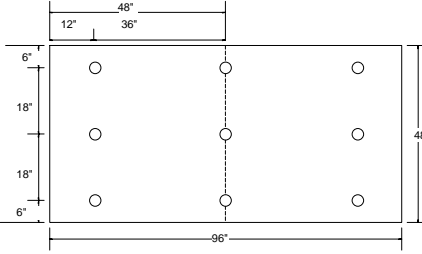
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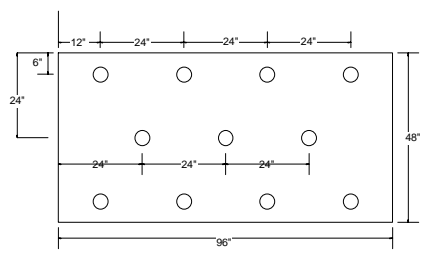
Corners (9)



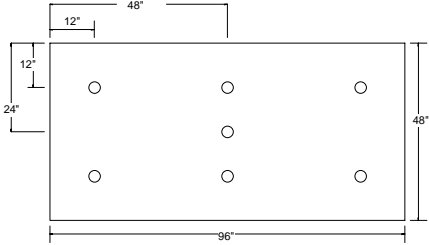
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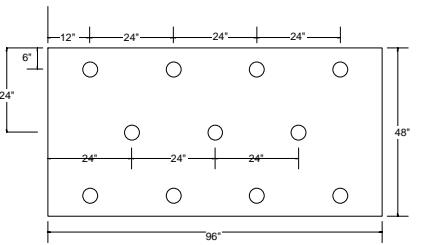
Perimeters (9)



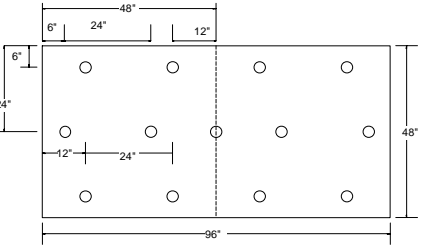
Corners (11)



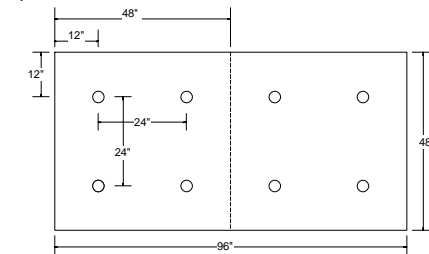
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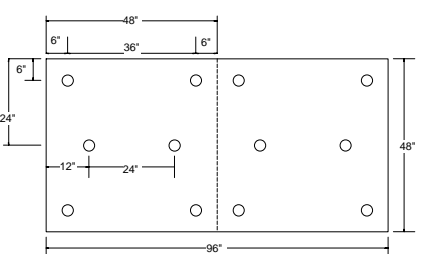
Perimeters (11)



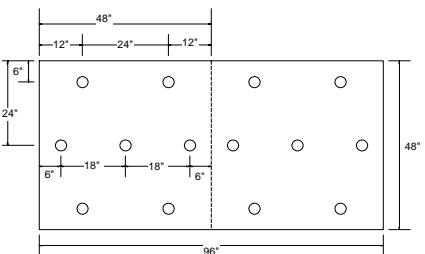
Corners (13)



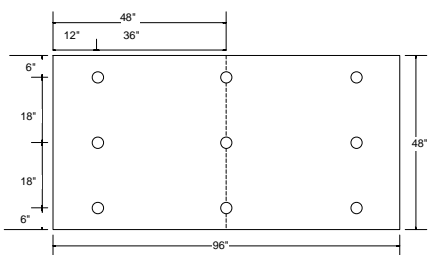
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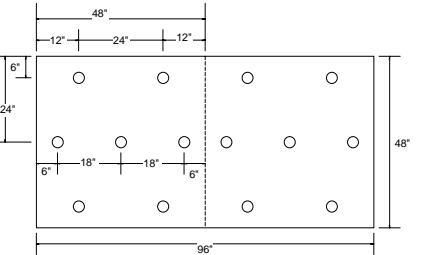
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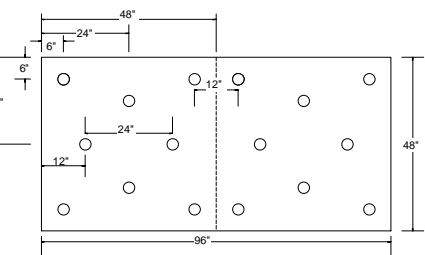
Corners (14)



Field (9)



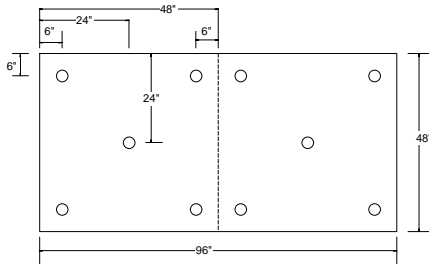
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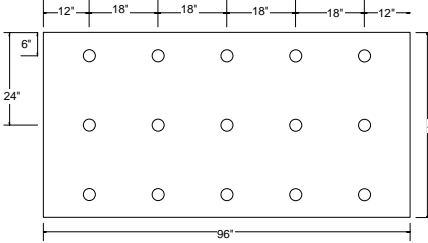
Corners (16)

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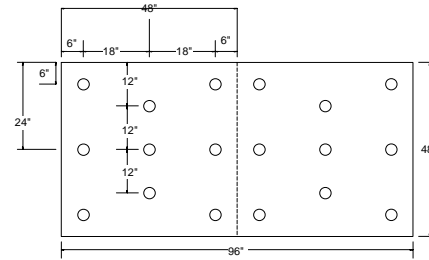
Fastener Patterns



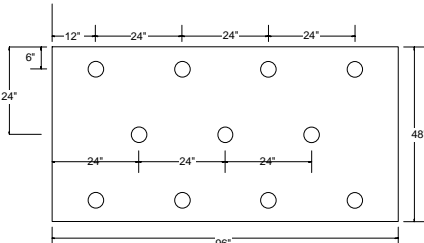
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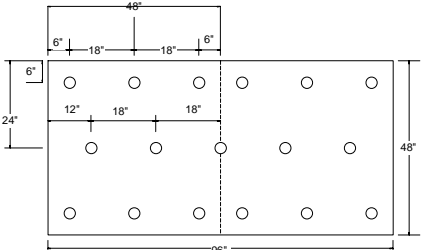
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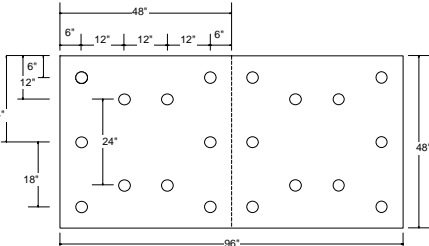
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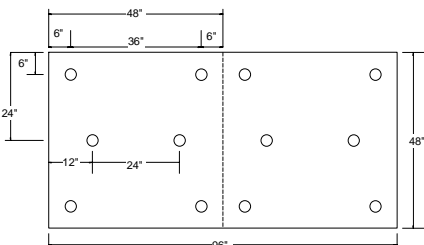
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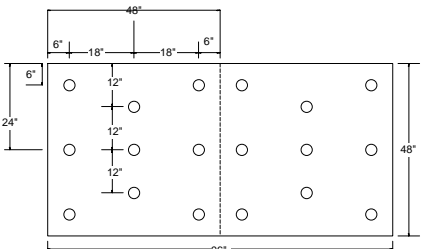
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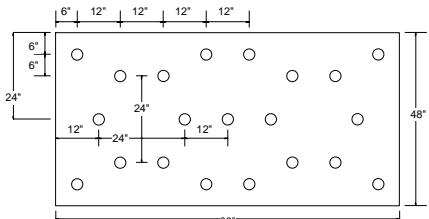
Corners (20)



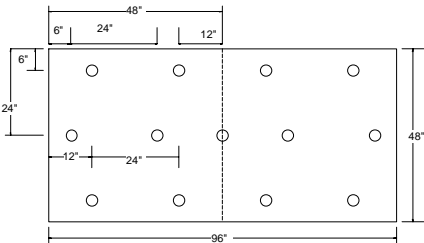
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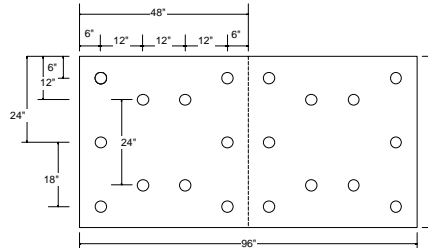
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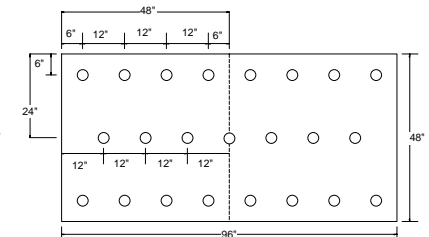
Corners (21)



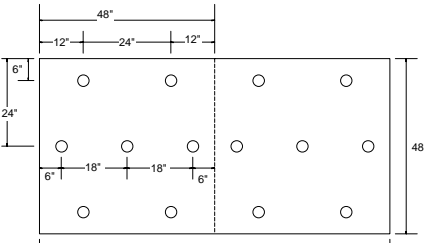
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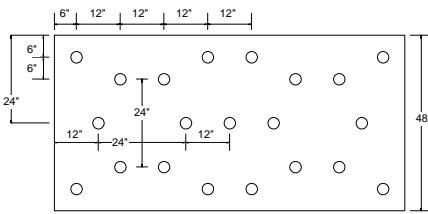
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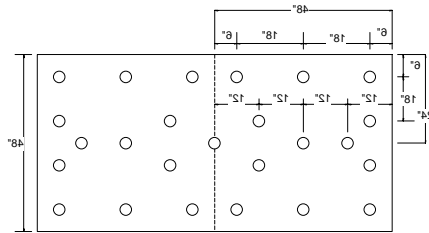
Corners (23)



Field (14)



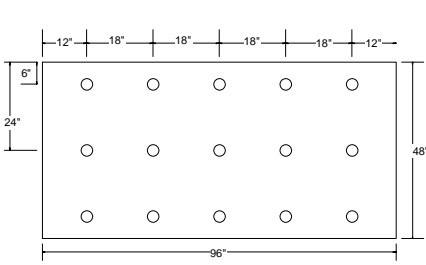
Perimeters (21)



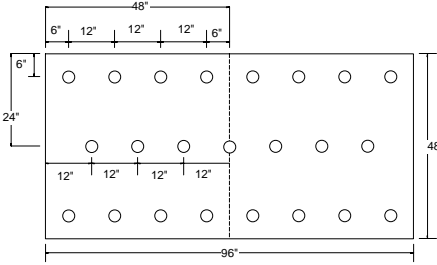
Corners (25)

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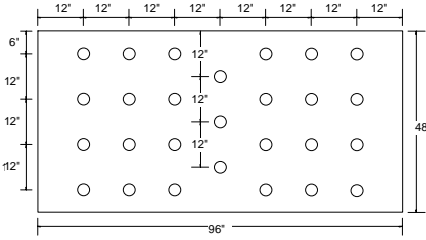
Fastener Patterns



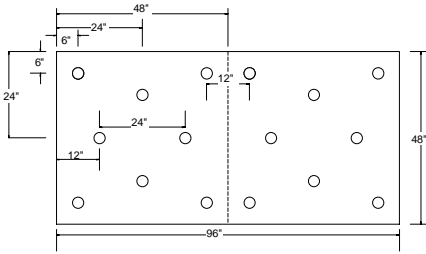
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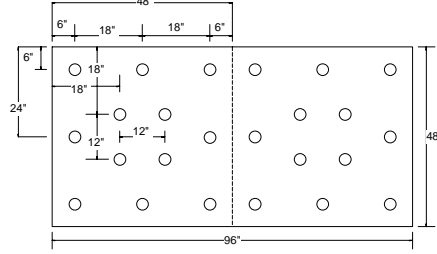
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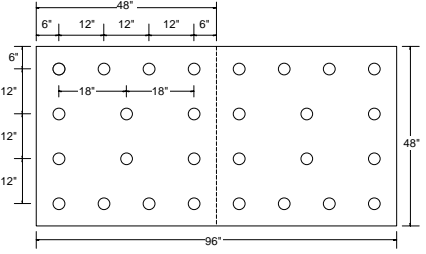
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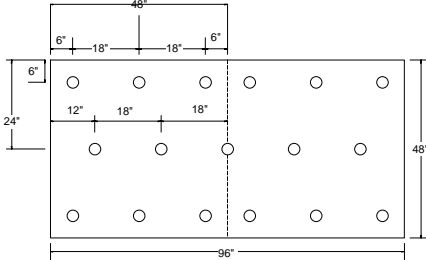
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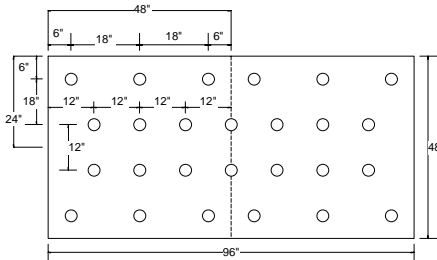
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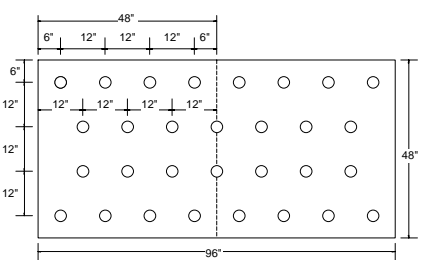
Corners (28)



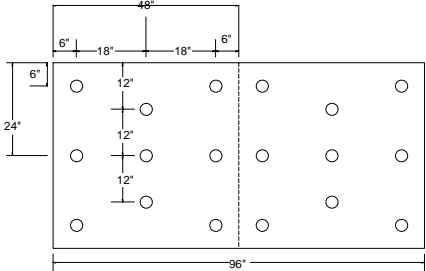
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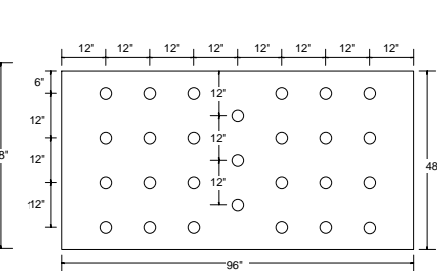
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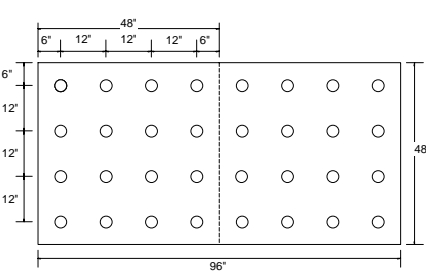
Corners (30)



Field (18)



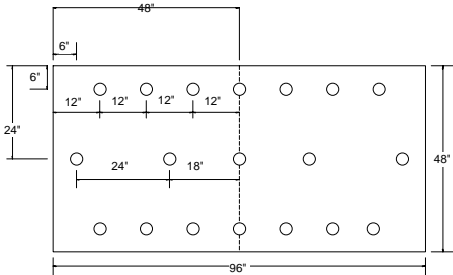
Perimeters (27)



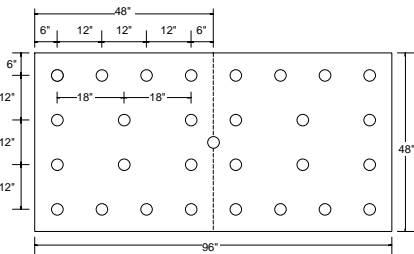
Corners (32)

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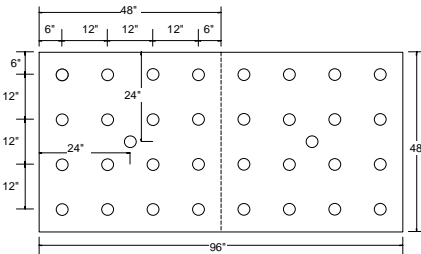
Fastener Patterns



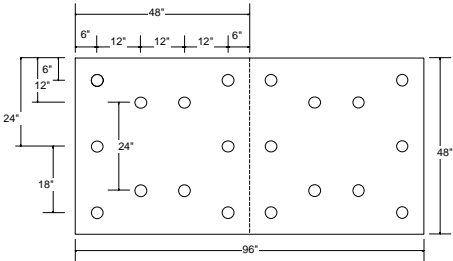
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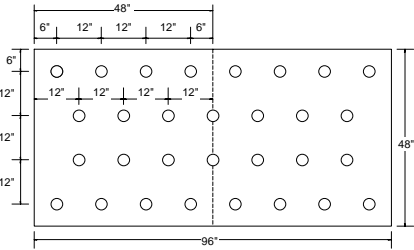
Perimeters (29)



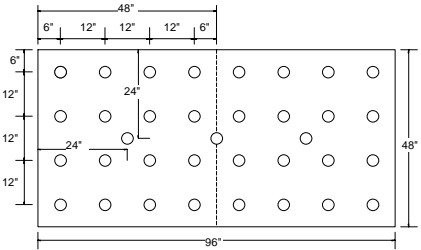
Corners (34)



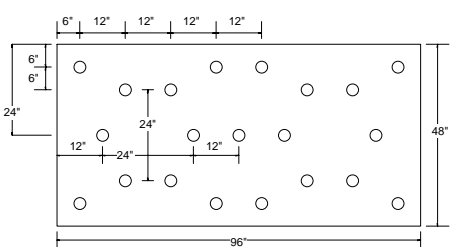
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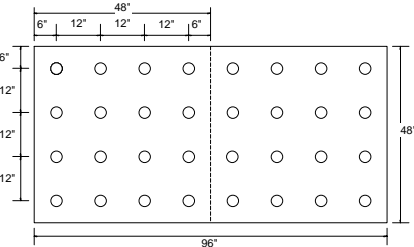
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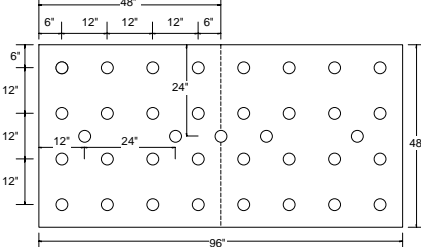
Corners (35)



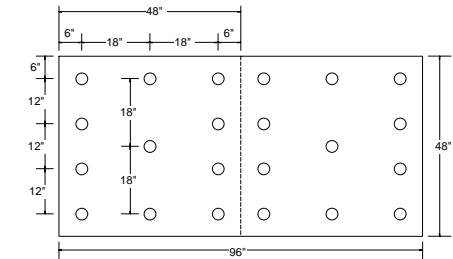
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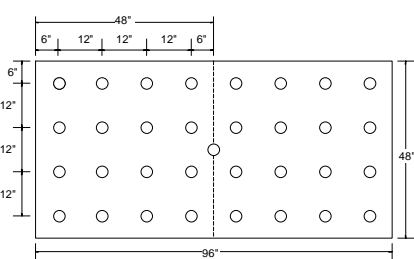
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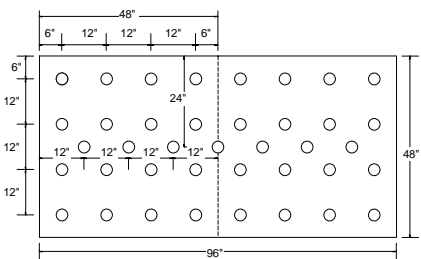
Corners (37)



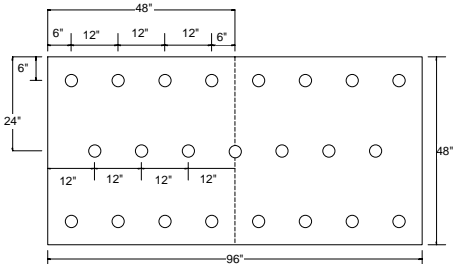
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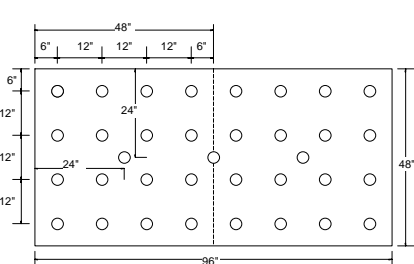
Perimeters (33)



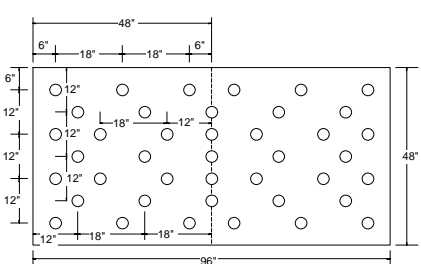
Corners (39)



Field (23)



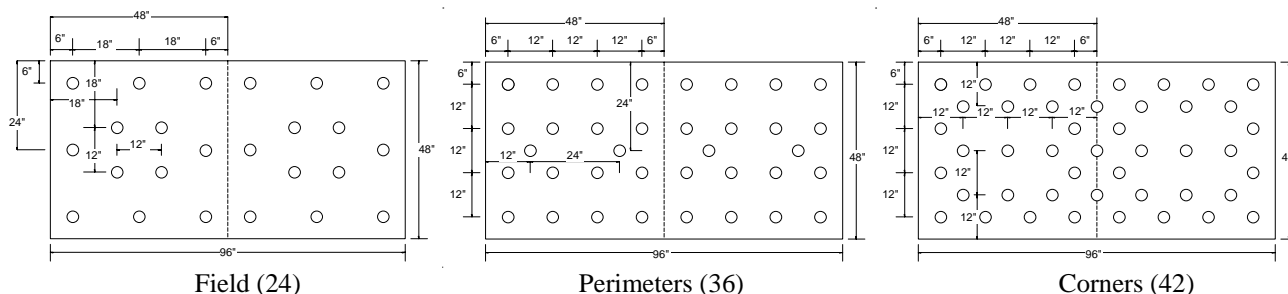
Perimeters (35)



Corners (41)

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Fastener Patterns



2. Structural concrete deck

- a) Mechanically attachment, as required for steel deck, is acceptable over structural concrete with the appropriate Firestone fastener. Maintains same rating as steel deck application
- b) Mopped Systems – concrete deck
 1. Min. 1.5" ISO 95+ GL or tapered ISO 95+ GL (min. ½" start, max. ¼" taper) mopped to structural concrete (multiple layers acceptable), any Approved Firestone EPDM adhered with BA-2004, **achieves 1-390 rating**
 2. Min. 1.5" ISO 95+ GL or tapered ISO 95+ GL (min. ½" start, max. ¼" taper) mopped to structural concrete (multiple layers acceptable), min. ¼" Georgia-Pacific "Dens-Deck" mopped to the ISO 95+ GL, any Approved Firestone EPDM adhered with BA-2004, **achieves 1-330 rating**
 3. Min. 1.5" ISO 95+ GL or tapered ISO 95+ GL (min. ½" start, max. ¼" taper) mopped to structural concrete (multiple layers acceptable), min. ½" FiberTop Wood Fiberboard mopped to the ISO 95+ GL, any Approved Firestone EPDM adhered with BA-2004, **achieves 1-195 rating**
- c) I.S.O.Spray Systems – concrete deck
 1. Min. 1.5" ISO 95+ GL (Flat stock only) is set in full bed of I.S.O.Spray (multiple layers of flat stock to a max. of 12" acceptable), any Approved Firestone EPDM adhered with BA-2004, **achieves 1-780 rating**
 2. Min. 1.5" ISO 95+ GL or tapered ISO 95+ GL (min. ½" start, max. ¼" taper) set in full bed of I.S.O.Spray to structural concrete (multiple layers acceptable), min. ¼" Georgia-Pacific "Dens-Deck" set in full bed of I.S.O.Spray to the ISO 95+ GL, any Approved Firestone EPDM adhered with BA-2004, **achieves 1-690 rating**
 3. Min. 1.5" ISO 95+ GL or tapered ISO 95+ GL (min. ½" start, max. ¼" taper) set in full bed of I.S.O.Spray to structural concrete (multiple layers acceptable), min. ½" FiberTop Wood Fiberboard set in full bed of I.S.O.Spray to the ISO 95+ GL, any Approved Firestone EPDM adhered with BA-2004, **achieves 1-510 rating**
- d) I.S.O.FIX – concrete deck
 1. Min. 1.5" ISO 95+ GL (flat or tapered) secured to concrete with I.S.O.FIX with ¾" to 1" beads 12" o.c. Optional second layer of ISO 95+ GL (flat or tapered) is secured to the first layer of insulation with I.S.O.FIX with ¾" to 1" beads 12" o.c. An optional layer of ½" FiberTop Wood Fiberboard can be attached to the top layer of ISO 95+ GL with I.S.O.FIX with ¾" to 1" beads 12" o.c., any Approved Firestone EPDM adhered with BA-2004, **achieves 1-165**.
- e) I.S.O. Twin Pack – concrete
 1. Min. ¼" Dens-Deck or Dens-Deck Prime secured to concrete with ½" to ¾" ribbons of I.S.O. Twin Pack 12" o.c. Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves 1-465 rating**
 2. Min. ¼" Dens-Deck or Dens-Deck Prime secured with ½" to ¾" ribbons of I.S.O. Twin Pack 12" o.c. to min. 1.5" ISO 95+ GL secured with ½" – ¾" ribbons of I.S.O. Twin Pack 12" o.c. to (opt) min 1.5" ISO 95+ GL secured with ½" – ¾" ribbons of I.S.O. Twin Pack 12" o.c. to the concrete deck. Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves 1-255 ratings**.

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3. Min. ¼” Dens-Deck or Dens-Deck Prime secured to new asphaltic vapor barrier or properly prepared BUR with ½” to ¾” ribbons of I.S.O. Twin Pack 12” o.c. Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves max. 1-315 rating**
 4. Tapered ISO 95+ GL secured with ½” – ¾” ribbons of I.S.O. Twin Pack 12” o.c. to (opt) subsequent layers of ISO 95+ GL secured with ½” – ¾” ribbons of I.S.O. Twin Pack 12” o.c. secured to min. 1.5” ISO 95+ GL with ½” – ¾” ribbons of I.S.O. Twin Pack 12” o.c. secured to concrete deck. Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves 1-315.**
 5. Min. ½” FiberTop Wood fiberboard secured with ½” to ¾” ribbons of I.S.O. Twin Pack 12” o.c. to min. 1.5” ISO 95+ GL secured with ½” – ¾” ribbons of I.S.O. Twin Pack 12” o.c. to (opt) min 1.5” ISO 95+ GL secured with ½” – ¾” ribbons of I.S.O. Twin Pack 12” o.c. to the concrete deck. Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves 1-255 ratings.**
 6. Min. ½” FiberTop Wood fiberboard secured with ½” to ¾” ribbons of I.S.O. Twin Pack 12” o.c. to min. 1.5” ISO 95+ GL secured with ½” – ¾” ribbons of I.S.O. Twin Pack 12” o.c. to (opt) min 1.5” ISO 95+ GL secured with ½” – ¾” ribbons of I.S.O. Twin Pack 12” o.c. to new asphaltic vapor barrier or properly prepared BUR. Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves max. 1-255 ratings.**
- f) I.S.O. Twin Pack – gypsum (re-roof)
1. Min. ¼” Dens-Deck or Dens-Deck Prime (4 x 4) or min. ½” FiberTop Wood Fiberboard (4 x 4) secured to properly prepared gypsum deck with ½” to ¾” ribbons of I.S.O. Twin Pack 12” o.c. Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves 1-90 rating**
 2. (opt) min. ¼” Dens-Deck or Dens-Deck Prime (4 x 4) or (opt) min. ½” FiberTop Wood Fiberboard (4 x 4) secured with ½” to ¾” ribbons of I.S.O. Twin Pack 12” o.c. to flat or tapered ISO 95+ GL secured to (opt) subsequent layers of ISO 95+ GL secured with ½” to ¾” ribbons of I.S.O. Twin Pack 12” o.c. to properly prepared gypsum deck Any Approved Firestone EPDM adhered membrane with BA-2004, **achieves 1-90 rating**

**FACTORY MUTUAL APPROVED
FIRESTONE MECHANICALLY ATTACHED SYSTEMS**

SYSTEM: MECHANICALLY ATTACHED SYSTEMS
MEMBRANE: STANDARD, LS-FR OR FIRE RETARDANT RUBBERGARD®
DECK: STEEL OR CONCRETE
CONSTRUCTION: NEW OR TEAR OFF

Note: Rows of fasteners with plates or battens may be no greater than 60% of the field spacing in the perimeter areas and no greater than 40% of the field spacing in the corner areas. Perimeter / corners are determined as 10% of the buildings lesser plan dimension or 40 % of the roof height, whichever is least, but not less than 3 feet. Rows with plates or battens should run perpendicular to steel deck ribs. Exception: for Class 1-75 or below rows may be parallel in the defined perimeter width if the row spacing is less than or equal to 3 feet. Insulation attachment in perimeter / corner areas does not need to be enhanced provided the assembly DOES NOT incorporate an air or vapor barrier.

<u>Insulation</u>	<u>Thickness</u>	<u>Notes</u>
ISO 95+ GL	1.0" to 12"	1,4
AC Foam II	1.4" to 12.5"	2,4
Multi-Max FA	1.5" to 4.0"	2,4
E'NRG'Y-2	1.4" to 12"	2,4
Hy-Therm AP	1.5" to 12"	2,4
Apache Pyrox	1.4" to 12"	2,4
Firestone FiberTop B, C, E, S	min. 1/2"	1,5
Georgia-Pacific "Dens-Deck"	1/4"	1,5
1/2" Firestone FiberTop C, S over EPS	1" to 6" (EPS)	1,3,5
1" Firestone FiberTop B, C, E, S over EPS	1" to 6" (EPS)	1,3,5
1/2" Firestone FiberTop B, E over EPS	1" to 6" (EPS)	1,3,5
OSB / plywood	7/16" (OSB), 15/32" Plywood	1,5

Exterior Fire Ratings*

Insulation	Standard EPDM	STD / PC-100	LS-FR	LS-FR / PC-100	FR EPDM
ISO's listed	C at max. ¼:12	A at max. ¾:12	A at max. ½:12	A at max. ¾:12	A at max. ¾:12
FiberTop	A at max. ¼:12	A at max. 1:12	A at max 1:12	A at max. 1:12	A at max 1- 1/2:12
Dens-Deck	A at max. ¼:12	A at max. 1:12	A at max 1:12	A at max. 1:12	A at max 1- 1/2:12
OSB/Plywood	A at max. ¼:12	A at max. 1:12	A at max 1:12	A at max. 1:12	A at max 1- 1/2:12

* Exterior fire rating can be maintained over FM Approved Wood Decks (up to and including a maximum slope of 2:12) when min. ¼" Georgia-Pacific "Dens-Deck" is placed directly on the Wood Deck under the insulation.

- (1) See pages 35-40 for Firestone insulation fastening patterns.
- (2) Consult manufacturer for approved fasteners and fastening pattern and suitability of insulation with fully adhered system.
- (3) Polystyrene are those manufactured from ARCO, BASF, Hunstman, Dow (max. 10-1/2") and UC Industries (max. 4"), see specific polystyrene manufacturers FM Approval for Installation requirements; 5/8" Type X gypsum, 1/2" Dens-Deck" or 3/4" perlite thermal barrier required over steel decks (see manufacturers Approval listing for specifics).
- (4) As an option, this insulation (single or multiple layers) may be attached to new concrete deck with a 20-25 lb. /sq. flood coat of Type III asphalt. Optional, min. ½ inch FiberTop woodfiber may be adhered to the insulation with asphalt.
- (5) Acceptable uplift rating for use over structural concrete, recover applications or as top layer in a multi-layer assembly on steel decks, but may not be used by itself on a steel deck.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

SYSTEM: MECHANICALLY ATTACHED SYSTEMS
MEMBRANE: RUBBERGARD® MAX AND MAX FR
DECK: STEEL OR CONCRETE
CONSTRUCTION: NEW OR TEAR OFF

Note: Rows of fasteners with plates or battens may be no greater than 60% of the field spacing in the perimeter areas and no greater than 40% of the field spacing in the corner areas. Perimeter / corners are determined as 10% of the buildings lesser plan dimension or 40 % of the roof height, whichever is least, but not less than 3 feet. . Rows with plates or battens should run perpendicular to steel deck ribs. Exception: for Class 1-75 or below rows may be parallel in the defined perimeter width if the row spacing is less than or equal to 3 feet. Insulation attachment in perimeter / corner areas does not need to be enhanced provided the assembly DOES NOT incorporate an air or vapor barrier.

<u>Insulation</u>	<u>Thickness</u>	<u>Notes</u>
ISO 95+ GL	1.0" to 12"	1,4
AC Foam II	1.4" to 12.5"	2,4
Multi-Max FA	1.5" to 4.0"	2,4
E'NRG'Y-2	1.4" to 12"	2,4
Hy-Therm AP	1.5" to 12"	2,4
Apache Pyrox	1.4" to 12"	2,4
Firestone FiberTop C, S	1/2"	1,5
Firestone FiberTop B, E	1/2"	1,5
Firestone FiberTop C, E, S	1"	1,5
Georgia-Pacific "Dens-Deck"	1/4"	1,5
Georgia-Pacific "Dens-Deck"	1/2"	1,5
1/2" Firestone FiberTop C, S over EPS	1" to 6" (EPS)	1,3,5
1" Firestone FiberTop B, C, E, S over EPS	1" to 6" (EPS)	1,3,5
1/2" Firestone FiberTop B, E over EPS	1" to 6" (EPS)	1,3,5
OSB / plywood	7/16" (OSB), 15/32" Plywood	1,5

External Fire Ratings *

Insulation	Max (w/BA-2004 or WBBA)	MAX FR (w/BA-2004)	MAX (w/WBBA)
ISO	A at max. ¼:12	A at max. 2-1/2:12	A at max. 2:12
WFB	A at max. ½:12	A at max. 4:12	A at max. 2-1/2:12
Dens-Deck	A at max. ½:12	A at max. 4:12	A at max. 2-1/2:12
OSB / Plywood	A at max. ½:12	A at max. 4:12	A at max. 2-1/2:12

* Exterior fire rating can be maintained over FM Approved Wood Decks (up to and including a maximum slope of 2:12) when min. ¼" Georgia-Pacific "Dens-Deck" is placed directly on the Wood Deck under the insulation.

- (1) See pages 35-40 for Firestone insulation fastening patterns.
- (2) Consult manufacturer for approved fasteners and fastening pattern and suitability of insulation with fully adhered system.
- (3) Polystyrene are those manufactured from ARCO, BASF, Hunstman, Dow (max. 10-1/2") and UC Industries (max. 4"), see specific polystyrene manufacturers FM Approval for Installation requirements; 5/8" Type X gypsum, 1/2" Dens-Deck" or 3/4" perlite thermal barrier required over steel decks (see manufacturers Approval listing for specifics).
- (4) As an option, this insulation (single or multiple layers) may be attached to new concrete deck with a 20-25 lb. /sq. flood coat of Type III asphalt. Optional, min. ½ inch FiberTop woodfiber may be adhered to the insulation with asphalt.
- (5) Acceptable uplift rating for use over structural concrete, recover applications or as top layer in a multi-layer assembly on steel decks, but may not be used by itself on a steel deck.

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

**FACTORY MUTUAL APPROVED
FASTENING PATTERNS FOR
FIRESTONE MECHANICALLY ATTACHED SYSTEMS
(STEEL OR CONCRETE DECKS)**

Note: Rows of fasteners with plates or battens may be no greater than 60% of the field spacing in the perimeter areas and no greater than 40% of the field spacing in the corner areas. Perimeter / corners are determined as 10% of the buildings lesser plan dimension or 40 % of the roof height, whichever is least, but not less than 3 feet. . Rows with plates or battens should run perpendicular to steel deck ribs. Exception: for Class 1-75 or below rows may be parallel in the defined perimeter width if the row spacing is less than or equal to 3 feet. Insulation attachment in perimeter / corner areas does not need to be enhanced provided the assembly DOES NOT incorporate an air or vapor barrier.

Minimum ASTM A 611 grade “C” Deck

System	Rating	Batten / Seam Plate / Row Spacing	Fastener Spacing
Batten-In-The-Seam			
Standard, LS-FR	1-60	7' o.c.	6" o.c.(AP/HD)(1)
FR	1-60	7' o.c.	6" o.c.(AP/HD)(1)
LS-FR	1-90	6' o.c.	6" o.c.(AP/HD)(1)
MAS			
Standard, LS-FR	1-60	7' o.c.	6" o.c.(AP/HD)(1)
FR	1-60	7' o.c.	6" o.c.(AP/HD)(1)
LS-FR	1-90	6' o.c.	6" o.c.(AP/HD)(1)
MAX, MAX FR			
Mechanically attached	1-60	9 ½' o.c.	6" o.c. (AP/HD)(5)
System	1-60	9 ½' o.c.	12" o.c. (1)(2)
	1-75	7' o.c.	12" o.c (2)(4)
	1-90	9 ½' o.c.	6" o.c. (AP/HD)(4)
	1-90	7' o.c.	6" o.c. (AP/HD)(3)

Minimum ASTM A 611 grade “E” Deck

System	Rating	Batten / Seam Plate / Row Spacing	Fastener Spacing
MAX, MAX FR			
Mechanically attached	1-105	9 ½' o.c.	6" o.c. (AP/HD)(4)
System	1-90	9 ½' o.c.	12" o.c. (4)(6)
	1-105	9 ½' o.c.	6" o.c. (AP/HD)(7)

- (1) Firestone metal batten
- (2) Firestone HD fasteners only.
- (3) Only Firestone 2" Seam Plate, “V” plate or metal batten may be used.
- (4) metal or ¾" polymer batten bar may be used to achieve this rating
- (5) Firestone 2" seam plate or “V” plate may be used and maintain this rating.
- (6) HD+ fastener
- (7) Requires “V” plate and 60 mil MAX or MAX FR

“The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes.”

FACTORY MUTUAL BALLAST GUIDELINES
(Taken from FM Loss Prevention Data Sheet 1-28 AND 1-29)
FM RECOMMENDED BALLAST WEIGHT (LB/SQ FT) FOR ROOF FIELD/PERIMETERS/CORNERS
Ground Roughness B

Steel or pre-cast panel deck with ≤ 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 89	10/12/15	>0 ≤ 60	10/12/15	>0 ≤ 60	12/15/15	>0 ≤ 30	12/15/15
>89 ≤ 130	12/15/18	>60 ≤ 89	12/15/15	>60 ≤ 89	12/15/18	>30 ≤ 55	12/15/18
>130 - ?	See Note 1	>89 - ?	See Note 1	>89 - ?	See Note 1	>55 - ?	See Note 1

Ground Roughness B

Steel or pre-cast panel deck with > 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 89	10/10/12	>0 ≤ 60	10/10/12	>0 ≤ 60	12/12/12	>0 ≤ 30	12/12/12
>89 ≤ 130	12/12/15	>60 ≤ 89	12/12/12	>60 ≤ 89	12/12/15	>30 ≤ 55	12/12/15
>130 ≤ 220	12/15/18	>89 ≤ 150	12/15/18	> 89 - ?	See Note 1	>55 ≤ 89	12/15/18
>220 - ?	See Note 1	>150 - ?	See Note 1			> 89 - ?	See Note 1

Ground Roughness B

Cementitious Wet Fill (Concrete) deck with ≤ 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 89	10/10/10	>0 ≤ 60	10/10/10	>0 ≤ 60	10/12/12	>0 ≤ 30	10/12/12
>89 ≤ 130	12/12/15	>60 ≤ 89	10/12/12	>60 ≤ 89	12/12/15	>30 ≤ 55	12/12/15
>130 ≤ 220	12/15/18	>89 ≤ 140	12/15/18	>89 - ?	See Note 1	>55 ≤ 89	12/15/18
>220 - ?	See Note 1	>140 - ?	See Note 1			>89 - ?	See Note 1

Ground Roughness B

Cementitious Wet Fill (Concrete) deck with > 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 89	10/10/10	>0 ≤ 60	10/10/10	>0 ≤ 60	10/10/12	>0 ≤ 30	10/10/12
>89 ≤ 130	12/12/12	>60 ≤ 89	10/10/12	>60 ≤ 89	12/12/12	>30 ≤ 55	12/12/12
>130 ≤ 220	12/12/15	>89 ≤ 140	12/12/15	> 89 ≤ 165	15/15/18	>55 ≤ 89	12/12/15
>220 - 500	15/15/18	>140 - 350	15/15/18	>165 - ?	See Note 2	> 89 - ?	See Note 2

Note 1: Use an Adhered or Mechanically attached system that is rated for 90 psf or greater.

Note 2: Use an Adhered or Mechanically attached system that is rated for 105 psf or greater.

Ground Roughness B - Urban and suburban areas, well wooded areas or other terrain with numerous closely-spaced obstructions the size of single family dwellings or larger.

Ground Roughness C - Open terrain with scattered obstructions of heights generally less than 30 ft. (9 m). This includes flat, open country and grasslands.

Ground Roughness D - flat, unobstructed areas directly exposed to wind blowing over large bodies of water. This category should be used for areas extending inland from the shore a distance of 1500 ft. (460m) or ten times the height of the building or structure, whichever is greater.

- (1) Width of perimeter is 10% of the building width or 40% of the building height, whichever is smaller, but not less than 8.5 feet. Corner areas are square with side dimensions equal to the perimeter width, but the 10% lesser building dimension limit **is not** applied in determining the **corner** dimension.
- (2) Wind speeds are taken from Factory Mutual Loss Prevention Data Sheet 1-28 and are based on a 50 year mean recurrence interval.
- (3) Stone ballast shall be smooth stone, 1" to 2" nominal diameter, which meets the gradation requirements of standard size No. 3 for coarse aggregate per ASTM D448 (85% larger than 1" diameter).

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

FACTORY MUTUAL BALLAST GUIDELINES
(Taken from FM Loss Prevention Data Sheet 1-28 AND 1-29)
FM RECOMMENDED BALLAST WEIGHT (LB/SQ FT) FOR ROOF FIELD/PERIMETERS/CORNERS
Ground Roughness C

Steel or pre-cast panel deck with ≤ 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 25	10/12/15	>0 ≤ 15	10/12/15	>0 ≤ 15	12/15/15	>0 ≤ 15	12/12/15
>25 ≤ 75	12/15/15	>15 ≤ 45	12/15/15	>15 ≤ 35	12/15/18	>15 - ?	See Note 1
>75 ≤ 89	12/15/18	>45 ≤ 89	12/15/18	>35 - ?	See Note 1		
>89 - ?	See Note 1	>89 - ?	See Note 1				

Ground Roughness C

Steel or pre-cast panel deck with > 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 25	10/10/12	>0 ≤ 15	10/10/12	>0 ≤ 15	12/12/12	>0 ≤ 15	12/12/15
>25 ≤ 75	12/12/12	>15 ≤ 45	12/12/12	>15 ≤ 35	12/12/15	>15 ≤ 30	12/15/18
>75 ≤ 89	12/12/15	>45 ≤ 89	12/12/15	>35 ≤ 70	12/15/18	>30 - ?	See Note 1
>89 ≤ 90	12/15/18	>89 - ?	See Note 1	>70 - ?	See Note 1		
>90 - ?	See Note 1						

Ground Roughness C

Cementitious Wet Fill (Concrete) deck with ≤ 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 25	10/10/10	>0 ≤ 15	10/10/10	>0 ≤ 15	10/12/12	>0 ≤ 15	12/12/15
>25 ≤ 75	10/12/12	>15 ≤ 45	10/12/12	>15 ≤ 35	12/12/15	>15 ≤ 30	12/15/18
>75 ≤ 89	12/12/15	>45 ≤ 89	12/12/15	>35 ≤ 70	12/15/18	>30 - ?	See Note 1
>89 ≤ 90	12/15/18	>89 - ?	See Note 1	>70 - ?	See Note 1		

Ground Roughness C

Cementitious Wet Fill (Concrete) deck with > 36" parapet

≤85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
>0 ≤ 25	10/10/10	>0 ≤ 15	10/10/10	>0 ≤ 15	10/10/12	>0 ≤ 15	12/12/12
>25 ≤ 75	10/10/12	>15 ≤ 45	10/10/12	>15 ≤ 35	12/12/12	>15 ≤ 30	12/12/15
>75 ≤ 89	12/12/12	>45 ≤ 89	12/12/12	>35 ≤ 70	12/12/16	>30 ≤ 89	15/15/18
>89 ≤ 90	12/12/15	>89 ≤ 165	15/15/18	>70 ≤ 89	15/15/18	>89 - ?	See Note 2
>90 ≤ 275	15/15/18	>165 - ?	See Note 2	>89 - ?	See Note 2		

Note 1: Use an Adhered or Mechanically attached system that is rated for 90 psf or greater.

Note 2: Use an Adhered or Mechanically attached system that is rated for 105 psf or greater.

Ground Roughness B - Urban and suburban areas, well wooded areas or other terrain with numerous closely-spaced obstructions the size of single family dwellings or larger.

Ground Roughness C - Open terrain with scattered obstructions of heights generally less than 30 ft. (9 m). This includes flat, open country and grasslands.

Ground Roughness D - flat, unobstructed areas directly exposed to wind blowing over large bodies of water. This category should be used for areas extending inland from the shore a distance of 1500 ft. (460m) or ten times the height of the building or structure, whichever is greater.

- (1) Width of perimeter is 10% of the building width or 40% of the building height, whichever is smaller, but not less than 8.5 feet. Corner areas are square with side dimensions equal to the perimeter width, but the 10% lesser building dimension limit **is not** applied in determining the **corner** dimension.
- (2) Wind speeds are taken from Factory Mutual Loss Prevention Data Sheet 1-28 and are based on a 50 year mean recurrence interval.
- (3) Stone ballast shall be smooth stone, 1" to 2" nominal diameter, which meets the gradation requirements of standard size No. 3 for coarse aggregate per ASTM D448 (85% larger than 1" diameter).

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."

FACTORY MUTUAL BALLAST GUIDELINES
(Taken from FM Loss Prevention Data Sheet 1-28 AND 1-29)
FM RECOMMENDED BALLAST WEIGHT (LB/SQ FT) FOR ROOF FIELD/PERIMETERS/CORNERS
Ground Roughness D

Steel or pre-cast panel deck with $\leq 36''$ parapet

≤ 85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
$>0 \leq 30$	12/15/15	$>0 \leq 15$	12/15/15	$>0 \leq 15$	12/15/18	N/A	See Note 1
$>30 \leq 89$	12/15/18	$>15 \leq 50$	12/15/18	$>15 - ?$	See Note 1		
$>89 - ?$	See Note 1	$>50 - ?$	See Note 1				

Ground Roughness D

Steel or pre-cast panel deck with $> 36''$ parapet

≤ 85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
$>0 \leq 30$	12/12/12	$>0 \leq 15$	12/12/12	$>0 \leq 15$	12/12/15	N/A	See Note 1
$>30 \leq 89$	12/12/15	$>15 \leq 50$	12/12/15	$>15 \leq 35$	12/15/18		
$>89 - ?$	See Note 1	$>50 \leq 89$	12/15/18	$>35 - ?$	See Note 1		
		$>89 - ?$	See Note 1				

Ground Roughness D

Cementitious Wet Fill (Concrete) deck with $\leq 36''$ parapet

≤ 85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
$>0 \leq 30$	10/12/12	$>0 \leq 15$	10/12/12	$>0 \leq 15$	12/12/15	N/A	See Note 1
$>30 \leq 89$	12/12/15	$>15 \leq 50$	12/12/15	$>15 \leq 35$	12/15/18		
$>89 - ?$	See Note 1	$>50 \leq 89$	12/15/18	$>35 - ?$	See Note 1		
		$>89 - ?$	See Note 1				

Ground Roughness D

Cementitious Wet Fill (Concrete) deck with $> 36''$ parapet

≤ 85 mph		90 mph		100 mph		110 mph	
Roof Height (ft)	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights	Roof Height	Ballast weights
$>0 \leq 30$	10/10/12	$>0 \leq 15$	10/10/12	$>0 \leq 15$	12/12/12	$>0 \leq 45$	15/15/18
$>30 \leq 89$	12/12/12	$>15 \leq 50$	12/12/12	$>15 \leq 35$	12/12/15	$>45 - ?$	See Note 2
$>89 \leq 165$	15/15/18	$>50 \leq 89$	12/12/15	$>35 \leq 89$	15/15/18		
$>165 - ?$	See Note 2	$>89 \leq 90$	15/15/18	$>89 - ?$	See Note 2		
		$>90 - ?$	See Note 2				

Note 1: Use an Adhered or Mechanically attached system that is rated for 90 psf or greater.

Note 2: Use an Adhered or Mechanically attached system that is rated for 105 psf or greater.

Ground Roughness B - Urban and suburban areas, well wooded areas or other terrain with numerous closely-spaced obstructions the size of single family dwellings or larger.

Ground Roughness C - Open terrain with scattered obstructions of heights generally less than 30 ft. (9 m). This includes flat, open country and grasslands.

Ground Roughness D - flat, unobstructed areas directly exposed to wind blowing over large bodies of water. This category should be used for areas extending inland from the shore a distance of 1500 ft. (460m) or ten times the height of the building or structure, whichever is greater.

- (1) Width of perimeter is 10% of the building width or 40% of the building height, whichever is smaller, but not less than 8.5 feet. Corner areas are square with side dimensions equal to the perimeter width, but the 10% lesser building dimension limit **is not** applied in determining the **corner** dimension.
- (3) Wind speeds are taken from Factory Mutual Loss Prevention Data Sheet 1-28 and are based on a 50 year mean recurrence interval.
- (3) Stone ballast shall be smooth stone, 1" to 2" nominal diameter, which meets the gradation requirements of standard size No. 3 for coarse aggregate per ASTM D448 (85% larger than 1" diameter).

"The above stated assemblies may not be suitable for a Firestone Red Shield Warranty. Contact Firestone Roofing Solutions Department, prior to installation, for approval of assembly for warranty purposes."