

Unacclad by Firestone Code Approval Guide

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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 external fire sources. The accepted method for measuring external fire resistance is ASTM Standard E-108. This test standard, and closely related standards such as Underwriters Laboratories UL-790 and Uniform Building Code 15-2, is used to determine the ability of a roof system to hinder the horizontal spread or vertical penetration of an external fire source.

Noncombustible Roof Decks (Steel, Concrete, Poured Gypsum) require testing for horizontal spread of flame.

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

ASTM E-108, UL-790 and UBC 15-2. All classified roof covering assemblies fall into one of the three following 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 (Class A, B, C, verifiable or not) **of the same deck type** and establishes 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 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 roofing assembly classification will need to be for each roofing project.

It should be noted that these classifications apply to roofing assemblies, and NOT the metal roofing panel. A metal roofing panel that is classified as part of a Class A assembly when installed over a particular insulated or non-insulated construction may not qualify as part of a Class A assembly if you make changes within the insulated or non-insulated construction.

The column titled "UL Item Number" in the following listings has been added as a service to those who have the UL Building Materials Directory. It identifies the UL listing from which our Code Approval Guide listing derives (e.g. "A,FA,23" means Class A, Fully Adhered, item number 23; "B,OS,01" means **Class B, Other System, item number 01**, etc.).

* From Underwriters Laboratories Roofing Materials and Systems Directory, January, 2007, page 1.

UL CLASS A, B, C

SYSTEM: METAL ROOFING
ASSEMBLIES: UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9, UC-11, UC-600, UC-601, UC-700, UC-750, UC-500, UC-501, UR, HR, NB1
CONSTRUCTION: NEW, RETROFIT

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
NL	A	C	Deck: Barrier Board: 1) Dens-Deck, min ¼ inch thick 2) UL Classified gypsum board, min. ½ inch thick 3) min. one layer Elk "Versashield" Surfacing: one of the assemblies shown above plus NB2 steel, copper, aluminum		A,OS, 01
NL	A	C or Spaced Sheathing	Deck: Underlayment: One layer of Elk "Versashield",, MA Ply Sheet: One layer Type 30 base sheet or Elk "Versashield",, MA Surfacing: one of the assemblies shown above plus NB2 steel or copper		A, OS,02
NL	A	C	Deck: Underlayment: Two layers of Elk "Versashield",, MA Surfacing: one of the assemblies shown above plus NB2 aluminum		A,OS,03
NL	A	C or Spaced Sheathing	Deck: Underlayment: One or more layers of Elk "Versashield",, MA Surfacing: one of the assemblies shown above plus NB2 steel or copper		A,OS,05
NL	A	C or Spaced Sheathing	Deck: Underlayment: One or more layers of Elk "Versashield",, MA Surfacing: one of the assemblies shown above plus NB2 steel, fastened to 2 x 2 wood battens		A,OS,06
NL	B	C	Deck: Underlayment: One layer of Elk "Versashield",, MA Surfacing: one of the assemblies shown above plus NB2 steel, copper or aluminum		B,OS,01
NL	B	Spaced sheathing	Deck: Underlayment: One layer of Elk "Versashield",, MA Surfacing: one of the assemblies shown above plus NB2 steel or copper		B,OS,02

UL CLASS A, B, C

SYSTEM: METAL ROOFING
ASSEMBLIES: 5-V--Crimp
CONSTRUCTION: NEW, RETROFIT

Max Slope	Class	Deck	Insulation Assembly	Remarks	UL Item No.
NL	A	C-5/8 or Spaced Sheath -ing	Deck: Underlayment: One layer of Elk "Versashield",, MA Ply Sheet: One layer Type 30 base sheet or Elk "Versashield", MA Surfacing: 5-V-Crimp	Elk UL item #	A,OS,01

Impact Resistance

Testing to UL 2218, “Impact Resistance of Prepared Roof Covering Materials”, results in Classifications for impact resistance that are expressed as Class 1, 2, 3 or 4 which relate to a roof covering’s ability to withstand impacts from 1-1/4, 1-1/2, 1-3/4 and 2 inch diameter steel balls , respectively. The acceptance criteria to metal roof panels is a follows: withstand the assigned class designation impact without visible evidence of tearing, fracturing, cracking, splitting, rupture ,crazing or other opening of the roof covering layer. Classification is for metal panels placed over solid wood decking (3/8” or greater in thickness).

Class 4 ratings were achieved for the following panels designations: 5-V crimp, UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-9, UC-11, UC-500, UC-501, UC-600, UC-601, UC-700, UC-750, UR, HR, NB1, NB2

Deck Constructions

Roof Deck Constructions Classified for Uplift Resistance have been tested to UL 580, “Tests for Uplift Resistance of Roof Assemblies”. The UL 580 test method subjects a 10 ft. by 10 ft. test sample to various static and oscillating air pressures to index performance under uplift loads imposed on roof decks.

The nominal static uplift pressure, the oscillating uplift pressure and the maximum static uplift pressure for each Class are:

Class	Nominal Static Uplift Pressure (psf)	Range of Oscillating Pressure (psf)	Maximum Static Uplift Pressure (psf)
15	15	11 to 21	23
30	30	22 to 42	45
60	60	44 to 83	75
90	90	66 to 90	105

The static pressures are maintained for a 5 minute period and the oscillating pressures are applied at a 10 ± 2 second frequency and are maintained for a 60 minute period for each Class. An assembly rated Class 60 has successfully withstood pressures imposed during Class 30 and Class 60 tests. An assembly rated Class 90 has successfully withstood pressures imposed during Class 30, Class 60 and Class 90 tests.

The following panel designations have achieved Class 90 ratings:

Panel Designation	Material	Deck Construction Number
UC-1 with UC-1 batten	Coated steel or aluminum	510 / 501A
UC-2 with UC-2 batten	Coated steel or aluminum	511 / 511A
UC-3	Coated steel	622
UC-3	Zinc	623 / 624
UC-3	Coated steel or aluminum	225 / 512 / 512A
UC-4	Aluminum	513 / 513A
UC-4	Coated steel	376 / 377 / 378 / 513 / 513A
UC-4	Copper	399
UC-5 with UC-5 batten	Coated steel	514
UC-6	Coated steel or aluminum	571 / 571A
UC-6	Aluminum	571A
5-V Crimp	Coated steel	629

UL 1897 Testing

Test is conducted in accordance with UL 1897 “Uplift Test for Roof Covering Systems”. The test method subjects a minimum 10 ft by 10 ft sample to various short term (one minute increments) static air pressure to index performance under uplift loads imposed on a roofing system’s securement to a specified roof deck.

Steel decks

Uplift resistance = - 142 psf

Deck: Steel, min 22 MSG

Foamed Plastic (rigid insulation): Min. 1 in., max thickness 4 in. Joints staggered between layers. Mechanically fastened to the steel deck per manufacturers recommendation.

Underlayment: One layer Type 30 organic felt with 2 in. side laps. Mechanically fastened to the steel deck per manufacturers recommendations.

Underlayment: One layer UL Classified ELK “VersaShield” with 2 in. side laps., loose laid.

Fasteners (screws): Fasteners used to attach panel clips to steel deck to be No. 12 pancake wafer head steel screws. Length to penetrate steel deck a minimum $\frac{3}{4}$ in. Two screws used per clip inserted into clip guide holes.

Bearing Plates: Plates used with panel screw fasteners under panel to be 4 by 4 in. min 26 gauge stainless steel. As an alternate, $\frac{1}{2}$ in. thick (15/32 in actual) plywood, APA rated sheathing, square edged may be used.

Roof Deck Fasteners (Panel Clips): Two part assembly, base 5 in. long, 1 in. wide, 0.42 in. high. Fabricated from No. 22 MSG min thick coated steel. Upper tab 3 in. long, 0.42 in. wide, 1.786 in. high. Fabricated from No. 24 MSG min thick coated steel. Spaced a maximum 12 in. OC. Identified as “UC-3 Expansion Clip”.

Roof Panel: Width 16 in. max. with 1-1/2 in high legs. No. 24 MSG min thick coated steel. Panels continuous over three or more clips with no end laps. Panels ribs seamed with electric seaming tool with seaming operation to include upper tabs of panel clips. Identified as “UC-3”.

Uplift resistance = - 187 psf

Deck: Steel, min 22 MSG

Foamed Plastic (rigid insulation): Min. 1 in., max thickness 4 in. Joints staggered between layers. Mechanically fastened to the steel deck per manufacturers recommendation.

Underlayment: One layer Type 30 organic felt with 2 in. side laps. Mechanically fastened to the steel deck per manufacturers recommendations.

Underlayment: One layer UL Classified ELK “VersaShield” with 2 in. side laps., loose laid.

Vapor Barrier: One layer Colbond “Enkamat 7010”, loose laid

Fasteners (screws): Fasteners used to attach panel clips to steel deck to be No. 12 pancake wafer head steel screws. Length to penetrate steel deck a minimum $\frac{3}{4}$ in. Two screws used per clip inserted into clip guide holes.

Bearing Plates: Plates used with panel screw fasteners under panel to be 4 by 4 in. min 26 gauge stainless steel. As an alternate, $\frac{1}{2}$ in. thick (15/32 in actual) plywood, APA rated sheathing, square edged may be used.

Roof Deck Fasteners (Panel Clips): Two part assembly, base 5 in. long, 1 in. wide, 0.42 in. high. Fabricated from min. 0.0225 in. thick 304 stainless steel. Upper tab 3 in. long, 0.42 in. wide, 1.786 in. high. Fabricated from min. 0.0172 in. thick 304 stainless steel. Spaced a maximum 12 in. OC. Identified as “UC-3 Expansion Clip”.

Roof Panel: Width 16 in. max. with 1-1/2 in high legs. 0.027 in. thick RHEINZINK. This is a zinc material. Panels continuous over three or more clips with no end laps. Panels ribs double seamed with electric seaming tool with seaming operation to include upper tabs of panel clips. Identified as “UC-3”.

UL 1897 Testing

Plywood decks

Uplift Resistance – **-155 psf**

Deck: Plywood, min 5/8 in. thick CDX

Underlayment: One layer Type 30 organic felt with 2 in. side lap. Fastened to the plywood deck per manufacturers recommendations.

Underlayment: One layer UL Classified Elk “VersaShield” with 2 in. side lap, loose laid.

Fasteners (Screws): No. 9 by 1-1/2 in. long hex head steel screws with a bonded washer. Fasteners spaced 24 in. OC and located on the top part of the panel v-crimp.

Roof Panels: “5-V-Crimp” panel. 0.172 in. min thickness steel. Panel width 22-1/2 in.

Uplift Resistance – **-247 psf**

Deck: Plywood, min 19/32 in. thick CDX

Underlayment: One layer Type 30 organic felt with 2 in. side lap. Fastened to the plywood deck per manufacturers recommendations.

Underlayment: One layer UL Classified Elk “VersaShield” with 2 in. side lap, loose laid.

Vapor Barrier: One layer of Colbbond “Enkamat 7010”, loose laid

Fasteners (Screws): Fasteners used to attach panel clips to plywood deck to be No. 10 by 1-1/2 in. long pancake head stainless steel screws. Two screws used per clip inserted in clip guide holes.

Roof Deck Fasteners (Panel Clips): Two part assembly, base 5 in. long, 1 in. wide, 0.42 in. high. Fabricated from min. 0.0225 in. thick 304 stainless steel. Upper tab 3 in. long, 0.42 in. wide, 1.786 in. high. Fabricated from min. 0.0172 in. thick 304 stainless steel. Spaced a maximum 12 in. OC. Identified as “UC-3 Expansion Clip”.

Roof Panels: Width 16 in. max. with 1-1/2 in high legs. 0.027 in. thick RHEINZINK. This is a zinc material. Panels continuous over three or more clips with no end laps. Panels ribs double seamed with and electric seaming tool with seaming operation to include upper tabs of panel clips. Identified as “UC-3”.

Metal Purlins

Uplift Resistance – **-165 psf**

Supports (Purlins): No. 16 MSG steel (50ksi yield strength) spaced max 3 ft 0 in. OC

Fasteners (Screws): Used to attach panel clips to purlins, No. ¼-14 by 7/8 in. long , self-drilling, self-taping, hex-head steel. Two screws used per clip.

Roof Deck Fasteners (Panel Clips): “UC-6 Clip”. Two part assembly. Located over panel sides, fastened to supports using two fasteners per clip.

Metal Roof Deck Panels: “UC-6” panel. 0.040 in. min thickness aluminum. Panel width 16 in., height of female rib 2 in., male rib 1-3/4 in. Panels continuous over two or more spans. Panels seamed 180° at ribs with an electric seamer.

P Designs

The following panel designations can be used in Design Nos.: **P225, P227, P230, P237, P259, P508, P510, P512, P514, P518, P701, P711, P717, P720, P722, P723, P726, P731, P734, P736, P801, P815, P819.**

Mechanically Attached Metal Roof Panels – Type UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-500, UC-501, UC-600, UC-601, UC-700, U, HR and R roof panels (26 MSG min gauge coated steel, min 0.020 in. thick copper or 0.032 min. gauge coated aluminum) placed over specified insulation and/or roof covering for the respective designs. Panel secured to top layer of 7/16 in. APA-rated oriented strand board (OSB) laminated to rigid insulation or 5/8 in. plywood over rigid insulation. Refer to individual Roof-Ceiling design under the appropriate Building Unit item for name of Classified Companies. Panels secured to oriented strand board or plywood at side ribs with panel clips designed specifically for these panels. Panel clips spaced 18 in. OC using No. 12-15 No. 3 Phillips self-drilling, self-tapping truss head steel or stainless steel screw. Zinc plated carbon steel screws. The oriented strand board laminated insulation or plywood covered rigid insulation are mechanically fastened to steel roof deck and covered with a 30 lb. felt.

Mechanically Attached Metal Roof Panels – Type UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8, UC-500, UC-501, UC-600, UC-601, UC-700, U, HR and R roof panels (26 MSG min gauge coated steel, min 0.020 in. thick copper or 0.032 min. gauge coated aluminum) placed over specified insulation and/or roof covering for the respective designs.

Type UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC-8 and UC-700 are secured by their panel clips with the upper portion of the clip engaging the panel rib, a 3 in. by 4 in. bearing plate fabricated of nominal 0.018 in. thick coated steel is used under each panel clip. The bearing plate shall be placed over the specified roof insulation. The fastener shall penetrate the roof deck a min of ½ in. and shall be spaced 18 in. OC.

Type UC-500, UC501, UC-600, UC-601, U, HR an R are screwed into the top of the panel rib through the metal panels into the specified insulation. Panel clips are attached using No. 12-15 Phillips drive truss head steel or stainless steel screw with a “S” point or tek point. Two fasteners per clip are used. The fasteners shall penetrate the roof deck a min. of ½ in. and shall be spaced 18 in. OC.

State of Florida Product Approval

Specific State of Florida Product Approvals can be viewed by going to www.floridabuildingcode.org/.

Florida Product Approval Number	Firestone Metal Products Profile	Type of Metal
FL 175-R2	UC-3, UC-4, UC-9, UC-11	See specific product approval
FL 2833-R1	UC-5, UC-6	See specific product approval
FL 3570-R1	UC-1, UC-2, UC-3, UC-4	See specific product approval
FL 4193-R1	5-V-Crimp	See specific product approval
FL 5292-R1	UC-3	See specific product approval

Miami-Dade

Specific Miami-Dade Notice of Acceptance (NOA) can be viewed by going to www.maimidade.gov/buildingcode/.

Miami-Dade NOA#	Firestone Metal Products Profile	Type of Metal
06-0821.09*	UC-3 (expires 02/16/11)	Aluminum, min. 0.032, WD, NI
06-0821.13*	5-V-Crimp (expires 12/08/10)	Steel, min. 26 ga., WD, NI
06-0821.14*	UC-3 (expires 04/14/08)	Steel, min. 24 ga., WD, NI
06-0821.15*	UC-3 (expires 04/14/08)	Copper, min 16 oz., WD, NI
06-0821.16*	UC-4 (expires 03/22/11)	Steel, min. 24 ga., WD, NI
06-0821.17*	UC-9, UC-11 (expires 11/25/07)	Steel, min, 24 ga., WD, NI
01-0509.12*	UC-6 (expires 02/06/08)	Steel, large & small Impact rated, listed under Copper Sales
01-0509.13*	UC-5 (expires 01/16/08)	Steel, large & small Impact rated, listed under Copper Sales
02-0910.01*	UC-3 (expires 04/14/08)	24 ga steel, 16 oz. copper, WD, NI, listed under Copper Sales
04-0716.04*	UC-3 (expires 08/11/10)	24 ga. Steel, 22 ga steel deck, insulated, listed under Copper Sales
04-0805.03*	UC-3 (expires 08/04/10)	24 ga Rheinzink, WD, NI, listed under Copper Sales
04-0921.01*	UC-3 (expires 08/18/10)	24 ga Rheinzink, 22 ga steel deck, insulated, listed under Copper Sales

Notes

WD = wood deck, 19/32" or greater

NI = non-insulated

* - See specific approval for maximum pressure allowed for all areas of the roof

Energy Star Approvals

Color	Models	Initial Solar Reflectance	Solar Reflectance after 3 years
Almond (433B330)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.57	0.56
Bone White (431A893)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.72	0.7
Champagne Metallic (439Z636)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.37	0.36
City Scape (432B080)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.35	0.34
Classic Copper (439Z637)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.42	0.40
Dark Ivy (435B444)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.25	0.25
Patina Green (435B363)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.26	0.28
Regal Red (434A986)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.42	0.41
Sandstone (433B272)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.51	0.50
Sierra Tan (437B480)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.35	0.34
Silver Metallic (439Z608)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.59	0.60
Stone White (434B217)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.57	0.56
Terra Cotta (434A847)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.34	0.33
Tropical Patina (435B321)	UC-1, UC-2, UC-3, UC-4, UC-5, UC-6, UC-7, UC 8, UC-9, UC-600, UC-601, UC-700, VR Classic Omega, UR Pro Omega, NB2-Builtite II, NB1-Builtite I	0.28	0.28
Galvalume Plus	UC-1 through UC 11, UC-600, UC-601, UC-700, NB1-Builtite I, NB-2 Builtite II, HR-Ultra Omega, UR Pro Omega, VR Classic Omega	0.68	0.57
Galvalume	UC-1 through UC 11, UC-600, UC-601, UC-700, NB1-Builtite I, NB-2 Builtite II, HR-Ultra Omega, UR Pro Omega, VR Classic Omega	0.78	0.58

CRRC Rated Panels

Color	Model	Initial Solar Reflectance	3-year Solar Reflectance	Initial thermal Emittance	3-year Thermal Emittance	CRRC Product ID
Dynapoon Reflective White	Any panel	0.70	Pending	0.86	Pending	0806--0001
Weather X Solar White	Any panel	0.70	Pending	0.85	Pending	0806--0002
Fluropon L/S Solar White	Any panel	0.70	Pending	0.85	Pending	0806--0003
Fluropon Cityscape	Any panel	0.35	Pending	0.84	Pending	0806--0004
Fluropon Classic II Silver	Any panel	0.56	Pending	0.76	Pending	0806--0005
Fluropon Bone White	Any panel	0.70	Pending	0.84	Pending	0806--0006
Fluropon Sandstone	Any panel	0.51	Pending	0.84	Pending	0806--0007
Fluropon L/S Regal White	Any panel	0.70	Pending	0.85	Pending	0806--0008

Air and Water Infiltration

Model	Water Penetration E 1646-95	Water Penetration E 331-96	Sealant	25 mph Cfm/ft	Air Leakage E-283-91		
					25 mph Cfm/ft ²	50 mph Cfm/ft	50 mph Cfm/ft ²
UC-1 24ga & 0.038 AL 18" wide	No entry	No entry	No	0.04	0.03	0.08	0.06
UC-2 24ga & 0.038 AL 16" wide	No entry	No entry	Not tested	N/A	N/A	N/A	N/A
UC-3 24ga & 0.038 AL 18" wide	See below	No entry	No	0.04	0.03	0.08	0.05
UC-4 24 ga, 18" wide	No entry	Sealed- None Unsealed-None	No Yes	0.33 0.06	0.22 0.04	0.77 0.26	0.52 0.17

Model	Water Penetration E 1646-95	Water Penetration E 331-96	Air Leakage E-1680-95			
			Static pressure differential (psf) no sealant	Total Air Leakage	Air Infiltration rate (cfm/ft)	Air Infiltration rate (cfm/sq.ft.)
UC-4 24 ga, 18" wide	See above	See above	-1.57	0.7	0.015	0.010
			+1.57	2.0	0.044	0.028
			-6.24	0.7	0.015	0.010
			+6.24	7.1	0.158	0.099

Air and Water Infiltration

Model	Water Penetration E 1646-95	Water Penetration E 331-96	Air Leakage E-1680-95			
			Static pressure differential (psf) no sealant	Total Air Leakage	Air Infiltration rate (cfm/ft)	Air Infiltration rate (cfm/sq.ft.)
UC-3 24 ga, 20" wide	No entry	See above	-1.57	0.8	0.022	0.011
			+1.57	0.6	0.017	0.008
			-6.24	1.0	0.022	0.0138
			+6.24	2.4	0.067	0.333
			Air Leakage E-283-91			
UC-3 24 ga, 20" wide	See above	See above	12.0	3.2	0.089	0.044