

## Intertek NAFS-11 Testing

Intertek has completed testing on the following in accordance with AAMA/WDMA/CSA 101/I.S.2A440-11 "North American Standard / Specification for windows, doors and skylights"

### SINGLE DOORS Tested with the new DS1 Storm - Sill System

#### Jeld-Wen Steel Skin Single **OUTSWING** Door 35-3/4" x 83" (dead bolt / passage set)

1. Positive design pressure (DP)	=	1920	PA	(40 PSF)	
2. Negative design pressure (DP)	=	1920	PA	(40 PSF)	
3. Water penetration resistance test pressure	=	400	PA	(8.25 PSF)	PG 55
4. Canadian air infiltration / exfiltration	=	A3			

#### Jeld-Wen Fiber Glass Skin Single **OUTSWING** Door 35-3/4" x 83" (dead bolt / passage set)

1. Positive design pressure (DP)	=	1920	PA	(40 PSF)	
2. Negative design pressure (DP)	=	1920	PA	(40 PSF)	
3. Water penetration resistance test pressure	=	400	PA	(8.25 PSF)	PG 55
4. Canadian air infiltration / exfiltration	=	A3			

#### Lynden Door Canada: Protek Steel Skin Single **INSWING** Door 40" x 86" (dead bolt / passage set)

1. Positive design pressure (DP)	=	2880	PA	(60.1 PSF)	
2. Negative design pressure (DP)	=	2880	PA	(60.1 PSF)	
3. Water penetration resistance test pressure	=	290	PA	(6.0 PSF)	PG 40
4. Canadian air infiltration / exfiltration	=	A3			

#### Lynden Door Canada: Protek Steel Skin Single **OUTSWING** Door 40" x 86" (dead bolt / passage set)

1. Positive design pressure (DP)	=	2880	PA	(60.1 PSF)	
2. Negative design pressure (DP)	=	2880	PA	(60.1 PSF)	
3. Water penetration resistance test pressure	=	580	PA	(12.0 PSF)	PG 60
4. Canadian air infiltration / exfiltration	=	A3			

#### Lynden Door Canada: Protek Steel Skin Single **INSWING** Door 49" x 98" (multi-point)

1. Positive design pressure (DP)	=	2880	PA	(60.2 PSF)	
2. Negative design pressure (DP)	=	2880	PA	(60.2 PSF)	
3. Water penetration resistance test pressure	=	220	PA	(4.5 PSF)	PG 30
4. Canadian air infiltration / exfiltration	=	A3			

#### Lynden Door Canada: Protek Steel Skin Single **OUTSWING** Door 49" x 98" (multi-point)

1. Positive design pressure (DP)	=	4800	PA	(100.2 PSF)	
2. Negative design pressure (DP)	=	4800	PA	(100.2 PSF)	
3. Water penetration resistance test pressure	=	540	PA	(11.25 PSF)	PG 75
4. Canadian air infiltration / exfiltration	=	A3			

**NOTE:** All Testing done by DraftSeal in conjunction with InterTek Testing Services.

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### SINGLE DOORS Tested with the new DS1 Storm - Sill System

#### Richerson's: Fiberglass Skin Smooth Flush Glaze Single **INSWING** Door 35-3/4" x 84" (dead bolt / passage set)

1. Positive design pressure (DP)	=	1920	PA	(40 PSF)	
2. Negative design pressure (DP)	=	1920	PA	(40 PSF)	
3. Water penetration resistance test pressure	=	220	PA	(4.5 PSF)	PG 30
4. Canadian air infiltration / exfiltration	=	A3			

#### Richerson's: Fiberglass Skin Smooth Flush Glaze Single **OUTSWING** Door 35-3/4" x 84" (dead bolt / passage set)

1. Positive design pressure (DP)	=	1920	PA	(40 PSF)	
2. Negative design pressure (DP)	=	1920	PA	(40 PSF)	
3. Water penetration resistance test pressure	=	720	PA	(15 PSF)	PG 100
4. Canadian air infiltration / exfiltration	=	A3			

#### Mastergrain: Fiberglass Skin Textured (Fiber Glass Full Glaze), Single **INSWING** Door 35-3/4" x 84" (dead bolt / passage set)

1. Positive design pressure (DP)	=	1920	PA	(40 PSF)	
2. Negative design pressure (DP)	=	1920	PA	(40 PSF)	
3. Water penetration resistance test pressure	=	220	PA	(4.5 PSF)	PG 30
4. Canadian air infiltration / exfiltration	=	A3			

#### Mastergrain: Fiberglass Skin Textured (Fiber Glass Full Glaze), Single **OUTSWING** Door 35-3/4" x 84" (dead bolt / passage set)

1. Positive design pressure (DP)	=	3840	PA	(80 PSF)	
2. Negative design pressure (DP)	=	3840	PA	(80 PSF)	
3. Water penetration resistance test pressure	=	580	PA	(12 PSF)	PG 80
4. Canadian air infiltration / exfiltration	=	A3			

#### Delta Door: Wood Stile & Rail (3 Bottom Panels and 6 Top Divided True Lite) Single **INSWING** Door 36" x 84" (dead bolt / passage set)

1. Positive design pressure (DP)	=	3360	PA	(70 PSF)	
2. Negative design pressure (DP)	=	3360	PA	(70 PSF)	
3. Water penetration resistance test pressure	=	260	PA	(5.4 PSF)	PG 35
4. Canadian air infiltration / exfiltration	=	A2			

#### Delta Door: Wood Stile & Rail (3 Bottom Panels and 6 Top Divided True Lite) Single **OUTSWING** Door 36" x 84" (dead bolt / passage set)

1. Positive design pressure (DP)	=	3360	PA	(70 PSF)	
2. Negative design pressure (DP)	=	3360	PA	(70 PSF)	
3. Water penetration resistance test pressure	=	510	PA	(10 PSF)	PG 70
4. Canadian air infiltration / exfiltration	=	A3			

**NOTE:** All Testing done by DraftSeal in conjunction with InterTek Testing Services.

## Intertek NAFS-11 Testing

Intertek has completed testing on the following in accordance with AAMA/WDMA/CSA 101/I.S.2A440-11  
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### DOUBLE DOOR Tested with the new DS1 Storm - Sill System

**Richerson's: Fiberglass Skin Smooth Flush Glaze OUTSWING (Double Door) - 2 piece outswing astragal used. 35-3/4" x 79" x 2 (dead bolt / passage set)**



1. Positive design pressure (DP)	=	1200	PA	(25.1 PSF)	
2. Negative design pressure (DP)	=	1200	PA	(25.1 PSF)	
3. Water penetration resistance test pressure	=	730	PA	(15.3 PSF)	PG 100
4. Canadian air infiltration / exfiltration	=	A3			

**Lynden Door Canada: Therma-Tru Fiberglass Skin Textured, OUTSWING (Double Door) - 2 piece outswing astragal used. Full glaze with lite kit (double door) 35-3/4" x 83" x 2 (dead bolt / passage set). Transom - Direct glaze 20" height**



1. Positive design pressure (DP)	=	960	PA	(20.1 PSF)	
2. Negative design pressure (DP)	=	960	PA	(20.1 PSF)	
3. Water penetration resistance test pressure	=	330	PA	(6.9 PSF)	PG 45
4. Canadian air infiltration / exfiltration	=	A3			

Operational force - pass

Forced entry resistance - pass

Vertical deflection - pass

**Masonite: Steel Skin Full Lite Outswing (Double Door) - 2 piece OUTSWING TB astragal used. 35-3/4" x 83" x 2 (dead bolt / passage set). This test unit used DS421 kerf inserted weatherseal 4 individual pieces (not continuous kerf). The positive and negative DP test was not required for this unit.**



1. Positive design pressure (DP)	=	N/A	PA		
2. Negative design pressure (DP)	=	N/A	PA		
3. Water penetration resistance test pressure	=	290	PA	(6.06 PSF)	PG 40
4. Canadian air infiltration / exfiltration	=	A3			

### SINGLE DOOR With Side Lites and Transom - Tested with the new DS1 Storm - Sill System

**Plastpro One lite DRS10: Fiberglass INSWING single door 35-3/4" x 95", with 2 x sidelites & transom (direct glaze), MP used**



1. Positive design pressure (DP)	=	1920	PA	(40 PSF)	
2. Negative design pressure (DP)	=	1920	PA	(40 PSF)	
3. Water penetration resistance test pressure	=	220	PA	(4.5 PSF)	PG 30
4. Canadian air infiltration / exfiltration	=	A3			

**PVC JAMB Tested with the new DS1 Storm - INSWING Sill System (Uniform load structural test only)**

**Cellular PVC jamb from Vi-Lux Mouldings Inc. tested with Woodgrain 6 panel fiberglass door 35-3/4" x 84"**



1. Positive design pressure (DP)	=	3360	PA	(70 PSF)	
2. Negative design pressure (DP)	=	3360	PA	(70 PSF)	

Forced entry resistance - pass

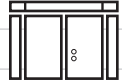
**NOTE:** All Testing done by DraftSeal in conjunction with InterTek Testing Services.

## Intertek NAFS-11 Testing

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"North American Standard / Specification for windows, doors and skylights"

### DOUBLE DOOR Tested with the new DS1 Storm - Sill System

**Western Door: Wood doors INSWING (One door 4 panels, 42" x 95"), (One door, 15 panels 42" x 95") with 2 side lite panels (one sidelite direct glaze, other side lite glazed panel) and direct glaze transom.**



1. Positive design pressure (DP)	=	1680	PA	(35.1 PSF)	
2. Negative design pressure (DP)	=	1680	PA	(35.1 PSF)	
3. Water penetration resistance test pressure	=	220	PA	(4.6 PSF)	PG 30
4. Canadian air infiltration / exfiltration	=	A3			

Operational force - pass

Forced entry resistance - pass

Vertical deflection - pass

### Product Evaluation for DS750, DS850 & DS1051AV INSWING DS1 Storm - Sill System (Second generation)

Intertek has conducted an engineering evaluation for AK Draft Seal Ltd. on their inswing door systems, to evaluate physical properties. The evaluation was conducted to determine if the proposed alternate sills would continue to show compliance in accordance with NAFS-08 and NAFS-11.

Based on the information contained and referenced herein, it is Intertek's professional judgement based on sound engineering principles that the following is true:

**The alternate proposed sills DS750AV 7-1/2" Sill, DS850AV 8-1/2" Sill & DS1051AV 10" Sill can be used with the certified inswing door assemblies listed with Intertek, and these certified door assemblies would maintain the current product designators when evaluated in accordance with NAFS-08 and NAFS-11.**

### Product Evaluation for DS421 Kerf Inserted Weatherseal

Intertek has conducted a product evaluation for AK DraftSeal, on the DS421 weatherstrip, to evaluate its physical properties. The evaluation was conducted to determine if the currently listed AK DraftSeal NAFS-Certified Door-Frame Assemblies using the 4-piece kerf inserted DS421 weatherseal will maintain compliance with the North American Fenestration Standard, 2008 and 2011; CSA A440S1, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS - North American Fenestration Standard/Specification for windows, doors, and skylights, 2009.

Based on the information contained and referenced herein, it is Intertek's professional judgement based on sound engineering principles that the following is true:

- AK DraftSeal NAFS-Certified Door-Frame Assemblies using the DS421 4-piece kerf mounted weatherstrip can achieve the same ratings for air leakage resistance and water penetration resistance as per NAFS-08, NAFS-11 and CSA A440S1.

**NOTE:** All Testing done by DraftSeal in conjunction with InterTek Testing Services.

# Intertek NAFS-11 Testing

## Product Evaluation for Aluminum Astragals for Inswing and Outswing Double Doors

Intertek Testing Services NA Ltd. (Intertek) is conducting a product evaluation for A.K. DraftSeal Ltd., on the Aluminum Astragals for Outswing and Inswing DS Storm Sills, to evaluate physical performance. The evaluation is being conducted to determine if the DS446N, DS448N, DS445N and DS447N series astragals will perform similarly as the DS346N and DS348N series, by the requirements of AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS – North American Fenestration Standard/ Specification for windows doors and skylights, 2008, 2011; CSA A440S1, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS – North American Fenestration Standard/ Specification for windows doors and skylights, 2009.

### Product and Assembly Description

The product(s) under evaluation are extruded aluminum astragals, for either in-swing or out-swing applications on NAFS rated door assemblies. Table 1 below summarizes the configurations of each astragal series; further details can be found in the excerpt of the DraftSeal catalogue included in the Appendix of this Evaluation.

Product Series	In-swing / Out-swing	Thermally Broken (Y/N)
DS346N	In-swing	No
DS348N	In-swing	Yes
DS345N	Out-swing	No
DS347N	Out-swing	Yes
DS446N	In-swing	No
DS448N	In-swing	Yes
DS445N	Out-swing	No
DS447N	Out-swing	Yes

**Table 1:** Astragal configurations evaluated

Intertek has conducted a product evaluation for A.K. DraftSeal Ltd., on the Aluminum Astragals for Outswing and Inswing DS Storm Sills, to evaluate physical performance. The evaluation is being conducted to determine if the DS445N, DS446N, DS447N and DS448N Series astragals will perform similarly as the DS345N, DS346N, DS347N and DS348N Series respectively, by the requirements of AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS – North American Fenestration Standard/ Specification for windows doors and skylights, 2008, 2011; CSA A440S1, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS – North American Fenestration Standard/ Specification for windows doors and skylights, 2009.

Based on the information contained and referenced herein, it is Intertek’s professional judgment based on sound engineering principles that the following is true:

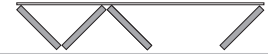
- The DraftSeal DS445N, DS446N, DS447N and DS448N Series should perform similarly as the DS345, DS346N, DS347N and DS348N Series respectively, when mounted on a NAFS rated, side hinged door assembly.

# Intertek NAFS-11 Testing

## FOLDING

### Folding Door System, **OUTSWING**

#### Eclipse 3L1R Richardson's Fiberglass Skin Smooth Flush Glaze Panels 35-3/4" x 95" x 1-3/4"

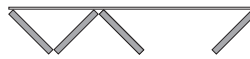


1. Positive design pressure (DP)	=	1440	PA	(30.1 PSF)	
2. Negative design pressure (DP)	=	1440	PA	(30.1 PSF)	
3. Water penetration resistance test pressure	=	330	PA	(6.9 PSF)	PG 45
4. Canadian air infiltration / exfiltration	=	A3			

Forced entry resistance - pass

### Folding Door System, **OUTSWING**

#### Eclipse 3L1R Fir Full Lite Panels 39" x 118" x 1-3/4"



1. Positive design pressure (DP)	=	1200	PA	(25.1 PSF)	
2. Negative design pressure (DP)	=	1200	PA	(25.1 PSF)	
3. Water penetration resistance test pressure	=	330	PA	(6.9 PSF)	PG 45
4. Canadian air infiltration / exfiltration	=	A3			

Forced entry resistance - pass

## EXTERIOR POCKET DOOR

Intertek had performed Air Leakage, Water Penetration Resistance and Uniform Load testing on a Pocket Door system submitted directly by Mondoor Canada. Testing was performed in accordance with ASTM E283-04(2012), "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen", ASTM E547-00(2009) "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Air Pressure Difference" and ASTM E330/E330M-14 "Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference". Test pressures used were based on the performance table for Class R products within AAMA/WDMA/CSA 101/1.S.2/A440-08 "Standard/Specification for windows, doors, and unit skylights and AAMA/WDMA/CSA 101/1.S.2/A440-11 "Standard/Specification for windows, doors, and unit skylights".



### Mondoor: Exterior pocket door system. Door size 40" x 96". Overall unit size 78" (1980mm) x 102" (2600mm)

1. Positive design pressure (DP)	=	1680	PA	(35.1 PSF)	
2. Negative design pressure (DP)	=	1680	PA	(35.1 PSF)	
3. Water penetration resistance test pressure	=	330	PA	(6.9 PSF)	PG 40
4. Canadian air infiltration / exfiltration	=	A3			

Forced entry resistance - pass

**NOTE:** All Testing done by DraftSeal in conjunction with InterTek Testing Services.

# QAI Laboratories (NAFS 11 Testing)

**Richerson's: Fiberglass Skin Smooth Flush Glaze Single INSWING Door 35-3/4" x 83-3/4" (36" x 84") (dead bolt / passage set)**



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1. Positive design pressure (DP)	=	Not required in this test
2. Negative design pressure (DP)	=	Not required in this test
3. Water penetration resistance test pressure	=	260 PA DP 35
4. Canadian air infiltration / exfiltration	=	A2

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Force to latch - pass

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## TEST # 1

### Assembly # 1 Description:

3684 single inswing door, double drilled with continuous DS420 kerf inserted weathersealing gasket on frame and sill.  
Sill model: DS750AVT.

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## TEST # 2

### Assembly # 2 Description:

3684 single inswing door, double drilled with four piece DS421 kerf inserted weathersealing gasket on frame and sill.  
Sill model: DS750AVT.

Assembly # 2 was the same as # 1 but the gasket was switched out to perform test # 2.

## QAI Laboratories (NAFS 11 Testing)

### ENGINEERING EVALUATION FOR DS5500, DS7500, DS8500

A.K. Draft Seal Ltd. has designed an oak top and vinyl top sill (part numbers DS5500AOAK\_v1 and DS5500AVT\_v1 respectively) to substitute for the equivalent PWS sills (Part numbers PW25120 and PW25121). A.K. Draft Seal Ltd. has requested an evaluation be conducted by QAI Laboratories to determine equivalency when tested to AAMA/WDMA/CSA 101/I.S.2/A440-11 (NAFS).

The critical dimensions of the door sill are not changing and identical materials are being used. The position of the weatherstrip remains unchanged, and the same weatherstrip is to be used.

Although the 5500 Series sills are being specifically evaluated, this evaluation also applies to the below sills as they are also of identical construction to the competitors equivalent sill.

Sill Type	A.K. Draft Seal Ltd. Sill	Competitors Sill
Oak top	DS5500AOAK_v1	PW25120
Vinyl top	DS5500AVT_v1	PW25121
Oak top	DS7500AOAK_v1	PW27120
Vinyl top	DS7500AVT_v1	PW27121
Oak top	DS8500AOAK_v1	PW28120
Vinyl top	DS8500AVT_v1	PW28121

The component substitution was evaluated to the applicable sections of the NAFS standard below:

#### AAMA/WDMA/CSA 101/I.S.2/A440-11 - Physical Standard

#### CONCLUSION:

The substitution of the above mentioned door sills will not negatively impact the Door system performance when tested to AAMA/WDMA/CSA 101/I.S.2/A440-11 "North American Fenestration Standard/Specification for windows, doors, and skylights". This evaluation also applies to equivalent sill substitutions for varying depths of wall dimension (i.e. 2x6 or 2x8 wall construction) as noted in the evaluation.



## QAI Laboratories (NAFS 11 Testing)

This summary confirms that A.K. Draft Seal Ltd. 6'8" Inswing and Outswing Masonite Single Doors have been tested to the performance requirements of AAMA/WDMA/CSA 101/IS2/A440-11 NAFS - North American Fenestration Standard / Specification for windows, doors and skylights standard with the following results.

Fenestration Type	Project #	Test Type	NAFS 2011 Test Result
Masonite 6'8" Inswing Single Door Fiberglass full glaze	T1022-6a	Force to Latch	Pass
		Air Leakage	A2 Level
		Water Penetration	PG 30 (220 Pa)
		Structural	PG 30 (2160 Pa)
		Forced-Entry	Pass
Masonite 6'8" Outswing Single Door Fiberglass full glaze	T1022-6b	Force to Latch	Pass
		Air Leakage	A2 Level
		Water Penetration	PG 30 (220 Pa)
		Structural	PG 30 (2160 Pa)
		Forced-Entry	Pass

### Masonite 6'8" **INSWING** Single Door - 950 mm wide x 2065 mm tall (37.4" x 81.3"):

#### Primary Designator:

Class R – PG30: Size tested 950 x 2065 mm (37.4 x 81.3 in)

Class R – PG1440 (SI): Size tested 950 x 2065 mm

#### Secondary Designator:

Positive Design Pressure (DP) = 1440 Pa (30 psf)

Negative Design Pressure (DP) = -1440 Pa (-30 psf)

Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)

Canadian Air Infiltration / Exfiltration = A2 Level

### Masonite 6'8" **OUTSWING** Single Door - 949 mm wide x 2056 mm tall (37.4" x 80.9"):

#### Primary Designator:

Class R – PG30: Size tested 949 x 2056 mm (37.4 x 80.9 in)

Class R – PG1440 (SI): Size tested 949 x 2056 mm

#### Secondary Designator:

Positive Design Pressure (DP) = 1440 Pa (30 psf)

Negative Design Pressure (DP) = -1440 Pa (-30 psf)

Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)

Canadian Air Infiltration / Exfiltration = A2 Level

# QAI Laboratories (NAFS 11 Testing)

## Sampling Plan/Procedures:

One unused, Inswing T/SDS Combination Assembly w/ DB & L was provided by the client as a typical production sample and examined at the QAI laboratory to determine compliance with the submitted documentation, then tested on March 13, 2017 - April 20, 2017 as being representative of the model covered in this report.



## Test Conditions:

QAI Laboratories Ltd. (QAI) was retained by A.K. Draft Seal Ltd. to perform testing in accordance with the mandatory test requirements of AAMA/WDMA/CSA 101/I.S.2/A440-11 NAFS - North American Fenestration Standard / Specification for windows, doors and skylights on a representative sample of a 2882 mm x 2915 mm Inswing T/SDS Combination Assembly w/ DB & L.

This report includes tests performed on a specimen of specific dimensions. Actual product performance may be affected by variations in the products dimensions, assembly details and installation method. The drawings supplied by A.K. Draft Seal Ltd. were verified by QAI for the unit tested and are shown in Appendix A.

## Product Ratings:

Table 1: Summary of test results

Test Name	AAMA/WDMA/CSA 101/I.S.2/A440-11 NAFS - North American Fenestration Standard / Specification for windows, doors and skylights Result:
Force To Latch Test (6.4.5.1)	Pass – 3.90 lbf
Air Leakage Resistance (ASTM E283)	Pressure differential = 75 Pa A3 Level <sup>a</sup> Infiltration result = 0.470 L/s/m <sup>2</sup> (0.093 cfm/ft <sup>2</sup> ) – A3 Level <sup>a</sup> Exfiltration result = 0.405 L/s/m <sup>2</sup> (0.080 cfm/ft <sup>2</sup> ) – A3 Level <sup>a</sup>
Water Penetration Resistance Test (ASTM E547)	Maximum pressure differential = 180 Pa (DP 25 – 3.75 psf) <sup>ab</sup>
Uniform Load Deflection Test (ASTM E330 – Procedure A)	Design pressure = 1200 Pa (DP 25) Deflection at design pressure = 6.8 mm (0.2660")
Uniform Load Structural Test (ASTM E330 – Procedure A)	Design pressure = 1440 Pa (DP 30) Maximum pressure differential = 2160 Pa (45.0 psf)
Forced Entry Resistance Test (AAMA 1304)	Pass

**NOTE:** AAMA/WDMA/CSA 101/I.S.2/A440-11, Clause 9.2.5: The air, water and structural tests were performed on test specimens installed per the method outlined in the test conditions section of this report. The test procedures are designed to test the performance of the test specimen only and are not used to test the performance of the installation, in particular the perimeter sealant joint and the anchoring of the assembly. However, products not installed according to the installation method described in this report may not perform to an equivalent performance level.