

Evaluation Report

InsulStar® Spray Polyurethane Foam Adhesive

Manufacturer

NCFI Polyurethanes

1515 Carter Street
Mount Airy, NC 27030
(800) 346-8229

for

Florida Product Approval

FL 9975.1 R4

Florida Building Code 2010

Per Rule 9N-3

Method: 2 – B

Category: Roofing

Sub - Category: Cements – Adhesives – Coatings

Product Description: *InsulStar®*
Material: *Spray Polyurethane Foam Adhesive*
Application Type: *3 inch Fillet*

Prepared by:

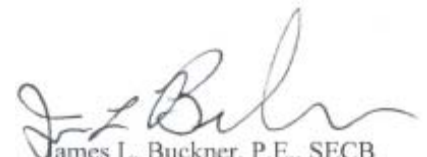
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Florida Professional Engineer # 31242
Florida Evaluation ANE ID: 1916
Project Manager: Youry Demosthenes
Report No. 11-230-Insulstar-SPFA-Fillet-ER_10
Date: 12 / 8 / 11

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12/15/11

1.0 Product

1.1 **Manufacturer** NCFI Polyurethanes

1.2 **Product Name:** InsulStar®

2.0 Evaluation Scope:

2.1 Compliance with the following

Florida Building Code (FBC) 2010

2.2 Evaluation Method:

Florida Product Approval Rule 9N-3.005 (2) (b)

2.3 Evaluation Classification:

Category: Roofing

Sub Category: Adhesives

2.4 Properties Evaluated

Structural Properties

2.5 Limits of Evaluation:

This product assembly evaluation is limited to compliance with section 2.1 to section 2.4 of this report.

3.0 Evaluated Uses:

3.1 Structural:

The InsulStar® Spray Polyurethane Foam adhesive, as evaluated in this report, can be used for supplemental attachment of roof plywood deck to rafters/truss top chords (dimensional lumber). This product may be used for code plus wind resistance in new construction or for enhancing the wind uplift resistance on existing structures.

4.0 Product Assembly Description:

4.1 General:

InsulStar® is a two component, one to one by volume, self-adhering, spray applied closed-cell polyurethane foam adhesive. InsulStar® Spray Polyurethane Foam adhesive is produced in the field by combining an isocyanate (component 11-016A) and a resin (component 11-016R). This spray foam adhesive provides wind uplift resistance when applied directly to the junction of the roof plywood deck and the roof rafter/truss top chords. InsulStar® Spray Polyurethane Foam adhesive fillet is applied to both sides of the roof rafter/truss top chords.

5.0 Evaluated Components to be Adhered:

5.1 Roof Deck:

Type: Plywood per FBC Chapter 23

5.2 Rafter/Truss Top Chord:

Function: Typically Roof Rafter or Wood Truss Top Chord

Type: Dimensional Lumber

Spacing: 24 in. o.c. (As Tested and Evaluated)

(Design of components is outside the scope of this evaluation)

6.0 Product Assembly Structural Performance:

6.1 Allowable Design Uplift Resistance:

Resistance - **190 PSF**

7.0 Performance Standard:

7.1 The following test protocols were performed to demonstrate compliance with the intent of the code:

- TAS 202–94, *Criteria for Testing building Envelope Components using Uniform Static Air Pressure* (Structural & Negative Load Only)
- TAS 203–94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*
- ASTM E330-02 – *Standard Test Method for Structural by Uniform Static Air Pressure Difference* (Structural & Negative Load Only)

8.0 Code Compliance:

- 8.1 The product assembly described herein has demonstrated compliance with the Florida Building Code (FBC) 2010, Section 1714.2.

9.0 (Optional) Insulation:

- 9.1 Evaluation of additional Spray Polyurethane Foam to the underside of wood deck for insulation purposes is outside the scope of properties evaluated in this report. Any applications and/or uses that are not within the scope of this evaluation shall be the responsibilities of others.

10.0 Limitations and Conditions of Use:

- 10.1 InsulStar® Spray Polyurethane Foam Adhesive shall be installed by a NCFI Polyurethanes qualified spray foam applicator trained in the processing and application of SPF systems as well as the plural component polyurethane dispensing equipment.
- 10.2 Scope of "Limitations and Conditions of Use" for this evaluation:
This evaluation report for "State Approval" contains technical documentation, specifications and installation method(s) which include "Limitations and Conditions of Use" throughout the report in accordance with Rule 9N-3.005. Per Rule 9N-3.004, the Florida Building Commission is the authority to approve products under "State Approval".
- 10.3 Option for application outside "Limitations and Conditions of Use"
Rule 9N-3.005(1)(e) allows engineering analysis for "project specific approval by the local authorities having jurisdiction in accordance with the alternate methods and materials authorized in the Code". Chapter one of the FBC and IBC addresses design for alternative materials, design and methods of construction. Any modification of the product as evaluated in this report and approved by the Florida Building Commission is outside the scope of this evaluation and will be the responsibility of others.
- 10.4 The scope of this evaluation is limited to structural properties.
- 10.5 This report does not evaluate the use of this product for other types of applications as allowed in the code.
- 10.6 Fire Classification and Thermal Properties are outside the scope of Rule 9N-3, and are therefore not included in this evaluation.
- 10.7 This report does not evaluate the use of this product for use in the High Velocity Hurricane Zone code section. (Dade & Broward Counties)

11.0 Quality Assurance:

The manufacturer has demonstrated compliance of products in accordance with the Florida Building Code and Rule 9N-3.005 (3) for manufacturing under a quality assurance program audited by an approved quality assurance entity through **Keystone Certification, Inc.** (FBC Organization ID#: QUA 1824).

12.0 Components & Material Standards:

Material shall comply with:

<u>Property:</u>	<u>Nominal Values:</u>	<u>Standard:</u>
Core Density	1.5 – 3.0 pcf	ASTM D 1622
Compressive Strength	15 psi minimum	ASTM D 1621
Tensile Strength	15 psi minimum	ASTM D 1623

13.0 General Installation Method:

- Surface Preparation:

All surfaces intended to be sprayed with NCFI's InsulStar® Spray Polyurethane Foam Adhesive must be dry, clean, and secure. Remove sawdust and other debris from areas intended to be sprayed by blowing with compressed air or vacuuming with a shop vacuum. Check surfaces with NCFI MDP strips to verify dryness. All metals to which adhesive is to be applied must be free of oil, grease, rust, etc. Primers should be used where necessary.

- Fillet Foam Application:

Apply InsulStar® Spray Polyurethane Foam Adhesive using a "picture framing" technique. Foam must cover at least 3-inches of the rafter member and 3-inches of the roof deck. The resulting triangular cant, at least 3-inches high and 3-inches wide, will cover the joint between the rafter member and the underside of the roof deck. Spray foam adhesive shall be applied in consecutive layers not to exceed 2 inches per pass. Allow foam to fully expand and cool for a period of 10 minutes between each layer.

Install the system in compliance with the evaluated installation method(s). The installation method(s) described herein have been evaluated to address the scope of the evaluation. Refer to manufacturer's installation instructions as a supplemental guide for spray foam application.

(Refer to installation method on Page6 of this evaluation report.)

14.0 Evaluation Reference Data:

14.1 Testing Application Standard (TAS) 202-94

Criteria for Testing building Envelope Components using Uniform Static Air Pressure
By Certified Testing Laboratories, Inc. (TST ID: 1577)
Test Number# CTLA 2066W, Date: 08/24/11

14.2 Testing Application Standard (TAS) 203-94

Criteria for Testing Products Subject to Cyclic Wind Pressure Loading
By Certified Testing Laboratories, Inc. (TST ID: 1577)
Test Number# CTLA 2066W, Date: 08/24/11

14.3 ASTM E330 – 02

Test Method for Structural Performance by uniform Static Air Pressure Difference
By Certified Testing Laboratories, Inc. (TST ID: 1577)
Test Number# CTLA 2066W-1, Date: 08/24/11

14.4 Quality Assurance

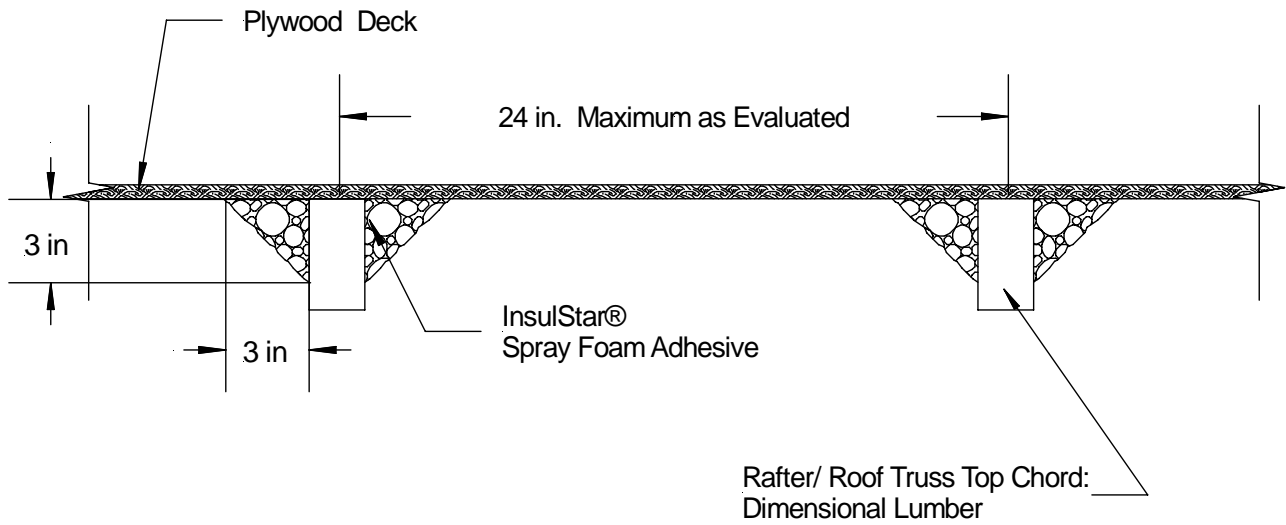
Keystone Certification, Inc. (FBC Organization ID#: QUA 1824)
NCFI Polyurethanes Licensee #535

14.5 Certification of Independence

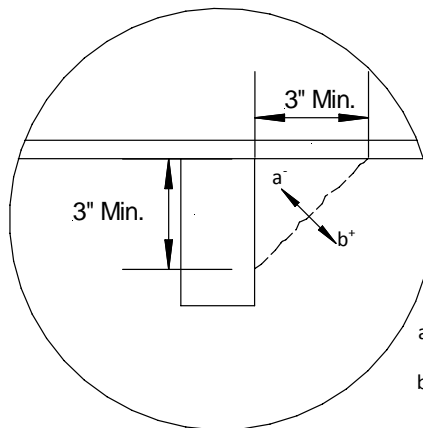
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)

Installation Method NCFI Polyurethanes InsulStar® Spray Polyurethane Foam Adhesive

Application Type: Fillet



Typical Roof Deck Section



- a' Direction: Zero Tolerance
- b' Direction: Any Greater

Fillet Tolerances