

REPORT NUMBER: 101692671MID-006r ORIGINAL ISSUE DATE: September 18, 2014 REVISED: October 2, 2014

> EVALUATION CENTER Intertek 8431 Murphy Drive Middleton, WI 53562

RENDERED TO

InSoFast LLC 7895 180TH Street North Hugo, MN 55038 Contact: Edward Scherrer Phone: 651-491-0675 Email: ed@insofast.com

PRODUCT EVALUATED: InSofast Proprietary 2" EPS foam system

EVALUATION PROPERTY: Fastener Withdrawal Strength Fastener Lateral Load (Shear) Strength

Report of Testing of Insofast LLC proprietary 2" EPS foam system for the requirements of the following criteria: ASTM D1761 (2006) Standard Test Methods for Mechanical Fasteners in Wood.

"This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program."

FEST REPORT

1 Table of Contents

| 1 | Table of Contents2 | | | | | | |
|---|--------------------|---------------------------------|---|--|--|--|--|
| 2 | Introduction3 | | | | | | |
| 3 | Tes | Test Samples3 | | | | | |
| | 3.1. | SAMPLE SELECTION | } | | | | |
| | 3.2. | SAMPLE AND ASSEMBLY DESCRIPTION | } | | | | |
| 4 | Tes | ting and Evaluation Methods | ; | | | | |
| | 4.1. | Fastener Pullout Test | } | | | | |
| | 4.2. | Lateral Load Strength Test4 | ŀ | | | | |
| 5 | Tes | ting and Evaluation Results4 | ŀ | | | | |
| | 5.1. | RESULTS AND OBSERVATIONS4 | ŀ | | | | |
| 6 | Cor | nclusion5 | ; | | | | |

2 Introduction

Intertek has conducted testing for InSoFast LLC, on InSoFast's proprietary foam system to evaluate fastener pullout and lateral load strengths. Testing was conducted in accordance with ASTM D1761-06 – *Standard Test Methods for Mechanical Fasteners in Wood.* This evaluation began September 9, 2014 and was completed September 10, 2014.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were randomly selected on July 15, 2014 by Intertek representative John Schachtner, at the Deversifoam facility, located in Rockford, MN. Samples were received at the Evaluation Center on August 24, 2014.

The subject test specimen is a traceable sample selected from the manufacturer's facility. Intertek selected the specimen and has verified the composition, manufacturing techniques, and quality assurance procedures.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

InSoFast LLC system are based on simple interlocking stacking units consisting of proprietary EPS panels. The panels are made of 2" EPS foam 1.25 lb/ft³ containing a polypropylene "I" shaped spline which the fasteners are place.

4 **Testing and Evaluation Methods**

The test specimens consisted of I-shaped splines molded into the EPS of the foam panels as represented in the end-use configuration. The samples were secured in the test equipment so that the block with the spline was secured in a manner representative of pull on the spline to show anchorage into the spline.

**No pilot holes were used.

4.1. Fastener Pullout Test

Six (6) samples were prepared for fastener pullout testing. The screws were #6 (0.114" root diameter) x 1 5/8" long, coarse thread type W gypsum board fasteners. The fasteners were inserted 1" into the splines of the sample, at the center location of the spline.



All fasteners were withdrawn immediately after they were driven into the Spline of the foam specimen. A load was applied to the fastener- assembly, with the fastener being withdrawn in tensile at a uniform rate of platen separation of 0.10 in/min. The test continued until the load dropped by a minimum of 50% the maximum load strength.

4.2. Lateral Load Strength Test

Six (6) samples were prepared for lateral load strength testing. The screws were #6 (0.114" root diameter) x 1 5/8" long, type W gypsum board fasteners. The screws were inserted into the spline of the sample through a 3/16" test platen, at the location 1" from the top of the spline.

All fasteners were tested immediately after they were driven into the foam-spline specimen. The spline/sample was secured vertically to the table of the Instron Universal Testing Machine, representative of the end use configuration. A load was applied to the top of the test platen so that the platen could slide along the vertical surface of the sample, eventually causing the fastener to shear when the ultimate load was reached. The fastener lateral load strength was determined with the platens moving in tension, at a uniform rate of 0.10 in/min. The test continued until the load dropped by a minimum of 50% the maximum load strength.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

| Withdrawal Load Strength | | | | |
|----------------------------|-------|--|--|--|
| Average Maximum Load (lbf) | 325.4 | | | |
| Lateral Load Strength | | | | |
| Average Maximum Load (lbf) | 470.6 | | | |

Test Equipment:

• Instron Model 5582 Universal Test Machine (Inventory #0870, calibration due12-19-14)

6 Conclusion

Intertek has conducted testing for InSoFast LLC, on 2" EPS panel with a polypropylene fastener spline, to evaluate fastener pullout and lateral load strengths. Testing was conducted in, following the standard methods of ASTM D1761-06 – *Standard Test Methods for Mechanical Fasteners in Wood*. This evaluation began September 9 and was completed September 10.

The conclusions of this test report may be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK

Kent Kelsey

Reported by:

Kent Kelsey Testing Engineer Building Products

Reviewed by:

Baldeep Sandhu Technologist Building Products



Client: InSoFast LLC Project No: 101692671MID-006r October 2, 2014 Page 6 of 10

APPENDIX A Test Data Summary Sheets



Client: InSoFast LLC Project No: 101692671MID-006r



Picture of polypropylene spline





| Test: | Screw Holding C | apacity Test | | | | |
|----------------------|--------------------|------------------|--|------------------------|---------------|----------|
| Date: | 10-Sep-2014 | _ | | | | |
| Project No: | 101692671 | | | | | |
| Client: | InSoFast | | | | | |
| Product: | e spline | | | | | |
| Specimen ID: | MID-1407171444-0 | 001 | | | | |
| Fastener Type: | 1-5/8" type W #6 g | gypsum sheathing | g screw | | | |
| Pilot Hole: | None | | | | | |
| | | | | | | |
| Test Method(s): | ASTM D 1761 | | | | | |
| | | | | | | |
| Equipment: | Instron 5582 Tens | ile Test Machine | (Middleton | ID#00087 | 0) Cal due | 12/19/14 |
| Crosshead Pull Rate: | 0.1 | inch / minute | | | | |
| Tested By: | Renor Seals & Ke | nt Kelsey | | | | |
| | | | | | | |
| | | | | | | |
| FASTENER WITHDRA | <u> </u> | TEST | 3 | | | |
| | Width | Maximum Load | | | | |
| Sample # | (in) | (lbs) | MC (%) | | Observat | ions |
| | | | n/a | | | |
| 1 | 1.500 | 402.0484 | n/a | Sci | rew hit cros | s member |
| 2 | 1.500 | 337.1649 | n/a | Sci | rew hit cros | s member |
| 3 | 1.500 | 330.5997 | n/a | Sci | rew hit cros | s member |
| 4 | 1.500 | 352.7150 | n/a | Screw hit cross member | | s member |
| 5 | 1.500 | 241.6494 | n/a | S | Screw thru fa | ace only |
| 6 | 1.500 | 288.4663 | n/a | _ | | aco only |
| | 1.500 | 200.4003 | n/a | S | Screw thru fa | |
| | 1.500 | 200.4003 | n/a n/a | S | crew thru fa | ace only |
| | 1.300 | 200.4003 | | S | crew thrufa | |
| | | | n/a | S | Screw thru fa | |
| | | 200.4003 | n/a n/a | S | Screw thru fa | |
| | | 200.4003 | n/a n/a n/a | S | crew thru fa | |
| | | | n/a n/a n/a n/a | S | crew thru fa | |
| | | | n/a n/a n/a n/a n/a | S | crew thru fa | |
| | | | n/a n/a n/a n/a n/a | S | crew thru fa | |
| | | | n/a n/a n/a n/a n/a n/a | S | crew thru fa | |
| | | | n/a n/a n/a n/a n/a n/a n/a | S | crew thru fa | |
| | | | n/a n/a n/a n/a n/a n/a n/a n/a | S | | |
| | AVERAGE: | 325.4 | n/a n/a n/a n/a n/a n/a n/a n/a | S | | |
| | | | n/a n/a n/a n/a n/a n/a n/a n/a | S | | |



Client: InSoFast LLC Project No: 101692671MID-006r

| Test: | Shear Strength 1 | ſest | | Page 2 of 2 |
|-------------|------------------|--------------------|----------|--------------|
| Date: | 10-Sep-14 | | | |
| Project No: | 101692671 | | | |
| Client: | InSoFast | | | |
| Product: | EPS foam panel w | vith polypropylene | spline | |
| | Width | Maximum Load | <u> </u> | |
| Sample # | (in) | (lbs) | MC (%) | Observations |
| 1 | 1.5 | 483.1271 | n/a | Broke screw |
| 2 | 1.5 | 504.0392 | n/a | Broke screw |
| 3 | 1.5 | 438.5359 | n/a | Broke screw |
| 4 | 1.5 | 476.2029 | n/a | Broke screw |
| 5 | 1.5 | 451.0841 | n/a | Broke screw |
| | | | n/a | |
| | AVERAGE: | 470.6 | | |
| | STD DEV: | 26.1 | | |
| | CoV: | 5.5% | | |

REVISION SUMMARY

| DATE | SUMMARY |
|--------------------|--|
| September 18, 2014 | Original Document |
| October 2, 2014 | Revise pages 3,4,8 and 9 to state # 6 screw, included root diameter. |
| | Changed reviewer to Baldeep. |
| | |