TEST REPORT

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.

1 Table of Contents

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/ft^3 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All fasteners were withdrawn immediately after they were driven into the Spline of the foam specimen.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:

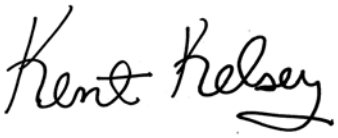
- *Instron Model 5582 Universal Test Machine (Inventory #0870, calibration due12-19-14)*

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



Reported by: _____
Kent Kelsey
Testing Engineer
Building Products

Reviewed by: _____
Baldeep Sandhu
Technologist
Building Products

APPENDIX A

Test Data Summary Sheets

Picture of polypropylene spline

Test:	**Screw Holding Capacity Test**						
Date:	10-Sep-2014						
Project No:	101692671						
Client:	InSoFast						
Product:	EPS foam panel with polypropylene spline						
Specimen ID:	MID-1407171444-001						
Fastener Type:	1-5/8" type W #6 gypsum sheathing screw						
Pilot Hole:	None						
Test Method(s):	ASTM D 1761						
Equipment:	*Instron 5582 Tensile Test Machine (Middleton ID#000870) Cal due 12/19/14*						
Crosshead Pull Rate:	0.1	inch / minute					
Tested By:	Renor Seals & Kent Kelsey						

FASTENER WITHDRAWAL (PULL-OUT) TEST **3**

Sample #	Width (in)	Maximum Load (lbs)	MC (%)	Observations
			n/a	
1	1.500	402.0484	n/a	Screw hit cross member
2	1.500	337.1649	n/a	Screw hit cross member
3	1.500	330.5997	n/a	Screw hit cross member
4	1.500	352.7150	n/a	Screw hit cross member
5	1.500	241.6494	n/a	Screw thru face only
6	1.500	288.4663	n/a	Screw thru face only
			n/a	
			n/a	
			n/a	
			n/a	
			n/a	
			n/a	
			n/a	
			n/a	
			n/a	
			n/a	
	AVERAGE:	**325.4**		
	STD DEV:	55.1		
	CoV:	16.9%		

Test:	**Shear Strength Test**					Page 2 of 2
Date:	10-Sep-14					
Project No:	101692671					
Client:	InSoFast					
Product:	EPS foam panel with polypropylene spline					

Sample #	Width (in)	Maximum Load (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	
			n/a	
			n/a	
			n/a	
			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.