

Pei Evaluation Service® is an accredited ISO Standard 17065 Product Certifier, accredited by the IAS. This **Product Evaluation Report** represents a product that **Pei ES** has Evaluated. This product has a Product Evaluation Service Agreement & Follow-up Inspection Service Agreement. This **Product Evaluation Report** in no way implies warranty for this product or relieves **Foam Supplies, Inc.** of their liabilities for this product. This **PER** is an official document if it is within one year of the initial or re-approval date.

Initial Approval
January, 1998

Re-Approved
May, 2018

See all **Pei ES** Listings at: www.p-e-i.com

Report Owner

Foam Supplies, Inc.
4387 North Rider Trail
Earth City, MO 63045

Approved Manufacturing Locations

Foam Supplies, Inc.
590 Benjamin's Way
Lewisville, TX 75057

Product

FoamNail® Polyurethane Structural Foam Adhesive

Evaluation Report Information

www.foamsupplies.com

FSI Contact: David Modray - (314) 344-1516

General Details

FoamNail adhesive is used to bond wood framing to gypsum in wall and ceiling construction without the use of mechanical fasteners. The manufacturing location listed above has an approved Quality Assurance Manual to manufacture the **FoamNail** Polyurethane Structural Foam Adhesive and is inspected quarterly by *Progressive Engineering Inc. (Pei)*.

Product Description

FoamNail is a two-part polyurethane structural foam adhesive system. It is applied by pumping two components at a 1 to 1 volumetric ratio under pressure through heating equipment to produce one continuous bead. The two components are an "A-ISO" and a "B-RESIN". The A-ISO is a purchased material and the B-RESIN is manufactured by **Foam Supplies Inc.** This adhesive does not off-gas Formaldehyde into the air.

Containers and Storage

The A and B components are shipped in pressurized cylinders. Storage of these containers should be in an indoor dry environment, at temperatures ranging from 70°F to 105°F. **FoamNail** will have a storage life of up to six months in these conditions.

General Product Use and Limitations

The wood framing and gypsum surfaces shall be clean, dry and free of dust, ice and loose particles. The substrates shall have a surface temperature above 50°F. **FoamNail** adhesive should be applied in an ambient temperature range of 50°F. to 110°F. The adhesive is applied along the intersection of the gypsum and the wood framing according to **Foam Supplies Inc.** Application Instructions. The adhesive temperature in the cylinders should be a minimum of 70°F and an optimum temperature of 80°F. to 85°F. After the last bead is applied, the structure shall not be moved for a minimum of two minutes. The structure should stay in the same ambient conditions for the first 24 hours.

FoamNail adhesive can be used on 16-in o.c. and 24-in o.c. framing for wall and ceiling applications. The fillet beads produced shall be sized per Fig.1 and Note 1 under wall shear design values. A bead should never be greater than 3" in size. The adhesive beads are applied along one side of field framing and along both sides at gypsum seams.

- The **FoamNail** adhesive shall be installed according to **Foam Supplies Inc.** Application Instructions. A copy of these instructions must be made easily available at the assembly areas.
- This Evaluation is for **FoamNail** to be applied in an indoor manufacturing facility and is not meant to be applied in an outdoor uncontrolled environment.
- **FoamNail** adhesive is to be manufactured at the **Foam Supplies Inc.** plant in Lewisville, TX following their approved quality assurance program with unannounced Inspections by *Progressive Engineering Inc.*
- The use of **FoamNail** adhesive in a fire rated assembly is not addressed in this **PER**.
- A vapor barrier cannot be used between the adhesive and the substrates.
- **FoamNail** is to be applied to the back side standard raw gypsum and is not intended for other gypsums such as foil backed, moisture resistant or water resistant gypsums.
- Construction of assemblies using **FoamNail** and their design values should be as described in the following test reports.
- Gypsum board may be installed in both non-structural finish material and structural applications within the limits of this **PER**. All gypsum board must be in compliance to ASTM C1396, and all lumber must be kiln dried and graded.

Building Code & Standard Compliance

Must be used with an approved thermal barrier not less than 1/2" (12.7mm) gypsum wallboard or approved material equivalent in compliance with the requirements of the 2006 IRC, Section R314.4 and the 2009, 2012, and 2015 IRC, Section R316.4.

Must be used with an approved thermal barrier not less than 1/2" (12.7mm) gypsum wallboard or approved material equivalent in compliance with the requirements of the 2006, 2009, 2012, and 2015 IBC, Section 2603.4.

Meets or exceeds the requirements of the 2006, 2009, 2012, and 2015 IBC, Section 2603.9 based on large-scale tests and acceptance criteria of UL-1715.

August 1, 2017 - Texas Industrialized Housing and Buildings Administrative Rules - Section: 70.103. (c) (2)

NC Residential Code, 2012 Edition - Section R316.6

NC Building Code, 2012 Edition - Section 2603.9

ASTM E84 - Class A Fire Rating: Flame Spread Index - 20 and Smoke Developed Index - 60

Meets or exceeds the Acceptance Criteria of UL-1715 for use with 3/8" Gypsum Wallboard after 15 Minute Exposure Requirements, where flames shall not extend to the extremities or through the doorway opening of the tested specimen.

Meets or exceeds the Acceptance Criteria of UL-1715 for use with 1/2" Gypsum Wallboard after 15 Minute Exposure Requirements, where flames shall not extend to the extremities or through the doorway opening of the tested specimen.

Meets or exceeds the Acceptance Criteria of UL-1715 for use with 5/8" Gypsum Wallboard after 15 Minute Exposure Requirements, where flames shall not extend to the extremities or through the doorway opening of the tested specimen.

Meets or exceeds adhesion of gypsum panels to wood framing for 200°F Stability and 30 Minute Exposure Requirements of the 2012 IBC, Section 803.10 Stability.

Test Standards

Pei Standard No. 89-1 - Simple Span Ceiling or Roof Diaphragm Shear Resistance Test Procedure for Manufactured Homes

Pei Standard No. 93-7 - Performance Requirements for Fastening Gypsum Board to Wood Framing using a Two-Part Urethane Adhesive

Pei Standard No. 93-8 - Ceiling Board Dead Load Test Procedure

Pei Standard No. 99-23 - Small Scale Shear Strength Comparison Tests.

ASTM C 557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing

ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction

ASTM E 84 (UL 723) - Standard Test Method for Surface Burning Characteristics of Building Materials

UL-1715 - UL Standard for Safety Fire Test of Interior Finish Material

Table 1 - Wall Shear Designs with Gypsum Board

Framing				Gypsum Orientation	Gypsum Brand	Single or Double Sided	Ultimate Load lb/ft	Test Report #
Top Plate	Bott. Plate	Studs	Stud Spacing					
1x3	1x3	2x3	16" o.c.	5/16" Vertical	Gold Bond	Single	520.4	1999-1346C
					GA-Pacific	Single	521.7	1999-1346E
					USG Fiber BRD	Single	602.5	1999-2462C
					Gold Bond	Single	560.8	1999-2462D
					GA-Pacific	Single	582.2	1999-2462E
				1/2" Vertical	FibeRock MH	Single	523.1	1999-1346F
				1/2" Horizontal	USG MH	Single	517.0	2012-1569B
					Gold Bond	Single	573.0	1999-1346A
					FibeRock MH	Single	516.7	1999-1346D
					USG BRD	Single	682.0	1999-2462A
GA-Pacific	Single	646.7	1999-2462B					
2x3	2x3	2x3	16" o.c.	5/16" Vertical	GA-Pacific	Single	740.2	1999-2792A
					USG MH	Single	811.7	1999-2792B
					Gold Bond	Single	768.3	1999-2792C
				1/2" Horizontal	USG MH	Single	622.0	2012-1569C
					GA-Pacific	Single	708.7	1999-1858
					USG MH	Single	818.7	1999-2462F
					Gold Bond	Single	649.1	1999-1346B

Notes:

1. Bead sizes as described in each test report
2. Ultimate load does not include any required safety factors

Design Values

Ceiling Diaphragm Design Load = **192 plf** (10' minimum width x 52'-0" Maximum diaphragm span)

Ceiling Diaphragm Design Load = **176.9 plf** (17'-6" minimum width x 52'-0" Maximum diaphragm span)

Ceiling Dead Load Resistance = **16.9 psf**

Note:

Ceiling Diaphragm and Dead Load Resistance testing is valid for all gypsum boards listed below, as long as the gypsum manufactured maintains a third party product listing showing compliance to ASTM C1396.

Gypsum Brands Tested for Ceiling use

1/2" American Gypsum Ceiling Board

1/2" Georgia-Pacific Gypsum Board

5/16" Gold Bond Gypsum Board

1/2" SHEETROCK® Brand MH UltraLight Ceiling Panels ULTRA-BASE™

1/2" USG FibeRock Brand MH Gypsum Fiber Board

5/16" USG SHEETROCK MH Gypsum Ceiling Panels

5/8" USG SHEETROCK Firecode Core Type X Gypsum (Dead Load Use Only)

Adhesive Application

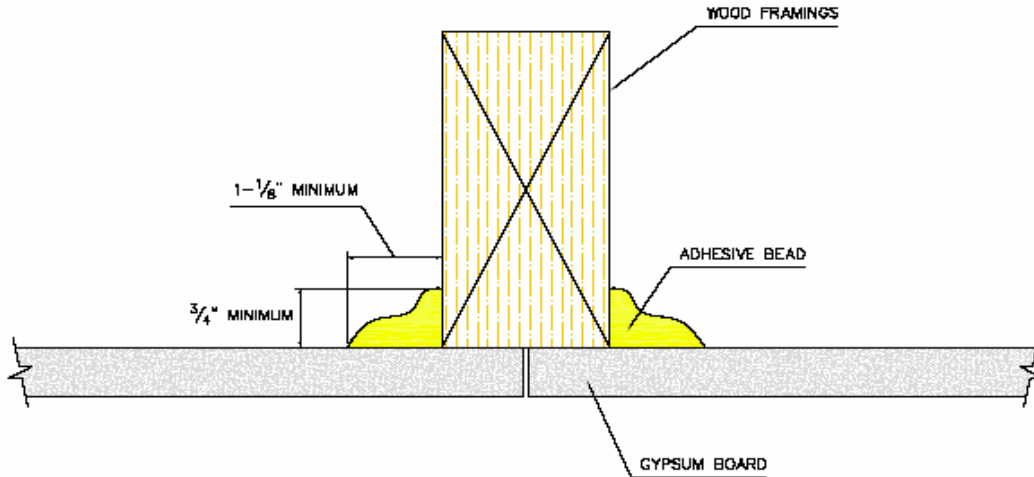


Figure 1 - Ceiling use bead sizes

Product Labeling

Each cylinder shipped of **FoamNail** that is covered by this **PER** must have a label attached with at least the following information:

1. [Foam Supplies Inc.](#) Name and Address.
2. Date of manufacture or Lot No.
3. Shelf life information
4. This **PER** Number & **Pei ES** Logo
5. Component name

Acceptable Evaluation Marks



Product Documentation

A Product Evaluation Service Agreement between *Pei Evaluation Service*[®] and *Foam Supplies Inc.*
 A Follow-up Inspection Service Agreement between *Progressive Engineering Inc.* and *Foam Supplies Inc.*

Quality Assurance Manual - Dated: April 26, 2018

FoamNail Guidelines for Use, Application & Safe Handling - Dated: March, 2014

SDS sheet for **FoamNail** - Dated: January 1, 2016

Opinion Letter - Dated: 11/10/1999

Opinion Letter - Dated: 7/17/2000

Opinion Letter - Dated: 10/5/2001

Opinion Letter - Dated: 4/19/2002

Opinion Letter - Dated: 4/29/2002

Ceiling Diaphragm Test Reports

A *Pei* Test Report No. 1997-1904 - Full Scale Ceiling Diaphragm Test on an 11'-9" x 44'-0" Flat Ceiling using FSI FoamNail[®] Adhesive - Dated: 9/29/1997 - Latest Revision: 7/20/1998

A *Pei* Test Report No. 1997-1906 - Full Scale Cathedral Ceiling Diaphragm Test on an 11'-9" x 44'-0" Using FSI FoamNail[®] Adhesive - Dated: 10/7/1997 - Latest Revision: 8/5/1998

A *Pei* Test Report No. 1997-2114 - Full Scale Ceiling Diaphragm Test on an 15'-6" x 44'-0" Flat Ceiling Using FSI FoamNail[®] Adhesive - Dated: 10/27/1997 - Latest Revision: 7/20/1998

A *Pei* Test Report No. 1997-2116 - Full Scale Cathedral Ceiling Diaphragm Test on an 15'-6" x 44'-0" Using FSI FoamNail[®] Adhesive - Dated: 10/22/1997 - Latest Revision: 8/5/1998

A *Pei* Test Report No. 1999-1110 - Full Scale Ceiling Diaphragm Test on an 9'-6" x 52'-0" Flat Ceiling Using FSI FoamNail[®] Adhesive - Dated: 6/8/1999

A *Pei* Test Report No. 1999-1146 - Full Scale Ceiling Diaphragm Test on an 15'-6" x 52'-0" Flat Ceiling Using FSI FoamNail[®] Adhesive - Dated: 6/10/1999

A *Pei* Test Report No. 1999-1148 - Full Scale Ceiling Diaphragm Test on an 18'-0" x 52'-0" Cathedral Ceiling Using FSI FoamNail[®] Adhesive - Dated: 6/18/1999 - Latest Revision: 7/14/1999

A *Pei* Test Report No. 1999-1348 - Full Scale Cathedral Ceiling Diaphragm Test on an 9'-6" x 52'-0" Using FSI FoamNail[®] Adhesive - Dated: 6/7/1999 - Latest Revision: 2/7/2013

A *Pei* Test Report No. 2012-1569 (Addendum E) - Full Scale Cathedral Ceiling Diaphragm Test on an 10'-0" x 52'-0" Using FSI FoamNail[®] Adhesive - Dated: 5/21/2012

A *Pei* Test Report No. 2013-0444 - Full Scale Ceiling Diaphragm Test on an 17'-6" x 52'-0" Cathedral Ceiling Using FSI FoamNail[®] Two-Part Polyurethane Structural Adhesive and 1/2" American Gypsum Interior Ceiling Board - Dated: 4/23/2013

Ceiling Dead Load Test Reports

A *Pei* Test Report No. 1997-2334 - Ceiling Dead Load Test using FSI FoamNail[®] Adhesive - Dated: 10/23/1997

A *Pei* Test Report No. 2001-0800 - Ceiling Dead Load Test using FSI FoamNail[®] Adhesive and 5/8" Gypsum - Dated: 5/21/2001

A *Pei* Test Report No. 2012-1569 (A) - PEI Standard No. 93-8 Ceiling Board Dead Load Test on 1/2" SHEETROCK[®] Brand MH Ultralight Ceiling Panels Ultra-Base™ Parallel to 24" o.c. Lumber Framing using FSI FoamNail[®] - Dated: 11/16/2012 - Latest Revision: 12/28/2012

PEI Standard No. 93-7 Test Report

A *Pei* Test Report No. 1998-2254 - PEI Standard No. 93-7 Test on FSI FoamNail[®] Adhesive - Dated: 11/29/1998 - Latest Revision: 12/21/1998

Stability at 200°F Test Report

A *Pei* Test Report No. 2012-1394 - 2012 IBC 803.10 Wall and Ceiling Finishes Stability at 200°F FSI FoamNail[®] Two-Part Polyurethane Adhesive - Dated: 4/12/2013

ASTM E84 (UL 723) Test Report

A Test Report No. R10576/10CA18945 - Report of Surface Burning Characteristics Tests on Two Beads of FoamNail Applied to Cement Board - Dated: 4/29/2010

UL-1715 Test Report

A Test Report No. RCB 0306 - UL-1715 Fire Test of Interior Finish Material - Dated: 11/25/2003

ASTM D 5582 Test Report

A *Pei* Test Report No. 2008-1778 - ASTM D 5582 Determining Formaldehyde Levels from Wood Products using a Desiccator - Dated: 11/21/2008 - Latest Revision: 4/27/2014

Small Scale Test Report

A *Pei* Test Report No. 1999-0236 - Small Scale Shear Strength Comparison Test - Dated: 1/20/1999