



**PFS
Test
Report**

PFS TEST REPORT #12-032_C

**AZEK HAND RAIL TESTING
TO CONFIRM WITH
IBC 2012, IRC 2012 AND ASTM E985 LOAD
FOR
AZEK BUILDING PRODUCTS, INC.
SCRANTON, PA**

By:
PFS Corporation
1507 Matt Pass
Cottage Grove, WI 53527



TL-109

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Quality Assurance • Design Calculations • Sampling • Witnessing

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MDF panels, I-Joists, Rim-board, LVL, Trusses

WOOD-PLASTIC COMPOSITE LUMBER and GUARDRAIL SYSTEMS

Deck boards, Structural Elements, Guards, and Handrails

BUILDING STRUCTURAL COMPONENTS

Load Bearing Performance

STRUCTURAL INSULATED PANELS

Structural Performance and Adhesive Qualification

STRUCTURAL and CONSTRUCTION ADHESIVES

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ROOF COVERINGS and EXTERIOR SIDINGS

All types

FASTENERS and CONNECTIONS

Nails, Screws, Staples, Bolts, Connector Plates, Joist Hangers

CORPORATE HEADQUARTERS and LABORATORY

1507 Matt Pass
Cottage Grove, WI 53527
Tel: (608) 839-1013
Fax: (608) 839-1014
James A. Rothman, PE
jrothman@pfscorporation.com

NORTHEAST REGION

2877 Skatetown Road
Bloomsburg, PA 17815
Tel: (570) 784-8396
Fax: (570) 784-5961
Richard L. Wenner, PE
rwenner@pfscorporation.com

MIDWEST REGION

1507 Matt Pass
Cottage Grove, WI 53527
Tel: (608) 839-1013
Fax: (608) 839-1014
Ronald H. Reindl, AIA
rreindl@pfscorporation.com

WESTERN REGION

3637 Motor Avenue, Suite 380
Los Angeles, CA 90034
Tel: (310) 559-7287
Fax: (310) 559-1368
J. Robert Nelson, PE
rnelson@pfscorporation.com

SOUTH CENTRAL REGION

2520 K Avenue, Suite 700-735
Plano, TX 75074
Tel: (972) 424-2740
Fax: (608) 839-3995
Jeremy Hopland
jerhopland@pfscorporation.com

SOUTHEAST REGION

2109 Rainy Lake Street
Wake Forest, NC 27587
Tel: (919) 217-7002
Fax: (919) 217-7003
Larry A. Beineke, PE, Ph.D.
lbeineke@pfscorporation.com



PFS Corporation

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Headquarters

1507 Matt Pass
Cottage Grove, WI 53527

Phone: 608.839.1013
Fax: 608.839.1014

Website

www.pfscorporation.com

James A. Rothman, PE

President
jrothman@pfscorporation.com

Regional Offices

Northeast
Bloomsburg, PA
570.784.8396

Southcentral
Plano, TX
972.424.2740

Western
Los Angeles, CA
310.559.7287

Midwest
Cottage Grove, WI
608.839.1013

Southeast
Wake Forest, NC
919.217.1013

Sales Office
Mentone, AL
256.634.4071



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GENERAL

The PFS Corporation, Cottage Grove, Wisconsin, performed client requested testing services for AZEK Building Products, Inc., of Scarnton, PA. The handrail test specimens were received in good order at PFS on May 1, 2012. The test was conducted on May 5, 2012.

TEST SPECIMENS

Testing was performed on submitted handrail design as per client drawing “revised 10/9/09” dated 9/24/09 (copy attached.).

The handrail test specimen consisted of 78-in. long Azek Hand Rail composed of a 1.29-in. OD aluminum round tube with 0.11-in. nominal thickness with 0.10-in.-wall vinyl cover. The rail was attached with powder coated aluminum brackets spaced at 72-in.-on-centers. The brackets (HRBW) attach to the rail with 2 #12 x 1-in.-long SS FH PH screws (pre-drilled using 13/64 drill bit). A 3-in. overhang (measured from mounting bracket center to end of rail) occurred at each end. The rail system nominal diameter was 1-1/2-in.

One handrail assembly sample was fabricated and tested -

Handrail mounted on Azek composite post with a 3/8x2” lag bolt on each mounting bracket(Photo 1, 2). The mounting brackets were spaced at 6-ft on center. The Azek posts were securely fixed to the test frame.

CONDITIONING

The boards were stored and tested in the ambient laboratory atmosphere of approximately 70 - 75°F and 40 - 50% relative humidity.

TEST PROCEDURE AND RESULTS

The handrail assemblies were tested according to ASTM E985-06, Sec. 7.1.1 to confirm with the IBC 2012 and IRC 2012 load requirements of 50 plf uniformly distributed load and 200 lbf concentrated load. Each handrail assembly was tested for the following six loading configurations -

1. 200 lbf concentrated load applied at the midspan vertically,
2. 200 lbf concentrated load applied at the midspan horizontally,
3. 200 lbf concentrated load applied at the bracket vertically
4. 200 lbf concentrated load applied at the bracket horizontally
5. 50 plf uniform load (300 lbf at quarter points) vertically,
6. 50 plf uniform load (300 lbf at quarter points) horizontally.

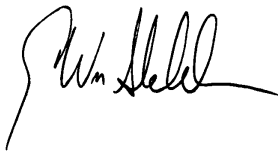
The tests were performed on one assembly with one load configuration at a time on the sample assembly. The load was applied with a hydraulic cylinder and test fixture apparatus. The test force was measured with an electronic load cell positioned between the test specimen and hydraulic cylinder. The load was gradually applied until the test requirement force magnitude was obtained. The 50 plf uniform load test was applied with reaction points located at 1/4 of the test span.

The handrail assembly mounted on Azek posts did not show any sign of failure at the prescribed loads.

TEST REPORT DUPLICATION

This report shall not be reproduced, except in full, without the written approval of PFS Corporation, Cottage Grove, Wisconsin.

Testing Performed by:



Jim Sheldon
Lead Lab Technician

Report Prepared and
Tests Witnessed by:



Deepak Shrestha, PhD, PE
General Manager – PFS Lab



PHOTO 1: Handrail mounted on Azek post

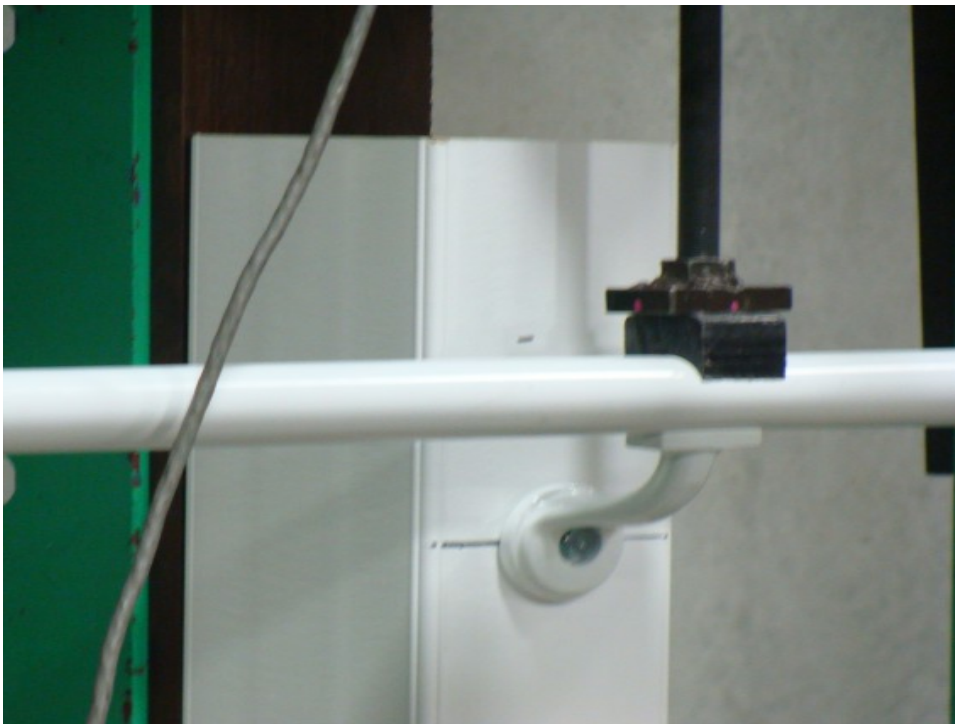


PHOTO 2: Handrail mounted on Azek post

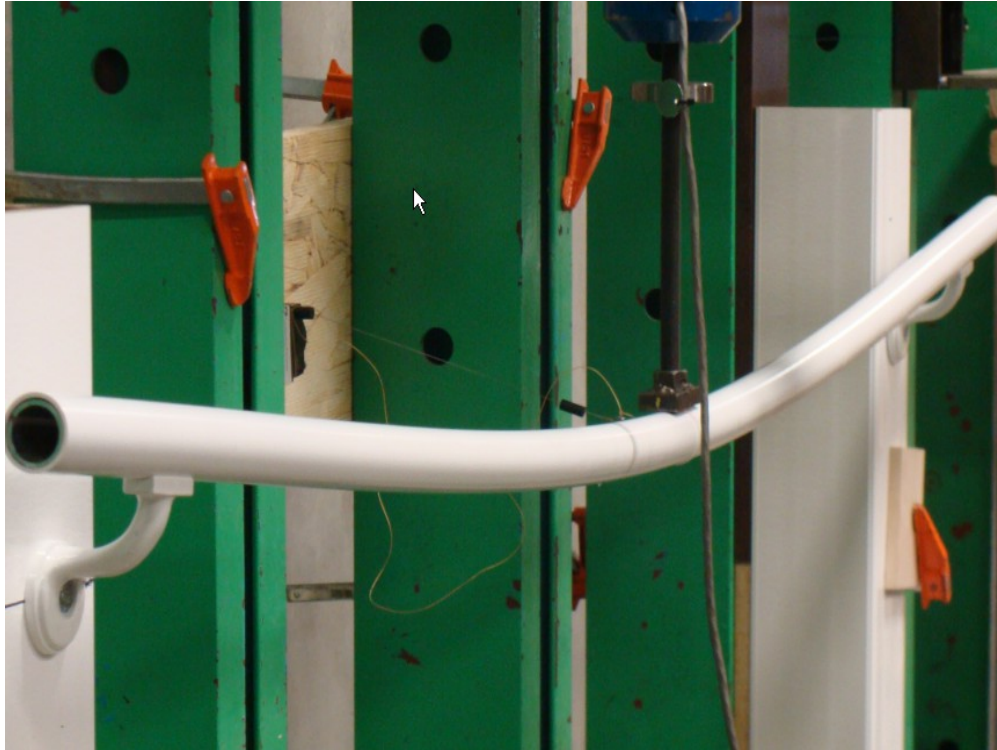


PHOTO 3: 200 lbf Load Applied – Vertical Midspan



PHOTO 4: 200 lbf Load Applied – Horizontal Midspan

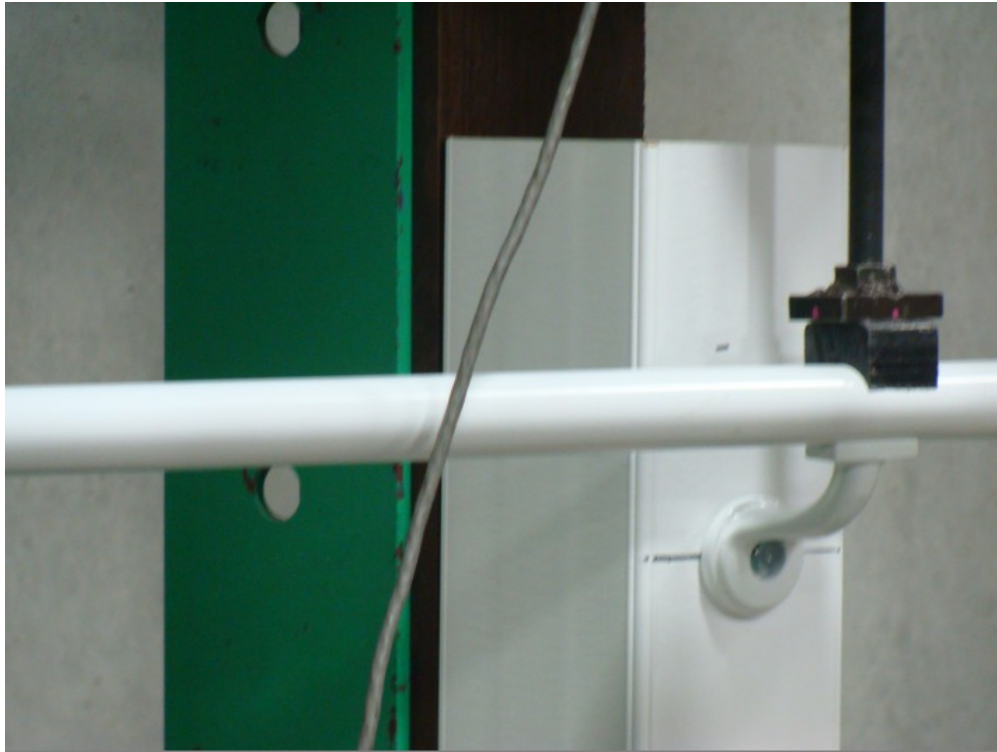


PHOTO 5: 200 lbf Load Applied – Vertical Support

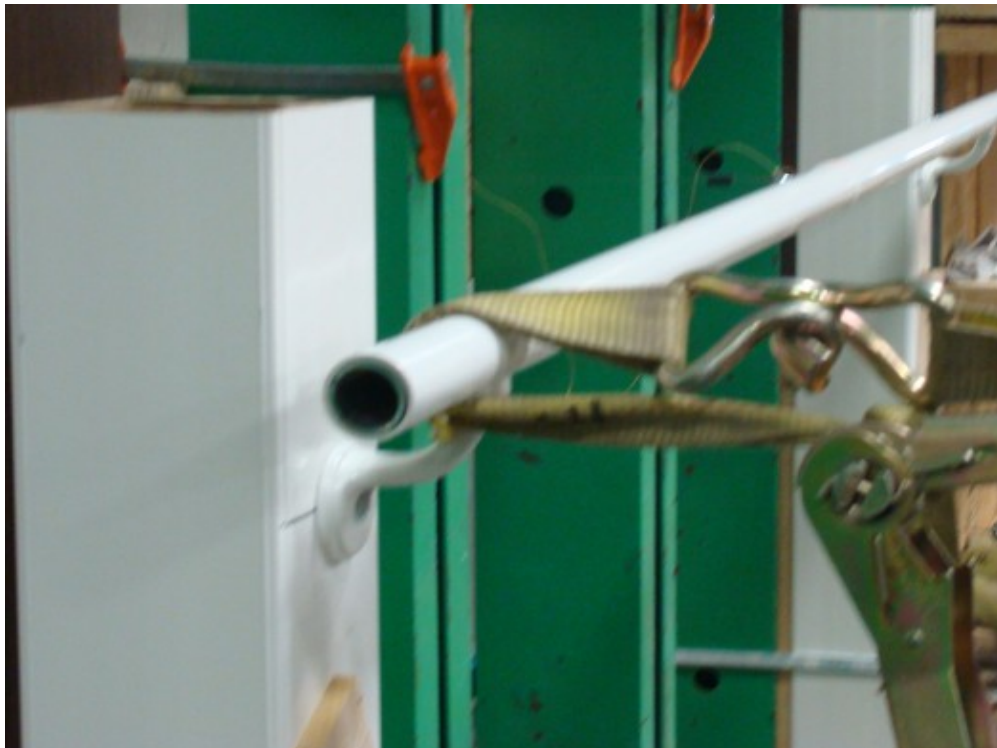


PHOTO 6: 200 lbf Load Applied – Horizontal Support

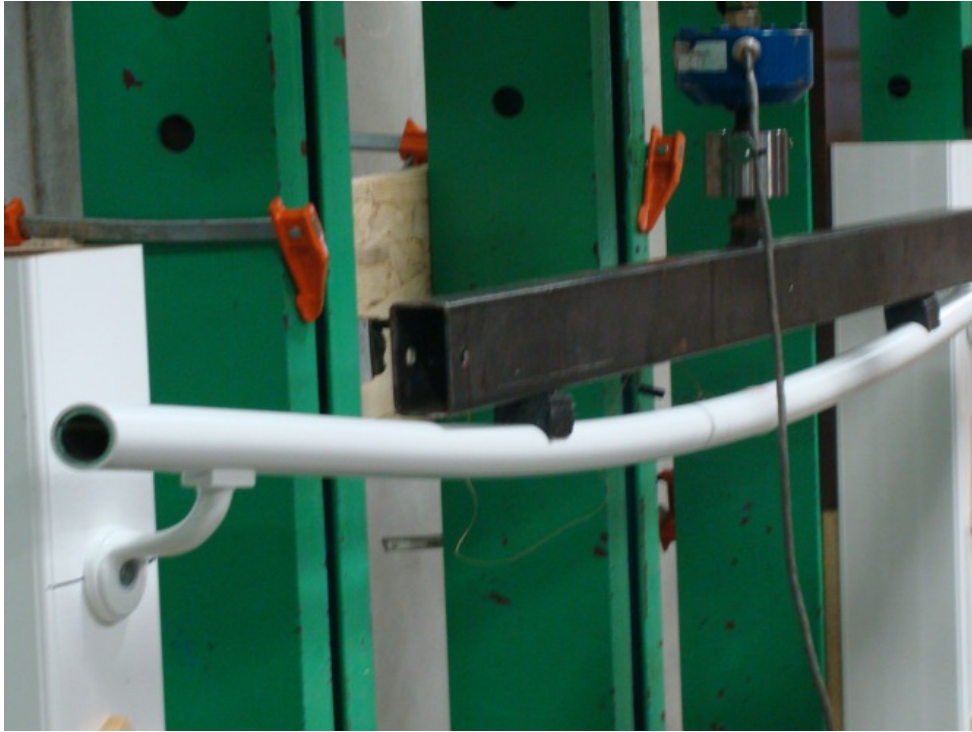


PHOTO 7: 50 plf Load – Vertical (photo taken at 300 lbf)



PHOTO 8: 50 plf Load Applied – Horizontal (photo taken at 300 lbf)