

***William R. Heiden III, P.E.***

**Aerosmith Fastening Systems**

Gripshank<sup>®</sup> Pins  
Surepin<sup>®</sup> Fasteners

**Product Evaluation Report**

Pneumatically Driven Steel Pins

Plywood on Steel Framing

OSB on Steel Framing

5/8" USG Securock™ Firecode X Glass-Mat Sheathing on Steel Framing

5/8" Georgia Pacific Dens-Glass<sup>®</sup> Gold Fireguard Type X

5/16" James Hardie Building Products - Hardiplank<sup>®</sup> & Hardipanel<sup>®</sup>

**Applicable Codes & Standards**

2010 Florida Building Code (FBC)

American Society of Civil Engineers 7-10 (ASCE 7-10)

**Product Evaluator:**

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**WRH Project No.**

2012-02-001



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## **Product Evaluated**

Gripshank<sup>®</sup> Pins  
Surepin<sup>®</sup> Fasteners

Gripshank<sup>®</sup> Pins are manufactured from AISI C1060 steel, heat treated to Rockwell C hardness between 52 & 55. The pins are zinc electro-plated (ASTM B633) or mechanically plated using zinc or a nickel metal alloy (B695). The minimum plating thickness is 0.0002".

Surepin<sup>®</sup> Fasteners are manufactured from AISI 1060 steel, heat treated to Rockwell C hardness between 52 & 55 and a R45N surface hardness between 39 & 50. The pins are zinc electro-plated (ASTM B633) or mechanically plated using zinc or a nickel metal alloy (B695).

### **Manufacturer Location:**

Aerosmith Fastening Systems  
5621 Dividend Road  
Indianapolis, IN 46241

### **Testing Organization:**

Progressive Engineering, Inc. (*Pei*)  
58640 State Rd. 15  
Goshen, IN46528

## **Product Manufacturing**

Gripshank<sup>®</sup> Pins are manufactured by independent companies. Any company manufacturing product for Aerosmith Fastening Systems, that is intended to be listed by this Product Evaluation Report, must have an agreement in place and has been approved & audited quarterly by Pei.

## **Listing Details**

Gripshank<sup>®</sup> Pins are pneumatically driven steel pins used to attach siding & sheathing materials to cold formed steel framing (CFSF). The pins pierce the siding and steel framing so that the specially design steel shanks grip the CFSF. The threaded portion of the steel shank must penetrate completely through the steel framing thickness a minimum 5/16" inch.

## **Evaluation Objective:**

Determination & publication of maximum applicable seismic & wind speed (3-sec gust) for pneumatically driven Gripshank<sup>®</sup> Pins based on testing of various framing systems. Verification that material conforms to applicable Florida Building Code testing requirements.

## **Statement of Compliance:**

As the product evaluator, the undersigned certifies that the product is in compliance with the requirements of the 2010 Florida Building Code.

## **Applicable Tests:**

- |            |  |
|------------|--|
| ASTM E330  | Standard test method for the structural performance of exterior windows, doors, skylights and curtain walls by uniform static air pressure difference. |
| ASTM E370  | Standard Test Methods & Definitions for Mechanical Testing of Steel Products   |
| ASTM E564  | Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings  |
| ASTM D1761 | Standard Test Methods for Mechanical Fasteners in Wood   |
| ASTM E2126 | Standard for Cyclic (reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resistance Systems for Buildings               |

## **Framing Materials**

### **Steel Framing**

The steel framing shall comply with ASTM A653 with the minimum steel thickness for each nominal gauge size tested.

### **Approved Sheathing**

1. 15/32" Plywood (4-ply), TECO test rated sheathing and labeled "PS1-07, exposure 1, sheathing span rated 32/16, 15/32" category" or equivalent.
2. Oriented Strand Board (OSB), APA rated structural 1 or equivalent.
3. 5/8" USG Securock<sup>™</sup> Firecode X Glass-Mat Sheathing or equivalent.
4. 5/8" Georgia Pacific Dens-Glass<sup>®</sup> Gold Fireguard Type X

## Product Evaluated

Gripshank<sup>®</sup> Pins

Surepin<sup>®</sup> Fasteners

## Referenced Test Reports

- 1) Progressive Engineering, Inc. Report #2003-784 - Test Methods for Mechanical Fasteners in Wood (ASTM D1761)  
Gripshank<sup>®</sup> (p/n 2325A) withdrawal from 12, 14, 16, 18, & 22 gauge steel studs (33ksi min. steel).
- 2) Progressive Engineering, Inc. Report #2007-985 (A) - Negative Wind Load Test (ASTM E330)  
5/8" Dens-Glass<sup>®</sup> and 16ga. (50 ksi) steel framing using 2325A Gripshank<sup>®</sup> fasteners
- 3) Progressive Engineering, Inc. Report #2007-985 (B) - Negative Wind Load Test (ASTM E330)  
5/8" Dens-Glass<sup>®</sup> and 16ga. (33 ksi) steel framing using 2325A Gripshank<sup>®</sup> fasteners
- 4) Progressive Engineering, Inc. Report #2011-427 (A) - Negative Wind Load Test (ASTM E330)  
Dry 5/8" USG Securock<sup>®</sup> Firecode X Glass-mat Sheathing, Vertical on 24"o.c. 18ga. steel framing using a steel pin p/n 2325A
- 5) Progressive Engineering, Inc. Report #2011-427 (B) - Negative Wind Load Test (ASTM E330)  
Dry 5/8" USG Securock<sup>®</sup> Firecode X Glass-mat Sheathing, Vertical on 24"o.c. 16ga. steel framing using a steel pin p/n 2325A
- 6) Progressive Engineering, Inc. Report #2010-765 (A) - Cyclic (Reversed) Load Test for Shear Resistance (ASTM E2126)  
15/32" Plywood on 16ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 2"o.c. perimeter/12"o.c. field studs
- 7) Progressive Engineering, Inc. Report #2010-765 (B) - Cyclic (Reversed) Load Test for Shear Resistance (ASTM E2126)  
15/32" Plywood on 16ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 6"o.c. perimeter/12"o.c. field studs
- 8) Progressive Engineering, Inc. Report #2010-765 (C) - Cyclic (Reversed) Load Test for Shear Resistance (ASTM E2126)  
7/16" OSB on 16ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 2"o.c. perimeter/12"o.c. field studs
- 9) Progressive Engineering, Inc. Report #2010-765 (D) - Cyclic (Reversed) Load Test for Shear Resistance (ASTM E2126)  
7/16" OSB on 16ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 6"o.c. perimeter/12"o.c. field studs
- 10) Progressive Engineering, Inc. Report #2010-765 (E) - Cyclic (Reversed) Load Test for Shear Resistance (ASTM E2126)  
7/16" OSB on 18ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 4"o.c. perimeter/12"o.c. field studs
- 11) Progressive Engineering, Inc. Report #2010-765 (G) - Cyclic (Reversed) Load Test for Shear Resistance (ASTM E2126)  
7/16" OSB on 14ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 2"o.c. perimeter/12"o.c. field studs
- 12) Progressive Engineering, Inc. Report #2010-766 (A) - Static load test for shear resistance of framed walls for buildings (ASTM E564)  
7/16" OSB, structural 1 on 14ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 6"o.c. perimeter/12"o.c. field studs
- 13) Progressive Engineering, Inc. Report #2010-766 (B) - Static load test for shear resistance of framed walls for buildings (ASTM E564)  
15/32" Plywood on 16ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 6"o.c. perimeter/12"o.c. field studs
- 14) Progressive Engineering, Inc. Report #2010-766 (C) - Static load test for shear resistance of framed walls for buildings (ASTM E564)  
15/32" Plywood on 16ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 2"o.c. perimeter/12"o.c. field studs
- 15) Progressive Engineering, Inc. Report #2010-766 (D) - Static load test for shear resistance of framed walls for buildings (ASTM E564)  
7/16" OSB, structural 1 on 18ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 4"o.c. perimeter/12"o.c. field studs
- 16) Progressive Engineering, Inc. Report #2010-766 (E) - Static load test for shear resistance of framed walls for buildings (ASTM E564)  
7/16" OSB, structural 1 on 16ga. Steel Framing, Aerosmith Gripshank<sup>®</sup> Pins, Pin Spacing 6"o.c. perimeter/12"o.c. field studs
- 17) Progressive Engineering, Inc. Report #2006-349 (A) - Negative Wind Load Test (ASTM E330)  
48"x48" Hardipanel<sup>®</sup> on 16"o.c. 20ga. steel framing using a steel pin p/n 2382A
- 18) Progressive Engineering, Inc. Report #2006-349 (B) - Negative Wind Load Test (ASTM E330)  
48"x48" Hardipanel<sup>®</sup> on 24"o.c. 20ga. steel framing using a steel pin p/n 2382A
- 19) Progressive Engineering, Inc. Report #2006-349 (C) - Negative Wind Load Test (ASTM E330)  
6-1/4" Wide Hardiplank<sup>®</sup> on 24"o.c. 20ga. steel framing using a steel pin p/n 2382A
- 20) Progressive Engineering, Inc. Report #2006-349 (D) - Negative Wind Load Test (ASTM E330)  
7-1/4" Wide Hardiplank<sup>®</sup> on 24"o.c. 20ga. steel framing using a steel pin p/n 2382A

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## **Referenced Test Reports (continued)**

- 21) Progressive Engineering, Inc. Report #2006-349 (E) - Negative Wind Load Test (ASTM E330)  
8-1/4" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2382A
- 22) Progressive Engineering, Inc. Report #2006-349 (F) - Negative Wind Load Test (ASTM E330)  
6-1/4" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 23) Progressive Engineering, Inc. Report #2006-349 (G) - Negative Wind Load Test (ASTM E330)  
7-1/4" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 24) Progressive Engineering, Inc. Report #2006-349 (H) - Negative Wind Load Test (ASTM E330)  
8-1/4" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 25) Progressive Engineering, Inc. Report #2006-349 (I) - Negative Wind Load Test (ASTM E330)  
6-1/4" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 26) Progressive Engineering, Inc. Report #2005-1255 (B) - Negative Wind Load Test (ASTM E330)  
6-1/4" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 27) Progressive Engineering, Inc. Report #2005-1255 (C) - Negative Wind Load Test (ASTM E330)  
8-1/4" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 28) Progressive Engineering, Inc. Report #2005-1255 (D) - Negative Wind Load Test (ASTM E330)  
12" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 29) Progressive Engineering, Inc. Report #2005-1255 (E) - Negative Wind Load Test (ASTM E330)  
48"x96" Hardipanel® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A
- 30) Intertek ETL SEMKO Report #3117855-001 - Strength of Anchors in Concrete Elements (ASTM E488-96)  
12" Wide Hardiplank® on 24"o.c. 20ga. steel framing using a steel pin p/n 2385A

**Table 1. Test Results - ASTM E330**

Report	Testing Agency	FASTENERS					SHEATHING				FRAMING			Avg. Ultimate Load (PSF)	Allowable Load <sup>2</sup> (PSF)	
		Type	Part No.	Shank Dia. (in.)	Head Dia. (in.)	Spacing field perim. (in.)	Type <sup>7</sup>	Width	Length	Thk. (in.)	Type	Steel Thk. (min.)	Tensile Strength (ksi)			Spacing (in.)
2007-985 (A)	PEI	Aerosmith Gripshank® Pins	2325A	0.100	0.312	8" o.c. 8" o.c.	Dens-Glass®	48"	48"	5/8"	CFSF	16 ga.	50 ksi	16 in.	95.3	38.1
2007-985 (B)	PEI	Aerosmith Gripshank® Pins	2325A	0.100	0.312	8" o.c. 8" o.c.	Dens-Glass®	48"	48"	5/8"	CFSF	16 ga.	33 ksi	24 in.	100.7	40.3
2011-427 (A)	PEI	Aerosmith Gripshank® Pins	2325A	0.100	0.312	4" o.c. 6" o.c.	USG Securock®	48"	96"	5/8"	CFSF	18 ga.	46.7 ksi	24 in.	81.8	32.7
2011-427 (A)	PEI	Aerosmith Gripshank® Pins	2325A	0.100	0.312	4" o.c. 6" o.c.	USG Securock®	48"	96"	5/8"	CFSF	16 ga.	58.9 ksi	24 in.	88.2	35.3
2006-349 (A)	PEI	Aerosmith Gripshank® Pins	2382A	0.110	0.244	8" o.c. 4" o.c.	Hardipanel®	48"	48"	5/16"	CWN	20 ga.	33 ksi	16 in.	82.0	32.8
2006-349 (B)	PEI	Aerosmith Gripshank® Pins	2382A	0.110	0.244	8" o.c. 4" o.c.	Hardipanel®	48"	48"	5/16"	CWN	20 ga.	33 ksi	24 in.	54.3	21.7
2006-349 (C)	PEI	Aerosmith Gripshank® Pins	2382A	0.110	0.244	Every Lap Joint	Hardiplank®	6-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	156.5	62.6
2006-349 (D)	PEI	Aerosmith Gripshank® Pins	2382A	0.110	0.244	Every Lap Joint	Hardiplank®	7-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	117.2	46.9
2006-349 (E)	PEI	Aerosmith Gripshank® Pins	2382A	0.110	0.244	Every Lap Joint	Hardiplank®	8-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	89.4	35.8
2006-349 (F)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.285	Every Lap Joint	Hardiplank®	6-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	79.3	31.7
2006-349 (G)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.294	Every Lap Joint	Hardiplank®	7-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	46.0	18.4
2006-349 (H)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.285	Every Lap Joint	Hardiplank®	8-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	35.8	14.3
2006-349 (I)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.285	Every Lap Joint	Hardiplank®	8-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	82.0	32.8
2005-1255 (B)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.285	Every Lap Joint	Hardiplank®	6-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	81.1	32.4
2005-1255 (C)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.285	Every Lap Joint	Hardiplank®	8-1/4"		5/16"	CWN	20 ga.	33 ksi	24 in.	35.7	14.3
2005-1255 (D)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.285	Every Lap Joint	Hardiplank®	12"		5/16"	CWN	20 ga.	33 ksi	24 in.	59.9	24.0
2005-1255 (E)	PEI	Aerosmith Gripshank® Pins	2385A	0.100	0.285	Every Lap Joint	Hardipanel®	48"	96"	5/16"	CWN	20 ga.	33 ksi	24 in.	60.6	24.2

1. For panel sheathing, Pins were installed 3/8" from panel edge & 2" from corners.

2. For lap siding, butt joints were placed at 1/3 & 2/3 of the wall height with 1-1/4" siding overlap. Pins were set at 3/8" from siding end & 3/4" up from the bottom edge.

3. CWN (cold formed steel framing - CFSF) dimensions - 1-3/8" depth, 3-5/8" flange & 3/8" return.

4. The values are based on testing per ASTM E330, and represent the capacity of the sheathing to resist flexural failure or fastener pull-through using a 2.5 safety factor.

5. Framing design is the responsibility of the Designer of Record.

**Table 2. Test Results - ASTM E564**

Report	Testing Agency	FASTENERS					SHEATHING				FRAMING			Avg. Ultimate Load (PLF)	
		Type	Part No.	Shank Dia. (in.)	Head Dia. (in.)	Spacing field perim. (in.)	Type <sup>7</sup>	Width	Length	Thk. (in.)	Type	Steel Thk. (min.)	Tensile Strength (ksi)		Spacing (in.)
2010-766(A)	PEI	Aerosmith Gripshank® Pins	5454	0.144	0.294	6" o.c. 12" o.c.	OSB	48"	96"	7/16"	CFSF	14 ga.	50 ksi	24 in.	1007.0
2010-766 (B)	PEI	Aerosmith Gripshank® Pins	2385A	0.101	0.300	6" o.c. 12" o.c.	Plywood	48"	96"	15/32"	CFSF	16 ga.	50 ksi	24 in.	1002.0
2010-766 (C)	PEI	Aerosmith Gripshank® Pins	2385A	0.101	0.300	2" o.c. 12" o.c.	Plywood	48"	96"	15/32"	CFSF	16 ga.	50 ksi	24 in.	1007.0
2010-766 (D)	PEI	Aerosmith Gripshank® Pins	2385A	0.101	0.300	4" o.c. 12" o.c.	OSB	48"	96"	7/16"	CFSF	18 ga.	50 ksi	24 in.	1327.0
2010-766 (E)	PEI	Aerosmith Gripshank® Pins	2385A	0.101	0.300	6" o.c. 12" o.c.	OSB	48"	96"	7/16"	CFSF	16 ga.	50 ksi	24 in.	997.0

1. Allowable Load = Average Ultimate Load/2.0 (Factor of Safety = 2.0)
2. Values are based on tested wall heights of 8 ft. (refer to Progressive Engineering, Inc. test reports referenced above).
3. Simpson Strong-Tie, model HTT4 Tension tie (or equal), is required at both ends of the wall and must be installed per manufacturer's installation instructions.
4. Cold Formed Steel Framing (CFSF) shall comply with ICC AC230, Nov. 1, 2010, section 3.3 for grades, dimensions, mechanical properties (Fy - 50 ksi min.)
5. Interpolated values based on actual tested values for 2"/12" & 6"/12" pin spacing results.
6. Maximum aspect ratio of 2:1.
7. Sheathing to be installed vertically with double studs at each sheathing seam (48" o.c.)
8. TECO test rated sheathing labeled "PS1-07, exposure 1, sheathing span 32/16, 15/32 category".

**Table 3. Test Results - ASTM E2126**

Report	Testing Agency	FASTENERS					SHEATHING				FRAMING			Avg. Ultimate Load (PLF)	
		Type	Part No.	Shank Dia. (in.)	Head Dia. (in.)	Spacing field perim. (in.)	Type <sup>7</sup>	Width (ft.)	Length (ft.)	Thk. (in.)	Type	Steel Thk. (min.)	Tensile Strength (ksi)		Spacing (in.)
2010-765(A)	PEI	Aerosmith Gripshank® Pins	2325A	0.104	0.300	2" o.c. 12" o.c.	Plywood	48"	96"	15/32"	CFSF	16 ga.	50 ksi	24 in.	1721.0
2010-765 (B)	PEI	Aerosmith Gripshank® Pins	2385A	0.101	0.300	6" o.c. 12" o.c.	Plywood	48"	96"	15/32"	CFSF	16 ga.	50 ksi	24 in.	888.9
2010-765(C)	PEI	Aerosmith Gripshank® Pins	2325A	0.104	0.300	2" o.c. 12" o.c.	OSB	48"	96"	7/16"	CFSF	16 ga.	50 ksi	24 in.	1674.9
2010-765 (D)	PEI	Aerosmith Gripshank® Pins	2325A	0.104	0.300	6" o.c. 12" o.c.	OSB	48"	96"	7/16"	CFSF	16 ga.	50 ksi	24 in.	844.9
2010-765(E)	PEI	Aerosmith Gripshank® Pins	2325A	0.104	0.300	4" o.c. 12" o.c.	OSB	48"	96"	7/16"	CFSF	18 ga.	50 ksi	24 in.	1011.4
2010-765 (G)	PEI	Aerosmith Gripshank® Pins	2325A	0.104	0.300	2" o.c. 12" o.c.	OSB	48"	96"	7/16"	CFSF	14 ga.	50 ksi	24 in.	1911.5

1. Allowable Load = Average Ultimate Load/FS (Seismic FS = 2.5, Wind FS = 2.0)
2. PLF values are based on tested wall heights of 8 ft. (refer to Progressive Engineering, Inc. test reports referenced above).
3. Simpson Strong-Tie, model HTT4 Tension tie (or equal), is required at both ends of the wall and must be installed per manufacturer's installation instructions.
4. Cold Formed Steel Framing (CFSF) shall comply with ICC AC230, Nov. 1, 2010, section 3.3 for grades, dimensions, mechanical properties (Fy - 50 ksi min.)
5. Interpolated values based on actual tested values for 2"/12" & 6"/12" pin spacing results.
6. Maximum aspect ratio of 2:1.
7. Sheathing to be installed vertically with double studs at each sheathing seam (48" o.c.)
8. TECO test rated sheathing labeled "PS1-07, exposure 1, sheathing span 32/16, 15/32 category".



**Table 7. Basic Wind Speed Coefficients & Constants**

Building Ht. (ft)	K <sub>z</sub>			K <sub>zt</sub>	K <sub>d</sub>	Zone 4	Zone 5	GC <sub>pi</sub>
	Exp B	Exp C	Exp D			GC <sub>p</sub>	GC <sub>p</sub>	
0 - 15	0.70	0.85	1.03	1	0.85	1.1	1.4	0.18
20	0.70	0.90	1.08	1	0.85	1.1	1.4	0.18
25	0.70	0.94	1.12	1	0.85	1.1	1.4	0.18
30	0.70	0.98	1.16	1	0.85	1.1	1.4	0.18
35	0.73	1.01	1.19	1	0.85	1.1	1.4	0.18
40	0.76	1.04	1.22	1	0.85	1.1	1.4	0.18
45	0.78	1.06	1.24	1	0.85	1.1	1.4	0.18
50	0.81	1.09	1.27	1	0.85	1.1	1.4	0.18

Building Ht. (ft)	q (Zone 4)			q (Zone 5)		
	Exp B	Exp C	Exp D	Exp B	Exp C	Exp D
0 - 15	0.001950	0.002367	0.002869	0.002407	0.002922	0.003541
20	0.001950	0.002507	0.003008	0.002407	0.003094	0.003713
25	0.001950	0.002618	0.003120	0.002407	0.003232	0.003851
30	0.001950	0.002730	0.003231	0.002407	0.003369	0.003988
35	0.002033	0.002813	0.003314	0.002510	0.003472	0.004091
40	0.002117	0.002897	0.003398	0.002613	0.003576	0.004194
45	0.002173	0.002952	0.003454	0.002682	0.003644	0.004263
50	0.002256	0.003036	0.003537	0.002785	0.003748	0.004366

**Sample: Maximum Basic Wind Speed (mph)**

$$q_z = 0.00256 * K_z * K_{zt} * K_d * V^2$$

$$\text{Load Factor}(1.6) * \text{Design Wind Pressure (PSF)} = q_z * (GC_p \pm GC_{pi})$$

Therefore, by substituting the panel Allowable Load (PSF) for the Design Wind Pressure and solving for the Maximum Basic Wind Speed the following equation is obtained.

$$\text{Max. Basic Wind Speed (V)} = [(1.6 * \text{Allowable Load}) / (0.00256 * K_z * K_{zt} * K_d * (GC_p + GC_{pi}))]^{1/2}$$

**Table 8. Seismic & Wind Shearwall Capacities - Cold Formed Steel Framing (CFSF)**

Values per Progressive Engineering, Inc. calculation 2011-0578, Dated: 7/14/11.

Fastener Type	Sheathing Thickness (min.)	Sheathing Type	Panel Size & Direction <sup>7</sup>	CFSF thickness	Stud Spacing (in.)	Pin Shank & Head Dia. (min.)	Pin Spacing (in.)	SHEARWALL CAPACITY (PLF)				
								Occupancy Category	v' <sub>asd</sub> Seismic	v' <sub>asd</sub> Wind	v' <sub>LRFD</sub> Seismic	v' <sub>LRFD</sub> Wind
Aerosmith Gripshank® Pins	15/32"	Rated Plywood (4-ply)	4'x8' Vertical	16 ga.	24" o.c.	0.104" Shank 0.300" Head	2" Perimeter 12" Field	I or II	602.0	819.0	903.0	1065.0
								III	655.0		982.0	
								IV	661.0		991.0	
Aerosmith Gripshank® Pins	15/32"	Rated Plywood (4-ply)	4'x8' Vertical	16 ga.	24" o.c.	0.104" Shank 0.300" Head	4" Perimeter 12" Field	I or II	462.0	623.0	693.0	809.5
								III	498.0		747.0	
								IV	501.0		751.5	
Aerosmith Gripshank® Pins	15/32"	Rated Plywood (4-ply)	4'x8' Vertical	16 ga.	24" o.c.	0.104" Shank 0.300" Head	6" Perimeter 12" Field	I or II	322.0	427.0	483.0	554.0
								III	341.0		512.0	
								IV	341.0		512.0	
Aerosmith Gripshank® Pins	15/32"	APA Rated OSB "Structural 1"	4'x8' Vertical	16 ga.	24" o.c.	0.104" Shank 0.300" Head	2" Perimeter 12" Field	I or II	611.0	804.0	916.0	1045.0
								III	643.0		964.0	
								IV	643.0		964.0	
Aerosmith Gripshank® Pins	7/16"	APA Rated OSB "Structural 1"	4'x8' Vertical	16 ga.	24" o.c.	0.104" Shank 0.300" Head	4" Perimeter 12" Field	I or II	464.0	604.5	696.0	786.0
								III	483.5		725.0	
								IV	483.5		725.0	
Aerosmith Gripshank® Pins	7/16"	APA Rated OSB "Structural 1"	4'x8' Vertical	16 ga.	24" o.c.	0.104" Shank 0.300" Head	6" Perimeter 12" Field	I or II	317.0	405.0	476.0	527.0
								III	324.0		486.0	
								IV	324.0		486.0	
Aerosmith Gripshank® Pins	7/16"	APA Rated OSB "Structural 1"	4'x8' Vertical	18 ga.	24" o.c.	0.104" Shank 0.300" Head	4" Perimeter 12" Field	I or II	405.0	506.0	607.0	657.0
								III	405.0		607.0	
								IV	405.0		607.0	
Aerosmith Gripshank® Pins	7/16"	APA Rated OSB "Structural 1"	4'x8' Vertical	14 ga.	24" o.c.	0.104" Shank 0.300" Head	2" Perimeter 12" Field	I or II	765.0	956.0	1147.0	1243.0
								III	765.0		1147.0	
								IV	765.0		1147.0	

1. PLF values are based on tested wall heights of 8 ft. (refer to Progressive Engineering, Inc. test reports referenced above).
2. Simpson Strong-Tie, model HTT4 Tension tie (or equal), is required at both ends of the wall and must be installed per manufacturer's installation instructions.
3. Cold Formed Steel Framing (CFSF) shall comply with ICC AC230, Nov. 1, 2010, section 3.3 for grades, dimensions, mechanical properties (Fy - 50 ksi min.).
4. Interpolated values based on actual tested values for 2"/12" & 6"/12" pin spacing results.
5. Maximum aspect ratio of 2:1.
6. Sheathing to be installed vertically with double studs at each sheathing seam (48" o.c.)
7. TECO test rated sheathing labeled "PS1-07, exposure 1, sheathing span 32/16, 15/32 category".
8. Aerosmith pins with 0.100" dia. pins were installed 3/8" from panel edge & 2" from corners.

**Table 9. Maximum Basic Wind Speeds**

ASCE 7-10 Method 1 (see Sample Calculation, pg. 3)

Maximum Allowable Wind Speed - 3-second gust, Based on 2009 IBC & 2010 FBC

Sheathing Panels	Panel Size & Direction	Fastener Type	Pin Spacing (in.)	Frame Type	CFSF Studs	Stud Spacing (in.)	Pin Shank & Head Dia. (min.)	Allowable Load <sup>1</sup> (PSF)	Basic Wind Speed (MPH)			Basic Wind Speed (MPH)			
									Wall Zone 4			Wall Zone 5			
									Exp. B	Exp. C	Exp. D	Exp. B	Exp. C	Exp. D	
5/8" Georgia Pacific Dens-Glass® Gold Fireguard Type X	4'x8'x5/8" Vertical	Aerosmith Gripshank® Pins	8" Perim. 8" Field	CFSF	16 ga. 50 ksi	16 o.c.	0.100" Shank 0.312" Head	38.1	0 - 15	177	161	146	159	144	131
									20	177	156	142	159	140	128
									25	177	153	140	159	137	126
									30	177	149	137	159	135	124
									35	173	147	136	156	133	122
									40	170	145	134	153	131	121
									45	168	144	133	151	129	120
									50	164	142	131	148	128	118
5/8" Georgia Pacific Dens-Glass® Gold Fireguard Type X	4'x8'x5/8" Vertical	Aerosmith Gripshank® Pins	8" Perimeter 8" Field	CFSF	16 ga. 33 ksi	24 o.c.	0.100" Shank 0.312" Head	40.3	0 - 15	182	165	150	164	149	135
									20	182	160	146	164	144	132
									25	182	157	144	164	141	129
									30	182	154	141	164	138	127
									35	178	151	139	160	136	126
									40	174	149	138	157	134	124
									45	172	148	137	155	133	123
									50	169	146	135	152	131	121
5/8" USG Securock™ Firecode X Glass-Mat Sheathing	4'x8'x5/8" Vertical	Aerosmith Gripshank® Pins	6" Perimeter 4" Field	CFSF	18 ga. 46.7 ksi	24 o.c.	0.100" Shank 0.312" Head	32.7	0 - 15	164	149	135	147	134	122
									20	164	145	132	147	130	119
									25	164	141	130	147	127	117
									30	164	138	127	147	125	115
									35	160	136	126	144	123	113
									40	157	134	124	142	121	112
									45	155	133	123	140	120	111
									50	152	131	122	137	118	109
5/8" USG Securock™ Firecode X Glass-Mat Sheathing	4'x8'x5/8" Vertical	Aerosmith Gripshank® Pins	6" Perimeter 4" Field	CFSF	16 ga. 58.9 ksi	24 o.c.	0.100" Shank 0.312" Head	35.3	0 - 15	170	154	140	153	139	126
									20	170	150	137	153	135	123
									25	170	147	135	153	132	121
									30	170	144	132	153	129	119
									35	167	142	131	150	127	117
									40	163	140	129	147	126	116
									45	161	138	128	145	124	115
									50	158	136	126	142	123	114

1. Allowable Load = Average Ultimate Load/3 (Factor of Safety = 3)

2. PSF values are based on tested wall heights of 8 ft. (refer to Progressive Engineering, Inc. test reports referenced above).

3. Cold Formed Steel Framing (CFSF) shall comply with ICC AC230, Nov. 1, 2010, section 3.3 for grades, dimensions, mechanical properties (Fy - 50 ksi min.)

4. Interpolated values based on actual tested values for 2"/12" & 6"/12" pin spacing results.

5. Sheathing to be installed vertically with double studs at each sheathing seam (48" o.c.)

6. TECO test rated sheathing labeled "PS1-07, exposure 1, sheathing span 32/16, 15/32 category".

7. Aerosmith pins with 0.100" dia. pins were installed 3/8" from panel edge & 2" from corners.

**Table 10. Maximum Basic Wind Speeds**

ASCE 7-10 Method 1 (see Sample Calculation, pg. 3)

Maximum Allowable Wind Speed - 3-second gust, Based on 2009 IBC & 2010 FBC

Sheathing Panels	Panel Size & Direction	Fastener Type	Pin Spacing (in.)	Frame Type	CWN Studs	Stud Spacing (in.)	Pin Shank & Head Dia. (min.)	Allowable Load <sup>1</sup> (PSF)	Building Ht. (ft)	Basic Wind Speed (MPH)			Basic Wind Speed (MPH)		
										Wall Zone 4			Wall Zone 5		
										Exp. B	Exp. C	Exp. D	Exp. B	Exp. C	Exp. D
Hardipanel®	4'x4'x5/16"	Aerosmith Gripshank® 2382A Pins	4" Perim. 8" Field	CWN	20 ga. 33 ksi	16 o.c.	0.110" Shank 0.244" Head	32.8	0 - 15	164	149	135	148	134	122
									20	164	145	132	148	130	119
									25	164	142	130	148	127	117
									30	164	139	127	148	125	115
									35	161	137	126	145	123	113
									40	157	135	124	142	121	112
Hardipanel®	4'x4'x5/16"	Aerosmith Gripshank® 2382A Pins	4" Perim. 8" Field	CWN	20 ga. 33 ksi	24 o.c.	0.110" Shank 0.244" Head	21.7	0 - 15	134	121	110	120	109	99
									20	134	118	107	120	106	97
									25	134	115	106	120	104	95
									30	134	113	104	120	102	93
									35	131	111	102	118	100	92
									40	128	110	101	115	99	91
Hardiplank®	6-1/4" Wide Plank	Aerosmith Gripshank® 2382A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.110" Shank 0.244" Head	62.6	0 - 15	227	206	187	204	185	168
									20	227	200	182	204	180	164
									25	227	196	179	204	176	161
									30	227	192	176	204	172	158
									35	222	189	174	200	170	156
									40	218	186	172	196	167	155
Hardiplank®	7-1/4" Wide Plank	Aerosmith Gripshank® 2382A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.110" Shank 0.244" Head	46.9	0 - 15	196	178	162	177	160	146
									20	196	173	158	177	156	142
									25	196	169	155	177	152	140
									30	196	166	152	177	149	137
									35	192	163	150	173	147	135
									40	188	161	149	169	145	134
Hardiplank®	8-1/4" Wide Plank	Aerosmith Gripshank® 2382A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.110" Shank 0.244" Head	35.8	0 - 15	171	155	141	154	140	127
									20	171	151	138	154	136	124
									25	171	148	135	154	133	122
									30	171	145	133	154	130	120
									35	168	143	131	151	128	118
									40	164	141	130	148	126	117

1. Allowable Load = Average Ultimate Load/3 (Factor of Safety = 3)

2. PSF values are based on tested wall heights of 8 ft. (refer to Progressive Engineering, Inc. test reports referenced above).

3. Cold Formed Steel Framing (CFSF) shall comply with ICC AC230, Nov. 1, 2010, section 3.3 for grades, dimensions, mechanical properties (Fy - 50 ksi min.)

4. Interpolated values based on actual tested values for 2"/12" & 6"/12" pin spacing results.

5. Sheathing to be installed vertically with double studs at each sheathing seam (48" o.c.)

6. TECO test rated sheathing labeled "PS1-07, exposure 1, sheathing span 32/16, 15/32 category".

7. Aerosmith pins with 0.100" dia. pins were installed 3/8" from panel edge & 2" from corners.

**Table 11. Maximum Basic Wind Speeds**

ASCE 7-10 Method 1 (see Sample Calculation, pg. 3)

Maximum Allowable Wind Speed - 3-second gust, Based on 2009 IBC & 2010 FBC

Sheathing Panels	Panel Size & Direction	Fastener Type	Pin Spacing (in.)	Frame Type	CWN Studs	Stud Spacing (in.)	Pin Shank & Head Dia. (min.)	Allowable Load <sup>1</sup> (PSF)	Building Ht. (ft)	Basic Wind Speed (MPH)			Basic Wind Speed (MPH)		
										Wall Zone 4			Wall Zone 5		
										Exp. B	Exp. C	Exp. D	Exp. B	Exp. C	Exp. D
Hardiplank®	6-1/4" Wide Plank	Aerosmith Gripshank® 2385A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	31.7	0 - 15	161	146	133	145	132	120
									20	161	142	130	145	128	117
									25	161	139	128	145	125	115
									30	161	136	125	145	123	113
									35	158	134	124	142	121	111
									40	155	132	122	139	119	110
Hardiplank®	7-1/4" Wide Plank	Aerosmith Gripshank® 2385A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	18.4	0 - 15	123	112	101	111	100	91
									20	123	108	99	111	98	89
									25	123	106	97	111	95	87
									30	123	104	95	111	93	86
									35	120	102	94	108	92	85
									40	118	101	93	106	91	84
Hardiplank®	8-1/4" Wide Plank	Aerosmith Gripshank® 2385A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	14.3	0 - 15	108	98	89	98	89	80
									20	108	96	87	98	86	79
									25	108	94	86	98	84	77
									30	108	92	84	98	82	76
									35	106	90	83	96	81	75
									40	104	89	82	94	80	74
Hardiplank®	6-1/4" Wide Plank	Aerosmith Gripshank® 2385A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	32.8	0 - 15	164	149	135	148	134	122
									20	164	145	132	148	130	119
									25	164	142	130	148	127	117
									30	164	139	127	148	125	115
									35	161	137	126	145	123	113
									40	157	135	124	142	121	112

1. Allowable Load = Average Ultimate Load/3 (Factor of Safety = 3)
2. PSF values are based on tested wall heights of 8 ft. (refer to Progressive Engineering, Inc. test reports referenced above).
3. Cold Formed Steel Framing (CFSF) shall comply with ICC AC230, Nov. 1, 2010, section 3.3 for grades, dimensions, mechanical properties (Fy - 50 ksi min.)
4. Interpolated values based on actual tested values for 2"/12" & 6"/12" pin spacing results.
5. Sheathing to be installed vertically with double studs at each sheathing seam (48" o.c.)
6. TECO test rated sheathing labeled "PS1-07, exposure 1, sheathing span 32/16, 15/32 category".
7. Aerosmith pins with 0.100" dia. pins were installed 3/8" from panel edge & 2" from corners.

**Table 12. Maximum Basic Wind Speeds**

ASCE 7-10 Method 1 (see Sample Calculation, pg. 3)

Maximum Allowable Wind Speed - 3-second gust, Based on 2009 IBC & 2010 FBC

Sheathing Panels	Panel Size & Direction	Fastener Type	Pin Spacing (in.)	Frame Type	CWN Studs	Stud Spacing (in.)	Pin Shank & Head Dia. (min.)	Allowable Load <sup>1</sup> (PSF)	Building Ht. (ft)	Basic Wind Speed (MPH)			Basic Wind Speed (MPH)		
										Wall Zone 4			Wall Zone 5		
										Exp. B	Exp. C	Exp. D	Exp. B	Exp. C	Exp. D
Hardiplank®	6-1/4" Wide Plank	Aerosmith Gripshank® 2385A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	32.4	0 - 15	163	148	135	147	133	121
									20	163	144	131	147	130	118
									25	163	141	129	147	127	116
									30	163	138	127	147	124	114
									35	160	136	125	144	122	113
									40	157	134	124	141	120	111
Hardiplank®	7-1/4" Wide Plank	Aerosmith Gripshank® 2385A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	14.3	0 - 15	108	98	89	97	88	80
									20	108	95	87	97	86	78
									25	108	93	86	97	84	77
									30	108	91	84	97	82	76
									35	106	90	83	95	81	75
									40	104	89	82	94	80	74
Hardiplank®	8-1/4" Wide Plank	Aerosmith Gripshank® 2385A Pins	Every Lap Joint	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	24.0	0 - 15	140	127	116	126	115	104
									20	140	124	113	126	111	102
									25	140	121	111	126	109	100
									30	140	119	109	126	107	98
									35	137	117	108	124	105	97
									40	135	115	106	121	104	96
Hardipanel®	4'x8'x5/16"	Aerosmith Gripshank® 2385A Pins	4" Perim. 8" Field	CWN	20 ga. 33 ksi	24 o.c.	0.100" Shank 0.285" Head	24.2	0 - 15	141	128	116	127	115	105
									20	141	124	114	127	112	102
									25	141	122	112	127	110	100
									30	141	119	110	127	107	99
									35	138	117	108	124	106	97
									40	135	116	107	122	104	96

1. Allowable Load = Average Ultimate Load/3 (Factor of Safety = 3)

2. PSF values are based on tested wall heights of 8 ft. (refer to Progressive Engineering, Inc. test reports referenced above).

3. Cold Formed Steel Framing (CFSF) shall comply with ICC AC230, Nov. 1, 2010, section 3.3 for grades, dimensions, mechanical properties (Fy - 50 ksi min.)

4. Interpolated values based on actual tested values for 2"/12" & 6"/12" pin spacing results.

5. Sheathing to be installed vertically with double studs at each sheathing seam (48" o.c.)

6. TECO test rated sheathing labeled "PS1-07, exposure 1, sheathing span 32/16, 15/32 category".

7. Aerosmith pins with 0.100" dia. pins were installed 3/8" from panel edge & 2" from corners.

**Table 13. Performance Testing on Surepin® Fasteners - ASTM E488-96**

Product	Pneumatic Nailer	Nail Penetration (min.)	Shank Dia. (in.)	Head Dia. (in.)	Ultimate Load (lbs.)	Allowable Load (lbs.)
Aerosmith 5323HP 1-1/4" Smooth Galvanized Pin	Max HN-120A	3/4" - 1"	0.145	0.300	1165.51	466.20
Aerosmith 5503HP 1-1/4" Smooth Galvanized Pin	Max HN-120A	1-1/8" - 1-3/16"	0.145	0.300	1168.83	467.53

1. Allowable Load includes a factor of safety of 2.5.
2. Ultimate & Allowable Loads based on nails embedded into concrete block at the center of the web.

## **Limitations of Use**

- 1) Product(s) is to be installed on framing that is equal to or stronger than the materials listed.
- 2) Product(s) is to be installed on steel framing that is equal to or stronger than the studs listed.
- 3) Product(s) is to be installed only where the product assemblies listed meet or exceed the local wind speed and are in conformance with the 2010 FBC installation requirements.
- 4) Product(s) shall not be used as a nail base. Mechanical attachment of exterior claddings must be made directly to the framing.
- 5) Fasteners shall be driven flush with the gypsum panel surface without countersinking or being deep enough to break the glass mat.
- 6) Fasteners for wood panel sheathings (plywood and OSB) shall be driven no more than 1/16" from the panel surface with no more than two (2) out of ten (10) fasteners driven greater than 1/16" (per APA Technical Note TT-012A, 01/2007).
- 7) Product(s) shall be stored in the original unopened packaging at the site and stored in an enclosed shelter providing protection from physical damage and exposure from the elements until use.
- 8) Product(s) shall be stored to prevent exposure to standing or cascading water.
- 9) Product(s) must be installed per manufacturer's product literature and specifications.
- 10) This product evaluation pertains only to the assemblies tested.