



Project Number: U5263.014.231
January 3, 2024

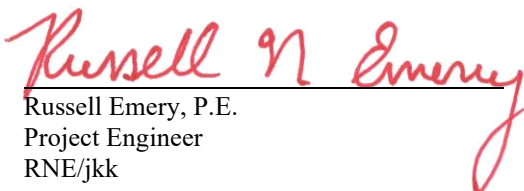
Product Approval Administrator
Building Codes & Standards Section
Department of Business & Professional Regulations
1940 North Monroe Street, Suite 90
Tallahassee, FL 32399-2100

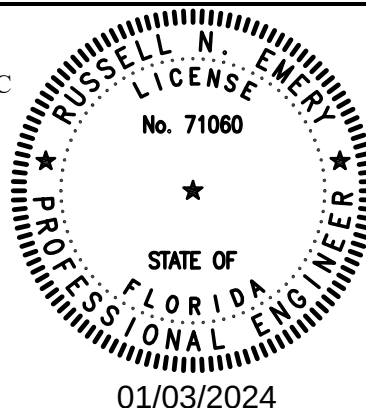
REFERENCE: **Florida Product Approval of ATAS Roof Panel: 2-3/8" Field-Lok [FL 3556]
Product Approval Evaluation**

Manufacturer: ATAS International, Inc.
Manufacturer Address: 6612 Snowdrift Rd., Allentown, PA 18106
Model Name: ATAS Roof Panel: 2-3/8" Field-Lok [FL 3556]
Maximum Design Load: See Calculations Attached per Configuration

Testing Summary					
TEST	DESCRIPTION	TEST LOCATION	TEST REPORT DATE	TEST REPORT #	TEST SEALED BY
ASTM E1592-01	Structural Performance of Sheet Metal Roof and Siding Systems	Farabaugh Engineering and Testing, Inc.	05/17/2003 05/16/2003	T154-03 T152-03	Daniel G. Farabaugh, P.E.
ASTM E1592-94	Exploratory Simulated Wind Uplift Pressure Testing	ENCON Consultants, Inc. Factory Mutual	12/24/1996 12/31/1998	C456-6 1D7A7.AM	Harold G. Simpson, P.E. P.J. Smith
For maximum sizes, spans, loads and anchor types, refer to the installation drawings.					
Referenced test reports were reviewed against the most recent version and have been found to be compliant and having no impact on the performance report.					
To the best of my knowledge, the above product conforms to the requirements of the 2023 Florida Building Code when installed in accordance with the instructions and limitations outlined in the attached installation drawings.					

Sincerely,
VECTOR STRUCTURAL ENGINEERING, LLC


Russell Emery, P.E.
Project Engineer
RNE/jkk



Russell N Emery
2024.01.04
10:10:10-07'00'

Russell N. Emery
No. 71060

This item has been digitally signed and sealed by Russell N. Emery on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.



JOB NO.: U5263.014.231

PROJECT: ATAS FBC PRODUCT APPROVAL

PRODUCT: 2-3/8" FIELD LOK

Design Assumptions

2 3/8" Rib FLS 137 and FLS 180 Panel

0.030" Aluminum and 24-gauge Steel

Effective wind area = 10 sq. ft.

5/8" plywood roof sheathing for new construction, 1/2" sheathing for reroofing

2 screws per clip

#14-13 DP1 screws into wood

Allowable fastener loads from manufacturer test data, Cold-Formed Steel Design Manual 2012, and Aluminum Design Manual 2015

No stress increase for wind applied

3003-H14 and 3105-H14 aluminum sheet ($F_y = 17$ ksi, $F_u = 20$ ksi), ASTM A653 SS 50 steel sheet ($F_y = 50$ ksi).

22 gauge clip stem and 16 gauge clip base

Factor of Safety on panel = 2.0 (FBC 1504.9)

Factor of Safety on fastener = 3.0

Fastener Strengths

Pull-out

#14-13 DP1

5/8" plywood

Ultimate Pullout (lbs) =

483 (based on manufacturer test data)

F.S. =

3

$P'_{not}/\Omega =$

161 lbs

#14-13 DP1

5/8" plywood

Ultimate Pullout (lbs) =

407 (based on manufacturer test data)

F.S. =

3

$P'_{not}/\Omega =$

136 lbs

Pull-Over -- 16-gauge steel clip base

#14-13 DP1, 1/2" diameter head/washer

t_1 (in) =

0.0598

F_{tu1} (ksi) =

65

F.S. =

3

d_w (in) =

0.5

$P_{nov}/\Omega =$

972 lbs

Ultimate Clip Strength							
Report No.	Test	Panel	Failure Pressure (psf)	Panel Width (in)	Clip Spacing (in)	Rib Height (in)	Ultimate Clip Load (lbs)
FET T154-03	ASTM E1592	0.032 FLS180	86.9	18	48	2.375	521
FET T154-03	ASTM E1592	0.032 FLS180	132.1	18	24	2.375	396
Encon C456-6	ASTM E1592	24 ga FLS180	135.2	18	30.5	2.375	515
FET T152-03	ASTM E1592	0.040 FLS180	149.4	18	30	2.375	560
Encon C456-6	ASTM E1592	24 ga FLS180	72.8	18	61	2.375	555
Encon C456-6	ASTM E1592	24 ga FLS180	52	18	91	2.375	592
Encon C456-7	ASTM E1592	22 ga FLS180	156	18	30	2	585
Encon C456-7	ASTM E1592	22 ga FLS180	104	18	60	2	780
Encon C456-7	ASTM E1592	22 ga FLS180	67.6	18	91	2	769

Note: Failure Pressure at given at clip disengagement. Clip disengagement caused by panel rolling of the clip due to

Observations:

Clip strength appears to be independent of materia, thickness and rib height

Excluding the 780 lbs. and 769 lbs. ultimate clip loads, the average clip strength is 532 lbs.

The standard deviation is 66.6 lbs.

Use a clip strength of 1 standard deviation less than the mean.

Ultimate load = 465 lbs

F.S. = 3

$P'_{clip}/\Omega = 155 \text{ lbs}$

Allowable Wind Pressure Based on Connection Failure for 5/8" Plywood				
Panel	Allowable Fastener Load (lbs)	Panel Width (ft)	Clip Spacing (ft)	Allowable Pressure (psf)
FLS137	155	1.15	0.5	271
	155	1.15	1	135
	155	1.15	1.5	90
	155	1.15	2	68
	155	1.15	2.5	54
	155	1.15	3	45
	155	1.15	3.5	39
	155	1.15	4	34
FLS180	155	1.5	0.5	207
	155	1.5	1	103
	155	1.5	1.5	69
	155	1.5	2	52
	155	1.5	2.5	41
	155	1.5	3	34
	155	1.5	3.5	30
	155	1.5	4	26

Clip failure controls over screw failure (pullout of 2 screws = 322 lbs).

Allowable Wind Pressure Based on Connection Failure for 1/2" Plywood				
Panel	Allowable Fastener Load (lbs)	Panel Width (ft)	Clip Spacing (ft)	Allowable Pressure (psf)
FLS137	155	1.15	0.5	271
	155	1.15	1	135
	155	1.15	1.5	90
	155	1.15	2	68
	155	1.15	2.5	54
	155	1.15	3	45
	155	1.15	3.5	39
	155	1.15	4	34
FLS180	155	1.5	0.5	207
	155	1.5	1	103
	155	1.5	1.5	69
	155	1.5	2	52
	155	1.5	2.5	41
	155	1.5	3	34
	155	1.5	3.5	30
	155	1.5	4	26

Clip failure controls over screw failure (pullout of 2 screws = 272 lbs).

Buckling Moment Based on Panel Failure							
Report No.	Material	Panel	Test	Maximum Pressure (psf)	Span (in)	Panel Buckling Moment (lb-ft/ft)	Buckling Moment for 0.032"
FET T154-03	0.032 Al	2 3/8 FLS180	E1592	64.54	48	129	129
FET T152-03	0.040 Al	2 3/8 FLS180	E1592	66.77	60	209	167

Maximum Pressure determined from panel buckling.

Assume buckling load related to bending moment.

Use an ultimate buckling moment of 129 ft-lbs/ft for 2 3/8" FLS180 x 0.032" aluminum

0.030 Aluminum FLS180 buckling moment = 0.032 FLS180 buckling moment $\times t_{0.030} / t_{0.032}$

= 129 psf $\times 0.030" / 0.032" = 121$ lb-ft/ft

0.030 Aluminum FLS137 buckling moment = 0.032 FLS180 buckling moment $\times w_{FLS180} / w_{FLS137} \times t_{0.030} / t_{0.032}$

= 129 psf $\times 18" / 13.75" \times 0.030" / 0.032" = 158$ lb-ft/ft

Steel FLS180 buckling moment = Aluminum FLS180 buckling moment $\times F_{y,Stl} / F_{y,Al} \times t_{Stl} / t_{Al}$

= 129 psf $\times 50$ ksi / 17 ksi $\times 0.0239" / 0.032" = 283$ lb-ft/ft

Steel FLS137 buckling moment = Steel FLS180 buckling moment $\times w_{FLS180} / w_{FLS137}$

= 263 psf $\times 18" / 13.75" = 371$ psf

Allowable Wind Pressure Based on Panel Strength					
Panel	Ultimate Mom. (ft-lb/ft)	Factor of Safety	Allowable Mom. (ft- lb/ft)	Clip Spacing	Allowable Pressure (psf)
0.030FLS137	158	2	79	0.5	2528
	158	2	96	1	768
	158	2	96	1.5	341
	158	2	96	2	192
	158	2	96	2.5	123
	158	2	96	3	85
	158	2	79	3.5	52
	158	2	79	4	40
0.030FLS180	121	2	61	0.5	1936
	121	2	61	1	484
	121	2	61	1.5	215
	121	2	61	2	121
	121	2	61	2.5	77
	121	2	61	3	54
	121	2	61	3.5	40
	121	2	61	4	30
24 ga FLS137	371	2	186	0.5	5936
	371	2	186	1	1484
	371	2	186	1.5	660
	371	2	186	2	371
	371	2	186	2.5	237
	371	2	186	3	165
	371	2	186	3.5	121
	371	2	186	4	93
24 ga FLS180	283	2	142	0.5	4528
	283	2	142	1	1132
	283	2	142	1.5	503
	283	2	142	2	283
	283	2	142	2.5	181
	283	2	142	3	126
	283	2	142	3.5	92
	283	2	142	4	71

Panel Span vs. Wind Summary

Governing Allowable Pressures:

By comparison of connection strength and panel strength, the connection strength controls. Also, allowable pressure is independent of sheathing thickness because clip failure controls over screw pull-out.

5/8" Plywood					
Panel	Clip Spacing (ft)	Connection Allowable Pressure (psf)	0.030" Panel Allowable Pressure (psf)	24-ga Panel Allowable Pressure (psf)	Controlling Allowable Pressure (psf)
FLS137	0.5	271	2528	5936	271
	1	135	768	1484	135
	1.5	90	341	660	90
	2	68	192	371	68
	2.5	54	123	237	54
	3	45	85	165	45
	3.5	39	52	121	39
	4	34	40	93	34
FLS180	0.5	207	1936	4528	207
	1	103	484	1132	103
	1.5	69	215	503	69
	2	52	121	283	52
	2.5	41	77	181	41
	3	34	54	126	34
	3.5	30	40	92	30
	4	26	30	71	26

1/2" Plywood					
Panel	Clip Spacing (ft)	Connection Allowable Pressure (psf)	0.030" Panel Allowable Pressure (psf)	24-ga Panel Allowable Pressure (psf)	Controlling Allowable Pressure (psf)
FLS137	0.5	271	2528	5936	271
	1	135	768	1484	135
	1.5	90	341	660	90
	2	68	192	371	68
	2.5	54	123	237	54
	3	45	85	165	45
	3.5	39	52	121	39
	4	34	40	93	34
FLS180	0.5	207	1936	4528	207
	1	103	484	1132	103
	1.5	69	215	503	69
	2	52	121	283	52
	2.5	41	77	181	41
	3	34	54	126	34
	3.5	30	40	92	30
	4	26	30	71	26

Test Report References

Standard	Report Number	Laboratory	Laboratory Location
ASTM E1592-01	T152-03	Farabaugh Engineering & Testing	Turtle Creek, PA
ASTM E1592-01	T154-03	Farabaugh Engineering & Testing	Turtle Creek, PA
ASTM E1592-94	C456-6	ENCON Consultants	Tulsa, OK
ASTM E1592-94	C456-7	ENCON Consultants	Tulsa, OK