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SOLAR WAREHOUSE
MIAMI-DADE TEST REPORT

SCOPE OF WORK
ASTM D1761 FASTENER WITHDRAWAL AND LATERAL RESISTANCE EVALUATION OF MR-SW-HP-8S - SWH PV MOUNTING SYSTEM, 8" VERSION STANDOFF

REPORT NUMBER
R5185.02-106-18 R0

TEST DATES
09/17/24 - 09/23/24

ISSUE DATE
10/21/24

RECORD RETENTION END DATE
09/23/34

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ATI 24056

LABORATORY CERTIFICATION NO.
22-0428.14

PAGES
12

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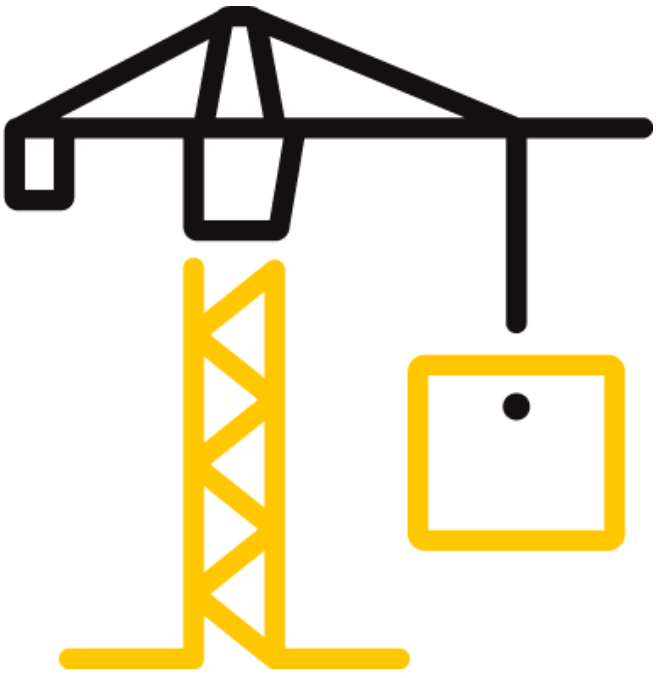

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MIAMI-DADE TEST REPORT FOR SOLAR WAREHOUSE
Report No.: R5185.02-106-18 R0
Date: 10/21/24

REPORT ISSUED TO
SOLAR WAREHOUSE
9628 Valley Blvd
Rosemead, California 91770

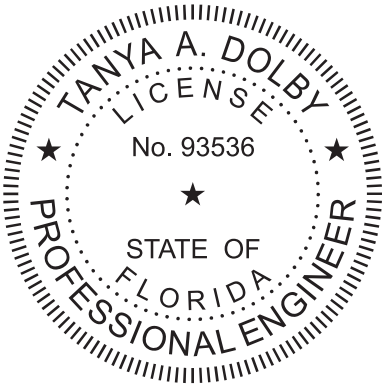
SECTION 1
SCOPE

Products: MR-SW-HP-8S - SWH PV Mounting System, 8" Version Standoff

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Solar Warehouse to evaluate MR-SW-HP-8S - SWH PV Mounting System, 8" Version Standoff in accordance with ASTM D1761 for fastener withdrawal and lateral resistance. Results obtained are tested values and were secured by using the designated test method. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.



For INTERTEK B&C:

COMPLETED BY:	Cag S. Saylor	**REVIEWED BY:**	Tanya Dolby, P.E.
TITLE:	Technician III Materials Laboratory	**TITLE:**	Manager, Engineering Services
SIGNATURE:	Digitally Signed by: Cag Saylor	**SIGNATURE:**	Digitally Signed by: Tanya Dolby
DATE:	10/21/24	**DATE:**	2024.10.22 13:14:03 -04'00'

CSS:dmc/td/kae

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SECTION 2
TEST METHOD

The specimens were evaluated in accordance with the following:

> **ASTM D1761-20**, *Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials,* Sections 4-13 Fastener Withdrawal and Sections 14-21 Lateral Fastener Resistance

SECTION 3
MATERIAL SOURCE

The materials were provided by Solar Warehouse. The following was received in good condition on 7/31/24:

- (24) Sets of MR-SW-HP-8S - SWH PV 8" Mounting Systems
- (4) Tubes of Chem Link M-1 Universal Adhesive & Sealant

Refer to the product description photos in Section 9. The materials were tested as received, except for preparing test specimens from the original materials. Representative materials/test specimens will be retained by Intertek B&C for a minimum of ten years from the test completion date.

SECTION 4
TEST EQUIPMENT

NAME	ICN/DESCRIPTION
INSTRON UTM	ICN: INT02020
30 kN Load Cell	ICN: INT02023
Moisture Meter	ICN: Y003141

Note: *Calibration certificates are available upon request.*

SECTION 5
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Cag Saylor	Intertek B&C
Dawn M. Chaney	Intertek B&C
Tanya Dolby, P.E.	Intertek B&C

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SECTION 6
TEST PROCEDURES

All conditioning of test specimens and test conditions were at standard laboratory conditions, unless otherwise reported. Refer to the test related photos in Section 9.

ASTM D1761 - Fastener Withdrawal, Sections 4-13
Withdrawal evaluations were performed on 19/32" plywood sheathing. Each piece of sheathing was predrilled with a 3/16" lead hole through the sheathing and rafter. The 5/16" hanger bolt fastener was then installed and sealed using Chem Link M-1 Universal Sealant. After the sealant cured, specimens were loaded onto an Instron UTM (ICN: INT02020) equipped with a 30 kN load cell (ICN: INT02023). Load was applied at a rate of 0.10 in/min until failure was achieved. The specimens were determined to have failed when the load dropped 25% from the peak value. The moisture content of the sheathing pieces was recorded using a Delmhorst Moisture Meter (ICN: Y003141).

ASTM D1761 - Lateral Fastener Resistance, Sections 14-21
Lateral resistance evaluations were performed on 19/32" plywood sheathing. Each piece of sheathing was predrilled with a 3/16" lead hole through the sheathing and rafter. The 5/16" hanger bolt fastener was then installed and sealed using Chem Link M-1 Universal Sealant. After the sealant cured, load was applied at a rate of 0.10 in/min using an Instron UTM (ICN: INT02020) equipped with a 30 kN load cell (ICN: INT02023). The specimens were tested beyond the maximum load representing a complete lateral failure. The moisture content of the sheathing pieces was recorded using a Delmhorst Moisture Meter (ICN: Y003141).

SECTION 7
TEST SPECIMEN DESCRIPTIONS

TEST PROCEDURE	NUMBER OF SPECIMENS	NOMINAL SPECIMEN DIMENSIONS
ASTM D1761, Sections 4-13 Fastener Withdrawal	10	16" x 17.5"
ASTM D1761, Sections 14-21 Fastener Lateral Resistance	10	16" x 17.5"

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SECTION 8
TEST RESULTS

ASTM D1761, Sections 4-13 - Fastener Withdrawal

SPECIMEN ID	MOISTURE CONTENT (%)	MAXIMUM FORCE (lbf)	DISPLACEMENT (in)	FAILURE MODE
1	8.0	2,940	1.145	fastener withdrawal
2	8.1	3,080	1.114	clip fracture
3	7.9	2,510	0.508	fastener withdrawal
4	7.6	3,330	1.151	fastener withdrawal
5	7.7	2,540	1.021	fastener withdrawal
6	7.8	3,130	0.930	fastener withdrawal
7	8.4	2,710	0.642	fastener withdrawal
8	8.1	1,950	0.454	fastener withdrawal
9	7.8	1,930	0.550	fastener withdrawal
10	7.6	2,910	0.954	fastener withdrawal
Average	**7.9**	**2,703**	**0.847**	
Std. Dev.	0.25	477	0.28	

ASTM D1761, Sections 14-21 - Lateral Fastener Resistance

SPECIMEN ID	MOISTURE CONTENT (%)	MAXIMUM FORCE (lbf)	DISPLACEMENT (in)	FAILURE MODE
1	8.0	1,280	5.271	Clip Break
2	7.8	934	4.397	Clip Break
3	7.6	799	4.187	Clip Break
4	7.6	802	4.372	Clip Break
5	8.0	872	4.473	Clip Break
6	9.6	778	4.268	Clip break
7	8.7	823	4.062	Clip break
8	8.2	1030	4.542	Clip Break
9	7.7	795	4.062	Clip break
10	9.2	1,150	5.167	Clip break
Average	**8.2**	**926**	**4.480**	
Std. Dev.	0.70	173	0.42	

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SECTION 9
CONCLUSION

The requested test method does not contain specific performance requirements. Results are reported as obtained.

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SECTION 10
PHOTOGRAPHS

Photo No. 1
Material as Received

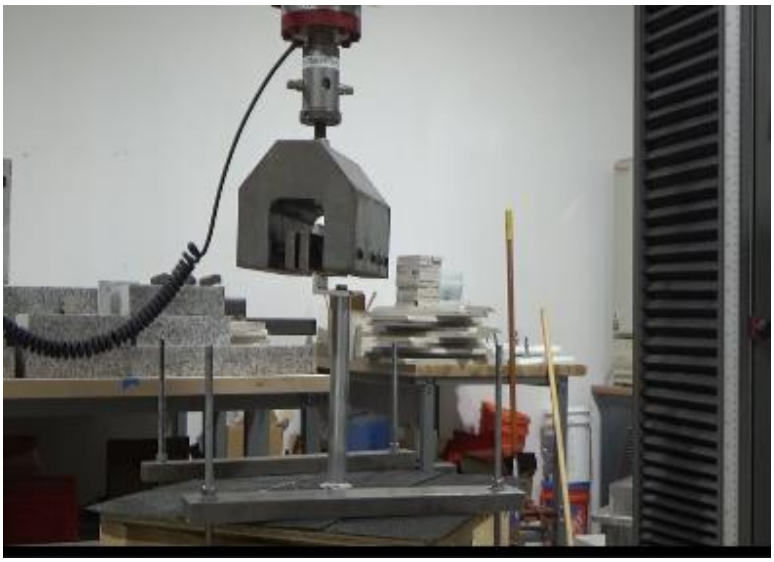

Photo No. 2
ASTM D1761 Fastener Withdrawal Test Setup

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Photo No. 3
ASTM D1761 Fastener Withdrawal at Test End (typical)

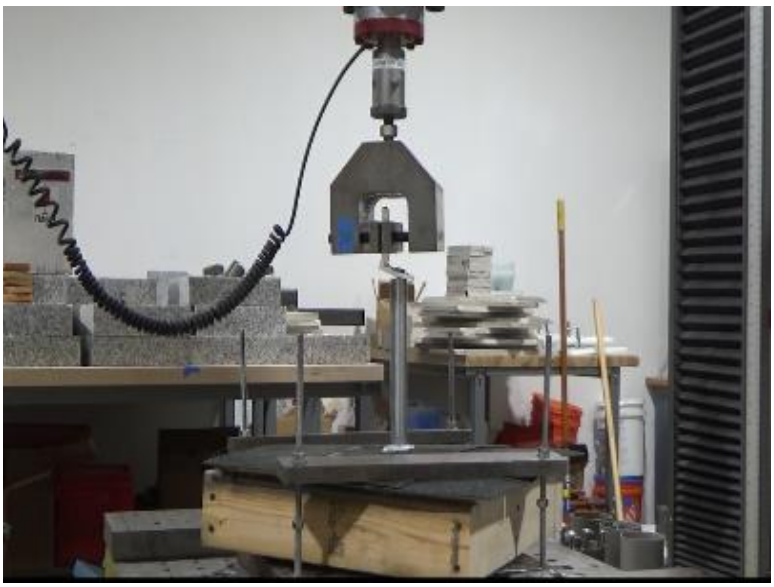

Photo No. 4
ASTM D1761 Fastener Withdrawal at Test End (typical)

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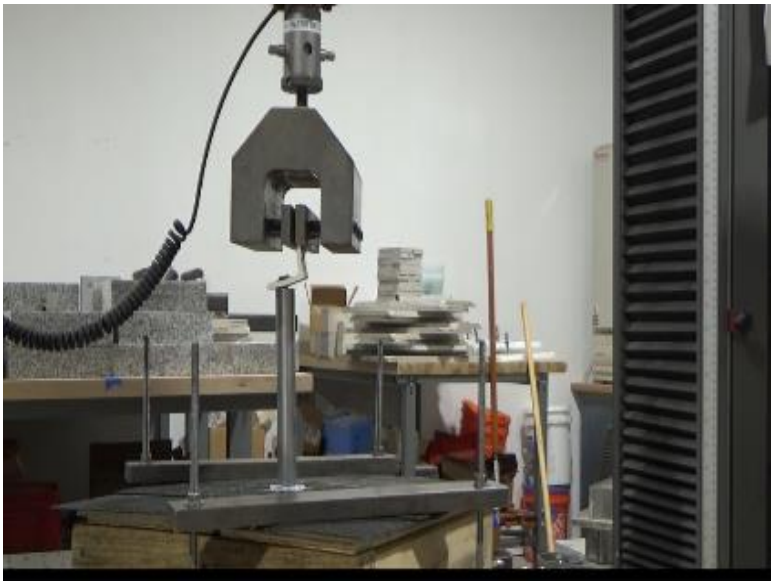

Photo No. 5
ASTM D1761 Fastener Withdrawal at Test End (typical)

Photo No. 6
ASTM D1761 Lateral Fastener Resistance Test Setup

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Photo No. 7
ASTM D1761 Lateral Fastener Resistance Test in Progress

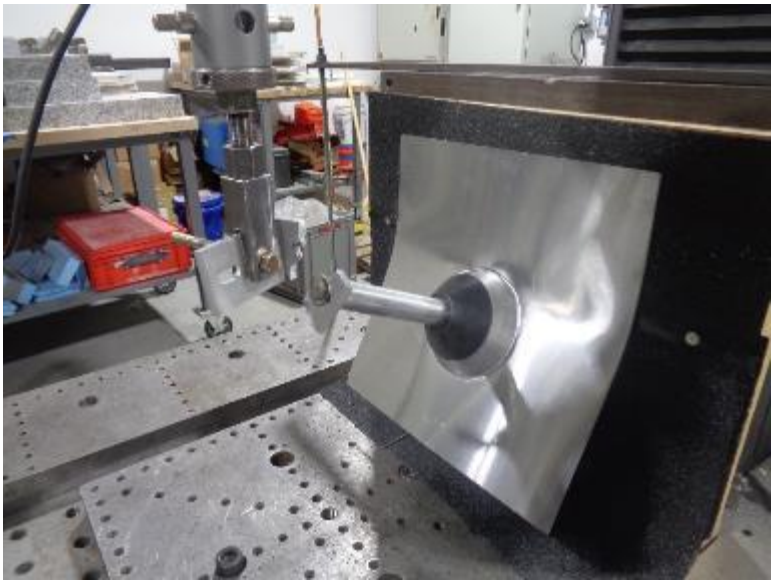

Photo No. 8
ASTM D1761 Lateral Fastener Resistance at Test End (typical)

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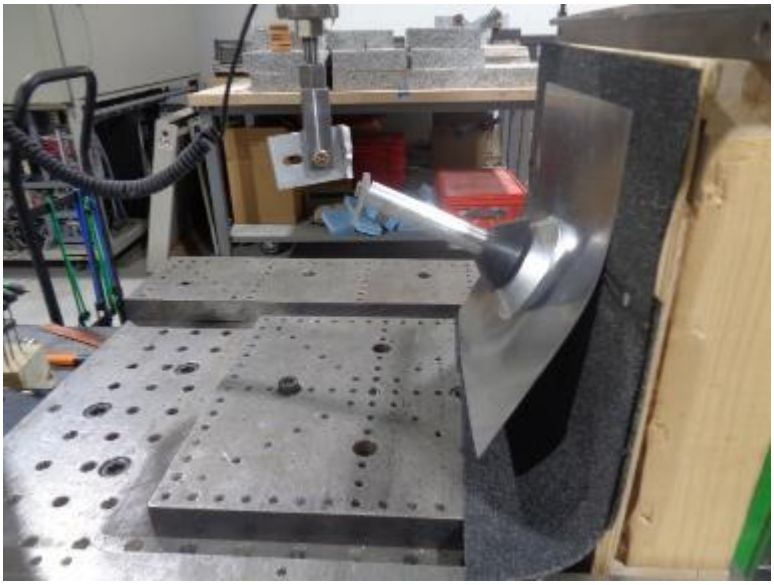

Photo No. 9
ASTM D1761 Lateral Fastener Resistance at Test End (typical)

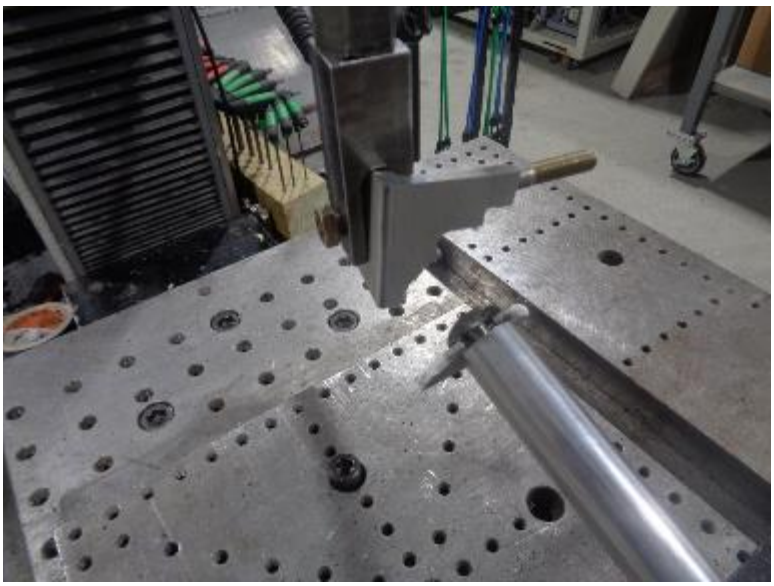

Photo No. 10
ASTM D1761 Lateral Fastener Resistance Failure Detail (typical)

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SECTION 11
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	10/21/24	N/A	Original Report Issue