

TEST REPORT

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ORIGINAL ISSUE DATE: October 21, 2010
REVISED DATE: N/A

EVALUATION CENTER

Intertek
8431 Murphy Drive
Middleton, WI 53562

RENDERED TO

Metals Plus LLC
214 Wallens Hill Road
Winsted, CT 06098

PRODUCT EVALUATED: Steel Roof Bracket System
EVALUATION PROPERTY: Non-Standardized Testing

Report of Testing a Steel Roof Bracket System for compliance with the applicable requirements of the following criteria: Non-Standardized Testing of a Steel Roof Bracket System.

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REVISION SUMMARY

DATE	SUMMARY
October 28, 2010	Original report

2 Introduction

Intertek has conducted testing for Metal Plus LLC on Steel Roof Bracket Systems to evaluate the bracket clamping torque until slippage occurred on one roof slope of snap lock and mechanical seam roofing systems. Testing was conducted as a non-standardized test. This evaluation began October 25, 2010 and was completed October 26, 2010.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client. Samples were not independently selected for testing. Standing seam metal roof pieces consisting of snap lock and mechanical seam panels were preassembled by the client. Samples were received at the Evaluation Center on September 20, 2010.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

Test brackets were installed at test lab on a mechanical standing seam roof at an 18/12 pitch slope.

4 Testing and Evaluation Methods

The testing method used was non-standardized testing. The roofing brackets were placed into position on samples of a wet snap lock metal roof and wet mechanical seam metal roofs. With the bracket in place and lightly clamped the adjustment thumbscrews were hand tightened. The brackets were then unclamped releasing the pressure and the thumbscrews turned one full rotation and re-clamped measuring the clamping torque applied on the clamping handle. All samples were tested on an 18/12 pitch slope (56.31°) with a 600 lbf load applied for 5 minutes with bracket movement recorded every minute. The test was repeated with additional turns of the thumbscrew at ½ turn increments for a total of 3 full rotations.

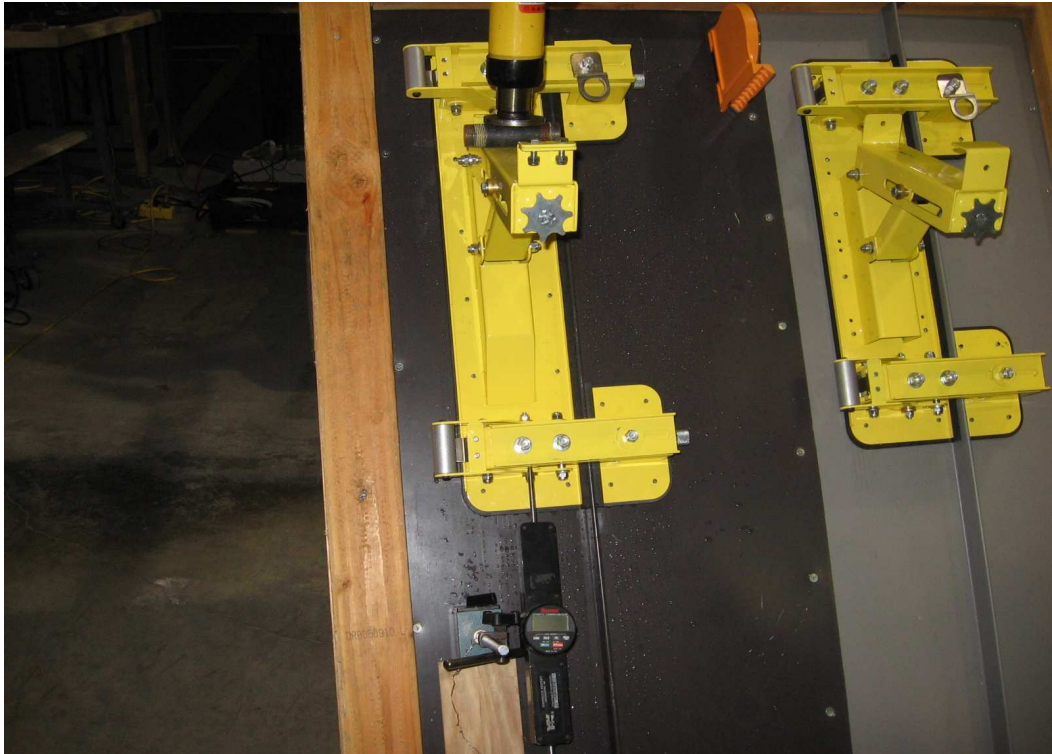
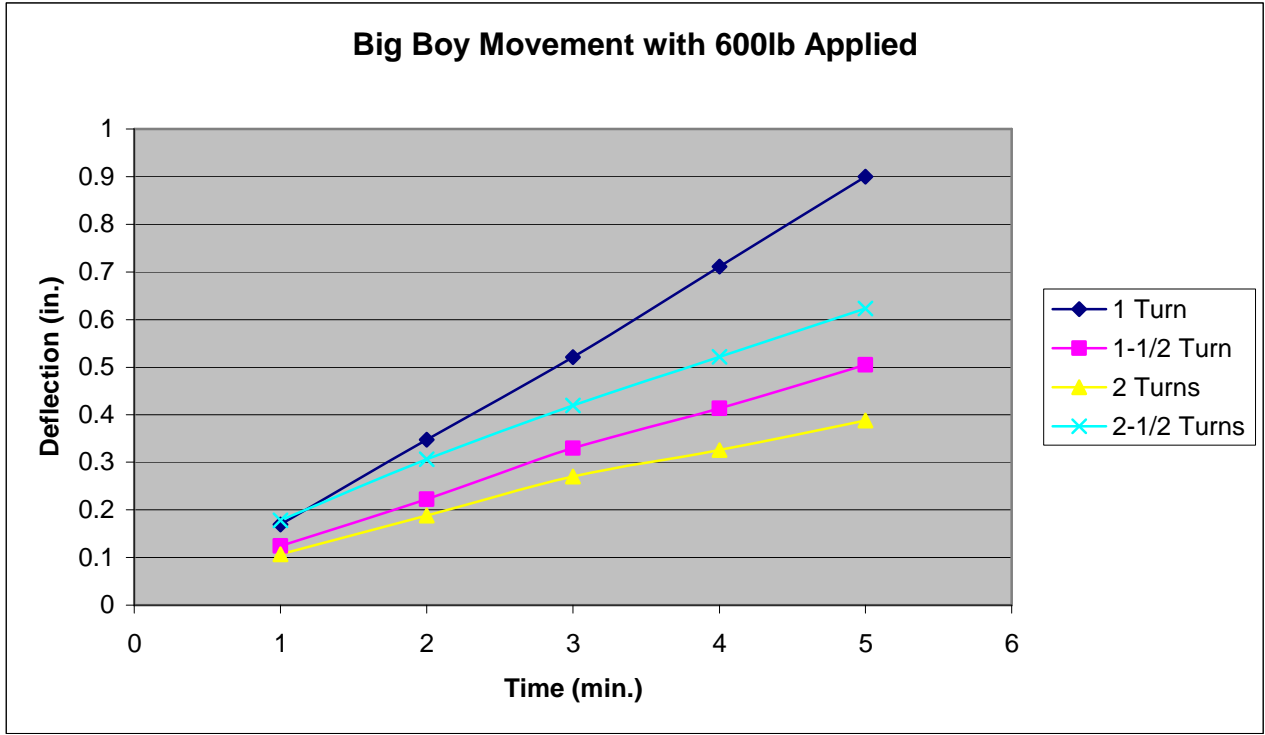
5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

Big Boy - Black Roof

Slope: 18/12 Load: 600 lbf

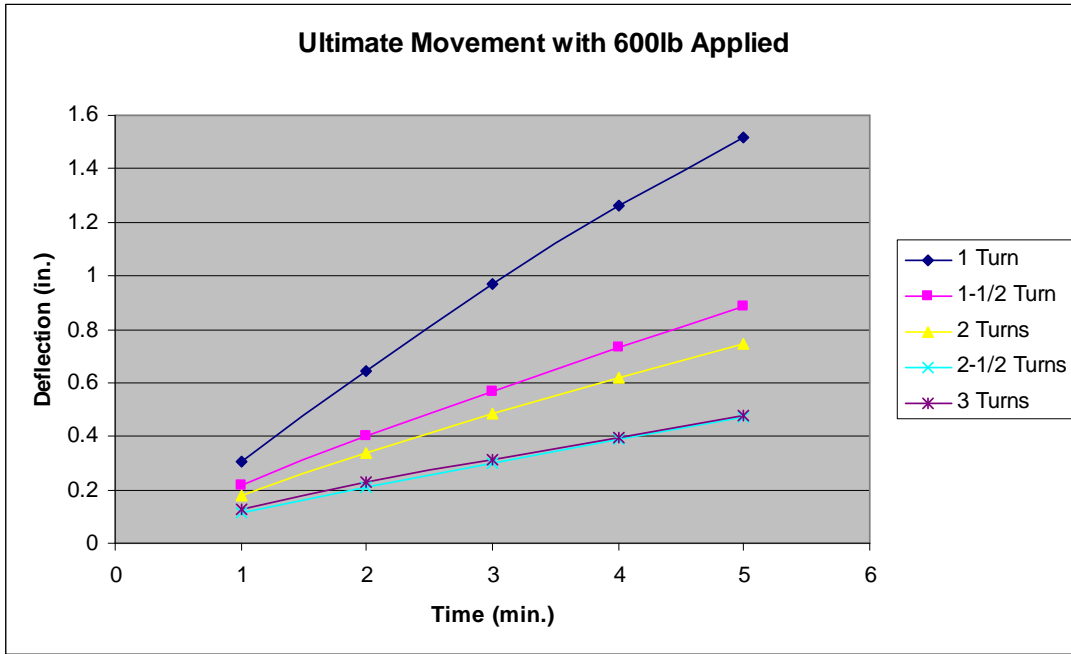
Turn	Time (min)	Def. (in)	Handle Torque
1	1	0.169	Upper - 17 ft-lb. Lower - 17.5 ft-lb.
	2	0.348	
	3	0.521	
	4	0.711	
	5	0.900	
1-1/2	1	0.124	Upper - 22 ft-lb. Lower - 22 ft-lb.
	2	0.222	
	3	0.330	
	4	0.414	
	5	0.505	
2	1	0.107	Upper - 25.5 ft-lb. Lower - 26 ft-lb.
	2	0.188	
	3	0.270	
	4	0.326	
	5	0.388	
2-1/2	1	0.178	Upper - NA, Hole Stripped @ approx. 45 ft-lb. Lower - 45 ft-lb.
	2	0.306	
	3	0.420	
	4	0.522	
	5	0.623	
3	1	-	Could not clap Upper handle. Part of handle broke while trying to pry close. Lower - NA
	2	-	
	3	-	
	4	-	
	5	-	



Ultimate – Black Roof

Slope: 18/12 Load: 600 lbf

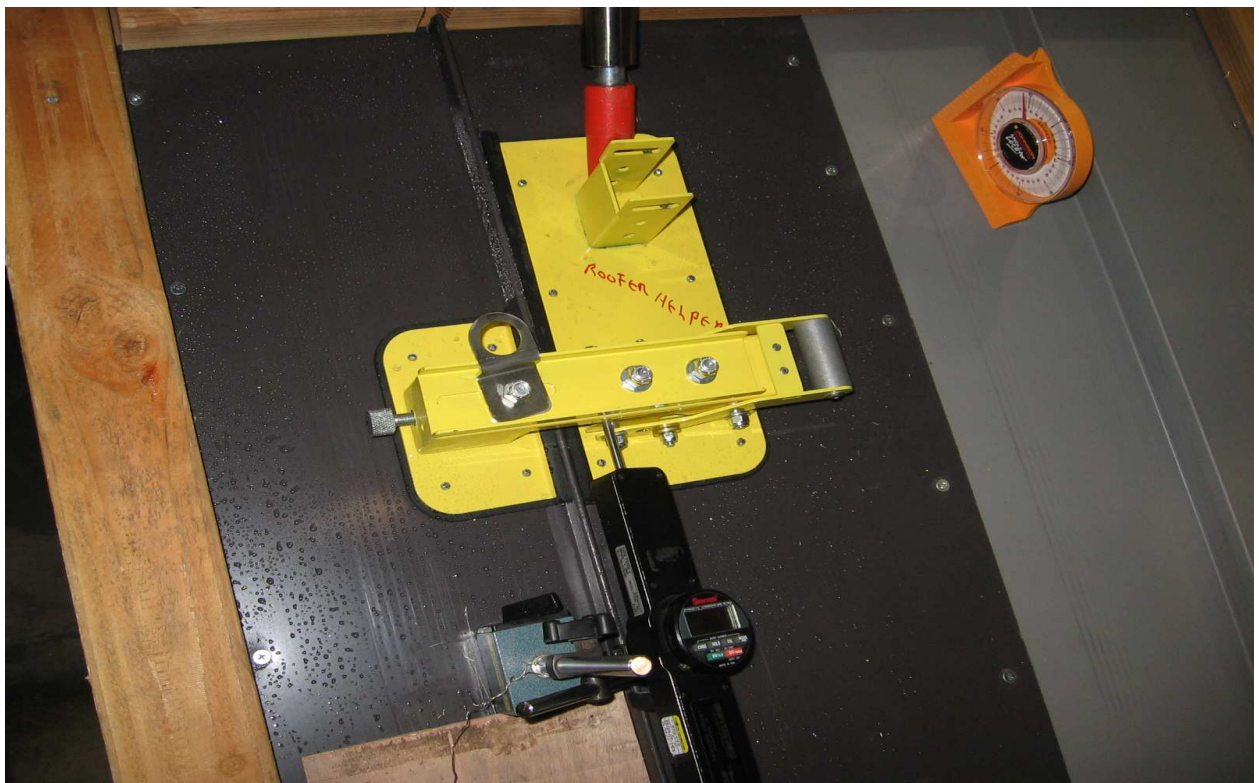
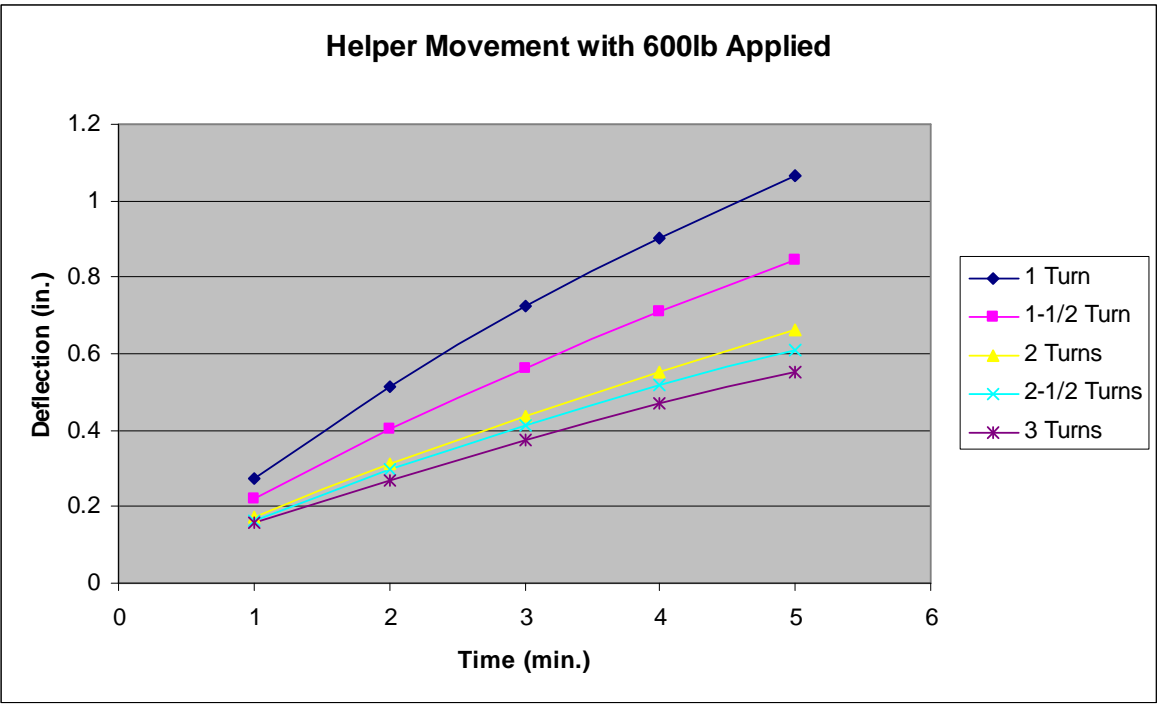
Turn	Time (min)	Def. (in)	Handle Torque
1	1	0.307	Upper - 22 ft-lb. Lower - 23 ft-lb.
	2	0.643	
	3	0.966	
	4	1.263	
	5	1.514	
1-1/2	1	0.217	Upper - 25 ft-lb. Lower - 25 ft-lb.
	2	0.402	
	3	0.570	
	4	0.735	
	5	0.888	
2	1	0.181	Upper - 35 ft-lb. Lower - 30 ft-lb.
	2	0.337	
	3	0.482	
	4	0.619	
	5	0.748	
2-1/2	1	0.113	Upper - 35 ft-lb. Lower - 30 ft-lb.
	2	0.210	
	3	0.300	
	4	0.388	
	5	0.471	
3	1	0.125	Upper hole stripped at Aprox. 35 ft-lb. Lower hole stripped at Aprox. 35 ft-lb.
	2	0.230	
	3	0.310	
	4	0.397	
	5	0.476	



Helper – Black Roof

Slope: 18/12 Load: 600 lbf

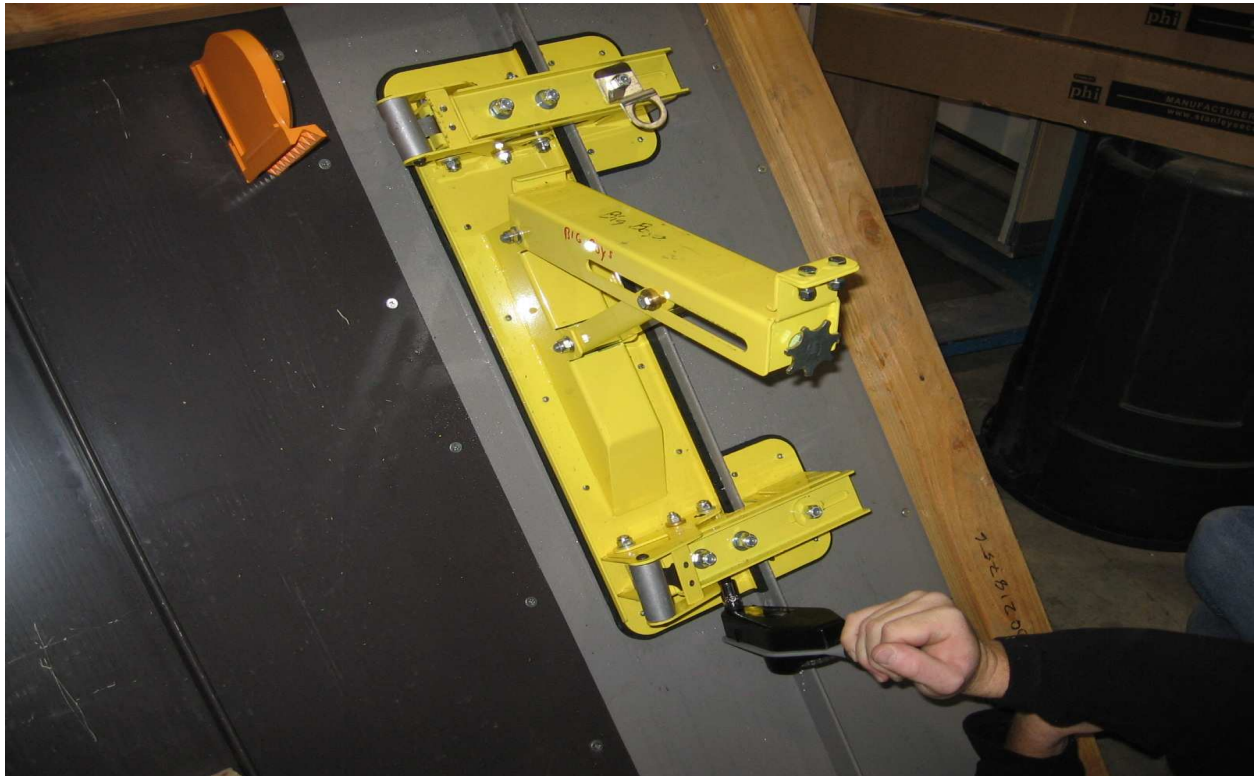
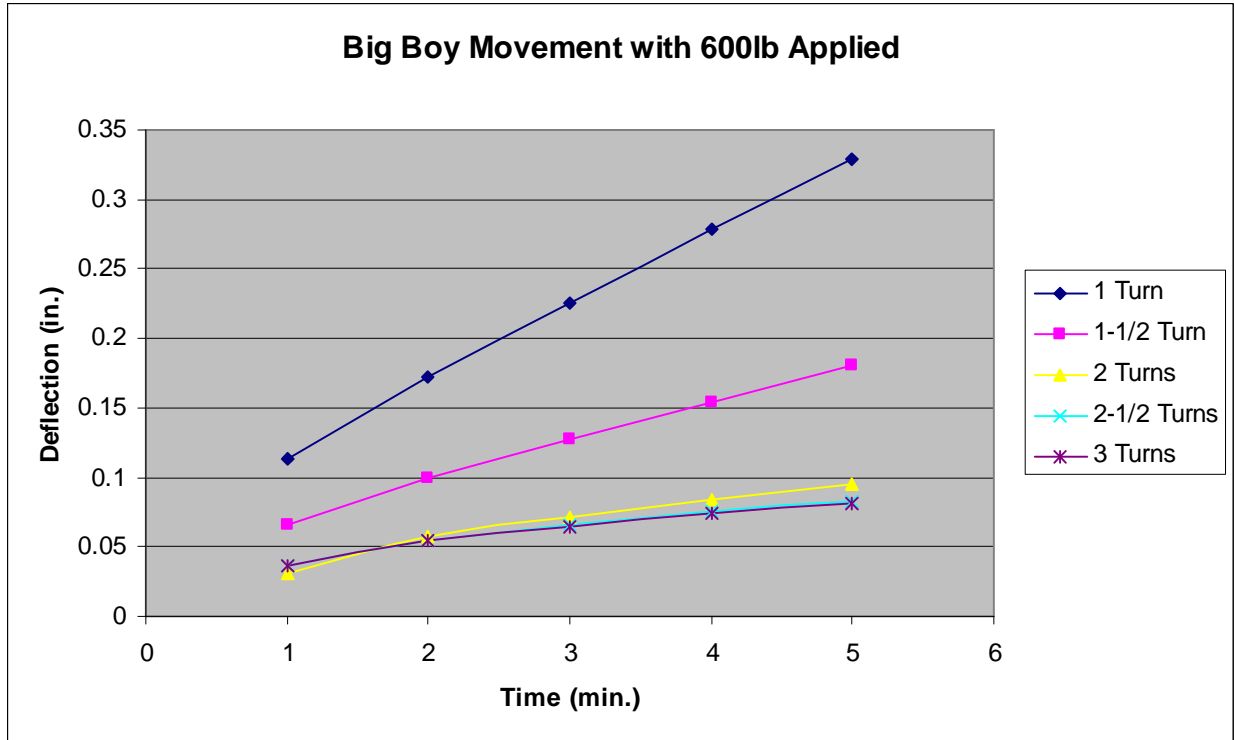
Turn	Time (min)	Def. (in)	Handle Torque
1	1	0.275	15 ft-lb.
	2	0.516	
	3	0.723	
	4	0.902	
	5	1.067	
1-1/2	1	0.221	26 ft-lb
	2	0.401	
	3	0.562	
	4	0.712	
	5	0.844	
2	1	0.171	30 ft-lb
	2	0.310	
	3	0.437	
	4	0.554	
	5	0.661	
2-1/2	1	0.161	35 ft-lb
	2	0.296	
	3	0.412	
	4	0.518	
	5	0.611	
3	1	0.157	40 ft-lb
	2	0.269	
	3	0.375	
	4	0.469	
	5	0.551	



Big Boy – Gray Roof

Slope: 18/12 Load: 600 lbf

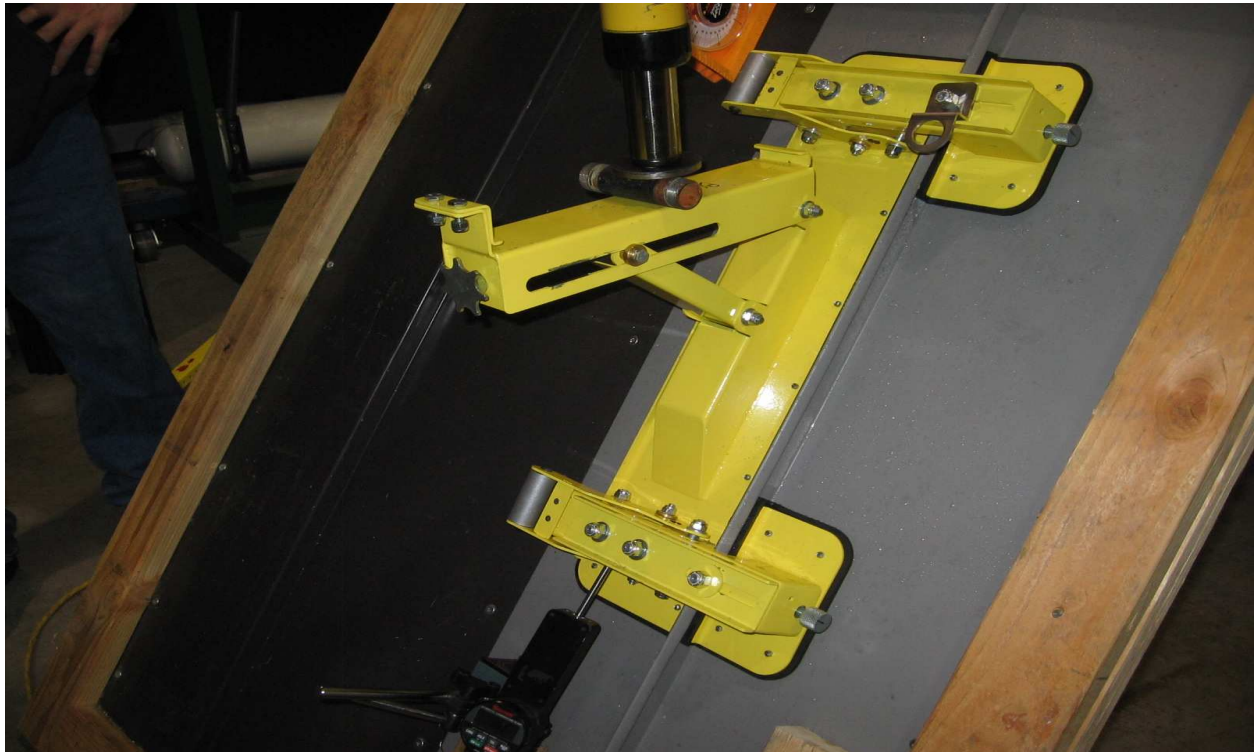
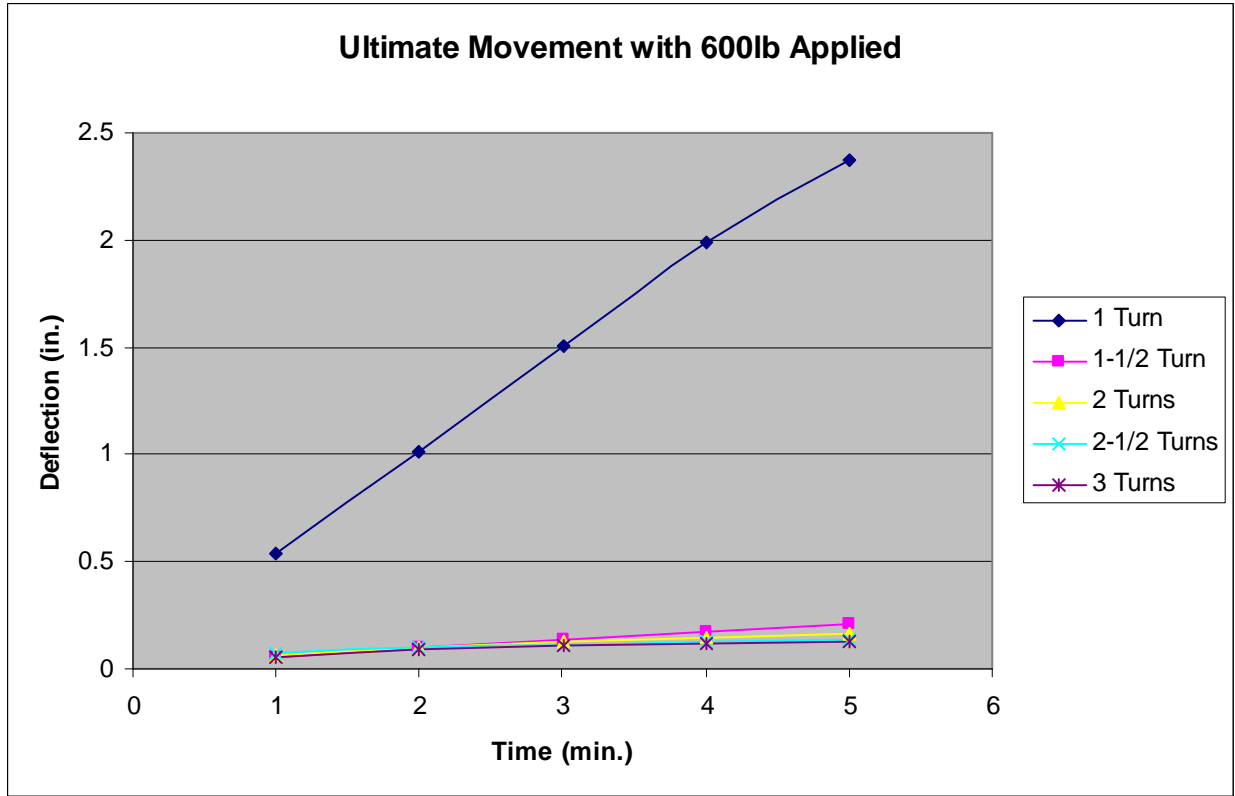
Turn	Time (min)	Def. (in)	Handle Torque
1	1	0.113	Upper - Removed damaged spring clip. 15 ft-lb. Lower - 23 ft-lb.
	2	0.172	
	3	0.225	
	4	0.278	
	5	0.329	
1- 1/2	1	0.066	Upper - 22 ft-lb. Lower - 35 ft-lb.
	2	0.099	
	3	0.128	
	4	0.154	
	5	0.180	
2	1	0.031	Upper - 25 ft-lb. Lower - 37 ft-lb.
	2	0.058	
	3	0.072	
	4	0.084	
	5	0.095	
2- 1/2	1	0.037	Upper - 35 ft-lb. Lower - 45 ft-lb.
	2	0.054	
	3	0.066	
	4	0.075	
	5	0.082	
3	1	0.036	Upper - 47 ft-lb. Lower hole stripped at Aprox. 45 ft-lb.
	2	0.054	
	3	0.065	
	4	0.074	
	5	0.081	



Ultimate – Gray Roof

Slope: 18/12 Load: 600 lbf

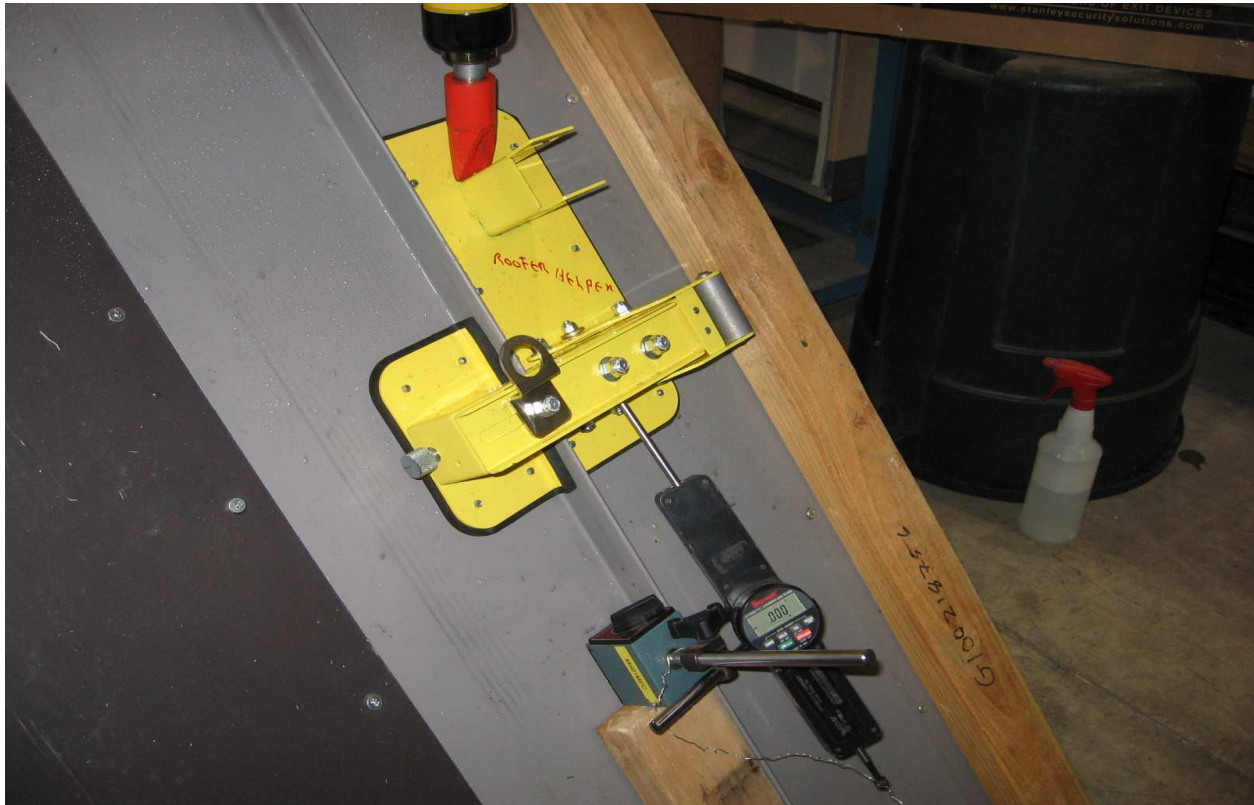
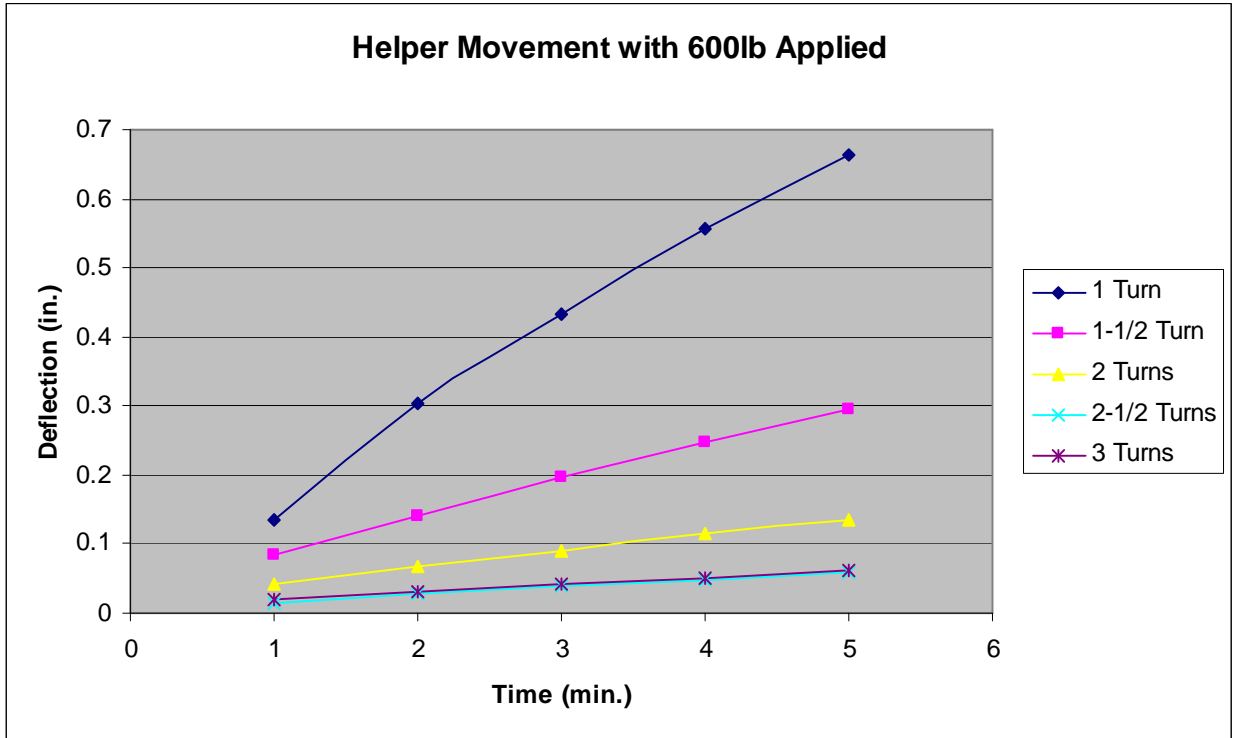
Turn	Time (min)	Def. (in)	Handle Torque
1	1	0.534	Upper - hole stripped @ approx. 27 ft-lb. Lower - 25 ft-lb.
	2	1.012	
	3	1.505	
	4	1.987	
	5	2.368	
1- 1/2	1	0.057	NA Lower - 35 ft-lb.
	2	0.099	
	3	0.137	
	4	0.172	
	5	0.206	
2	1	0.064	Upper - Unable to clamp without pry bar. Lower - 35 ft-lb.
	2	0.098	
	3	0.124	
	4	0.145	
	5	0.164	
2- 1/2	1	0.069	Upper - Unable to clamp without pry bar. Lower - 45 ft-lb.
	2	0.096	
	3	0.112	
	4	0.128	
	5	0.139	
3	1	0.059	Upper - Unable to clamp without pry bar. Lower hole stripped at Aprox. 50 ft-lb.
	2	0.091	
	3	0.109	
	4	0.121	
	5	0.132	



Helper – Gray Roof

Slope: 18/12 Load: 600 lbf

Turn	Time (min)	Def. (in)	Handle Torque
1	1	0.135	19 ft-lb.
	2	0.305	
	3	0.434	
	4	0.556	
	5	0.664	
1-1/2	1	0.084	25 ft-lb
	2	0.141	
	3	0.196	
	4	0.248	
	5	0.296	
2	1	0.042	30 ft-lb
	2	0.068	
	3	0.091	
	4	0.114	
	5	0.136	
2-1/2	1	0.015	35 ft-lb
	2	0.027	
	3	0.038	
	4	0.048	
	5	0.058	
3	1	0.02	50 ft-lb
	2	0.032	
	3	0.043	
	4	0.052	
	5	0.061	



5.2. EXAMINATION OF RESULTS

Product	Turns	Time	Def (in)
Big Boy Black	2	5	0.388
Ultimate Black	2 ½	5	0.471
Helper Black	3	5	0.551
Big Boy Grey	3	5	0.081
Ultimate Grey	3	5	0.132
Helper Grey	2 ½	5	0.058

6 Conclusion

Intertek has conducted testing for Metal Plus LLC on the Steel Roof Bracket System to evaluate bracket slippage on a roof slope of snap lock and mechanical seam roofing systems. Testing was conducted as a non-standardized test. This evaluation began October 25, 2010 and was completed October 26, 2010.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK

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