

Solar Collector Test Report

A Report to: **Your Solar Home, Inc.**
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Report No.: 07-08-9195
3 Pages, 2 Appendices

Date: January 14, 2008

1.0 INTRODUCTION

This report documents Uniform Positive and Negative Load testing of two air-heating solar collectors for Your Solar Home, Inc. Testing was done in accordance with Section 6.2.5 of CAN/CSA Standard F378-87 “*Solar Collectors*”.

The National Solar Test Facility is operated by Bodycote Testing Group for Natural Resources Canada.

2.0 SAMPLE DESCRIPTION

Bodycote Sample Number: **07-08-9195-1**
Manufacturer Name: Your Solar Home, Inc.
Collector Model: 1500 G
Serial Number: 01-000211
Collector Type: Flat plate, air-heating, PV panel section attached at top
General Construction: Aluminum extrusion frame, aluminum back sheet
Cover Plate: Clear glass
Dimensions:
 Gross (including PV Section): 2.210 m length x 1.154 m width¹; Area: 2.550 m²
 Collector Aperture: 1.784 m length x 1.010 m width; Area: 1.802 m²
 PV Section Aperture: 0.270 m length x 1.010 m width; Area: 0.273 m²
Heat Transfer Fluid: Air

Bodycote Sample Number: **07-08-9195-2**
Manufacturer Name: Your Solar Home, Inc.
Collector Model: 1500 GS
Serial Number: n/a
Collector Type: Flat plate, air-heating
General Construction: Aluminum extrusion frame, aluminum back sheet
Cover Plate: Clear glass
Dimensions:
 Gross (includes PV Section): 2.208 m length x 1.097 m width; Area: 2.422 m²
 Collector Aperture: 2.121 m length x 1.010 m width; Area: 2.142 m²
Heat Transfer Fluid: Air

¹ Includes width of the reinforcement extrusions provided by Your Solar Home, Inc.

3.0 UNIFORM POSITIVE AND NEGATIVE LOAD TEST PROCEDURE

The Uniform Positive and Negative Load tests were done in accordance with Section 6.2.5 of CAN/CSA-F378-87 “*Solar Collectors*”. The two collector types tested are intended for surface and rack mounting, and were therefore tested for both types of installation. Test pressure differentials used were +1.5 kPa, -0.5 kPa and -2.0 kPa, in that order. Acceptance criteria for this test are contained in Section 5.6.2 of the Standard.

The 1500G model was first reinforced (by Bodycote staff) with two 19” long aluminum extrusions provided by the Client, and in accordance with the instructions in the “Add-On Reinforcement Kit” amendment to the Solarheat 1000G/1500G installation manual (version 2.2) provided by the Client.

Both collector samples and their associated mounting hardware were assembled as per the installation manual provided by Your Solar Home, Inc., and then attached in turn to the load test table.

4.0 TEST RESULTS

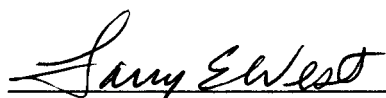
There was no apparent permanent distortion of either test sample observed after testing.

5.0 CONCLUSIONS

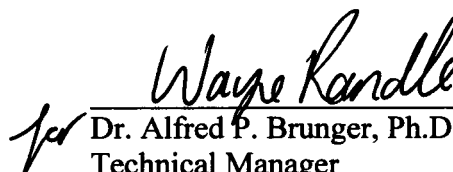
Bodycote Samples 07-08-9195-1 and 07-08-9195-2 both **passed** the CSA-F378-87 Positive and Negative Load Tests at the pressures specified for surface-mounted and for rack-mounted collectors.

Reported by:

Reviewed by:



Larry E. West, C.E.T.
Technologist
National Solar Test Facility



Dr. Alfred P. Brunger, Ph.D., P.Eng.
Technical Manager
National Solar Test Facility

This report refers only to the particular samples, units, material, instrument, or other subject used and referred to in it, and is limited by the tests and/or analyses performed. Similar articles may not be of like quality, and other testing and/or analysis programs might be desirable and might give different results.

APPENDIX A

Bodycote Sample 07-08-9195-1

Test Forms

Test Photos

(3 Pages)

Uniform Positive and Negative Load Test - Surface Mounted Collectors
(CSA standard F378-87, section 6.2.5)

GENERAL

BODYCOTE Sample No.: 07-08-9195-1
Manufacturer: Your Solar Home
Model No.: 1500G CW/PV panel).
Mounting Method: Using mfg. supplied mounting
extrusions + according to mfg. installation manual.
Collector Design Distance Between Cover and Absorber: N/A cm (A)
Tested by: Greg E West Date: 2008-01-08

POSITIVE LOAD APPLICATION 1.5 kPa
Test Starting Time: 10:06 AM Test Duration 10 minutes
Test Completion Time: 10:16 AM

NEGATIVE LOAD APPLICATION -0.5 kPa
Test Starting Time: 10:21 AM Test Duration 10 minutes
Test Completion Time: 10:31 AM

RESULTS
Cover Plate Permanent Deflection: N/A cm (B)
% of Design Distance: $B / A \times 100 =$ N/A %
Damage to Collector: None
Positive
Negative

Description of Damage:

Collector: Accepted
Rejected

Equipment used: Manometer MII# B07852

Approved by: Wayne Revell Date: 2008-Jan-9

Uniform Positive and Negative Load Test - Rack Mounted Collectors

(CSA standard F378-87, section 6.2.5)

GENERAL

BODYCOTE Sample No.: 07-08-9195-1
 Manufacturer: Your Solar Home
 Model No.: 1500G (w/PV panel)
 Mounting Method: Using mfr. supplied mounting parts & according to mfr. installation manual.
 Collector Design Distance Between Cover and Absorber: N/A cm (A)
 Tested by: Samy Entest Date: 2008-01-08

POSITIVE LOAD APPLICATION 1.5 kPa

Test Starting Time: 10:06 AM Test Duration 10 minutes
 Test Completion Time: 10:16 AM

NEGATIVE LOAD APPLICATION -2.0 kPa

Test Starting Time: 10:57 Test Duration 10 minutes
 Test Completion Time: 11:07

RESULTS

Cover Plate Permanent Deflection: N/A cm (B)
 % of Design Distance: $B / A \times 100 =$ N/A %

Damage to Collector: None
 Positive
 Negative

Description of Damage:

Collector: Accepted
 Rejected

Equipment used: Manometer MII# B07852

Approved by: Wayne Randall Date: 2008-Jan-9



Figure 1: Side view of collector below test enclosure.

APPENDIX B

Bodycote Sample 07-08-9195-2

Test Forms

Test Photos

(4 Pages)

Uniform Positive and Negative Load Test - Surface Mounted Collectors
(CSA standard F378-87, section 6.2.5)

GENERAL

BODYCOTE Sample No.: 07-08-9195-2
Manufacturer: Your Solar Home
Model No.: 1500 GS
Mounting Method: Using mfr. supplied mounting extrusions,
and according to YSH installation manual.
Collector Design Distance Between Cover and Absorber: N/A cm (A)
Tested by: LARRY WEST Date: 2008-01-09

POSITIVE LOAD APPLICATION 1.5 kPa

Test Starting Time: 10:38 AM Test Duration 10 minutes
Test Completion Time: 10:48 AM

NEGATIVE LOAD APPLICATION -0.5 kPa

Test Starting Time: 10:53 AM Test Duration 10 minutes
Test Completion Time: 11:03 AM

RESULTS

Cover Plate Permanent Deflection: N/A cm (B)
% of Design Distance: $B/A \times 100 =$ N/A %

Damage to Collector: None
Positive
Negative

Description of Damage:

Collector: Accepted
Rejected

Equipment used: Manometer MII# B07852

Approved by: Wayne Randle Date: 2008-Jan-9

Uniform Positive and Negative Load Test - Rack Mounted Collectors
(CSA standard F378-87, section 6.2.5)

GENERAL

BODYCOTE Sample No.: 07-08-9195-2
Manufacturer: Your Solar Home
Model No.: 1500 GS
Mounting Method: as per mfrs. manual & using supplied mounting extrusions.
Collector Design Distance Between Cover and Absorber: N/A cm (A)
Tested by: LARRY WEST Date: 2008-01-09

POSITIVE LOAD APPLICATION 1.5 kPa

Test Starting Time: 10:38 AM Test Duration 10 minutes
Test Completion Time: 10:48 AM

NEGATIVE LOAD APPLICATION -2.0 kPa

Test Starting Time: 11:10 AM Test Duration 10 minutes
Test Completion Time: 11:20 AM

RESULTS

Cover Plate Permanent Deflection: N/A cm (B)
% of Design Distance: $B / A \times 100 =$ N/A %

Damage to Collector: None
Positive
Negative

Description of Damage:

Collector: Accepted
Rejected

Equipment used: Manometer MII# B07852

Approved by: Wayne Randall Date: 2008-Jan-9



Figure 1: Overall view of positive/negative load test apparatus (excluding blower).

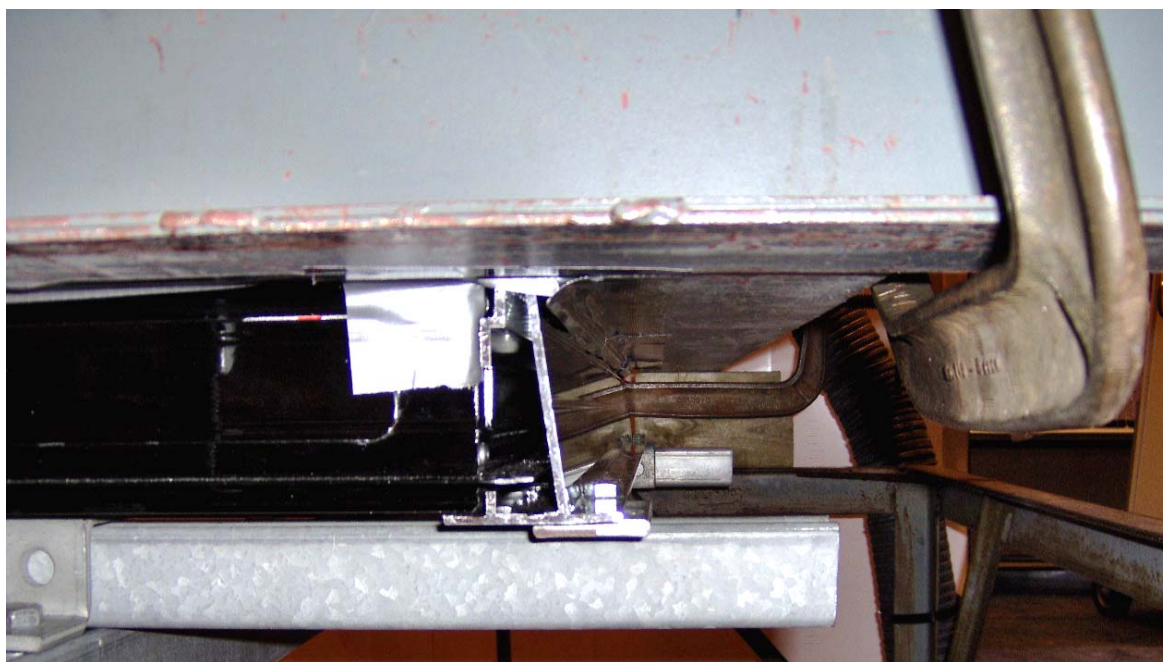


Figure 2: Side view of collector showing mounting bracket and attachment to load test table.



Figure 3: Top view (enclosure cover removed) showing tape seal around edges.