



EcoFasten Solar® 877-859-3947 Committed to the Support of Renewable Energy

**Load Test Report (for reference only)**

**Machine:** Universal or tensile testing machine with a capacity of 5,000lbs or more. ASTM E74 certified load cell and display to measure load and a dial or electronic indicator accurate to .001" to measure displacement.

**Specimen:** One solar bracket fastened according to the manufactures installation instructions to a 12"x12" or larger section of the roof substrate. Sealants, flashings and other roofing materials that have no affect on bracket strength may be omitted from the assembly.

**Apparatus:** A welded steel structure reinforced as necessary to prevent buckling, warping or twisting while the specimen is under load. The apparatus is securely fastened to the bed of the testing machine.

**Setup:** Attach the specimen to the apparatus using #12 or #14 self drilling screws in sufficient quantity and spacing so as to prevent failure of the roof substrate prior the failure of the snow guard bracket. Position the apparatus on the test machine bed and connect the load cell to the bracket so that the load is applied as it would be during normal service.

**Procedure:** Photograph the specimen and apparatus prior to testing. Load the bracket slowly with an upward pull until failure. Photograph the specimen after testing. Do a minimum of three tests using a new specimen for each test. If after three tests the results are inconsistent, conduct two additional tests.

**Failure:** Any of the following occurrences shall be considered failure.

- A. Fastener failure (fracture or withdrawal).
- B. Structural failure of bracket.

**Reporting:** On the data sheet, record the ultimate load (in pounds) and mode of failure for each test. Calculate and record the mean load for all tests conducted. Note any unusual observations during testing as well as a description of the specific failure observed for each test. Fill out all requested information on the data sheet.

Test Data			
Product: EF-SS-44		Substrate: 1 ½" Spruce Board	Fastener: 2" Olympic XHD
Failure: Any of the following occurrences shall be considered failure.			
A. Fastener failure (fracture or withdrawal). B. Structural failure of bracket.			
Test #	Ultimate Load (lbs)	Mode of Failure	Description
1	4452.8	A	Fasteners withdrew from board
2	4144.9	A	Fasteners withdrew from board
3	4304.5	A	Fasteners withdrew from board
Mean	4300.7		



### Fastener Pull-Out Comparison

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To determine the Eco-44 ultimate pull out capacity for your project you will first need to know the single fastener pull out capacity of the fastener you plan to use when fastened in to your roof deck. The best way to determine this is to do an onsite pull test. If an onsite test is not possible contact the fastener manufacturer and ask for their published pull out data. The estimated Eco-44 ultimate load will be 4 times the single fastener pull out capacity.

(Single Screw Pullout Capacity)  $\times$  3.2 = Eco-44 Ultimate Pullout Capacity

For example:

Fastener = Triangle #14-13 Concealer

Roof Deck = 5/8" CDX Plywood

Single Fastener Ultimate Pullout

Capacity in 5/8" CDX Plywood = 483 lbs

Eco-44 Estimated Ultimate Pullout Capacity =

483 lbs  $\times$  4 = 1546 lbs

This process determines the expected ultimate load; appropriate safety factor must still be applied. Each plate must be fastened with four fasteners.

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