Solar / Fuel Cell Technologies
Photovoltaic Modules

TÜV Rheinland PTL

Attn: Mr. Chris Bamat
Lead Validation Engineer
Ecolibrium Solar
340 West State Street
Unit 22
Athens, OH 45701

August 26, 2015

Letter of Conformance – Mechanical Load Tests

Type of Equipment: PV Mounting System
Model Designation: EcoX2
Serial Number: N/A
Test Requirement: ANSI/UL 2703, First Edition

TÜV Rheinland Reference File: L2-ELS150128a(Rev1)
TÜV Rheinland Project Number: ELS150128a

Dear Mr. Bamat,

Ecolibrium Solar's **EcoX2 PV mounting system** has been successfully evaluated for Mechanical Loading according to the requirements of UL 2703, Section 21.

Congratulations on this achievement.

The following modules have been evaluated and qualified for use on the EcoX2 racking system using the identified **Applied Test Loads**. For all modules in Table 1, the **Applied Test Load** exceeds the minimum test loading required for compliance.

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Table 1: Mechanical Load Test Results per ANSI/UL 2703, Section 21

Tested Modules			Applied Test Loads		
Module Manufacturer	**Model Type**	**Surface Area (sqft)**	**Downward Pressure Test Load (psf)**	**Upward Pressure Test Load (psf)**	**Down-slope Test Load (psf)**
Yingli Solar	YL250P-29b	17.58	60	60	35
SolarWorld	Sunmodule Plus SW 275 mono black	18.05	60	60	35
Trina Solar	TSM-255PA05.18	17.6	60	60	35
Canadian Solar	CS6P-245P	17.33	60	60	35
LG Electronics	LG270S1C-B3	17.65	45	45	35
Q Cells	Q.PRO BFR-G3 255	17.98	60	60	35
Jinko Solar	JKM250P-60	17.62	60	60	35
SunEdison	SE – F265KMD - 38	17.69	60	60	35
Hyundai	HiS-M255RG	17.62	60	60	35

Design Load Ratings in each direction for each module is determined by calculating safety factor according to: **Design Load Rating = Applied Test Load / 1.5**. Table 2 indicates the **Design Load Ratings** for the tested module types as well as modules from the same manufacturers qualified for use on the EcoX2 system. The criteria for this Qualification by Similarity is based on verification that approved modules from the same manufacturer must have identical frame geometries to the tested module and must be the same (or lower) surface area.

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Table 2: Design Load Ratings and Qualified Module List

Evaluated Modules			Design Load Ratings		
Module Manufacturer	**Model Type (X used to indicate variable text)**	**Surface Area (sqft)**	**Downward Pressure Test Load (psf)**	**Upward Pressure Test Load (psf)**	**Down-slope Test Load (psf)**
Yingli Solar	YL2XXP-29b	17.58	40	40	23
	YL2XXP-30b	17.58	40	40	23
SolarWorld	Sunmodule Pro - SW XXX Poly	18.05	40	40	23
	Sunmodule Plus - SW XXX MONO	18.05	40	40	23
	Sunmodule Plus - SW XXX Mono Black	18.05	40	40	23
Trina Solar	TSM-XXX PX05.18	17.6	40	40	23
Canadian Solar	CS6P-XXXM	17.33	40	40	23
	CS6P-XXXP	17.33	40	40	23
LG Electronics	LGXXXN1C-B3-X3	17.65	30	30	23
	LGXXXS1K-B3-X3	17.65	30	30	23
	LGXXXS1C-B3-X3	17.65	30	30	23
	LGXXXA1C-B3-X3	17.65	30	30	23
Q Cells	Q.PRO BFR-G3 XXX	17.98	40	40	23
	Q.PRO-G3 XXX	17.98	40	40	23
	Q.Plus-G3 XXX	17.98	40	40	23
Jinko Solar	JKMXXXP-60	17.62	40	40	23
	JKMXXXM-60	17.62	40	40	23
	JKMXXXPP-60	17.62	40	40	23
	JKMXXXMM-60	17.62	40	40	23
SunEdison	SE – FXXXXXX - XX	17.69	40	40	23
Hyundai	HiS-MXXXMG	17.62	40	40	23
	HiS-MXXXRG	17.62	40	40	23
	HiS-MXXXRW	17.62	40	40	23

This letter may be used as a letter of conformance (LOC) indicating these PV modules are suitable for use on the EcoX2 PV mounting system. The EcoX2 racking system installation manual may be updated to include these modules.

Sincerely,

Jack Castagna, PE
Solar Components Program Manager
TÜV Rheinland PTL

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