

EcoFoot5D™ Install Guide Appendix – UL2703 Qualification

EcoFoot5D™ High Density 5-Degree Ballasted Racking System

Document No. ES10561

Rev 1.6, January 2020

Ecolibrium Solar's EcoFoot5D™ product has been tested in accordance with the ANSI/UL2703-2015 Standard for Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels. This testing standard includes subjecting samples of the racking to temperature and humidity cycling to simulate component aging, electrical bonding tests on all system components, system grounding tests, tests to verify that use of the system does not increase the risk of fire, and module-specific mechanical load testing.

EcoFoot5D racking maintains a Class A fire rating when installed in landscape or portrait orientation according to the installation instructions, on a low slope roof Class A roof with Type 1 modules and Type 2 modules. When installing Type 2 modules a Ballast Tray is required. For roofs with lower fire ratings, the existing rating is maintained when EcoFoot5D is used.

EcoFoot5D module clamps and wind deflectors are certified as recognized components under UL2703 for system electric bonding when installed with the below listed modules. Rows within an array, having a fuse rating of up to 25 amps, may be grounded via a single properly sized ground lug acting as a Grounding Electrode Conductor (GEC). The EcoFoot5D install guide contains instructions for bonding and grounding modules if deviation from standard installation is required. Per UL2703, the EcoFoot5D system creates a continuous bonded structure with all the below listed modules when installed per instructions in the install guide.

Mechanical load testing is underway and will be conducted in 2 ways. First, load testing will be completed on system components that have been subject to temperature and humidity cycle tests. This verifies the long-term stability of all materials and components used. Second, the modules listed below will be mechanically load tested to the UL2703 standard. The module manufacturer and all approved module series are listed with the resulting load ratings in the table below.

UL2703 System Label: The label shown below is stamped into to the Wind Deflector (identified as component 5 in the installation guide).



The Date Code **ABCYZZ** shown above will appear on production parts, letters defined as follows:

- *ABC* shall be an acronym for identifying the source factory
- *Y* shall be the Quarter of the year (i.e. 1, 2, 3, 4) of manufacture
- *ZZ* shall be the last 2 digits of the year of manufacture

The modules below are listed for mechanical loading, grounding and bonding according to UL2703.
The table continues on subsequent pages.

Note: "XXX" represents module wattage

Manufacturer	Module Series	Downforce Design Load (psf)	Uplift Design Load (psf)
Boviet Solar	BVM6612 P-XXX	42.9	11.8
	BVM6612 P-XXX (BB)		
	BVM6612-M-XXX		
	BVM6612 M-XXX (BB)		
	BVM6610P-XXX	50	11.8
	BVM6610M-XXX		
	BVM6610M (BB)-XXX		
BVM6610P (BB)-XXX			
Canadian Solar	CS6P-XXXM	30	15.1
	CS6P-XXXP	43.4	13.6
	CS6X-XXXP		
	CS6U-XXXP		
	CS6U-XXXM	42.8	13.3
	CS6U-XXXP (1500V)		
CS6U-XXXM (1500V)			
ET Solar	ET-M672XXXWW	40	13.4
	ET-M672XXXWB		
	ET-P672XXXWW		
	ET-P672XXXWB		
	ET-M672XXXBB		
ET-P672XXXBB			
Hansol	HSXXXTD-AN4	35	13.4
	HSXXXTD-AN3		
	HSXXXUD-AN1		
Hanwha Q Cells (continued next page)	Q.PRO BFR-G4 XXX	49.8	13.5
	Q.PLUS BFR-G4.1 XXX		
	Q.PRO BFR-G4.1 XXX		
	Q.PRO BFR-G4.3 XXX		
	Q.PEAK-G4.1 XXX		
	Q.PEAK-G4.1/MAX XXX		
	Q.PEAK BLK G4.1 XXX		
	Q.PRO G4 XXX		
	Q.PLUS G4 XXX		
	Q.PEAK-G4.1/TAA XXX		
	Q.PEAK BLK G4.1/TAA XXX		
	Q.PLUS BFR G4.1/TAA XXX		

Manufacturer	Module Series	Downforce Design Load (psf)	Uplift Design Load (psf)
Hanwha Q Cells (con't.)	Q.PEAK BLK G4.1/TAA XXX	49.8	13.5
	Q.PLUS BFR G4.1/TAA XXX		
	Q.PLUS BFR G4.1/MAX XXX		
	B.LINE PLUS BFR G4.1 XXX		
	B.LINE PRO BFR G4.1 XXX		
	Q.PRO EC-G4.4 XXX		
	Q.PLUS L-G4.2 XXX	33	10.2
	Q.PEAK L-G4.2 XXX		
	Q.PLUS L-G4.1 XXX		
	Q.PLUS L-G4 XXX		
	Q.PRO L-G4 XXX		
	Q.PRO L-G4.1 XXX		
	Q.PRO L-G4.2 XXX		
	B.LINE PLUS L-G4.2 XXX		
B.LINE PRO L-G4.1 XXX			
B.LINE PRO L-G4.2 XXX			
Heliene	72M-XXX	40	15
	72M-XXX BLK		
	72P-XXX		
	60P-XXX		
	60M-XXX		
	60M-XXX HOME PV		
Hyundai	HiS-MXXXTI	40	10.2
	HiS-SXXXTI		
	HiS-MXXXRI	22.8	15
	HiS-SXXXRI		
	HiS-SXXXKI		
Jinko	JKMXXXP-60	30	15.1
	JKMXXXM-48		
	JKMSXXXPP-60	45	15
	JKMXXXM-60		
	JKMXXXM-60-V		
	JKMXXXPP-60(Plus)		
	JKMXXXPP-60		
	JKMXXXPP-60-J4		
	JKMXXXPP-60-V	42.9	13.4
	JKMXXXM-60B		
	JKMXXXP-72		
	JKMXXXPP-72		
JKMXXXM-72(Plus)			
JKMXXXM-72			
JKMXXXPP-72(Plus)			
JKMXXXPP-72-V			

Manufacturer	Module Series	Downforce Design Load (psf)	Uplift Design Load (psf)
LG	LGXXXN2W-G4	40	13.3
	LGXXXN2W-A5	40	12.5
	LGXXXN1C-A5		
	LGXXXN1K-A5		
	LGXXXS1C-A5		
	LGXXXS2W-A5		
LONGi	LR6-72-XXXM	40	13.4
	LR6-72HV-XXXM	30	15
	LR6-72HPH-XXXM		
REC Solar	RECXXTTP2 BLK2	49.8	15
	RECXXTTP2 BLK		
	RECXXTTP2		
	RECXXTTP		
	RECXXTTP BLK		
	RECXXP		
	RECXXP BLK		
	RECXXTTP2SB 72 XV	35	13
	RECXXTTP2S 72 XV		
RECXXTTP2S 72			
ReneSola	JCXXM-24/Ab	30	13.4
	JCXXM-24/Bb		
S-Energy	SNXXP-15	30	10
	SNXXP-10		
	SNXXM-10		
	SNXXM-10 (40T)		
	SNXXP-10 (40T)		
Silfab	SLG-M XXX	30	13.1
	SLG-P XXX		
	SLG-X XXX		
	SSG-M XXX		
	SSG-P XXX		
	SLA-P XXX	40	13.3
	SLA-X XXX		
	SLA-M XXX		
	SSA-M XXX		
	SSA-P XXX		
SolarWorld	SW Poly Pro SW XXX	30	15.1
	SW Poly 2.5 SWXXX		
	Sunmodule Plus SW Mono		
	SWXXX		
	Sunmodule Protect SW Mono		

Manufacturer	Module Series	Downforce Design Load (psf)	Uplift Design Load (psf)
Talesun	TP672P-XXX	30	12
	TP672M-XXX		
Trina	TSM-XXX PA05.08	30	15.1
	TSM-XXXDD14A(II)	40	13.4
	TSM-XXXDE14A(II)		
	TSM-XXXPE14A	40	13.4
TSM-XXXPD14			
Yingli	YLXXXP-29b	30	15.1
	YLXXXC-30b		

Notes:

- Testing is underway for module data listed as TBD and will be available soon.
- Testing for loads on downslope are not required for ballasted racking.
- The above list is not exhaustive. New modules are being tested on an ongoing basis. Contact Ecolibrium Solar directly for specific module information and Letters of Completion from TÜV Rheinland.

Revision History

Revision	Description of Changes	Date
1.0	Initial Release	2017-September-05
1.1	Updated Final Load Ratings Added Tested Modules	2017-November-28
1.2	Added LONGI Modules	2018-January-22
1.3	Added REC Modules	2018-April-13
1.4	Added 4 Trina and 3 Hansol Modules Updated 3 REC Modules	2018-July-16
1.5	Added 3 Hyundai Modules	2019-May-7
1.6	Added 1 LONGI and 7 Helienne Modules	2020-January-28

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