

EcoFoot2+ Install Guide Appendix - UL2703 Qualification

Ecolibrium Solar® EcoFoot2+ Flat-Roof Ballasted Racking System

Ecolibrium Solar’s EcoFoot2+ 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.

EcoFoot2+ 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 and Type 2 modules. For roofs with lower fire ratings, the existing rating is maintained when EcoFoot2+ is used.

EcoFoot2+ 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 Ecofoot2+ install guide contains instructions for bonding and grounding modules in the event that deviation from standard installation is required. Per UL2703, the EcoFoot2+ system creates a continuous bonded structure with all the below listed modules when installed per instructions in the install guide.

Mechanical load testing has been conducted in 2 ways. Firstly, load testing has been 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. Secondly, the modules listed below have been 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.

To document the UL2703 system rating, the label shown below is stamped into to the wind deflector – component E from the install guide.



The below listed modules are listed for mechanical loading, grounding and bonding according to UL2703. The table continues on the next page.

Note: "XXX" represents module wattage

Manufacturer	Module Series	Max. Downforce w/Mid-span Supports	Max. Downforce w/o Mid-span Supports	Max. Uplift
Boviet Solar	BVM6612 P-XXX	50 psf	30 psf	11.8 psf
	BVM6612 P-XXX (BB)			
	BVM6612-M-XXX			
	BVM6612 M-XXX (BB)			
	BVM6610P-XXX			
	BVM6610M-XXX			
	BVM6610M (BB)-XXX			
Hanwha Q Cells	BVM6610P (BB)-XXX	55 psf	N/A	13.5 psf
	Q.PRO BFR-G4 XXX			
	Q.PLUS BFR-G4.1 XXX			
	Q.PRO BFR-G4.3 XXX			
	Q.PEAK BFR-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			
	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			
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				



Manufacturer	Module Series	Max. Downforce w/Mid-span Supports	Max. Downforce w/o Mid-span Supports	Max. Uplift
Hyundai	HiS-MXXXTI HiS-SXXXTI	40 psf	30 psf	10.2 psf
Jinko	JKMXXXP-60 JKMXXXM-72	N/A	30 psf 30 psf	30 psf 15 psf
Yingli	YLXXXP-29b	N/A	30 psf	30 psf
Trina	TSM-XXX PA05.08	N/A	30 psf	30 psf
Canadian Solar	CS6P-XXXX CS6X-XXXX	N/A	30 psf 38 psf	30 psf 15 psf
	CS6U-XXXX CS6U-XXXM CS6U-XXXX (1500V) CS6U-XXXM (1500V)	50 psf	25 psf	13.3 psf
	LG	LGXXXN2W-G4	N/A	35 psf 15 psf
	ReneSola	JCXXXM-24/Ab JCXXXM-24/Bb	N/A	30 psf 30 psf
Silfab	SLG-M XXX SLA-P XXX SLA-X XXX SLG-P XXX SLG-X XXX SSA-P XXX SSG-M XXX SSG-P XXX	30 psf	N/A	11.6 psf

Notes:

- Testing is underway for module data listed as N/A 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.

Release Notes		
Revision	Reason	Effective Date
1.0	Initial Release	4/25/17
1.1	<p>Modules Added:</p> <p>Boviet Solar BVM6612 P-XXX BVM6612 P-XXX (BB) BVM6612-M-XXX BVM6612 M-XXX (BB) BVM6610P-XXX BVM6610M-XXX BVM6610M(BB)-XXX BVM6610P(BB)-XXX</p> <p>Hanwha Q Cells Q.PRO BFR-G4 XXX Q.PLUS BFR-G4.1 XXX Q.PRO BFR-G4.3 XXX Q.PEAK BFR-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 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 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</p> <p>Hyundai HiS-M3XXTI HiS-S3XXTI</p>	5/17/17



Release Notes		
Revision	Reason	Effective Date
1.1 (cont.)	<p>Modules Added (cont.):</p> <p>Canadian Solar CS6U-XXXX CS6U-XXXM CS6U-XXXX (1500V) CS6U-XXXM (1500V)</p> <p>ReneSola JCXXXM-24/Bb</p> <p>Silfab SLG-M XXX SLA-P XXX SLA-X XXX SLG-P XXX SLG-X XXX SSA-P XXX SSG-M XXX SSG-P XXX</p> <p>Modules Updated: Jinko JKMXXXM-72 LG LGXXXN2W-G4 ReneSola JCXXXM-24/Ab</p>	5/17/17