STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail:siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

November 15, 2023

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
kbaldwin@rc.com

RE: **DOCKET NO. 505** - Haddam Quarter Solar, LLC Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a 2.8-megawatt-AC solar photovoltaic electric generating facility located south of Haddam Quarter Road and north of Johnson Lane, Durham, Connecticut and associated electrical interconnection. **Development and Management Plan Revision and Condition Acknowledgement.**

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated November 13, 2023 regarding a revision to the Development and Management (D&M) Plan and compliance with the condition of the Council's D&M Plan Decision of August 18, 2023 for the above-referenced facility.

Pursuant to Regulations of Connecticut State Agencies (RCSA) §16-50j-62(b), your request to install ZNShine ZXM7-SHLDD144-550W panels in lieu of VSUN550-144BMH-DG-550W panels is hereby approved.

The November 13, 2023 correspondence also includes TCLP test results for the above-referenced solar panels indicating the panels would not be characterized as hazardous waste at the time of disposal, under current testing criteria in compliance with the condition in the Council's D&M Plan Decision of August 18, 2023 to submit TCLP test results for the selected solar panels. Therefore, the condition of the Council's D&M Plan Decision has been satisfied.

This approval of the requested D&M Plan revision and acknowledgement of compliance with the condition of the Council's August 18, 2023 D&M Plan approval apply only to the requested D&M Plan revision and the satisfied condition in the correspondence dated November 13, 2023.

Please be advised that deviations from the Council's Decision and Order and D&M Plan approvals are enforceable under the provisions of Connecticut General Statutes § 16-50u. Furthermore, the Certificate Holder is responsible for reporting requirements pursuant to RCSA §16-50j-62.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/RDM/laf

Robinson+Cole

KENNETH C. BALDWIN

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Hartford, CT 06103-3597
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kbaldwin@rc.com
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Also admitted in Massachusetts
and New York

November 13, 2023

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Docket No. 505 – Application of Haddam Quarter Solar, LLC, a wholly owned subsidiary of Louth Callan Renewables, for a Certificate of Environmental Compatibility and Public Need for the Construction, Maintenance and Operation of a 2.8 MW/AC Solar Photovoltaic Project Off Johnson Lane in Durham, Connecticut**

D&M Plan Modifications – Change in Solar Panel

Dear Attorney Bachman:

On behalf of Haddam Quarter Solar, LLC (the "Petitioner"), I respectfully request Siting Council ("Council") staff approval for a minor change to the Docket No. 505 D&M Plan approved by the Council on August 18, 2023. The Petitioner has decided to change the solar PV module it intends to use at the site to the ZNShine ZXM7-SHLDD144-550W panel. A copy of the new panel specification sheet is attached to this letter. Also attached is the TCLP Report for the new solar PV module.

If you have any questions or need any additional information regarding this request, please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Copy to:
George Eames, First Selectman
Nikhil Johnson
Kyzer Gardiola

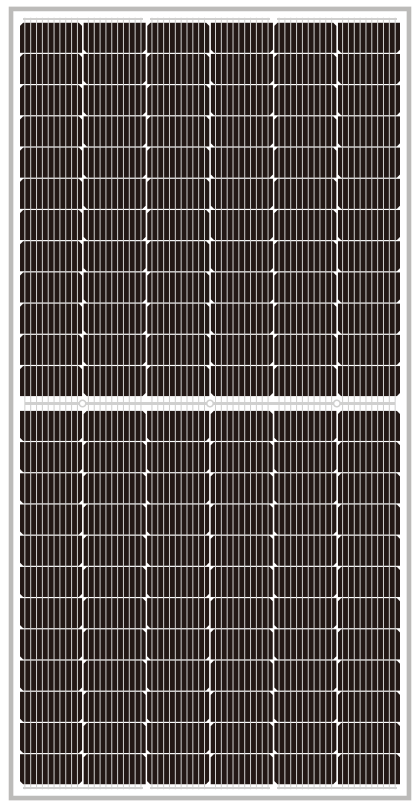
28284932-v1

ZXM7-SHLDD144 Series

ZNSHINESOLAR

Znshinesolar 10BB HALF-CELL Bifacial Light-Weight
Double Glass Monocrystalline PERC PV Module

525W | 530W | 535W | 540W | 545W | 550W



Excellent cells efficiency

MBB technology decreases the distance between busbar and finger grid line which is benefit to power increase.

Better Weak Illumination Response

More power output in weak light condition, such as haze, cloudy, and early morning.

Anti PID

Ensured PID resistance through the quality control of cell manufacturing process and raw materials.

Adapt To Harsh Outdoor Environment

Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity environment.

TIER 1

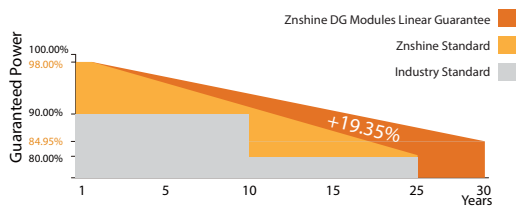
Global,Tier 1 bankable brand,with independently certified state-of-the-art automated manufacturing.

Excellent Quality Managerment System

Warranted reliability and stringent quality assurances well beyond certified requirements.

Bifacial Technology

Up to 25% additional power gain from back side depending on albedo.



12 years product guarantee
30 years output guarantee

0.45% annual degradation
over 30 years

IEC61215/IEC61730/IEC61701/IEC62716/UL61730

ISO 9001: Quality Management System

ISO 14001: Environmental Management System

ISO45001: Occupational Health and Safety Management System

Founded in 1988, ZNShine solar is a world's leading high-tech PV module manufacturer.With the state-of-the-art production lines, the company boasts module capacity of 6GW. Bloomberg has listed ZNShine as a global Tier 1 PV module maker. Today Znshine has distributed its sales to more than 60 countries around the globe.

www.znshinesolar.com

ZXM7-SHLDD144 Series

Znshinesolar 10BB HALF-CELL Bifacial Light-Weight Double Glass Monocrystalline PERC PV Module

ZNSHINESOLAR

ELECTRICAL CHARACTERISTICS | STC*

Nominal Power Watt Pmax(W)*	525	530	535	540	545	550
Power Output Tolerance Pmax(%)	0~+3	0~+3	0~+3	0~+3	0~+3	0~+3
Maximum Power Voltage Vmp(V)	40.90	41.10	41.30	41.50	41.70	41.90
Maximum Power Current Imp(A)	12.85	12.91	12.96	13.02	13.07	13.13
Open Circuit Voltage Voc(V)	49.20	49.40	49.60	49.80	50.00	50.20
Short Circuit Current Isc(A)	13.59	13.65	13.71	13.77	13.83	13.89
Module Efficiency (%)	20.32	20.52	20.71	20.90	21.10	21.29

*STC (Standard Test Condition): Irradiance 1000W/m², Module Temperature 25℃, AM 1.5
*Measuring tolerance: ±3%

ELECTRICAL CHARACTERISTICS | NMOT*

Maximum Power Pmax(Wp)	392.70	396.40	399.90	403.60	406.80	410.80
Maximum Power Voltage Vmpp(V)	38.00	38.20	38.40	38.50	38.80	38.90
Maximum Power Current Impp(A)	10.33	10.38	10.42	10.47	10.49	10.56
Open Circuit Voltage Voc(V)	46.00	46.20	46.30	46.50	46.70	46.90
Short Circuit Current Isc(A)	10.98	11.02	11.07	11.12	11.17	11.22

*NMOT(Nominal module operating temperature):Irradiance 800W/m²,Ambient Temperature 20℃,AM 1.5,Wind Speed 1m/s

ELECTRICAL CHARACTERISTICS WITH 25% REAR SIDE POWER GAIN

Front power Pmax/W	525	530	535	540	545	550
Total power Pmax/W	656	663	669	675	681	688
Vmp/V(Total)	41.00	41.20	41.40	41.60	41.80	42.00
Imp/A(Total)	16.01	16.08	16.15	16.23	16.30	16.37
Voc/V(Total)	49.30	49.50	49.70	49.90	50.10	50.30
Isc/A(Total)	16.95	17.02	17.10	17.17	17.25	17.32

MECHANICAL DATA

Solar cells	Mono PERC
Cells orientation	144（6×24）
Module dimension	2278×1134×30 mm(With Frame)
Weight	33.5 kg
Glass	2.0 mm+2.0mm, High Transmission, AR Coated Heat Strengthened Glass
Junction box	IP 68，3 diodes
Cables	4 mm² ,350 mm
Connectors	MC4-compatible

TEMPERATURE RATINGS

NMOT	44℃ ±2℃
Temperature coefficient of Pmax	-0.35%/℃
Temperature coefficient of Voc	-0.29%/℃
Temperature coefficient of Isc	0.05%/℃
Refer.Bifacial Factor	70±5%

WORKING CONDITIONS

Maximum system voltage	1500 V DC
Operating temperature	-40℃~+85℃
Maximum series fuse	30 A
Maximum load(snow/wind)	5400 Pa / 2400 Pa

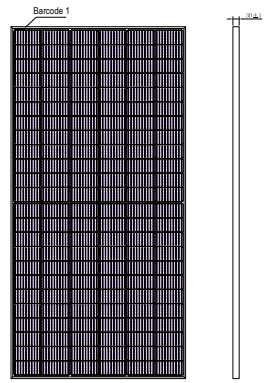
*Do not connect Fuse in Combiner Box with two or more strings in parallel connection
*Remark:Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

PACKAGING CONFIGURATION

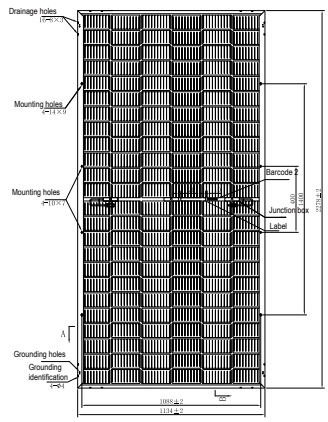
Piece/Box	36
Piece/Container(40'HQ)	720
Piece/Container(with additional small package)	/

*Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

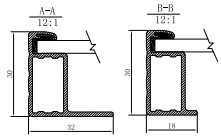
DIMENSIONS(MM)



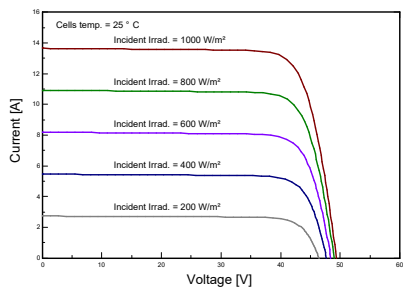
Front View



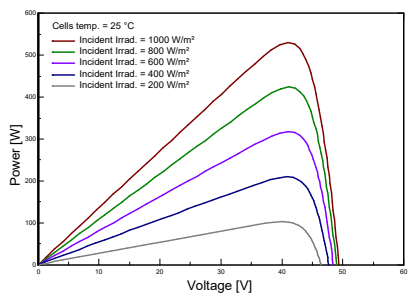
Back View



I-V CURVES OF PV MODULE(530W)



P-V CURVES OF PV MODULE(530W)



Add：1#, Zhixi Industrial Zone，JintanJiangsu 213251，P.R. China Tel：+86 519 6822 0233

TÜV Rheinland (Shanghai) Co., Ltd.

ZNshine Solar Module TCLP Report

Commissioned Test

Client: ZNSHINE PV-TECH Co., Ltd.

Report No.: CN227VOX 001

September 2022

TÜV Rheinland (Shanghai) Co., Ltd.

B1-13F No. 177, Lane 777 West Guangzhong Road
Jing'an District, Shanghai, P.R.China

www.tuv.com/solar

Please contact: Allen Qian

Phone: +86 21 6081 4897

Email: Allen.Qian@tuv.com

Rev No.	Rev. Date	Content/Changes	Prepared/revised	Checked/released
1	30 September 2022	Formal Report	Allen Qian	Shangshang Ju

X

Inspector

X

Reviewer

Disclaimer

TÜV Rheinland has prepared this document solely for the project referred to in this report on behalf of the Client based on the hereto related appointment letter ("Agreement"). This report is, in all cases, subject to the terms and conditions set forth herein and in the Agreement, in particular exclusions on liability.

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Client:	ZNSHINE PV-TECH Co., Ltd.
Quotation No.:	245782345
Order No.:	244446750
Order Date:	31.08.2022

List of Contents

List of Abbreviations

ND: Not detected

μg/L: Microgram per liter

mg/L: Milligrams per liter

TCLP: Toxicity Characteristic Leaching Procedure

TUV: TÜV Rheinland (Shanghai) Co., Ltd.

J-Box: Junction-Box

1. Executive Summary

General Information	
Client	ZNSHINE PV-TECH Co., Ltd.
Project Name	ZNshine Solar Module TCLP
Product Specification	ZNshine Solar Photovoltaic Module: ZXM7-SHLDD144-XXX/M, ZXM6-NHLDD144-XXX/M
Detail of sample	1. A section of the laminate, including the glass superstrate and substrate (top and bottom), the encapsulant, the cell and the interconnect wires (aka ribbons) 2. A section of the aluminum frame with the adhesive used to adhere the frame to the laminate 3. A complete junction box assembly, including the adhesive used to adhere the assembly to the substrate, the junction box, diodes, cables, connectors and potting compound.
Test Details	
Scope of work	TCLP
Test Period	22.09.2022 - 28.09.2022
Laboratory	TÜV Building III, No.177, Lane 777, West Guangzhong Road Jingan District, Shanghai, China
Reference Standards	For Arsenic, Mercury, Selenium: HJ/T 300-2007; HJ694-2014
	For Barium, Cadmium, Chromium, Lead, Silver: HJ/T 300-2007; HJ776-2015
Result	1. Arsenic was found in Laminate, Frame, J-box. 2. Barium was found in frame. 3. Mercury was found in J-box. 4. Other elements were not found. Note: Refer to table 1 for data Detail in next page.

2. Results

Table 1:

Metal	Results			Threshold	Unit
	Laminate	Frame	J-box		
Arsenic	1.0	1.4	1.0	0.3	μg/L
Barium	ND	0.03	ND	0.01	mg/L
Cadmium	ND	ND	ND	0.05	mg/L
Chromium	ND	ND	ND	0.03	mg/L
Lead	ND	ND	ND	0.1	mg/L
Mercury	ND	ND	0.08	0.04	μg/L
Selenium	ND	ND	ND	0.4	μg/L
Silver	ND	ND	ND	0.03	mg/L

Remark: ND: Not detected.

Reference Standards: For Arsenic, Mercury, Selenium: HJ/T 300-2007; HJ694-2014

Reference Standards: For Barium, Cadmium, Chromium, Lead, Silver: HJ/T 300-2007; HJ776-2015

3. Equipment List

Table 2:

Equipment name	Equipment Type	Equipment number
Atomic fluorescence photometer	AFS8510	F-004-01
Inductively coupled plasma emission spectrometer	Icap6000	Icap6000

End of the report