Test Report issued under the responsibility of:

TEST REPORT
IEC 61730-2
PV Module Safety Qualification –
Part 1: Requirements for construction and
Part 2: Requirements for testing

Report Number. .....:	GCTC2025WT0176-02-02
Date of issue .....:	2025-08-07
Total number of pages.....:	84
Name of Testing Laboratory preparing the Report.....:	Guoce Testing Technology (Suzhou) Co., Ltd.
Applicant's name.....:	MEM PANEL SOLAR ENERJİ VE SANAYİ TİCARET A.Ş
Address .....:	Organize Sanayi Bölgesi 3.Cadde NO:4 Onikişubat, Kahramanmaraş , Türkiye
Test specification:	
Standards.....:	IEC 61730-2:2023 in conjunction with IEC 61730-1:2023
Test procedure .....:	CB Scheme
Non-standard test method .....:	N/A
TRF template used .....:	IECEE OD-2020-F1:2023, Ed.1.6
Test Report Form No.....:	IEC61730_2F
Test Report Form(s) Originator ....:	TÜV Rheinland LGA Products GmbH
Master TRF.....:	Dated 2024-04

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	Photovoltaic (PV) Module(s)
Trade Mark ..... :	MEM SOLAR
Manufacturer ..... :	MEM PANEL SOLAR ENERJİ VE SANAYİ TİCARET A.Ş
Address ..... :	Organize Sanayi Bölgesi 3.Cadde NO:4 Onikişubat, Kahramanmaraş , Türkiye
Model/Type reference ..... :	With Mono-crystalline Silicon Solar Cells:(double glass half-cell, N type) M66H8NTP (xxx=600~630w, in steps of 5W, 132 cells)
Ratings ..... :	Max. System voltage: 1500V Maximum Over-Current Protection: 35A

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	CB Testing Laboratory:	Guoce Testing Technology (Suzhou) Co., Ltd.	
Testing location/address ..... :		2/F.,Building 11, No.18, YaoFeng East Road, Mudu, Wuzhong District, Suzhou, Jiangsu, China	
☐	Associated Testing Laboratory:		
Testing location/address ..... :			
Prepared by (name, function, signature) ..... :		Project Engineer Bin Cao	Bin Cao
Approved by (name, function, signature) ..... :		Reviewer Lichun.qian	Lichun.qian

List of attachments (including a total number of pages in each attachment):	
	attachment number / number of pages
Installation manual:	Attachment 1/ 25 pages
Drawings mechanical:	Attachment 2/ 1 pages
Circuit diagram:	N/A
Photographs:	Attachment 6 3 pages
Component datasheets / certificates	Attachment 3: certificate of junction box, 3 page. Attachment 4: certificate of cable, 3 page. Attachment 5: certificate of connector, 2 page.
Others:	Annex 1: Constructional details/ Bill of Material (BOM)

Summary of testing:

This report includes qualification test results for a basic BOM and also extension to alternative materials. The retest guideline IEC 62915 was used to evaluate the below extensive changes. The test results are presented within this test report.

- Basic qualification tests were performed on double-glass mono-crystalline 1/2 cut cell (210*182mm) module M66H8NTP-610(BOM1) as a representative model type, the tests of low class and high class of this BOM were performed on model M66H8NTP-630 and M66H8NTP-630;

Tests performed (name of test and test clause):	**Testing location: (CBTL, SPTL, CTF, Subcontractor)**
IEC 61730-1: 2023 IEC 61730-2: 2023	Except for the Fire Test (MST 23), All tests and Quality Inspection were performed in Guoce Testing Technology (Suzhou) Co., Ltd. 2/F., Building 11, No.18, YaoFeng East Road, Mudu, Wuzhong District, Suzhou, Jiangsu, China

Summary of compliance with National Differences

The text of IEC 61730-1:2016 was approved by CENELEC as EN 61730-1:2018 without any modification.

The text of IEC 61730-2:2016 was approved by CENELEC as EN 61730-2:2018 without any modification.

This project is conducted in accordance with IEC 61730-1:2023, IEC 61730-2:2023.

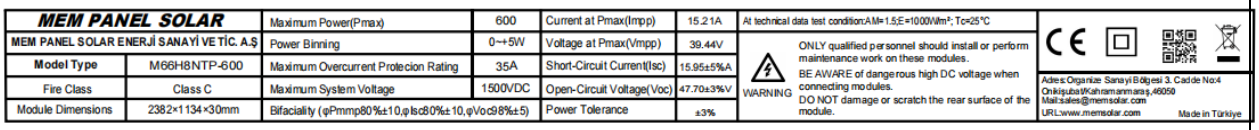
The tests performed include all the contents in IEC 61730-1:2016, IEC 61730-2:2016 and the requirements are more stringent.

☒ **The product fulfils the requirements of EN 61730-1:2018, EN 61730-2:2018**

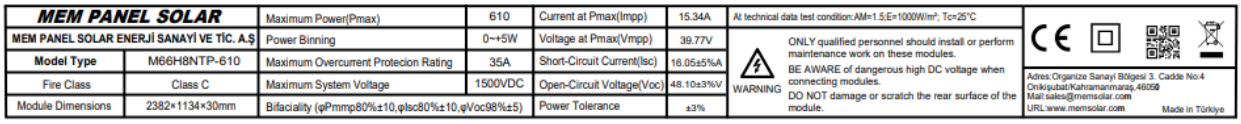
Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

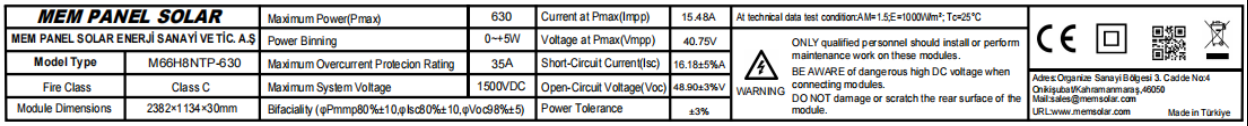
(Note: The marking plate represents all models covered by this report except for difference in electrical ratings and model designation. See “General product information” for electrical ratings for all models. As there will be other lower wattages to be covered under same report which follows same back label format.)



M66H8NTP-600



M66H8NTP-610



M66H8NTP-630

Marking plate

Test item particulars..... :	N/A
Accessories and detachable parts included in the evaluation..... :	N/A
Mounting system used..... :	Refer to installation manual
Other options included..... :	N/A
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)
Abbreviations used in the report:	
Pmax – Maximum power	HF – Humidity Freeze
Vmp – Maximum power voltage	DH – Damp Heat
Imp – Maximum power current	TC – Thermal Cycling
Isc – Short circuit current	α – Current temperature coefficient
Voc – Open circuit voltage	β – Voltage temperature coefficient
FF – Fill factor	δ – power temperature coefficient
STC – Standard Test Conditions (25°C, 1 000 W/m²)	NMOT – Nominal Module Operating Temperature (20°C, 800 W/m²)
MQT – Module Quality Tests	VFMrated – Rated diode(s) forward voltage
VFM – Measured diode(s) forward voltage	NP – Nameplate
m_1 – the measurement uncertainty in % of laboratory for Pmax	m_2 – the measurement uncertainty in % of laboratory for Voc
m_3 – the measurement uncertainty in % of laboratory for Isc	t_1 – the manufacturer's rated lower production tolerance in % for Pmax
t_2 – the manufacturer's rated upper production tolerance in % for Voc	t_3– the manufacturer's rated upper production tolerance in % for Isc
r – Pmax measurement reproducibility	
BNPI – Bifacial nameplate irradiance	BSI – Bifacial stress irradiance
G_{BNPI} – Equivalent bifacial nameplate irradiance	aBSI – Applied bifacial stress irradiance
φ – Bifaciality refers to the ratios between the main I-V characteristics of the rear side and the front side of a bifacial device, typically at Standard Test Conditions (STC) unless otherwise specified. It is quantified with reference to bifaciality coefficients, namely as φ.	
φ_{Pmax} – Maximum power bifaciality coefficient	φ_{Voc} – Open-circuit voltage bifaciality coefficient
φ_{Isc} – Short-circuit current bifaciality coefficient	
Testing Dates (YYYY-MM-DD)	
Date of first test item received..... :	2025-04-30
Dates of tests (beginning/end)..... :	2025-05-06/ 2025-06-18

General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (factories) ..... :	MEM PANEL SOLAR ENERJİ VE SANAYİ TİCARET A.Ş Organize Sanayi Bölgesi 3.Cadde NO:4 Onikişubat, Kahramanmaraş , Türkiye

PRODUCT ELECTRICAL RATINGS:				
Monofacial Module：				
Module type				
Voc [V] / Tolerance	/	/	/	/
Vmp [V]	/	/	/	/
Isc [Adc] / Tolerance	/	/	/	/
Imax [Adc]	/	/	/	/
Pmp [W] / Tolerance	/	/	/	/
Maximum system voltage [V]	/	/	/	/
Maximum Over-Current Protection Rating [A]	/	/	/	/
Module type	/	/	/	/
Voc [V] / Tolerance	/	/	/	/
Vmp [V]	/	/	/	/
Isc [Adc] / Tolerance	/	/	/	/
Imax [Adc]	/	/	/	/
Pmp [W] / Tolerance	/	/	/	/
Maximum system voltage [V]	/	/	/	/
Maximum Over-Current Protection Rating [A]	/	/	/	/
Note: Further qualification for higher and/or lower output power see annex 3				

Bifacial Modules:

—	Module type	M66H8NTP-600	M66H8NTP-630	M66H8NTP-610	
STC condition	P_{max} [W] /Tolerance	600	630	610	/
	V_{oc} [V] /Tolerance	47.70	48.90	48.10	/
	I_{sc} [Adc] /Tolerance	15.95	16.18	16.05	/
	V_{mp} [V]	39.44	40.75	39.77	/
	I_{mp} [Adc]	15.21	15.48	15.34	/
BNPI condition	P_{max} [W] /Tolerance	664	698	675	/
	V_{oc} [V] /Tolerance	48	49.20	48.40	/
	I_{sc} [Adc] /Tolerance	17.67	17.92	17.78	/
Bifaciality coefficient	φP_{max}	80±10%	80±10%	80±10%	/
	φV_{oc}	99±1%	99±1%	99±1%	/
	φI_{sc}	80±10%	80±10%	80±10%	/
—	Maximum system voltage [V]	1500	1500	1500	/
—	Maximum Over-Current Protection Rating [A]	35	35	35	/

Product Safety Ratings		
Maximum systems voltage (Vsys) ..... :	1500	V
Maximum over-current protection rating..... :	35	A
Class in accordance with IEC 61140 ..... :	See clause 4.1	
Intended use (list details) ..... :	See clause 4.5	
The modules are intended for a maximum operating altitude [meters above sea level] of ..... :	≤ 2000	m
Recommended maximum series/parallel module configurations ..... :	Refer to installation manual	

General product information:

Modifications:

☒ Initial module design qualification

☐ Extension of module design qualification

☐ Original test report ref. no. ..... :

Model differences and modification:

☒ Test programs for crystalline silicon PV modules	☐ Test programs for thin-film PV modules
☐ 4.2.1 Modification to frontsheet	☐ 4.3.1 Modification to frontsheet
☐ 4.2.2 Modification to encapsulation system	☐ 4.3.2 Modification to encapsulation system
☒ 4.2.3 Modification to cell technology	☐ 4.3.3 Modification to front contact (e. g. TCO)
☐ 4.2.4 Modification to cell and string interconnect material or technique	☐ 4.3.4 Modification to cell technology
☐ 4.2.5 Modification to backsheet	☐ 4.3.5 Modification to cell layout
☐ 4.2.6 Modification to electrical termination	☐ 4.3.6 Modification to back contact
☐ 4.2.7 Modification to bypass diode	☐ 4.3.7 Modification to edge deletion
☐ 4.2.8 Modification to electrical circuitry	☐ 4.3.8 Modification to interconnect material or technique
☐ 4.2.9 Modification to edge sealing	☐ 4.3.9 Modification to backsheet
☐ 4.2.10 Modification to frame and/or mounting structure	☐ 4.3.10 Modification to electrical termination
☐ 4.2.11 Change in PV module size	☐ 4.3.11 Modification to bypass diode
☒ 4.2.12 Higher or lower output power (by 10 % or more) with the identical design and size and using the identical cell process	☐ 4.3.12 Modification to edge sealing
☐ 4.2.13 Increase of over-current protection rating	☐ 4.3.13 Modification to frame and/or mounting structure
☐ 4.2.14 Increase of system voltage	☐ 4.3.14 Change in PV module size
☐ 4.2.15 Change in cell fixing tape	☐ 4.3.15 Higher or lower output power (by 10 % or more) with the identical design and size
	☐ 4.3.16 Increase of over-current protection rating
	☐ 4.3.17 Increase of system voltage

NOTE: The clause references for modifications are excerpted from IEC TS 62915

6 SAMPLING			
	☐ The modules tested (modules and laminate) were taken at random from a production batch and subjected to manufacturer's normal quality control and inspection for safety testing		N/A
	☒ The modules tested (modules and laminate) were prototypes of a new design and not taken from a production batch.		P
	☒ Preconditioning of test samples was performed within IEC 61215 performance testing		P
	☐ Preconditioning of test samples was performed separately from IEC 61215 performance testing		N/A
Supplementary information: None.			

Module group assignment:

Sample #	Sample Group ID	Type/model	Sample S/N	Remark
1	Control	M66H8NTP-610	492130I2508913	—
6	E	M66H8NTP-610	492131I2501427	—
7	D	M66H8NTP-610	492130I2599019	—
13	A	M66H8NTP-610	492310I2500280	—
14	B	M66H8NTP-610	492310I2500887	—
15	B	M66H8NTP-610	492309I2503181	—
16	B1	M66H8NTP-610	492131I2599006	—
17	C	M66H8NTP-610	492131I2501080	—
18	F	M66H8NTP-610	492130I2509645	—
19	G	M66H8NTP-610	492131I2599002	—
20	Fire test	M66H8NTP-610	492130I2508546	—
21	Fire test	M66H8NTP-610	492131I2501109	—
22	Module-Break	M66H8NTP-610	492131I2501517	—
23	Ignitability	M66H8NTP-630	492131I2502974	—
Remarks: —				

Note (1) Use the "General product information" field to give any information on model differences within a product type family covered by the test report and describe the range of electrical and safety ratings, if the TRF covers a type family of modules.

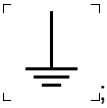
Note (2) Use Annex 2 to list the used materials and components of the module (manufacturer/supplier and type reference)

Note (3) The module numbers/identifiers are set in accordance to IEC 62915 Photovoltaic (PV) modules – Retesting for type approval, design and safety qualification, Annex A3 of IEC 62915

IEC 61730 Part 1: Requirements for construction

5 CLASSIFICATION, APPLICATIONS AND INTENDED USE			
5.1 General			
	The module has been evaluated for the following Class (IEC 61140) ……:	☐ Class 0 ☒ Class II ☐ Class III	—
5.5 Rating categories and special applications			
	PV modules are installed in the following special applications:		—
	Building attached PV (BAPV)	☐ yes ☒ no	—
	Building integrated PV (BIPV)	☐ yes ☒ no	—
	Applications in areas where snow and / or wind load exceeding loads as tested in IEC 61730-2 are expected	☐ yes ☒ no	—
	Applications at environmental temperature exceeding the limits indicated in of IEC 61730-1:2016	☐ yes ☒ no	—
	other (please specify)	☐ yes, as follows: ☒ no	—
6 REQUIREMENTS FOR DESIGN AND CONSTRUCTION			
6.1 General			—
	PV module suitable for operation in outdoor non-weather protected locations, exposed to direct and indirect (albedo) solar radiation, in an environmental temperature range of at least –40°C to +40°C and up to 100 % relative humidity as well as rain.	Compliance is verified by evaluation of materials, components.	P
	Product shipped from the factory as	☒ completely assembled ☐ subassemblies	—
	The provided assemblies of the product do not involve any action that is likely to affect compliance with the requirements of the IEC 61730 series.	PV modules are completely assembled.	P
	Incorporation of a PV module into the final assembly does not require any alteration of the PV module from its originally evaluated form.	No assembly part is present.	N/A
	Equipotential bonding continuity is not interrupted by installation	PV modules are completely assembled.	P
	Any adjustable or movable structural part are provided with a locking device	No adjustable or movable structural part	N/A
	PV modules have no accessible burrs, sharp edges or sharp points	See Table 43	P
	Parts are prevented from loosening or turning	See Table 45 and 46	P

6.2 Marking and documentation			
6.2.1	Instructions related to safety are in an official language of the country where the equipment is to be installed.	Manufacturer can provide installation manual in multiple languages	P
6.2.2 Marking			
6.2.2.1 General			
	Each PV module includes the following clear and indelible markings:		P
	a) Name, registered trade name, or registered trade mark of manufacturer	Marking on the label	P
	b) Type or model number designation	Marking on the label	P
	c) Serial number	Marking on the label	P
	d) Date and place of manufacture; alternatively serial number assuring traceability of date and place of manufacture	traceable from serial number	P
	e) Polarity of terminals or leads	“+“ and “-“ indicated on terminal.	P
	f) “Maximum system voltage” or ”Vsys”	Marking on the label	P
	g) Class of protection against electrical shock, in accordance with Clause 4 of IEC 61730-1:2016	Marking on the label	P
	h) “Voltage at open-circuit” or “Voc” including manufacturing tolerances	Marking on the label	P
	i) “Current at short-circuit” or “Isc” including manufacturing tolerances	Marking on the label	P
	j) “PV module maximum power” or “Pmax” including manufacturing tolerances	Marking on the label	P
	k) “Maximum overcurrent protection rating”	See Table 31	P
	All electrical data are shown as relative to standard test conditions (STC) (1 000 W/m^2, (25 $\pm$ 2) °C, AM 1.5 according to IEC 60904-3).	Marking on the label	P
	International symbols are used where applicable.	Marking on the label	P
	PV connectors or wiring are marked in accordance to IEC 62852 with a symbol „Do not disconnect under load”.	Connector fulfill the requirements of IEC 62852. Symbol or warning notice indicated on connector.	P
	Symbol or warning notice are imprinted or labelled close to connector	Connector fulfill the requirements of IEC 62852. Symbol or warning notice indicated on connector.	P
	PV connectors are clearly marked indicating the terminal polarity.	“+“ and “-“ indicated on terminal.	P

	For Class II and Class 0 PV modules, the  (IEC 60417-6042: Caution, risk of electric shock) symbol is applied near the PV module electrical connection means.	Electrical hazard symbol indicated on type label	P
	PV modules are marked to indicate the class	☒ class II:  ☐ class III:  ☐ class 0: no symbol	P
	PV modules provided with a functional earth connection (see section 5.2.2.2.2)	—	N/A
	PV modules with terminals for field wiring rated only for use with copper wire are marked, at or adjacent to the terminals, with the statement "Use copper wire only", "Cu only", or the equivalent.	PV modules provided with terminals for field wiring rated for use with all types of wiring material, do not need to be marked.	P
	PV modules with terminals for field wiring rated only for use with a different specific wiring material are marked with a similar statement referring to the rated material.	PV modules provided with terminals for field wiring rated for use with all types of wiring material, do not need to be marked.	P
6.2.2.2 Symbols			
6.2.2.2.1 Equipotential bonding			
	Bonding conductor for equipotential bonding is identified with:	☒  ☐ 	P
	No other terminal or location is identified in this manner	Specified in datasheet	P
6.2.2.2.2 Functional earthing			
	Field installed functional earthing conductor is identified with the symbol:		N/A
6.2.3 Documentation			
6.2.3.1 General			
	Documentation describing electrical and mechanical installation is provided.	Written in installation manual	P
	The documentation states the class for protection against electrical shock under which the PV module was qualified and any specific limitations required for that class.	Written in installation manual	P
	The documentation assures that installers and operators receive appropriate and sufficient instructions for safe installation, use and maintenance of the PV modules that it accompanies.	Written in installation manual	P
	The documentation is supplied in at least one of the official languages of the country where the PV modules will be installed.	Written in installation manual	P

	Assembly instructions are provided with a product shipped in subassemblies, and are detailed and adequate to the degree required to facilitate complete and safe assembly of the product.	Written in installation manual	P
	Documentation is provided in paper form in each shipping unit or as an electronic link.		—
	– The web address is marked on the device or provided in an information sheet enclosed with each shipping unit.	—	N/A
	– The web address is in the form of a Uniform Resource Locator (URL – http://www.___.com/___/), or a Quick Response Code (QR code).	Written in installation manual	P
	– The web address link takes the user to an internet page containing the required information or a direct link to the required information.	Written in installation manual	P
	– The file is in a file format that is commonly used and is downloadable.	—	N/A
	The needs for maintaining and supporting information during the life cycle of the supported product is taken into account when planning the preparation of information for use as in IEC/IEEE 82079-1.	Written in installation manual	P
	The documentation contains the following information:		—
	– Name, registered trade name, or registered trade mark of manufacturer	On label	P
	– Type or model number designation	On label	P
	– "Maximum system voltage" or "V_{sys}"	On label	P
	– Class of protection against electrical shock	On label	P
	– "Voltage at open-circuit" or "V_{OC}" including manufacturing tolerances. For bifacial modules, open-circuit voltage is reported at two irradiance levels as defined in IEC 61215-1.	On label	P
	– "Current at short-circuit" or "I_{SC}" including manufacturing tolerances. For bifacial PV modules, short-circuit current is reported at STC, BNPI and aBSI.	On label	P
	– "PV module maximum power" or "P_{max}" including manufacturing tolerances. For bifacial modules, P_{max} is reported at two irradiance levels as defined in IEC 61215-1	On label	P
	– For bifacial PV modules, clear indication of the front side, or if both are designed for prolonged exposure to direct sunlight (> 300 W/m^2)	On label	P

	– For flexible modules, the minimum radius of curvature	On label	P
	– Positive ("+" or downward) and negative ("−" or upward) design load ratings in pascal (Pa) excluding the test load safety factor, as verified in the static mechanical load test (MST 34)	On label	P
	– Maximum overcurrent protection rating	See Table 31	P
	– A module temperature rating of 70 °C, (or if tested to IEC TS 63126 Level1 or Level 2, 80 °C or 90°C)	Refer to CDF	P
	– Connector manufacturer and model used; refer to manual for designated mating connectors	Written in installation manual	P
	– a link (website or QR code) to required documentation if a paper copy of the documentation required is not included with the module	Written in installation manual	
	– Recommended maximum series / parallel PV module configurations	Written in installation manual	P
	– Temperature coefficient for voltage at open-circuit	On label	P
	– Temperature coefficient for maximum power	On label	P
	– Temperature coefficient for short-circuit current	On label	P
6.2.3.2 Suitable environmental and mounting conditions			
	The documentation states the environmental and mounting conditions for which the module has been qualified, including:		—
	The maximum rated altitude the PV module is designed for:	2000m	—
	Indication of the negative (upward) and positive (downward) design load ratings during the static mechanical load test according to MST 34	Written in installation manual	—
	For bifacial PV modules, the exposure side meets the following requirements:	—	—
	– Clear indication of which side(s) of the module have been tested for the front side exposure	—	N/A
	– The back side is restricted for use with indirect or limited direct sunlight (less than 300 W/m^2) unless tested as a front side	—	N/A
	– Each side meets the requirements for front side if both sides of a module are intended for use with prolonged exposure to direct sunlight (>300 W/m^2)	—	N/A

	Temperature range from a lower limit of environmental temperature of −40 °C to the upper limit set by a 98th percentile module operating temperature of 70 °C, (80 °C or 90 °C if tested to Level 1 or Level 2 conditions as described in IEC TS 63126)	Written in installation manual	P
	Guidance on geographic areas, mounting conditions and system design and installation factors where the anticipated 98th percentile module operating temperature will be greater than 70 °C (or 80°C or 90°C if tested to Level 1 or Level 2 conditions)	Written in installation manual	P
	Factors that can increase voltage or current beyond the STC values are given in the documentation, including the following or equivalent statements:	—	—
	– "A photovoltaic module is likely to experience conditions that produce higher current and/or voltage than reported at standard test conditions. Factors to consider include module temperature and front side irradiance (and, for bifacial modules, ground or roof albedo, row spacing, and installation height). Accordingly, the values of V_{OC} and I_{SC} (or for bifacial modules, $I_{SC\text{-}aBSI)}$ marked on this PV module should be multiplied by a factor of 1,25 when determining voltage and current ratings for components connected to the PV output."	Written in installation manual	P
	– "The safety factor of 1,25 given for the minimum voltage rating of the components in the example statement above may be modified during the design of a system according to the minimum temperature of the location of the installation and the temperature coefficient for V_{OC}. The safety factor of 1,25 given for conductor current ratings values for I_{SC} (or for bifacial modules, $I_{SC\text{-}aBSI}$) may be adjusted based on the maximum values of irradiance incident on the front side of the module (and the rear side for bifacial modules). To this purpose, a full simulation for the specific location and module orientation (and for bifacial modules, ground albedo, row spacing and installation height) is required. Further guidance for the choice of a safety factor other than 1,25 is given in IEC 62548."	Written in installation manual	P
	A statement advising that artificially concentrated sunlight producing a PV module's current above the value reported on the nameplate shall not be directed onto the front side or the back side of the PV module.	—	N/A
	Evaluation of the following standards:	—	—

	– IEC 61701	—	N/A
	– IEC 62716	—	N/A
	– IEC 62109-3 (MIE Type A or B)	—	N/A
	– IEC TS 63126 (temperature Level 1 or 2)	—	N/A
6.2.3.3 Mounting			
	The documentation includes adequate information and instructions for each mounting methods listed in the manufacturer's mounting instructions as well as:		—
	– A statement indicating the minimum mechanical means for securing the PV module evaluated during the mechanical load test (MST 34 of IEC 61730-2) and the conformity to the mechanical load requirements of the series IEC 61215	Written in installation manual	P
	– Limitations to the mounting situation (e.g.slope, orientation, mounting means, cooling, specific spacing and any other condition that can influence the safety of the PV module installation)	Written in installation manual	P
	– Type of adhesive and the allowable substrates if adhesives are used for mounting (i.e.flexible modules)	—	N/A
	– The manufacturer and unique part number of the adhesive, the required surface preparation, adhesive application process, and curing condition if adhesives are specified for use in the field to provide mechanical securement to specific roof coverings or mounting systems	—	N/A
6.2.3.4 Connectors/wiring			
	The documentation includes a detailed description of the following information related to the connectors and wiring method:		—
	– Minimum cable diameters, rated voltage, current and temperature of cables for PV modules intended for field wiring and compliance with IEC 62930, type 131 or type 133; or EN 50618	Written in installation manual	P
	– Limitations on wiring methods and wire management that apply to the junction box for the PV module	Written in installation manual	P
	– Statement that wiring to interconnect modules shall be rated for the application, and it is important that the user is aware of national installation codes.	Written in installation manual	P
	– Type of terminals for field wiring	Written in installation manual	P
	– Specific model / types together with the manufacturer name/brand of the PV connector(s) to which the PV module connectors can be mated	Written in installation manual	P

	– The bonding method(s) to be used, if applicable, is specified either all provided or specified hardware	—	—
	– The type and ratings of bypass diode to be used (if applicable)	—	—
6.2.3.5 Fire ratings			—
	– A statement indicating	☒ fire rating(s) and applied standards ☐ statement regarding resistance to external fire sources not evaluated	N/A
	– Limitations to the achieved ratings (e.g. installation slope, sub structure or other applicable installation information)	—	N/A
	– A statement indicating the minimum mechanical means for securing the PV module	See Table 27 and Table 36	
	– A statement indicating the maximum altitude	≤ 2000 m above sea level. Written in installation manual.	P
	– For roof mounrting, specific parameter(s) are provided when the fire rating is dependent on a specific mounting structure, specific spacing, or specific means of attachment to the roof or structure.	—	N/A

6.3 Electrical components and insulation			
6.3.2 Internal wiring			
	Internal wiring has sufficient current carrying capacity for the relevant application.	See Table 31	P
6.3.3 External wiring and cables			
	External wires and cables fulfil the requirements of	☐ EN 50618 (alternative to IEC 62930 type 131) ☒ IEC 62930 (type 131 or type 133)	P
6.3.4 Module overcurrent protection rating			
	Overcurrent protecting rating is determined according to IEC 60269-6.	Compliance verified by reverse current overload test (MST 26) See Table 31	P
6.3.5 Connectors			
	External DC connectors fulfil the requirements of IEC 62852 and additional requirements in 6.5.2.2.	Certification according to IEC 62852	P
	Connectors are marked in accordance with 6.2.2.	Certification according to IEC 62852	P

6.3.6 Junction boxes for PV modules			
	Junction boxes for PV modules fulfil the requirements of IEC 62790 and additional requirements in 6.5.2.2.3.	Certification according to IEC 62790	P
	Module level testing is performed to validate adhesion/connection of the junction box to the module and minimum clearance and creepage distances.	See Table 11, 24 and 26	p
6.3.7 Frontsheets and backsheets			
	Frontsheet material:	☒ Glass ☐ Polymeric material ☐ Others.	—
	Backsheet material:	☒ Glass ☐ Polymeric material ☐ Others.	—
	Polymeric frontsheets and backsheets fulfil the requirements of IEC 62788-2-1.	—	N/A
	Backsheets are restricted for use with indirect or limited direct sunlight equal to or lower than 300 W/m^2.	—	N/A
	The DTI requirements listed in Table 3 and Table 4 of IEC 61730-2 are fulfilled by single or multiple layers of RUI as described in IEC 62788-2-1	See Table 1	P
	Adhesion of frontsheet and backsheet toencapsulant or glass is appropriate.	Compliance is checked at module level by test sequences of IEC 61730-2 listed in this report.	P
6.3.8 Insulation barriers			
	Components comply with the requirements for their relevant standards	See Annex 2	—
	Pollution degree	See Table 1, Table 2, Table 3	—
	Material group	See Table 1, Table 2, Table 3	—
6.3.9 Electrical connections			
6.3.9.1 General			
	Polymeric materials for cemented insulation parts and insulation in thin layers shall withstand environmental, thermal, electrical and mechanical stresses as far as they occur.	See 5.5.2	P

	Distances through insulation (dti) of solid insulation comply with the minimum distance as required:	**For single-glass series:** Frontsheet is glass comprised of single layer. Dti=3.15mm Backsheet KFB-30(Plus) is comprised of multiple layers. See table table 49 for dti of backsheet. **For double-glass series:** Frontsheet is glass comprised of single layer. Dti=2.00mm Backsheet is glass comprised of single layer. Dti=2.00mm	—
	System voltage…….:	1500VDC	—
	Distance through insulation req./meas. (mm):	0.3 / 0.313	P
6.3.9.2 Terminals for external cables and PV connector ribbons			
	Terminals for electrical connections are suitable for the type and range of conductor cross-sectional areas, and they meet the relevant requirements of IEC 62790 and additional RTE, RTI, and TI requirements of 6.5.2.2.3.	—	P
	Insulated terminals are designed to prevent a reduction of clearances and creepage distances by any possible displacement.	—	P
6.3.9.3 Splices and connections inside a PV module			
	Splices and connections are mechanically secured and provide electrical continuity.	No splice.	N/A
	Electrical connections are soldered, welded, conductively adhered, crimped, or otherwise securely connected.	No splice.	N/A
	A soldered or conductively adhered joint is additionally mechanically secured.	No splice.	N/A
6.3.10 Encapsulants			
	Thermal properties are sufficient for intended application.	Compliance checked by IEC 61730-2:2023 tests for pollution degree 2 listed in this report.	N/A
	The insulation properties according to 6.5.2.2 are met, if applicable.	Compliance checked by IEC 61730-2:2023 tests for pollution degree 2 listed in this report.	P
6.3.11 Bypass diodes			
	Bypass diodes are rated to withstand the current and voltage for their intended use.	See Table 29 and Table 44	P

6.4 Mechanical and electromechanical connections			
6.4.1 General			
	Type of connection:	☒ Connection within frame ☒ Mounting interfaces via adhesive ☒ frame to clamp a mounting system ☒ Equipotential bonding ☒ Attachment of junction box ☐ mechanical connections within the laminate:	—
	Mechanical connections are durable to withstand the thermal, mechanical, and environmental stresses occurring in the application.	See Table 9, Table 27 and Table 35	P
	Removable parts are only detachable with the aid of tools.	Tools is needed for removal.	P
	Lids attached without screws have one or several detectable feature(s) to avoid damaging the lid or the feature(s).	—	P
	No contact of tools with the live parts when the lid is removed.	—	P
	No friction between surfaces as the sole means to inhibit the turning or loosening of a part, unless provisions to prevent unintended movement or rotation of the component is given.	N/A	N/A
6.4.2 Screw connections			
	Screws and mechanical connections withstand the mechanical stresses occurring in normal use.	No screw is used.	N/A
	Screws are not made of a material which is soft or liable to creep.	No screw is used.	N/A
	Screws used to provide mechanical stability and continuity for equipotential bonding withstand the mechanical stresses occurring in normal use.	No screw is used.	N/A
	At least one screw per electrical- mechanical connection ensures the electrical connection between the metallic components.	No screw is used.	N/A
	Screws used for mechanical and electrical connections with a nominal diameter of less than 3 mm are screwed into metal.	No screw is used.	N/A
	For screws used for mechanical and electrical connections two full threads are engaged into the metal.	No screw is used.	N/A
	Screwed and other fixed connections are in such a way that they do not come loose through torsion, bending stresses, vibration, etc.	No screw is used.	N/A
6.4.3 Rivets			
	Rivets that have the double function of being concurrently electrical and mechanical connections are locked against loosening.	No rivet is used.	N/A

6.4.4 Thread-cutting screws			
	Thread-cutting and self-tapping screws are not used for interconnection of current-carrying parts made of a material which is soft or liable to creep.	No thread-cutting screw is used.	N/A
	No thread-forming or thread-cutting (self-tapping) screws (sheet metal screws) are used for the connection of current-carrying parts.	No thread-cutting screw is used.	N/A
	Thread-cutting (self-tapping) screws are not used if they are likely to be operated by the user or installer.	No thread-cutting screw is used.	N/A
	Thread-cutting and thread-forming screws, used to provide continuity for equipotential bonding, are such that it is not necessary to disturb the connection in normal use.	No thread-cutting screw is used.	N/A
	For equipotential bonding one screw is permitted if two full threads engage the metal.	No thread-cutting screw is used.	N/A
6.4.5 Form/press/ tight fit			
	Form/press/tight fits of metallic components which are not separately equipotentially bonded are electrically connected.	—	P
	Requirements of MST 01, MST 32 and MST 34 are met, continuity of equipotential bonding (MST 13) is performed before and after the MST 32 and MST 34 tests	See Table 9, Table 27 and Table 36	P
6.4.6 Connections by adhesives			
	Compliance is checked by tets of IEC 61730-2:2023	Compliance checked by MST 13, MST 17, MST 32, MST 34, and MST 42	P
	The specific substrate(s) that was (were) adhered to the flexible module in the tests are noted in the documentation.	—	P
	Adhesion of a polymer relied upon for insulation to another insulating layer is appropriate for the application.	—	P
	Requirements for adhesive materials are met	See 6.5.4	P
	Connection by adhesive which is considered as cemented joint fulfils the requirements of 6.6.4.3.	See 6.6.4.3	P
6.4.7 Other connections			
	Other connections such as, welded or soldered, as well as materials and processes for creating the connections are appropriate for the application and for the intended use.	Compliance checked by MST 01 and MST 13.	P
	Other connections which are relied upon for equipotential bonding fulfil the requirements of (MST 13).	Compliance checked by MST 13.	P

6.5 Materials			
6.5.2 Polymeric materials			
6.5.2.1 General			
	Polymeric materials are able to durably and safely withstand the electrical, mechanical, thermal, environmental, and corrosive stresses occurring in the application.	Assessed polymeric parts see Annex 2 (BOM). Test results see subsequent sections	P
	Polymeric materials are resistant to electrical and mechanical property degradation.	Test results see subsequent sections	P
	Components meet the requirements of the following standards on the component level:		P
	– IEC 62788-2-1 for frontsheets and backsheets	Test results see subsequent sections	P
	– IEC 62790 for junction-boxes for PV modules	Test results see subsequent sections	P
	– IEC 62852 for connectors for DC-application in PV systems	Test results see subsequent sections	P
	– IEC 62930 (or EN 50618 for type 131) for electric cables for PV systems	Test results see subsequent sections	P
6.5.2.2 Polymeric materials used as electrical insulation			
6.5.2.2.1 General			
	The material which serves as functional insulation is appropriate according to 6.6.4.4.	See Table 7 and Table 46	P
	The material relied upon for insulation in thin layers is appropriate for the application according to 6.6.4.2.	See 6.6.4.2	P
	Insulation is not impaired by short-term or long-term thermal stresses that can occur in manufacturing processes, transportation, and during normal operation by electrical stress and weathering to an extent that it does not comply with the requirements of IEC 61730-1 and IEC 61730-2.	Test results see subsequent sections	P
6.5.2.2.2 Endurance to electrical stress			
	Materials used as electrical insulation are in compliance with the insulation coordination requirements	See 6.6.3	P
	Materials relied upon for insulation (RUI) have sufficient breakdown strength and comply with 6.6.4.2.	Test results see subsequent sections	P
	The polymeric material which is part of a potential tracking path is resistant to surface tracking, in coordination with the design dimensions in 6.6.3.	Test results see subsequent sections	P
6.5.2.2.3 Endurance to thermal stress			
	Materials used as relied upon insulation have a minimum RTE, RTI or TI in accordance with IEC 60216-5 or IEC 60216-1 of at least 90 °C.	☒ TI :122°C ☐ RTE : ☐ RTI :	P

6.5.2.2.4 Endurance to environmental stress			
	The material's endurance to withstand simulated environmental stress is checked by compliance with IEC 61730-2 at module level.	—	P
	Components comply with the requirements in the individual applicable international Standards.	—	P
6.5.2.3 Flammability			
	BAPV and BIPV comply with specific fire-related safety requirements originating from national building codes.	—	N/A
	External polymeric parts of the PV module whose deterioration could impair the safety comply with all the following additional requirements:		—
	– minimum flammability class V-1	—	P
	– Ignitability test (MST 24) in final application (laminated or the PV module)	—	P
	– Polymeric parts which are not components of the laminate fulfil the requirements of ignitability test	Assessed polymeric parts see Annex 2 (BOM)Compliance checked by MST 24	P
	Polymeric materials between two parts of different potential that is recatogorized as described in 6.6.4.4, the encapulant(s) meet(s) the requirements:		—
	-flammability class minimum HB	Assessed polymeric parts see Annex 2 (BOM)	P
	-or method to verify spacings is established in the production process	—	N/A
6.5.2.4 Rigid polymeric materials used for mechanical functions			
	Rigid polymeric materials used for mechanical functions pass the following tests:		
	– Mechanical strength at lower temperatures, IEC 62790:2020, 5.3.8 followed by MST 01 (visual inspection) of IEC 61730-2.	—	N/A
	– Weather resistance test, IEC 62790:2020, 5.3.11 followed by MST 01 (visual inspection) of IEC 61730-2.	—	N/A
	– minimum flammability class V-1	—	N/A
	– RTI/RTE/TI (≥ 90 °C)	☐ TI : ☐ RTE : ☐ RTI : Assessed polymeric parts see Annex 2 (BOM)	N/A
6.5.3 Metallic materials			
6.5.3.1 General			
	Metallic components withstand a minimum corrosion atmospheric category level C2 in ISO 9224:2012.	—	P

	Metal parts are not in contact to metal parts having a difference of their electrochemical potentials of more than 600 mV.	Assessed parts see Annex 2 (BOM)	P
	Iron or mild steel is plated, painted, or enamelled for protection against corrosion.	Compliance is checked by inspection.	P
	Corrosion protection is at least equivalent to a zinc coating of 0.015 mm thickness	Assessed parts see Annex 2 (BOM) Compliance checked by MST 01	P
6.5.3.2 Current carrying parts			
	Assessed parts:	See Annex 2 (BOM)	P
	Current-carrying parts have sufficient mechanical strength and electrical conductivity.	Compliance checked by MST 13 and MST 26	P
	Current-carrying materials are protected against corrosion.	Compliance is checked by inspection.	P
	The coating for protective coated metal is capable of preventing corrosion according to either one of the listed standards.	☐ ISO 1456 ☐ ISO 1461 ☐ ISO 2081 ☐ ISO 2093	N/A
	Coated metal not used if the current-carrying parts are stressed by abrasion.	Compliance is checked by inspection.	P
6.5.4 Adhesives			
	Adhesives are appropriate for the application.	Compliance checked by MST 01, MST 11, MST 17, MST 34, MST 35, MST 36, and MST 42	P
	Adhesive as part of the relied upon electrical insulation meets the requirements of 6.5.2.2.3	See 6.5.2.2.3	P
6.6 Protection against electric shock			
6.6.1 General			
	Adequate protection against contact with hazardous live parts is provided.	See safety ratings	N/A
	Specimen poses no risk of electric shock.	Test results see subsequent sections	P
6.6.2 Protection against accessibility to hazardous live parts			
6.6.2.1 General			
	Class of module	See safety ratings	—
	For class 0 and Class II modules adequate protection against accessibility to hazardous live parts (> 35 V DC) provided.	Compliance checked by MST 01 and MST 11	P
	For Class 0 PV modules, accessible parts are separated from hazardous live parts by at least basic insulation.	Table 2 of 6.6.2.3 of IEC 61730-1 Compliance checked by MST 01 and MST 11	P

	Class II PV modules are constructed and enclosed that only parts separated from hazardous live parts by double or reinforced insulation are accessible.	Table 2 of 6.6.2.3 of IEC 61730-1 Compliance checked by MST 01 and MST 11	P
	For Class III PV modules, live parts of different polarity are separated by at least functional insulation.	Table 2 of 6.6.2.3 of IEC 61730-1 Compliance checked by MST 01 and MST 11	P
	Polymeric Materials used for realizing protection against accessibility of hazardous live parts by means of enclosure, insulation barrier or relied upon insulation comply with the requirements of 6.5.2.	—	—
6.6.2.2 Protection by means of enclosures and insulation barriers			
	Enclosures or insulation barriers are so designed that, after mounting, the live parts are not accessible (even after possible deformation).	—	P
	Degree of protection of the housing is not impaired by any possible deformation.	—	P
	Parts of enclosures and insulation barriers that provide protection are not removable without the use of a tool.	—	P
	Lids which are attached without screws have one or several detectable features, e.g. recesses,	—	N/A
	Tool to open the lid do not come into contact with the live parts if lid is removed correctly.	—	P
	Insulation barriers are held in place and are not affected by influences expected during normal operation. Electrical and mechanical properties don't fall below the minimum acceptable values for the application.	—	P
	Parts are prevented from loosening or turning.	—	P
6.6.2.3 Protection by means of insulation of live parts			
	Insulation materials providing the sole insulation between a live part and an accessible metal part, or between uninsulated live parts not of the same potential, are of adequate thickness and of a material appropriate for the application in compliance with Table 2 of IEC 61730-1.	Compliance verified by evaluation of materials and components.	P
6.6.3 Insulation coordination			
6.6.3.1 General			
	Clearance and creepage distances fulfil the requirements in Table 3 and Table 4 of IEC 61730-1.	See Table 1 and Table 2.	—
6.6.3.2 Influencing factors			
6.6.3.2.1	Pollution degree	See Table 1 Compliance checked by the required tests in IEC 61730-2	—

6.6.3.2.2	Material group	See Table 1 and 6.6.4.3	—
6.6.3.3 Creepage distance			
	Minimum values for creepage distance are in accordance with Table 3 or Table 4 of IEC 61730-1. Compliance is checked by MST 57.	See Table 1	P
6.6.3.4 Clearance			
	Clearance values are met for air gaps between conductive parts. Compliance is checked by MST 57.	See Table 1	P P
	Derating factor for altitude above 2000 m is considered.	See Table 2 Compliance checked by MST 14	P
	Minimum clearance distance requirements between live parts of different potential inside the junction box are verified according to Table 3 and Table 4 of IEC 61730-1 related to the relevant working voltage.	See Table 1	P
6.6.4 Distance through functional and replied upon insulation			
6.6.4.1 General			
	Polymeric materials for cemented insulation parts and insulation in thin layers withstand environmental, thermal, electrical and mechanical stresses as far as they occur.	See 6.5.2	P
	Distances through insulation (d.t.i.) of solid insulation comply with the minimum distance as required:	See Annex 2	—
	System voltage…….:	See safety ratings	—
	Distance through insulation req./meas. (mm):	See Annex 2	
	The insulation fulfils the material classification as given in IEC 60216-1, IEC 60216-2 and IEC 60216-5 (RTE/TI/RTI).	See Annex 2	—
6.6.4.2 Thin layers – relied upon insulation			
	Relied upon insulation in thin layers is applied at	☒ Backsheet ☐ Front sheet ☐ insulation within laminate ☐ others	—
	Frontsheets and backsheets fulfil the requirements of IEC 62788-2-1.	See 6.3.7	P
	Thickness of the other insulation materials used for RUI, except glass or ceramic materials, are verified by MST 04 (insulation thickness test) and MST 16 (insulation test) after MST 12 (cut susceptibility test).	See Table 47 and Table 39	P
	The thickness requirement (DTI) of row 4) of Table 3 and Table 4 is fulfilled.	See Table 1	P

	For a single-layer construction that the RUI layers contributing to the DTI fulfils the following requirements:		—
	– Minimum thickness complies with thin-layers requirements in Table 3 or Table 4 of IEC 61730-2.	See Table 1 and Annex 2	P
	– RTE/TI/RTI complies with 6.5.2.2.3.	See Annex 2	—
	– Insulation provides sufficient dielectric strength. Test voltage (2000V + 4 times system voltage) …….: V	See Annex 2	—
	For a multiple-layer construction that the RUI layers contributing to the DTI fulfils the following requirements:		—
	Each layer providing RUI meeth the following requirements:		—
	– RTE/TI/RTI complies with 6.5.2.2.3	See Annex 2	—
	– One layer meets the dielectric strength requirements for reinforced insulation; or at least two layers each meet the dielectric strength requirements for basic insulation (1 000 V + 2 times the system voltage) ….: V	—	—
	– The full construction meets the following requirements:	—	—
	-The full multilayer construction meets the following requirements:		
	– DTI value is in compliance with values according to line 4) "DTI" of Table 3 and Table 4 of IEC 61730-1.		
	– Test voltage for entire multi-layer sheet providing relied upon insulation (2000V + 4 times system voltage) …….: V	See Annex 2	
6.6.4.3 Cemented joints			
	Cemented joints were considered as	☐ Edge seal ☐ Interface between junction box and mounting surface ☐ Others ☐ No cemented joints	
	Distances along cemented joints comply with the minimum distances as required in table 3 or table 4:		—
	System voltage…….:	See safety ratings	
	Distance along cemented joints, req./meas. [mm]:	—	
	A distance between two rigid parts other than used for junction boxes is considered as cemented joint if following requirements are met:		—

	– Neither cracks nor voids in the insulating compounds have been occurred which either by themselves or in combination	—	N/A
	– No breakdown at MST 16 (initial and final tests) with a 1.35 times higher test voltage occurred.	—	N/A
	– No breakdown at MST 17 (initial and final tests) with a 1.35 times higher test voltage occurred.	—	N/A
	– The electrically insulating adhesive / sealant has a volume resistivity of bigger than 50×10^6 Ω cm (dry) / bigger than 10×10^6 Ω cm (wet)	—	N/A
	– Peel test (MST 35) was passed (rigid / flexible or flexible / flexible)	See Table 36	N/A
	– Lap shear strength test (MST 36) was passed (rigid / rigid)	See Table 37	N/A
	A distance between two rigid parts or rigid to flexible parts used for junction boxes is considered as cemented joint if following requirement is met:		—
	– The measured distances through cemented joints at adhesive area of junction box do not fall below the minimum values listed in Tables 3 and 4.	Verified by MST 57	N/A
	Supplement information: Above mentioned tests have to be performed for each cemented joint. Also, the materials and their properties have to be listed in annex 2		
6.6.4.4 Distance through functional insulation			
	Distance through functional insulation meets the requirements described in line 3) a) of Table 3 and Table 4 of IEC 61730-1.	See Table 1	P
	The values in line 3) b) of Table 3 and Table 4 of IEC 61730-1 is used as the following requirements are met:		—
	– the MST 57 insulation thickness test is passed	—	P
	– ☐the encapsulant meets flammability requirements, minimum HB according to IEC 60695-11-10 ☐a method to verify spacings is included in the production process	—	N/A

Table 1	**Clearance and creepage distances (Clause 6.6.3.3 and 6.6.3.4 of IEC 61730-1:2023) and Evaluation of clearances, creepage distances and distance through functional insulation (MST 57 of IEC 61730-2:2023)**								
Sample no.			1，6，7，13-23						
Clearance (cl) and creepage distance (cr) at/of/between:	Line of table 3or 4	Type of insulation	Pollution degree	CTI Material group	Working voltage [V]	Clearance[a] cl & Creepage cr [mm]			
						Required	Design	Measured (initial)	Measured (final)
Position 1: Shortest distance string connector – module edge	1a	☐ Functional ☐ Basic ☐ Suppl. ☒ Reinforced	☒ 1 ☐ 2 ☐ 3	☒ I ☐ II ☐ IIIa	Vsys	Cl: 19.4 Cr:10.4	Cl: — Cr:—	Cl: — Cr:—	Cl: — Cr:—
Position 2: Shortest distance cell – module edge	1a	☐ Functional ☐ Basic ☐ Suppl. ☒ Reinforced	☒ 1 ☐ 2 ☐ 3	☒ I ☐ II ☐ IIIa	Vsys	Cl: 19.4 Cr:10.4	Cl: — Cr:—	Cl: — Cr:—	Cl: — Cr:—
Position 3: Cell to cell	2	☐ Functional ☐ Basic ☐ Suppl. ☒ Reinforced	☒ 1 ☐ 2 ☐ 3	☒ I ☐ II ☐ IIIa	Vwork / < 35	Cl: 0.1 Cr:0.2	Cl: — Cr:—	Cl: — Cr:—	Cl: — Cr:—
Position 4: String to string	2	☐ Functional ☐ Basic ☐ Suppl. ☒ Reinforced	☒ 1 ☐ 2 ☐ 3	☒ I ☐ II ☐ IIIa	Vwork / < 35	Cl: 0.1 Cr:0.2	Cl: — Cr:—	Cl: — Cr:—	Cl: — Cr:—
Position 5: E.g., distance between terminals in JB or between terminal and outer JB enclosure	3	☐ Functional ☐ Basic ☐ Suppl. ☒ Reinforced	☒ 1 ☐ 2 ☐ 3	☒ I ☐ II ☐ IIIa	Vwork / < 35	Cl: 0.2 Cr: 0.2	Cl: — Cr: —	Cl: — Cr: —	Cl: — Cr: —
Supplementary information: The junction box is sealed with potting material.									
[a] List relevant position and test voltage for each clearence which is verified by Impulse voltage test according to IEC 60664-1.									

Table 2: 6.6.3.4 - Clearance evaluated by Impulse voltage test								
Test Date [YYYY-MM-DD] .....:		2025-05-10						
Results								
☐ No evidence of dielectric breakdown or surface tracking observed								
Supplementary information:								
Clearance (cl) at/of/between: Sample#	Line of table 3or 4	Type of insulation	Working voltage	Impulse voltage	Measured			Verdict
					Voltage Peak kV	T_1 µs	T_2 µs	--
Position 1: Entire module (Sample# 19)	3	☐ Functional ☐ Basic ☐ Suppl. ☒ Reinforced	1500V	19680V	+19.54 +19.57 +19.52 -19.48 -19.58 -19.54	1.39 1.36 1.45 1.46 1.42 1.42	54.70 54.76 54.68 54.70 54.75 54.73	P
Position:		☐ Functional ☐ Basic ☐ Suppl. ☐ Reinforced						
Supplementary information: —								

IEC 61730 Part 2: Requirements for testing

8 Testing
Test sequences see IEC 61730-2 Deviations from test sequence are possible but must be documented. See also table 5-

10 TEST PROCEDURES			
10.1 General: Safety qualification testing included the following Module Safety Tests (MST) of IEC 61730-2			
Initial Testing			
10.2	MST 01 – Visual inspection .....:	See appended Table 4	P
10.3	MST 02 - Performance at STC .....:	See appended Table 5	P
10.4	MST 03 – Maximum power determination .....:	See appended Table 6	P
10.13	MST 16 – Insulation test .....:	See appended Table 7	P
10.14	MST 17 – Wet leakage current test .....:	See appended Table 8	P
10.11	MST 13 – Continuity test of equipotential bonding:	See appended Table 9	P
10.9	MST 11 – Accessibility test .....:	See appended Table 10	P
Sequence A			
10.26	MST 37 – Materials creep test.....:	See appended Table 11	P
10.11	MST 13 – Continuity test of equipotential bonding:	See appended Table 9	P
10.9	MST 11 – Accessibility test .....:	See appended Table 10	P
Sequence B			
10.30	MST 53 – Damp heat test 200h.....:	See appended Table 12	P
10.31	MST 54 – UV test 60kWh/m² .....:	See appended Table 13	P
10.29	MST 52 – Humidity freeze test .....:	See appended Table 14	P
10.31	MST 54 – UV test 60kWh/m² .....:	See appended Table 15	P
10.29	MST 52 – Humidity freeze test .....:	See appended Table 12	P
Sequence B1			
10.32	MST 55 – Cold conditioning.....:	See appended Table 16	P
10.33	MST 56 – Dry heat conditioning .....:	See appended Table 17	P
10.29	MST 52 – Humidity freeze test .....:	See appended Table 18	P
10.32	MST 55 – Cold conditioning.....:	See appended Table 19	P
10.29	MST 52 – Humidity freeze test .....:	See appended Table 20	P

Sequence C			
10.31	MST 54 – UV test 15kWh/m² .....:	See appended Table 21	P

10.28	MST 51 – Thermal cycling 50 test .....:	See appended Table 22	P
10.29	MST 52 – Humidity freeze test .....:	See appended Table 23	P
10.27	MST 42 – Robustness of terminations test.....:	See appended Table 24	P
Sequence D			
10.30	MST 53 – Damp heat test.....:	See appended Table 25	P
10.27	MST 42 – Robustness of terminations test.....:	See appended Table 26	P
10.23	MST 34 – Static mechanical load test .....:	See appended Table 27	P
Sequence E			
10.28	MST 51 – Thermal cycling 200 test .....:	See appended Table 28	P
Sequence F			
10.19	MST 25 – Bypass diode thermal test.....:	See appended Table 29	P
10.16	MST 22 – Hot-spot endurance Test.....:	See appended Table 30	P
10.20	MST 26 – Reverse current overload test.....:	See appended Table 31	P
Sequence G1			
10.12	MST 14 – Impulse voltage test .....:	See appended Table 32	P
Sequence G2			
10.34	MST 57 - Evaluation of insulation coordination	See appended Table 33	P
Other tests			
10.17	MST 23 – Fire Test .....:	See appended Table 34	P
10.18	MST 24 – Ignitability test .....:	See appended Table 35	P
10.21	MST 32 – Module breakage test.....:	See appended Table 36	P
10.24	MST 35 – Peel test .....:	See appended Table 37	N/A
10.25	MST 36 – Lap shear strength test .....:	See appended Table 38	N/A
Final Testing			
10.10	MST 12 – Cut susceptibility test .....:	See appended Table 39	P
10.11	MST 13 – Continuity test of equipotential bonding:	See appended Table 9	P
10.9	MST 11 – Accessibility test.....:	See appended Table 10	P
10.4	MST 03 – Maximum power determination.....:	See appended Table 40	P
10.1	MST 01 – Visual inspection .....:	See appended Table 41	P
10.6	MST 05 – Durability of markings.....:	See appended Table 42	P
10.7	MST 06 – Sharp edge test.....:	See appended Table 43	P
10.8	MST 07 – Bypass diode functionality test.....:	See appended Table 44	P
10.22	MST 33a – General screw connections test.....:	See appended Table 45	N/A
10.22	MST 33b – Locking Screw connections test.....:	See appended Table 46	N/A
10.5	MST 04 – Insulation thickness test.....:	See appended Table 47	P
Supplementary information: —			

Table 3: Overview of MST items for each test sample														
MST item	Sample No.													
	1	6	7	13	14	15	16	17	18	19	20	21	22	23
Control module	X													
MST 01 – Visual inspection	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MST 02 – Performance at STC	X													
MST 03 – Maximum power determination	X	X	X	X	X	X	X	X	X	X				
MST 04 – Insulation thickness test					X	X								
MST 05 – Durability of markings	X	X	X		X	X	X	X	X	X				
MST 06 – Sharp edge test	X	X	X		X	X	X	X	X	X				
MST 07 – Bypass diode functionality test	X	X	X		X	X	X	X	X	X				
MST 11 – Accessibility test		X	X	X	X	X	X	X	X	X				
MST 12 – Cut susceptibility test		X	X		X	X	X	X						
MST 13 – Continuity test of equipotential bonding		X	X	X	X	X	X	X	X	X				
MST 14 – Impulse voltage test										X				
MST 16 – Insulation test		X	X	X	X	X	X	X	X	X				
MST 17 – Wet leakage current test		X	X	X	X	X	X	X	X	X				
MST 21 – Temperature Test														
MST 22 – Hot-spot endurance Test									X					
MST 23 – Fire Test											X	X		
MST 24 – Ignitability test														X
MST 25 – Bypass diode thermal test									X					
MST 26 – Reverse current overload test														
MST 32 – Module breakage test													X	
MST 33 – Screw connections test														
MST 34 – Static mechanical load test			X											
MST 35 – Peel test														
MST 36 – Lap shear strength test:														
MST 37 – Materials creep test:				X										
MST 42 – Robustness of terminations test			X					X						
MST 51 – Thermal cycling test 50								X						
MST 51 - Thermal cycling test 200		X												
MST 52 – Humidity freeze test					X	X	X	X						
MST 53 – Damp heat test 200 h					X	X								
MST 53 – Damp heat test 1000 h			X											
MST 54 – UV test 15 KWh/m²								X						

MST 54 – UV test 60 KWh/m²					X	X								
MST 55 – Cold conditioning							X	X						
MST 56 – Dry heat conditioning							X	X						

Table 4: MST 01 - Initial Visual inspection			
Test Date [YYYY-MM-DD] .....:		2025-05-06	—
Sample # 1	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 6	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 7	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 13	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 14	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 15	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 16	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 17	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 18	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 19	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 20	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample #	Findings .....:	☐ Yes ☒ No	

21	Nature and position of findings – comments or attach photos		—
Sample # 22	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		
Sample # 23	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Supplementary information:For creepage distances and clearances see Table 1, Table 2, Table 3 and Table 4			

Table 5: MST 02 - Performance at STC

Sample test .....:	1						—
Test Date [YYYY-MM-DD] .....:	2025-05-06						—
Irradiance [W/m^2] .....:	1000 or G_{BNPI}						—
Module temperature [°C] .....:	25						—
Test method .....:	☒ Simulator ☐ Natural sunlight						—
Rated I_{SC} including manufacturing tolerances ...:	—						—
Rated V_{OC} including manufacturing tolerances .:	—						—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmp [W]	FF [%]	Result
01-Front	15.61	48.61	14.91	40.91	610.0	80.41	—
01-Rear	11.74	48.26	11.53	41.78	481.6	85.00	—
01-BNPI	17.26	48.68	16.48	40.84	672.9	80.11	—
Supplementary information: —							

Table 6: MST 03 - Maximum power determination

Test Date [YYYY-MM-DD] .....:	2025-05-06						—
Irradiance [W/m^2] .....:	1000						—
Module temperature [°C] .....:	25						—
Test method .....:	☒ Simulator ☐ Natural sunlight						—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmp [W]	FF [%]	Result
6-F	15.72	48.67	14.94	41.03	612.9	80.13	P
6-B	11.57	48.30	11.63	41.67	484.7	86.76	P
7-F	15.75	48.67	14.94	41.04	613.1	79.96	P
7-B	11.58	48.42	11.51	41.78	480.8	85.76	P
13-F	15.71	48.74	14.87	41.47	616.8	80.56	P
13-B	11.77	48.39	11.68	41.73	487.4	85.62	P
14-F	15.74	48.66	14.85	41.48	616.1	80.40	P
14-B	11.76	48.39	11.67	41.73	487.2	85.61	P
15-F	15.68	48.72	14.87	41.39	615.2	80.51	P

15-B	11.69	48.29	11.50	41.89	481.7	85.33	P
16-F	15.65	48.60	14.94	40.87	610.6	80.27	P
16-B	11.69	48.29	11.50	41.89	481.6	85.33	P
17-F	15.64	48.63	14.78	41.47	613.0	80.57	P
17-B	11.69	48.29	11.50	41.89	481.7	85.36	P
18-F	15.64	48.64	14.79	41.41	612.3	80.48	P
18-B	11.67	48.29	11.51	41.81	481.3	85.39	P
19-F	15.67	48.58	14.77	41.35	610.6	80.20	P
19-B	11.76	48.25	11.54	41.77	481.9	84.97	P
Supplementary information: —							

Table 7: MST 16 - Initial Insulation test

Test Date [YYYY-MM-DD] .....:	2025-05-06				—
Test Voltage applied [V, DC] .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
6	21200	>14.81	—	No	P
7	24800	>14.81	—	No	P
13	27300	>14.81	—	No	P
14	21700	>14.81	—	No	P
15	25400	>14.81	—	No	P
16	20900	>14.81	—	No	P
17	19800	>14.81	—	No	P
18	22400	>14.81	—	No	P
19	23500	>14.81	—	No	P
Supplementary information: Size of module 2.70 [m²]					

Table 8: MST 17 - Wet leakage current test

Test Date [YYYY-MM-DD] .....:	2025-05-06		—
Test Voltage applied [V, dc] .....:	1500		—
Solution resistivity [Ω cm] .....:	2581		—
Solution temperature [°C] .....:	23.5		—
Sample #	Measured [MΩ]	Required [MΩ]	Result
6	3090	>14.81	P
7	5810	>14.81	P
13	10280	>14.81	P
14	7320	>14.81	P

15	11570	>14.81	P
16	4830	>14.81	P
17	6240	>14.81	P
18	5410	>14.81	P
19	6530	>14.81	P
30	3090	>14.81	P
32	5810	>14.81	P
38	10280	>14.81	P
44	7320	>14.81	P
Supplementary information: Size of module 2.70 [m²]			

Table 9: MST 13 - Continuity test of equipotential bonding

Test Date Initial examination [YYYY-MM-DD] ...:	2025-05-06	—
Test Date Final examination [YYYY-MM-DD] ...:	2025-06-19	—
Maximum over-current protection rating [A]	35	—
Current applied [A]	87.5	—
Location of designated grounding point.....	At the side of longer side	—
Location of second contacting point	A: Adjacent (connected) exposed conductive component with the greatest physical displacement from the grounding point. B: Adjacent longer side grounding point. C: Adjacent shorter side grounding point.grounding point.	—

Sample #	Position in test sequence:	Voltage [V]	Resistance [Ω]	
6	Initial examination	A: 0.0481 B: 0.0410 C: 0.0331	A: 0.0006 B: 0.0005 C: 0.0004	P
	Preconditioning: MST 51	—	—	—
	Final examination	A: 0.0482 B: 0.0410 C: 0.0335	A: 0.0006 B: 0.0005 C: 0.0004	P
7	Initial examination	A: 0.0480 B: 0.0395 C: 0.0340	A: 0.0006 B: 0.0005 C: 0.0004	P
	Preconditioning: MST 53, MST 42,MST 34	—	—	—
	Final examination	A: 0.0481 B: 0.0393 C: 0.0340	A: 0.0006 B: 0.0005 C: 0.0004	P

13	Initial examination	A: 0.0478 B: 0.0401 C: 0.0331	A: 0.0006 B: 0.0005 C: 0.0004	P
	Preconditioning: MST 37	—	—	—
	Final examination	—	—	—
14	Initial examination	A: 0.0468 B: 0.0391 C: 0.0336	A: 0.0006 B: 0.0005 C: 0.0004	P
	Preconditioning: MST 54, MST 53, MST 52	—	—	—
	Final examination	A: 0.0467 B: 0.0401 C: 0.0332	A: 0.0006 B: 0.0005 C: 0.0004	P
15	Initial examination	A: 0.0482 B: 0.0405 C: 0.0324	A: 0.0006 B: 0.0005 C: 0.0004	P
	Preconditioning: MST 54, MST 53, MST 52	—	—	—
	Final examination	A: 0.0480 B: 0.0405 C: 0.0325	A: 0.0006 B: 0.0005 C: 0.0004	P
16	Initial examination	A: 0.0479 B: 0.0406 C: 0.0334	A: 0.0006 B: 0.0005 C: 0.0004	P
	Preconditioning: MST 55, MST 56, MST 52	—	—	—
	Final examination	A: 0.0477 B: 0.0407 C: 0.0331	A: 0.0006 B: 0.0005 C: 0.0004	P
17	Initial examination	A: 0.0475 B: 0.0404 C: 0.0337	A: 0.0006 B: 0.0005 C: 0.0004	P
	Preconditioning: MST 54, MST 51, MST 52, MST 42	—	—	—
	Final examination	A: 0.0477 B: 0.0402 C: 0.0334	A: 0.0006 B: 0.0005 C: 0.0004	P
Supplementary information:—				

Table 10: MST 11 - Accessibility test			
Test Date **Initial** examination [YYYY-MM-DD]....	2025-05-06		—
Test Date Final examination [YYYY-MM-DD].....	2025-06-19		—
Sample #	Position in test sequence:		
6	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 51	—	—

	Final examination, access?	☒ Yes ☐ No	
7	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 53,MST 42,MST 34	—	—
	Final examination, access?	☒ Yes ☐ No	
13	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 37	—	—
	Final examination, access?	—	—
14	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 54, MST 53, MST 52	—	—
	Final examination, access?	☒ Yes ☐ No	
15	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 54, MST 53, MST 52	—	—
	Final examination, access?	☒ Yes ☐ No	
16	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 55, MST 56, MST 52	—	—
	Final examination, access?	☒ Yes ☐ No	
17	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 54, MST 51, MST 52, MST 42	—	—
	Final examination, access?	☒ Yes ☐ No	
18	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 22, MST 25, MST 26	—	—
	Final examination, access?	☒ Yes ☐ No	
19	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 14, MST 57	—	—
	Final examination, access?	☒ Yes ☐ No	
33	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 51	—	—
	Final examination, access?	—	—
34	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 53, MST 42, MST 34	—	—
	Final examination, access?	☒ Yes ☐ No	
40	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 37	—	—
	Final examination, access?	☒ Yes ☐ No	
41	Initial examination, access?	☒ Yes ☐ No	

	Preconditioning: MST 52, MST 53	—	—
	Final examination, access?	☒ Yes ☐ No	
42	Initial examination, access?	☒ Yes ☐ No	
	Preconditioning: MST 53, MST 52, MST 54	—	—
	Final examination, access?	☒ Yes ☐ No	
43	Initial examination, access?	☒ Yes ☐ No	P
	Preconditioning: MST 55, MST 56, MST 52	—	—
	Final examination, access?	☒ Yes ☐ No	P
44	Initial examination, access?	☒ Yes ☐ No	P
	Preconditioning: MST 51, MST 52, MST 42	—	—
	Final examination, access?	☒ Yes ☐ No	P
Supplementary information:			

SEQUENCE A					
Sample #	13				—
Table 11: MST 37 - Materials creep test					
Test Date [YYYY-MM-DD] start/end .....:			2025-05-09/ 2025-05-17		—
Duration [h] .....:			200		—
Applied temperature [°C] .....:			90±3		—
MST 01: Visual inspection after materials creep test					—
Test Date [YYYY-MM-DD].....:			2025-05-17		—
Findings ..... :			☐ Yes.....☒ No		
Nature and position of findings – comments or attach photos			No visual defects found		—
Supplementary information: For clearance and creepage distances see table XYZ					
MST 16: Insulation test after materials creep test					—
Test Date [YYYY-MM-DD[.....:			2025-05-17		—
Test Voltage applied [V, dc].....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
13	26800	>14.81	—	No	P
MST 17: Wet leakage current test after materials creep test					—
Test Date [YYYY-MM-DD].....:			2025-05-17		—
Cemented joint.....:			☐ Yes	☐ No	
Test Voltage applied (V, dc) .....:			1500		—
Solution resistivity (Ω cm).....:			2558		—

Solution temperature (°C) .....:		21.8	—
Sample #	Measured (MΩ)	Required (MΩ)	Result
13	9870	>14.81	P
Supplementary information: —			

SEQUENCE B		
Sample #	14,15	—
Table 12: MST 53 - Damp heat test		
Test Date [YYYY-MM-DD] start/end .....:	2025-05-09/ 2025-05-17	—
Applied load [N] .....:	200	—
Duration [h] .....:	5	—
MST 01: Visual inspection after Damp heat test		—
Test Date [YYYY-MM-DD].....:	2025-05-17	—
Findings .....:	☐ Yes ☒ No	
Nature and position of findings – comments or attach photos	No visual defects found	—

MST 16: Insulation test after Damp heat test					—
Test Date [YYYY-MM-DD].....:			2025-05-17		—
Cemented joints .....:			☐ Yes	☐ No	—
Test Voltage applied [V, DC] .....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
14	21500	≥14.81	—	No	P
15	24900	≥14.81	—	No	P
Supplementary information: —					

Table 13: MST 54 - UV test (front side)		
Sample #	**15**	
Test Date [YYYY-MM-DD] start/end .....:	2025-05-18/2025-06-03	—
Module temperature [°C] .....:	60	—
Irradiation total [kWh/ m²] .....:	60	—
Open circuits .....:	☐ Yes ☒ No	
MST 01: Visual inspection after UV test		—
Test Date [YYYY-MM-DD].....:	2025-06-03	—
Findings .....:	☐ Yes ☒ No	
Nature and position of findings – comments or	No visual defects found	—

attach photos					
MST 16: Insulation test after UV test					—
Test Date [YYYY-MM-DD]....:			2025-06-03		—
Cemented joints ....:			☐ Yes	☐ No	
Test Voltage applied [V, DC] ....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
15	25300	≥14.81	—	No	P
Supplementary information: —					

Table 14: MST 54 - UV test (back side)					
Sample #	**14**				
Test Date [YYYY-MM-DD] start/end ....:			2025-05-18/ 2025-06-03		—
Module temperature [°C] ....:			60		—
Irradiation total [kWh/ m²] ....:			60		—
Open circuits ....:			☐ Yes	☒ No	
MST 01: Visual inspection after UV test					—
Test Date [YYYY-MM-DD]....:			2025-06-03		—
Findings ....:			☐ Yes	☒ No	
Nature and position of findings – comments or attach photos			No visual defects found		—
MST 16: Insulation test after UV test					—
Test Date [YYYY-MM-DD]....:			2025-06-03		—
Cemented joints ....:			☐ Yes	☐ No	
Test Voltage applied [V, DC] ....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
14	22700	≥14.81	—	No	P
Supplementary information:					

Table 15: MST 52 - Humidity freeze test			
Test Date [YYYY-MM-DD] start/end ....:	2025-06-04/ 2025-06-14		—
Total cycles ....:	10		—
Open circuits ....:	☐ Yes	☒ No	
Sample #	—		
14	—		
15	—		

MST 01: Visual inspection after Humidity freeze test					—
Test Date [YYYY-MM-DD]....:	2025-06-14				—
Findings .... :	☐ Yes	☐ No			
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Humidity freeze test					—
Test Date [YYYY-MM-DD]....:	2025-06-14				—
Cemented joints....:	☐ Yes	☐ No			—
Test Voltage applied [V, DC] ....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
14	21800	≥14.81	—	No	P
15	24100	≥14.81	—	No	P
MST 17: Wet leakage current test after Humidity freeze 10 test					—
Test Date [YYYY-MM-DD]....:	2025-06-14				—
Cemented joints....:	☐ Yes	☐ No			—
Test Voltage applied [V, dc]....:	1500				—
Solution resistivity [Ω cm) ....:	2437				—
Solution temperature [°C] ....:	22.4				—
Sample #	Measured (MΩ)	Required (MΩ)			Result
14	8230	≥14.81			P
15	10430	≥14.81			P
Supplementary information: —					

SEQUENCE B1			
Sample #	16		—
Table 16: MST 55 - Cold conditioning			
Test Date [YYYY-MM-DD] start/end ....:	2025-05-09/ 2025-05-11		—
Temperature [°C] Duration [h] ....:	-40 / 48		—
MST 01: Visual inspection after Cold conditioning			—
Test Date [YYYY-MM-DD]....:	2025-05-11		—
Findings .... :	☐ Yes	☒ No	
Nature and position of findings – comments or attach photos	No visual defects found		—
MST 16: Insulation test after Cold conditioning			—
Test Date [YYYY-MM-DD]....:	2025-05-11		—
Cemented joints....:	☐ Yes	☐ No	—
Test Voltage applied [V, DC] ....:	8000/1500		—

Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
16	21400	≥14.81	—	No	P
Supplementary information: --					

Table 17: MST 56 - Dry heat conditioning					
Test Date [YYYY-MM-DD] start/end .....:	2025-05-12/ 2025-05-20				—
Temperature [°C] Duration [h] .....:	200				—
Applied load [N] .....:	5				
MST 01: Visual inspection after Dry heat conditioning					—
Test Date [YYYY-MM-DD].....:	2025-05-20				—
Findings .....:	☐ Yes		☒ No		
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Dry heat conditioning					—
Test Date [YYYY-MM-DD].....:	2025-05-20				—
Cemented joints.....:	☐ Yes		☒ No		—
Test Voltage applied (V, DC) .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
16	19800	≥14.81	—	No	P
Supplementary information: —					

Table 18: MST 52 - Humidity freeze test					
Test Date [YYYY-MM-DD] start/end .....:	2025-05-21/ 2025-05-31				—
Total cycles.....:	10				—
Open circuits.....:	☐ Yes		☒ No		
MST 01: Visual inspection after Humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-05-31				—
Findings .....:	☐ Yes		☒ No		
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-05-31				—
Cemented joints.....:	☐ Yes		☒ No		—
Test Voltage applied [V, DC] .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	

16	20400	≥14.81	—	No	P
Supplementary information: —					

Table 19: MST 55 - Cold conditioning					
Test Date [YYYY-MM-DD] start/end .....:	2025-06-01/ 2025-06-03				—
Temperature [°C] / Duration [h] .....:	-40 / 48				—
MST 01: Visual inspection after Cold conditioning					—
Test Date [YYYY-MM-DD].....:	2025-06-03				—
Findings .....:	☐ Yes		☒ No		
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Cold conditioning					—
Test Date [YYYY-MM-DD].....:	2025-06-03				—
Cemented joints.....:	☐ Yes		☒ No		—
Test Voltage applied (V, DC) .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
16	20600	≥14.81	—	No	P
Supplementary information: —					

Table 20: MST 52 - Humidity freeze test					
Test Date [YYYY-MM-DD] start/end .....:	2025-06-04/ 2025-06-14				—
Total cycles .....:	10				—
Open circuits .....:	☐ Yes		☒No		
MST 01: Visual inspection after Humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-06-14				—
Findings .....:	☐ Yes		☒ No		
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-06-14				—
Cemented joints.....:	☐ Yes		☐ No		—
Test Voltage applied [V, DC] .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
16	21400	≥14.81	—	No	P
MST 17: Wet leakage current test after humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-06-14				—

Cemented joints ..... :	☐ Yes	☒ No	—
Test Voltage applied [V, dc] ..... :	1500		—
Solution resistivity [Ω cm] ..... :	2451		—
Solution temperature [°C] ..... :	22.3		—

Sample #	Measured (MΩ)	Required (MΩ)	Result
16	5280	≥14.81	P

Supplementary information:

SEQUENCE C		
Sample #	17	—
Table 21: MST 54 - UV test		
Test Date [YYYY-MM-DD] start/end ..... :	2025-05-09/ 2025-05-13	—
Module temperature [°C] ..... :	60	—
Irradiation total [kWh/ m²] ..... :	15	—
Open circuits ..... :	☐ Yes ☒ No	
Back side (only for bifacial modules)		
Test Date (YYYY-MM-DD) start/end ..... :	2025-05-13/ 2025-05-17	—
Module temperature [°C] ..... :	60	—
Irradiation total [kWh/ m²] ..... :	15	—
Open circuits ..... :	☐ Yes ☒ No	P

MST 01: Visual inspection after UV test			—
Test Date [YYYY-MM-DD] ..... :	2025-05-17		—
Findings ..... :	☐ Yes	☒ No	
Nature and position of findings – comments or attach photos	No visual defects found		—
MST 16: Insulation test after UV test			—
Test Date [YYYY-MM-DD] ..... :	2025-05-17		—
Cemented joints ..... :	☐ Yes	☒ No	—
Test Voltage applied [V, DC] ..... :	8000/1500		—

Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
17	20700	≥14.81	—	No	P

Supplementary information: —

Table 22: MST 51 - Thermal cycling test		
Test Date [YYYY-MM-DD] start/end ..... :	2025-05-18/ 2025-05-26	—
Total cycles ..... :	50	—

Applied current [A] .....:	18.4/ 0.1				—
Applied load [N] .....:	5				—
Limiting voltage [V)] .....:	—				—
Open circuits .....:	☐ Yes ☒ No				
MST 01: Visual inspection after Thermal cycling test					—
Test Date [YYYY-MM-DD].....:	2025-05-26				—
Findings ..... :	☐ Yes ☒ No				
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Thermal cycling test					—
Test Date [YYYY-MM-DD].....:	2025-05-26				—
Cemented joints.....:	☐ Yes ☐ No				—
Test Voltage applied [V, DC] .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
17	21300	≥14.81	—	No	P
Supplementary information: —					

Table 23: MST 52 - Humidity freeze test

Test Date [YYYY-MM-DD] start/end .....:	2025-05-27/ 2025-06-06				—
Total cycles .....:	10				—
Open circuits .....:	☐ Yes ☒ No				
MST 01: Visual inspection after Humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-06-06				—
Findings ..... :	☐ Yes ☒ No				
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-06-06				—
Cemented joints..... :	☐ Yes ☐ No				—
Test Voltage applied [V, DC] .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
17	20300	≥14.81	—	No	P
MST 17: Wet leakage current test after humidity freeze test					—
Test Date [YYYY-MM-DD].....:	2025-06-06				—
Cemented joints..... :	☐ Yes ☐ No				—

Test Voltage applied [V, dc].....:		2461	—
Solution resistivity [Ω cm] .....:		23.3	—
Solution temperature [°C] .....:		21.4	—
Sample #	Measured (MΩ)	Required (MΩ)	Result
17	6210	>14.81	P
Supplementary information: —			

Table 24: MST 42 - Robustness of terminations test					
Test Date [YYYY-MM-DD].....:			2025-06-06		—
MQT 14.1: Retention of junction box on mounting surface					
Applied force in all directions parallel to the mounting surface and parallel to the module edges [N] .....:			40		—
Applied force perpendicular to the mounting surface [N] .....:			40		—
Supplementary information:					
MST 01: Visual inspection after retention of junction box on mounting surface					
Test Date [YYYY-MM-DD].....:			2025-06-06		—
Findings ..... :			☐ Yes	☒ No	
Nature and position of findings – comments or attach photos			No visual defects found		—
MST 16: Insulation test after retention of junction box on mounting surface					—
Test Date [YYYY-MM-DD].....:			2025-06-06		—
Cemented joints.....:			☐ Yes	☐ No	—
Test Voltage applied [V, DC] .....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
17	20260	>14.81	—	No	P
MST 17: Wet leakage current test after retention of junction box on mounting surface					
Test Date [YYYY-MM-DD].....:			2025-06-06		—
Cemented joints.....:			☐ Yes	☐ No	—
Test Voltage applied [V] .....:			1500		—
Solution resistivity [Ω cm].....:			2432		—
Solution temperature [°C] .....:			22.7		—
Sample #	Measured (MΩ)		Required (MΩ)		Result
17	6180		>14.81		P
Supplementary information: —					

SEQUENCE D

Sample #	07	—

Table 25: MST 53 - Damp heat test

Test Date [YYYY-MM-DD] start/end .....:	2025-05-09/ 2025-06-19	—
Applied load [N] .....:	5	—
Total hours .....:	1000	—
MST 01: Visual inspection after damp heat test		—
Test Date [YYYY-MM-DD].....:	2025-06-19	—
Findings ..... :	☐ Yes ☒ No	
Nature and position of findings – comments or attach photos	No visual defects found	—
MST 16: Insulation test after damp heat test		—
Test Date [YYYY-MM-DD].....:	2025-06-19	—
Cemented joints..... :	☐ Yes ☒ No	—
Test Voltage applied [V, DC] .....:	8000/1500	—

Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
07	21500	≥14.81	—	No	P

MST 17: Wet leakage current test after damp heat test		—
Test Date [YYYY-MM-DD].....:	2025-06-19	—
Cemented joints..... :	☐ Yes ☒ No	—
Test Voltage applied [V, dc].....:	1500	—
Solution resistivity [Ω cm].....:	2518	—
Solution temperature [°C] .....:	21.4	—

Sample #	Measured (MΩ)	Required (MΩ)	Result
07	6320	>14.81	P

Supplementary information:—

Table 26: MST 42 - Robustness of terminations test

Test Date [YYYY-MM-DD].....:	2025-06-19	—
MQT 14.1: Retention of junction box on mounting surface		
Applied force in all directions parallel to the mounting surface and parallel to the module edges [N] .....:	40	—
Applied force perpendicular to the mounting surface [N] .....:	40	—
Supplementary information:		
MST 01: Visual inspection after retention of junction box on mounting surface		
Test Date [YYYY-MM-DD].....:	2025-06-19	—
Findings ..... :	☐ Yes ☒ No	

Nature and position of findings – comments or attach photos			No visual defects		—
MST 16: Insulation test after retention of junction box on mounting surface					—
Test Date [YYYY-MM-DD]....:			2025-06-19		—
Cemented joints....:			☐ Yes	☒ No	—
Test Voltage applied [V, DC] ....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
07	15120	≥14.81	—	No	P
MST 17: Wet leakage current test after retention of junction box on mounting surface					
Test Date [YYYY-MM-DD]....:			2025-06-19		—
Cemented joints....:			☐ Yes	☐ No	—
Test Voltage applied [V] ....:			1500		—
Solution resistivity [Ω cm] ....:			< 3500 Ω cm at 22 ± 2°C		—
Solution temperature [°C] ....:			23.4		—
Sample #	Measured (MΩ)		Required (MΩ)		Result
07	5730		≥14.81		P
Supplementary information: —					

Table 27: MST 34 - Static mechanical load test			
Test Date [YYYY-MM-DD]....:	2025-06-19		—
Mounting method ....:	Mounting with clamps		—
Design Load [Pa] / Safety factor γm....:	front side: 3600Pa/ 1.5 back side: 1600Pa/ 1.5		—
Load applied to....:	front side	back side	—
Mechanical load [Pa]....:	5400	2400	—
First cycle time (start/end) ....:	1h	1h	—
Intermittent open circuit (yes/no) ....:	No	No	
Second cycle time (start/end) ....:	1h	1h	—
Intermittent open circuit (yes/no) ....:	No	No	
Third cycle time (start/end) ....:	1h	1h	—
Intermittent open circuit (yes/no) ....:	No	No	
Supplementary information: —			
MST 01: Visual inspection after Static mechanical load test			—
Test Date [YYYY-MM-DD]....:	2025-06-19		—
Findings .... :	☐ Yes	☒ No	
Nature and position of findings – comments or attach photos	No visual defects		—

MST 16: Insulation test after Static mechanical load test					—
Test Date [YYYY-MM-DD]....:			2025-06-19		—
Cemented joints....:			☐ Yes	☒ No	—
Test Voltage applied [V, DC] ....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
07	23560	≥14.81	—	No	P
MST 17: Wet leakage current test after Static mechanical load test					—
Test Date [YYYY-MM-DD]....:			2025-06-19		—
Cemented joints....:			☐ Yes	☒ No	—
Test Voltage applied [V, dc]....:			1500		—
Solution resistivity [Ω cm) ....:			2479		—
Solution temperature [°C] ....:			23.4		—
Sample #	Measured (MΩ)		Required (MΩ)		Result
07	5430		>14.81		P
Supplementary information:—					
SEQUENCE E					
Sample #	6				—
Table 28: MST 51 - Thermal cycling test					
Test Date [YYYY-MM-DD] start/end ....:			2025-05-13/ 2025-06-14		—
Total cycles ....:			200		—
Applied current [A] ....:			18.4/ 0.1		—
Applied load [N] ....:			5		—
Limiting voltage [V] ....:			—		—
Open circuits ....:			☐ Yes	☒ No	
MST 01: Visual inspection after Thermal cycling test					—
Test Date [YYYY-MM-DD]....:			2025-06-14		—
Findings ....:			☐ Yes	☒ No	
Nature and position of findings – comments or attach photos			No visual defects		—
MST 16: Insulation test after Thermal cycling test					—
Test Date [YYYY-MM-DD]....:			2025-06-14		—
Cemented joints....:			☐ Yes	☒ No	—
Test Voltage applied [V, DC] ....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
06	18750	≥14.81	—	No	P

MST 17: Wet leakage current test after Thermal cycling test				—
Test Date [YYYY-MM-DD]....:	2025-06-14			—
Cemented joints....:	☐ Yes	☒ No		—
Test Voltage applied [V, dc]....:	1500			—
Solution resistivity [Ω cm]....:	2453			—
Solution temperature [°C] ....:	22.3			—
Sample #	Measured (MΩ)	Required (MΩ)		Result
06	4060	>14.81		P
Supplementary information: —				

SEQUENCE F					
Sample #	18				—
Table 29: MST 25 - Bypass diode thermal test					
Test Date [YYYY-MM-DD] start/end ....:	2025-05-13				—
Module temperature [°C] ....:	75±5				—
Number of diodes in junction box....:	3				—
Diode manufacturer ....:	—				—
Diode type designation ....:	—				—
Max. permissible junction temperature Tjmax [°C] (according to diode datasheet)....:	200				—
Step 1, Determination of *VD* versus *TJ* characteristic					—
Diode	1,2,3				—
Ambient temperature of the junction box [°C]....:	30 ± 2	50 ± 2	70 ± 2	90 ± 2	
Pulsed current....:	19.4	19.4	19.4	19.4	—
Voltage drop [V] ....:	1#:0.4277 2#:0.4252 3#:0.4227	1#:0.4021 2#:0.4021 3#:0.4032	1#:0.3843 2#:0.3814 3#:0.3814	1#:0.3662 2#:0.3651 3#:0.3663	—
VD versus TJ characteristic....:	1#: V_D = -0.0010T_J + 0.4555 2#: V_D = -0.0010T_J + 0.4537 3#: V_D = -0.0010T_J + 0.4549				
Max. permissible junction temperature Tj_{max} [°C] (according to diode datasheet) .... :	200				
Step 2, Bypass diode thermal test					—
	Diode 1	Diode 2	Diode 3		Result
Current flow applied* [A]....:	19.4	19.4	19.4		—
Max. diode surface temperature allowed Tjmax [°C],....:	200	200	200		—
Voltage drop [V] after 1h....:	0.2919	0.2864	0.2924		—
Calculated max. junction temperature Tjcalc [°C] ....:	163.6	167.3	162.5		—

Tjcalc < Tjmax (test passed)? yes/no.....:	Yes	Yes	Yes	P
Current flow** (1.25 * Isc) [A].....:	24.25	24.25	24.25	—
Bypass diode remain(s) functional (yes/no).....:	Yes	Yes	Yes	P
Supplementary information: See Table 46 for the test details of bypass diode functionality test				

MST 01: Visual inspection after Bypass diode thermal test		
Test Date [YYYY-MM-DD].....:	2025-05-13	—
Findings .....:	☐ Yes ☒ No	
Nature and position of findings – comments or attach photos	No visual defects found	—

MST 16: Insulation test after Bypass diode thermal test					—
Test Date [YYYY-MM-DD].....:	2025-05-13				—
Cemented joints.....:	☐ Yes ☒ No				—
Test Voltage applied [V, DC] .....:	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
18	21900	≥14.81	—	No	P

MST 17: Wet leakage current test after Bypass diode thermal test			—
Test Date [YYYY-MM-DD]:.....	2025-05-13		—
Cemented joints.....:	☐ Yes ☒ No		—
Test Voltage applied [V]:.....	1500		—
Solution resistivity [Ω cm] .....:	2497		—
Solution temperature [°C] .....:	22.8		—
Sample #	Measured (MΩ)	Required (MΩ)	Result
18	4920	>14.81	P
Supplementary information: —			

Table 30: MST 22 - Hot-spot endurance test		
Test Date [YYYY-MM-DD] start/end .....:	2025-05-14/2025-05-16	—
Cell interconnection circuit.....:	☐ S ☒ SP ☐ PS	—
Irradiance during each cycle…….....:	1233	—
Module temperature at thermal equilibrium in each cycle [°C] .....:	59.27	—
Determination of worst case cell		—
Maximum measured cell temperature in each cycle [°C] .....:	1V:151.91/ 6V:150.87/ 2H:141.63/1N: 146.24	—
Shading rate [%] or number of cells shaded.....:	55/55/60/55	—
Test hours for each cycle.....:	1	—

Supplementary information: For bifacial PV modules, the exposure was performed under aBSI which is equal to 1000W/m² + φ•300W/m².

MST 01: Visual inspection after hot-spot endurance test							—
Test Date [YYYY-MM-DD]:	2025-05-16						—
Findings :	☐ Yes ☒ No						
Nature and position of findings – comments or attach photos	No visual defects found						—
MST 02: Maximum power determination after hot-spot endurance test							—
Test Date [YYYY-MM-DD]:	2025-05-16						—
Module temperature [°C]:	Corrected to 25						—
Irradiance [W/m²]:	Corrected to 1000						—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmp [W]	FF [%]	Result
18-F	15.53	48.53	14.64	41.33	605.1	80.27	—
18-B	11.57	48.36	11.38	41.93	477.2	85.26	—

MST 16: Insulation test after hot-spot endurance test					—
Test Date [YYYY-MM-DD]:	2025-05-16				—
Cemented joints:	☐ Yes ☒ No				—
Test Voltage applied [V] :	8000/1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
18	21500	≥14.81	—	No	P

MST 17: Wet leakage current test after hot-spot endurance test			—
Test Date [YYYY-MM-DD]:	2025-05-16		—
Cemented joints:	☐ Yes ☒ No		—
Test Voltage applied [V] :	1500		—
Solution resistivity [Ω cm]:	2513		—
Solution temperature [°C] :	23.1		—
Sample #	Measured (MΩ)	Required (MΩ)	Result
18	5370	>14.81	P
Supplementary information: —			

Sample #	18	—
Table 31: MST 26 - Reverse current overload test		
Test Date [YYYY-MM-DD]:	2025-05-17	—
Module over-current protection rating [A]:	35	—

Test current [A].....:	47.25				—
Range of applied voltage [V] .....:	59.1~54.3				—
Test duration .....:	2 hours				—
Observations					Result
Maximum external module surface temperature during the test [°C] :	98.4				P
MST 01: Visual inspection after Reverse current overload test					—
Test Date [YYYY-MM-DD].....:	2025-05-17				—
Findings .....:	☐ Yes	☒ No			
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Reverse current overload test					—
Test Date [YYYY-MM-DD].....:	2025-05-17				—
Cemented joints .....:	☐ Yes	☒ No			—
Test Voltage applied [V, DC] .....:	1500				—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
18	22700	≥14.81	—	No	P
MST 17: Wet leakage current test after Reverse current overload test					—
Test Date [YYYY-MM-DD].....:	2025-05-17				—
Cemented joints .....:	☐ Yes	☒ No			—
Test Voltage applied [V, dc].....:	1500				—
Solution resistivity [Ω cm].....:	2547				—
Solution temperature [°C] .....:	22.8				—
Sample #	Measured (MΩ)	Required (MΩ)			Result
18	4630	>14.81			P
Supplementary information: —					

SEQUENCE G1		
Sample #:	19	—
Table 32: MST 14 - Impulse voltage test		
Test Date [YYYY-MM-DD] .....:	2025-05-10	—
Maximum system voltage [V].....:	1500	—
Required Impulse voltage [V].....:	19680	—
Measured Impulse voltage [V] .....:	19540	—
T_1 [µs].....:	1.39	—
T_2 [µs].....:	54.70	—

Thickness of conductive foil [mm] .....:	0.3				—
☒ No evidence of dielectric breakdown or surface tracking observed					
☒ No evidence of major visual defects (see table MST 01 below)					
MST 01: Visual inspection after Impulse voltage test					—
Test Date [YYYY-MM-DD].....:	2025-05-10				—
Findings ..... :	☐ Yes	☒ No			
Nature and position of findings – comments or attach photos	No visual defects found				—
MST 16: Insulation test after Impulse voltage test					—
Test Date [YYYY-MM-DD].....:	2025-05-10				—
Cemented joints..... :	☐ Yes	☒ No			—
Test Voltage applied [V, DC] .....:					—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
19	18620	>14.81	—	No	P
Supplementary information:—					

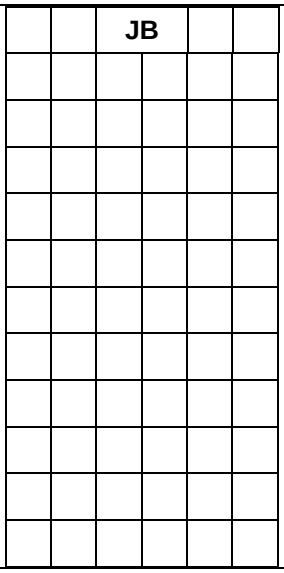
SEQUENCE G2			
Sample #:	19		—
Table 33: MST 57 - Evaluation of insulation coordination			
Test Date (YYYY-MM-DD)	2025-05-11		—
Minimum distance between [mm]:			—
(a1) Cell to inner edge of A-side frame (mean value, only for framed module) .....:	10.22		—
(a2) cell to laminate edge.....:	2353		P
(b1) string connector to inner edge of A-side frame (mean value, only for framed module) .....:	5.41		—
(b2) String connector to laminate edge.....:	1112		P
(c) String space .....:	9.84		P
(d) String connector to string connector.....:	6.59		P
(e) String connector inside the junction box to the outer surface of the junction box .....:	2.77		P
Supplementary information: lamination diagram is listed in Annex 4			

OTHER TESTS		
Sample #:	20,21	—
Table 34: MST 23 - Fire test		
Test Date (YYYY-MM-DD).....:	2025-06-10	—

Module fire resistance class (A, B, C) .....:	C	—
No. of modules provided to create the test assembly .....:	2 for spread of flame test 1 for burning brand test	—
☒ The module complies with the requirements for the fire resistance class		
Supplementary information: —		

Sample #:	23	—
Table 35: MST 24 - Ignitability test		
Test Date [YYYY-MM-DD].....:	2025-06-10	—
Flame application point.....:	—	—
Surface exposure.....:	☒ Yes ☐ No	—
Backsheet foil exposure.....:	☐ Yes ☒ No	—
Frame adhesive exposure .....:	☒ Yes ☐ No	—
Edge exposure.....:	☐ Yes ☒ No	—
Junction box adhesive exposure.....:	☒ Yes ☐ No	—
Type label exposure.....:	☐ Yes ☒ No	—
Backrail adhesive exposure.....:	☐ Yes ☒ No	—
Ignition occurs .....:	☐ Yes ☒ No	—
Flame spread less as 150 mm	☒ Yes ☐ No	
Length of destroyed area.....:	—	
Supplementary information:		

Sample #:	22		—
Table 36: MST 32 - Module breakage test			
Test Date (YYYY-MM-DD) .....:	2025-05-16		—
Weight of impactor (kg).....:	45		—
Thickness of sample (mm) .....:	30		—
Mounting technique used .....:	Clamps mounting (4 points)		—
Module breakage .....:	☐	No breakage	—
	☒	No separation from frame or mounting structure	—
	☒	Breakage occurred, no shear or opening large enough for a 76 mm diameter sphere to pass freely developed	—
	☒	Breakage occurred, no particles larger than 65 cm² ejected from sample	—
	☐	Continuity of equipotential bonding provided, see table 10.11	—
Nature and position of findings – comments or attach photos			Result
No visual defects			P
Supplementary information: N/A			

Sample #:	N/A	—
Table 37: MST 35 - Peel test (only for cemented joints)		
Test Date [YYYY-MM-DD] .....:	N/A	—
Location	☐ Flexible Frontsheet ☐ Flexible Backsheet ☐ Rigid Frontsheet ☐ Rigid Backsheet ☐ Other areas	—
Width of cemented joint	☐ ≤ 10 mm ☐ > 10mm	—
Description of area		—
Arithmetic mean M1 of adhesion force of unconditioned samples [N]	N/A	—
Arithmetic mean M2 of adhesion force of samples conditioned with sequence B [N]	N/A	—
Loss of adhesion force: $\frac{\sum_1^n M2}{\sum_1^n M1} > 0{,}5$	N/A	
Supplementary information: —		

Sample #:	/	—
Table 38: MST 36 - Lap shear strength test (only for cemented joints)		
Test Date [YYYY-MM-DD] .....:	N/A	—
Preconditioning:		
MST 53 Test Date [YYYY-MM-DD] start/end ....:	N/A	—
MST 54 Test Date [YYYY-MM-DD] start/end ....:	N/A	—
MST 52 Test Date [YYYY-MM-DD] start/end ....:	N/A	—
MST 54 Test Date [YYYY-MM-DD] start/end ....:	N/A	—
MST 52 Test Date [YYYY-MM-DD] start/end ....:	N/A	—

Arithmetic mean M1 of adhesion force of unconditioned samples [N]	N/A	—
Arithmetic mean M2 of adhesion force of samples conditioned with sequence B [N]	N/A	—
Loss of adhesion force: $\frac{\sum_1^{10} M2}{\sum_1^{10} M1} > 0{,}5$	N/A	
Supplementary information:		

Table 39: MST 12 - Cut susceptibility test			
Test Date [YYYY-MM-DD]...............................:		/	—
Applied force [N]...:		8.9	—
MST 01 Visual inspection after cut test			—
Test Date [YYYY-MM-DD]...............................:		—	—
Sample #	Findings ....:	☐ Yes........................☒ No	
	Nature and position of findings – comments or attach photos	No visual defects found	—
Sample #	Findings ....:	☐ Yes........................☒ No	
	Nature and position of findings – comments or attach photos	No visual defects found	—
Sample #	Findings ....:	☐ Yes........................☒ No	
	Nature and position of findings – comments or attach photos	No visual defects found	—
Sample #	Findings ....:	☐ Yes........................☒ No	
	Nature and position of findings – comments or attach photos	No visual defects found	—
Sample #	Findings ....:	☐ Yes........................☒ No	
	Nature and position of findings – comments or attach photos	No visual defects found	—
Sample #	Findings ....:	☐ Yes........................☒ No	
	Nature and position of findings – comments or attach photos	No visual defects found	—
Sample #	Findings ....:	☐ Yes........................☒ No	
	Nature and position of findings – comments or attach photos	No visual defects found	—

MST 16: Insulation test after cut test					—
Test Date [YYYY-MM-DD]...............................:			—		—
Cemented joints ....:			☐ Yes	☐ No	—
Test Voltage applied [V, DC] ....:			8000/1500		—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	

—	—	—	—	No	P
—	—	—	—	No	P
—	—	—	—	No	P
—	—	—	—	No	P
—	—	—	—	No	P
—	—	—	—	No	P
—	—	—	—	No	P

MST 17: Wet leakage current test after cut test			—
Test Date [YYYY-MM-DD]....:	—		—
Cemented joints ....:	☐ Yes	☐ No	—
Test Voltage applied [V, dc]....:	—		—
Solution resistivity [Ω cm]....:	—		—
Solution temperature [°C] ....:	—		—
Sample #	Measured [MΩ]	Required [MΩ]	Result
—	—	—	P
—	—	—	P
—	—	—	P
—	—	—	P
—	—	—	P
—	—	—	P
—	—	—	P
Supplementary information:			

Table 40: MST 03 - Maximum power determination final						
Test Date [YYYY-MM-DD]....:	2025-06-18					—
Module temperature [°C] ....:	25					—
Irradiance [W/m²]....:	1000					—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmp [W]	FF [%]
1-F	15.57	48.46	14.86	40.82	606.3	80.37
1-B	11.72	48.12	11.48	41.74	479.2	84.97
6-F	15.68	48.46	14.91	40.84	609.0	80.17
6-B	11.49	48.02	11.38	41.50	472.5	85.67
7-F	15.63	47.64	14.79	40.13	593.7	79.72
7-B	11.43	47.96	11.46	41.32	473.4	86.36
14-F	15.60	48.45	14.68	41.35	607.0	80.29

14-B	11.65	48.39	11.56	41.70	482.1	85.50
15-F	15.11	49.62	14.69	41.04	602.7	80.41
15-B	11.62	48.02	11.41	41.68	475.6	85.24
16-F	15.52	48.28	14.80	40.56	600.3	80.11
16-B	11.52	48.59	11.35	42.02	477.0	85.20
17-F	15.53	48.12	14.81	40.59	601.3	80.48
17-B	11.57	48.35	11.37	41.70	474.3	84.75
18-F	15.49	48.61	14.58	41.43	604.1	80.21
18-B	11.52	48.49	11.28	42.21	476.2	85.22
Supplementary information: —						

Table 41: MST 01 - Final Visual inspection			
Test Date [YYYY-MM-DD].....:		2025-06-18	—
Sample # 1	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 6	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 7	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 14	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 15	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 16	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 17	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Sample # 18	Findings .....:	☐ Yes ☒ No	
	Nature and position of findings – comments or attach photos		—
Supplementary information: —			

Table 42: MST 05 - Durability of markings		
Test Date [YYYY-MM-DD].....:	2025-06-18	—

Sample #	Markings legible	Not easily removable	No curling	Result
1	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
6	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
7	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
14	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
15	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
16	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
17	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
18	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P
Supplementary information: —				

Table 43: MST 06 - Sharp edge test		
Test Date [YYYY-MM-DD].....:	2025-06-18	—

Sample #	The black indicating tape is visible through the resulting cut.	Result
1	☒ Yes ☐ No	P
6	☒ Yes ☐ No	P
7	☒ Yes ☐ No	P
14	☒ Yes ☐ No	P
15	☒ Yes ☐ No	P
16	☒ Yes ☐ No	P
17	☒ Yes ☐ No	P
18	☒ Yes ☐ No	P
Supplementary information: —		

Table 44: MST 07 - Bypass diode functionality test		
Test Date [YYYY-MM-DD].....:	2025-06-18	—
☐ **Method A**		—
Ambient temperature [°C].....:	N/A	—
Current flow applied [A].....:	N/A	—

Sample #	VFM	VFMrated	VFM = (N × VFMrated) ± 10 %	Result
N/A	N/A	N/A	☐ Yes ☐ No	N/A
N/A	N/A	N/A	☐ Yes ☐ No	N/A
☒ **Method B**				—

Sample #	IV curve after shading			Result
	Diode 1 working properly	Diode 2 working properly	Diode 3 working properly	
1	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	P

6	☒ Yes	☐ No	☒ Yes	☐ No	☒ Yes	☐ No	P
7	☒ Yes	☐ No	☒ Yes	☐ No	☒ Yes	☐ No	P
14	☒ Yes	☐ No	☒ Yes	☐ No	☒ Yes	☐ No	P
15	☒ Yes	☐ No	☒ Yes	☐ No	☒ Yes	☐ No	P
16	☒ Yes	☐ No	☒ Yes	☐ No	☒ Yes	☐ No	P
17	☒ Yes	☐ No	☒ Yes	☐ No	☒ Yes	☐ No	P
18	☒ Yes	☐ No	☒ Yes	☐ No	☒ Yes	☐ No	P
Supplementary information: —							

Table 45: MST 33a - Test for general screw connections

Test Date [YYYY-MM-DD]..... :	—	—

Sample #	Thread diameter [mm]	Torque [Nm]	Result
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Supplementary information:

Table 46: MST 33b - Test for locking screws

Test Date [YYYY-MM-DD]..... :	N/A	—

Sample #	Thread diameter [mm]	Torque [Nm]	Result
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Supplementary information:

Sample #	—	—

Table 47: MST 04 - Insulation thickness test

Test Date [YYYY-MM-DD]..... :	—	—

Max. System voltage ..... :	—	—
Thickness of insulation acc. datasheet ..... :	—	—
Required thickness of insulation..... :	—	—
Measurement uncertainty ..... :	—	—
Location	Measured thickness (including uncertainty) μ m	Result
A	—	—
B	—	—
C	—	—
D	—	—
E	—	—
F	—	—
G	—	—
H	—	—
I	—	—
J	—	—
K	—	—
L	—	—
Supplementary information: Min. requirement acc. to table 3/4 of IEC 61730-1.		

Annex 1: Constructional details / Bill of Material (BOM)

5.3.2 Internal wiring		
Cell connector 1		
Manufacturer:	Type:	Material:
JA Solar Technology Co. Ltd.	ϕ0.40 x 6mm	Sn60%Pb40%., base CU
Thickness [μm]:	Dimension [mm]:	Coatings:
—	ϕ0.30 x 5mm	Sn60%Pb40%.
Supplementary Information: None.		
Cell connector 2		
Manufacturer:	Type:	Material
TELISON	ϕ0.40 x 6mm	Sn60%Pb40%., base CU
Thickness [μm]:	Dimension [mm]:	Coatings:
—	ϕ0.30 x 5mm	Sn60%Pb40%.
Supplementary Information: None.		
Cell connector 3		
Manufacturer:	Type:	Material
JUREN	ϕ0.40 x 6mm	Sn60%Pb40%., base CU
Thickness [μm]:	Dimension [mm]:	Coatings:
—	ϕ0.30 x 5mm	Sn60%Pb40%.
Supplementary Information: None.		
String connector 1		
Manufacturer:	Type:	Material
Changshu Furton Metal Materials Co., Ltd.	Layer thickness15um	Sn60%Pb40%., base CU
Thickness [μm]:	Dimension [mm]:	Coatings:
—	0.26mm	Sn60%Pb40%.
Supplementary Information: None.		
String connector 2		
Manufacturer:	Type:	Material
TELISON	Layer thickness15um	Sn60%Pb40%., base CU
Thickness [μm]:	Dimension [mm]:	Coatings:
—	0.26mm	Sn60%Pb40%.
Supplementary Information: None.		
String connector 3		
Manufacturer:	Type:	Material
JUREN	Layer thickness15um	Sn60%Pb40%., base CU
Thickness [μm]:	Dimension [mm]:	Coatings:
—	0.26mm	Sn60%Pb40%.
Supplementary Information: None.		

5.3.3 External wiring and cables		
Cables 1		
Manufacturer:	Type:	Material:
JA Solar Technology Co. Ltd.	H1Z2Z2-K 1x4.0 mm^2, DC1500V, -40°C to 90°C	Base Cu
Diameter [mm^2]:	Length [mm]:	Max. Temperature:
		120°C
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No.	☒ IEC 62930 ☐ EN 50618	—

Supplementary Information: None.		
Cables 2		
Manufacturer:	Type:	Material:
EGE KABLO ENDUSTRİ MALZ. SAN. VE TİC. A.Ş.	H1Z2Z2-K 1x4.0 mm², DC1500V, -40°C to 90°C	Base Cu
Diameter [mm²]:	Length [mm]:	Max. Temperature:
4.0	300	120°C
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. TUV R 60162320	☒ IEC 62930 ☐ EN 50618	—
Supplementary Information: None.		
Cables 3		
Manufacturer:	Type:	Material:
QC Solar (Suzhou) Corporation	H1Z2Z2-K 1x4.0 mm², DC1500V, -40°C to 90°C	Base Cu
Diameter [mm²]:	Length [mm]:	Max. Temperature:
		120°C
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No. TUV R 50447239	☒ IEC 62930 ☐ EN 50618	—
Supplementary Information: None.		
Cables 4		
Manufacturer:	Type:	Material:
SCON Endüstri San. ve Tic. A.Ş.	HALOGEN FREE LOW SMOKE PV 1x4.0 mm², DC1500V, -40°C to 90°C	Base Cu
Diameter [mm²]:	Length [mm]:	Max. Temperature:
		120°C
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No. TUV R 50657275	☒ IEC 62930 ☐ EN 50618	—
Supplementary Information: None.		
Cables 5		
Manufacturer:	Type:	Material:
ZHEJIANG TWINSEL ELECTRONIC TECHNOLOGY CO., LTD.	H1Z2Z2-K 1x4.0 mm², DC1500V, -40°C to 90°C	Base Cu
Diameter [mm²]:	Length [mm]:	Max. Temperature:
		120°C
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No. R 50331848 0001	☒ IEC 62930 ☒ EN 50618	—
Supplementary Information: None.		

5.3.4 Connectors 1		
Manufacturer:	Type:	Class:
QC Solar (Suzhou) Corporation	QC4.10-cds	A
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	35A	100°C
IP-rating:	Locked:	—
IP68	☒ Yes / ☐ No	—
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No. TUV R 50505605	☒ IEC 62852	—

Supplementary Information: None.		
5.3.4 Connectors 2		
Manufacturer:	Type:	Class:
STAUBLI	PV-KST4-EVO2	A
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	50A	115°C
IP-rating:	Locked:	—
IP68	☒ Yes / ☐ No	—
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No. TUV R 60127169	☒ IEC 62852	—
Supplementary Information: None.		
5.3.4 Connectors 3		
Manufacturer:	Type:	Class:
Suzhou Xtong Photovoltaic Tech. Co. Ltd..	PV-XT101.1	A
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	50A	100°C
IP-rating:	Locked:	—
IP68	☒ Yes / ☐ No	—
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No. TUV R 5056873	☒ IEC 62852	—
Supplementary Information: None.		
5.3.4 Connectors 4		
Manufacturer:	Type:	Class:
ZHEJIANG TWINSEL ELECTRONIC TECHNOLOGY CO., LTD.	PV-SY02	A
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	50A	
IP-rating:	Locked:	—
IP68	☒ Yes / ☐ No	—
Certified: ☒ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No. TUV SUD B 083073 0011 Rev. 03	☒ IEC 62852	—
Supplementary Information: None.		

5.3.5 Junction boxes 1		
Manufacturer:	Type:	Class:
JA Solar Technology Co. Ltd.	PVJB-JA-005	II
IP-rating:	Dimensions (l x w x h) [mm²]:	Weight [g]:
IP68	—	—
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	30	85°C
Electrical Termination cell side:	Electrical Termination cell side:	Number of Bypass Diodes
Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	3
Potted:	Certified: ☒ Yes / ☐ No	Standards:
☒ Yes / ☐ No	Certifier and Cert. No.	☒ IEC 62790
Supplementary Information: None.		
5.3.5 Junction boxes 2		

Manufacturer:	Type:	Class:
QC Solar (Suzhou) Corporation	3Qxy	II
IP-rating:	Dimensions (l x w x h) [mm²]:	Weight [g]:
IP68	—	—
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	35	
Electrical Termination cell side:	Electrical Termination cell side:	Number of Bypass Diodes
Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	3
Potted:	Certified: ☒ Yes / ☐ No	Standards:
☒ Yes / ☐ No	Certifier and Cert. No. TUV R 50510013	☒ IEC 62790
5.3.5 Junction boxes 3		
Manufacturer:	Type:	Class:
ZHEJIANG TWINSEL ELECTRONIC TECHNOLOGY CO., LTD.	PV-SY030	II
IP-rating:	Dimensions (l x w x h) [mm²]:	Weight [g]:
IP68	—	—
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	30	85°C
Electrical Termination cell side:	Electrical Termination cell side:	Number of Bypass Diodes
Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	3
Potted:	Certified: ☒ Yes / ☐ No	Standards:
☒ Yes / ☐ No	Certifier and Cert. No. TUV SUD B 083073 0022 Rev. 08	☒ IEC 62790
5.3.5 Junction boxes 4		
Manufacturer:	Type:	Class:
Ekinler Endüstri San. ve Tic. A.S.	Ekinler Endüstri San. ve Tic. A.S.	II
IP-rating:	Dimensions (l x w x h) [mm²]:	Weight [g]:
IP68	—	—
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	35	85°C
Electrical Termination cell side:	Electrical Termination cell side:	Number of Bypass Diodes
Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	3
Potted:	Certified: ☒ Yes / ☐ No	Standards:
☒ Yes / ☐ No	Certifier and Cert. No. TUV SUD B 001051 0004 Rev. 00	☒ IEC 62790
5.3.5 Junction boxes 5		
Manufacturer:	Type:	Class:
SCON Endüstri San. ve Tic.	MAX	II

A.Ş.		
IP-rating:	Dimensions (l x w x h) [mm²]:	Weight [g]:
IP68	—	—
Max. Voltage:	Max. Current:	Max. Temperature:
DC 1500V	35	85°C
Electrical Termination cell side:	Electrical Termination cell side:	Number of Bypass Diodes
Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	Soldered ☒ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	3
Potted:	Certified: ☒ Yes / ☐ No	Standards:
☒ Yes / ☐ No	Certifier and Cert. No. 44 780 23 406749-267	☒ IEC 62790

5.3.6 Frontsheets and backsheets		
Frontsheet 1		
Used as: ☐ Basic Insulation ☒ Reinforced Insulation		
Total Dimensions (width x length) [mm]: 2382x1134		
Material:	Manufacturer:	Type:
Glass	XINYI	Double coated glass
Thickness [mm]:	Heat strength.: ☒ Yes / ☐ No	Coating: ☒ Yes / ☐ No
2.0	☒ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☒ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No. —	—
Supplementary Information: None.		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Total Thickness [mm]:	No of layers:	—
—	—	—
Layer No. 1 (air side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:

—	Certifier and Cert. No.—	—
Layer No. 2	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 4	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Backsheet 1		
Used as: ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
Glass	XINYI	Double coated glass
Thickness [mm]:	Heat strength.: ☐ Yes / ☐ No	Coating: ☐ Yes / ☐ No
—	☐ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☐ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No.—	—
Supplementary Information: —		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☒	Used as: ☐ Basic Insulation ☒ Reinforced Insulation	
Material:	Manufacturer:	Type:

FFC/PET/FFC	—	FFC-JW3010（Plus）
Total Thickness [mm]:	No of layers:	—
0.310	3	—
Layer No. 1 (air side)	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
FFC	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI 120 °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert.	—
Layer No. 2	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
PET	—Co., Ltd.	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI 120 °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
White	Certifier and Cert.	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
FFC	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI 120 °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
—	Certifier and Cert.	—
Layer No. n (Encapsulation side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.	—
Supplementary Information: —		
Frontsheet 2		
Used as: ☐ Basic Insulation ☒ Reinforced Insulation		
Total Dimensions (width x length) [mm]: 2382x1134		
Material:	Manufacturer:	Type:
Glass	KIBING	Double coated glass
Thickness [mm]:	Heat strength.: ☒ Yes / ☐ No	Coating: ☒ Yes / ☐ No
2.0	☒ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☒ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No. —	—

Supplementary Information: None.		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Total Thickness [mm]:	No of layers:	—
—	—	—
Layer No. 1 (air side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Layer No. 2	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 4	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		

Backsheet 2		
Used as: ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
Glass	KIBING	Double coated glass
Thickness [mm]:	Heat strength.: ☐ Yes / ☐ No	Coating: ☐ Yes / ☐ No
—	☐ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☐ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No.—	—
Supplementary Information: —		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☒	Used as: ☐ Basic Insulation ☒ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	FFC-JW3010（Plus）
Total Thickness [mm]:	No of layers:	—
—	3	—
Layer No. 1 (air side)	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert.	—
Layer No. 2	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
White	Certifier and Cert.	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III

Colour:	Certified ☐ Yes / ☒ No	Standards:
—	Certifier and Cert.	—
Layer No. n (Encapsulation side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.	—
Supplementary Information: —		
Frontsheet 3		
Used as: ☐ Basic Insulation ☒ Reinforced Insulation		
Total Dimensions (width x length) [mm]: 2382x1134		
Material:	Manufacturer:	Type:
Glass	ÇAĞDAŞ	Double coated glass
Thickness [mm]:	Heat strength.: ☒ Yes / ☐ No	Coating: ☒ Yes / ☐ No
2.0	☒ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☒ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No. —	—
Supplementary Information: None.		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Total Thickness [mm]:	No of layers:	—
—	—	—
Layer No. 1 (air side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Layer No. 2	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—

Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 4	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Backsheet 3		
Used as: ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
Glass	ÇAĞDAŞ	Double coated glass
Thickness [mm]:	Heat strength.: ☐ Yes / ☐ No	Coating: ☐ Yes / ☐ No
—	☐ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☐ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No.—	—
Supplementary Information: —		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☒	Used as: ☐ Basic Insulation ☒ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	FFC-JW3010（Plus）
Total Thickness [mm]:	No of layers:	—
—	3	—
Layer No. 1 (air side)	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	

Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert.	—
Layer No. 2	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
—	Certifier and Cert.	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
FFC	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
—	Certifier and Cert.	—
Layer No. n (Encapsulation side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.	—
Supplementary Information: —		
Frontsheet 4		
Used as: ☐ Basic Insulation ☒ Reinforced Insulation		
Total Dimensions (width x length) [mm]: 2382x1134		
Material:	Manufacturer:	Type:
Glass	EUROPEN	Double coated glass
Thickness [mm]:	Heat strength.: ☒ Yes / ☐ No	Coating: ☒ Yes / ☐ No
2.0	☒ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☒ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No. —	—
Supplementary Information: None.		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—

Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Total Thickness [mm]:	No of layers:	—
—	—	—
Layer No. 1 (air side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Layer No. 2	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—
Layer No. 4	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Backsheet 1		
Used as: ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
Glass	EUROPEN	Double coated glass

Thickness [mm]:	Heat strength.: ☐ Yes / ☐ No	Coating: ☐ Yes / ☐ No
—	☐ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☐ No	Certified: ☐ Yes / ☒ No	Standards:
Description	Certifier and Cert. No.—	—
Supplementary Information: —		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.—	—
Supplementary Information: —		
Multi-layer ☒	Used as: ☐ Basic Insulation ☒ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	FFC-JW3010（Plus）
Total Thickness [mm]:	No of layers:	—
—	3	—
Layer No. 1 (air side)	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert.	—
Layer No. 2	Used as: ☒ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
—	Certifier and Cert.	—
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☒ TI °C ☐ RTI °C	☒ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
—	Certifier and Cert.	—
Layer No. n (Encapsulation side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:

—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.	—
Supplementary Information: —		

5.3.7 Insulation barriers / Edge sealant		
Used as: ☐ Functional ☐ Basic Insulation ☐ Reinforced Insulation		
Total Dimensions (width x length) [mm]:		
Material:	Manufacturer:	Type:
—	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.	—
Supplementary Information: —		
5.3.9 Encapsulants 1		
Used as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Total Dimensions (width x length) [mm]:		
Material: (Frontsheet side)	Manufacturer:	Type:
EPE EVA	Hangzhou Fumao Photovoltaic Materials Co., LTD	EP304 F406PS
Thickness [mm]	Thermal Index:	Material Group:
0.30 ~ 0.75 mm	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert. No. —	—
Material: (Backsheet side)	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No. —	—
Supplementary Information: None.		
5.3.9 Encapsulants 2		
Used as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Total Dimensions (width x length) [mm]:		
Material: (Frontsheet side)	Manufacturer:	Type:
EPE EVA POE	SVECK	SV-15296P/SV-15297P CO-556/CO-557 SE-556/ SE-557
Thickness [mm]	Thermal Index:	Material Group:
0.45 ~ 0.75 mm	☐ RTE °C ☐ TI °C	☐ I ☐ II

	☐ RTI °C	☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert. No. —	—
Material: (Backsheet side)	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No. —	—
Supplementary Information: None.		
5.3.9 Encapsulants 3		
Used as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Total Dimensions (width x length) [mm]:		
Material: (Frontsheet side)	Manufacturer:	Type:
EPE EVA POE	UPS	EU307 EPET306 PT306
Thickness [mm]	Thermal Index:	Material Group:
0.30 ~ 0.75 mm	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert. No. —	—
Material: (Backsheet side)	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No. —	—
Supplementary Information: None.		
5.3.9 Encapsulants 4		
Used as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Total Dimensions (width x length) [mm]:		
Material: (Frontsheet side)	Manufacturer:	Type:
EPE EVA POE	CAPSUNN	CPS-V-001 CPS-E-001 CPS-P-001
Thickness [mm]	Thermal Index:	Material Group:
0.30 ~ 0.75 mm	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert. No. —	—
Material: (Backsheet side)	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III

Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No. —	—
Supplementary Information: None.		
5.3.9 Encapsulants 4		
Used as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Total Dimensions (width x length) [mm]:		
Material: (Frontsheet side)	Manufacturer:	Type:
	SOLINE	EVASOL EPESOL POESOL
Thickness [mm]	Thermal Index:	Material Group:
0.30 ~ 0.75 mm	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☒ No	Standards:
	Certifier and Cert. No. —	—
Material: (Backsheet side)	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No. —	—
Supplementary Information: None.		

5.5.2.3 Polymeric materials used as electrical insulation		
Location: —		
Application ☐ External part ☐ Support of live parts ☐ Mechanical functions		
Used as: ☐ Functional ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
—	—	—
Flammability class:	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No.	—
Supplementary Information: —		
Location: —		
Application ☐ External part ☐ Support of live parts ☐ Mechanical functions		
Used as: ☐ Functional ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
—	—	—
Flammability class:	—	—
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
—	Certifier and Cert. No. —	—

Supplementary Information: —

5.3.10 Bypass Diodes		
Manufacturer:	Type:	—
SCON Endüstri San. ve Tic. A.Ş.	40SQ045	—
Nominal current of diode I_F (A)	40	—
R_{THJ-C} (K/W) / R_{THJ-L} (K/W)	—	—
Max. T_J (°C)	200	—
Max. V_F at I_F (V)	45	—
Supplementary Information: None.		
5.3.10 Bypass Diodes 2		
Manufacturer:	Type:	—
ZHEJIANG TWINSEL ELECTRONIC TECHNOLOGY CO., LTD	SBRB3050TS	—
Nominal current of diode I_F (A)	30	—
R_{THJ-C} (K/W) / R_{THJ-L} (K/W)	—	—
Max. T_J (°C)	200	—
Max. V_F at I_F (V)	50	—
Supplementary Information: None.		
5.3.10 Bypass Diodes 3		
Manufacturer:	Type:	—
JA Solar Technology Co. Ltd.	MK5045	—
Nominal current of diode I_F (A)	50	—
R_{THJ-C} (K/W) / R_{THJ-L} (K/W)	—	—
Max. T_J (°C)	200	—
Max. V_F at I_F (V)	45	—
Supplementary Information: None.		
5.3.10 Bypass Diodes 4		
Manufacturer:	Type:	—
QC Solar (Suzhou) Corporation	QCM5045	—
Nominal current of diode I_F (A)	50	—
R_{THJ-C} (K/W) / R_{THJ-L} (K/W)	—	—
Max. T_J (°C)	200	—
Max. V_F at I_F (V)	45	—
Supplementary Information: None.		

5.4.2 / 5.4.4 Screws			
Application	Kind of screw:	Dimension (diameter/length)	Material
—	—	—	—
—	—	—	—
—	—	—	—
Supplementary Information: —			

5.4.3 Rivets		
Application	Dimension (diameter/length)	Material:
—	—	—
—	—	—

—	—	—
Supplementary Information: —		

5.4.6 Adhesives		
For Junction Boxes 1		
Manufacturer:	Type:	—
Shanghai Huitian New Material Co.,Ltd.	HT906Z, White	—
—	—	—
—	—	—
Additional function as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☒ TI 200 °C ☐ RTI °C	☒ I ☐ II ☐ III
Supplementary Information: None.		
For Junction Boxes 2		
Additional function as: ☐ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Manufacturer:	Type:	—
Minghao	MH-3667-A-B, White	—
—	—	—
—	—	—
Additional function as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☒ TI 200 °C ☐ RTI °C	☒ I ☐ II ☐ III
Supplementary Information: None.		
For Junction Boxes 3		
Additional function as: ☐ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Manufacturer:	Type:	—
Tonsan	1527, White	—
—	—	—
—	—	—
Additional function as: ☒ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Thickness [mm]	Thermal Index:	Material Group:
—	☐ RTE °C ☒ TI 200 °C ☐ RTI °C	☒ I ☐ II ☐ III
Supplementary Information: None.		

5.5.3 Metallic Materials		
Frame / Corner joint / Backrail:		
Manufacturer:	Type:	Dimension
JA Solar Technology Co. Ltd.	6005-T6	—
Xuchu	6005-T6	—
Yonz&Yongzhen	6005-T6	—
Panda	6005-T6	—
Arkat	6005-T6	—
Supplementary Information: —		
Others:		

Manufacturer:	Type:	Dimension
—	—	—
—	—	—
—	—	—
—	—	—
Supplementary Information: —		

Cell 1		
Kind of cell	Manufacturer:	Type:
☒ cSi ☐ CdTe ☐ aSi ☐ CiGs	JA Solar Technology Co. Ltd.	16BB N-type Mono cell
Thickness [μm]:	Dimension [mm]:	Number of busbars:
130 (±13)	210*182 (±1.5)	18
Supplementary Information: None.		
Cell 2		
Kind of cell	Manufacturer:	Type:
☒ cSi ☐ CdTe ☐ aSi ☐ CiGs	JTPV	16BB N-type Mono cell
Thickness [μm]:	Dimension [mm]:	Number of busbars:
130 (±13)	210*182 (±1.5)	18
Supplementary Information: None.		

Cell fixing Tape						
No.	Material	Manufacturer	Type	—	Ratings	—
1	—	—	—	—	—	—
2	—	—	—	—	—	—
3	—	—	—	—	—	—

END OF TEST REPORT