TÜV SÜD – PV-Module Factory Inspection Report	
TÜV SÜD - Branch Address…	

Inspection of Certified PV Modules at the Manufacturing Site

☒ **Initial Factory Inspection** ☐ Follow-up Inspection

Date/Place:

Participants

Applicant Company

TUV SUD Inspector

Position:

Details:

Applicant's Details

Legal Name	
Address	
Contact(s)/Position	
Ph./Fax	
Email	
Website	

Quality Manager's Details

Name	
Address	
Contact(s)/Position	
Ph./Fax	
Email	

Manufacturing Site(s)

Is the certified PV module manufactured in different sites?

☐ **Yes** ☒ **No**

Inspected Site(s):

Factory 1	
Address	
Contact(s)/Position	
Ph./Fax	
Email	

Factory 2	
Address	
Contact(s)/Position	
Ph./Fax	
Email	

Section 1- General Inspection Details

1. List of Certified PV Module(s)

1. Models covered by certification:

2. Technology (mono c-Si, poly s-Si, thin-film (a-Si, CdTe, CIGS)

3. Basic model tested: model name tested at ..

4. Specify differences between basic models and other models of the same product family
…….

5. Production period of tested samples

2. Inspected Production Areas

1. Storage of materials/components	☒ **(refer to section 5.1.1)**
2. Production line and processes	☒ **(refer to section 3 and 5.1.2)**
3. Product Verification Tests	☒ **(refer to section 4)**
4. Quality Assurance	☒ **(refer to section 5)**

3. Existing ISO 9000 Certifications

Issued by:

Date:

Validty:

Section 2 – Critical Components and Materials (with reference to CDF)

Important note for the inspector
The performance of a certified PV module acc. to IEC 61215 / IEC 61646 is critically linked to the materials, components and production processes used to manufacture the module. Modules using identical materials, components and processes, but differing only in size and in output power, form a so-called **product family**. All changes in module design and used materials/components must be notified to TÜV SÜD. TÜV SÜD reserves the right to repeat certain tests according to IECEE Retest Guideline prior to extending the certification to the new models.

2.1 Solar Cell(s)

Solar Cell #1

Type / Specifications	Supplier/Remarks
Technology: **Type:** **Area:** **Thickness:** **Same as CDF:** ☐ **Yes** ☐ **No**	

Solar Cell #2

Type / Specifications	Supplier/Remarks
Technology: **Type:** **Area:** **Thickness:** **Same as CDF:** ☐ **Yes** ☐ **No**	

2.2 Electrical Interconnections

2.2.1 Cell Connection

Description/ Type / Specifications	Supplier/Remarks
Same as Module Specs Form: ☐ **Yes** ☐ **No**	

2.2.2 String Connection

Description/Type / Specifications	Supplier/Remarks
Same as Module Specs Form: ☐ **Yes** ☐ **No**	

2.2.3 Soldering Material Used

Description/Type / Specifications	Supplier/Remarks
Same as Module Specs Form: ☐ Yes ☐ No	

2.3 Cell Encapsulation

2.3.1 Encapsulation Material (top of strings, back of strings)

Material/Type / Specifications	Supplier/Remarks
Same as Module Specs Form: ☐ Yes ☐ No	

2.3.2 Edge Sealing (if any)

Descritpion	Supplier/Remarks
Same as Module Specs Form: ☐ Yes ☐ No	

2.4 Superstrate / Substrate

2.4.1 Front Cover

Material/Type / Specifications	Supplier/Remarks
Same as Module Specs Form: ☐ Yes ☐ No	

2.4.2 Back Cover

Material/Type / Specifications	Supplier/Remarks
Same as Module Specs Form: ☐ **Yes** ☐ **No**	

2.5 Electrical Components

2.5.1 Junction Box

Type / Specifications/Certifications	Supplier/Remarks
Same as CDF: ☒ **Yes** ☐ **No** **Adhesive sealing compound of the box** **Same as Module Specs Form:** ☒ **Yes** ☐ **No** **Specify:**	

Terminals

Type / Specifications/Certifications	Supplier/Remarks
Inside the same junction box **Same as CDF:** ☐ **Yes** ☐ **No**	Same as junction box

2.5.2 Cable

Description/ Type / Specifications	Supplier/Remarks
Same as CDF: ☒ **Yes** ☐ **No**	

2.5.3 Connectors

Description/Type / Specifications	Supplier
Same as CDF: ☐ **Yes** ☐ **No**	

2.5.4 By-pass Diode	
Description/Type / Specifications	Supplier/Remrks
Type: ☐ p / n ☐ Schotky **Specifications** **- Max. junction temperature T_j=** **ºC** **- Max. foreward voltage at IF=** **A $V_{F=}$** **V** **- Max. blocking voltage:** **V** **Number of diodes:** **Cells per diode:** **Same as CDF:** ☐ **Yes** ☐ **No**	

2.6 Mounting Accessories	
2.6.1 Frame	
Description/Type / Specification	Supplier/Remarks
Same as Module Specs Form: ☐ **Yes** ☐ **No**	
2.6.2 Other Mounting Accessories (if any)	
Type / Specification	Supplier/Remarks
N/A	

2.7 Labeling	
Type / Specification	Supplier/Remarks
Barcode label ☐ **Yes** ☐ **No** If yes, does the barcode uniquely identify a model? **Module rating label** ☐ **Yes** ☐ **No** Applied on the back side	

Picture of definitive rating label

Section 3 – Production Processes

3. Production Processes

Certification according to IEC 61215 / IEC 61646 depends also on the production process as well as on the main process parameters.

3.1 Cell Tabbing

☐ Manually ☐ Automatic ☐ Externally

Description of process parameters	Supplier / Remarks
Number of soldering lines: **Process parameters; temperatuers, etc.**	**Working Instruction:** ☐ **Available** ☐ **Attached at the work station** ☐ **….**

3.2 Connection of Cells into Strings

☐ Manually ☐ Automatic ☐ Externally

Description of process parameters	Supplier / Remarks
Length of the soldered ribbon: **Min. distance between cells:** Distance holder: … ☐ Yes ☐ No	**Working Instruction :** ☐ **Available** ☐ **Attached at the work station** ☐ **….**

3.3 Interconnection of Strings

☐ Manually ☐ Automatic ☐ Externally

Description of process parameters	Supplier/Remarks
Min. distance: Distance holder: ☐ Yes ☐ No	**Temperature of soldering** **°C** **Working Instruction** ☐ **Available** ☐ **Attached at the work station** ☐ **….**

3.4 Preparation of Layers (sandwich)

☐ Manually ☐ Automatic ☐ Externally

Process description/parameters	Remarks
	Working Instruction : ☐ **Available** ☐ **Attached at the work station** ☐ **….**

3.5 Lamination Process

Type / Specification Laminator	Supplier / Remarks
Type: **Vacuum pressure:** **Temperature:** ºC **Temperature uniformity:** ºC **Lamination duration:** min **Process data recorded:** ☐ Yes ☐ No **Monitoring of process parameters and function check prior to use available?** ☐ Yes ☐ No	Working Instruction : ☐ **Available** ☐ **Attached at the work station** ☐ **….**

3.5.1 Curing

Type / Specification climatic chamber	Supplier / Remarks

3.6 Framing

☐ Manually ☐ Automatic ☐ External

	Supplier/ Remarks
	Working Instruction …. ☐ **Available** ☐ **Attached at the work station** ☐ **….**

Section 4 – Product Verification Tests (PVT)

4. PVT's
This section takes a look at the verifications made throughout the production processes.

4.1 Checking/Sorting of Cells	
Type / specification of solar simulator	Supplier of simulator / Remarks
Computer data base available? ☐ Yes ☐ No Checks done on: ☐ All cells ☐ Randomly on samples	

4.2 Intermediate Controls	
Are intermediate tests carried out during production? ☐ **(I-V),P** ☐ **Spectral** ☐ **Functional** ☐ **Other** *Specify tests on cells, laminate, module*	

4.3 Final Controls	
Are final tests carried out at the end of the production? ☐ **(I-V),P** ☐ **Spectral** ☐ **Functional** ☐ **Other** *Specify tests on cells, laminate, module*	**Working instruction:….** **Temp.. ºC ± ºC**

4.3 PV-Module Process Monitoring	
Processes monitored? ☐ **Barcode** ☐ **Work-progress slip** ☐ **Other** *Specify*	

Section 5 - Quality Assurance

5. Quality Assurance

This section is based on Permanent Document CIG 021 with regard to Quality Assurance aspects considered particularly important to the production of the certified modules.

Quality management system	☐ Yes	☐ No	Since:
Quality management manual	☐ Yes	☐ No	Last revision:
Quality manager	☐ Yes	☐ No	Name: Zhu Chenglong

Remarks:

5.1 Premises and Environmental Conditions

Environmental conditions in the production and storage spaces can have an influence on the quality of the PV modules.

5.1.1 Storage / Handling of Components/Materials

Description of the conditions: temperature, illumination, neatness, order

5.1.2 Production Areas

Description of conditions : temperature, illumination, neatness, order

5.2 Incoming Goods Inspections

Are materials, components and sub-assemblies which have a safety implication on the finished product verified by the manufacturer as complying with appropriate specification including the Certification Marks?	☐ yes ☐ no
Remarks	……
	……

If the manufacturer relies on Certificates of Conformity, do they clearly identify the product, quantity of items covered, the specification to which the products conform, the production date and are they signed or stamped by a person authorised by the supplier? *Remarks*	☐ yes ☐ no …… ……
Are non-conforming products clearly identified and/or segregated to prevent unauthorised use? *Remarks*	☐ yes ☐ no …… ……

5.3 Tests and Calibrations (control of output power)

Description of the methods (no. of calibrated modules in use, recalibration cycles for calibration/reference modules, time interval for inspection of solar simulator performance, production tolerances)
No. of calibrated modules: 0807230040; 0807210194; 0807240046; 0809190114; 809210089; recalibration cycles : 2 h

5.3.1 Handling of Test and Calibration Equipment

List of the used measurement and test equipment (reference modules, temperature sensors, IV-curve measuring equipment,etct): *reference modules, temperature sensors, IV-curve measuring equipment. We test the reference module with IV-curve measuring equipment for every two hours*

5.4 Documentation of Process Data

Description of the methods (data base, …): *data base and inspection station record*

5.4 Handling of Defective and Non-Conforming Products

Is there a procedure? ☐ Yes ☐ No

Describe how it is done in practice: *《control procedure of defective products》*

5.5 Customer Complaints

If no customer complaints have been received then the following questions should be applied to the process:

Is there a procedure?	☐ yes ☐ no
Are records kept of customer complaints?	☐ yes ☐ no …… ……
Are corrective actions regarding customer complaints recorded?	☐ yes ☐ no …… ……
Does the manufacturer review customer complaints?	☐ yes ☐ no …… ……

5.6 Changes to Certified Products

Is there a parts list or similar evidence available specifying the components/parts to be used during production/ assembly of certified products?	☐ yes ☒ no …… ……
Is there evidence that this parts list is under the control of the Licence Holder?	☐ yes ☐ no …… ……

5.7 Warranty

Product: ☐ years

Module output power: ☐ years

Section 6 - Conclusions

Did the inspection show any deficiencies?

☐ Critical	☐ Important	☐ Minor	☐ None
Certification not granted	CA's to be confirmed Certification granted upon CA's	CA's checked during next visit Certification granted	Grant certification

CA=Corrective Action

Remarks from the inspector, corrective measures and recommendations

General:

Production process:

Recommendations

Quality control and quality assurance:

Recommendations

Place / Date: ....
(Signature: Inspector)

Place / Date: ....
(Signature: Quality control manager)

Note.
A complete product description is available through component and material data sheets