TÜV Rheinland (Shanghai) Co., Ltd.

Test Report

Photovoltaic module qualification
according to IEC 61701:2011

TÜV Report No. 15062178.001

Shanghai, October 2013

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Test report No.: *Prüfbericht - Nr.:*	**15062178.001**
Client (Customer No. + address): *Auftraggeber (Kunden-Nr. + Adresse):*	**Nanjing Daqo New Energy Co., Ltd.** *No.28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu 211153 P.R.China*
Test Item: *Gegenstand der Prüfung:*	Photovoltaic (PV) Module(s) **Date of receipt:** *Eingangsdatum:* 28/06/2013
Identification: *Bezeichnung:*	DQxxxMSDa (xxx=270-325, in steps of 5) DQxxxMSCa (xxx=225-270, in steps of 5) DQxxxMSBa (xxx=205-245, in steps of 5) DQxxxPSDa (xxx=260-315, in steps of 5) DQxxxPSCa (xxx=205-260, in steps of 5) DQxxxPSBa (xxx=180-235, in steps of 5)
Order No.: *Auftragsnummer:*	154020019 **Quotation No.:** *Angebotsnummer:* 52078223
Testing location: *Prüfort:*	**TÜV Rheinland (Shanghai) Co., Ltd.** B1-13F No. 177, Lane 777, West Guangzhong Road, Zhabei District Shanghai 200072, P. R. China
Test specification: *Prüfgrundlage:*	**IEC 61701:2011**, edition 2.0: "Salt mist corrosion testing of photovoltaic (PV) modules" **Severity 6**
Test Result: *Prüfergebnis:*	All of the required tests were passed according the pass criteria outlined in the test specification noted above. It is therefore declared; that the photovoltaic modules of the aforementioned types fulfill the requirements and it is recommended that certification should be granted.

tested by / *geprüft:*

Date *Datum*	Project Engineer/ Martin Zhu *Title/Name*	Signature *Unterschrift*
08/10/2013		

reviewed by / *kontrolliert:*

Date *Datum*	Technical Certifier/ Gary Zhou *Title/Name*	Signature *Unterschrift*
14/10/2013		

Other Aspects / *Sonstiges:*

The test is performed on DQ260PSCa as representative module type.

Address/es of the manufacturing site/s:

Name / Description:	Nanjing Daqo New Energy Co., Ltd.
Street:	No.28 Yilong Road, Jiangning Development Zone
Postcode / City, Country:	Nanjing, Jiangsu 211153, P.R. China
Type of production:	Crystalline PV-module
Inspection report No:	15037444.002

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Summary of testing

History of certification:

Subject	Module type	Report no.	Certificate no.	Date of issue
Basic qualification EN IEC 61215	Type with 5” mono-crystalline cell: DQ***MFAa (***=165-190, in steps of 5) Type with 6” poly-crystalline cell: DQ***PSBa (***=180-220, in steps of 5) DQ***PSCa (***=205-245, in steps of 5)	15037935.001	PV 50182934 Page 1	11.06.2010
Basic qualification EN IEC 61730	See above	15037936.001	PV 50184235 Page 1	08.07.2010
Add Junction Box	Type with 5” mono-crystalline cell type: DQ***MFAa (***=165-190, in steps of 5) Type with 6” poly-crystalline cell type: DQ***PSBa (***=180-220, in steps of 5) DQ***PSCa (***=205-245, in steps of 5)	15037935.002	N/A	N/A
Add Junction Box	See above	15037936.002	N/A	N/A
Co License	With 5” mono-crystalline cell type: NH-***M72A (***=165-190 in steps of 5) With 6” poly-crystalline cell type: NH-***PO (***=180-220 in steps of 5) NH-***P (***=205-245 in steps of 5)	15037935.003	PV 50198390 Page 1	09.03.2011
Co License	See above	15037936.003	PV 50198394 Page 1	09.03.2011
Add Junction Box	Type with 5” mono-crystalline cell: DQ***MFAa (***=165-190, in steps of 5) Type with 6” poly-crystalline cell: DQ***PSBa (***=180-220, in steps of 5) DQ***PSCa (***=205-245, in steps of 5)	15037935.004	Declaration	14.06.2011
Add Junction Box	See above	15037936.004	Declaration	14.06.2011
Co License	Type with 5” mono-crystalline cell: DQ***MFAa (***=165-190, in steps of 5) Type with 6” poly-crystalline cell: DQ***PSBa (***=180-220, in steps of 5) DQ***PSCa (***=205-245, in steps of 5)	15037935.005	PV50214137 Page1	21.10.2011
Co License	See above	15037936.005	PV50214139 Page 1	21.10.2011

Extension to alternative materials EN IEC 61215	With 6” mono c-si cell types: DQxxxMSDa (xxx=270-325, in steps of 5, 72pcs) DQxxxMSCa (xxx=225-270, in steps of 5, 60pcs) DQxxxMSBa (xxx=205-245, in steps of 5, 54pcs) With 6” poly c-si cell types: DQxxxPSDa (xxx=260-315, in steps of 5, 72pcs) DQxxxPSCa (xxx=205-260, in steps of 5, 60pcs) DQxxxPSBa (xxx=180-235, in steps of 5, 54pcs)	15037935.007	PV50214137 Page3	17.07.2012
Extension to alternative materials EN IEC 61730	See above	15037936.007	PV50214139 Page 3	17.07.2012
Extension to alternative junction box EN IEC 61215	DQxxxMFAa (xxx=165-210, in steps of 5)	15037935.009	Declaration	06.06.2013
Extension to alternative junction box EN IEC 61730	See above	15037936.009	Declaration	06.06.2013
Extension to alternative frame EN IEC 61215	DQxxxPSCa (xxx=205-260, in steps of 5) DQxxxPSBa (xxx=180-235, in steps of 5) DQxxxMSCa (xxx=225-270, in steps of 5) DQxxxMSBa (xxx=205-245, in steps of 5)	15037935.010	Declaration	19.06.2013
Extension to alternative frame EN IEC 61730	See above	15037936.010	Declaration	19.06.2013
Extension to fire certifcate EN IEC 61730	5” mono c-Si families: DQxxxMFAa (xxx=165-210, in steps of 5) 6” mono c-Si families: DQxxxMSDa (xxx=270-325, in steps of 5) DQxxxMSCa (xxx=225-270, in steps of 5) DQxxxMSBa (xxx=205-245, in steps of 5) 6” poly c-Si families: DQxxxPSDa (xxx=260-315, in steps of 5) DQxxxPSCa (xxx=205-260, in steps of 5) DQxxxPSBa (xxx=180-235, in steps of 5)	15037936.011	PV 50184235 Page 4	26.06.2013

Extension to alternative materials EN IEC 61215	With 6” mono c-Si cells: DQxxxMSDa (xxx=270-325, in steps of 5) DQxxxMSCa (xxx=225-270, in steps of 5) DQxxxMSBa (xxx=205-245, in steps of 5) With 6” poly c-Si cells: DQxxxPSDa (xxx=260-315, in steps of 5) DQxxxPSCa (xxx=205-260, in steps of 5) DQxxxPSBa (xxx=180-235, in steps of 5) With 5” mono c-Si cells: DQxxxMFAa (xxx=165-210, in steps of 5)	15037935.011	Declaration	22.07.2012
Extension to alternative materials EN IEC 61730	See above	15037936.011	Declaration	22.07.2012

Summary of test locations:

All tests were performed at TÜV Rheinland (Shanghai) Co., Ltd.

According to the inquiry the resistance to salt mist of photovoltaic (PV) modules should be assessed in accordance with IEC 61701:2011. For the qualification of the modules to this test initial and final control measurements were performed before and after the salt mist corrosion testing. The measurements included relative power measurements, insulation testing and visual inspection. The maximum permissible power degradation of 5% must not be exceeded. Furthermore the minimum requirements for the insulation test and wet leakage test as defined in IEC 61215:2005 10.3 and 10.15 have to be met. No major visual defects as defined in IEC 61215 shall occur.
The test of the requirements of IEC 61701:2011 were all fulfilled according to its regulations of the pass criteria. The above listed module types have passed all tests of the IEC 61215:2005 standard before salt mist resistance test was applied (see history of certification)

General information

Abbreviations used in the report:			
Pmpp	– Maximum power	Vmpp	– Maximum power voltage
Impp	– Maximum power current	Voc	– Open circuit voltage
Isc	– Short circuit current	FF	– Fill factor
STC	– Standard Test Conditions		

Possible test case verdicts:	
- test case does not apply to the test object ..... :	N/A
- test object does meet the requirement ..... :	Pass (P)
- test object does not meet the requirement ..... :	Fail (F)

Date(s) of performance of tests ..... :	From 06/07/2013 until 26/09/2013

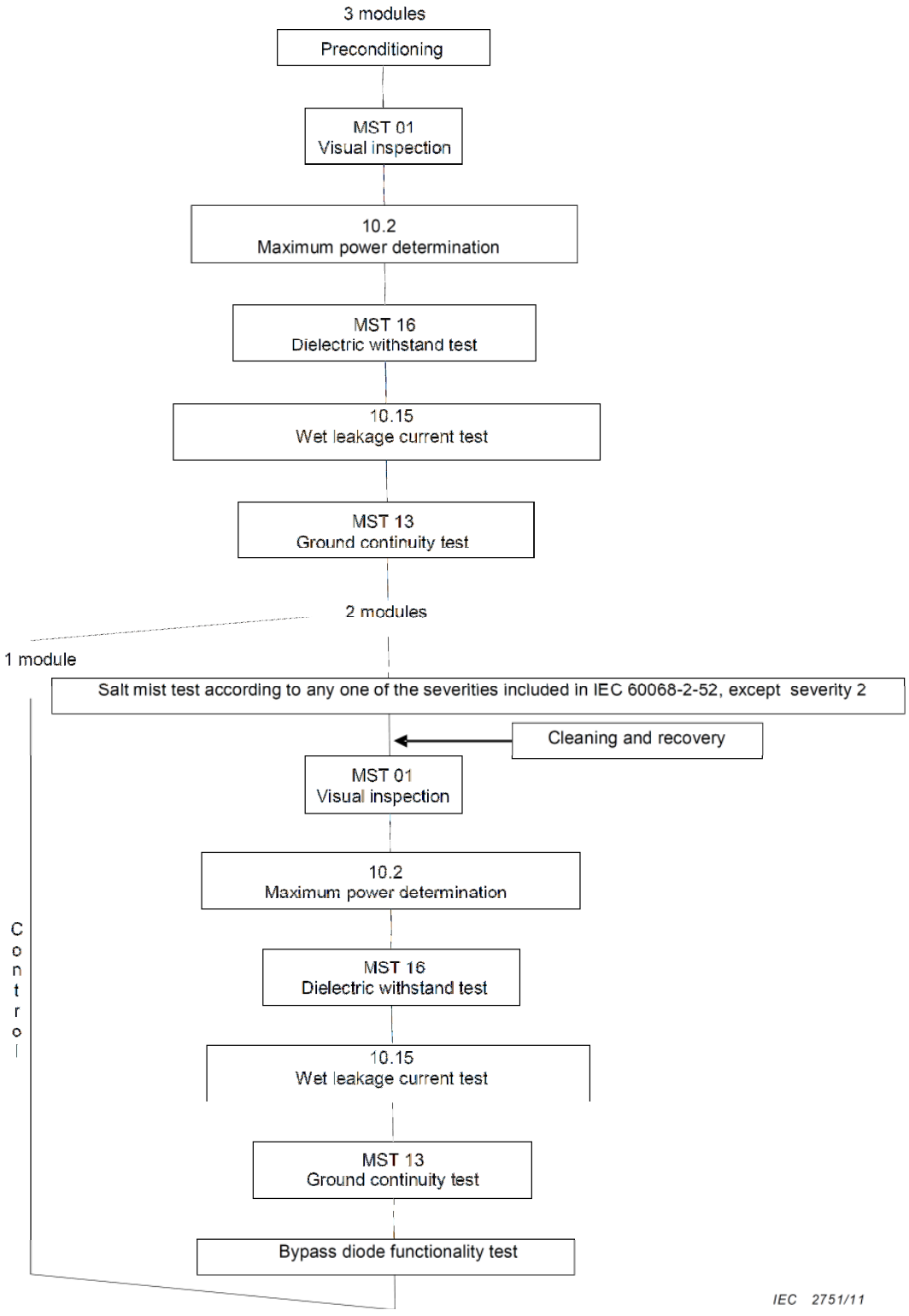
General remarks:

The test verdicts 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 testing laboratory.
"(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 point is used as the decimal separator.

List of test samples

Module type		
Sample #	Sample S/N	Remarks (cell/EVA/Back sheet/Junction box/Glass)
1	DQ 0313060502002	6" poly 60pcs / F806 / BS-W250-S-FA20-LE / PV-JM801-2 / CSG(Tempered Patterned Low Iron Glass)
2	DQ 0313060502005	6" poly 60pcs / F806 / BS-W250-S-FA20-LE / PV-JM801-2 / CSG(Tempered Patterned Low Iron Glass)
3	DQ 0313060502008	6" poly 60pcs / F806 / BS-W250-S-FA20-LE / PV-JM801-2 / CSG(Tempered Patterned Low Iron Glass)
Supplementary information: N/A		



NOTE 1 Preconditioning and tests 10.2 and 10.15 are taken from IEC 61215. Tests MST 01, MST 13 and MST 16 are taken from IEC 61730-2.

NOTE 2 The control module should be used as a check every time the test modules are measured to evaluate the effect of the salt mist test.

IEC 61701 – Salt mist corrosion testing of photovoltaic (PV) modules	
Requirement + Test / Remark	Verdict

Tables

Visual inspection (Initial) (MST 01)

Test Date [DD/MM/YYYY]..... :	08/07/2013	—
Sample #	Nature and position of initial findings	—
1	no visual defects	P
2	no visual defects	P
3	no visual defects	P
Supplementary information: N/A		

Maximum power determination (Initial) (10.2)

Test Date [DD/MM/YYYY]..... :			08/07/2013			—
Module temperature [°C]..... :			Corrected to 25 °C			—
Irradiance [W/m²]..... :			1000			—
Sample #	Pmpp [W]	Vmpp [V]	Impp [A]	Voc [V]	Isc [A]	FF [%]
1	248.7	30.38	8.19	37.76	8.74	75.4
2	247.9	30.37	8.16	37.73	8.72	75.3
3	248.2	30.40	8.16	37.74	8.73	75.4
Supplementary information: N/A						

Dielectric withstand test (Initial) (MST 16)

Test Date [DD/MM/YYYY]..... :			05/07/2013			—
Maximum system voltage [V_{DC}] ..... :			1000			—
High voltage applied [V_{DC}]..... :			6000			—
Insulation resistance measured at [V_{DC}]..... :			1000			—
Sample #	Measured	Area	Result*	Dielectric breakdown		—
	GΩ	m²	GΩ * m²	Yes (description)	No	
1	5.00	1.63	8.15	-	no	P
2	5.00	1.63	8.15	-	no	P
3	5.00	1.63	8.15	-	no	P
* Minimum requirement acc. to the standard is 0.04 GΩ*m²						
Supplementary information: N/A						

IEC 61701 – Salt mist corrosion testing of photovoltaic (PV) modules	
Requirement + Test / Remark	Verdict

Wet leakage current test (Initial) (10.15)

Test Date [DD/MM/YYYY] ..... :	05/07/2013			—
Insulation resistance measured at [V_{DC}] ..... :	1000			—
Solution resistivity [Ω cm] ..... :	< 3,500			P
Solution temperature [℃] ..... :	22 ± 3			P
Sample #	Measured	Area	Result*	—
	MΩ	m²	MΩ * m²	
1	1700.0	1.63	2771.0	P
2	1984.0	1.63	3233.9	P
3	1818.0	1.63	2963.3	P
* Minimum requirement acc. to the standard is 40 MΩ*m²				
Supplementary information: N/A				

Ground continuity test (Initial) (MST 13)

Test Date [DD/MM/YYYY] ..... :		08/07/2013		—
Maximum over-current protection rating [A]		15		—
Current applied [A]		37.5		—
Location of designated grounding point		At the center of longer side		—
Location of second contacting point		Adjacent side with greatest distance from the grounding point; At the center of another longer side; At the center of another shorter side		—
Sample No	Position in test sequence	Voltage [mV]	Resistance [mΩ]	—
1	Control module	116.7 81.5 54.8	3.11 2.17 1.46	P
2	Salt mist corrosion test	54.2 59.1 80.6	1.45 1.58 2.15	P
3	Salt mist corrosion test	94.2 53.1 133.6	2.51 1.42 3.56	P
Supplementary information: N/A				

IEC 61701 – Salt mist corrosion testing of photovoltaic (PV) modules	
Requirement + Test / Remark	Verdict

Performance of salt mist corrosion test (Severity 6)

Test Date [DD/MM/YYYY] start / end ..... :	24/09/2013	—
NaCl concentration ..... :	5%	—
Course of cycle	Spraying: 2hours / 28℃ / reaction of NaCl Humidity storage: 21.5hours / 40℃ / RH 93% After four periods of spraying and humidity storage, one storage period under standard atmosphere: 3 days / 23℃ / RH 50%	—
Duration..... :	8 cycles=56 days	—
Sample #	—	—
2	—	P
3	—	P
Supplementary information: N/A		

Visual inspection after salt mist corrosion test (MST 01)

Test Date [DD/MM/YYYY]..... :	24/09/2013	—
Sample #	Nature and position of findings	—
2	Slight corrosion	P
3	Slight corrosion	P
Supplementary information: N/A		

Maximum power determination after salt mist corrosion test (10.2)

Test Date [DD/MM/YYYY]..... :				24/09/2013				—
Module temperature [℃]..... :				Corrected to 25 ℃				—
Irradiance [W / m²]..... :				1000				—
Sample #	Pmpp [W]	Vmpp [V]	Impp [A]	Voc [V]	Isc [A]	FF [%]	Degradation [%]	—
2	248.5	30.43	8.165	37.78	8.732	75.3	0.14	P
3	249.4	29.92	8.333	37.78	8.775	75.2	0.60	P
Supplementary information: maximum allowable Pmpp degradation after this test is 5%								

IEC 61701 – Salt mist corrosion testing of photovoltaic (PV) modules	
Requirement + Test / Remark	Verdict

Dielectric withstand after salt mist corrosion test (MST 16)

Test Date [DD/MM/YYYY]..... :				24/09/2013		—
Maximum system voltage [V_{DC}] ..... :				1000		—
High voltage applied [V_{DC}]..... :				6000		—
Insulation resistance measured at [V_{DC}]..... :				1000		—
Sample #	Measured	Area	Result*	Dielectric breakdown		—
	GΩ	m²	GΩ * m²	Yes (description)	No	
2	5.00	1.63	8.15	-	no	P
3	5.00	1.63	8.15	-	no	P
* Minimum requirement acc. to the standard is 0.04 GΩ*m²						
Supplementary information: N/A						

Wet leakage current test after salt mist corrosion test (10.15)

Test Date [DD/MM/YYYY]..... :	24/09/2013			—
Insulation resistance measured at [V_{DC}]..... :	1000			—
Solution resistivity [Ω cm]..... :	< 3,500			P
Solution temperature [℃]..... :	22 ± 3			P
Sample #	Measured	Area	Result*	—
	MΩ	m²	MΩ * m²	
2	1383.0	1.63	2254.3	P
3	1508.0	1.63	2458.0	P
* Minimum requirement acc. to the standard is 40 MΩ*m²				
Supplementary information: N/A				

IEC 61701 – Salt mist corrosion testing of photovoltaic (PV) modules	
Requirement + Test / Remark	Verdict

Ground continuity test after salt mist corrosion test (MST 13)

Test Date [DD/MM/YYYY] ..... :		24/09/2013		—
Maximum over-current protection rating [A]		15		
Current applied [A]		37.5		
Location of designated grounding point		At the center of longer side		—
Location of second contacting point		Adjacent side with greatest distance from the grounding point; At the center of another longer side; At the center of another shorter side		—
Sample No	Position in test sequence	Voltage [mV]	Resistance [mΩ]	—
2	Salt mist corrosion test	74.7 70.4 112.8	1.99 1.88 3.01	P
3	Salt mist corrosion test	122.6 37.1 81.3	3.27 0.99 2.17	P
Supplementary information: N/A				

Bypass diode functional test after salt mist corrosion test

Test Date [DD/MM/YYYY] ..... :			24/09/2013			—
Diode manufacturer ..... :			HONGYANG			—
Diode type designation ..... :			10SQ050			—
Number of diodes in junction box ..... :			6			—
Max. permissible junction temperature Tj_{max} [°C] (according to diode datasheet) ..... :			200			—
Sample #	Diode 1	Diode 2	Diode 3	Diode 4	Diode 5	Diode 6
2	P	P	P	P	P	P
3	P	P	P	P	P	P
Supplementary information: N/A						

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Annex 1: Constructional Data Form (CDF)

Produkte *Products*		TÜVRheinland®
Our Reference 15062178.001		**Appendix No.** 1
Constructional Data Form (CDF) for Photovoltaic (PV) Modules (only for salt mist corrosion qualification)		Page 1 of 6

License Holder..... (full address)	Nanjing Daqo New Energy Co., Ltd. No.28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu, 211153 P.R. China	
Production Factory..... (full address)	Nanjing Daqo New Energy Co., Ltd. No.28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu, 211153 P.R. China	
Type of Product	Photovoltaic (PV) Modules	
Trademark.....	DAQO NEW ENERGY	
Type Name or Model No.	DQxxxPSBa (6" poly 54pcs)	DQxxxPSCa (6" poly 60pcs)
Maximum System Voltage [V_{DC}]	1000	1000
Rated Maximum Power [W]	180 , 185 , 190 , 195 , 200 , 205 , 210 , 215 , 220 , 225 , 230 , 235 ;	205 , 210 , 215 , 220 , 225 , 230 , 235 , 240 , 245 , 250 , 255 , 260 ;
Tolerance of Rating [%].....	±3	±3
Rated Short Circuit Current [A]....	7.72 , 7.80 , 7.98 , 8.06 , 8.24 , 8.38 , 8.47 , 8.55 , 8.66 , 8.72 , 8.77 , 8.87 ;	7.66 , 7.80 , 7.98 , 8.12 , 8.18 , 8.34 , 8.44 , 8.55 , 8.63 , 8.72 , 8.79 , 8.86 ;
Rated Open Circuit Voltage [V]	32.4 , 32.5 , 32.6 , 32.7 , 32.8 , 33.0 , 33.1 , 33.3 , 33.4 , 33.5 , 33.6 , 33.7 ;	36.1 , 36.2 , 36.4 , 36.5 , 36.7 , 36.8 , 36.9 , 37.0 , 37.1 , 37.2 , 37.3 , 37.5 ;
Over-current protection rating [A]:	15	15
Application Class (IEC 61730)	Class A / ~~B / C~~	Class A / ~~B / C~~
Protection Class.....	Class II	Class II
Dimensions (l x w x h) [mm]	1482×992×45/35/40	1640×992×45/35/40
Module area [m²].....	1.47	1.63
Min- creepage distance [mm]	20/17	20/17
Number of solar cells	54	60
Cells per bypass diode	18	20
Serial/parallel connection of cells (S,SP,SPS)	S	
Number of diodes	3 6(each 2 in parallel)	3 6(each 2 in parallel)

Shanghai, 2013.10.8 ZZL	Nanjing (City) 2013.09.17 (Date)
TÜV Rheinland Group	Liu Ming (Stamp and/or signature of applicant)

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Produkte *Products*		TÜVRheinland®
Our Reference 15062178.001		**Appendix No.** 1
Constructional Data Form (CDF) for Photovoltaic (PV) Modules (only for salt mist corrosion qualification)		Page 2 of 6

Type Name or Model No. :	DQxxxPSDa (6" poly 72pcs)	DQxxxMSDa (6" mono 72pcs)	DQxxxMSCa (6" mono 60pcs)	DQxxxMSBa (6" mono 54pcs)
Maximum System Voltage [VDC] :	1000	1000	1000	1000
Rated Maximum Power [W] :	260 , 265 , 270 , 275 , 280 , 285 , 290 , 295 , 300 , 305 , 310 , 315 ;	270 , 275 , 280 , 285 , 290 , 295 , 300 , 305 , 310 , 315 , 320 , 325 ;	225 , 230 , 235 , 240 , 245 , 250 , 255 , 260 , 265 , 270 ;	205 , 210 , 215 , 220 , 225 , 230 , 235 , 240 , 245 ;
Tolerance of Rating [%] :	±3	±3	±3	±3
Rated Short Circuit Current [A]:	8.01 , 8.12 , 8.20 , 8.35 , 8.40 , 8.45 , 8.50 , 8.55 , 8.63 , 8.71 , 8.80 , 8.89 ;	8.21 , 8.34 , 8.42 , 8.46 , 8.51 , 8.54 , 8.65 , 8.72 , 8.82 , 8.91 , 8.98 , 9.06 ;	8.19 , 8.35 , 8.47 , 8.56 , 8.64 , 8.73 , 8.82 , 8.89 , 8.95 , 9.03;	8.41 , 8.49 , 8.56 , 8.69 , 8.75 , 8.79 , 8.92 , 8.99 ,9.06 ;
Rated Open Circuit Voltage [V]:	43.8 , 43.9 , 44.0 , 44.1 , 44.3 , 44.5 , 44.6 , 44.7 , 44.8 , 44.9 , 45.0 , 45.1 ;	43.9 , 44.1 , 44.3 , 44.4 , 44.5 , 44.6 , 44.7 , 44.8 , 44.9 , 45.0 , 45.1 , 45.3 ;	36.6 , 36.7 , 36.8 , 36.9 , 37.0 , 37.1 , 37.3 , 37.4 , 37.6 , 37.8 ;	32.9 , 33.0 , 33.2 , 33.3 , 33.4 , 33.5 , 33.6 , 33.8 , 33.9 ;
Over-current protection rating [A]:	15	15	15	15
Application Class (IEC 61730):	Class A / ~~B / C~~	Class A / ~~B / C~~	Class A / ~~B / C~~	Class A / ~~B / C~~
Protection Class :	Class II	Class II	Class II	Class II
Dimensions (l x w x h) [mm] :	1956×992×50/40	1956×992×50/40	1640×992×45/35/40	1482×992×45/35/40
Module area [m²] :	1.94	1.94	1.63	1.47
Min- creepage distance [mm]:	17	17	17	17
Number of solar cells	72	72	60	54
Cells per bypass diode	24	24	20	18
Serial/parallel connection of cells (S,SP,SPS)	S			
Number of diodes	3 6(each 2 in parallel)	3 6(each 2 in parallel)	3 6(each 2 in parallel)	3 6(each 2 in parallel)

Shanghai, 2013.05.8
ZZL
TÜV Rheinland Group

(City) Nanjing (Date) 2013.09.27

Luo Ming
(Stamp and/or signature of applicant)

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Produkte *Products*		TÜVRheinland®
Our Reference 15062178.001		**Appendix No.** 1
Constructional Data Form (CDF) for Photovoltaic (PV) Modules (only for salt mist corrosion qualification)		Page 3 of 6

DAQO NEW ENERGY

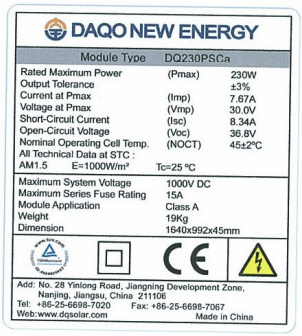
Module Type	DQ210MSBa	
Rated Maximum Power	(Pmax)	210W
Output Tolerance		±3%
Current at Pmax	(Imp)	7.62A
Voltage at Pmax	(Vmp)	27.6V
Short-Circuit Current	(Isc)	8.44A
Open-Circuit Voltage	(Voc)	33.6V
Nominal Operating Cell Temp.	(NOCT)	45±2°C
All Technical Data at STC:		
AM1.5 E=1000W/m²	Tc=25°C	
Maximum System Voltage	1000VDC	
Maximum Series Fuse Rating	15A	
Module Application	Class A	
Weight	17kg	
Dimension	1482×992×45mm	

Add: No.28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu, China 211103
Tel: +86 25 6698 7020 Fax: +86 25 6698 7067
Web: www.dqsolar.com Made in China

DAQO NEW ENERGY

Module Type	DQ200PSBa	
Rated Maximum Power	(Pmax)	200W
Output Tolerance		±3%
Current at Pmax	(Imp)	7.44A
Voltage at Pmax	(Vmp)	26.9V
Short-Circuit Current	(Isc)	8.24A
Open-Circuit Voltage	(Voc)	32.8V
Nominal Operating Cell Temp.	(NOCT)	45±2°C
All Technical Data at STC :		
AM1.5 E=1000W/m²	Tc=25 °C	
Maximum System Voltage	1000V DC	
Maximum Series Fuse Rating	15A	
Module Application	Class A	
Weight	17Kg	
Dimension	1482x992x45mm	

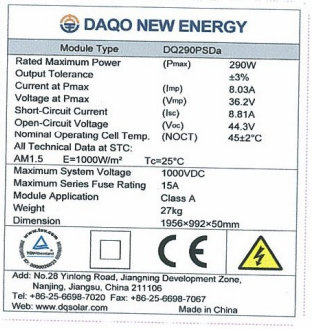
Add: No. 28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu, China 211106
Tel: +86-25-6698-7020 Fax: +86-25-6698-7067
Web:www.dqsolar.com Made in China



DAQO NEW ENERGY

Module Type	DQ230PSCa	
Rated Maximum Power	(Pmax)	230W
Output Tolerance		±3%
Current at Pmax	(Imp)	7.67A
Voltage at Pmax	(Vmp)	30.0V
Short-Circuit Current	(Isc)	8.34A
Open-Circuit Voltage	(Voc)	36.8V
Nominal Operating Cell Temp.	(NOCT)	45±2°C
All Technical Data at STC :		
AM1.5 E=1000W/m²	Tc=25 °C	
Maximum System Voltage	1000V DC	
Maximum Series Fuse Rating	15A	
Module Application	Class A	
Weight	19Kg	
Dimension	1640x992x45mm	

Add: No. 28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu, China 211106
Tel: +86-25-6698-7020 Fax: +86-25-6698-7067
Web:www.dqsolar.com Made in China



DAQO NEW ENERGY

Module Type	DQ290PSDa	
Rated Maximum Power	(Pmax)	290W
Output Tolerance		±3%
Current at Pmax	(Imp)	8.03A
Voltage at Pmax	(Vmp)	36.2V
Short-Circuit Current	(Isc)	8.81A
Open-Circuit Voltage	(Voc)	44.3V
Nominal Operating Cell Temp.	(NOCT)	45±2°C
All Technical Data at STC:		
AM1.5 E=1000W/m²	Tc=25°C	
Maximum System Voltage	1000VDC	
Maximum Series Fuse Rating	15A	
Module Application	Class A	
Weight	27kg	
Dimension	1956×992×50mm	

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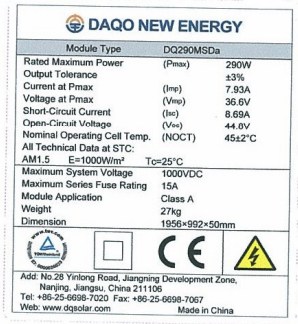
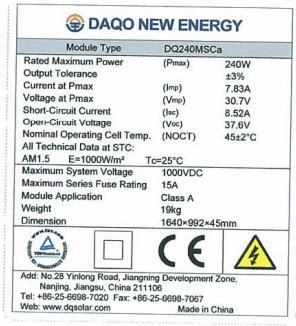


DAQO NEW ENERGY

Module Type	DQ290MSDa	
Rated Maximum Power	(Pmax)	290W
Output Tolerance		±3%
Current at Pmax	(Imp)	7.93A
Voltage at Pmax	(Vmp)	36.6V
Short-Circuit Current	(Isc)	8.69A
Open-Circuit Voltage	(Voc)	44.6V
Nominal Operating Cell Temp.	(NOCT)	45±2°C
All Technical Data at STC:		
AM1.5 E=1000W/m²	Tc=25°C	
Maximum System Voltage	1000VDC	
Maximum Series Fuse Rating	15A	
Module Application	Class A	
Weight	27kg	
Dimension	1956×992×50mm	

Add: No.28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu, China 211106
Tel: +86-25-6698-7020 Fax: +86-25-6698-7067
Web: www.dqsolar.com Made in China



DAQO NEW ENERGY

Module Type	DQ240MSCa	
Rated Maximum Power	(Pmax)	240W
Output Tolerance		±3%
Current at Pmax	(Imp)	7.83A
Voltage at Pmax	(Vmp)	30.7V
Short-Circuit Current	(Isc)	8.52A
Open-Circuit Voltage	(Voc)	37.6V
Nominal Operating Cell Temp.	(NOCT)	45±2°C
All Technical Data at STC:		
AM1.5 E=1000W/m²	Tc=25°C	
Maximum System Voltage	1000VDC	
Maximum Series Fuse Rating	15A	
Module Application	Class A	
Weight	19kg	
Dimension	1640×992×45mm	

Add: No.28 Yinlong Road, Jiangning Development Zone, Nanjing, Jiangsu, China 211106
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Web: www.dqsolar.com Made in China

Shanghai, 2013.09.26

TÜV Rheinland Group

(City) Nanjing (Date) 2013.09.27

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Our Reference 15062178.001		**Appendix No.** 1
Constructional Data Form (CDF) for Photovoltaic (PV) Modules (only for salt mist corrosion qualification)		Page 4 of 6

List of Critical Components (add lines for multiple material sources)

Object	Manufacturer / trademark	Type / model	Technical data / ratings	Standard (if applicable)	Certificates (if applicable)
Front cover	CSG HOLDING CO., LTD	3.2mm tempered glass (not used for 6" poly 72pcs and 6" mono 72pcs)	Thickness =3.2mm	-	-
		4.0 mm tempered glass (used for 6" poly 72pcs and 6" mono 72pcs)	Thickness =4.0mm	-	-
	Zhejiang Jiafu Glass Co., Ltd.	4.0 mm tempered glass (used for 6" poly 72pcs and 6" mono 72pcs)	Thickness =4.0mm	-	-
		3.2 mm tempered glass	Thickness =3.2mm	-	-
Rear cover	Toyo Aluminium K.K	BS-W250-S-FA20-LE	Thickness =0.35mm	-	-
Encapsulation material	BRIDGESTONE Corporation	S11 (only combined with JA cells and BS-W250-S-FA20-LE back sheet)	Thickness =0.5mm	-	-
	Hangzhou First PV Materials Co., LTD	First 806 (only combined with DQ cells)	Thickness =0.5mm	-	-
Frame parts	XIEJI ALUMINIUM	Aluminium Frame 6063-T5	wall thickness:2.0mm frame thickness:35mm(5" mono 72pcs)/45mm(60pcs&60 pcs)/50mm(72pcs)	-	-
			wall thickness:1.5mm frame thickness:35mm (only for 60pcs and 54pcs)	-	-
			wall thickness:1.7mm frame thickness:40mm	-	-
Adhesive (frame)	BEIJING TONSAN ADHESIVES CO. LTD	1527	-	-	-
Solar cell (used for 6" poly type families)	JA Solar Holding Co., Ltd,	156M	156mmx156mm (190μm±20μm)	-	-
Solar cell (used for 6" poly type families)	ZHENJIANG DAQO SOLAR Co., LTD.	P1563B	156mmx156mm (200μm±20μm)	-	-
Solar cell (used for 6" mono type families)	ZHENJIANG DAQO SOLAR Co., LTD.	M1563B	156mmx156mm (200μm±20μm)	-	-

Shanghai, 2013.09.09 (City) Nanjing (Date) 2013.09.07

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Object	Manufacturer / trademark	Type / model	Technical data / ratings	Standard (if applicable)	Certificates (if applicable)
Cell connectors	Chanline Photovoltaic Electronics Co., Ltd	1.8 mm×0.2mm (restricted combined with solar cell: 156M)	-	-	-
		1.6mm×0.2mm (restricted combined with solar cell: P1563B)	-	-	-
	Wuxi Sveck Technology Co., Ltd.	1.6mm×0.2mm (restricted combined with solr cell P1563B & M1563B)	-	-	-
String connectors	Chanline Photovoltaic Electronics Co., Ltd	5.0mm×0.2mm	-	-	-
	Wuxi Sveck Technology Co., Ltd.	5.0mm×0.2mm	-	-	-
Soldering material	-	-	-	-	-
Fluxing agent	Wuxi Asahi Soldering Co., Ltd.	ANX-3012	-	-	-
Adhesive (junction box)	BEIJING TONSAN ADHESIVES CO. LTD	1527	-	-	-
Potting material	-	-	-	-	-
Fixing tape,	TERAOKA SEISAKUSHO Co., LTD.	No.631S	-	-	-

Shanghai, 2013.12.8
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Constructional Data Form (CDF) for Photovoltaic (PV) Modules (only for salt mist corrosion qualification)		Page 6 of 6

Object	Manufacturer / trademark	Type / model	Technical data / ratings	Standard (if applicable)	Certificates (if applicable)
Combination A					
Junction box	Zhejiang Jiaming Tianheyuan Photovoltaics Technology Co.,Ltd.	PV-JM801-2	Max. Voltage = 1000V DC Max. Current =N/A Max. Diode Current = 12A	DIN V VDE 0126-5; 2008	R50175690
Cable	Zhejiang Jiaming Tianheyuan Photovoltaics Technology Co., Ltd.	PV1-F 1×4.0mm^2	Max. Voltage = 1.8KV DC Max. Current = N/A	TÜV 2Pfg1169; 2007	R50205246
	Wuxi Xinhongye Wire & Cable Co., Ltd.	PV1-F 1×4.0mm^2	Max. Voltage = 1.8KV DC Max. Current = N/A		R50129983
	Huzhou Shangfu Wire & Cable High Technology Co., Ltd.	PV1-F 1×4.0mm^2	Max. Voltage = 1.8KV DC Max. Current = N/A		R50133351
Connectors	Zhejiang Jiaming Tianheyuan Photovoltaics Technology Co.,Ltd.	PV-JM601	Max. Voltage = 1000V DC Rated. Current = 30A	EN 50521; 2008	R50175587
Bypass diode	HY Electronic Corp PANJIT SEMI CONDUCTOR	10SQ050	Tj max =200℃	-	-
Number of diodes	6 (each 2 in parallel)				

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(City) Nanjing (Date) 2013.09.17

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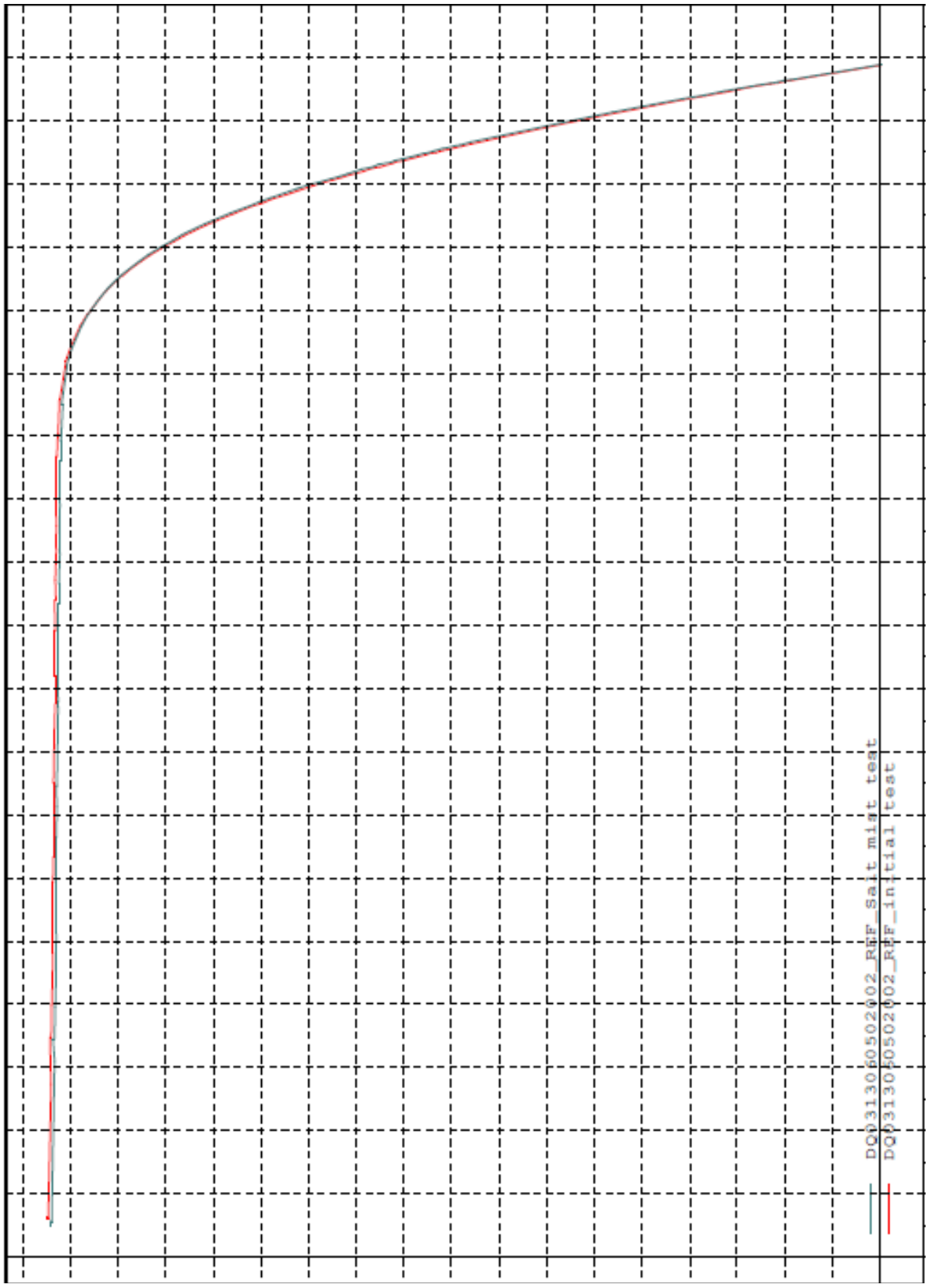
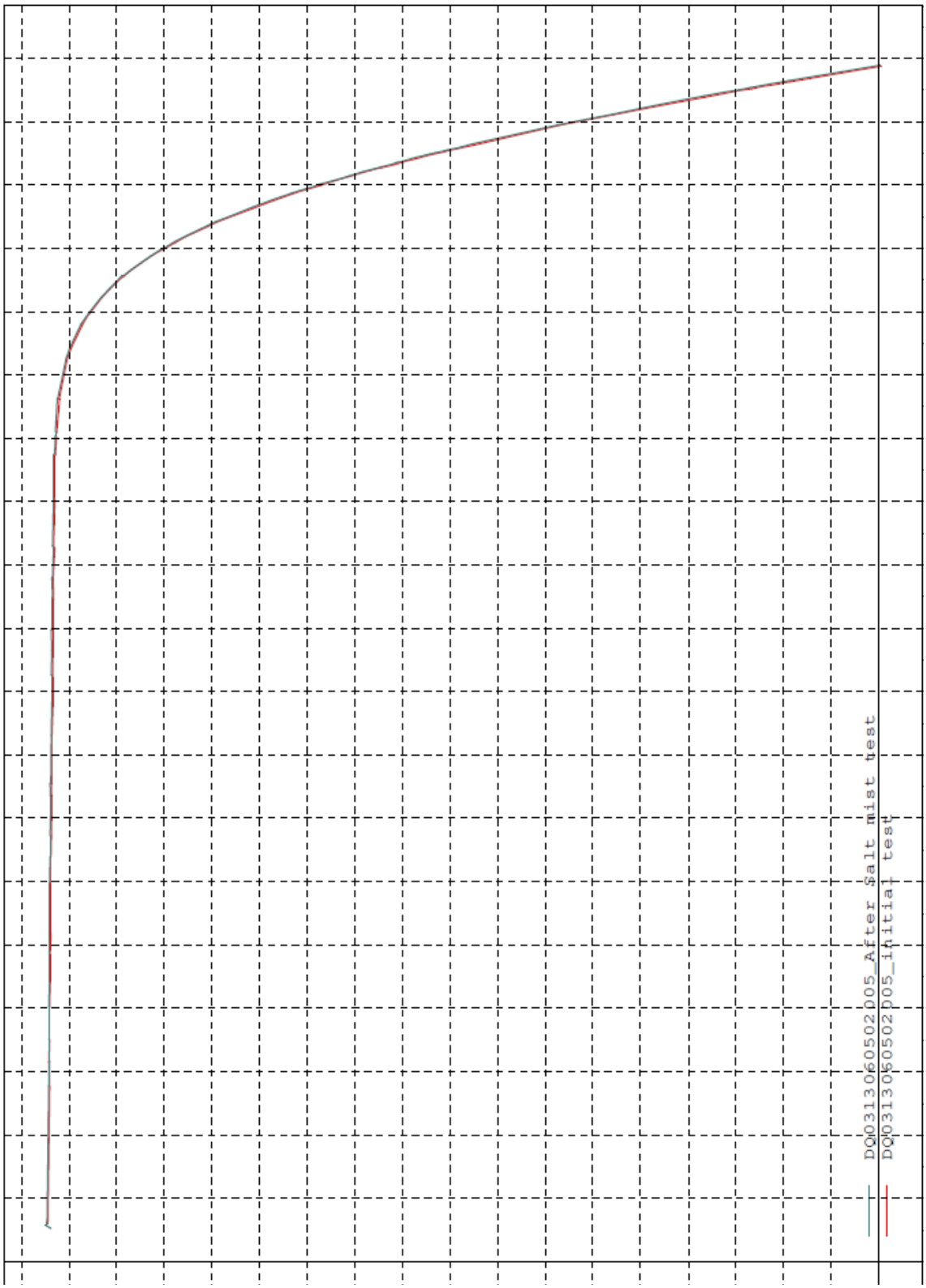
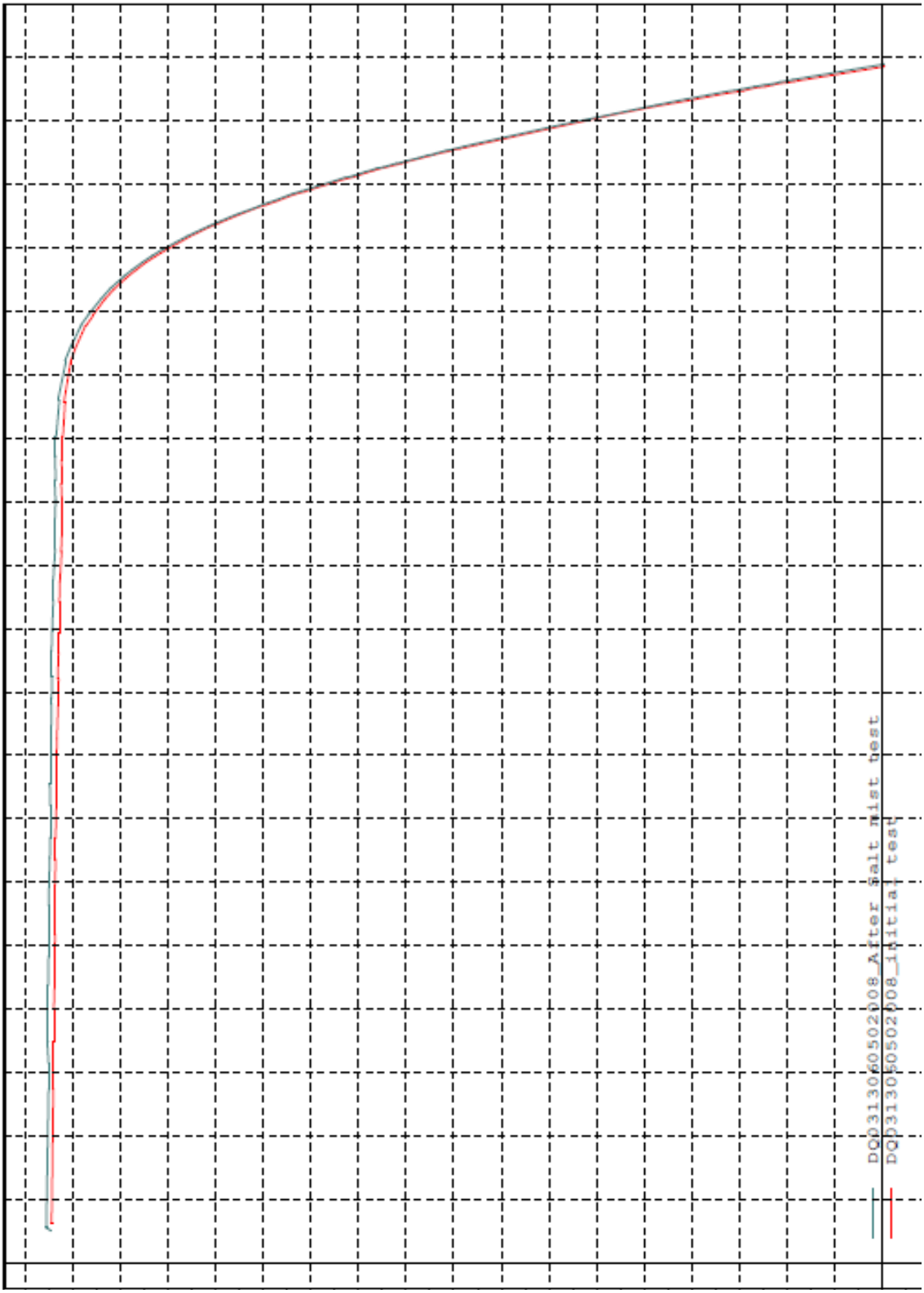
Annex 2: Measuring software

Program name	Version no.	Date	Application
PSL Software	2.5.8.6	September 2007	Operating software pulsed solar simulator
SLAP Tester	2.1.2	January 2010	Operating software pulsed solar simulator
Mismatch.exe	1.2	February 1998	Mismatch calculation

Annex 3: Measurement reports




DQ031306050200S_After Salt mist test
DQ031306050200S_Initial test


DQ031306050208_After salt mist test
DQ031305050208_Initial test

Annex 4: Photos of modules

Fig. 1: front view of test sample

Fig. 2: rear view of test sample

Fig. 3: detail view of closed junction box

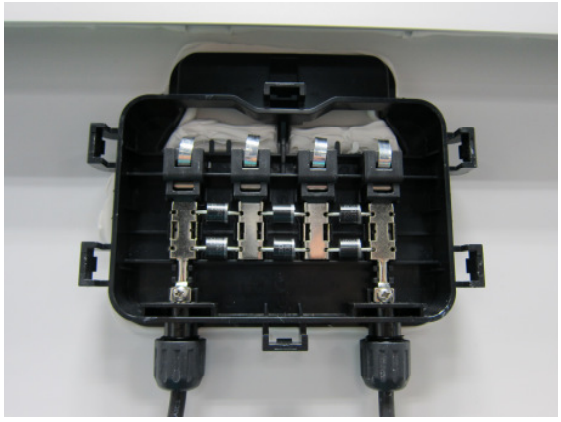


Fig. 4: detail view of open junction box

Fig. 5: detail view of connectors

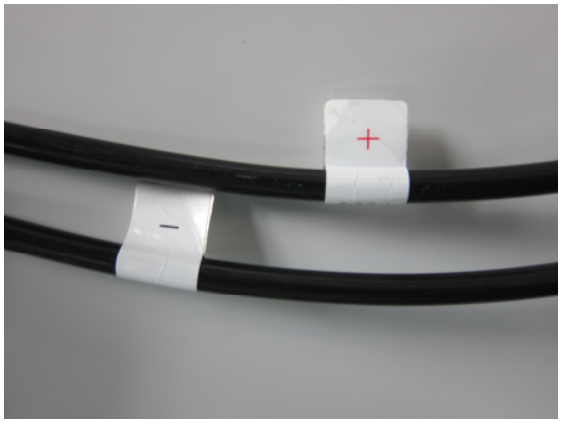


Fig. 6: detail view of type label

End of test report