

مجلس أبـــوظـبـي للــجـودة والــمـطـابـــقــة ABU DHABI QUALITY & CONFORMITY COUNCIL



The Environmental Trustmark

Abu Dhabi Conformity Assessment Scheme for Small-scale Solar Photovoltaic Systems

Page **i** This is an uncontrolled copy. To ensure the most recent document is used kindly refer to jawdah.qcc.abudhabi.ae





Amendment Page

To ensure that each controlled copy of this Conformity Assessment Scheme contains a complete record of amendments, the Amendment Page is updated and issued with each set of revised/new pages of the document.

	Amer	ndment	Dis	scard	Inse	<u>ert</u>
<u>No</u>	<u>Date</u>	Sections Changed	Page(s)	<u>lssue no</u>	<u>Page(s)</u>	<u>Issue</u> <u>no</u>
1	08/06/2017	Scheme Launched	-	-	10	1.0

Approved by:

Salem Al Qassimi Director Conformity Scheme Services

QCC-PCS-ASP037.01 Date: 08-JUN-2017 This is an uncontrolled copy. To ensure the most recent document is used kindly refer to jawdah.qcc.abudhabi.ae





TABLE OF CONTENTS

D	EFINIT	IONS	1
1	ABOU	T THE ABU DHABI QUALITY AND CONFORMITY COUNCIL	3
2	FORE	NORD	3
3	THE E	NVIRONMENTAL TRUSTMARK	4
4	REFER	ENCES	5
5	CERTI	FICATION REQUIREMENTS	7
	5.1	General Requirements	7
	5.2	Specific Performance Requirements	8
	5.3	Quality Management System Requirements	10
6	CONF	ORMITY ASSESSMENT PROCESS	10
7	IDENT	IFICATION AND LABELLING	10
8	SURVI	EILLANCE / AUDIT PROCEDURES	11
	8.1	General	11
	8.2	Quality Management System Audits of Manufacturer	11
	8.3	Testing and Inspection	11
9	FEES .		12
Α	PPEND	IX 1: PRODUCT CERTIFICATION APPLICATION FORM	13
Α	PPEND	IX 2: PRODUCT ASSESSMENT AND CERTIFICATION PROCESS	14





DEFINITIONS

For a comprehensive detailed list of definitions, please refer to the referenced standards and regulations listed in Section 4.

Terms in common use are not defined here and normal dictionary definitions.

Class 0 Equipment: equipment which comes with basic insulation as provision for basic protection and with no provisions for fault protection.

Class II Equipment: equipment which comes with basic insulation as provision for basic protection, and supplementary insulation as provision for fault protection, or alternatively in which basic and fault protection are provided by reinforced insulation.

Class III Equipment: equipment relying on limitation of voltage to ELV (extra-low voltage) values as provision for basic protection and with no provision for fault protection.

Connection Point (CP): the point which defines the boundary between the Owner's Electrical Installation installed at a Premises and the main cable or equipment owned by the Distribution Company.

Distribution Company: a company or body holding a distribution licence, granted by the Bureau, pursuant to Law No (2) of 1998. Currently there are two companies, Al Ain Distribution Company (AADC) and Abu Dhabi Distribution Company (ADDC).

Earthing: a general term used to describe the connection of conductive parts of an Electrical Installation or an appliance to earth.

Electroluminescence (EL): luminescence produced electrically, especially by the application of a voltage

Licensed Contractor: a person, entity or company which has been assessed by the Distribution Company as competent to work on Electrical Installations and issued a Competency Licence by that Distribution Company.

Low Voltage (LV): an a.c. voltage between 1000V between phases, or below 600V between any phase and earth or; a d.c. voltage below 1500V between conductors, or below 900V between any conductor to earth.

Main Distribution Board (MDB): the Distribution Board which accepts the main incoming LV supply from the Distribution Company or Owner's transformer;

Owner: the legal owner of the Premises in which an Electrical Installation is installed.





PV: Photovoltaic. The following are related definitions:

a.c. side: part of a PV installation from the a.c. terminals of the PV Inverter to the point of connection of the PV supply cable to the Electrical Installation;

Array: mechanically and electrically integrated assembly of PV Modules, and other necessary components, to form a d.c. power supply unit;

Junction Box: enclosure where PV Strings of any PV Array are electrically connected and where devices can be located;

DC Cable: output cable of a PV array;

Cell: basic PV device which can generate electricity when exposed to light such as solar radiation.

d.c. side: part of a PV installation from a PV cell to the d.c. terminals of the PV Inverter;

Inverter: device which converts d.c. voltage and d.c. current into a.c. voltage and a.c. current; PV supply cable connecting the AC terminals of the PV inverter to a distribution circuit of the electrical installation;

Module: smallest completely environmental protected assembly of interconnected PV cells;

Open Circuit Voltage, Voc: voltage under standard testing conditions across unloaded PV String, PV Array, or on the d.c. side of the PV Inverter.

Short Circuit Current, Isc: short circuit current of a PV Module, PV String, PV Array or PV generator under standard test conditions.

Solar PV Integrator: a registered entity with the Distribution Company carrying out Electrical Installation Work specific to Solar PV systems.





1 ABOUT THE ABU DHABI QUALITY AND CONFORMITY COUNCIL

The Abu Dhabi Quality and Conformity Council (QCC) was established by law No. 3 of 2009, issued by His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE and ruler of Abu Dhabi.

The QCC consists of a council of regulators that facilitate the provision of quality infrastructure in line with global standards. This quality infrastructure enables industry and regulators to ensure that products, systems and personnel can be tested and certified to UAE and International Standards. In addition to supporting regulators and government organizations through offering quality and conformity assessment facilities, expertise and resources, the Council is also engaged in promoting a culture of quality towards consumers. Additionally, the QCC is responsible for raising the quality of local products and ensuring Abu Dhabi exports meet international standards to improve interactions with global trade and integration into the global economy, as envisioned by Abu Dhabi Economic Vision 2030.

Products certified by the QCC receive the Abu Dhabi Trustmark. The Trustmark is designed to communicate that products, personnel or systems conform to various safety, quality and performance standards that are set by Abu Dhabi regulators.

2 FOREWORD

The Abu Dhabi Conformity Assessment Scheme for Small-scale Solar Photovoltaic (PV) Systems, enables manufacturers, suppliers and distributors of these systems to obtain voluntary certification which demonstrates that the systems meet quality and performance specifications suitable for the Emirate of Abu Dhabi. These specifications incorporate the following requirements:

- Quality assurance of the manufacturing process through a suitable Quality Management System (QMS)
- The Regulation and Supervision Bureau (RSB) Electricity Wiring Regulations and Small-Scale Solar Photovoltaic Energy-Netting Regulations
- Engineering Recommendation No. 1 of the Electricity Distribution Code. Limits for Harmonics in the Electricity Supply System.
- Abu Dhabi Urban Planning Council (UPC) Estidama Pearl Building and Villa Rating Systems optional renewable energy requirements.
- Abu Dhabi International Energy Conservation Code (ADIECC) on-site supply of renewable energy requirements.





The scope of certification includes all the components of a Small Scale Solar PV System with maximum capacity of 5MW starting from the PV Modules to the Connection Point to the utility grid, including but not limited to:

- Modules
- Array
- DC Cables
- Connectors
- Combiner boxes
- Fuses and diodes
- Inverters
- Isolation devices
- Main Distribution Board
- Protection devices

It is noted that mounting devices are excluded from the scope of certification and may be subject to a separate conformity assessment scheme. In addition, the metering system shall comply with RSB regulations and the distributions companies' (ADDC and AADC) requirements.

It is anticipated that implementation of this conformity assessment scheme will significantly benefit the Emirate of Abu Dhabi by contributing to the Emirate's renewable energy targets, thereby reducing greenhouse gas emissions associated with electricity generation from gas-fired power stations.

3 THE ENVIRONMENTAL TRUSTMARK

Products and systems that achieve certification, through formal evaluation against the QCC conformity assessment scheme criteria defined in this document, will be granted a Certificate of Conformity and are licensed to bear the Abu Dhabi Trustmark for Environmental Performance in product promotion and merchandising. The Certificate of Conformity enables manufacturers, distributors and suppliers of Solar PV Systems to present evidence of meeting appropriate standards for Abu Dhabi's built environment.

The Certificate of Conformity can be used to:

- Support the connection to the Utility by demonstrating compliance with the Electricity Wiring Regulations and the Small-Scale Solar PV Energy Netting Regulations issued by the Regulation and Supervision Bureau.
- Support the submission requirements of the Estidama PBRS credits RE-R1/1/5/6 and PVRS credits RE-R1/1/3 to demonstrate the Solar PV Systems performance.
- Support the submission requirements of the ADIECC renewable energy systems requirements.





The QCC's market surveillance inspectors actively ensure the integrity of the Trustmark for Environmental Performance is maintained through market surveillance and testing of products bearing the Trustmark.

Advisory note: A number of factors additional to the characteristics addressed in this assessment and surveillance plan may influence the performance of products, e.g. installation, maintenance, modification and incorrect operation. Such factors are beyond the scope of the third party product certification described in this document. The QCC recommends that suitable precautions, such as the use of competent and/or accredited/ approved building designers, solar photovoltaic system integrators, commissioners and building maintenance managers, to improve the likelihood of continued compliance of installed products.

The requirements herein may from time to time be varied by the issue of one or more 'QCC Notices' issued as controlled documents to certificate holders.

4 REFERENCES

The following standards and guidance documents (on their latest version to date) have been used to define the performance requirements within this Conformity Assessment Scheme:

- BS EN 60754-1 Test on gases evolved during combustion of materials from cables. Determination of the halogen acid gas content
- BS EN 60811- Electric and optical fibre cables. Test methods for non-metallic materials. Miscellaneous tests.
- EN 50618:2014 Electric cables for photovoltaic systems
- IEC 60068-2-68 Environmental testing Part 2-68: Tests Test L: Dust and sand
- IEC 60269-6 Low-voltage fuses Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems
- IEC 60332-1-2 Tests on electric and optical fibre cables under fire conditions Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame
- IEC 60529 Degrees of protection provided by enclosures (IP Code)
- IEC 60664-1 Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests
- IEC 61000 Electromagnetic compatibility (EMC)
- IEC 61215-1:2016 Terrestrial photovoltaic (PV) Modules Design qualification and type approval Part 1: Test requirements
- IEC 61215-1-1:2016 Terrestrial photovoltaic (PV) Modules Design qualification and type approval – Part 1-1: Special requirements for testing of crystalline silicon photovoltaic (PV) modules





- IEC 61215-1-2:2016 Terrestrial photovoltaic (PV) Modules Design qualification and type approval – Part 1-1: Special requirements for testing of thin-film Cadmium Telluride (CdTe) based photovoltaic (PV) modules
- IEC 61215-1-3:2016 Terrestrial photovoltaic (PV) modules Design qualification and type approval Part 1-3: Special requirements for testing of thin-film amorphous silicon based photovoltaic (PV) modules
- IEC 61215-1-4:2016 Terrestrial photovoltaic (PV) modules Design qualification and type approval - Part 1-4: Special requirements for testing of thin-film Cu(In,GA)(S,Se)₂ based photovoltaic (PV) modules
- IEC 61215-2:2016 Terrestrial photovoltaic (PV) Modules Design qualification and type approval Part 1: Test procedures
- IEC 62891 Overall efficiency of grid connected photovoltaic (PV) inverters
- IEC 61701 Salt mist corrosion testing of photovoltaic (PV) modules
- IEC 62716 Ammonia corrosion testing of photovoltaic (PV) modules
- IEC 61727 Photovoltaic (PV) systems Characteristics of the utility interface
- IEC 61730-1:2016 Photovoltaic (PV) module safety qualification Part 1: Requirements for construction
- IEC 61730-2:2016 Photovoltaic (PV) module safety qualification Part 2: Requirements for testing
- IEC 61853-1 Photovoltaic (PV) module performance testing and energy rating Part 1: Irradiance and temperature performance measurements and power rating
- IEC 61853-2 Photovoltaic (PV) module performance testing and energy rating-Part 2: Spectral responsivity, incidence angle and module operating temperature measurements
- IEC 62109-1 Safety of power converters for use in photovoltaic power systems Part 1: General requirements
- IEC 62109-2 Safety of power converters for use in photovoltaic power systems Part 2: Particular requirements for inverters
- IEC 62116 Utility-interconnected photovoltaic inverters Test procedure of islanding prevention measures
- IEC 62790 Junction boxes for photovoltaic modules Safety requirements and tests
- IEC 62852 Connectors for DC-application in photovoltaic systems Safety requirements and tests
- IEC TS 62941 Terrestrial photovoltaic (PV) modules Guideline for increased confidence in PV module design qualification and type approval
- PD CLC/TR 50670:2016 External fire exposure to roofs in combination with photovoltaic (PV) arrays. Test method(s)
- UL 1703 Standard for Flat-Plate Photovoltaic Modules and Panels





- UL 1741 Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
- UL 4703 Standard for Photovoltaic Wire
- The Electricity Wiring Regulations issued by the Regulation and Supervision Bureau for the water, wastewater and electricity sector in the Emirate of Abu Dhabi.
- The Small-scale Solar Photovoltaic Energy-Netting Regulations issued by the Regulation and Supervision Bureau for the water, wastewater and electricity sector in the Emirate of Abu Dhabi.
- Installation of Solar PV Systems Guidance Document issued by the Regulation and Supervision Bureau for the water, wastewater and electricity sector in the Emirate of Abu Dhabi.
- Engineering Recommendation No. 1 of the Electricity Distribution Code. Limits for Harmonics in the Electricity Supply System.
- The Pearl Rating System for Estidama Building Rating System: Design & Construction. Version 1.0, April 2010.
- The Pearl Rating System for Estidama Villa Rating System: Design & Construction. Version 1.0, April 2010.

5 CERTIFICATION REQUIREMENTS

5.1 General Requirements

In order to receive the QCC Trustmark certification, applications from manufacturers, suppliers and distributors of Solar PV Systems must be assessed according to the QCC's criteria (clause 5.2). Applicants shall complete the product certification form included in APPENDIX 1 and available electronically in the QCC website (http://jawdah.qcc.abudhabi.ae).

The general requirements for certification, along with the terms and conditions for the QCC certification of products and license of the Trustmark are contained in the application form available in the QCC Jawdah website: <u>http://jawdah.qcc.abudhabi.ae.</u> Applicants must register first before uploading all the application for certification documentation.

In addition, the applicant shall provide the following:

- Valid UAE Trade License.
- Authorisation letter from the manufacturer to deal with the product(s) seeking certification (if applying on the manufacturers' behalf).





5.2 Specific Performance Requirements

In order to gain certification, the product and/or system applying for certification shall meet the minimum performance requirements outlined in Tables 1, 2 and 3, and shall be compliant with the following standards:

- IEC 61730-1: 2016 & IEC 61730-2: 2016
- IEC 61215-1-x: 2016 (depending on the module type)
- IEC 60068-2-68

Solar PV Systems shall meet Application Class 0 or Class II of IEC 61730. Class III applications are not permitted.

Certificates shall be issued by a National Certifying Body (NCB) in the IECEE scheme -Refer to PV Module Listing Procedure and http://www.iecee.org/dyn/www/f?p=106:41:0 for details of NCBs. Certificates are a type that requires periodic factory inspections, and identifies all factories which are covered by the certification.

The testing laboratory used for performance measurement of the solar PV module shall be certified to ISO/IEC 17025 within the scope of the testing performed. The ISO/IES 17025 certification shall be issued by a certification body signatory to the International Laboratory Accreditation Cooperation - Mutual Recognition Agreement (ILAC-MRA). Alternatively, the testing facility shall have QCC recognition based on the scope of the certification sought.

Test reports validity: In all cases, the test reports submitted must not be older than 36 months on the day of submission.

Physical testing analysis or equivalent: Test reports shall demonstrate applicability and traceability to the products sold in the UAE.

In order to obtain QCC certification, the applicant shall provide the following current/valid documentation:

- Performance testing reports generated in accordance with the conformity certificates
- Evidence that installation is to be performed only by a Licensed Contractor and solar integrator in compliance with the requirements of the current edition of the Regulation and Supervision Bureau's Small Scale Solar Photovoltaic (PV) Energy Netting Regulations.
- Installation Manual that shall include instructions on safety, handling, mechanical mounting, Earthing and maintenance, and is suitable for use by the installer, and for the end user. Additionally, it shall include details for mounting modules with clamp systems including number of clamps and acceptable placement options. If clamps are not recommended, this is to be noted on the product datasheet.





- Product datasheet in a form suitable for the installer to provide to the end-user, as manufacturer's documentation. It shall include full model number, electrical data and tolerances matching the information on the conformity certificates.
- As part of the application, the applicant shall provide a written policy explaining the after-sales warranty process, which demonstrates how they handle complaints, batch defects and warranty claims and that this process is endorsed by the manufacturer.

Table 1: Performance type tests for Solar PV modules

Type Tests		Pass Criteria		
•	Accelerated ageing: accelerated climatic test at different environmental conditions, intensive UV exposure, outdoor exposure Mechanical stress: static mechanical load and suction, simulation of hail impact, robustness of connections Fault conditions simulations: bypass diode test, hot- spot effect due to partial shadowing Electrical characterization: Nominal Operating Cell Temperature (NOCT) determination, measure of performance at NOCT conditions and low irradiance, determination of temperature coefficients.	 No visual defects before/after each test as defined in the relevant standards Power output degradation lower than 5% after each test Meet IEC 61215-1 requirements after final stabilization Resistance insulation greater than 40 MW/m² 		
•	Fire resistance: fire exposure and flammability test	Comply with either: UL 1703 Part 31.1 and Part 31.2; and/or PD CLC/TR 50670		
•	Salt mist corrosion: in particular for PV systems intended to be installed in coastal environments.	 Comply with severity level SL 6 as per IEC 61701 		
•	Ammonia corrosion: not mandatory but recommended for PV systems intended to be installed in farms.	 Comply with IEC 62716 		

Table 2: Performance type tests for PV Inverters

Parameters	Test Standard Compliance
Minimum degree of protection IP 65	IEC 60529
Characteristics of the utility interface	IEC 61727
Electromagnetic Compatibility conformance	IEC 61000
Harmonics conformance in accordance with Engineering Recommendation No.1 of the Electricity Distribution Code: Limits for Harmonics in the Electricity Supply System (Version 1.0, 30 Nov 2005)	IEC 61000
Power converting equipment safety	IEC 62109-1 and IEC 62109-2
Overall efficiency of grid connected PV Inverters	IEC 62891
Islanding prevention measures of utility-interconnected PV inverters	IEC 62116

This is an uncontrolled copy. To ensure the most recent document is used kindly refer to jawdah.qcc.abudhabi.ae

Page 9





Table 3: Performance type tests for PV Systems ancillaries

Item	Test Standard Compliance	
DC connectors – safety requirements	IEC 62852	
DC cables shall be:	 EN 50618 	
 UV and Ozone resistant as per BS EN 60811 	 UL 4703 	
 Weather and moisture resistant 	IEC 60332-1-2	
 Temperature resistant (min. +90^oC) 	 BS EN 60754 	
 Flame retardant as per IEC 60332-1-2 	 BS EN 60811 	
 Non halogen as per BS EN 60754 		
 Acid and alkaline resistant as per BS EN 60811 		
PV junction boxes shall be of the thermos plastic type with IP 65	 IEC 62790 	
protection for outdoor use	 IEC 60529 	
Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices	UL 1741	

5.3 Quality Management System Requirements

The manufacturer (not the importer/distributor/retailer) must be certified according to ISO 9001:2008, the certificate being issued by a certification body accredited according to ISO/IEC 17021:2012 by an accreditation body signatory to the International Accreditation Forum Multilateral Recognition Agreement (IAF MLA).

The QCC reserves the right to conduct on site factory audits for verification of quality standards and procedures. If implemented, this will be covered by a Factory Audit Procedure.

6 CONFORMITY ASSESSMENT PROCESS

The assessment is based on the documentation submitted in compliance to clauses 5.1 - 5.3, including additional product information such as; product specifications, product descriptions and product photo documentation, which is evaluated for consistency, completeness and overall quality. Refer to APPENDIX 2 for diagram of the application assessment process.

7 IDENTIFICATION AND LABELLING

Each certified product must be provided with an evident label bearing the QCC Trustmark for Environmental Performance (depending on product and subject to agreement with the QCC Communications department).





8 SURVEILLANCE / AUDIT PROCEDURES

8.1 General

At a minimum, the surveillance and audit requirements listed under this section shall be applied to the certified product(s) and systems on an annual basis. When the validity of a certificate is to be demonstrated; this includes the validity of the accreditation of the certificate issuer.

8.2 Quality Management System Audits of Manufacturer

Proof of continued compliance (certification) is to be presented to the QCC annually or 30 days after expiry of the submitted ISO 9001 certificate (whichever comes first).

8.3 Testing and Inspection

Products carrying the QCC Trustmark of Environmental Performance will be subject to the following unannounced inspection activities:

- Annually, the QCC will undertake market surveillance activities to test certified products/systems available in the Abu Dhabi market for the following:
 - visual inspection and identification of components;
 - maximum power at Standard Test Conditions;
 - electroluminescence (EL); and
 - other tests deemed appropriate.

Manufacturers shall supply maximum power (Pmax), current-voltage (I-V) and EL testing results for the modules selected, as identified by the module serial numbers. EL images will be used amongst other things to determine if modules have been subject to damage in transit.

- Samples can be inspected i) on-site at installed locations of Abu Dhabi government/municipal owned buildings, ii) at point of entry to the Abu Dhabi Market, and/or iii) in the market.
- Samples will be assessed for compliance to selected specific requirements given in Clause 5 including review of the current certification, identification and labelling.
- The sampling schedule will target previously untested products/systems on a yearon-year basis to ensure eventual testing of all certified products and systems.
- If any product or system fails to meet the certification requirements during inspection, in the first instance, the QCC will liaise with the third party certification body to verify validity of the certification, and subsequently, request the supplier corrective actions, e.g. product/system withdraw, re-testing or re-certification.
- If one of these additional samples also fails to meet the certification specifications, the certification status of all products/systems from the applicant will be reviewed.





Proof of continued compliance to the requirements of the QCC certification must be provided if; i) a referenced standard listed in clause 4 has changed, or ii) the product/system has been modified in such a way that would affect its ability to meet the requirements of certification, or iii) annually following issuance of the QCC certificate, whichever comes first.

In cases i) or ii), the continued validity of the supplied product/system certification shall be demonstrated; in case iii) an affidavit shall be provided by the applicant and the manufacturer that the production system has not been modified and the specification of the product remains unchanged.

9 FEES

The applicant shall pay the necessary fees in accordance with the **Schedule of Fees** issued by the Abu Dhabi Executive Council, which is available in the QCC website (jawdah.qcc.abudhabi.ae) under the respective conformity assessment scheme.





APPENDIX 1: PRODUCT CERTIFICATION APPLICATION FORM

	جــلــس أبــــوظ بــــي للــجــودة والــمـطابـقــة ABU DHABI QUALITY AND CONFORMITY COUN	cil		
	QCC PRODUCT CERTIFICATION SCHEME			
Manufacturers, suppliers and distributors of a	bu Dhabi Certificatio	complete this form in supp	Diar Photovoltaic Systems	
of products that meet QCC's quality and perfe	ormance specifications.		·····, ····,	
Product seeking Trustmark Certification			Date:	
Manufacturer:		PV System model(s):		
Supplier:		Rating (kW):		
Certification Test Report Results			Report date:	
1. Application Class as per IEC 61730				
2. Performance Tests Results - Solar PV Modu	lles Fucluation	Chan dowd Lload	Commente	
Accelerated ageing	Evaluation	Standard Osed	comments	
Mechanical stress				
Fault condition simulations				
Electrical characterization				
Fire resistance				
Salt mist corrosion				
Ammonia corrosion				
3 Performance Tests Results - Solar PV Inver	tes			
Test	Evaluation	Standard Used	Comments	
Degree of Protection (IP)	Evaluation	Standard OSCu	connicito	
Characteristics of the utility interface				
Electromagnetic Compatibility conformance				
Harmonics conformance				
Power converting equipment safety				
Overall efficiency				
Islanding prevention measures				
A Performance Tests Results - Solar DV Syste	ms Ancilliaries			
A renormance resus hesuits soluri v syste				
Test	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables:	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C)	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen Acid and alkaline resistant	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Filame retardant Non halogen Acid and alkaline resistant PV junction boxes	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Bavid Shutdown Devices	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices General Requirements	Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°c) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices General Requirements	Evaluation Evaluation	Standard Used	Comments	
Test DC connectors – safety requirements DC cobles: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices General Requirements UAE License	Body Expiry date	Standard Used	Comments	
Test DC connectors – safety requirements DC cobles: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices Issuing UAE License Quality Management System	Body Expiry date	Standard Used	Comments	
Test DC connectors – safety requirements DC cobles: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90%C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices Issuing UAE License Quality Management System International Certification	Body Expiry date	Standard Used	Comments Comments V: YES NO n has been provided and is deemed acceptable:	
Test DC connectors – safety requirements DC cobles: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90%C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices Issuing UAE License Quality Management System International Certification	Body Expiry date	Standard Used	Comments	
Test DC connectors – safety requirements DC cobles: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90%C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices Issuing UAE License Quality Management System International Certification Testing Facility Certification	Body Expiry date	Standard Used	Comments	
Test DC connectors – safety requirements DC cobles: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90%C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices Issuing UAE License Quality Management System International Certification Testing Facility Certification Distribution Agreement	Body Expiry date	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90°C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices Issuing UAE License Quality Management System International Certification Destribution Agreement Installation Manual and Quality Management	Body Expiry date	Standard Used	Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90%C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices General Requirements UAE License Quality Management System International Certification Destribution Agreement Installation Manual and Quality Management Warranty:	Body Expiry date	Standard Used	Comments Image: Comments	
Test DC connectors – safety requirements DC cables: UV and Ozone resistant Weather and moisture resistant Power converting equipment safety Temperature resistant (min. +90%C) Flame retardant Non halogen Acid and alkaline resistant PV junction boxes Combiner boxes, PV optimizers, and PV Rapid Shutdown Devices General Requirements UAE License Quality Management System International Certification Destribution Agreement Installation Manual and Quality Management Warranty:	Body Expiry date	Standard Used	Comments	

Page **13**





APPENDIX 2: PRODUCT ASSESSMENT AND CERTIFICATION PROCESS



QCC-PCS-ASP037.01 Date: 08-JUN-2017

This is an uncontrolled copy. To ensure the most recent document is used kindly refer to jawdah.qcc.abudhabi.ae

Page **14**