



Saudi Standards, Metrology and Quality Organization

SASO

Technical Regulation for Solar Photovoltaic Systems

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Note:

**Only the Arabic version of this Regulation is authentic in law and is
applicable where there are differences with this translation**

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Preamble

In line with the accession of the Kingdom of Saudi Arabia (KSA) to the World Trade Organization (WTO), as per the Decree No. 244 of the Council of Ministers, dated 21/09/1426 A.H., concerning the approval of documentation on the Kingdom's accession to the WTO, and the requirements by which the KSA shall adapt its relevant systems with the principles of WTO agreements, particularly, the Technical Barriers to Trade (TBT), which stipulates that no unnecessary technical requirements shall impede the flow of commodities among the member states, and that technical requirements and methods of conformity assessment shall not discriminate between products on the basis of origin, through the issuance of Technical Regulations that include the essential requirements and standardized business procedures.

In accordance with Article 3 (Clause-1), Statute of Saudi Standards, Metrology and Quality Organization, issued in accordance with the Council of Ministers Decree No. 216, dated 17/06/1431 A.H. (31/05/2010 A.D.), stipulating that: **“SASO shall issue Saudi standards, quality systems and guidelines and conformity assessment, compatible with international standards and guidelines, that meet the requirements of the World Trade Organization (WTO) Agreement, in addition to their compliance with Islamic Sharia and serving the interests of Saudi Arabia”**;

In accordance with Article 4 (Clause-2), Statute of Saudi Standards, Metrology and Quality Organization, issued in accordance with the Council of Ministers Decree No. 216, dated 17/06/1431 A.H. (31/05/2010 A.D.), stipulating that: **“SASO shall issue regulations for conformity assessment procedures of commodities, products, and services according to approved standards”**;

In accordance with Article 4 (Clause-14), Statute of Saudi Standards, Metrology and Quality Organization, issued in accordance with the Council of Ministers Decree No. 216, dated 17/06/1431 A.H. (31/05/2010 A.D.), stipulating that: **“SASO shall review the laws and control regulations related to SASO's work fields, and develop them, and propose amendments thereto in line with quality and safety requirements, and refer them to competent bodies in order to review and issue them, in accordance with applicable procedures”**;

In accordance with Article 6 (Clause-1), Statute of Saudi Standards, Metrology and Quality Organization, issued in accordance with the Council of Ministers Decree No. 216, dated 17/06/1431 A.H. (31/05/2010 A.D.), stipulating that: **“Subject to Article 4 of this Statute, SASO shall be the authority in charge of matters related to standards, conformity assessment procedures, granting the quality mark, metrology and calibration. All public and private sectors shall be adhered to the Saudi standards in all purchases”**.

Whereas the standards of the products included in a regulation shall be a basis for the conformity of such products with the essential safety requirements included in the specified regulation.

Therefore, SASO has developed this Technical Regulation.

Note: This preamble and all the annexes of this regulation shall form an integral part thereof.

Article (1): Terms and Definitions

1/1 When applying the articles of this regulation, terms and expressions hereunder – shall have the meanings indicated in front thereof, unless the context otherwise requires:

KSA: The Kingdom of Saudi Arabia.

SASO: Saudi Standards, Metrology and Quality Organization.

The Board: SASO's Board of Directors.

Regulatory Authorities: Government body/bodies with regulatory tasks in consonance according to their specializations, which are responsible for the implementation and enforcement of technical regulations, whether in customs, markets, or manufactories.

Market Surveillance Authorities: Government body/ bodies responsible for carrying out market surveys.

Market Surveillance: Activities and measures carried out by the market surveillance authorities to verify that products meet the requirements stipulated in the relevant technical regulations, and to ensure that they do not pose a risk to health, safety, environment, or any other aspect related to the protection of the public interest.

Technical Regulation: A document approved by The Board that provides, the specifications of products, associated processes and production methods, including applicable administrative provisions; with which compliance is mandatory. It may include or pay attention to terms, definitions, packaging, and requirements of markings or labelling products, services, processes or production methods.

Standard: A document approved by the Board that provides, for the regular and recurring use, non-mandatory rules of products or processes and production methods. It may include, or pay attention to terms, definitions, packaging, and requirements of markings or labelling products, services, processes or production methods.

Essential Requirements: The special requirements of the products; that may affect the safety, health, and the environment; that must be adhered to.

Hazard(s): A potential source of harm.

Risk (s): A potential risk causing damage; associated with the severity of damage.

Supplier:

- A product manufacturer, in case that he is resident in the KSA, or the person identified as the manufacturer of the product, through linking the product to their name, or to a relevant commercial description, or any person renews a product.
- An agent, if the manufacturer is outside the KSA, or an importer in the absence of an agent of the manufacturer in KSA.
- Any person in the supply chain. whose activities may affect the product characteristics.

Conformity Assessment Procedures: A document approved by the Board, which describes the procedures used directly, or indirectly for the conformity assessment.

Notified Bodies: Conformity Assessment Bodies “Third Party”, approved by SASO in accordance with the regulation of approving Conformity Assessment Bodies.

Certificate of Conformity: A certificate issued by SASO or a notified body, which ensures the conformity of a product, or any batch thereof, with the requirements of relevant standards.

Supplier Declaration of Conformity: A declaration by the supplier by which it declares that a product conforms to the requirements herein and applicable legislations, without the mandatory intervention of a third party neither in the design stage, nor in the production stage of the manufacturing process. A declaration may depend on testing the product in accordance with the relevant legislation.

Saudi Quality Mark: A mark granted by SASO, which declares that the supplier has established an effective management system, which ensures that the products they supply are produced in accordance with the applicable regulations, granting procedures, and the relevant Saudi standards.

Placing on Market: Launching a product for the first time in the Saudi market for which the manufacturer/supplier is responsible.

Making Available on the Market: Any supply of the product for distribution, consumption or use in the KSA, in the course of a commercial activity, in return for payment or free of charge.

Withdrawal: Any procedure that aims to prevent placing the product in the market or in a supply chain.

Recall: Any procedure that aims to recall products made available for the end-user.

Product: All equipment and devices for solar photovoltaic systems and components associated with power generation.

Photovoltaic (PV): Description of the process of generating electricity directly from solar radiation related to the generation of voltage or current when radiation energy falls on the surfaces of solar cells composed of semiconductors.

Photovoltaic Cells (PV cells): Cells made of semiconductors, which are used to convert sunlight into continuous electrical energy.

Photovoltaic Modules (PV Module): It is the main component in solar systems that convert sunlight into direct electrical current (DC). It consists of a group of photovoltaic cells that are assembled and connected together in series. They are also called solar photovoltaic panels (PV panels).

PV Inverter: A device that is converts the direct current (DC) electricity produced from photovoltaic panels or batteries into alternating current (AC) for the purpose of private use or for export to the local network.

Interface Protection Device: It is the automatic disconnection device between the inverter and the network connection point.

Name Plate: A metal or plastic sign connected to a door or to the wall of the product, which displays the company name and product data.

1/2 The terms and expressions specified herein shall have the meanings specified in the applicable laws, regulations, and decrees of SASO.

Article (2): Scope

The provisions of this Technical Regulation shall apply to solar power systems that generate electricity and the following components thereto:

- Photovoltaic units.
- Voltage inverters.
- Cables and conductors.
- Cutting, coupling and control equipment.
- Interlayer protection devices.

Article (3): Objectives

This regulation aims to lay out the essential safety requirements for solar PV systems that generate electricity and their components included in the scope of this regulation, including firefighting requirements and electromagnetic compatibility requirements, and to identify the conformity assessment procedures with which the suppliers shall comply, in order to ensure the conformity of these products, to maintain the consumer health and safety and to preserve the environment through reducing carbon emissions and comply with the preparation of technical legislations complementary to the national renewable energy transformation initiative.

Article (4): Obligations of Supplier

Suppliers shall be responsible for registering the products with SASO and the relevant authorities; this shall ensure that no product is launched in KSA before obtaining the Certificate of Conformity. The supplier shall comply, throughout all stages of the supply chain, with the following requirements:

4/1 General Requirements

- A) Fulfillment of the requirements of this regulation, including registering the product with SASO and the relevant authorities (by obtaining the Certificate of Conformity) to ensure that it meets the necessary safety requirements upon installation, operation and maintenance, and to comply with the forms and conformity procedures as approved by SASO.
- B) Cooperation and coordination with SASO and the Regulatory Authorities by providing all documents and data as required, including the product inspection reports and the Certificate of Conformity.
- C) Suppliers shall provide all documents related to design, manufacturing, installation, operation and maintenance of the product.
- D) To provide an effective quality management system in the factory. (A manufacturer certified with ISO 9001 is considered as met with the requirements of this Article.)
- E) To provide an effective environmental management system in the factory. (A manufacturer certified with ISO 14001 is considered as met with the requirements of this Article.)

4/2 Technical Requirements:

The product shall meet the basic characteristics of the solar PV systems and their components set out in the standards in Annex (1), as follows:

4/2/1 Solar PV Units

- A) The photovoltaic units shall fulfill the technical requirements mentioned in the standards set forth in Annex (1-A) which specify the general safety requirements and, efficiency of the PV units, and the tests that must be performed to identify the mechanical and electrical properties necessary for the operating conditions in the environment of the KSA.
- B) The PV Junction box shall meet the requirements of the relevant standard contained in Annex (1-A) when more than one PV unit exists.
- C) The requirements mentioned in the relevant standards shall be met, regarding the mandatory documentation of the product that must be submitted.
- D) The requirements mentioned in the relevant standards shall be met, regarding the marks and data that must be installed in name plate of the product.

4/2/2 Photovoltaic Inverter:

Photovoltaic Inverters shall meet the requirements specified in the relevant standards, as mentioned in **Annex (1)**, in addition to the requirements of the regulations issued by the relevant authorities competent with the regulatory framework for linking PV power systems to the **national electricity grid**.

4/2/3 Cables and Conductors

Cables and conductors shall meet the requirements mentioned in the standards contained in Annex (1-D).

4/2/4 Cutting, Coupling and Control Equipment

The solar photovoltaic system shall have cutting and connecting control devices, including (quick disconnection) switches, and shall comply with the requirements mentioned in the standards contained in **Annex (1-E)**.

4/2/5 Interlayer Protection Devices

Interlayer protection devices shall meet the requirements mentioned in the standards listed in **Annex (1-F)**.

4/3 Metrological Requirements

International System of Units (SI Units), its multiplies, or its parts shall be applied during design, manufacturing or distribution.

4/4 Packaging Requirements

Ensure that all components of the solar PV system are packaged in accordance with the packaging requirements stipulated in the standards and relevant technical regulations.

Article (5): Labeling

5/1 Data cards and labels

- A) The data and labels card shall be affixed to the product and written in both Arabic and English. Images and phrases used on the product packaging shall not violate the public law, morals, and the Islamic values prevailing in KSA.
- B) The data card/label of the solar PV systems and their components, prepared for placement and display on the market, shall include the following data and marks:
 - Usage warnings and instructions/guidelines.
 - Nominal properties of the product and the values and type of protection.

5/2 Technical Data Panel

5/2/1 A data panel of the photovoltaic units shall be provided in accordance with the standards contained in Annex (1-A), provided that the following information is included, as a minimum:

1	Name of Manufacturer	8	Open circuit voltage (Voc)
2	Model	9	Short circuit current (Isc)
3	Type of Unit	10	Maximum system Voltage (Vsys)
4	Maximum unit Power (Pmax)	11	Operating temperature range
5	Voltage for maximum Power (Vmp)	12	Weight and Dimensions
6	Current at maximum Power (Imp)	13	Degree of protection
7	(Safety class)	14	Class of Fire

5/2/2 A data panel of the photovoltaic inverters shall be provided in accordance with the standards contained in Annex (1-A), provided that the following information is included, as a minimum:

1	Name of Manufacturer	9	Maximum input current
2	Model	10	Rated Power
3	Type	11	Rated Voltage
4	Maximum Constant Current Power	12	Maximum output current
5	Maximum power points voltage	13	Frequency
6	Number of maximum power points	14	Degree of Protection
7	Maximum input voltage	15	Weight and Dimensions
8	(Safety class)	16	Class of Fire

Article (6): Conformity Assessment Procedures

6/1 The supplier - responsible for placement of the solar power systems in the market - shall obtain a Certificate of Conformity issued by a notified body approved by SASO, in accordance with the regulation of issuing corresponding national

- conformity certificates according to the program of conformity assessment tests and certification of electro-technical equipment and components (IECEE).
- 6/2 Notified Bodies shall implement the conformity assessment procedures according the specified model, in order to ensure fulfillment of the requirements of this Technical Regulation and relevant standards set out in Annex (1) of this Regulation.
- 6/3 The product inspection reports must be issued by accredited laboratories within the laboratories registered and approved by SASO.
- A) The product shall be accompanied by a technical file, which includes the following:
1. All documents and plans/schemes proving the compliance of the product with the provisions of this technical regulation.
 2. Supplier (manufacturer/importer) Declaration of Conformity in accordance with the form attached in Annex (2).
 3. Risk Assessment Document.
- B) Supplier shall collaborate with Regulatory Authorities and Market Surveillance Authorities through the submission of technical file documentation, certifications of conformity, and any other certified information proving that the product is in conformity with this regulation and the relevant standards, upon request.
- C) PV solar systems subject to this Regulation that bear Saudi quality mark or its equivalent shall be deemed in conformity to the requirements stipulated herein.

Article (7): Responsibilities of Regulatory Authorities (Customs Ports - Factories)

Regulatory Authorities, as a part of their competences, shall carry out the following:

- 7/1 Regulatory Authorities shall verify that PV power generating systems and their components fulfill the requirements of the specified conformity assessment procedures, and the associated technical documents attached to the consignments.
- 7/2 Regulatory Authorities are entitled to randomly take samples of PV power generating systems and their components, and refer such samples to the competent laboratories to ascertain the extent of the conformity of such sample with the requirements set out in this Technical Regulation.
- 7/3 Regulatory Authorities have the right to charge the suppliers (manufacturers/importers) with the costs of tests and associated fees.
- 7/4 In case of a non-conformity of the product, Regulatory Authorities shall withdraw the concerned products from warehouses, and take the necessary legal actions.

Article (8): Responsibilities of Market Surveillance Authorities

Market Surveillance Authorities, as a part of their competences, shall carry out the following:

- 8/1 Enforce the market surveillance procedures to the products in markets and the products stored in warehouses, in order to check the safety of the product and the extent of fulfillment of the requirements stipulated in this Technical Regulation and relevant standards.
- 8/2 Withdraw samples of the product, whether from the market or warehouses of suppliers (manufacturers and importers), in order to conduct the necessary tests and to verify the conformity of such products with the requirements set out in this Technical Regulation.
- 8/3 In case of non-conformity of – displayed or stored – products with the requirements of this Technical Regulation, Market Surveillance Authorities shall take all administrative actions including withdrawal and recall of such products. Procedures and penalties – stipulated in Article (9) – shall be applied after taking the necessary actions.

Article (9): Violations and penalties

- 9/1 It is prohibited to manufacture, import, launch, or even advertise the products non-conforming with the requirements of the articles stipulated in this Technical Regulation.
- 9/2 Failure to meet the requirements of this Regulation shall be a sufficient reason for Market Surveillance Authorities and Regulatory Authorities to consider the product as non-conforming, which may pose a risk to the health and safety of consumers and to the environment, including:
 - A) Non-fixing or improper fixing of conformity labels, Saudi Quality Mark, or its equivalent.
 - B) Failure to issue or incorrect issuance of the Certificate of Conformity or the Supplier Declaration of Conformity.
 - C) Lack, unavailability, or incompleteness of the technical documentation upon request.
 - D) Lack, unavailability, or incompleteness of product data/labels, safety guidelines, or usage instructions.
- 9/3 In case of a violation of the provisions hereof, Market Surveillance Authorities shall take all necessary actions to eliminate such violations, and their effects from the market. To this end, Market Surveillance Authorities may:
 - A) Mandate the violating party – that is responsible for placing and offering of the product – to withdraw the product from the warehouses or markets in order to remedy such violations, if possible. The product may be exported or destroyed (according to the nature of the product) within the period specified by the Market Surveillance Authorities.
 - B) Withdraw, restrain or destroy the products, or take any other necessary action to recall such products from the markets. In addition, as the case

may be, Market surveillance Authorities may announce the withdrawal of the product from the markets, and the violating party shall bear all associated expenses.

C) Deal with the violating products covered by this regulation in accordance with laws and regulations applicable in the Regulatory Authorities and Market Surveillance Authorities.

- 9/4 In case of non-conformity of the products, SASO shall take the necessary actions concerning products non-conforming with the requirements of this Regulation, including the cancellation of the relevant Certificate of conformity, while taking the necessary measures with the Notified body, which issued the certificate.
- 9/5 Without prejudice to any other law, a party that violates any of the provisions hereof shall be subject to the penalties stipulated in applicable Anti-Commercial Fraud Law or any other superseding law.

Article (10): General Provisions

- 10/1 The photovoltaic components subject to the requirements of this regulation shall comply with the requirements of the relevant authorities concerned with the regulatory framework for linking solar PV solar systems to the national electrical grid and service providers.
- 10/2 Suppliers shall bear full legal responsibility for the implementation of the requirements of this Technical Regulation, and shall be subject to the penalties stipulated in the Anti-Commercial Fraud laws and/or any other related laws, in case any violation of the articles thereof is proven.
- 10/3 This Technical Regulation shall not impede the supplier to comply with all other systems/regulations applicable in the KSA; pertaining to trading, transporting, or storing the product, in addition to the rules/regulations related to the environment, security, and safety.
- 10/4 Suppliers of the PV solar systems subject to the provisions of this Technical Regulation shall provide the inspectors of the Regulatory and Market Surveillance Authorities with all necessary information and facilities, when required, to carry out their assigned tasks.
- 10/5 If new originated cases that cannot be treated under the provisions of this Technical Regulation, or a dispute arises as a result of the application of those provisions, such matter shall be referred to the competent committee in SASO, in order to issue a proper resolution regarding the case or dispute, while taking the public interest into consideration.
- 10/6 The supplier may submit a new request after elimination of the reasons of rejection for the conformity assessment procedures request, and after the necessary corrections have been made. The supplier shall be responsible for any additional expenses determined by SASO.
- 10/7 SASO shall examine the complaints received regarding the products having a Certificate of Conformity or a Quality Mark, if any, and verify the validity of such complaints, and take the necessary legal actions in case of any violations.

- 10/8 SASO have the right to annul the **Certificate of Conformity** or the Quality Mark license, if any, if the supplier violates the provisions herein, and shall take the legal actions to ensure the preservation of the rights of SASO.
- 10/9 If any modifications were made to the product during the validity period of the **Certificate of Conformity or the Quality Mark license**, if any, (except for figure modifications), the certificate, license, or the Supplier Declaration of Conformity for this product shall be annulled, and a new request shall be submitted.
- 10/10 SASO shall, exclusively, have the right to construe the articles herein. All beneficiaries of the application of this Technical Regulation shall adhere to the interpretations issued by SASO.

Article (11): Transitional Provisions

- 11/1 The supplier shall take corrective actions in accordance with the provisions of this Technical Regulation within a period of **no more than six months** as of the date of publication.
- 11/2 Subject to the provisions of item (1) of this Article, products, not complying with the provisions specified in this Technical Regulation may be traded for a maximum of one year as of the date of publication.
- 11/3 This regulation cancels – once adopted – shall supersede all preceding regulations in the field of conforming PV solar systems that generate electricity and their components to safety requirements before being placed in the market, and after.

Article (12): Publication

This Technical Regulation shall be published in the Official Gazette.

Annex No. (1)

A) List of Standards for Photovoltaic (PV) Systems and their Components

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
1	PV Units	الوحدات الكهروضوئية الأرضية - تأهيل التصميم واعتماد النوع - الجزء 1: متطلبات الإختبار	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements.	SASO IEC 61215-1
		الوحدات الكهروضوئية الأرضية - تأهيل التصميم واعتماد النوع - الجزء 1-1: متطلبات خاصة لاختبار الوحدات الشمسية الكهروضوئية السليكونية احادية البلورة	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-1: Special requirements for testing of crystalline silicon photovoltaic (PV) modules	SASO IEC 61215-1-1
		الوحدات الكهروضوئية الأرضية - تأهيل التصميم واعتماد النوع - الجزء 1-2: متطلبات خاصة لاختبار الوحدات الشمسية الكهروضوئية المبنية على طبقات رقيقة من الكاديوم تيلوريد (CdTe)	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-2: Special requirements for testing of thin-film Cadmium Telluride (CdTe) based photovoltaic (PV) modules	SASO IEC 61215-1-2
		الوحدات الكهروضوئية الأرضية - تأهيل التصميم واعتماد النوع - الجزء 1-3: متطلبات خاصة لاختبار الوحدات الشمسية الكهروضوئية المبنية على	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-3: Special requirements	SASO IEC 61215-1-3

Product	Standard Title in Arabic	Standard Title in English	Standard No.
	طبقة رقيقة من السليكون غير المتبلور امورفس سيليكون (a-Si)	for testing of thin-film amorphous silicon based photovoltaic (PV) modules	
	الوحدات الكهروضوئية الأرضية - تأهيل التصميم واعتماد النوع - الجزء 1-4: متطلبات خاصة لاختبار الوحدات الشمسية الكهروضوئية المبنية على طبقة رقيقة من نحاس (انديوم، جاليوم) (كبريت، سليليوم2)، Cu(In,GA)(S,Se)2	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	SASO IEC 61215-1-4
	الوحدات الكهروضوئية الأرضية - تأهيل التصميم واعتماد النوع- الجزء 2: اجراءات الاختبار	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test procedures	SASO IEC 61215-2
	الوحدات الكهروضوئية الأرضية - تأهيل التصميم واعتماد النوع - الجزء 1: متطلبات الإختبار	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements.	SASO IEC 61215-1
	مؤهلات سلامة الوحدات الكهروضوئية - الجزء 1: متطلبات التركيب	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction.	SASO IEC- 61730-1
	مؤهلات سلامة الوحدة الكهروضوئية-الجزء 2: متطلبات الاختبار	Photovoltaic (PV) module safety qualification - Part 2:	SASO IEC 61730-2

Product	Standard Title in Arabic	Standard Title in English	Standard No.
		Requirements for testing.	
	اختبار تأكل الرذاذ الملحي للوحدات الكهروضوئية	Salt mist corrosion testing of photovoltaic (PV) modules.	SASO IEC 61701
	الاختبار البيئي - الجزء 2-68: الاختبارات - اختبار : الغبار والرمل	Environmental testing - Part 2-68: Tests - Test L: Dust and sand	SASO IEC 60068-2-68
	الوحدات الكهروضوئية - اختبار تأكل الأمونيا	Photovoltaic (PV) modules - Ammonia corrosion testing.	SASO IEC 62716
	متطلبات العلامات والوثائق للوحدات الكهروضوئية	Marking and documentation requirements for Photovoltaic Modules	EN 50380
	صناديق وصلة الوحدات الفوتو فولتية (الكهروضوئية) - متطلبات السلامة والاختبارات.	Junction boxes for photovoltaic modules - Safety requirements and tests	SASO IEC 62790
	اختبار أداء وحدة كهروضوئية وتصنيف الطاقة - الجزء 1: قياس الأداء للإشعاع ودرجة الحرارة وتصنيف القدرة	photovoltaic (pv) module performance testing and energy rating - part 1: irradiance and temperature performance measurements and power rating	SASO IEC 61853-1
	الألواح الفوتو فولتية PV - طرق الاختبار للكشف عن التدهور الناجم عن الجهد	Photovoltaic (PV) modules - Test methods for the detection of	SASO IEC TS 62804-1

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		المستحث - الجزء 1 : السليكون البلورية	potential-induced degradation – Part 1: Crystalline silicon	
		تصنيف الفوتو فولتيه: متطلبات التصميم	Photovoltaic (PV) arrays – Design requirements	SASO-IEC- 62548
		الألواح الفوتو فولتية الأرضية (PV) - دليل لزيادة الثقة في تأهيل التصميم واعتماد الطراز للألواح الفوتوفولتية الأرضية (PV)	Terrestrial photovoltaic (PV) modules – Guideline for increased confidence in PV module design qualification and type approval	SASO IEC TS 62941
		الوصلات لتطبيقات التيار المستمر في النظم الفوتو فولتية (الكهروضوئية) - متطلبات السلامة والاختبارات	Connectors for DC- application in photovoltaic systems – Safety requirements and tests	SASO IEC TS 62852
		الألواح الفوتو فولتية (PV) - اختبار الحمل الميكانيكي (الديناميكي) الدوري	Photovoltaic (PV) modules – Cyclic (dynamic) mechanical load testing	SASO IEC TS 62782
2	Cutting, coupling, and control equipment	الالواح الفوتوفولتية المركزة والتركيبات - تأهيل التصميم واعتماد الطراز .	Concentrator photovoltaic (CPV) modules and assemblies – design qualification and type approval	SASO-IEC- 62108
		الوحدات الكهروضوئية الأرضية ذات الطبقة	Thin-film terrestrial photovoltaic (PV) modules – Design	IEC 61646

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		الرقيقة (PV) - مؤهلات التصميم والموافقة على النوع	qualification and type approval	
		الوحدات الفوتوفولتية (PV) الارضية - دليل ضمان الجودة الفعالة في تركيب وتشغيل وصيانة أنظمة PV	Terrestrial photovoltaic (PV) systems - Guidelines for effective quality assurance in PV systems installation, operation and maintenance	SASO-IEC-TS-63049
		مؤهلات سلامة الوحدات الكهروضوئية - الجزء 1: متطلبات التركيب	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction.	SASO IEC-61730-1
		مؤهلات سلامة الوحدة الكهروضوئية-الجزء 2: متطلبات الاختبار	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing.	SASO IEC 61730-2
		اختبار تآكل الرذاذ الملحي للوحدات الكهروضوئية	Salt mist corrosion testing of photovoltaic (PV) modules.	SASO IEC 61701
3	General Requirements	الاختبار البيئي - الجزء 2-68: الاختبارات - اختبار : الغبار والرمل	Environmental testing - Part 2-68: Tests - Test L: Dust and sand	SASO IEC 60068-2-68
		الوحدات الكهروضوئية - اختبار تآكل الأمونيا	Photovoltaic (PV) modules - Ammonia corrosion testing.	SASO IEC 62716
		متطلبات العلامات والوثائق للوحدات الكهروضوئية	Marking and documentation requirements for	EN 50380

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
			Photovoltaic Modules	
		صناديق وصلة الوحدات الفوتو فولتية (الكهروضوئية) - متطلبات السلامة والاختبارات.	Junction boxes for photovoltaic modules - Safety requirements and tests	SASO IEC 62790
		اختبار أداء وحدة كهروضوئية وتصنيف الطاقة - الجزء 1: قياس الأداء للإشعاع ودرجة الحرارة وتصنيف القدرة	photovoltaic (pv) module performance testing and energy rating - part 1: irradiance and temperature performance measurements and power rating	SASO IEC 61853-1
		الألواح الفوتو فولتية PV - طرق الاختبار للكشف عن التدهور الناجم عن الجهد المستحث - الجزء 1: السليكون البلورية	Photovoltaic (PV) modules - Test methods for the detection of potential-induced degradation - Part 1: Crystalline silicon	SASO IEC TS 62804-1
4		تصنيف الفوتو فولتية: متطلبات التصميم	Photovoltaic (PV) arrays - Design requirements	SASO-IEC-62548
		الألواح الفوتو فولتية الأرضية (PV) - دليل لزيادة الثقة في تأهيل التصميم واعتماد الطراز للألواح الفوتو فولتية الأرضية (PV)	Terrestrial photovoltaic (PV) modules - Guideline for increased confidence in PV module design qualification and type approval	SASO IEC TS 62941

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		الوصلات لتطبيقات التيار المستمر في النظم الفوتو فولتية (الكهروضوئية) - متطلبات السلامة والاختبارات	Connectors for DC-application in photovoltaic systems - Safety requirements and tests	SASO IEC TS 62852
		الألواح الفوتو فولتية (PV) - اختبار الحمل الميكانيكي (الديناميكي) الدوري	Photovoltaic (PV) modules - Cyclic (dynamic) mechanical load testing	SASO IEC TS 62782
		معدات الوصل والفصل والتحكم ذات الجهد المنخفض - الجزء 3: المفاتيح، الفواصل، من المفاتيح والفواصل والفيوزات - وحدات مجمعة	low-voltage switchgear and controlgear - part 3: switches, disconnectors, switch-disconnectors and fuse-combination units	SASO IEC 60947-3
		مجموعات معدات الوصل والفصل والتحكم ذات الجهد المنخفض - الجزء 1: قواعد عامة	low-voltage switchgear and controlgear assemblies - part 1: general rules	SASO IEC 61439-1
		لوحات المفاتيح الكهربائية ذات الجهد المنخفض ومجموعات التحكم - الجزء 2: مجموعات الفصل والوصل والتحكم لأنظمة القدرة	low-voltage switchgear and controlgear assemblies - part 2: power switchgear and controlgear assemblies	SASIO IEC 61439-2
		أجهزة الحماية من التمرور للجهد المنخفض - الجزء	Low-voltage surge protective devices -	SASO-IEC-61643-31

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		31: : المتطلبات وطرق الاختبار ل SPDs للتركيبات الفوتوفولتية	Part 31: Requirements and test methods for SPDs for photovoltaic installations	
		أجهزة الحماية ضد الصواعق للجهد المنخفض - الجزء 32: أجهزة الحماية ضد الصواعق المتصلة بـ .d.c جانب المنشآت الفوتوفولتية - مبادئ الاختيار والتطبيق	Low-voltage surge protective devices - Part 32: Surge protective devices connected to the d.c. side of photovoltaic installations - Selection and application principles	SASO-IEC-61643-32
		مكونات ائزان النظام للأنظمة الكهروضوئية - الأجواء البيئية الطبيعية لتقييم التصميم	Balance of system components for photovoltaic systems - design qualification natural environments	SASIO IEC 62093
		متطلبات السلامة لمحولات القدرة للاستخدام في أنظمة القدرة الكهروضوئية - الجزء 1: المتطلبات العامة	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements	SASO IEC 62109-1
		متطلبات السلامة لمحولات القدرة للاستخدام في أنظمة القدرة الكهروضوئية - الجزء 2: المتطلبات الخاصة بالعواكس .	Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters.	SASO IEC 62109-2

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		مواصفات العواكس والمحولات وحدات التحكم ومعدات الربط البيني للاستخدام مع موارد الطاقة الموزعة	Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resource	UL 1741
		إجراء اختبار لتدابير منع تجزئة الخدمة - للعواكس الكهروضوئية المترابطة	Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters	SASO IEC 62116
		الكفاءة الكلية للعواكس الكهروضوئية المتصلة بالشبكة.	Overall efficiency of grid connected photovoltaic inverters	EN 50530
		المقومات العاكسة الفوتو فولتية - صفحة البيانات وبطاقة المعلومات	Photovoltaic inverters - Data sheet and name plate	IEC 62894
		المقومات العاكسة الفوتو فولتية للربط بمزود الخدمة - إجراء الاختبار لقياس الجهد المنخفض العابر	Utility-interconnected photovoltaic inverters - Test procedure for low voltage ride-through measurements	SASO IEC TS 62910
		متطلبات السلامة لمعدات وأنظمة مغيرات القدرة الإلكترونية - الجزء 1: عام	Safety requirements for power electronic converter systems and equipment - Part 1: General	SASO IEC 62477-1

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
5	CONVERTERS) (/ INVERTERS	الأنظمة الكهروضوئية - مكيفات القدرة - إجراء لقياس الكفاءة	Photovoltaic systems - Power conditioners - Procedure for measuring efficiency	IEC 61683
متطلبات السلامة لمحولات القدرة للاستخدام في أنظمة القدرة الكهروضوئية - الجزء 1: المتطلبات العامة		Safety of power converters for use in photovoltaic power systems - Part 1: General requirements	SASO IEC 62109-1	
متطلبات السلامة لمحولات القدرة للاستخدام في أنظمة القدرة الكهروضوئية - الجزء 2: المتطلبات الخاصة بالعواكس .		Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters.	SASO IEC 62109-2	
		خلايا ثانوية وبطاريات لخزن الطاقة المتجددة - متطلبات عامة وطرق اختبار - الجزء 2: تطبيقات مستقلة عن الشبكة	Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid application	IEC 61427-1

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		خلايا ثانوية وبطاريات لخزن الطاقة المتجددة - متطلبات عامة وطرق اختبار - الجزء 2: تطبيقات على الشبكة.	Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 2: On-grid applications	SASO-IEC- 61427-2
6	Batteries	خلايا ثانوية وبطاريات لخزن الطاقة المتجددة - متطلبات عامة وطرق اختبار - الجزء 2: تطبيقات مستقلة عن الشبكة	Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid application	IEC 61427-1
7	Cables	الكابلات كهربائية لأنظمة الطاقة الكهروضوئية	Electric cables for photovoltaic systems	EN 50618
موافقة للسلك الكهروضوئي		Standard for Photovoltaic Wire	UL 4703	
الكابلات الكهربائية المستخدمة في الأنظمة الضوئية (الفوتو فولتية) ذات جهد تيار مستمر (DC) حتى ويشمل 1,5 كيلو فولت		Electric cables for photovoltaic systems with a voltage rating of 1,5 kV DC	SASO-IEC- 62930	

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		وحدات التحكم لشحن البطاريات للنظم الكهروضوئية - الأداء والتشغيل	Battery charge controllers for photovoltaic systems - Performance and functioning	SASO-IEC-62509
		محطات توليد الطاقة الكهروضوئية المثبتة على الأرض - إرشادات التصميم والتوصيات	Ground-mounted photovoltaic power plants - Design guidelines and recommendations	IEC TS 62738
		المصفوفات الفوتوفولتية - متطلبات التصميم.	Photovoltaic (PV) arrays - Design requirements	SASO-IEC-62548
8	Solar panels rules	الانظمة الفوتوفولتية - تقييم التصميم للمسارات الشمسية	Photovoltaic systems - Design qualification of solar trackers	SASO-IEC-62817
9	Interlayer Protection System	نظم وشبكات الاتصالات لآلية محطات القدرة - الجزء 7-420: بنية الاتصالات - العقد المنطقية لمصادر طاقة التوزيع	Communication networks and systems for power utility automation - Part 7-420: Basic communication structure - Distributed energy resources logical node.	SASO - IEC 61850-7-420
		متطلبات السلامة الخاصة بالمعدات الكهربائية لأغراض القياس والتحكم والاستخدام المختبري - الجزء 1: المتطلبات العامة	Safety requirements for electrical equipment for measurement, control, and laboratory use - part	SASO-IEC-61010-1

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
			1: general requirements	
	Safety Requirements	مرحلات القياس ومعدات الحماية - الجزء 26: متطلبات التوافق الكهرومغناطيسي	Measuring relays and protection equipment – Part 26: Electromagnetic compatibility Requirement	SASO-IEC 60255-26
		الاختبار البيئي - الجزء 2-2: الاختبارات - اختبار B الحرارة الجافة	Environmental testing – Part 2-2: Tests – Test B: Dry heat.	SASO- IEC 60068-2-2
		مرحلات القياس ومعدات الحماية - الجزء 27: متطلبات سلامة المنتج.	Measuring relays and protection equipment – Part 27: Product safety requirements.	SASO-IEC 60255-27
		التركيبات الكهربائية للمباني - الجزء 7-712: متطلبات التركيبات أو المواقع الخاصة - نظم الإمداد بالطاقة الشمسية الكهروضوئية	Electrical installations of buildings – Part 7-712: Requirements for special installations or locations – Solar photovoltaic (PV) power supply system	SASO-IEC 60364-7-712
	Photovoltaic Devices	الأجهزة الكهروضوئية - الجزء 1: طرق القياس الخطية	Photovoltaic devices – Part 10: Methods of linearity measurement.	SASO-IEC 60904-10
		الأجهزة الكهروضوئية - الجزء 2: متطلبات الأجهزة الكهروضوئية المرجعية	Photovoltaic devices – Part 2: Requirements for	SASO-IEC 60904-2

Product	Standard Title in Arabic	Standard Title in English	Standard No.
		photovoltaic reference devices.	
	الأجهزة الكهروضوئية - الجزء 4: الأجهزة الشمسية المرجعية - إجراءات إنشاء تتبع المعايرة	Photovoltaic devices - Part 4: Reference solar devices - Procedures for establishing calibration traceability.	SASO- IEC 60904-4
	الأجهزة الكهروضوئية - الجزء 5: تحديد درجة حرارة المكافئة للخلية (ECT) للأجهزة الكهروضوئية (PV) باستخدام طريقة جهد الدارة المفتوحة	Photovoltaic devices - Part 5: Determination of the equivalent cell temperature (ECT) of photovoltaic (PV) devices by the open- circuit voltage method.	SASO IEC 60904-5
	الأجهزة الكهروضوئية - الجزء 7: حساب خطأ عدم التوافق الطيفي الوارد في اختبار الأجهزة الكهروضوئية	Photovoltaic devices - Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices.	SASO - IEC 60904-7
	الأجهزة الكهروضوئية - الجزء 8: قياس الاستجابة الطيفية للجهاز الكهروضوئي)	Photovoltaic devices - Part 8: Measurement of spectral responsivity of a photovoltaic (PV) device.	SASO-IEC 60904-8
	نظم وشبكات الاتصالات لآلية محطات القدرة - الجزء 420-7: بنية الاتصالات	Communication networks and systems for power	SASO - IEC 61850-7-420

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		- العقد المنطقية لمصادر طاقة التوزيع	utility automation - Part 7-420: Basic communication structure - Distributed energy resources logical node.	
		متطلبات السلامة الخاصة بالمعدات الكهربائية لأغراض القياس والتحكم والاستخدام المختبري - الجزء 1: المتطلبات العامة	Safety requirements for electrical equipment for measurement, control, and laboratory use - part 1: general requirements	SASO-IEC-61010-1
10	Photovoltaic Systems	- الأجهزة الكهروضوئية - الجزء 9: متطلبات أداء المحاكى الشمسي	Photovoltaic devices - Part 9: Solar simulator performance requirements	SASO- IEC 60904-9
		- أداء النظم الفوتوفولتية - الجزء 1 : المراقبة	<ul style="list-style-type: none"> Photovoltaic system performance - Part 1: Monitoring 	SASO-IEC-61724-1
		- أداء النظم الفوتوفولتية - الجزء 2 : طريقة تقييم السعة	<ul style="list-style-type: none"> Photovoltaic system performance - Part 2: Capacity evaluation method 	SASO-IEC-TS-61724-2

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
		أداء النظم الفوتوفولتية - الجزء 3 : طريقة تقييم الطاقة	<ul style="list-style-type: none"> Photovoltaic system performance - Part 3: Energy evaluation method 	SASO-IEC- TS-61724-3
		التعبير التحليلي للأشكال الشمسية اليومية	Analytical expression for daily solar profiles.	SASO - IEC 61725
		مصنوفة كهروضوئية من السيليكون البلوري - قياس مميزات منحنى التيار- الجهد في موقع العمل	Crystalline silicon photovoltaic (PV) array - On-site measurement of I-V characteristics.	SASO-IEC 61829
11		النظم الكهروضوئية (PV) -متطلبات الاختبار والتوثيق والصيانة - الجزء 1 : نظم الربط بالشبكة - التوثيق واختبارات التكليف والفحص	Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance - Part 1: Grid connected systems - Documentation, commissioning tests and inspection	SASO IEC 62446-1
		أنظمة (PV) الكهروضوئية - خصائص التوصيل البيني في الخدمات	Photovoltaic (PV) systems - Characteristics of the utility interface	SASO-IEC- 61727
		الأجهزة الكهروضوئية - الجزء 1: قياس الخصائص الفوتوفولتية للتيار - الجهد	Photovoltaic devices - Part 1: Measurement of photovoltaic current-	SASO-IEC- 60904-1

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
			voltage characteristics	
		الأجهزة الكهروضوئية - الجزء 9: متطلبات أداء المحاكي الشمسي	Photovoltaic devices - Part 9: Solar simulator performance requirements	SASO- IEC 60904-9
		أداء النظم الفوتوفولتية - الجزء 1 : المراقبة	<ul style="list-style-type: none"> Photovoltaic system performance - Part 1: Monitoring 	SASO-IEC- 61724-1
		أداء النظم الفوتوفولتية - الجزء 2 : طريقة تقييم السعة	<ul style="list-style-type: none"> Photovoltaic system performance - Part 2: Capacity evaluation method 	SASO-IEC- TS-61724-2
		أداء النظم الفوتوفولتية - الجزء 3 : طريقة تقييم الطاقة	<ul style="list-style-type: none"> Photovoltaic system performance - Part 3: Energy evaluation method 	SASO-IEC- TS-61724-3
12	Electromagnetic Compatibility	التوافق الكهرومغناطيسي:(EMC) الجزء (3-2): الحدود - حدود الانبعاث لتيار توافقي (تيار دخل المعدة 16<= أمبير لكل طور	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input	SASO GSO IEC 61000- 3-2

Product	Standard Title in Arabic	Standard Title in English	Standard No.
		current ≤ 16 A per phase).	
	<p>التوافق الكهرومغناطيسي - الجزء 3-12: الحدود - حدود التيارات التوافقية التي تنتج من أجهزة موصلة بأنظمة جهد منخفض للأغراض العامة وتيار دخل أكبر من 16 أمبير وأصغر من أو يساوي 75 أمبير لكل طور.</p>	<p>Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤ 75 A per phase.</p>	<p>SASO- IEC 61000-3-12</p>
	<p>التوافق الكهرومغناطيسي الجزء (6 - 1) (EMC): المواصفات القياسية العامة - المناعة الخاصة بالبيئات السكنية والتجارية والصناعات الخفيفة</p>	<p>Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments.</p>	<p>SASO GSO IEC 61000- 6-1</p>
	<p>التوافق الكهرومغناطيسي الجزء (6 - 2) (EMC): المواصفات القياسية العامة - مناعة البيئات الصناعية</p>	<p>Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.</p>	<p>SASO GSO IEC 61000- 6-2</p>
	<p>التوافق الكهرومغناطيسي الجزء (6 - 3) (EMC): المواصفات القياسية العامة - مواصفات الانبعاثات للبيئات السكنية والتجارية والصناعية الخفيفة.</p>	<p>Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.</p>	<p>SASO IEC 61000-6-3</p>

	Product	Standard Title in Arabic	Standard Title in English	Standard No.
13		التوافق الكهرومغناطيسي (EMC): الجزء (6): المواصفات القياسية العامة - القسم (4): معايير الانبعاث للبيئات الصناعية.	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.	SASO GSO IEC 61000- 6-4
		أنظمة توليد القدرة الفوتو فولتية - متطلبات التوافق الكهرومغناطيسي وطرق الاختبار لمعدات تحويل القدرة	Photovoltaic power generating systems - EMC requirements and test methods for power conversion equipment	SASO IEC 62920

Note: The list of standards mentioned in this Annex is subject to review, and it is the responsibility of suppliers to ensure that they use the latest & updated standards.

B) **List of Products and HS Codes**

No.	Product Categories	HS Code
1	Other Transformers not exceeding 1kVA and exceeding 1kVA but not exceeding 16kVA	8504
2	Photovoltaic & solar cells	8541
3	Electric Cable less than 10mm up to 80v	8444 8544

Note: The products and customs codes on the electronic platform Saber are the updated and approved version.

