



Annex to the accreditation certificate
Annexe au certificat d'accréditation
Bijlage bij accreditatie-certificaat
Beilage zur Akkreditierungszertifikat

432-TEST

EN ISO/IEC 17025:2005

Version/Version/Versie/Fassung	6-2
Issue date / Date d'émission / Uitgiftedatum / Ausgabedatum:	2017-10-30
Validity date / Date limite de validité / Geldigheidsdatum / Gültigkeitsdatum:	2019-05-09

Nicole Meurée-Vanlaethem

Chair of the Accreditation Board

La Présidente du Bureau d'Accréditation

Voorzitster van het Accreditatiebureau

Vorsitzende des Akkreditierungsbüro

The accreditation is granted to/ L'accréditation est délivrée à/
De accreditatie werd uitgereikt aan/ Die akkreditierung wurde erteilt für:

ELIOSYS SA
Quartier Polytech 2-B56
Rue des Pôles, 1
4000 LIEGE

Secrétariat:

**Service public fédéral, Economie,
P.M.E., Classes moyennes et Energie**

Direction générale de la Qualité et de la Sécurité
Division Qualité et Innovation

Bd du Roi Albert II, 16 - 5^{ème} étage - B-1000 Bruxelles

Website: <http://economie.fgov.be>
Numéro d'entreprise: 0314.595.348

Accréditation B E L A C Accreditation

Tél: +32 2 277 54 34
Fax: +32 2 277 54 41

Internet: <http://belac.fgov.be>
E-Mail: Belac@economie.fgov.be

Secretariaat:

**Federale Overheidsdienst, Economie,
K.M.O., Middenstand en Energie**

Algemene Directie Kwaliteit en Veiligheid
Afdeling Kwaliteit en Innovatie

Koning Albert II-laan 16 - 5^{de} verd. - B-1000 Brussel

Website: <http://economie.fgov.be>
Ondernemingsnummer: 0314.595.348

.be

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
Visual inspection	10.1 / MQT 01, MST 01	Photovoltaic module	Detection of any visual defects in the module	IEC 61215 IEC 61730
Maximum power determination	10.2 / MQT 02, MST03	Photovoltaic module	Determination of the maximum power of the module before and after the various environmental tests	IEC 61215
Insulation test & Dielectric withstand test	10.3 / MQT 03, MST 16	Photovoltaic module	Determination if the module is sufficiently well-insulated between current-carrying parts and the frame or the outside world.	IEC 61215 IEC 61730
Measurement of temperature coefficient	10.4 / MQT 04	Photovoltaic module	Determination of the temperature coefficients of current (α), voltage (β) and peak power (δ) from module measurements	IEC 61215
Measurement of NOCT/NMOT	10.5 / MQT 05	Photovoltaic module	Determination of the NOCT (nominal operating cell temperature) or NMOT (nominal module operating temperature) of the module	IEC 61215
Performance at STC and NOCT/NMOT	10.6 / MQT 06, MST02	Photovoltaic module	Determination of how the electrical performance of the module varies with load at STC (Standard test condition) and at NOCT or MNOT	IEC 61215
Performance at low irradiance	10.7 / MQT 07	Photovoltaic module	Determination of how the electrical performance of the module varies with load at 25 °C and an irradiance of 200 W/m ²	IEC 61215
Outdoor exposure test	10.8 / MQT 08	Photovoltaic module	Preliminary assessment of the ability of the module to withstand exposure to outdoor conditions and to reveal any synergistic degradation effects which may not be detected by laboratory tests	IEC 61215

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
Hot-spot endurance test	10.9 / MQT 09, MST 22	Photovoltaic module	Determination of the ability of the module to withstand hot-spot heating effects, for example solder melting or deterioration of the encapsulation	IEC 61215 IEC 61730
UV preconditioning	10.10 / MQT 10, MST 54	Photovoltaic module	Preconditioning the module with ultraviolet (UV) radiation	IEC 61215 IEC 61730
Thermal cycling test	10.11 / MQT 11, MST 51	Photovoltaic module	Determination of the ability of the module to withstand thermal mismatch, fatigue and other stresses caused by repeated changes of temperature	IEC 61215 IEC 61730
Humidity freeze test	10.12 / MQT 12, MST 52	Photovoltaic module	Determination of the ability of the module to withstand the effects of high temperature and humidity followed by sub-zero temperatures	IEC 61215 IEC 61730
Damp heat test	10.13 / MQT 13, MST 53	Photovoltaic module	Determination of the ability of the module to withstand the effects of long-term penetration of humidity	IEC 61215 IEC 61730
Robustness of termination test	10.14 / MQT 14, MST 42	Photovoltaic module	Verification if that the terminations and the attachment of the module could withstand mechanical stresses.	IEC 61215 IEC 61730
Wet leakage current test	10.15 / MQT 15, MST 17	Photovoltaic module	Evaluation of the insulation of the module under wet operating conditions.	IEC 61215 IEC 61730
Mechanical load test (static)	10.16 / MQT 16, MST 34	Photovoltaic module	Determination of the ability of the module to withstand wind, snow, static or ice loads.	IEC 61215 IEC 61730
Hail test	10.17 / MQT 17	Photovoltaic module	Verification that the module is capable of withstanding the impact of hailstones	IEC 61215
Bypass diode testing (thermal test)	10.18 / MQT18, MST 07, MST 25	Photovoltaic module	Assessing the adequacy of the thermal design and relative long-term reliability of the by-pass diodes	IEC 61215 IEC 61730

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
Stabilisation / Light-soaking	10.19 / MQT 19	Photovoltaic module	Stabilization of the electrical characteristics by means of natural sunlight or simulated solar irradiation	IEC 61215
Accessibility test	MST 11	Photovoltaic module	Determination if uninsulated electrical connections represent a shock hazard to personnel	IEC 61730
Cut susceptibility test	MST 12	Photovoltaic module	Determination whether any front and rear surfaces of the module made of polymeric materials are capable of withstanding routine handling during installation and maintenance without exposing personnel to the danger of electric shock	IEC 61730
Ground continuity test	MST 13	Photovoltaic module	Determination if that there is a conductive path between all exposed conductive surfaces of the module, so that the exposed conductive surfaces can be adequately grounded in a PV system.	IEC 61730
Impulse voltage test	MST 14	Photovoltaic module	Verification of the capability of the solid insulation of the module to withstand over-voltages of atmospheric origin	IEC 61730
Temperature test	MST 21	Photovoltaic module	Determination of the maximum reference temperatures for various components and materials used to construct the module	IEC 61730
Reverse current overload test	MST 26	Photovoltaic module	Determination of the maximum reference temperatures for various components and materials used to construct the module	IEC 61730
Module breakage test	MST 32	Photovoltaic module	Provide confidence that cutting or piercing injuries can be minimized if the module is broken	IEC 61730
Mechanical resistance test (static or dynamic)	PIT 1	Photovoltaic module	Determination of the mechanical resistance of a solar module	based on 10.16 with variable frequency or
Performance at a determined climate	PIT 2	Photovoltaic module	Determination of how the electrical performance of the module varies with the test conditions (Hr,T and Irradiance)	same as 10.2 under various conditions of temperature and humidity

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
Visualization of defaults by electrolumiscence	EL	Photovoltaic module	Number and severity level of defaults affecting the electrical performance	publication UL
Potential induced degradation test	PID	Photovoltaic module	Determination of the PID susceptibility	IEC TS62804
Insulation thickness test	MST 04	Photovoltaic module	This test shall verify compliance to the minimum insulation thickness for thin layers	IEC 61730
Markings durability	MST 05	Photovoltaic module	Verification of markings durability	IEC 61730
Sharp edge test	MST 06	Photovoltaic module	Verify that the PV module surfaces are free from dangerous sharp edges, burrs, etc.	IEC 61730
Screw connection test	MST 33	Photovoltaic module	Resistance of components such as screws and nuts transmitting contact pressure or which are likely to be tightened by the user	IEC 61730
Materials creep test	MST 37	Photovoltaic module	Verify that there is no creep or loss of adhesion between elements of the PV module when operated at high temperature	IEC 61730
Cold conditioning	MST 55	Photovoltaic module	Evaluate a PV module for applicability of Pollution Degree PD=1 (-40 °C ± 3 °C for 48 h)	IEC 61730
Dry hot conditioning	MST 56	Photovoltaic module	Evaluate a PV module for applicability of Pollution Degree PD = 1, (105 °C ± 5 °C less than 50 % relative humidity for 200 h).	IEC 61730