

Annex to the accreditation certificate BELAC No. 432-TEST

ELIOSYS SA

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In the name of the Accreditation Board,
The Chair,

Nicole Meurée-Vanlaethem

BELAC

Secretariat :

FEDERAL PUBLIC SERVICE ECONOMY, SME'S, SELF-EMPLOYED AND ENERGY
General Direction Quality and Safety
Accreditation

Boulevard du Roi Albert II, 16 – 5th floor – BE-1000 Brussels - Belgium

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

Web site : <http://Belac.fgov.be> - **E-Mail**: Belac@economie.fgov.be

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
Visual inspection	10.1 MST 01	Photovoltaic module	Detection of any visual defects in the module	IEC 61215 IEC 61646 IEC 61730
Maximum power determination	10.2	Photovoltaic module	Determination of the maximum power of the module before and after the various environmental tests	IEC 61215 IEC 61646
Insulation test & Dielectric withstand test	10.3 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 61646 IEC 61730
Measurement of temperature determination	10.4	Photovoltaic module	Determination of the temperature coefficients of current (α), voltage (β) and peak power (δ) from module measurements	IEC 61215 IEC 61646
Measurement of NOCT	10.5	Photovoltaic module	Determination of the NOCT (nominal operating cell temperature) of the module	IEC 61215 IEC 61646
Performance at STC and NOCT	10.6	Photovoltaic module	Determination of how the electrical performance of the module varies with load at STC (Standard test condition) and at NOCT	IEC 61215 IEC 61646
Performance at low irradiance	10.7	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 IEC 61646

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
Outdoor exposure test	10.8	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 IEC 61646
Hot-spot endurance test	10.9 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 61646 IEC 61730
UV preconditioning	10.10 MST 54	Photovoltaic module	Preconditioning the module with ultraviolet (UV) radiation	IEC 61215 IEC 61646 IEC 61730
Thermal cycling test	10.11 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 61646 IEC 61730
Humidity freeze test	10.12 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 61646 IEC 61730
Damp heat test	10.13 MST 53	Photovoltaic module	Determination of the ability of the module to withstand the effects of long-term penetration of humidity	IEC 61215 IEC 61646 IEC 61730
Robustness of termination test	10.14 MST 42	Photovoltaic module	Verification if that the terminations and the attachment of the module could withstand mechanical stresses.	IEC 61215 IEC 61646 IEC 61730

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Wet leakage current test	10.15 MST 17	Photovoltaic module	Evaluation of the insulation of the module under wet operating conditions.	IEC 61215 IEC 61646 IEC 61730
Mechanical load test	10.16 MST 34	Photovoltaic module	Determination of the ability of the module to withstand wind, snow, static or ice loads.	IEC 61215 IEC 61646 IEC 61730
Hail test	10.17	Photovoltaic module	Verification that the module is capable of withstanding the impact of hailstones	IEC 61215 IEC 61646
Bypass diode thermal test	10.18 MST 25	Photovoltaic module	Assessing the adequacy of the thermal design and relative long-term reliability of the by-pass diodes	IEC 61215 IEC 61646 IEC 61730
Light-soaking	10.19	Photovoltaic module	Stabilization of the electrical characteristics of thin-film modules by means of natural sunlight or simulated solar irradiation	IEC 61646
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

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
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
Partial discharge test	MST 15	Photovoltaic module	Verification that the superstrate or substrate comply with the partial discharge test	IEC 61730
Conduit bending	MST 33	Photovoltaic module	Provide assurance of the ability of the junction box to withstand load forces which may be applied to the conduit during and after installation	IEC 61730
Terminal box knock out test	MST 44	Photovoltaic module	Provide the insurance that removable hole covers will remain in place under nominal force	IEC 61730

Test name	Internal identification testcode	Nature of samples	Measured parameters	Standard test method
Mechanical fatigue resistance test	PIT 1	Photovoltaic module	Determination of the mechanical resistance of a solar module	same as 10.16 with a different frequency
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