

TÜV Rheinland (Shanghai) Co., Ltd.

Test Report

**Photovoltaic module qualification
according to IEC 61730-1:2004
and IEC 61730-2:2004**

TÜV Report No: 15048971.003

Shanghai, October 2012



| | | | | | |
|---|--|--|-----------------------------|--|---|
| Test report no.: <i>Prüfbericht - Nr.:</i> | 15048971.003 | | | | |
| Client (Customer no. + address): <i>Auftraggeber</i> <i>(Kunden-Nr. u. Adresse):</i> | Phono Solar Technology Co.,Ltd. 2 Xinke Road, Nanjing Hi-tech Zone Nanjing 210032, P. R. China | | | | |
| Test item: <i>Gegenstand der Prüfung:</i> | Photovoltaic (PV) Module(s) | Date of receipt: <i>Eingangsdatum:</i> | 06/09/2012 | | |
| Identification: <i>Bezeichnung:</i> | With 6" mono c-Si type: PSxxxM-20/U(xxx=215-270, in steps of 5, 60 pcs) PSxxxM-18/V(xxx=195-240, in steps of 5, 54 pcs) PSxxxM-12/G(xxx=130-160, in steps of 5, 36 pcs) With 6" poly c-Si type: PSxxxP-20/U(xxx=215-265, in steps of 5, 60 pcs) PSxxxP-18/V(xxx=195-235, in steps of 5, 54 pcs) PSxxxP-12/G(xxx=130-160, in steps of 5, 36 pcs) With 5" mono c-Si type: PSxxxM-24/F(xxx=170-210, in steps of 5, 72 pcs) PSxxM-12/D(xx=85-95, in steps of 5, 36 pcs) PSxxxM-12/D(xxx=100-105, in steps of 5, 36 pcs) | | | | |
| Order no.: <i>Auftragsnummer:</i> | 154010217 | Quotation no.: <i>Angebotsnummer:</i> | 2089199 | | |
| Testing location: <i>Prüfart:</i> | TÜV Rheinland (Shanghai) Co., Ltd. B1-13F No. 177, Lane 777, West Guangzhong Road, Zhabei District Shanghai 200072, P. R. China Test was performed at: TÜV Rheinland Japan Ltd., Yokohama Laboratory 4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan | | | | |
| Test specification: <i>Prüfgrundlage:</i> | IEC 61730-2: 2004 , EN 61730-2: 2007 "Photovoltaic (PV) module safety qualification – Part 2: Requirements for testing" Clause 10.8 MST 23 Fire Test | | | | |
| Test result: <i>Prüfergebnis:</i> | Clause 10.8 MST 23 Fire Test was passed according to its regulations of the pass criteria. | | | | |
| compiled by / erstellt: | reviewed by / kontrolliert: | | | | |
| <i>1/Nov/2012</i> | Project Engineer/ Yanbo Yang | <i>Yanbo Yang</i> | <i>1 NOV 2012</i> | Technical Certifier/ Christian Dreier | <i>[Signature]</i> |
| <i>Date</i> <i>Datum</i> | <i>Title/Name</i> <i>Titel/Name</i> | <i>Signature</i> <i>Unterschrift</i> | <i>Date</i> <i>Datum</i> | <i>Title/Name</i> <i>Titel/Name</i> | <i>Signature</i> <i>Unterschrift</i> |
| Other Aspects / Sonstiges: | | | | | |
| -The fire test Class C (IEC 61730-2 / MST 23) was performed and passed on representative models of all module types according to client's request. - Annex1: Constructional Data Form (CDF). - Annex2: Fire test report. | | | | | |
| Factory inspection report: <i>Fertigungsstätten- inspektionsbericht:</i> | 15032486.003 | | | | |
| This test report relates to the listed test samples. Without permission of the test centre this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products. Dieser Prüfbericht bezieht sich nur auf die gelisteten Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht | | | | | |

auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

Address of the manufacturing site:

| | |
|------------------------|--------------------------------------|
| Name / Description: | Phono Solar Technology Co., Ltd. |
| Street: | 2 Xinke Road, Nanjing Hi-tech Zone |
| Postcode / City: | Nanjing, Jiangsu 210032, P. R. China |
| Type of production: | C-Si PV Module Production |
| Inspection report no.: | 15032486.003 |

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| IEC /EN 61730 - 2 |
|-------------------|

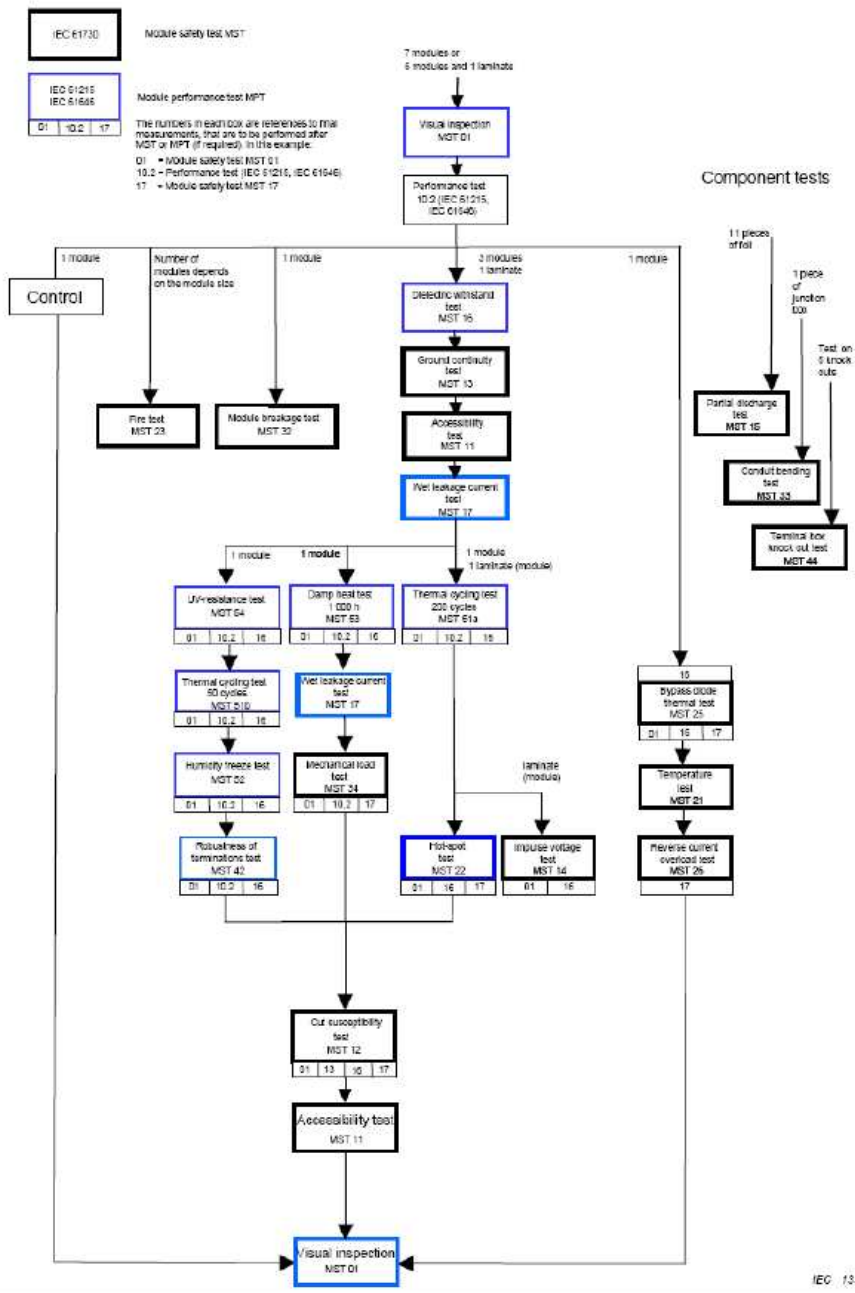
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| Test case verdicts | | |
|---|-------------------------|-------------|
| Test case does not apply to the test object : N(.A.) | | |
| Test item does meet the requirement : P(ass) | | |
| Test item does not meet the requirement .: F(ail) | | |
| Testing | | |
| Date of receipt of test item : 06 Sep. 2012 | | |
| Date(s) of performance of test : 11 Sep. 2012 | | |
| Testing was conducted on following models: | | |
| Sample number | Serial number | Model |
| 1 | PSUP02658880812 | PS240P-20/U |
| 2 | PSUP02668880812 | PS240P-20/U |
| 3 | PSUP02638880812 | PS240P-20/U |
| 4 | PSUP02578880812 (Dummy) | PS240P-20/U |
| 5 | PSUP02628880812 (Spare) | PS240P-20/U |
| 6 | PSUP02598880812 | PS240P-20/U |
| 7 | PSUP02588880812 | PS240P-20/U |
| 8 | PSUP02618880812 | PS240P-20/U |
| 9 | PSUP02648880812 (Dummy) | PS240P-20/U |
| 10 | PSUP02608880812 (Spare) | PS240P-20/U |
| Remark: Sample 1-5 were built with Dyneon TM Scotchshield Film17. Sample 6-10 were built with AKASOL PVL-3-HR 1000V. | | |

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| General remarks |
| This report shall not be reproduced except in full without the written approval of the testing laboratory. |
| The test results presented in this report relate only to the item tested and do not satisfy the condition for customer to use tested items as reference devices. |
| Throughout this report a dot is used as the decimal separator. |

Test Schematic



61730-2 part**6. Sampling**

| 6. | Sampling | Result - Remark | Verdict |
|----|---|---|---------|
| | When the modules to be tested are prototypes of a new design and not from production, this fact shall be noted in the test report (see Clause 7). | Equipments and processes to produce these samples were made under the same conditions of mass production. | P |

10. Test Procedures**10.1. Visual Inspection MST 01**

| 10.1. | Visual Inspection MST 01 | Result - Remark | Verdict |
|--------|---|------------------|---------|
| 10.1.2 | Procedure This test is identical with 10.1 from IEC 61215/IEC 61646 with the additional inspection criteria of – Any other conditions which may affect safety; – Markings not consistent with Clause 11 of IEC 61730-1. | | |
| 10.1.3 | No presence of defect | No visual defect | P |

MST 23 – FIRE TEST

| 10.8 | MST 23 – FIRE TEST | Result - Remark | Verdict |
|--|---|-----------------|---------|
| | Module fire resistance class (A, B, C)..... : | Class C | — |
| | No. of modules provided to create the test assembly | 2 | — |
| | Spread-of-Flame: Sample 1, 2, 6 & 7 | | — |
| | <input checked="" type="checkbox"/> The module complies with the requirements for the fire resistance class C | | P |
| | Burning-Brand: Sample 3 & 8 | | — |
| | <input checked="" type="checkbox"/> The module complies with the requirements for the fire resistance class C | | P |
| Supplementary information: Dummy samples were used for each test assembly. | | | |

End of Test Report