|  |  |  |
| --- | --- | --- |
| **Annex 7c to the Contract pursuant to DE-UZ 116**  **Blue Angel Eco-Label for „Solar-Powered Products“** |  | **Please use this  form!** |

Manufacturer (Applicant):

Distributor (Label User):

Brand / Trade name:

Type Designation:

### Measurement Protocol pursuant to para. 3.3.1 of the DE-UZ 116 Basic Criteria

**1) Measurement Protocol on the I-U and P-U Characteristic Curve of the Solar Module under NOCT Conditions according to IEC 61215, Chapter 10.6**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date: |  | | | |
| Protocol No.: |  | | | |
| Measuring facility/instruments: |  | | | |
| Accuracy of instruments: |  | | | |
| Irradiation device: |  | | | |
| Test Setup (possibly photo): |  | | | |
| Person conducting the test: |  | | | |
| Product under test: |  | | | |
| Item number: |  | | | |
| Serial number: |  | | | |
| Irradiance during measurement: | Minimum       [W/m2] | Maximum       [W/m2] | Mean value       [W/m2] | Standard deviation       [W/m2] |
| Module temperature during measurement: | Minimum       [°C] | Maximum       [°C] | Mean value       [°C] | Standard deviation       [°C] |
| Ambient temperature during measurement: | Minimum       [°C] | Maximum       [°C] | Mean value       [°C] | Standard deviation       [°C] |

NOCT characteristic curve (diagram):

Value used to determine the charge time (see Appendix)

**2) Charger Test Protocol under NOCT Conditions:**

|  |  |
| --- | --- |
| Date: |  |
| Protocol No.: |  |
| Measurement facility/instruments: |  |
| Accuracy of the measuring instruments: |  |
| Test Setup: |  |
| Person conducting the test: |  |
| Product under test: |  |
| Item number: |  |
| Serial number: |  |

|  |  |  |
| --- | --- | --- |
| MPPT: | Yes | No |
| Selected MPP power value under NOCT conditions (=NOCT-power level): | [W] | |
| For chargers without MPP converter: Selected power range under NOCT conditions (=P(U0 – P(UMPP) | [W] | |

|  |  |
| --- | --- |
| Ambient temperature (= charger temperature): | [°C] |
| Battery terminal voltage at the beginning of charging: | [V] |
| Battery terminal voltage at the end of charging: | [V] |
| Nominal capacity according to data sheet: | [Ah] |
| Charge time specified by the charger manufacturer: | [Ah] |
| Charge time determined for almost full charge (≥  90%): | [h] |
| Charge time determined for full charge (100%): | [h] |
| Calculated average charge time per Ah for full charge: | [h/Ah] |

Charge current flow as U-t and I-t diagram:

Time indentified for almost full charge (see Appendix)

**3) Measurement Protocol on the Outdoor Test for Determining the Battery Temperature under NOCT Conditions of the Solar Module (only for chargers whose solar generator and battery cannot be locally separated****):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date: |  | | | |
| Protocol No.: |  | | | |
| Measurement facility/ instruments: |  | | | |
| Test Setup (possibly photo): |  | | | |
| Accuracy of measuring instrument: |  | | | |
| Person conducting the test: |  | | | |
| Product under test: |  | | | |
| Item number: |  | | | |
| Serial number: |  | | | |
| Irradiance during measurement: | Minimum       [W/m2] | Maximum       [W/m2] | Man value       [W/m2] | Standard deviation       [W/m2] |
| Module temperature during measurement: | Minimum       [°C] | Maximum       [°C] | Mean value       [°C] | Standard deviation       [°C] |
| Ambient temperature during measurement: | Minimum       [°C] | Maximum       [°C] | Mean value       [°C] | Standard deviation       [°C] |
| Battery temperature during measurement: | Minimum       [°C] | Maximum       [°C] | Mean value       [°C] | Standard deviation       [°C] |
| Wind speed during measurement: | Minimum       [m/s] | Maximum       [m/s] | Mean value       [m/s] | Standard deviation       [m/s] |

**Determination of the Charge time under NOCT Conditions (only for chargers whose solar generator and battery cannot be locally separated):**

|  |  |
| --- | --- |
| Power supply used: |  |
| Measuring instruments used: |  |
| Accuracy of instruments: |  |
| Test Setup (possibly photo): |  |
| Preset battery temperature: | [°C] |
| Battery terminal voltage at the beginning of charging: | [V] |
| Battery terminal voltage at the end of charging: | [V] |
| Nominal capacity of the battery according to data sheet: | [Ah] |
| Charging capacity specified by the charger manufacturer: | [Ah] |
| Charge time determined for almost full charge (≥  90%): | [h] |
| Charge time determined for full charge (100%): | [h] |
| Average charge time determined for full charge: | [h/Ah] |

Charge current flow as U-t and I-t diagram:

Time indicated for almost full charge (see Appendix)

**4) To be Completed if an additional own charge time measurement is made using the irradiance data listed in the table in Appendix 2 for Munich or Hamburg in summer or winter (up to 4 tables):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date: |  | | | |
| Protocol No.: |  | | | |
| Measuring facility/ instruments: |  | | | |
| Test setup (possibly photo): |  | | | |
| Accuracy of instruments: |  | | | |
| Person conducting the test: |  | | | |
| Product under test: |  | | | |
| Item number: |  | | | |
| Serial number: |  | | | |
| Irradiance during measurement: | Minimum       [W/m2] | Maximum       [W/m2] | Man value       [W/m2] | Standard deviation       [W/m2] |
| Module temperature during measurement: | Minimum       [°C] | Maximum       [°C] | Mean value       [°C] | Standard deviation       [°C] |
| Ambient temperature during measurement: | Minimum       [°C] | Maximum       [°C] | Mean value       [°C] | Standard deviation       [°C] |
| Wind speed during measurement: | Minimum       [m/s] | Maximum       [m/s] | Mean value       [m/s] | Standard deviation       [m/s] |

**Charge Time Measurement:**

|  |  |
| --- | --- |
| Power supply used: |  |
| Measuring instruments used: |  |
| Accuracy of instruments: |  |
| Temperature of the charger: | = ambient temperature (see above) |
| Battery terminal voltage at the beginning of charging: | [V] |
| Battery terminal voltage at the end of charging: | [V] |
| Nominal capacity of the battery according to data sheet: | [Ah] |
| Capacity specified by the charger manufacturer: | [Ah] |
| Charge time determined for almost full charge  (≥  90%): | [h] |
| Charge time determined for full charge (100%): | [h] |
| Average charge time determined for full charge: | [h/Ah] |

Charge current flow as I-t diagram: (see Appendix)

Time indicated for almost full charge

|  |  |  |  |
| --- | --- | --- | --- |
| **Place:** |  |  |  |
|  |  |  |
| **Date:** |  |  |

**Legally binding signature /company stamp**