

# 保証・認証

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# 国内・海外の国際機関の認証を取得

## ◆TÜV-NORD



国家規格に基づいたドイツ政府公認の検査機関による、厳しい条件下（高温・高湿・高電圧）での各種性能試験、安全性試験、塩水、アンモニアガス、PID耐久試験に当社の太陽電池モジュールがクリアしたことを証明しています。

### 1.モジュールの性能および安全性認証・規格

| 規格概要             | IEC番号                | 対応JIS番号                | 内容                                                                      |
|------------------|----------------------|------------------------|-------------------------------------------------------------------------|
| 太陽電池モジュールの性能・信頼性 | IEC 61215-1 : 2016   | JIS C 61215-1 : 2020   | 地上設置の太陽電池（PV）モジュール－設計適格性確認及び型式認証－第1部：試験要求事項                             |
|                  | IEC 61215-1-1 : 2016 | JIS C 61215-1-1 : 2020 | 地上設置の太陽電池（PV）モジュール－設計適格性確認及び型式認証－第1-1部：結晶シリコン太陽電池（PV）モジュールの試験に関する特別要求事項 |
|                  | IEC 61215-2 : 2016   | JIS C 61215-2 : 2020   | 地上設置の太陽電池（PV）モジュール－設計適格性確認及び型式認証－第2部：試験方法                               |
| 太陽電池モジュールの安全性    | IEC 61730-1 : 2016   | JIS C 61730-1 : 2020   | 太陽電池（PV）モジュールの安全適格性確認－第1部：構造に関する要求事項                                    |
|                  | IEC 61730-2 : 2016   | JIS C 61730-2 : 2020   | 太陽電池（PV）モジュールの安全適格性確認－第2部：試験に関する要求事項                                    |
|                  | IEC 62790:2020       | JIS C 62790 : 2020     | 太陽電池（PV）モジュール用端子箱－安全性要求事項及び試験                                           |
| 塩水噴霧腐食認証         |                      | IEC61701:2020          |                                                                         |
| アンモニアガス認証        |                      | IEC62716:2013          |                                                                         |
| PID試験            |                      | IEC TS 62804-1:2025    |                                                                         |

### 2.火災等級・感電保護クラス

|                             |                  |          |
|-----------------------------|------------------|----------|
| 火災等級<br>Fire Safety Class   | ANSI/UL1703-2018 | Class C  |
| 感電保護クラス<br>Protection Class | IEC 61730        | Class II |

◆ J-pec



低炭素社会づくりに貢献する太陽光発電の普及を推進するため、住宅用太陽光発電システムを設置する方を対象とした補助金制度です。

◆ その他の承認



◆ 製品品質保証

|                         |                                                                                             |
|-------------------------|---------------------------------------------------------------------------------------------|
| P-type(PERC)太陽電池モジュール   | 顧客に販売してから25年間、納入初年度は2.0%までの出力低下となり、2年目以降は毎年0.55%までの出力低下となります。保証期間終了時の最大出力は、84.8%以上を保証いたします。 |
| N-type(TOPCon)太陽電池モジュール | 顧客に販売してから30年間、納入初年度は1.0%までの出力低下となり、2年目以降は毎年0.4%までの出力低下となります。保証期間終了時の最大出力は、87.4%以上を保証いたします。  |
| 生産物賠償責任保険（PL保険）         | 太陽電池モジュールのほか、当社が販売する製品によるリスクにも対応致します。                                                       |

# CERTIFICATE

**TÜV NORD CERT GmbH**

herewith declares that

**Leapton Energy Co., Ltd.**

Tousei Bld.6F, 1-2-1, Aioicho, Chuo-ku Kobe-shi, Hyogo, Japan

is authorized to provide the product mentioned below with the mark as illustrated:

**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**



Valid from: 2024-07-29

Valid until: 2029-07-10

Certification program:

P12-VA-01 Rev. 17 09.20

Certification fundamental(s):

IEC 61215-1:2021 / EN IEC 61215-1:2021;

IEC 61215-1-1:2021 / EN IEC 61215-1-1:2021;

IEC 61215-2:2021 / EN IEC 61215-2:2021;

IEC 61730-1:2023;

IEC 61730-2:2023.

Registered No.:

44 780 24 406749 - 299

Manufacturer and factory(-ies):

See Annex 1

Test Report No.:

492013317.001

File No.:

PVP05178/24P-03

A handwritten signature in blue ink, appearing to read "Rafael Nolasco".

**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



Essen, 2024-07-29

Please also pay attention to the information stated overleaf.

**Manufacturer and factory(-ies):**

Manufacturer: **Leapton Energy Co., Ltd.**  
Tousei Bld.6F,1-2-1,Aioicho,Chuo-ku Kobe-shi,Hyogo,Japan

Factory: **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

Factory inspection report no.: 862010379.007

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products

**Description of product(s):**

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module types:                                                   | <b>PV Modules with Half-cut 210*210mm Mono-crystalline Silicon Solar Cells:</b><br>132 cells: LP210*210-M-66-MH-***W (** = 630-665, in increment of 5)<br>120 cells: LP210*210-M-60-MH-***W (** = 575-605, in increment of 5)<br>108 cells: LP210*210-M-54-MH-***W (** = 515-545, in increment of 5)<br>96 cells: LP210*210-M-48-MH-***W (** = 460-480, in increment of 5)<br>84 cells: LP210*210-M-42-MH-***W (** = 400-420, in increment of 5)             |
| Maximum system voltage:                                         | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Maximum overcurrent protection rating:                          | 30A                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Electrical protection class:                                    | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Pollution degree:                                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 98th percentile module operating temperature (T <sub>98</sub> ) | 70°C                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Design load (positive / negative):                              | 3600Pa / 1600Pa                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Safety factors:                                                 | 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Fire safety class:                                              | Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)                                                                                                                                                                                                                                                                                                                                                                                             |
| Module types:                                                   | <b>PV Modules with Half-cut 182*182/188mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>156 cells: LP182*182-M-78-NH-***W (** = 580-625, in increment of 5)<br>144 cells: LP182*182-M-72-NH-***W (** = 555-600, in increment of 5)<br>132 cells: LP182*182-M-66-NH-***W (** = 510-550, in increment of 5)<br>120 cells: LP182*182-M-60-NH-***W (** = 460-500, in increment of 5)<br>108 cells: LP182*182-M-54-NH-***W (** = 410-450, in increment of 5) |
| Maximum system voltage:                                         | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Maximum overcurrent protection rating:                          | 25A                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Electrical protection class:                                    | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Pollution degree:                                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 98th percentile module operating temperature (T <sub>98</sub> ) | 70°C                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Design load (positive / negative):                              | 3600Pa / 1600Pa                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Safety factors:                                                 | 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Fire safety class:                                              | Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)                                                                                                                                                                                                                                                                                                                                                                                             |



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**Consumer Products**

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|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module types:                                                   | <b>PV Modules with Half-cut 182*210mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>132 cells: LP182*210-M-66-NH-***W (** = 580-635, in increment of 5)<br>120 cells: LP182*210-M-60-NH-***W (** = 530-575, in increment of 5)<br>108 cells: LP182*210-M-54-NH-***W (** = 475-520, in increment of 5)<br>96 cells: LP182*210-M-48-NH-***W (** = 420-460, in increment of 5) |
| Maximum system voltage:                                         | 1500V                                                                                                                                                                                                                                                                                                                                                                            |
| Maximum overcurrent protection rating:                          | 25A                                                                                                                                                                                                                                                                                                                                                                              |
| Electrical protection class:                                    | Class II                                                                                                                                                                                                                                                                                                                                                                         |
| Pollution degree:                                               | 1                                                                                                                                                                                                                                                                                                                                                                                |
| 98th percentile module operating temperature (T <sub>98</sub> ) | 70°C                                                                                                                                                                                                                                                                                                                                                                             |
| Design load (positive / negative):                              | 3600Pa / 1600Pa                                                                                                                                                                                                                                                                                                                                                                  |
| Safety factors:                                                 | 1.5                                                                                                                                                                                                                                                                                                                                                                              |
| Fire safety class:                                              | Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)                                                                                                                                                                                                                                                                                                                 |

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module types:                                                   | <b>PV Modules with Half-cut 182*199/191mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>144 cells: LP182*199-M-72-NH-***W (** = 570-655, in increment of 5)<br>132 cells: LP182*199-M-66-NH-***W (** = 525-600, in increment of 5)<br>120 cells: LP182*199-M-60-NH-***W (** = 475-545, in increment of 5)<br>108 cells: LP182*199-M-54-NH-***W (** = 430-490, in increment of 5) |
| Maximum system voltage:                                         | 1500V                                                                                                                                                                                                                                                                                                                                                                                 |
| Maximum overcurrent protection rating:                          | 25A                                                                                                                                                                                                                                                                                                                                                                                   |
| Electrical protection class:                                    | Class II                                                                                                                                                                                                                                                                                                                                                                              |
| Pollution degree:                                               | 1                                                                                                                                                                                                                                                                                                                                                                                     |
| 98th percentile module operating temperature (T <sub>98</sub> ) | 70°C                                                                                                                                                                                                                                                                                                                                                                                  |
| Design load (positive / negative):                              | 3600Pa / 1600Pa                                                                                                                                                                                                                                                                                                                                                                       |
| Safety factors:                                                 | 1.5                                                                                                                                                                                                                                                                                                                                                                                   |
| Fire safety class:                                              | Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)                                                                                                                                                                                                                                                                                                                      |



**TÜV NORD CERT GmbH**  
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|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module types:                                                   | <b>PV Modules with Half-cut 210*210mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>132 cells: LP210*210-M-66-NH-***W (** = 675-700, in increment of 5)<br>120 cells: LP210*210-M-60-NH-***W (** = 615-635, in increment of 5)<br>108 cells: LP210*210-M-54-NH-***W (** = 555-570, in increment of 5)<br>96 cells: LP210*210-M-48-NH-***W (** = 490-510, in increment of 5)<br>84 cells: LP210*210-M-42-NH-***W (** = 430-445, in increment of 5) |
| Maximum system voltage:                                         | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Maximum overcurrent protection rating:                          | 30A                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Electrical protection class:                                    | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Pollution degree:                                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 98th percentile module operating temperature (T <sub>98</sub> ) | 70°C                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Design load (positive / negative):                              | 3600Pa / 1600Pa                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Safety factors:                                                 | 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Fire safety class:                                              | Class C according to ANSI/UL 1703-2018 (as per ANSI/UL 790-2018)                                                                                                                                                                                                                                                                                                                                                                                       |

## Remark:

For detailed product information, please refer to CDF (Constructional Data Form) attached to test report with same file no.



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



# CERTIFICATE

**TÜV NORD CERT GmbH**

herewith declares that

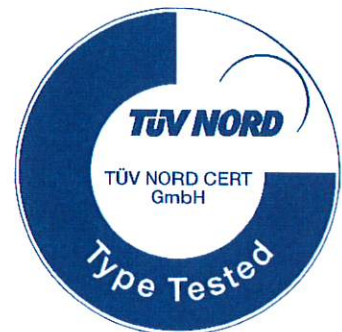
**Leapton Energy Co., Ltd.**

Tousei Bld.6F,1-2-1,Aioicho,Chuo-ku Kobe-shi,Hyogo,Japan

is authorized to provide the product mentioned below with the mark as illustrated:

**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**



Valid from: 2025-02-14

Valid until: 2029-06-25

Certification program:

P12-VA-01 Rev. 17 09.20

Certification fundamental(s):

IEC 61215-1:2021 / EN IEC 61215-1:2021;

IEC 61215-1-1:2021 / EN IEC 61215-1-1:2021;

IEC 61215-2:2021 / EN IEC 61215-2:2021;

IEC 61730-1:2023;

IEC 61730-2:2023.

Registered No.:

44 780 24 406749 - 300R1M1

Manufacturer and factory(-ies):

See Annex 1

Test Report No.:

492013318.002

File No.:

PVP02018/25P



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



Essen, 2025-02-14

Please also pay attention to the information stated overleaf.

**Manufacturer and factory(-ies):**

Manufacturer: **Leapton Energy Co., Ltd.**  
Tousei Bld.6F,1-2-1,Aioicho,Chuo-ku Kobe-shi,Hyogo,Japan

Factory: **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

Factory inspection report no.: 862010379.007

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

## Description of product(s):

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module types:                                                   | <b>Double Glass PV Modules with Half-cut 210*210mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>132 cells: LP210*210-M-66-NB-***W (*** = 665-730, in increment of 5)<br>120 cells: LP210*210-M-60-NB-***W (*** = 610-665, in increment of 5)<br>108 cells: LP210*210-M-54-NB-***W (*** = 550-595, in increment of 5)<br>96 cells: LP210*210-M-48-NB-***W (*** = 490-530, in increment of 5)<br>84 cells: LP210*210-M-42-NB-***W (*** = 430-465, in increment of 5)<br>*** indicates rated output power generated from front side under STC |
| Maximum system voltage:                                         | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Maximum overcurrent protection rating:                          | 30A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Electrical protection class:                                    | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Pollution degree:                                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 98th percentile module operating temperature (T <sub>98</sub> ) | 70°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Design load (positive / negative):                              | 3600Pa / 1600Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Safety factors:                                                 | 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Fire safety class:                                              | Class A according to UL790                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module types:                                                   | <b>Double Glass PV Modules with Half-cut 182*182/188mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>156 cells: LP182*182-M-78-NB-***W (*** = 580-620, in increment of 5)<br>144 cells: LP182*182-M-72-NB-***W (*** = 535-600, in increment of 5)<br>132 cells: LP182*182-M-66-NB-***W (*** = 490-550, in increment of 5)<br>120 cells: LP182*182-M-60-NB-***W (*** = 445-500, in increment of 5)<br>108 cells: LP182*182-M-54-NB-***W (*** = 400-450, in increment of 5)<br>*** indicates rated output power generated from front side under STC |
| Maximum system voltage:                                         | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Maximum overcurrent protection rating:                          | 25A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Electrical protection class:                                    | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Pollution degree:                                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 98th percentile module operating temperature (T <sub>98</sub> ) | 70°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Design load (positive / negative):                              | 3600Pa / 1600Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



Safety factors: 1.5  
Fire safety class: Class A according to UL790

Module types: **Double Glass PV Modules with Half-cut 182\*210mm n-type TOPCon Bifacial Silicon Solar Cells:**

132 cells: LP182\*210-M-66-NB-\*\*\*W (\*\*\* = 580-640, in increment of 5)

120 cells: LP182\*210-M-60-NB-\*\*\*W (\*\*\* = 530-580, in increment of 5)

108 cells: LP182\*210-M-54-NB-\*\*\*W (\*\*\* = 475-520, in increment of 5)

96 cells: LP182\*210-M-48-NB-\*\*\*W (\*\*\* = 420-465, in increment of 5)

\*\*\* indicates rated output power generated from front side under STC

Maximum system voltage: 1500V

Maximum overcurrent protection rating: 25A

Electrical protection class: Class II

Pollution degree: 1

98th percentile module operating temperature (T<sub>98</sub>) 70°C

Design load (positive / negative): 3600Pa / 1600Pa

Safety factors: 1.5

Fire safety class: Class A according to UL790

Module types: **Double Glass PV Modules with Half-cut 182\*199/191mm n-type TOPCon Bifacial Silicon Solar Cells:**

144 cells: LP182\*199-M-72-NB-\*\*\*W (\*\*\* = 570-655, in increment of 5)

132 cells: LP182\*199-M-66-NB-\*\*\*W (\*\*\* = 525-600, in increment of 5)

120 cells: LP182\*199-M-60-NB-\*\*\*W (\*\*\* = 475-545, in increment of 5)

108 cells: LP182\*199-M-54-NB-\*\*\*W (\*\*\* = 430-490, in increment of 5)

\*\*\* indicates rated output power generated from front side under STC

Maximum system voltage: 1500V

Maximum overcurrent protection rating: 25A

Electrical protection class: Class II

Pollution degree: 1

98th percentile module operating temperature (T<sub>98</sub>) 70°C

Design load (positive / negative): 3600Pa / 1600Pa

Safety factors: 1.5



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

Anlage 2 zum Zertifikat Nr.: / Annex 2 to Certificate No.: **44 780 24 406749 - 300R1M1**

Seite / Page **3** von / of **3**

Aktenzeichen: / File reference: **PVP02018/25P**

**2025-02-14**

Fire safety class: Class A according to UL790

Remark:

For detailed product information, please refer to CDF (Constructional Data Form) attached to test report with same file no.

A handwritten signature in blue ink, appearing to read "Regina K.", is positioned above the company name.

**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products

# Zertifikat

*Certificate*

**Registrier-Nr.**

*Registered No.*

**44 780 23 406749 - 107A2M2**

**Zeichen des Auftraggebers**  
*Customer's reference*

**QT-PVP09154/23C**

**Auftragsdatum**  
*Date of order*

**2023-09-18**

**Aktenzeichen**  
*File reference*

**PVP09154/23C**

**Prüfbericht Nr.**  
*Test report no.*

**492012397.003**

**Name und Anschrift  
des Auftraggebers**

**Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry  
Zone, Changshu City Jiangsu Province, 215500, P.R. China

*Name and address of  
the customer*

ist berechtigt, das unten  
genannte Produkt  
mit dem abgebildeten Zeichen  
zu kennzeichnen



*is authorized to  
provide the product  
mentioned below with  
the mark as illustrated*

**Fertigungsstätte**

**See Annex 1**

*Manufacturing plant*

**Geprüft nach**

**IEC 62790:2020**

*Tested in accordance with*

**Beschreibung des  
Produktes**  
(Details s. Anlage 2)

**Anschlussdose für Photovoltaik-Module**  
*Junction box for PV modules*

*Description of products*  
(Details see Annex 2)

**PV-LP-T01**



**TÜV NORD CERT GmbH**  
Zertifizierungsstelle  
Fachleiter Konsumgüter



**Gültig bis/ Valid until: 2028-04-24**

**Essen, 2023-11-14**

**Bitte beachten sie auch die umseitigen Hinweise**  
*Please also pay attention to the information stated overleaf*

Anlage 1 zum Zertifikat Nr.: / Annex 1 to Certificate No.: **44 780 23 406749 - 107A2M2**

Seite / Page **1** von / of **1**

Aktenzeichen: / File reference: **PVP09154/23C**

**2023-11-14**

**Fertigungsstätte:**

*Manufacturer:*

**Fertigungsstätte 1:**

*Manufacturer 1:*

**Ningbo GZX PV Technology Co., Ltd.**

No.28, Binhai 5th Road, Hangzhou Bay New District

Ningbo City, Zhejiang Province, 315336, P.R. China

**Betriebsprüfbericht nr.:**

*Factory inspection report no.:*

862010330.006

**Fertigungsstätte 2:**

*Manufacturer 2:*

**Changzhou Greateen New Energy Technology Co.,Ltd.**

Zhaiqiao Industrial Park,Qianhuang town Wujin District,

Changzhou 213174,P.R.China

**Betriebsprüfbericht nr.:**

*Factory inspection report no.:*

862010769.001

**Fertigungsstätte 3:**

*Manufacturer 3:*

**Changshu Friends Connector Technology Co., Ltd.**

No. 19 Zhongtian Road Changkun Industrial Park Shajiabang Town

Changshu City Jiangsu P.R. China

**Betriebsprüfbericht nr.:**

*Factory inspection report no.:*

862010851.001



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

**Beschreibung des Produktes:**

*Description of product(s):*

**Typbezeichnung:**

*Type designation:*

PV-LP-T01

**Beschreibung:**

*Description:*

**Anschlussdose für Photovoltaik-Module**

*Junction box for PV modules*

**Allgemeine Informationen:**

*General Information:*

**Nennspannung:**

*Rated voltage:*

1500V DC

**Bemessungsstrom:**

*Rated Current:*

20A(with NINGBO GZX GF3545 diode)

25A(with NINGBO GZX GF5045 diode)

30A(with NINGBO GZX GF5545 diode)

**Nenntemperatur:**

*Rated temperature:*

-40°C to +85°C

**IP Grad:**

*IP Degree:*

IP68 (1m, 1h)

**Application-Klasse:**

*Application Class:*

Class A

**Schutz-klasse:**

*Safety Class:*

Class II



Die oben aufgeführten Produkte dürfen wie folgt gekennzeichnet werden:  
*The above mentioned products could be provided with the following marking:*

**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**





# CERTIFICATE

**TÜV NORD CERT GmbH**

herewith declares that

**Leapton Solar (Changshu) Co., Ltd.**

No. 9, Sunshine Avenue, Yushan High Technology Industry Zone, Changshu City  
Jiangsu Province, 215500, P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**



Valid from: 2024-07-23

Valid until: 2029-07-22

|                                 |                                    |
|---------------------------------|------------------------------------|
| Certification program:          | P12-VA-01 Rev. 17 09.20            |
| Certification fundamental(s):   | IEC 61701:2020 / EN IEC 61701:2020 |
| Remark:                         | Test Method 5                      |
|                                 | Test duration: 672 hours           |
| Registered No.:                 | 44 780 24 406749 - 286             |
| Manufacturer and factory(-ies): | See Annex 1                        |
| Test Report No.:                | 492013306.001                      |
| File No.:                       | PVP01197/24P-03                    |



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



Essen, 2024-07-23

Please also pay attention to the information stated overleaf.

**Manufacturer and factory(-ies):**

Manufacturer: **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

Factory: **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

Factory inspection report no.: 862010379.007

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

**Description of product(s):**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module types:                | <b>PV Modules with Half-cut 182*182/188mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>156 cells: LP182*182-M-78-NH-***W (** = 580-625, in increment of 5)<br>144 cells: LP182*182-M-72-NH-***W (** = 555-600, in increment of 5)<br>132 cells: LP182*182-M-66-NH-***W (** = 510-550, in increment of 5)<br>120 cells: LP182*182-M-60-NH-***W (** = 460-500, in increment of 5)<br>108 cells: LP182*182-M-54-NH-***W (** = 410-450, in increment of 5) |
| Maximum system voltage:      | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Fuse rating:                 | 25A                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Application class:           | Class A                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Electrical protection class: | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Module types:                | <b>PV Modules with Half-cut 182*210mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>132 cells: LP182*210-M-66-NH-***W (** = 580-635, in increment of 5)<br>120 cells: LP182*210-M-60-NH-***W (** = 530-575, in increment of 5)<br>108 cells: LP182*210-M-54-NH-***W (** = 475-520, in increment of 5)<br>96 cells: LP182*210-M-48-NH-***W (** = 420-460, in increment of 5)                                                                             |
| Maximum system voltage:      | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Fuse rating:                 | 25A                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Application class:           | Class A                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Electrical protection class: | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Module types:                | <b>PV Modules with Half-cut 182*199/191mm n-type TOPCon Bifacial Silicon Solar Cells:</b><br>144 cells: LP182*199-M-72-NH-***W (** = 570-655, in increment of 5)<br>132 cells: LP182*199-M-66-NH-***W (** = 525-600, in increment of 5)<br>120 cells: LP182*199-M-60-NH-***W (** = 475-545, in increment of 5)<br>108 cells: LP182*199-M-54-NH-***W (** = 430-490, in increment of 5)                                                                        |
| Maximum system voltage:      | 1500V                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Fuse rating:                 | 25A                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Application class:           | Class A                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Electrical protection class: | Class II                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

Module types:

**PV Modules with Half-cut 210\*210mm n-type TOPCon Bifacial Silicon Solar Cells:**

132 cells: LP210\*210-M-66-NH-\*\*\*W (\*\* = 675-700, in increment of 5)

120 cells: LP210\*210-M-60-NH-\*\*\*W (\*\* = 615-635, in increment of 5)

108 cells: LP210\*210-M-54-NH-\*\*\*W (\*\* = 555-570, in increment of 5)

96 cells: LP210\*210-M-48-NH-\*\*\*W (\*\* = 490-510, in increment of 5)

84 cells: LP210\*210-M-42-NH-\*\*\*W (\*\* = 430-445, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A

Application class:

Class A

Electrical protection class:

Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form).



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



# CERTIFICATE

**TÜV NORD CERT GmbH**  
herewith declares that

**Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City, Jiangsu Province, 215500  
P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**



Valid from: 2023-07-31  
Valid until: 2028-07-30

|                               |                          |
|-------------------------------|--------------------------|
| Certification program:        | P12-VA-01 Rev. 17 09.20  |
| Certification fundamental(s): | IEC 61701:2020           |
| Remark:                       | Test Method 5            |
|                               | Test duration: 672 hours |
| Registered No.:               | 44 780 23 406749 - 233   |
| Manufacturer:                 | see Annex 1              |
| Test Report No.:              | 492012601.001            |
| File No.:                     | PVP04137/23P-05          |

A handwritten signature in blue ink, reading 'Robert Müller'.

**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

Essen, 2023-07-31

Please also pay attention to the information stated overleaf.



Anlage 1 zum Zertifikat Nr.: / Annex 1 to Certificate No.: 44 780 23 406749 - 233

Seite / Page 1 von / of 1

Aktenzeichen: / File reference: PVP04137/23P-05

2023-07-31

**Manufacturer:**

Manufacturer:

**Leapton Solar (Changshu) Co., Ltd.**

No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City

Jiangsu Province, 215500, P.R. China

Factory inspection report no.:

862010379.006

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.

A handwritten signature in blue ink, appearing to read "Robert Miao".

**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



**Description of product(s):**

Module types:

**Double Glass PV Modules with 7" Half Cut Mono-crystalline Silicon Solar Cells:**

144 cells: LP182\*182-M-72-MB-\*\*\*W (\*\* = 520-550, in increment of 5)

132 cells: LP182\*182-M-66-MB-\*\*\*W (\*\* = 475-505, in increment of 5)

120 cells: LP182\*182-M-60-MB-\*\*\*W (\*\* = 435-455, in increment of 5)

108 cells: LP182\*182-M-54-MB-\*\*\*W (\*\* = 390-410, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**Double Glass PV Modules with 8" Half Cut Mono-crystalline Silicon Solar Cells:**

132 cells: LP210\*210-M-66-MB-\*\*\*W (\*\* = 630-670, in increment of 5)

120 cells: LP210\*210-M-60-MB-\*\*\*W (\*\* = 575-610, in increment of 5)

108 cells: LP210\*210-M-54-MB-\*\*\*W (\*\* = 515-545, in increment of 5)

96 cells: LP210\*210-M-48-MB-\*\*\*W (\*\* = 460-485, in increment of 5)

84 cells: LP210\*210-M-42-MB-\*\*\*W (\*\* = 400-425, in increment of 5)

110 cells: LP210\*210-M-55-MB-\*\*\*W (\*\* = 520-555, in increment of 5)

100 cells: LP210\*210-M-50-MB-\*\*\*W (\*\* = 475-505, in increment of 5)

90 cells: LP210\*210-M-45-MB-\*\*\*W (\*\* = 425-455, in increment of 5)

80 cells: LP210\*210-M-40-MB-\*\*\*W (\*\* = 380-400, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A or 35A

Application class:

Class A

Electrical protection class:

Class II



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



Module types:

**Double Glass PV Modules with half-cut 7" n-type TOPCon Bifacial Mono Solar Cells:**

156 cells: LP182\*182-M-78-NB-\*\*\*W (\*\* = 580-625, in increment of 5)

144 cells: LP182\*182-M-72-NB-\*\*\*W (\*\* = 555-605, in increment of 5)

132 cells: LP182\*182-M-66-NB-\*\*\*W (\*\* = 510-555, in increment of 5)

120 cells: LP182\*182-M-60-NB-\*\*\*W (\*\* = 460-505, in increment of 5)

108 cells: LP182\*182-M-54-NB-\*\*\*W (\*\* = 410-450, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A or 30A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**Double Glass PV Modules with half-cut 8" n-type TOPCon Bifacial Mono Solar Cells:**

132 cells: LP210\*210-M-66-NB-\*\*\*W (\*\* = 675-705, in increment of 5)

120 cells: LP210\*210-M-60-NB-\*\*\*W (\*\* = 615-640, in increment of 5)

108 cells: LP210\*210-M-54-NB-\*\*\*W (\*\* = 555-575, in increment of 5)

96 cells: LP210\*210-M-48-NB-\*\*\*W (\*\* = 490-510, in increment of 5)

84 cells: LP210\*210-M-42-NB-\*\*\*W (\*\* = 430-445, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A or 35A

Application class:

Class A

Electrical protection class:

Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form) in Annex 1 of test report.



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products

# CERTIFICATE

**TÜV NORD CERT GmbH**  
herewith declares that

**Lepton Solar (Changshu) Co., Ltd.**

No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City, Jiangsu Province, 215500  
P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**



Valid from: 2024-07-23

Valid until: 2025-01-02

|                                 |                                 |
|---------------------------------|---------------------------------|
| Certification program:          | P12-VA-01 Rev. 17 09.20         |
| Certification fundamental(s):   | IEC 62716:2013 / EN 62716:2013. |
| Registered No.:                 | 44 780 20 406749 - 006R4A1M4    |
| Manufacturer and factory(-ies): | See Annex 1                     |
| Test Report No.:                | 492011340.005                   |
| File No.:                       | PVP01197/24P-02                 |



Essen, 2024-07-23

A blue ink signature of a representative of TÜV NORD CERT GmbH.

**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

Please also pay attention to the information stated overleaf.

**Manufacturer and factory(-ies):**

Manufacturer: **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

Factory: **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

Factory inspection report no.: **862010379.007**

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

**Description of product(s):**

Module types:

**PV Modules with 6" Half Cut Mono-crystalline Silicon Solar Cells:**

144 cells: LP158\*158-M-72-H-\*\*\*W (\*\* = 365-400, in increment of 5)  
132 cells: LP158\*158-M-66-H-\*\*\*W (\*\* = 335-365, in increment of 5)  
120 cells: LP158\*158-M-60-H-\*\*\*W (\*\* = 305-330, in increment of 5)  
144 cells: LP158\*158-M-72-MH-\*\*\*W (\*\* = 390-410, in increment of 5)  
132 cells: LP158\*158-M-66-MH-\*\*\*W (\*\* = 360-375, in increment of 5)  
120 cells: LP158\*158-M-60-MH-\*\*\*W (\*\* = 325-340, in increment of 5)  
144 cells: LP166\*166-M-72-MH-\*\*\*W (\*\* = 420-455, in increment of 5)  
132 cells: LP166\*166-M-66-MH-\*\*\*W (\*\* = 385-415, in increment of 5)  
120 cells: LP166\*166-M-60-MH-\*\*\*W (\*\* = 350-380, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

15A or 20A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**PV Modules with 6" Half Cut Poly-crystalline Silicon Solar Cells:**

144 cells: LP156\*156-P-72-H-\*\*\*W (\*\* = 335-370, in increment of 5)  
120 cells: LP156\*156-P-60-H-\*\*\*W (\*\* = 280-305, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

15A

Application class:

Class A

Electrical protection class:

Class II



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



## Module types:

**PV Modules with 7" Half Cut Mono-crystalline Silicon Solar Cells:**

156 cells: LP182\*182-M-78-MH-\*\*\*W (\*\* = 560-605, in increment of 5)

144 cells: LP182\*182-M-72-MH-\*\*\*W (\*\* = 515-555, in increment of 5)

132 cells: LP182\*182-M-66-MH-\*\*\*W (\*\* = 475-510, in increment of 5)

120 cells: LP182\*182-M-60-MH-\*\*\*W (\*\* = 430-465, in increment of 5)

108 cells: LP182\*182-M-54-MH-\*\*\*W (\*\* = 390-415, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A

Application class:

Class A

Electrical protection class:

Class II

## Module types:

**PV Modules with Half-cut 210\*210mm Mono-crystalline Silicon Solar Cells:**

132 cells: LP210\*210-M-66-MH-\*\*\*W (\*\* = 630-670, in increment of 5)

120 cells: LP210\*210-M-60-MH-\*\*\*W (\*\* = 575-610, in increment of 5)

108 cells: LP210\*210-M-54-MH-\*\*\*W (\*\* = 515-545, in increment of 5)

96 cells: LP210\*210-M-48-MH-\*\*\*W (\*\* = 460-485, in increment of 5)

84 cells: LP210\*210-M-42-MH-\*\*\*W (\*\* = 400-425, in increment of 5)

110 cells: LP210\*210-M-55-MH-\*\*\*W (\*\* = 520-555, in increment of 5)

100 cells: LP210\*210-M-50-MH-\*\*\*W (\*\* = 475-505, in increment of 5)

90 cells: LP210\*210-M-45-MH-\*\*\*W (\*\* = 425-455, in increment of 5)

80 cells: LP210\*210-M-40-MH-\*\*\*W (\*\* = 380-400, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A

Application class:

Class A

Electrical protection class:

Class II



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

Module types: **PV Modules with Half-cut 182\*182/188mm n-type TOPCon Bifacial Silicon Solar Cells:**  
156 cells: LP182\*182-M-78-NH-\*\*\*W (\*\* = 580-625, in increment of 5)  
144 cells: LP182\*182-M-72-NH-\*\*\*W (\*\* = 555-600, in increment of 5)  
132 cells: LP182\*182-M-66-NH-\*\*\*W (\*\* = 510-550, in increment of 5)  
120 cells: LP182\*182-M-60-NH-\*\*\*W (\*\* = 460-500, in increment of 5)  
108 cells: LP182\*182-M-54-NH-\*\*\*W (\*\* = 410-450, in increment of 5)

Maximum system voltage: 1500V  
Fuse rating: 25A  
Application class: Class A  
Electrical protection class: Class II

Module types: **PV Modules with Half-cut 182\*210mm n-type TOPCon Bifacial Silicon Solar Cells:**  
132 cells: LP182\*210-M-66-NH-\*\*\*W (\*\* = 580-635, in increment of 5)  
120 cells: LP182\*210-M-60-NH-\*\*\*W (\*\* = 530-575, in increment of 5)  
108 cells: LP182\*210-M-54-NH-\*\*\*W (\*\* = 475-520, in increment of 5)  
96 cells: LP182\*210-M-48-NH-\*\*\*W (\*\* = 420-460, in increment of 5)

Maximum system voltage: 1500V  
Fuse rating: 25A  
Application class: Class A  
Electrical protection class: Class II

Module types: **PV Modules with Half-cut 182\*199/191mm n-type TOPCon Bifacial Silicon Solar Cells:**  
144 cells: LP182\*199-M-72-NH-\*\*\*W (\*\* = 570-655, in increment of 5)  
132 cells: LP182\*199-M-66-NH-\*\*\*W (\*\* = 525-600, in increment of 5)  
120 cells: LP182\*199-M-60-NH-\*\*\*W (\*\* = 475-545, in increment of 5)  
108 cells: LP182\*199-M-54-NH-\*\*\*W (\*\* = 430-490, in increment of 5)

Maximum system voltage: 1500V  
Fuse rating: 25A  
Application class: Class A  
Electrical protection class: Class II



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products

Module types:

**PV Modules with Half-cut 210\*210mm n-type TOPCon Bifacial Silicon Solar Cells:**

132 cells: LP210\*210-M-66-NH-\*\*\*W (\*\* = 675-700, in increment of 5)

120 cells: LP210\*210-M-60-NH-\*\*\*W (\*\* = 615-635, in increment of 5)

108 cells: LP210\*210-M-54-NH-\*\*\*W (\*\* = 555-570, in increment of 5)

96 cells: LP210\*210-M-48-NH-\*\*\*W (\*\* = 490-510, in increment of 5)

84 cells: LP210\*210-M-42-NH-\*\*\*W (\*\* = 430-445, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A

Application class:

Class A

Electrical protection class:

Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form).



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



# CERTIFICATE

**TÜV NORD CERT GmbH**

herewith declares that

**Leapton Solar (Changshu) Co., Ltd.**

No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City, Jiangsu Province, 215500  
P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:



**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**

Certification program:

Certification fundamental(s):

Registered No.:

Manufacturer:

Test Report No.:

File No.:

P12-VA-01 Rev. 17 09.20

IEC 62716:2013 / EN 62716:2013 + AC:2014.

44 780 23 406749 - 234

see Annex 1

492012602.001

PVP04137/23P-06

Valid until: 2028-07-30



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

Essen, 2023-07-31

Please also pay attention to the information stated overleaf.



Module types:

**Double Glass PV Modules with half-cut 7" n-type TOPCon Bifacial Mono Solar Cells:**

156 cells: LP182\*182-M-78-NB-\*\*\*W (\*\*\*) = 580-625, in increment of 5)

144 cells: LP182\*182-M-72-NB-\*\*\*W (\*\*\*) = 555-605, in increment of 5)

132 cells: LP182\*182-M-66-NB-\*\*\*W (\*\*\*) = 510-555, in increment of 5)

120 cells: LP182\*182-M-60-NB-\*\*\*W (\*\*\*) = 460-505, in increment of 5)

108 cells: LP182\*182-M-54-NB-\*\*\*W (\*\*\*) = 410-450, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A or 30A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**Double Glass PV Modules with half-cut 8" n-type TOPCon Bifacial Mono Solar Cells:**

132 cells: LP210\*210-M-66-NB-\*\*\*W (\*\*\*) = 675-705, in increment of 5)

120 cells: LP210\*210-M-60-NB-\*\*\*W (\*\*\*) = 615-640, in increment of 5)

108 cells: LP210\*210-M-54-NB-\*\*\*W (\*\*\*) = 555-575, in increment of 5)

96 cells: LP210\*210-M-48-NB-\*\*\*W (\*\*\*) = 490-510, in increment of 5)

84 cells: LP210\*210-M-42-NB-\*\*\*W (\*\*\*) = 430-445, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A or 35A

Application class:

Class A

Electrical protection class:

Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form) in Annex 1 of test report.



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



**Description of product(s):**

Module types:

**Double Glass PV Modules with 7" Half Cut Mono-crystalline Silicon Solar Cells:**

144 cells: LP182\*182-M-72-MB-\*\*\*W (\*\* = 520-550, in increment of 5)  
132 cells: LP182\*182-M-66-MB-\*\*\*W (\*\* = 475-505, in increment of 5)  
120 cells: LP182\*182-M-60-MB-\*\*\*W (\*\* = 435-455, in increment of 5)  
108 cells: LP182\*182-M-54-MB-\*\*\*W (\*\* = 390-410, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**Double Glass PV Modules with 8" Half Cut Mono-crystalline Silicon Solar Cells:**

132 cells: LP210\*210-M-66-MB-\*\*\*W (\*\* = 630-670, in increment of 5)  
120 cells: LP210\*210-M-60-MB-\*\*\*W (\*\* = 575-610, in increment of 5)  
108 cells: LP210\*210-M-54-MB-\*\*\*W (\*\* = 515-545, in increment of 5)  
96 cells: LP210\*210-M-48-MB-\*\*\*W (\*\* = 460-485, in increment of 5)  
84 cells: LP210\*210-M-42-MB-\*\*\*W (\*\* = 400-425, in increment of 5)  
110 cells: LP210\*210-M-55-MB-\*\*\*W (\*\* = 520-555, in increment of 5)  
100 cells: LP210\*210-M-50-MB-\*\*\*W (\*\* = 475-505, in increment of 5)  
90 cells: LP210\*210-M-45-MB-\*\*\*W (\*\* = 425-455, in increment of 5)  
80 cells: LP210\*210-M-40-MB-\*\*\*W (\*\* = 380-400, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A or 35A

Application class:

Class A

Electrical protection class:

Class II



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



Module types:

**Double Glass PV Modules with half-cut 7" n-type TOPCon Bifacial Mono Solar Cells:**

156 cells: LP182\*182-M-78-NB-\*\*\*W (\*\* = 580-625, in increment of 5)

144 cells: LP182\*182-M-72-NB-\*\*\*W (\*\* = 555-605, in increment of 5)

132 cells: LP182\*182-M-66-NB-\*\*\*W (\*\* = 510-555, in increment of 5)

120 cells: LP182\*182-M-60-NB-\*\*\*W (\*\* = 460-505, in increment of 5)

108 cells: LP182\*182-M-54-NB-\*\*\*W (\*\* = 410-450, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A or 30A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**Double Glass PV Modules with half-cut 8" n-type TOPCon Bifacial Mono Solar Cells:**

132 cells: LP210\*210-M-66-NB-\*\*\*W (\*\* = 675-705, in increment of 5)

120 cells: LP210\*210-M-60-NB-\*\*\*W (\*\* = 615-640, in increment of 5)

108 cells: LP210\*210-M-54-NB-\*\*\*W (\*\* = 555-575, in increment of 5)

96 cells: LP210\*210-M-48-NB-\*\*\*W (\*\* = 490-510, in increment of 5)

84 cells: LP210\*210-M-42-NB-\*\*\*W (\*\* = 430-445, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A or 35A

Application class:

Class A

Electrical protection class:

Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form) in Annex 1 of test report.



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products

# CERTIFICATE

**TÜV NORD CERT GmbH**

herewith declares that

**Leapton Solar (Changshu) Co., Ltd.**

No. 9, Sunshine Avenue, Yushan High Technology Industry Zone, Changshu City  
Jiangsu Province, 215500  
P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**



Valid from: 2024-07-12

Valid until: 2024-12-12

|                                 |                                                                                |
|---------------------------------|--------------------------------------------------------------------------------|
| Certification program:          | P12-VA-01 Rev. 17 09.20                                                        |
| Certification fundamental(s):   | P12.4-AA-02 Rev. 00<br>(IEC TS 62804-1:2015 modified)                          |
| Remark:                         | Test temperature: 85°C;<br>Relative humidity: 85%;<br>Test duration: 96 hours. |
| Registered No.:                 | 44 780 19 406749 - 404R4A1M4                                                   |
| Manufacturer and factory(-ies): | See Annex 1                                                                    |
| Test Report No.:                | 492011339.005                                                                  |
| File No.:                       | PVP01197/24P-01                                                                |



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**



Essen, 2024-07-12

Please also pay attention to the information stated overleaf.



**Anlage 1 zum Zertifikat Nr.:** / *Annex 1 to Certificate No.:* **44 780 19 406749 - 404R4A1M4**

**Seite / Page 1 von / of 1**

**Aktenzeichen:** / *File reference:* **PVP01197/24P-01**

**2024-07-12**

**Manufacturer and factory(-ies):**

**Manufacturer:** **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

**Factory:** **Leapton Solar (Changshu) Co., Ltd.**  
No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City  
Jiangsu Province, 215500, P.R. China

**Factory inspection report no.:** 862010379.007

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



**TÜV NORD CERT GmbH**  
**Certification Body**  
**Consumer Products**

**Description of product(s):**

Module types: **PV Modules with 6" Half Cut Mono-crystalline Silicon Solar Cells:**  
144 cells: LP158\*158-M-72-H-\*\*\*W (\*\* = 365-400, in increment of 5)  
120 cells: LP158\*158-M-60-H-\*\*\*W (\*\* = 305-330, in increment of 5)

Maximum system voltage: 1500V

Fuse rating: 15A or 20A

Application class: Class A

Electrical protection class: Class II

Module types: **PV Modules with 6" Half Cut Mono-crystalline Silicon Solar Cells:**  
144 cells: LP166\*166-M-72-MH-\*\*\*W (\*\* = 420-455, in increment of 5)  
132 cells: LP166\*166-M-66-MH-\*\*\*W (\*\* = 385-415, in increment of 5)  
120 cells: LP166\*166-M-60-MH-\*\*\*W (\*\* = 350-380, in increment of 5)

Maximum system voltage: 1500V

Fuse rating: 20A

Application class: Class A

Electrical protection class: Class II

Module types: **PV Modules with 7" Half Cut Mono-crystalline Silicon Solar Cells:**  
156 cells: LP182\*182-M-78-MH-\*\*\*W (\*\* = 560-605, in increment of 5)  
144 cells: LP182\*182-M-72-MH-\*\*\*W (\*\* = 515-555, in increment of 5)  
132 cells: LP182\*182-M-66-MH-\*\*\*W (\*\* = 475-510, in increment of 5)  
120 cells: LP182\*182-M-60-MH-\*\*\*W (\*\* = 430-465, in increment of 5)  
108 cells: LP182\*182-M-54-MH-\*\*\*W (\*\* = 390-415, in increment of 5)

Maximum system voltage: 1500V

Fuse rating: 25A

Application class: Class A

Electrical protection class: Class II



**TÜV NORD CERT GmbH**  
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Module types:

**PV Modules with Half-cut 210\*210mm Mono-crystalline Silicon Solar Cells:**

132 cells: LP210\*210-M-66-MH-\*\*\*W (\*\* = 630-670, in increment of 5)  
120 cells: LP210\*210-M-60-MH-\*\*\*W (\*\* = 575-610, in increment of 5)  
108 cells: LP210\*210-M-54-MH-\*\*\*W (\*\* = 515-545, in increment of 5)  
96 cells: LP210\*210-M-48-MH-\*\*\*W (\*\* = 460-485, in increment of 5)  
84 cells: LP210\*210-M-42-MH-\*\*\*W (\*\* = 400-425, in increment of 5)  
110 cells: LP210\*210-M-55-MH-\*\*\*W (\*\* = 520-555, in increment of 5)  
100 cells: LP210\*210-M-50-MH-\*\*\*W (\*\* = 475-505, in increment of 5)  
90 cells: LP210\*210-M-45-MH-\*\*\*W (\*\* = 425-455, in increment of 5)  
80 cells: LP210\*210-M-40-MH-\*\*\*W (\*\* = 380-400, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**PV Modules with Half-cut 182\*182/188mm n-type TOPCon Bifacial Silicon Solar Cells:**

156 cells: LP182\*182-M-78-NH-\*\*\*W (\*\* = 580-625, in increment of 5)  
144 cells: LP182\*182-M-72-NH-\*\*\*W (\*\* = 555-600, in increment of 5)  
132 cells: LP182\*182-M-66-NH-\*\*\*W (\*\* = 510-550, in increment of 5)  
120 cells: LP182\*182-M-60-NH-\*\*\*W (\*\* = 460-500, in increment of 5)  
108 cells: LP182\*182-M-54-NH-\*\*\*W (\*\* = 410-450, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**PV Modules with Half-cut 182\*210mm n-type TOPCon Bifacial Silicon Solar Cells:**

132 cells: LP182\*210-M-66-NH-\*\*\*W (\*\* = 580-635, in increment of 5)  
120 cells: LP182\*210-M-60-NH-\*\*\*W (\*\* = 530-575, in increment of 5)  
108 cells: LP182\*210-M-54-NH-\*\*\*W (\*\* = 475-520, in increment of 5)  
96 cells: LP182\*210-M-48-NH-\*\*\*W (\*\* = 420-460, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A

Application class:

Class A



**TÜV NORD CERT GmbH**  
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Electrical protection class: Class II

Module types: **PV Modules with Half-cut 182\*199/191mm n-type TOPCon Bifacial Silicon Solar Cells:**

144 cells: LP182\*199-M-72-NH-\*\*\*W (\*\* = 570-655, in increment of 5)

132 cells: LP182\*199-M-66-NH-\*\*\*W (\*\* = 525-600, in increment of 5)

120 cells: LP182\*199-M-60-NH-\*\*\*W (\*\* = 475-545, in increment of 5)

108 cells: LP182\*199-M-54-NH-\*\*\*W (\*\* = 430-490, in increment of 5)

Maximum system voltage: 1500V

Fuse rating: 25A

Application class: Class A

Electrical protection class: Class II

Module types: **PV Modules with Half-cut 210\*210mm n-type TOPCon Bifacial Silicon Solar Cells:**

132 cells: LP210\*210-M-66-NH-\*\*\*W (\*\* = 675-700, in increment of 5)

120 cells: LP210\*210-M-60-NH-\*\*\*W (\*\* = 615-635, in increment of 5)

108 cells: LP210\*210-M-54-NH-\*\*\*W (\*\* = 555-570, in increment of 5)

96 cells: LP210\*210-M-48-NH-\*\*\*W (\*\* = 490-510, in increment of 5)

84 cells: LP210\*210-M-42-NH-\*\*\*W (\*\* = 430-445, in increment of 5)

Maximum system voltage: 1500V

Fuse rating: 30A

Application class: Class A

Electrical protection class: Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form).



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



# CERTIFICATE

**TÜV NORD CERT GmbH**

herewith declares that

**Leapton Solar (Changshu) Co., Ltd.**

No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City, Jiangsu Province, 215500  
P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

**Description of product (details see Annex 2):**

**Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**



Valid from: 2023-07-31

Valid until: 2028-07-30

|                               |                                                                                |
|-------------------------------|--------------------------------------------------------------------------------|
| Certification program:        | P12-VA-01 Rev. 17 09.20                                                        |
| Certification fundamental(s): | P12.4-AA-02 Rev. 00<br>(IEC TS 62804-1:2015 modified)                          |
| Remark:                       | Test temperature: 85°C;<br>Relative humidity: 85%;<br>Test duration: 96 hours. |
| Registered No.:               | 44 780 23 406749 - 235                                                         |
| Manufacturer:                 | see Annex 1                                                                    |
| Test Report No.:              | 492012603.001                                                                  |
| File No.:                     | PVP04137/23P-07                                                                |



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



Essen, 2023-07-31

Please also pay attention to the information stated overleaf.



Anlage 1 zum Zertifikat Nr.: / Annex 1 to Certificate No.: 44 780 23 406749 - 235

Seite / Page 1 von / of 1

Aktenzeichen: / File reference: PVP04137/23P-07

2023-07-31

**Manufacturer:**

Manufacturer:

**Leapton Solar (Changshu) Co., Ltd.**

No. 9, Sunshine Avenue, Yushan High Technology Industry Zone,  
Changshu City

Jiangsu Province, 215500, P.R. China

Factory inspection report no.:

862010379.006

**Remark:**

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



**Description of product(s):**

Module types:

**Double Glass PV Modules with 7" Half Cut Mono-crystalline Silicon Solar Cells:**

144 cells: LP182\*182-M-72-MB-\*\*\*W (\*\* = 520-550, in increment of 5)

132 cells: LP182\*182-M-66-MB-\*\*\*W (\*\* = 475-505, in increment of 5)

120 cells: LP182\*182-M-60-MB-\*\*\*W (\*\* = 435-455, in increment of 5)

108 cells: LP182\*182-M-54-MB-\*\*\*W (\*\* = 390-410, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A

Application class:

Class A

Electrical protection class:

Class II

Module types:

**Double Glass PV Modules with 8" Half Cut Mono-crystalline Silicon Solar Cells:**

132 cells: LP210\*210-M-66-MB-\*\*\*W (\*\* = 630-670, in increment of 5)

120 cells: LP210\*210-M-60-MB-\*\*\*W (\*\* = 575-610, in increment of 5)

108 cells: LP210\*210-M-54-MB-\*\*\*W (\*\* = 515-545, in increment of 5)

96 cells: LP210\*210-M-48-MB-\*\*\*W (\*\* = 460-485, in increment of 5)

84 cells: LP210\*210-M-42-MB-\*\*\*W (\*\* = 400-425, in increment of 5)

110 cells: LP210\*210-M-55-MB-\*\*\*W (\*\* = 520-555, in increment of 5)

100 cells: LP210\*210-M-50-MB-\*\*\*W (\*\* = 475-505, in increment of 5)

90 cells: LP210\*210-M-45-MB-\*\*\*W (\*\* = 425-455, in increment of 5)

80 cells: LP210\*210-M-40-MB-\*\*\*W (\*\* = 380-400, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

30A or 35A

Application class:

Class A

Electrical protection class:

Class II



Module types:

**Double Glass PV Modules with half-cut 7" n-type TOPCon Bifacial Mono Solar Cells:**

156 cells: LP182\*182-M-78-NB-\*\*\*W (\*\*\*) = 580-625, in increment of 5)

144 cells: LP182\*182-M-72-NB-\*\*\*W (\*\*\*) = 555-605, in increment of 5)

132 cells: LP182\*182-M-66-NB-\*\*\*W (\*\*\*) = 510-555, in increment of 5)

120 cells: LP182\*182-M-60-NB-\*\*\*W (\*\*\*) = 460-505, in increment of 5)

108 cells: LP182\*182-M-54-NB-\*\*\*W (\*\*\*) = 410-450, in increment of 5)

Maximum system voltage:

1500V

Fuse rating:

25A or 30A

Application class:

Class A

Electrical protection class:

Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form) in Annex 1 of test report.



**TÜV NORD CERT GmbH**  
Certification Body  
Consumer Products



## 15年間製品品質保証

## &lt;定義&gt;

本保証内容における当社にて製造されたアルミ合金架台について、関係する各地位を以下に定義します。

- ・リープトンエネルギー株式会社は、アルミ合金架台のメーカーの立場となり、本保証書の文章上においては、「当社」と呼称する事とします。
- ・当社の販売先（卸先）である「商社」、「販売店（販売業者）」、「工事施工店（施工業者）」等の企業で当社との商流において「媒介」を行う企業を「媒介業社」と呼称する事とします。
- ・当社よりの商品を販売した媒介業者等において、最終的に当社の太陽光発電設備を設置配備した事業主を法人・個人を問わず、「お客様」と呼称する事とします。

## &lt;15年間の製品保証及び保証の範囲&gt;

当社は、当社にて製造されたアルミ合金架台において、製品の品質を15年間（180ヶ月間）保証します。当該アルミ合金架台製品本体の品質が基準を満たさない場合、または保証期間内において本製品の故障や不具合が発生した場合には、以下の条件に従い、修理または交換を行う他、追加等で対処致します。また保証期間中に製品交換した場合、保証条項は新しい製品に適用します。但し、本保証は最初の納品より15年間の保証期間と致します。

また本品質保証書の対象は、アルミ合金架台製品本体のみに限定され、本製品の故障または不具合を原因とした二次的被害は本保証の対象外となります。

◎対象商品の取扱説明書に基づき、適切な設置が行われ、通常使用の環境下で適正な使用を行っていること。

◎保証対象となる製品の一部または全部において、引渡し時の検収において異常が無いこと。

◎保証対象となる製品の一部または全部の品質において、仕様の材料及び工場出荷時の異常が無いこと、欠陥がない商品と判断がされていること。

◎使用において対象商品の取扱説明書及び製品仕様書等に規定している通常の用途、設置、使用及び稼働の条件下で、機能性に異常が生じる状態でないもの。

◎当社製のアルミ合金架台の保証の範囲は、当社が定めた製品仕様・設計図面・施工マニュアル等に記載の指示や注意事項に従い、正常に使用した状態の範囲に限定されます。

当社は、不具合現品の返品または交換品の発送にかかる費用は、当社にて負担致します。

## &lt;適応除外と免責&gt;

下記の事項に該当する場合は、如何なる場合でもアルミ合金架台の製品保証の適応除外となり、当社は一切の責任を負いませんので、ご了承ください。

- 製品保証に係る補償の申請が保証期間外で行われた時。
- 製品の取り扱いにおいて、間違った使用方法、誤用、不注意、怠慢または事故等に起因して不適切な使用があった場合。
- 製品を改造、不適切な設置及び使用をした場合、また、お客様または第三者の故意、過失により不具合が発生した場合。
- 当社の提供する製品に関する取扱説明書、製品説明書、設置・使用・保守等のマニュアルを遵守しなかった場合、またカタログ、パンフレットに記載の注意事項等を遵守していない場合。
- アルミ合金架台の汚濁による腐食等を原因とした場合。
- 本来の製品機能に異常がなく、経年劣化、外観の変化に起因する場合。

- G. 設置場所における構造物等の変形、変位、土地の地盤沈下や傾斜地の地崩れや崩壊、土壌流出等に起因する不具合が生じた場合。
- H. 重塩害地域とされる地域での塩害を原因とした製品の劣化等がある場合。（※ 太陽光発電所の全部またはその一部が、海岸線より 5 0 0 m の距離に接触する場合には、重塩害地域とする。）
- I. 設置場所より 5 0 0 m の距離に接触する場所において養鶏場、牛舎等の畜産設備がある場合、または温泉、間欠泉、硫黄等の噴出等（火山性ガスの発生や強酸・強アルカリ性の湯気の発生、そのた金属等に影響を及ぼす自然環境を含む）がある場合。
- J. 当社が認証した技術者以外の者による修理や仕様の変更を行った場合。
- K. 既設の太陽光システムからの電力サージの発生、落雷、洪水、火災、事故等による破損及び当社が制御できない事象に起因した破損等が発生した場合。
- L. 設置場所の変更、移動または移設を行った場合。届出書面等による設置場所の住所の誤記、相違等の場合を含む。
- M. 設置場所周辺の自然特性に起因し、金属サビ、摩耗、コケ、藻等による汚濁、変色等が生じた場合。
- N. 獣や小動物の害に起因する損傷、機能不良、不具合が生じた場合。
- O. 契約当時の技術では予見できなかった事象等を原因とした不具合が生じた場合。
- P. 戦争、暴動、爆発事故等による偶然かつ外来の事故により不具合が生じた場合。

保証の有効期限を超えた場合は、全てに於いて無効となり、リープтонエナジー株式会社への賠償要求には適用致しません。また、いかなる状況下での発生に於いても、リープтонエナジー株式会社は製品自体に対してのみ責任を負担し、賠償を致します。

本保証書は弊社からソーラーシステム架台をご購入されたお客様のみに対し有効です。

本保証書は所有者以外に譲渡することはできません。

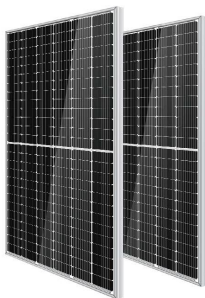
※ 本品質保証は日本国内においてのみ有効です。

※ 屋根材、雨樋、掴み金具は本品質保証の対象外です。

※ 基礎杭においては、原則、引渡しより 1 年間の保証となります。その他においては、当社のカタログまたは製品の施工説明書等に従うものとします。

リープтонエナジー株式会社

## 太陽電池モジュール

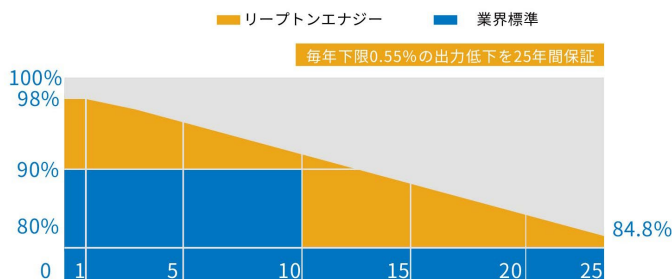


### ・製品保証15年 (P-type、N-type片面) 製品保証25年 (N-type両面)

リープтонエナジー製の太陽電池モジュールについて、取扱説明書に基づき適切な設置、通常の使用環境で正規の保守をすることを前提に、材料及び工場出荷品質に起因する欠陥に対して補償します。

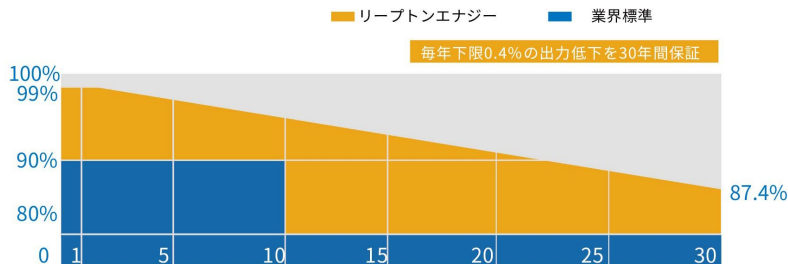
### ・出力保証25年 (P-type)

納入初年度は2.0%までの出力低下となり、2年目以降は毎年0.55%までの出力低下となります。保証期間終了時の最大出力は、84.8%以上を保証いたします。



### ・出力保証30年 (N-type)

納入初年度は1.0%までの出力低下となり、2年目以降は毎年0.4%までの出力低下となります。保証期間終了時の最大出力は、87.4%以上を保証いたします。



・アルミ架台：製品保証15年 ・リープтонエナジー製パワーコンディショナ：製品保証15年

上記保証及び補償内容は、販売店向けの内容になります。  
そのため、販売店の示す内容・条件と異なる場合があります。詳しくは販売店にお問い合わせください。

お問い合わせ ☎ 0120-850-800 ✉ [hosho@leaptonenergy.jp](mailto:hosho@leaptonenergy.jp)

リープтонエナジー株式会社

本社：〒650-0025 兵庫県神戸市中央区相生町1-2-1 東成ビルディング6F  
東京支社：〒105-0004 東京都港区新橋3-5-10 新三ビル6F

Ver.2024.3



MEMO

Handwriting practice lines consisting of 20 horizontal dotted lines.



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SOLAR

リープトンエネルギー株式会社