Flexible photovoltaic laminates

**M PVL 72 | 68 | 64**

### CONSTRUCTION CHARACTERISTICS

**Dimensions:**
- **length:** 2791 mm
- **width:** 394 mm
- **thickness:** 4 mm, 16 mm including potted terminal housing assembly

**Weight:**
- 3.8 kg

**Output cables:**
- 4 mm² - 560 mm length cables with MC® connectors pre-assembled on upper side of laminate

**Bypass diodes:**
- Connected across every solar cell

**Encapsulation:**
- Durable EFTE high light-transmissive polymer, UV-resistant, weather resistant

**Adhesive:**
- Ethylene propylene copolymer adhesive sealant with microbial inhibitor

**Cell type:**
- 11 triple junction amorphous silicon solar cells, 356 mm x 239 mm connected in series

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### Electrical specifications STC
*(Standard Test Conditions: 1000 W/m², AM 1.5, 25 °C cell temperature)*

<table>
<thead>
<tr>
<th>model</th>
<th>M PVL 72</th>
<th>M PVL 68</th>
<th>M PVL 64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum power (P_{max}):</td>
<td>72 Wp</td>
<td>68 Wp</td>
<td>64 Wp</td>
</tr>
<tr>
<td>Voltage at P_{max} (V_{mp})</td>
<td>16.5 V</td>
<td>16.5 V</td>
<td>16.5 V</td>
</tr>
<tr>
<td>Current at P_{max} (I_{mp})</td>
<td>4.36 A</td>
<td>4.13 A</td>
<td>3.88 A</td>
</tr>
<tr>
<td>Short-circuit current (I_{sc})</td>
<td>5.3 A</td>
<td>5.1 A</td>
<td>4.8 A</td>
</tr>
<tr>
<td>Open-circuit voltage (V_{oc})</td>
<td>23.1 V</td>
<td>23.1 V</td>
<td>23.1 V</td>
</tr>
<tr>
<td>Maximum series fuse rating</td>
<td>8 A</td>
<td>8 A</td>
<td>8 A</td>
</tr>
</tbody>
</table>

### Electrical specifications NOCT
*(Nominal Operating Cell Temperature: 800 W/m², AM 1.5, 1 m/sec. wind)*

<table>
<thead>
<tr>
<th>model</th>
<th>M PVL 72</th>
<th>M PVL 68</th>
<th>M PVL 64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum power (P_{max}):</td>
<td>55 Wp</td>
<td>53 Wp</td>
<td>50 Wp</td>
</tr>
<tr>
<td>Voltage at P_{max} (V_{mp})</td>
<td>15.4 V</td>
<td>15.4 V</td>
<td>15.4 V</td>
</tr>
<tr>
<td>Current at P_{max} (I_{mp})</td>
<td>3.60 A</td>
<td>3.42 A</td>
<td>3.24 A</td>
</tr>
<tr>
<td>Short-circuit current (I_{sc})</td>
<td>4.3 A</td>
<td>4.1 A</td>
<td>3.9 A</td>
</tr>
<tr>
<td>Open-circuit voltage (V_{oc})</td>
<td>21.1 V</td>
<td>21.1 V</td>
<td>21.1 V</td>
</tr>
<tr>
<td>NOCT</td>
<td>46 °C</td>
<td>46 °C</td>
<td>46 °C</td>
</tr>
</tbody>
</table>

### General characteristics
- High temperature and low light performance
- Output cables with Multi-Contact connectors on top
- Bypass diodes for shadow tolerance
- Treadable surface due to complete absence of glass

### Performance characteristics
- Rated power (P_{max}): 72 Wp or 68 Wp or 64 Wp
- Production P_{max} tolerance: ±5%

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### TRIPLE-JUNCTION SOLAR CELL SCHEME

1. Transparent electrode
2. Blue light absorbing cell
3. Green light absorbing cell
4. Red light absorbing cell
5. Reflective metal layer
6. Lower flexible layer (stainless steel)
7. Thickness of a triple-junction cell ~ 1 µ
I-V curves at various levels of irradiance at AM 1.5 and 25°C cell temperature

**Temperature coefficients**

(at AM 1.5, 1000 W/m² irradiance)

- **Temperature coefficient (TC) I_{sc}:** 0.001/K (0.10%/°C)
- **Temperature coefficient (TC) V_{oc}:** -0.0038/K (-0.38%/°C)
- **Temperature coefficient (TC) P_{max}:** -0.0021/K (-0.21%/°C)
- **Temperature coefficient (TC) I_{mp}:** 0.001/K (0.10%/°C)
- **Temperature coefficient (TC) V_{mp}:** -0.0031/K (-0.31%/°C)

\[
y = y_{\text{reference}} \times [1 + TC \times (T - T_{\text{reference}})]
\]

Note:
1. During the first 8-10 weeks of operation, electrical output exceeds specified ratings. Power output may be higher by 15%, operating voltage may be higher by 11% and operating current may be higher by 4%.
2. Electrical specifications are based on measurements performed at standard test conditions (irradiance 1000 W/m², air mass 1.5, cell temperature 25°C) after stabilization.
3. Actual performance may vary up to 10% from rated power due to low temperature operation, spectral and other related effects. Maximum system open-circuit voltage not to exceed 1000 Vdc per IEC regulations, according to protection class II or IEC EN 61730-2.
4. Specifications subject to change without notice.