BYPV (Hollow BIPV):
1. Use three layers or four layers tempering glass with 3mm, 4mm, 5mm, 6mm, 8mm, 10mm thickness
2. Adopt the imported PVB, which have durability, transparency.
3. Can be customized
4. Has a good sound insulation, heat insulation and enable the building more energy conservation and environmental protection

Application Range:
Greenhouse, Building Roof, Building Photovoltaic Curtain Wall. Ideal for Roof, Skylight and Facade. Enough sunlight radiate through space of solar cells can generate electricity as well as absorb sunshine.

BYPV, there are solar cells between the outer glass and inner glass and stick them to encapsulate (EVA or PVB). Between inter glass and indoor glass, there is a vacuum gap with division bar which can keep warm in door, sound and heat to insulate. Actually, in the base of double glazing panel, BYPV panel just add one vacuum gap.

BIPV Design:
Dimensions: 300 X 300mm to 2000 X 2500mm
Glass:
1. Thickness: 3.2mm, 4mm, 6mm, 8mm.
2. Kinds: tempered glass, ultra white tempered glass
Cell:
125 Mono solar cells, 156 Mono Solar Cell, 156 Poly Solar Cell, & Colourful 156 Poly Solar Cell.
Structure:
Double glazing glass BIPV, three layer hollow BIPV, four layer hollow BIPV

NEW DIMENSION IN RENEWABLE ENERGY HARVESTING

Building-integrated Photovoltaics (BIPV) are photovoltaic materials that are used to replace conventional building materials in parts of the building envelope such as the roof, skylights, or facades.[1] They are increasingly being incorporated into the construction of new buildings as a principal or ancillary source of electrical power, although existing buildings may be retrofitted with similar technology. The advantage of integrated Photovoltaic over more common non-integrated systems is that the initial cost can be offset by reducing the amount spent on building materials and labour that would normally be used to construct the part of the building that the BIPV modules replace.
Building Integration Benefits:

Nano Solar Light modules capture and deliver the power of the sun through thin-film PV modules that can be easily integrated into virtually any type of building material or application.

- **Lower Overall System Costs**
  NANO SOLAR Light modules require fewer balance of system components, fewer electrical connections and require less labour to install, lowering the overall cost of installation.

- **Lightest Weight Energy Source**
  NANO SOLAR Light modules are created using industry-changing lightweight, thin-film PV technology and are up to 20 percent more efficient than other flexible modules.

- **Powerful, Alternative Energy Source**
  NANO SOLAR Light modules deliver the best energy density of any flexible PV product available. This powerful, alternative energy source can differentiate building materials cost effectively.

- **Incentives for Integration**
  The integration of NANO SOLAR Light modules qualify for global energy incentives, such as feed-in tariffs and tax credits.

Architectural Aesthetics

Junction box, cable can be hidden in curtain wall under the professional design. At last it will not effect building appearance and be a perfect blending of nature and construction.

Architectural Lighting

We can adjust cell array to reach a reasonable transparency to meet architectural lighting.

Safety Performance

Usually we adopt two piece or more tempering glass to finish BIPV. It have good impact resistance, durability, transparency, safety.

Easy installation

BIPV is made from double glass solar panel and glass curtain wall. In terms of the installation technology and method they are similar to common glass curtain wall and can reach convenient installation requirements completely.

Long life

PVB in BIPV has better heat resistance, cold resistance, temperature resistance, moisture proof and anti-aging, impact resistance, and ultimately make BIPV have longer service life than EVA.

Green & Environmental Protection

BIPV is integrated in the building and do not need to occupy land area, no noise, no pollution.

BIPV buildings can be their own power to their own use, reduce power delivery costs and loss. BIPV buildings power generation and power peak has synchronicity and can relieve the state grid peak power demand. It has the great social benefits.

Product Type

**Double Glazing BIPV:**

1. Use double glazing with 3mm, 4mm, 5mm, 6mm, 8mm, 10mm thickness
2. Adopt the imported PVB, which have durability, transparency.
3. Can be customized
4. Economic and can be used widely.

**Application Range:**

Pavilion, Shed, Bus Platform, greenhouse, Building guardrail, Building roof, Building photovoltaic curtain wall; Ideal for roof, skylight, and facade so forth, enough sunlight radiate through space of solar cells, can generate electricity as well as absorb sunshine. Specification, power rating and transparency of one solar panel according to actual architecture structure can be changed freely. Structure Component:
Nano Solar has developed a wide range of photovoltaic glass specifically designed for installation in buildings. The photovoltaic properties allow this glasses to generate electricity even in those buildings where the orientation and inclination is not at its optimum (for example: north façade).

1. It is not a traditional photovoltaic module designed for ground installation. It has been designed specially as safety glass for buildings in order to comply with the Technical Code of the Building.
2. It is available in different thicknesses, sizes and grades of transparency.
3. It works in all weather conditions, including low light and cloudy conditions.
4. It produces low cost electricity (kWh), allowing lower capital investment and increased output per rated watt.
5. It is environmentally friendly and has a shorter energy payback period (the amount of time it takes to generate enough energy to equal the energy used to produce it) than traditional photovoltaic modules.
6. It is frameless and has a uniform colour that is aesthetically appealing. It is ideal for building integrated photovoltaics (BIPV) and other high-visibility applications.

### Power Per Unit Area

<table>
<thead>
<tr>
<th>Type of Glass</th>
<th>Power per Unit Area (Wp/sqm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline glass</td>
<td>120 to 180 Wp/sqm (11.1 to 16.7 Wp/Sq Ft)</td>
</tr>
<tr>
<td>CIS/CIGS* glass</td>
<td>90 to 140 Wp/sqm (8.4 to 12.0 Wp/Sq Ft)</td>
</tr>
<tr>
<td>a-Si · micro amorphous glass</td>
<td>50 to 90 Wp/sqm (4.6 to 8.4 Wp/Sq Ft)</td>
</tr>
</tbody>
</table>

* Electrical characteristics at Standard Test Conditions (STC): Irradiance: 92.94 W/Sq Ft (1000 W/sqm) Spectrum: AM 1.5 Temperature: 25 °C

### Thermal Coefficient

- Crystalline technology based photovoltaic glass (mono/poli): -0.45 %/°C.
- CIS/CIGS and μ-crystalline technology based photovoltaic glass: -0.36 %/°C.
- a-Si microamorphous technology based photovoltaic glass: -0.13 %/°C.

The thermal coefficient is a parameter reflecting the stability of the system under extreme meteorological conditions. The less the interval of variation per Celsius degree is, the more stable the system is, allowing heat loss to be minimal and the temperature dispersion to be better.

### Multi Functional Bio Climatic Properties

Ours are multifunctional bioclimatic solutions which combine both active and passive properties to give a great many advantages to the buildings which incorporate them.

BIPV is a design scheme that allows the building to generate its own energy. This new idea attempts to integrate photovoltaic technology into the internal structure of the building. By this, mean that the building would not exist without the BIPV. There are no ground-mounted arrays, no panels bolted to the roofs, there is solely the building. The point of BIPV is to make the process of constructing energy efficient buildings easier, more efficient, and more cost effective.

Take advantage of the sunlight to illuminate your building. Thanks to our Photovoltaic Transparent glass you will allow the entrance of the sunlight, avoiding UV radiation and infrared radiation, and seeing through the glass at the same time.

Choose between 10%, 20% or 30% of transparency degree, depending on the luminosity required and enjoy your views.

Semi-transparent double glazed photovoltaic insulating glass units can be incorporated into the project providing better thermal insulation properties.

Normally they consist of an external photovoltaic laminated glass of 0.24, 0.32, 0.40, 0.47, 0.59, 0.75 in (6, 8, 10, 12, 15 or 19 mm)thick, an air chamber of 16 mm for a greater thermal insulation Performance, and an inner pane of 6 mm thick glass.

Curtain walls offer architects a multitude of possibilities for the integration of photovoltaic solar energy into buildings in an efficient and ecological manner. Photovoltaic curtain wall provides a multi Functional solution where not only clean and free energy is being generated in-situ, but also natural illumination is being provided implementing solar control by filtering effect, avoiding infrared and UV irradiation to the interior (enhancing thermal comfort and avoiding interior aging).
Sustainability, energy efficiency and onsite renewable energy sources are the most important concepts that contemporary architecture pursues. All cities and buildings around the Globe are Going Green.

The large variety in form, structure and colour of transparent photovoltaic glass, combined with the aluminum frames, provides a free reign of creativity for architects so they can create designs which unite elegance, efficiency and energy saving.

In order to achieve even better thermal insulation, semi-transparent triple glazed insulating photovoltaic glass units could be considered as a possible solution. Generally they consist of an additional inner pane of 0.24 in (6 mm) thick glass which is incorporated into the double glazed unit.

Through laser cutting technology, the active area of the glass can be modified in order to get different patterns and 100% customized designs, leading to spectacular shapes and semi-transparency effects.

Do combine a pattern and a semi-transparency degree according to the pursued design and to the energy requirements of the project.

Depending on the selected pattern or design, and the degree of semi-transparency, peak power could decrease.

Laminated safety glass

Available in different technologies, colours, thickness and sizes. One of the principal applications of this laminated glass is use as ventilated photovoltaic façade or roof for which a complete package of services and complementary products has been developed to facilitate the installation in any type of building.

We offer the possibility of adapting the glass to the building's characteristics, to its location and to the client's economic or aesthetic needs.