

# Field Testing and Behaviour Assessment of Multiple BIPV Components in Madrid, Spain

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Topic: Building-Specific Solutions – Solar architecture and integrated building energy systems

## INTRODUCTION

- The climate emergency demands urgent action to prevent irreversible consequences.
- Existing buildings are key targets for climate-focused interventions.
- Energy renovation—with integrated renewable sources—offers a vital opportunity.



### Building-Integrated Photovoltaics (BIPV)

- Generate electricity while functioning as part of the building envelope.
- Highly adaptable in design and appearance, ideal for retrofits that integrate energy production without compromising architectural aesthetics.

## METHODOLOGY

The present study aims to analyse and compare various BIPV components currently available on the market, based on their specific characteristics, to better understand their real-world performance and promote their wider adoption among architects and professionals in the building sector.



1. Comprehensive review of international manufacturers.
2. Five European companies selected: Ertex Solar, Kromatix, Ertex Solar, GruppoSTG, Onyx Solar, and Sunerg.
3. Representative modules chosen from each catalogue for analysis.

## BIPV INSTALLATIONS

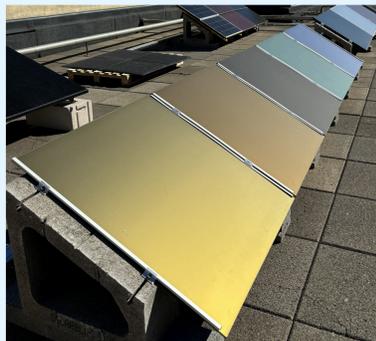
### EXTER SOLAR

- Model Q4, 720x720 mm.
- Colour variants: Terracotta, Gold, Black, Green, and Blue.



### KROMATIX

- Model KR6/6 cells GG44, 1005x1040 mm.
- Gold, Orange, Dark Grey, Green, and Blue.



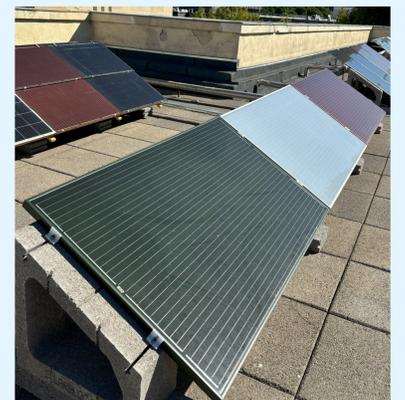
### GRUPPOSTG

- Model TG-EGM24ST, 1000x750 mm.
- Six units: 2 white, 2 terracotta, and 2 full black.



### SUNERG

- Model X-Color, 1655x1002 mm.
- Colours: white, red and green.



### ONYX SOLAR



- In the first two images, the following models are shown:
  - Onyx PV Glass c-Si 45x6", 1700 × 1000 mm: 2 semi-transparent units with visible PV cells.
  - Onyx PV Glass c-Si 60x6", 1700 × 1000 mm: 1 white unit, 2 Corten Steel units, 2 black units, and 2 semi-transparent units with visible PV cells.
- Last, model Onyx PV Glass Floor c-Si 16x6". Four units in black.

The installation was completed with all necessary components to ensure optimal solar capture and comprehensive monitoring of both energy production and environmental parameters.

The monitoring of the system has enabled:

- Detailed performance analysis, including intra- and inter-manufacturer comparisons.
- Evaluation of durability, soiling, visual appearance, and other factors.
- Insights into real-world behaviour and long-term BIPV performance.

