

PANEL PV, Solar-era.net: Flisom, Kiwa BDA , Panelen Holland, TNO.

The goal of this project was the development of a colored sandwich Photovoltaic (PV) panel based on Copper-Indium-Gallium-Diselenide (CIGS) thin film PV. This was done in collaboration with partners having expertise in building colored sandwich PV panels, in the framework of a SOLAR-ERA.NET project (<http://www.solar-era.net>). Flisom made the PV foils and developed the processes required for the integration into this new product. TNO developed the process to create shunt free translucent CIGS thin film PV. These translucent CIGS thin film PV are used to develop a product by Panelen Holland. This product is demonstrated in a small façade installation setup at the site of the project partner, Panelen Holland, in the Netherlands. BDA Dak en Gevel Advies established a knowledge base related to the product properties, the construction and product regulation.

Sandwich panels are generally used in construction, especially for façades, but can also be used for roofing applications. They have a defined structure which includes an insulation layer enclosed within two outside layers of different materials and properties. Generally one of the outside layers is suitable for external use with resistance against environmental impact. The inner “outside” is a mechanical protection and stabilizer against damage but will not be exposed to environmental influence.

In this project PV foils have been integrated, meaning laminated, with the outside layer of the sandwich panel becoming the back sheet (BS) of the PV panel in combination with the insulation and inner protective layer. A suitable BS has been identified, and the required lamination process successfully demonstrated, together with required environmental testing of the final product.

As PV panels generally shows only a dark, almost black color, translucent PV films were developed to allow for color coming from the outside of the sandwich panel. Translucence was achieved by structuring the PV foil with a laser process in such a way as to create a high number of small enough voids. The human eye cannot resolve these individual patterns and perceives only a colored surface. 50% transparency with remaining 40% of the original electrical performance was demonstrated. This is an impressive achievement, especially in view of the often observed shunting that can be induced by such laser patterning steps.

The solar foils have been processed and laminated to create several colored panels that are used in the demonstrator made by Panelen Holland.

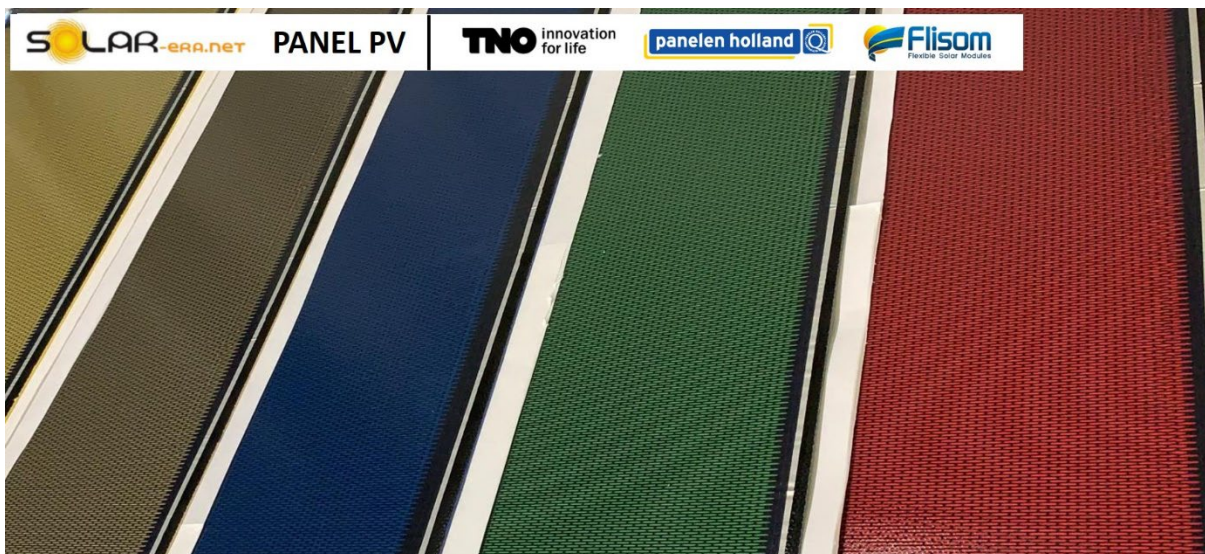


Figure 1, Different colored panels made in the PanelPV project.