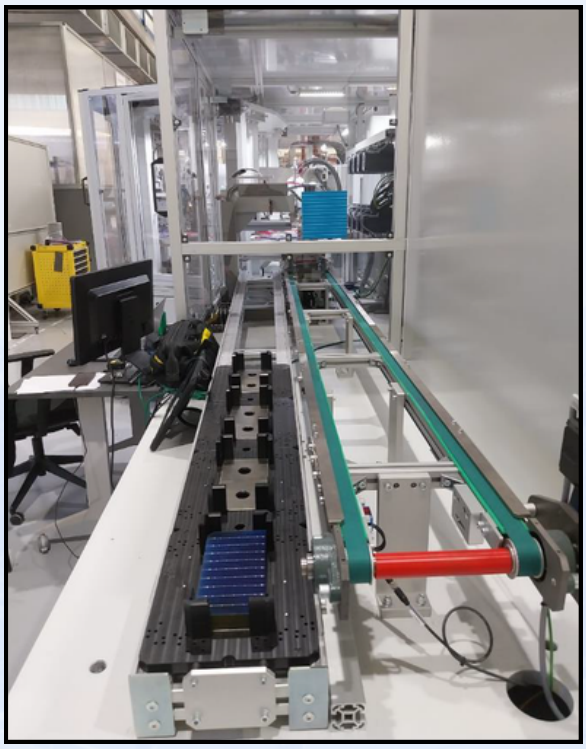
Seamless-PV drives the implementation of new integrated photovoltaic (IPV) solutions in different market sectors. The objective is to develop advanced manufacturing equipment, processes and digitalisation strategies focusing on glass-glass lamination as well as lightweight composite and polymer-based technologies.

Facing at real industrial environments and different market demands and opportunities, Seamless-PV sets up six pilot line levels and 11 different IPV demo cases across Europe, divided between integration in noise barriers, buildings, electric vehicles, and agriculture.

Innovative and flexible Tabber-Stringer machines



Under the leadership of Mondragon Assembly (MASS), the Seamless-PV consortium has developed two innovative machines: two innovative and flexible tabber-stringers, highly advanced and versatile machines designed to interconnect solar cells into strings, which are then assembled into solar panels.

The "flexibility" in their name highlights their ability to adapt to a wider range of cell formats, interconnection technologies, and production requirements compared to traditional, more rigid stringing machines. These machines represent a significant step forward, offering additional capabilities beyond current market standards.

◀ *Figure 1: the feedding system that takes the cells inside the machine*

1. Flexible Tabber-Stringer for Interconnecting Mono and Polycrystalline Cells of New Formats

This machine is designed to operate with mono and polycrystalline cells and offers two distinct operational modes:

- Standard Mode: Maintains a constant distance between cells.
- BIPV (Building Integrated Photovoltaics) Mode: Allows for variable cell distances, ranging from 2 to 200 mm. This flexibility is crucial for IPV solutions integrated into buildings, which require adaptability to diverse designs and configurations.

Key Components and Functionalities:

- **Ribbon feeding control**: Ensures precise flow of the interconnection material.
- **Cell feeder** (M10 full or half): Manages cell input.
- **Cell position control via camera**: Guarantees accurate positioning.
- **Innovative ribbon dispenser-positioner**: Allows for varying lengths between cells, essential for BIPV mode.
- **Welding process** developed specifically for this machine: Ensures a robust and reliable bond.
- **String cutting**: finalizes the cell string.

2. Flexible Tabber-Stringer for Interconnecting Zebra Cells with Greater Flexibility

This machine is specifically designed for producing strings using Zebra-cell technology. One of its distinctive features is the use of an Electrically Conductive Adhesive (ECA) for the bond between the ribbon and the cell.

Key Components and Functionalities:

Ribbon feeding control: similar to the first, ensures precision.
Cell feeder: Specific for Zebra cells (*Figure 1*)
Cell position control via camera: For precise alignment.
New ECA dispensing system: Innovative for applying the conductive adhesive.
Innovative ribbon dispenser-positioner: Also allows for variable lengths between cells.
Specific welding process developed for Zebra+ECA: optimized for this particular cell type and bonding technology.
String cutting: Completes string production.

These two advanced tabber-stringers, developed by Mondragon Assembly (MASS) with the contribution of Tecnalia Research and Innovation (TEC), are a concrete example of SEAMLESS-PV's commitment to providing cutting-edge manufacturing solutions that support the growth and adaptability of the integrated photovoltaic sector.

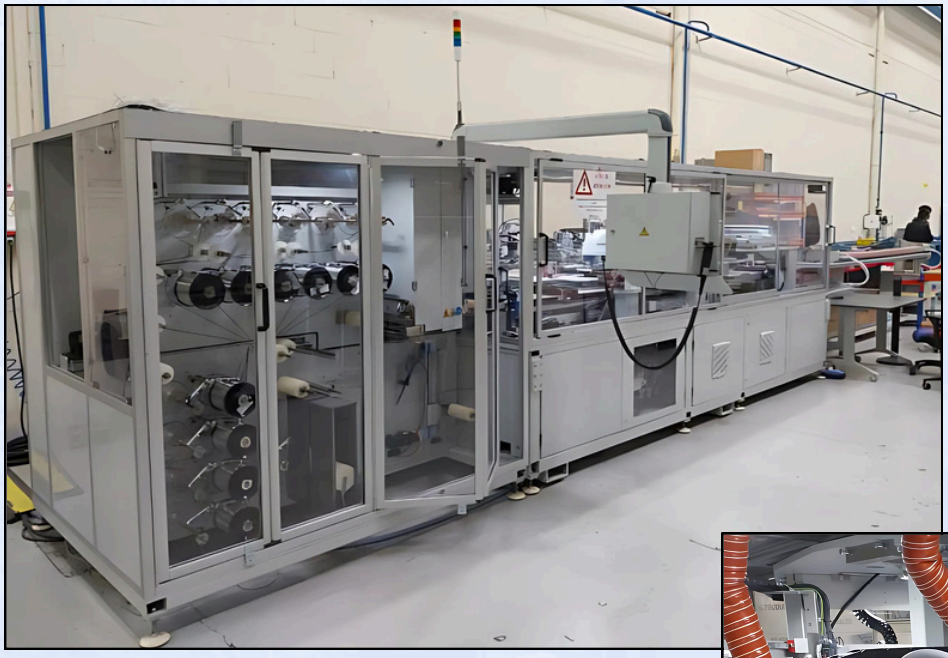
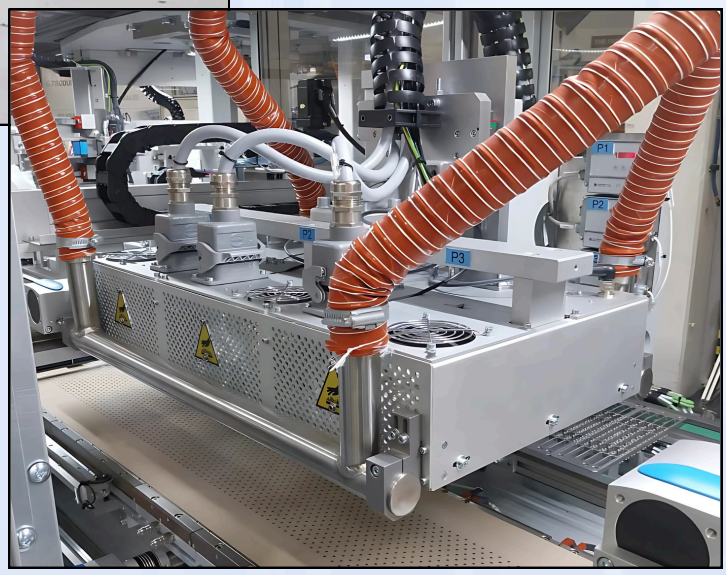


Figure 2: view of the complete tabber-stringer

Figure 3: particular of the Welding device, present in the machine able to process Zebra+ECA



LEARN MORE

If you want to learn more, check out all the **materials** and **results** available on **seamlesspv.eu**

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