



Organic PV

imec

O-line infrastructure

Location of the infrastructure :

Leuven,
Belgium

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Objectives :

- OPV material and architecture evaluation
- Upscaling towards inline processing of OPV modules

Main features :

Imec has set up an integrated OPV processing facility, the O-line. This facility is equipped to go through all necessary processing steps for the fabrication and characterization of state-of-the-art organic solar cells. Workbenches with exhaust hoods, ovens, hotplates and cleaning stations serve to prepare substrates and materials for processing. A purification column is available for zone-purification of small organic molecules. High-vacuum evaporation chambers with multiple sources are integrated with oxygen- and humidity-controlled gloveboxes. Also a multi-step programmable 8-inch spin coater, as well as an AM1.5 solar simulator is integrated into this glovebox configuration. Furthermore, for solution processing of active materials as well as electrode inks additional spin and blade coaters, screen and inkjet printers and spray coater are installed. A lifetime set-up for performance testing of organic solar cells under different illumination conditions is recently constructed. The atmosphere can be accurately controlled, ranging from inert nitrogen to high oxygen and humidity levels.



This allows scale-up of OPV module processing and characterization in an inline process flow and as such to serve as a pre-pilot environment to develop a complete inline production process for organic photovoltaics.

Limitations or constraints :

Evaporation tools are limited to maximum substrate sizes of 15 x 15 cm²

Typical services or results :

Material evaluation of photo-active compounds and inks, interlayer and electrode materials, by vacuum deposition or several solution processing techniques
New cell and module architectures can be fabricated and tested

Examples of research projects :

Development of vacuum deposited and fully solution processed multijunction OPV devices