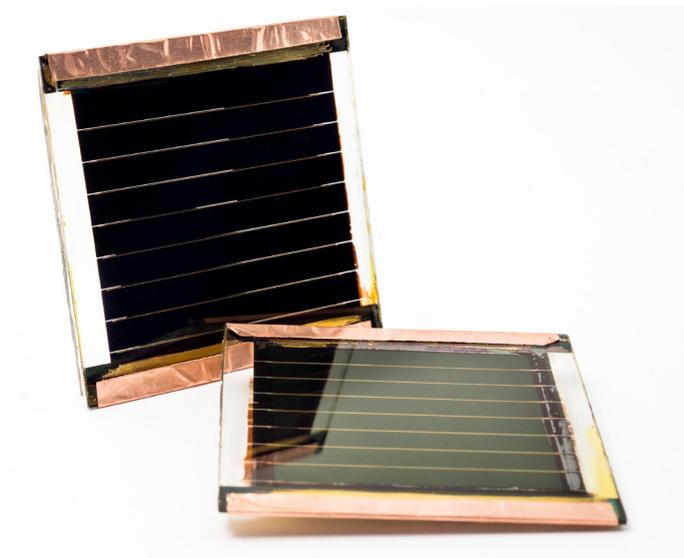


## THIN-FILM SOLAR CELLS

Thin-film solar cells are an alternative to the traditional rooftop modules made from crystalline silicon. They are suitable for a wider range of applications and generate electricity in a broader variety of circumstances. Their lightweight, flexible, semi-transparent features make them an ideal fit for portable or distributed electronics on surfaces such as window panes, façade elements or curved roofs. Imec develops materials, device architectures and processes to fabricate thin-film solar modules on an industrial scale.



High-efficient, large-area perovskite modules

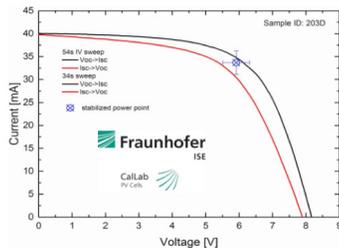
### WORLD-CLASS SCALABLE PEROVSKITE MODULE TECHNOLOGY

Starting from its small cell efficiencies of above 20%, imec together with its Solliance partners is focusing on upscaling perovskite PV technology to industrial applicable dimensions.

+15% power conversion efficiency has already been demonstrated at imec for perovskite modules of aperture area larger than 225 cm<sup>2</sup>, outperforming any other results reported so far.

### KEY BENEFITS

- Sustainable material systems
- Customized, high-throughput processing
- Spectral selectivity
- Application-specific



Certified efficiency of 12.4% for perovskite module with 16cm<sup>2</sup>



Translucent perovskite module



Tandem module stacking perovskite module on top of Si solar cell, boosting the efficiency beyond that of single junction Si



See-through, selectively transparent organic solar module suitable for energy harvesting in windows



Application for thin-film solar cells

## PEROVSKITES

The exceptional power conversion efficiencies and relative ease of fabrication make perovskite solar cells the rising star in the field of photovoltaics. Module processing on areas 15 by 15 cm up to 30 by 30 cm shows the high potential of this low-cost technology. The next step is to have a clear understanding of the working mechanism of these cells, in order to increase their efficiency and stability.

## INTEGRATION

Thin film solar cells are able to be produced with different color variations, selectively transparent or as 'see-through' modules. These unique aesthetic features make them an optimal fit for a wide range of applications, such as in buildings, vehicles or portable applications. Imec can explore this integration potential with its partners in dedicated projects.

## SILICON – PEROVSKITE TANDEM DEVICES

With its unique features and exceptional high efficiency, perovskite is an ideal candidate for developing tandem devices, in combination with silicon bottom cells. Imec develops this technology, adapting the perovskite modules and integration techniques to each partner's needs and interest and jointly develop the appropriate solution towards 30% efficient devices.

## ABOUT IMEC AND SOLLIANCE

Imec is a world leading R&D and innovation hub for nanoelectronics, digital and energy technologies, with research applications in healthcare, smart electronics, manufacturing, mobility and energy. As part of its research on thin-film PV, imec is a proud member of Solliance, a research alliance of thin-film expertise in the Eindhoven-Leuven-Aachen region.

## HOW TO PARTICIPATE IN THIS R&D

Are you an established producer looking to improve your processes and extend the range of cells you offer? Do you develop applications with solar cells, materials for solar cells, or integrate solar cells in your product? Or are you new to the field and are interested in diving into this exciting, promising domain?

Join us as a research partner. Come and discuss your plans and ideas with us. Together, we can draw up a win-win collaboration program and IP scheme.



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