HORIZON-CL5-2023-D3-02-12
Large area perovskite solar cells and modules

LUMINOSITY

Large area uniform industry compatible perovskite solar cell technology

Starting date of the project: 01/06/2024
Duration: 48 months

= Deliverable D5.1 =

Large Area Perovskite Films

Abstract

Deliverable D5.1 presents the first roll-to-roll processing of a perovskite semi-fabricate within LUMINOSITY. The work demonstrates the scalable deposition of a hole transport layer and perovskite absorber on flexible Al/FTO foil using roll-to-roll slot-die coating, followed by roll-to-roll encapsulation.

The resulting demonstrator comprises a 2.5-metre-long coated foil with an area of approximately 7,500 cm^2, exceeding the deliverable target of 6,000 cm^2. The encapsulated demonstrator has a total length of 3 metres.

Morphological and crystallographic analyses were performed using scanning electron microscopy and X-ray diffraction. The results indicated the formation of a largely closed perovskite film and the photoactive alpha-phase, while also identifying areas requiring further optimisation of coating uniformity and surface coverage.

The demonstrator confirms the feasibility of producing and encapsulating large-area perovskite semi-fabricates using roll-to-roll techniques and provides a basis for the subsequent integration and optimisation of the remaining solar-cell layers.

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