Prove Roll-to-roll process-ability of perOvskite mOdules by application of an innovative Foil substr

Publieke samenvatting / Public summary

Aanleiding

Hybrid inorganic-organic perovskite materials enable a game-changing technology for photovoltaic applications. These inexpensive, earth abundant and solution process-able materials yield efficient solar cells. However, roll-to-roll production of high quality films requires flexible, insulating substrates applicable over a wide temperature range (-40 to 500 °C). PROOF develops and proves the required substrate.

Doelstelling

The use of flexible substrates for PV applications, creates two main advantages: - it allows roll-to-roll and hence low cost PV production and; - it allows better and more advanced integration of a PV functionality in e.g. building elements and car (or vehicle) parts.

Korte omschrijving

The development of the suitable substrate for roll-to-roll processed perovskite solar modules contains the following main activities: 1 Formulation of novel UV-curing, electrically insulating and temperature stable lacquers for application on metal foils. 2 Characterization of the lacquer, measurements include rheological and wetting properties. 3 Coating the developed lacquers on various metal foils both on sheet-to-sheet scale (up to 30x30 cm2) as well as on roll-to-roll scale (30 cm wide, meters long). 4 Characterization of the coated metal foil to

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verify the coating quality, electrical insulation requirements, mechanical properties (bending test) and temperature range. 5 Test compatibility of selected coated foils with subsequent process steps for roll-to-roll processing perovskite modules. This includes roll-to-roll deposition of the electrode (silver nano-particles, silver nanowires or deposition of transparent conductive oxides through atomic layer deposition) on the foil/lacquer substrate. 6 Dissemination and exploitation of the project results.

Resultaat

PROOF delivers a suitable substrate enabling a roll-to-roll process to manufacture perovskite modules. The substrate allows to pass relevant test norms. The flexible substrate is compatible with the required process conditions (temperature, mechanical stress, stack compatibility) to obtain efficient, stable and cost-effective modules. These modules are suitable for building integrated photovoltaic applications.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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