

HORIZON EUROPE PROGRAMME

TOPIC HORIZON-CL5-2021-D3-03

Demonstration pilot lines for alternative and innovative PV technologies

(Novel c-Si tandem, thin film tandem, bifacial, CPV, etc.)

GA No. 101084046

Digitalised pilot lines for silicon heterojunction tunnel interdigitated back contact solar cells and modules



PILATUS

PILATUS - Deliverable report

D2.2 Thin wafer approach for the cell pilot line



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Deliverable Background:

This deliverable report aims to investigate the use of thin silicon wafers for the interdigitated back contact (IBC) solar cell production line. The use of thin wafers is an important consideration for improving the cost efficiency of IBC solar cells, as they allow for a reduced amount of material to be used while maintaining the same or close level of performances. Theoretical and practical approaches are detailed in order to highlight the main challenges to overcome in the pilot line to be installed during the project.

Publishable summary

This deliverable report aims to investigate the utilisation of thin silicon wafers for the interdigitated back contact (IBC) solar cell production line. The use of thin wafers is an important consideration for improving the cost efficiency of IBC solar cells, as they allow for a reduced amount of material to be used while maintaining the same or close level of performances. However, the use of thin wafers also presents several challenges in terms of manufacturing. They are less stiff and hence, more prone to stronger bowing due to their own weight or due to external stresses. The increased bowing of thin wafers might add challenges of wafer transport, automation and for some processes such as wet chemistry or screen-printing. Thin wafers are also more fragile and prone to breakage during handling, transportation, and processing. Ensuring uniformity is critical to achieving high efficiency and reliable performance. All these challenges may decrease the yield of thin wafer-based IBC solar cells compared to traditional solar cells. Therefore, addressing these challenges is necessary to ensure a successful and cost-effective production line.

This report aims to identify and assess the constraints and limitations of using thin M10 silicon wafers down to 110 μm for the entire production line of IBC solar cells.

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Project partners:

#	Partner short name	Partner Full Name
1	UNR	Uniresearch BV
2	MBG	Meyer Burger (Germany) GmbH
3	MBI	Meyer Burger (Industries) GmbH
4	FhG	Fraunhofer Gesellschaft zur Forderung der Angewandten Forschung EV
5	FZU	Fyzikalni Ustav AV CR V.V.I
6	EURAC	Accademia Europea di Bolzano
7	EXATEQ	Exateq GmbH
8	TNO	Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek TNO
9	NCR	Norwegian Crystals AS
10	ULIEGE	Universite de Liege
11	PADA	Finproject SpA
12	ISRA	ISRA Vision GmbH
13	CSEM	CSEM Centre Suisse d'Electronique et de Microtechnique SA – Recherche et Developpement
14	MBCH	Meyer Burger (Switzerland) AG
15	MBR	Meyer Burger Research AG
16	PASAN	PASAN SA
17	WCH	Wacker Chemie AG
18	EPFL	École Polytechnique Fédérale de Lausanne
19	CPT	Cambridge Photon Technology Limited

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