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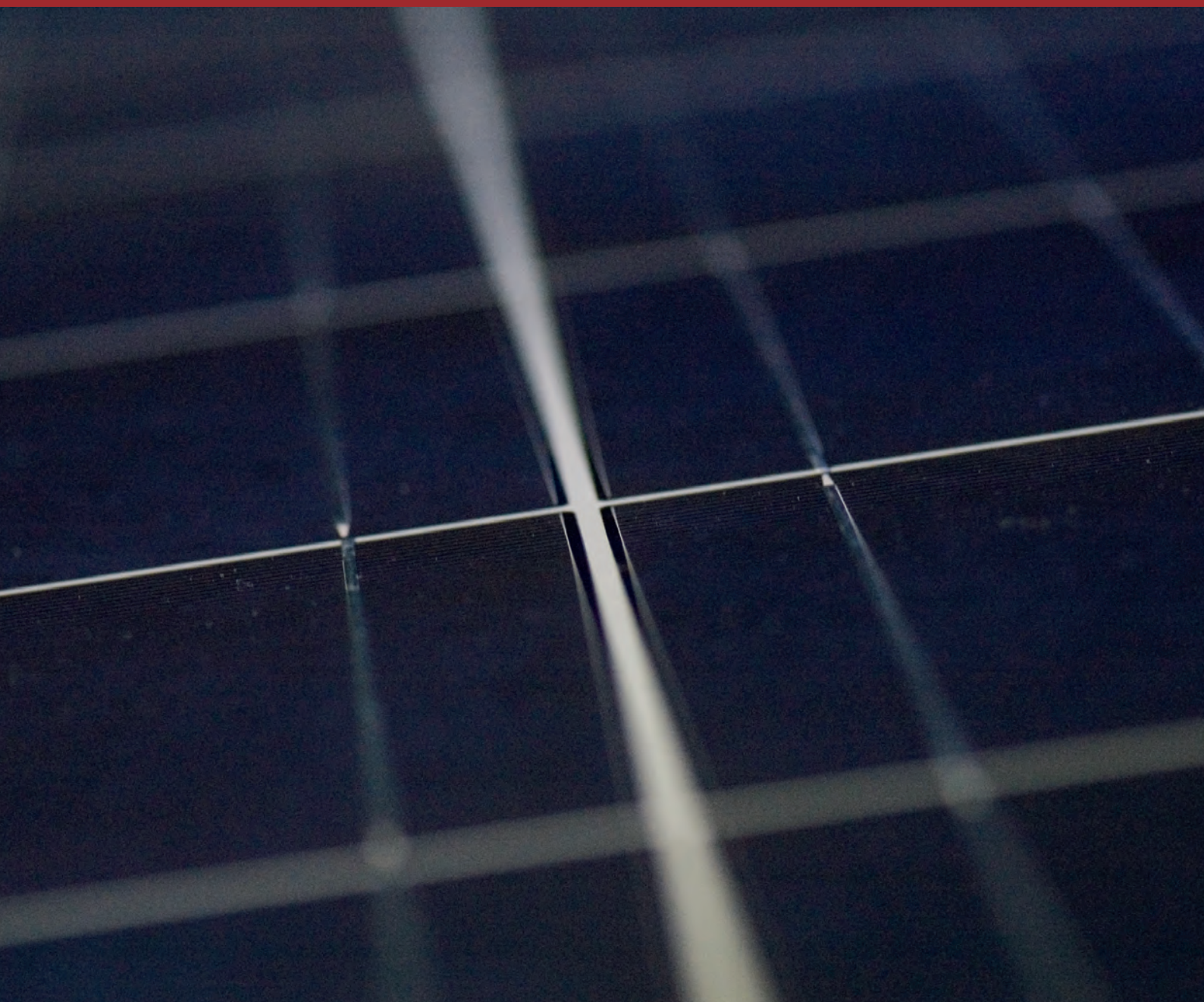
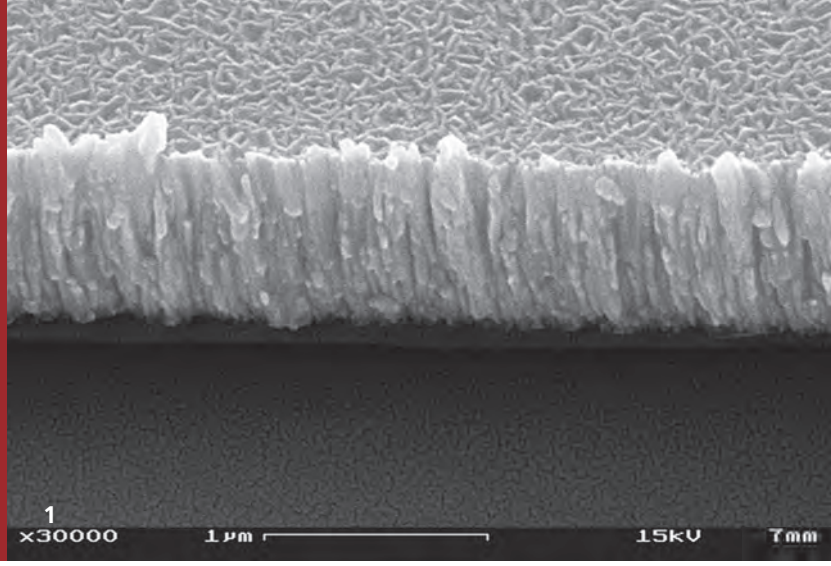
FRAUNHOFER INSTITUTE FOR ORGANIC ELECTRONICS, ELECTRON BEAM AND PLASMA TECHNOLOGY FEP

ELECTRICAL CONTACT LAYERS OF MOLYBDENUM FOR CIS- AND CIGS-CELLS



MOLYBDENUM CONTACT LAYERS WITH 10 TIMES HIGHER COATING RATES



1 *SEM micrograph of a molybdenum layer deposited via plasma-activated high-rate electron beam deposition*

ELECTRICAL BACK CONTACT LAYERS FOR CIS- AND CIGS-CELLS

The Fraunhofer FEP in Dresden uses one of its core technologies, plasma-activated electron beam deposition, to deposit molybdenum layers with a 10 times higher coating rate compared to the currently used magnetron sputtering technique. The raise of the coating efficiency does not influence the properties of the coated back contacts compared to their sputtered analogs. Their specific resistance as well as the performance of the complete CIGS-cells is retained.

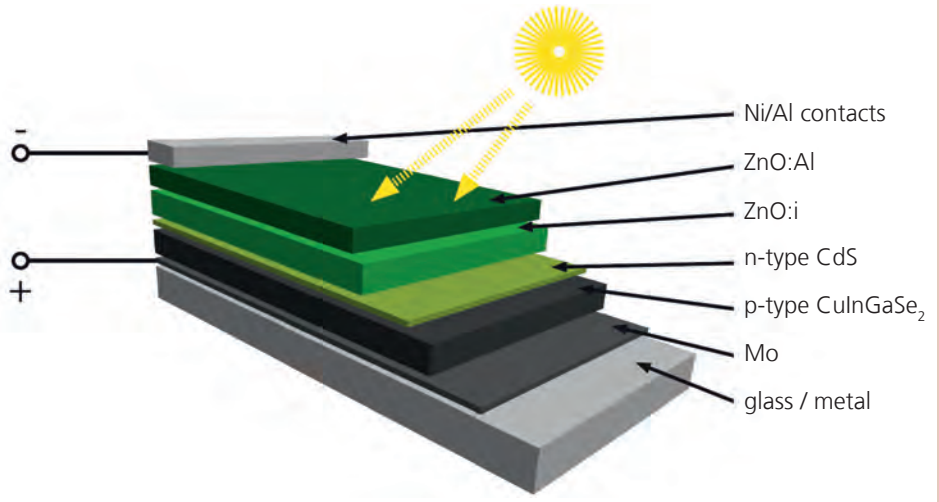
Molybdenum layers play a major role as electronic back contacts for Copper-Indium-(Gallium)-Diselenide/Disulfide (CIS and CIGS) solar cells. CIS- and CIGS-coatings are efficient light absorbing materials for solar cells. However, their typical manufacturing temperatures of ca. 600 °C require the use of high temperature stable substrates, like metal foils or glass, as well as temperature stable back contacts. Molybdenum displays very good heat and chemical stability. The example of high-rate molybdenum coating demonstrates the potential of the plasma-activated electron beam deposition technology.

Besides depositing back contacts (molybdenum, aluminum, silver) for different types of solar cells (CIS/CIGS or silicon based), the Fraunhofer FEP applies its core technologies like electron beam technology, pulse magnetron sputtering and plasma activated high-rate deposition also for the development of transparent conductive electrodes and deposition of absorption layers.

Federal Ministry of Education and Research

Functional layers for flexible, favorable-cost, thin film solar cells

Schematic view of a $CuInGaSe_2$ solar cell



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