

Non-contact Photoluminescence Imaging for Quality Control of Satellite Solar Panels

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Background/Motivation

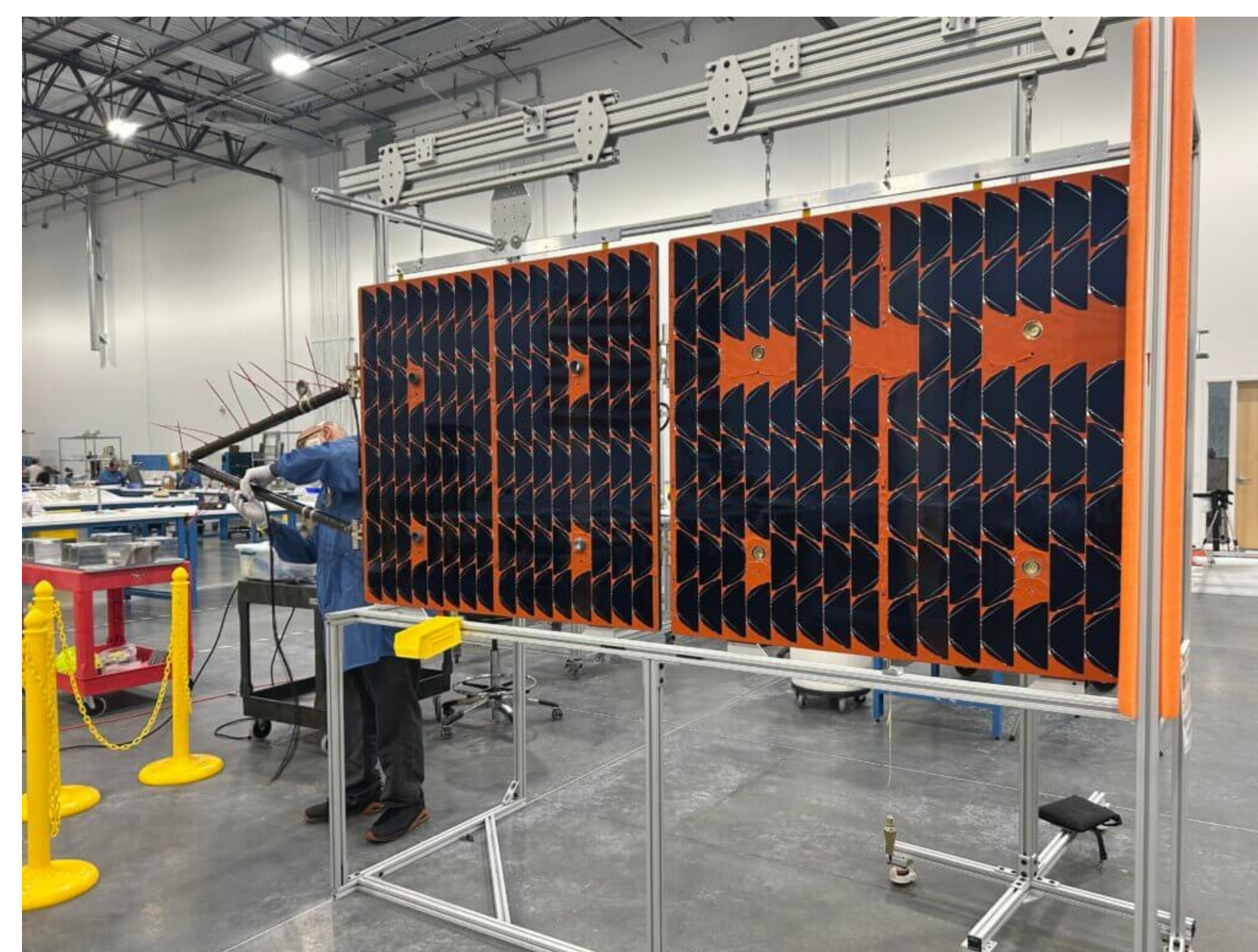
- BrightSpot Automation provides the Space PV industry with Electroluminescence (EL) and Photoluminescence (PL) tools to image defects such as cracked cells and shunts in solar cells, CICs, and panels



PLus-Spot >36cm

CellSpot <36cm

- MMA Space provides modular, rapidly manufacturable solar array assemblies for small satellite platforms, including high-power deployable arrays capable of generating up to 1400 W BOL as shown here. These integrated systems can include restraint/release and deployment mechanisms, solar array drives, and associated control electronics as required.



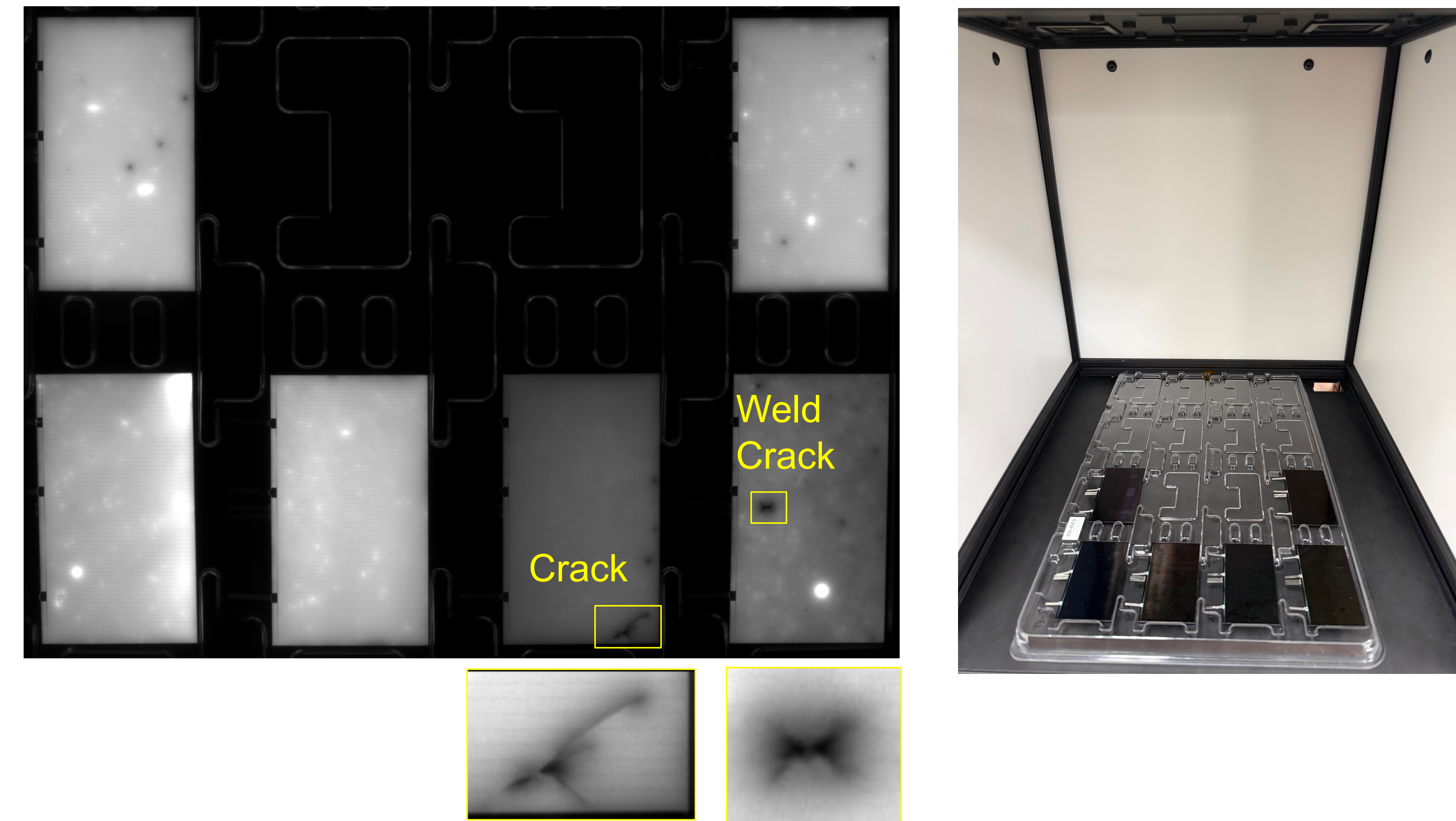
- Manufacturers wish to see defects in a gentle/fast non-contact test mode
- BrightSpot and MMA Space worked together here to demonstrate such capability with both Silicon and III-V Multijunction damaged cells:
 - In a plastic tray from the cell/CIC provider prior to any further processing
 - After welding/soldering cells into strings or further processing into a panel

Conclusion

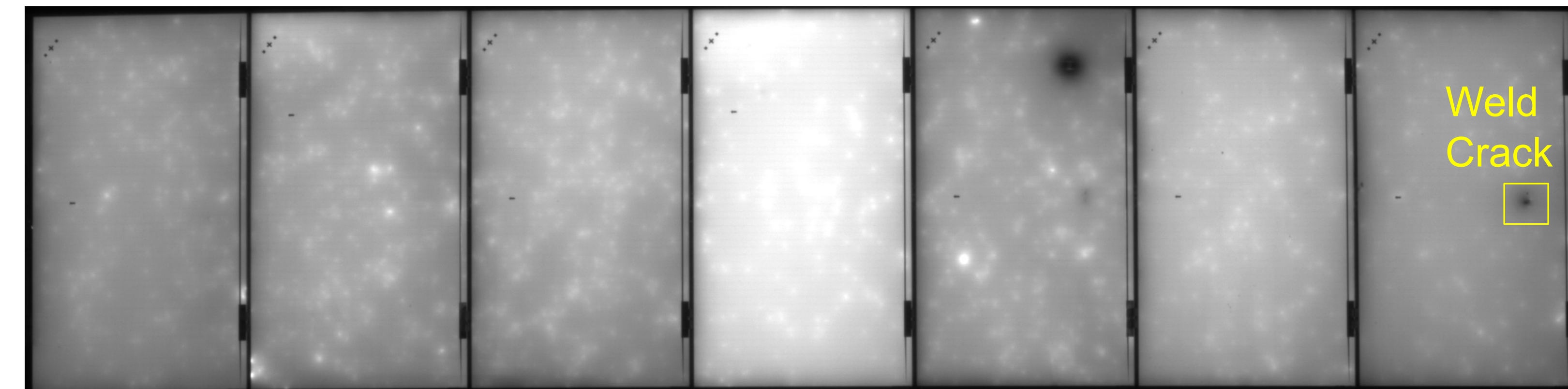
- The CellSpot PL tool can image trays of CICs with a cycle time of ~ 20 sec/tray including manual loading and unloading times
- All types of silicon and III-V cells/panels can be successfully imaged
- In any orientation
- At any stage of processing from partially processed cells to mounted arrays

III-V Multijunctions

Testing incoming CICs in trays

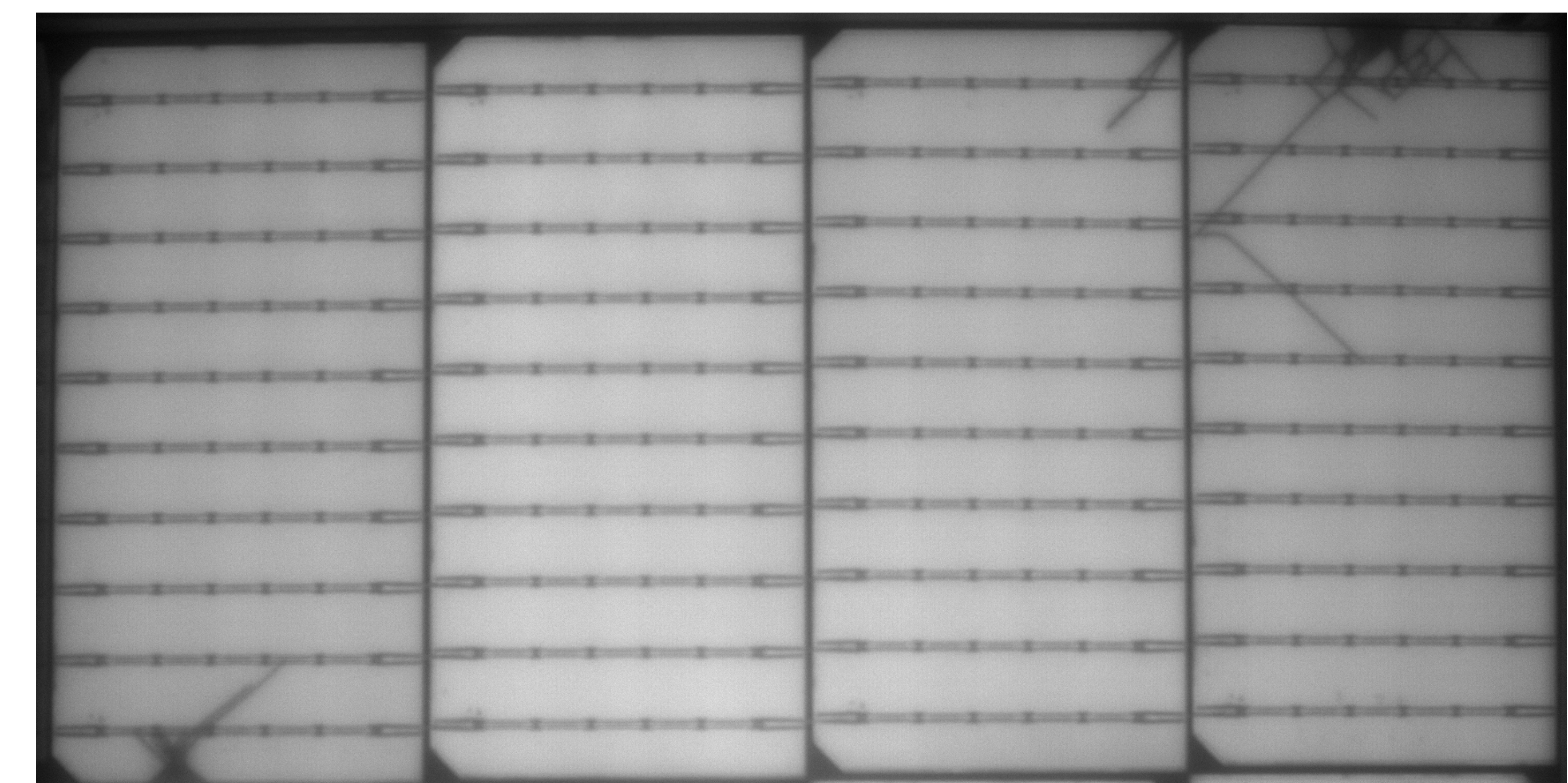


Testing strings after welding

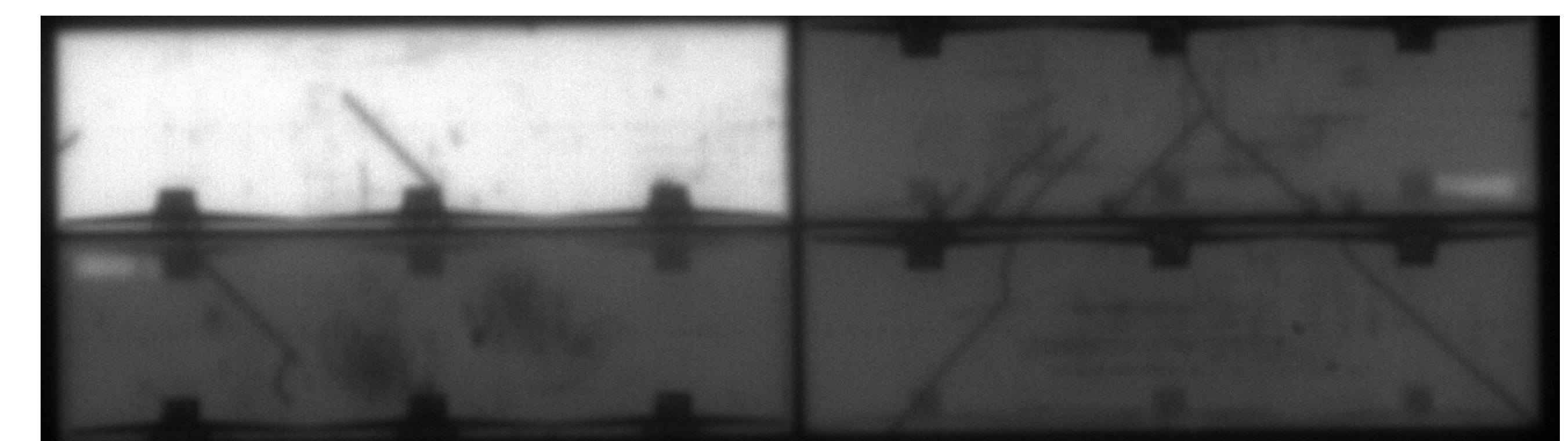


Silicon

170 cm² cells in string



20 cm² cells in string



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