



Getting More from Solar Cell Manufacturing

Improve production economics with advanced Digital Thermal Processing[™]

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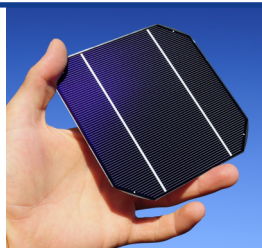
Digital Thermal Processing delivers applied energy through intense pulsed light (IPL), using non-equilibrium processing for improvements in how cells are produced. PulseForge tools have been used in production for years, making cell phone displays, RFID tags, and other applications. Customer experience plus recent publications demonstrate effectiveness in photovoltaics, with some key benefits.

- **Shortened thermal processing** from minutes down to seconds
- **Improved overall efficiency** due to higher open-circuit voltages and fill factors
- **Reduced energy consumption** due to on-demand energy delivery with no pre-heating
- **Reduced Ag cost** by using less material while achieving comparable or improved performance
- **Reduced space requirement** vs tunnel ovens since PulseForge tools are typically only 2 meters long or less

c-Si

“The highest efficiency of 23.0% is achieved by an IPL-annealed cell.

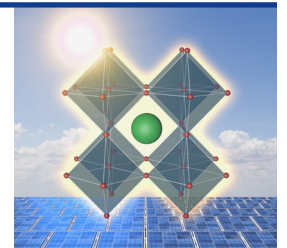
...Due to the pulse durations of several milliseconds only, IPL is very fast and offers a high throughput and, therefore, cost saving potential.”
 Fraunhofer ISE



Perovskites

HTL processing was reduced from 55 minutes down to 12 total seconds in a study performed by Dr. Julia Hsu at University of Texas, Dallas.

For more information on this and the Fraunhofer study, please scan the QR code.



Tool Configurations

PulseForge tools are available for R&D, in-line use, or for integration into other pieces of equipment for compact processing. Every tool is built with on-board calibration, is SPC-ready, and includes robust safety interlocks.

We look forward to using our technology and expertise to improve your economics!

