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Coherent – Enabling Cost Effective Solar Cell Production

High-volume manufacturing of solar panels has grown dramatically in the past few years, driven by increased consumer awareness and improvements within the equipment used to produce the solar cells. The majority of solar panels used today are comprised of either crystalline silicon (c-Si) wafers or glass substrates upon which various thin-film semiconductor materials are deposited. For each technology, lasers from Coherent are finding widespread applications.



Within c-Si solar cell production, new AVIA™ lasers are replacing traditional plasma etching tools for the "edge-isolation" phase, during which the front and rear surfaces of the cells are electrically isolated. Short wavelength operation coupled with high average powers (> 23 W at 355 nm or > 38 W at 532 nm) eliminates microcracks within the solar cells, while offering high-speed and throughput in excess of 3,000 wafers per hour.

Recently, several new applications for lasers in c-Si manufacturing have been pioneered by leading solar research labs within Germany. These techniques now allow long-pulse nanosecond PRISMA™ lasers and short-pulse pico-second Paladin lasers to complement AVIA™ lasers within Coherent's optimized pulsed Diode-Pumped Solid-State (DPSS) lasers for next-generation c-Si cell production. Solar manufacturers can now choose between IR, green, or UV wavelengths, pulse-width, repetition-rate, and output-power.



For thin-film production lines, Coherent PRISMA™ lasers have long been the laser-of-choice for the cell isolation and interconnection stages, generally referred to as

"patterning". Manufactured at the Coherent-Munich site, this facility offers dedicated applications labs equipped with a variety of PRISMA™ laser types and various scanner and optics configurations. 1064 nm versions are routinely applied for the P1 process for amorphous-Silicon thin-film panel production: 532 nm is used for both P2 and P3. The PRISMA™'s excellent beam quality, pulse-to-pulse stability at high-repetition rates above 100 kHz, and industrial turn-key design are key advantages here for end-users.

View Coherent's Solar Solutions Video:



For further information, please contact Finlay Colville, Director of Marketing: Solar at finlay.colville@coherent.com, or phone +44-1353-658-800.

To find out more about Coherent, visit our websites at www.coherent.fr and www.coherent.com or call us at 01 69 85 51 45.

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Coherent France - Domaine Technologique de Saclay - 4, rue René Razel
91892 Orsay cedex
Tel : 01 69 85 51 45 - Fax : 01 69 85 51 46

Si vous souhaitez vous désinscrire, merci d'envoyer un mail
à coherent.france@coherent.com