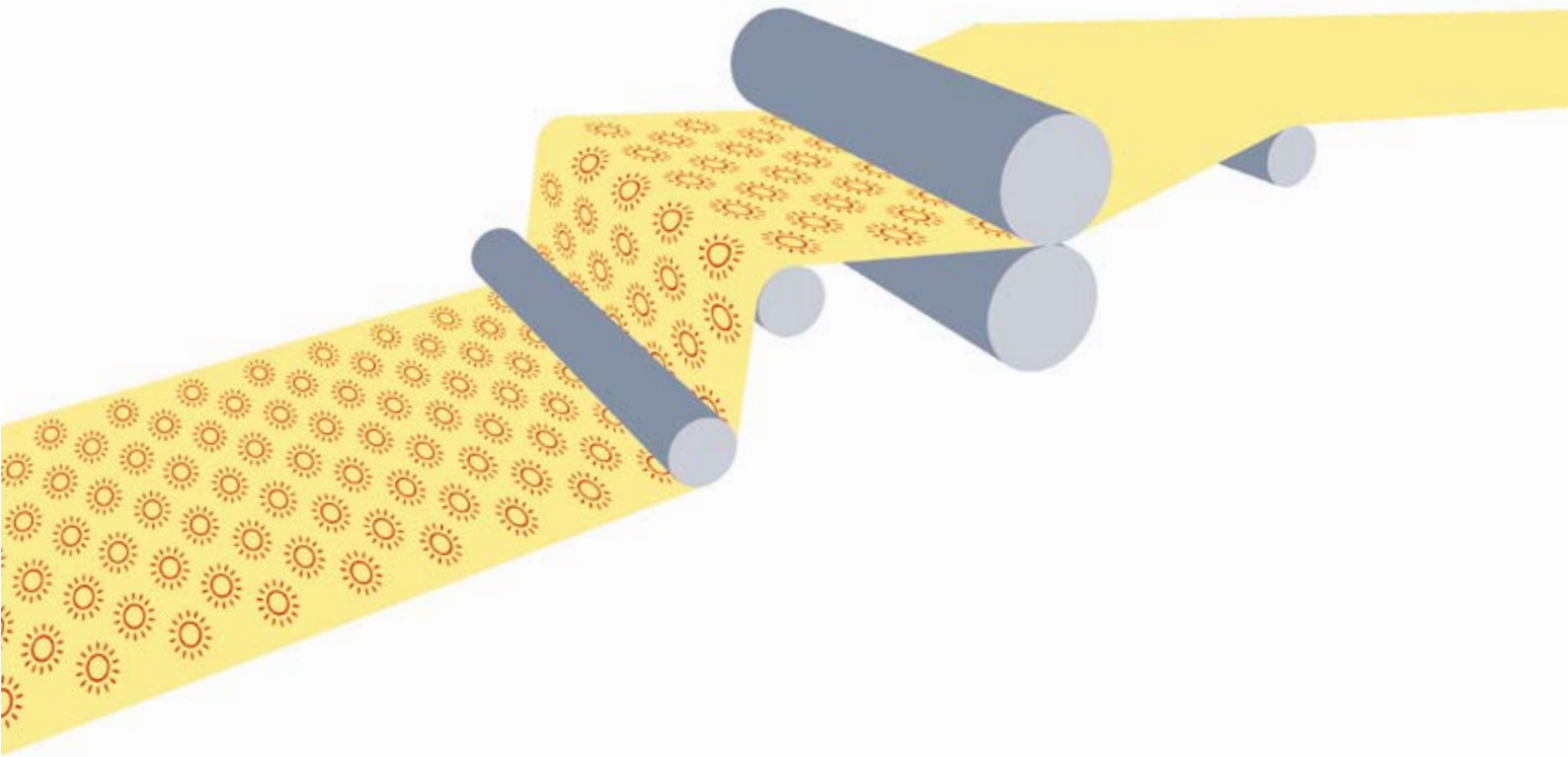


# Solar cells from a printing press

A high-accuracy drive and control system cuts costs and boosts efficiency in solar cell production – thanks to Rexroth's shaftless motion control system.



Converting the power of the sun directly into energy seems to be a fairly simple idea. But achieving that goal is quite a challenge. Compared with coal-fired generation, for example, solar power is still relatively costly – in part, because solar cell manufacturing is expensive. One cell maker in the U.S.A. is reducing costs with a revolutionary deposition concept and a high-precision production process. “The semiconductor layer, where light is converted to electric power, had to be applied in a highly complex vacuum deposition process,” explains Darin Stotz, sales manager at Northfield Automation Systems. That firm specializes in roll-to-roll thin material handling in the flexible circuit industry. “Working in close cooperation with our customer, we developed a machine that can apply copper indium gallium (di)selenide (CIGS) in an open-air environment instead of inside a vacuum chamber”

## Precision through synchronization

The result is that the company can manufacture solar cells in a process much like offset printing. The foil runs through rolls in large presses. Just like ink on newsprint, the layers must match up. But this process requires tight registration, down to a thousandth of a millimeter – along a production line that spans 30 meters. To achieve this, all the shafts of the different rolls in the press must be synchronized so that the foil is kept in exactly the right position for processing, throughout the entire line.

Precision like this is achieved thanks to the IndraMotion MLC control by Rexroth, with electronic synchronization for all the shafts. IndraMotion MLC is a further development of the SYNAX 200 system. If the line speed increases, then all the cylinders accelerate together, maintaining precise web position. To do so, the IndraDrive uses SERCOS III to communicate with the controls in real time.

The individual cylinders are no longer synchronized with a mechanical master shaft, but instead with digital servo drives, running on a standardized control platform. “Thanks to the Rexroth motion control solution with electronic shaft synchronization, we are able to shorten the development time for the machines by 20 percent,” Darin Stotz emphasizes. “In this way our customer deposits the semiconductor a hundred times faster and the solar panels are a hundred times thinner. This is a great step toward making solar cell production much more economical.” ◀

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