



1 Industrial stringer for ECA interconnection of HJT solar cells, in operation at Module-TEC – Module Technology Evaluation Center, Fraunhofer ISE. © teamtechnik Maschinen und Anlagen GmbH

2 Busbarless solar cell with printed adhesive directly on the cell.

3 Shingle interconnection of solar cells with ECA.

ELECTRICALLY CONDUCTIVE ADHESIVES IN PV MODULES

Electrically conductive adhesives (ECA) have become an important alternative to solder joints for the interconnection of heterojunction solar cells (HJT) as well as for shingle interconnection in industrial production.

At Fraunhofer ISE, adhesive cell interconnections are performed on high throughput industrial equipment with reproducible quality. The reliability of adhesive connections is tested in climate chambers and verified by detailed analysis.

Compliant Interconnection for Heterojunction Cells

The ECA process temperature remains below 200°C which prevents damage to the temperature-sensitive hetero layers of high efficiency heterojunction solar cells. The reduction of the thermo-mechanical stress in the cell interconnection results in less joint breakage and cells cracks. Novel ECA products allow curing in less than 20 seconds with resulting peel strength of 1 N/mm.

Unique for the Interconnection of Shingled Modules

Especially for shingled modules the use of ECA is a very promising interconnection technology. Stresses at the connection joints caused by module deflection and temperature changes are relieved by the adhesive layers.

Key Features of ECA Interconnections

- HJT compliant due to process temperature < 200°C
- strong joints – peel-forces of 1 N/mm
- fast process – cycle time on industrial equipment of 2.3 s, 1600 wafers/h
- lead-free material

Our Services

- process adaptation for different adhesives and solar cells
- prototyping of strings and modules
- electrical and mechanical characterization
- comprehensive reliability testing

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