

Leading the Future of PV



**Your
Sustainable
Partner**

Solutions for the Photovoltaics Industry

Heraeus. Technology delivered. All around the world. For more than 160 years.

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- Family owned technology group, headquartered in Hanau, Germany, founded 1851
- One of the biggest, family owned businesses in Germany
- More than 160 years of experience in Precious Metal Management
- 13.000 employees and more than 100 sites in 40 countries worldwide
- Products for environmental, health, electronics, mobility and industrial applications

Our contribution to the solar industry: Efficiency. Customized.

- Local manufacturing and supply capabilities in all key markets, ready for weekly shipment
- More than 45 years of experience in developing and manufacturing silver paste
- Advanced metallization products for crystalline, thin film and 3rd generation Photovoltaic solar cells
- Broad portfolio of technical and application engineering services for metallization pastes
- Production and distribution logistics optimized for frequent orders

WHAT WE CAN OFFER YOU:

- Strong innovation and IP
- High-quality products for high cell efficiencies
- 100% guarantee of consistent product quality – from small to large size batches
- Fast customization with sample lead times of one week
- Global supply capability with multiple Ag powder sources
- Unparalleled expertise in leading cell technologies like PERC
- Technical service centers in all key markets for broad collaboration with all partners along the PV value chain



Note:

PML: Product Modification Laboratory
TS: Technical Service

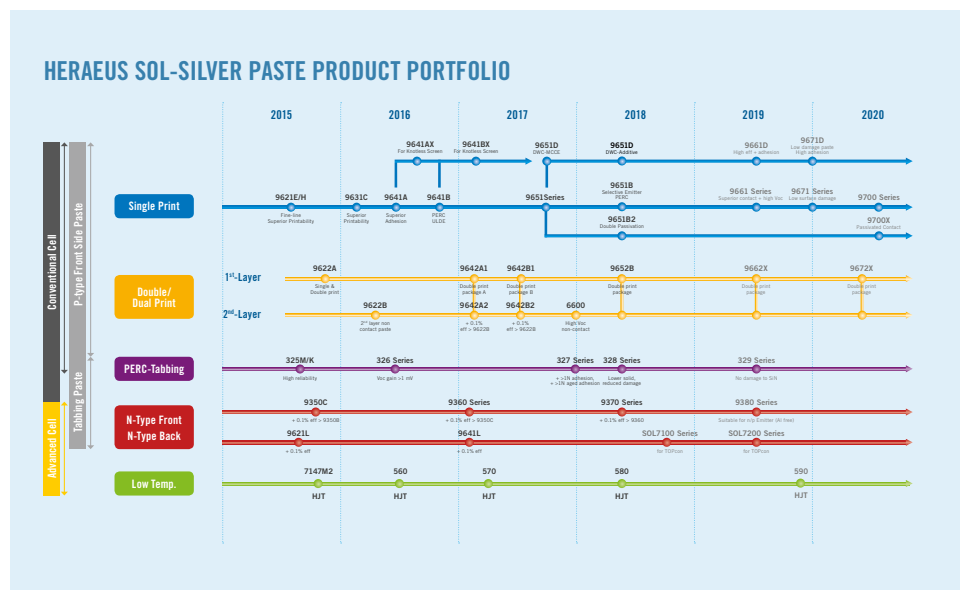
Heraeus. Leading the Future of PV.

Leading the Future of PV. Our innovation roadmap.



Leading the Future of PV. Our innovation roadmap.

- Targeted and systematic identification of relevant technological trends and integration of customer's suggestions and ideas
- Allows effective and efficient implementation of innovative products that enhance cell efficiencies, adhesion and printability
- Our innovation roadmap is key to our market leading product offering and continuously updated and expanded



IN ADDITION TO THE STANDARD PASTE PORTFOLIO, HERAEUS OFFERS ...

- ... customized metallization pastes to meet customers' individual requirements
- ... metallization pastes for novel printing and deposition technologies beyond screen printing

HIGH-QUALITY PRODUCTS FOR EXCELLENT CELL AND MODULE PERFORMANCE

- 100% guarantee of consistent product quality – from small to large size batches
- Local production and paste modification – for fast customization, scale up and delivery
- Sustainable silver supplier strategy

INDUSTRY-LEADING INNOVATIVE METALLIZATION SOLUTIONS

- Fundamental and customer-specific innovation
- Fast innovation cycles through local R&D
- Long-term innovation strategy
- Strong IP portfolio

MAXIMUM YIELD THROUGH OPTIMIZED PRODUCTION PROCESSES

- Highly skilled Application Engineering team
- Harmonization of product and production processes in a holistic approach
- Technical service centers in all key markets for close cooperation with customers

GLOBAL SUPPLY CAPABILITY

- Local manufacturing capabilities in all key markets – ready for weekly shipment
- Multiple silver powder suppliers including captive
- > 160 years of experience in precious metals management
- > 45 years of experience in silver paste

Heraeus. Leading the Future of PV.

Heraeus Photovoltaics Total Solutions.

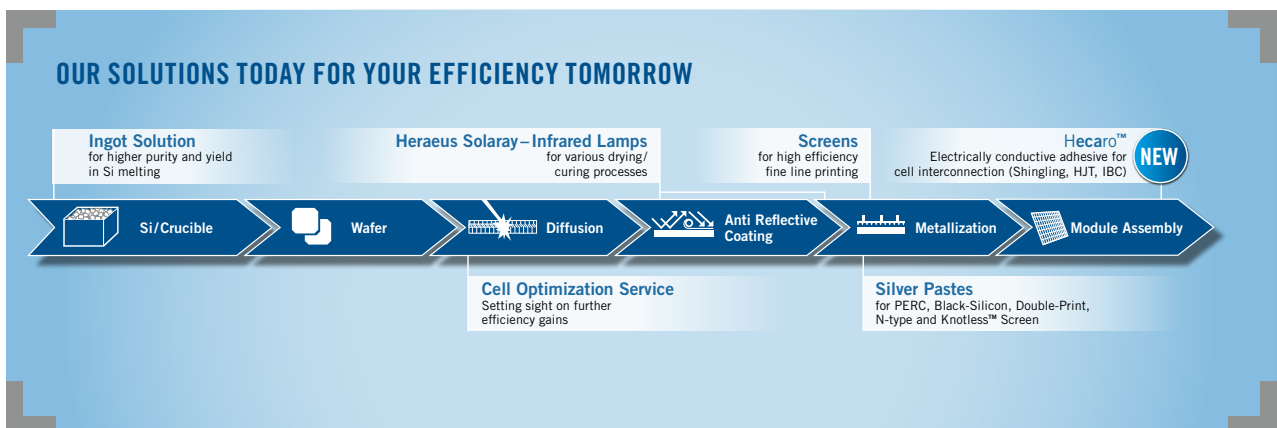
Providing our customers the edge in this dynamic industry.

In the solar industry, Heraeus Photovoltaics' R&D efforts aim primarily for optimizing solar cells, the key link in the photovoltaic value chain. By developing new applications and solutions for photovoltaic solar energy, Heraeus Photovoltaics contributes to reduce solar cell production costs. Furthermore, Heraeus Photovoltaics provides a photovoltaic total solution in order to improve customer's solar cell efficiency and yield.

WHAT WE CAN OFFER YOU:

- High-quality product bundles for high cell efficiencies
- Expertise on advanced solar cell analysis and process optimization
- Unparalleled expertise in leading cell technologies like PERC

This includes various beyond paste products: Ingot Solution – for higher purity and yield in Si melting, Heraeus Solaray – Infrared Lamps for various drying and curing processes, Cell Optimization Services – to set sight on further efficiency gains, Paste/Screen bundle service – for high efficiency fine line printing and Hecaro™ – our new electrically conductive adhesive for cell interconnection.



For further information, please check our Heraeus Photovoltaics Value Added Total Solutions Brochure.

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BEYOND THE HORIZON

Solutions for Photovoltaics

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