FOCUS

Applied research and development from fundamentals to systems…

… from laser technology, surface engineering, micro-machining to thin film and nanotechnology. An integrated materials testing and characterization completes the spectrum of the institute.

- Process and component development for cutting, ablation and structuring with laser, in particular high-speed machining
- Material-oriented process development for laser beam welding, special joining techniques and materials and component testing
- Process and component development for laser cladding and surface heat treatment
- Generation and characterization of functional layers by PVD, CVD, thermal spraying, and chemical reaction technology

In the field of photovoltaics the following topics are covered:

- Process development for deposition of thin films at atmospheric pressure (e.g. for passivation), for doping and etching
- Material-oriented process development for laser beam welding, special joining techniques and materials and component testing
- Combination of innovative printing technologies with laser processes for metallization of back-contacted solar cells
- Development of laser processes for soldering of solar cells and for ablation

SPONSORED BY THE

Federal Ministry of Education and Research

S-PAC
We automate the PV world.

CONTACT

Fraunhofer IWS Dresden

Winterbergstraße 28
01277 Dresden

Tel. +49 351 83391 3405
Fax +49 351 83391 3478

ines.dani@iws.fraunhofer.de
www.iws.fraunhofer.de/en

Fraunhofer IWS

S-PAC

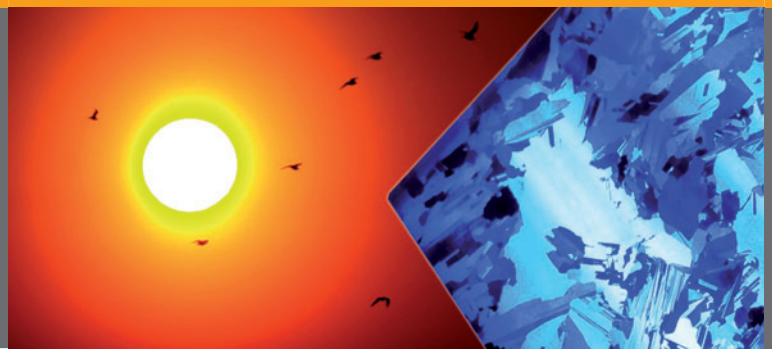
Saxon Photovoltaic Automation Cluster

S-PAC
We automate the PV world.

Fraunhofer IWS

PRODUCTS

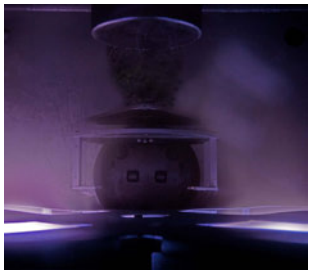
Business areas at Fraunhofer IWS in the fields of surface and thin film technology and laser material processing



PVD and Nanotechnology

Deposition of multi-layer systems and super hard carbon films

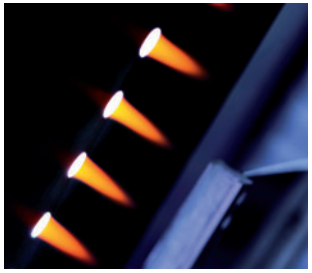
Synthesis and functionalization of single-walled carbon nanotubes Module and system technology for PVD



Chemical Surface and Reaction Technology

Deposition and etching processes for photovoltaics and electrode materials

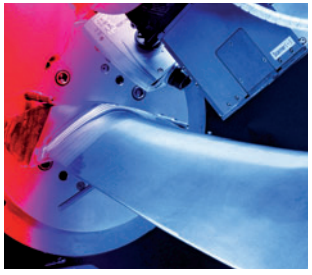
Atmospheric pressure plasma sources and process monitoring (gas phase, particle and thin film analytic)



Surface Treatment

Process development for surface hardening and process-specific systems engineering

Processes for surface recasting and alloying, laser gas alloying

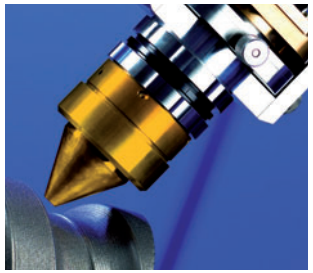


Thermal Coating and Build-up Technologies

Processes for laser cladding

Development of thermal spraying technologies and coating solutions

Printing technologies for 2D and 3D structures

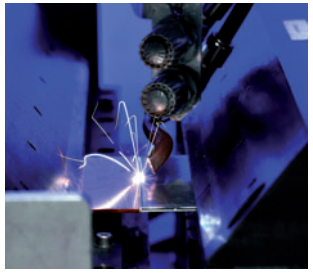


Joining

Laser induction welding and remote laser beam welding

Hybrid welding of hard-to-weld materials

Adhesive bonding of not-weldable materials



Laser Ablation and Cutting

Remote processing for joining, cutting, ablation and micromachining

High-speed laser cutting

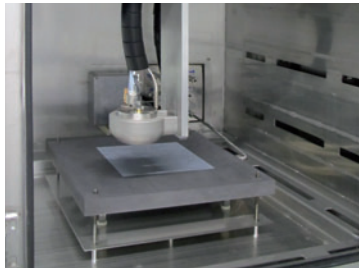
Laser micro-machining, cleaning and texturing

INNOVATIONS

S-PAC Innovations: Atmospheric Passivation technology and Metallisation

Inovation 1
Atmospheric Passivation

Lab equipment for atmospheric pressure ultrasonic spray pyrolysis for deposition of 20 to 30 nm thick passivation layers from AlO_x will be constructed. This equipment is part of a modular laser processing line for manufacturing of metal wrap through (MWT) solar cells.



Innovation 2
Metallisation

A particular challenge for the metallization of MWT cells is the filling of the vias. Using dispenser silver pastes will be pressed into the vias, dried and sintered.