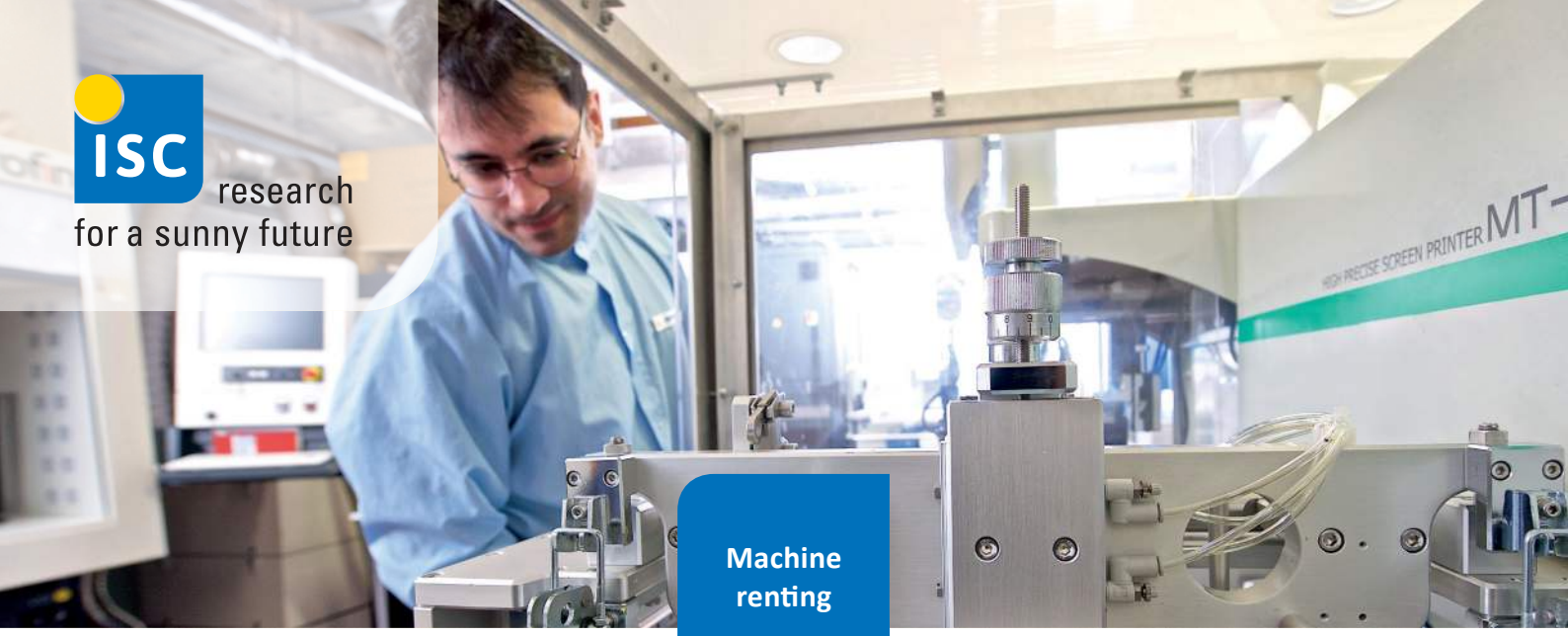
ISC research for a sunny future



Machine renting

Crystalline silicon solar cells and modules

A pilot line for the production and extensive characterisation of crystalline silicon solar cells and modules is available at ISC Konstanz. The laboratories at ISC Konstanz are equipped with facilities for series production so that all developed processes can be quickly transferred to industry. Only automation is absent from our line, due to the need to rapidly and flexible reconfigure our production processes to suit the variety of projects that we conduct.

All systems and measuring devices are used by our team for projects. However, after instruction, customers can also use them independently to carry out their own developments in our facilities. Tried and tested processes with a self-developed booking system support a well-coordinated process in this regard.

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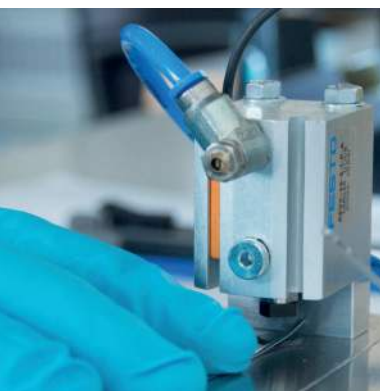

Here you will find an overview of the available equipment and machines:
www.isc-konstanz.de/equipment.pdf

The following list contains examples for the available equipment

FOR SOLAR CELLS

Equipment

- Tube diffusion furnace for BBr_3 and $POCl_3$ (Centrotherm)
- PECVD furnace for SiNx, SiOxNy, AlOx, aSi (Centrotherm)
- LPCVD furnace (Centrotherm)
- Tray-based PECVD furnace (Von Ardenne)
- Batch and inline wet-benches (acidic etching, alkaline etching and cleaning)
- Industrial type screen printer line (Asys Group)
- High precision stand-alone screen printer (Micro-Tec)
- Belt-furnace (Centrotherm)
- RTP furnace
- Multiple laser systems (various wavelengths and spot geometries)
- Boat etching tool (Singulus)
- Several fume hoods (HF compatible)

Characterization

- Cell tester (IV, EL), up to M12 wafer size (halm)
- EL, PL (custom made)
- Spectral response (PV-Tools)
- Wire mesh connection chuck (Pasan)
- QSSPC + sunsVoc (Sinton Instruments)
- Manual 4-point tester (GP-Solar)
- Automated 4-point tester (PV-Tools)
- Spectroscopic ellipsometer (Sentech)
- LID/LeTID setups (custom made)
- ECV (WEP)
- 3D Microscope (Olympus)
- Spectral photometer (Perkin Elmer)
- High Potential (Voltage) Tester (ETL-Prüftechnik)
- Corescan Multi Busbar (Sunlab)
- PV2000 (Semilab)
- FTIR Spectrometer (Thermo Fischer)
- Portable multigas FTIR gas analyser (Protea atmosFIRt)
- Viscometer (Brookfield)

FOR MODULES

Equipment

- Stringer (Teamtechnik)
- Laminator for up to 60 cell modules (Phototrade-P. Energy)
- Soldering stations
- Back contact minimodule line (Stepcraft)
- Ribbon cutter (Rotte)

Characterization

- Module flasher (halm)
- Module EL (MBJ)
- EL handheld camera (Optic Makario / Nikon)
- Infrared handheld camera (Jenoptik / InfraTec)
- Potential Induced Degradation (Weiss)
- PID chamber modules (ISC Konstanz)
- Module measuring system (ISC Konstanz)
- Climatic chamber (Vötsch)
- Peel tester (Zwick Roell)
- Differential scanning calorimetry (Netsch)
- UV-Chamber (PI-Berlin)
- Data logger

OTHERS

3D-Printer with heated chamber (CreatBot)

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