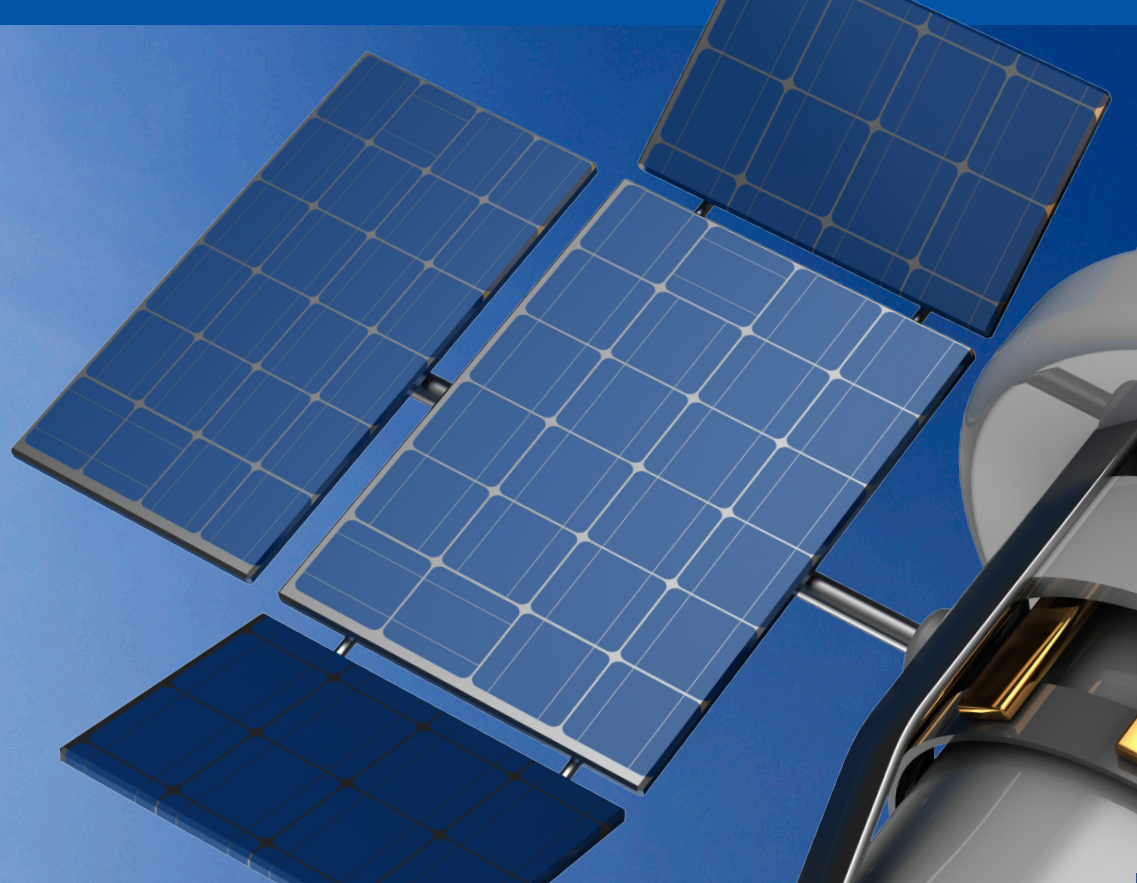
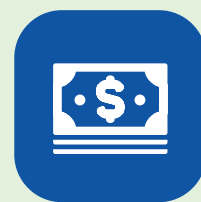


# ADVANCED ANALYTICAL SOLUTIONS FOR SOLAR CELLS



**The Solar Market consists** of a huge diversity of manufacturers of industrial products running many different processes yet still facing similar challenges. There is more and more pressure to achieve high product quality and reduce costs in order to stay one step ahead of the competition.

## With Our Instruments and Expertise, We Can Help You:



**Save money and ensure effective quality control**



**Streamline your processes for outstanding operational efficiency**



**Implement cost effective solutions by reverse engineering**

## Analytical Science for the Solar Industry Value Chain:

### R&D

Improving cell efficiency and developing new materials.

### Supplier

Purity of and impurities in raw materials and process chemicals.

### Process

Efficient and process-oriented quality testing.

### Solar Cell

QA/QC of solar cell components and final solar cell. Aging and defect analysis.

### Solar PV System

QA/QC of solar PV components.

## Typical Applications in the Solar Industry

### UV/Vis/NIR

- Optical Characterization of Glass, Encapsulant, Backsheet and Reflectors Measure Silicon Wafers/ Cells
- Aging Behavior
- Characterization of Nanomaterials



LAMBDA™ 850+/1050+

### Differential Scanning Calorimetry

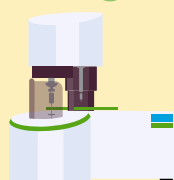
- Measurement of Polymer Encapsulants
- Analysis of Battery Active Layer Materials
- Curing Determination of EVA
- Study of Epoxy Materials
- Degree of Crosslinking using DMA
- Degradation Studies of PET Backsheet Materials



DSC 4000/6000/8000/8500

### Thermogravimetry

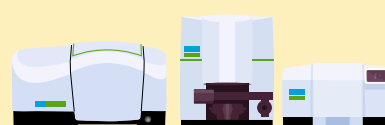
- Characterization of Polymers using TGA
- Adhesive Characterization using TG-IR
- Determination of EVA using TG-IR and TG-GC/MS
- Characterization of Novel TPO Encapsulants
- Thermal Degradation Studies of PV Encapsulants



TGA 4000/8000

### FTIR & FTIR Microscopy

- Development of Advanced Polymers by FT-IR/NIR
- Measurement of Silicon Wafers/Cells at Ambient/ Subambient Temperatures by FT-IR
- Determination of Infrared-Optical Properties of Polymer Films
- Raw Material Identification
- Impurity Measurements



Spectrum Two™ Spotlight™ 400 FT-IR

### Elemental Analysis

- Silicon Purity by ICP-OES or ICP-MS
- Purity/Impurities of Different Materials by ICP-OES or ICP-MS
- Purity/Impurities of Chemicals Used in Manufacturing



NexION® ICP-MS Avio® ICP-OES