

Dr. Schenk SolarMeasure Microscope Station: Perfect Scribe Analysis & Process Optimization



Dr. Schenk Microscope Station

Producing highly efficient solar modules at competitive prices requires all the process steps to be under the manufacturer's complete control.

Early detection of defects is the key to producing highly efficient and cost-competitive modules.

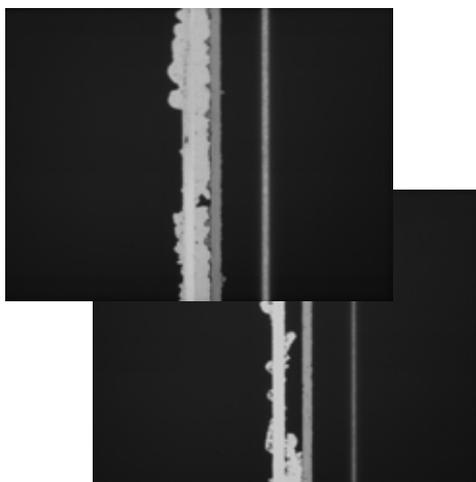
In thin film solar module production the quality of scribe lines is crucial. Defects can create a short circuit and endanger the function of the panels.

Dr. Schenk's SolarMeasure Microscope Station ensures the early detection of process deviations.

Speed and accuracy: important factors in process optimization

To be economic, thin film modules must be produced at high volumes while keeping the cost per Watt peak low. It is therefore important to match fast process throughput with high-quality scribes demonstrating very low defect count to ensure the final product displays the highest possible electrical-conversion efficiency.

The Dr. Schenk SolarMeasure Microscope Station enables fast reaction when deviations in the scribing process occur. In this way it helps to increase yield and optimize the production process. This measurement solution is the perfect enhancement to a SolarInspect system.



*Scribe defects detected with
Dr. Schenk SolarMeasure
Microscope Station*

KEY FEATURES

- Highest pixel resolution of the matrix camera (<math>< 3 \mu\text{m}</math>)
- Auto-focus function to compensate panel warpage
- Spot check for each individual scribe head
- No interruption of the panel movement
- Ideal combination with SolarInspect

Advanced optics enable manufacturers to see more

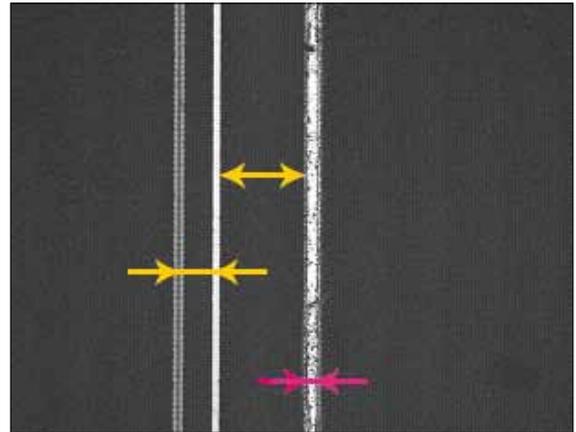
Though scribe lines may only be a few microns wide, their inspection and the detection of defects are critical to an efficient thin film solar cell.

The Dr. Schenk Microscope Station is based on a high-resolution matrix camera and measures the width of and distance between scribe lines. It performs the following measurements in situ (spot tests):

- width of scribe line Px
- distance of scribe line Px to Py

Since the distance and width of scribe lines do not change rapidly, spot tests are the ideal way to ensure fast and precise measurements.

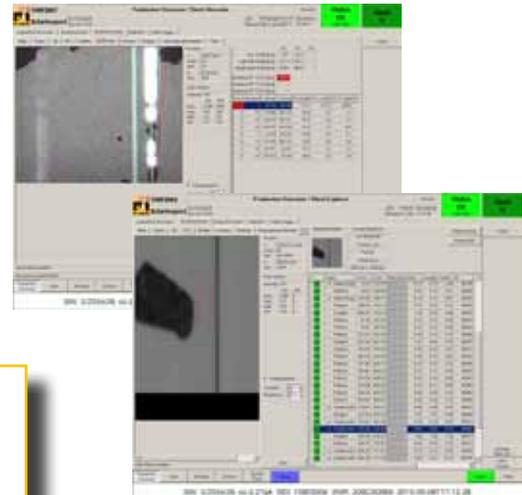
While standard systems cannot tolerate glass bounce or warp, the Dr. Schenk SolarMeasure Microscope Station is unaffected by these factors. The auto-focus function ensures precise measurements even in adverse conditions.



— Scribe Intervals
— Scribe Width

Assuring optimal cell performance

The Dr. Schenk SolarMeasure Microscope Station can be used in-line or off-line to inspect of solar module scribe lines. When used as an in-line option with SolarInspect to inspect the complete surface the number of defective solar panels is reduced as all scribe lines are scrutinized. The Microscope Station ensures fully automated quality control to deliver modules with the highest possible efficiency.



Screen shots: Underscribe (above) and overscribe (below) detected with Dr. Schenk's SolarMeasure Microscope Station

KEY BENEFITS

- Flexibility: in-line or off-line use depending on customer requirements
- Improved product quality: Detection of finest scribe line variations
- Combined with SolarInspect: Surface inspection and scribe line analysis in a single solution to save time, space and minimize the investment

About Dr. Schenk

Dr. Schenk GmbH, established in 1985, is a globally active, innovative high-tech company based in Munich, Germany. For the third decade now Dr. Schenk offers comprehensive solutions for automated quality assurance and production process monitoring for the solar, flat glass, film and foil, converting, optical media and semiconductor industries.

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