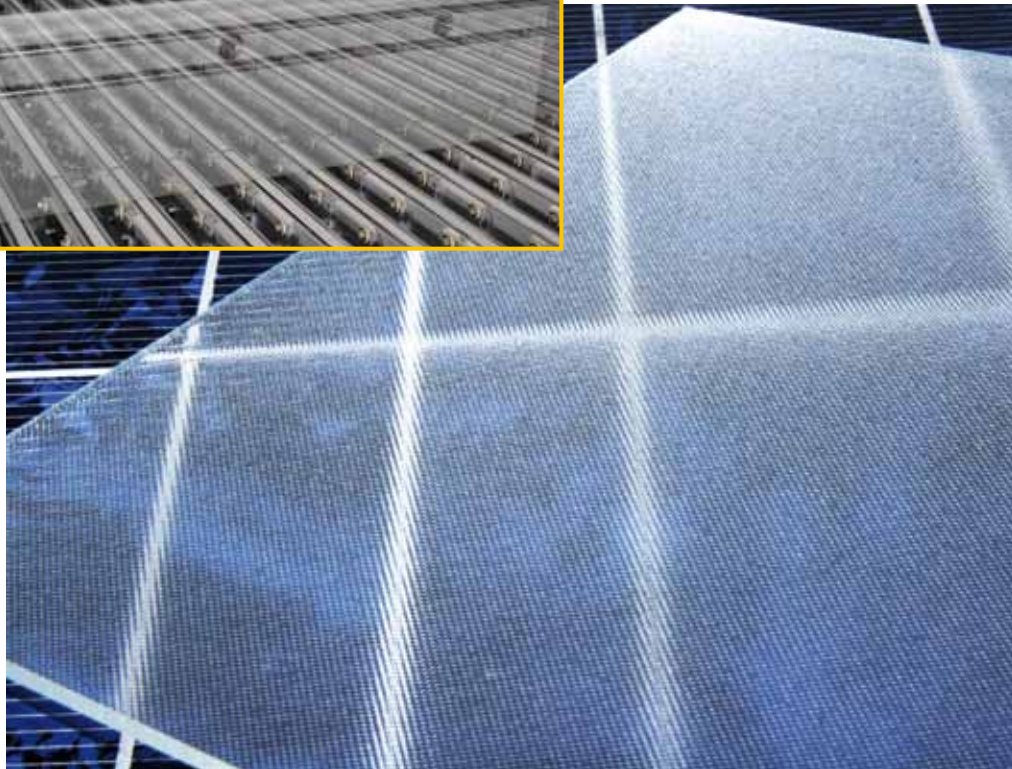
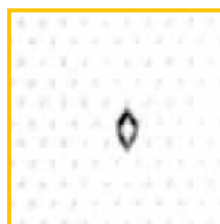


## Inspection of Patterned Glass for the Production of Solar Modules



**Efficient and Cost-Saving Automatic  
Quality Control for Patterned Glass**

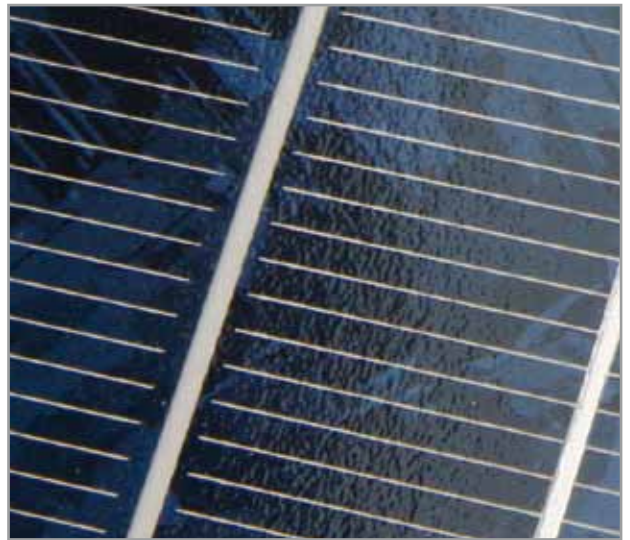


# GlassInspect

## Business advantage in a competitive market

In the extremely competitive solar panel market, suppliers for patterned glass substrates for silicon solar panels need to provide top quality for the best price. Defects in the glass substrate will hold up the production of solar panels, incur processing costs and reduce the confidence of customers.

Inspection of patterned glass is a challenging task for any optical inspection system, but Dr. Schenk's GlassInspect system is fully equal to the task. Bubbles, micro-cracks and edge chips are detected with unsurpassed reliability, preventing glass breakage and other quality defects later in the production.



### KEY BENEFITS

- Better quality:
  - Reduced waste and higher quality of final products
  - Increased customer satisfaction through fewer returns
- Better cost efficiency:
  - Cost savings by replacing manual quality control
  - Increased productivity through early detection of process problems
- Better profit:
  - Enables a fully automated production and packaging line
  - Increased throughput of the production
  - Faster time-to-market for new products through immediate process feedback
- Better risk management through documented product quality



# Ensures Quality, Improves Your Process

## Unmatched defect detection for patterned glass

The patterned surface structure used for glass substrates of silicon solar modules creates similar or even stronger optical signals than the actual inspected defect. This is the main challenge of automated optical inspection of structured glass. Where other inspection systems can only deliver limited results, Dr. Schenk has developed and manufactured GlassInspect, a system specialized to precisely distinguish between glass structure and defects covering 100 percent of the material surface including the edges.

Dr. Schenk's GlassInspect can eliminate nearly all of the "optical disturbances" from the surface structure. Additional electronic filters further support and improve this technology and glass defects can be detected reliably despite the distracting surface structure.

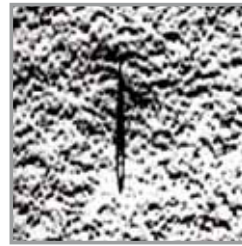
## Versatile application

GlassInspect for rolled patterned glass can be applied for both ribbon glass and cut glass sheets. For sheet glass, the system also measures the panel's shape and dimensions, providing an additional dimension of defect detection.



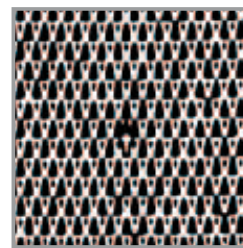
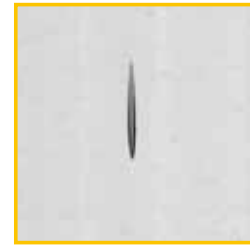
## Defect Images

*With conventional inspection system*

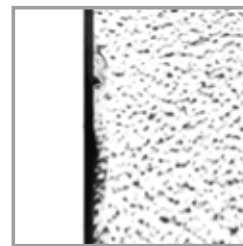


*Bubble, long*

*With Dr. Schenk's GlassInspect*



*Bubble, round*



*Edge chip*



## The complete inspection solution

Dr. Schenk's GlassInspect is the only fully production-integrated, automatic optical inspection system that combines more than 25 years of experience with the latest technology. It is the best solution to save time, money and resources, and to improve the quality of the production.

# Your Reliable Partner





*Dr. Schenk's production site*

Dr. Schenk GmbH, established in 1985, is an innovative high-tech company based near Munich, Germany. Dr. Schenk develops, produces and markets optical inspection and measurement solutions for automated quality assurance and production process monitoring. This includes high-quality, customizable handling solutions. Our products are a key success factor in the making and converting of many materials, e.g. plastics, textile materials, nonwovens, paper, metal, or glass, for a multitude of markets like display glass, automotive, packaging, medical, renewable energy, and many more.

Throughout the world more than 300 Dr. Schenk' employees continue to set new standards for the inspection of surfaces. Over 12,000 m<sup>2</sup> of modern, cleanroom-capable production and testing facilities are available to research, development and production to apply cutting-edge optics and electronics to customer applications.

Dr. Schenk offers extensive from-lab-to-fab knowledge. Customers benefit from our expertise in the translation of lab applications to large scale productions. Our sophisticated handling solutions complete the one-stop-shopping experience.

The company's objective is complete customer satisfaction. This is achieved through innovative and practical solutions that can be implemented into new and existing production lines. Local sales and service facilities around the world ensure fast support, technical service, training and consulting at any phase of a project.

From modular standard units to highly customized systems – Dr. Schenk's solutions have precision in focus!

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