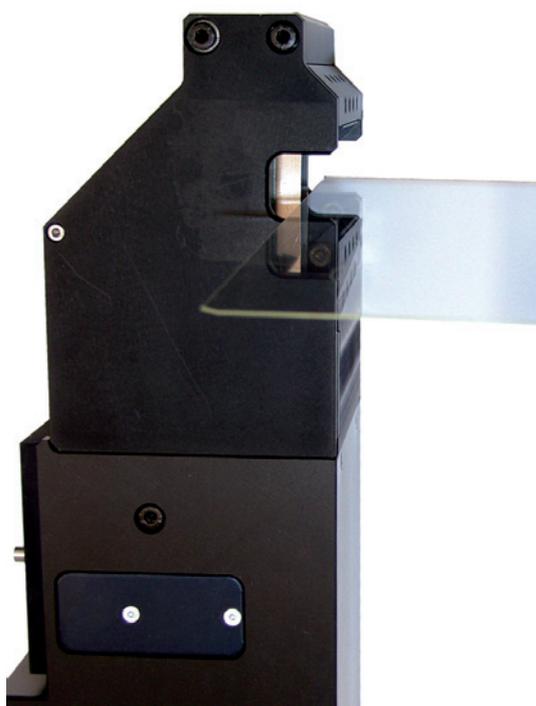


This is Real "Cutting-Edge" Technology for the Inspection of Glass Modules



Dr. Schenk's Glass.edge sensor for edge inspection

INTRODUCTION

The Glass.edge solution from Dr. Schenk is a special adaptation of the industry proven systems Chess.edge known for the inspection of display glass. Specifically designed for the needs of architectural and solar glass edges, this modular system detects defects that can occur in particular during edge grinding of single sheet glass.

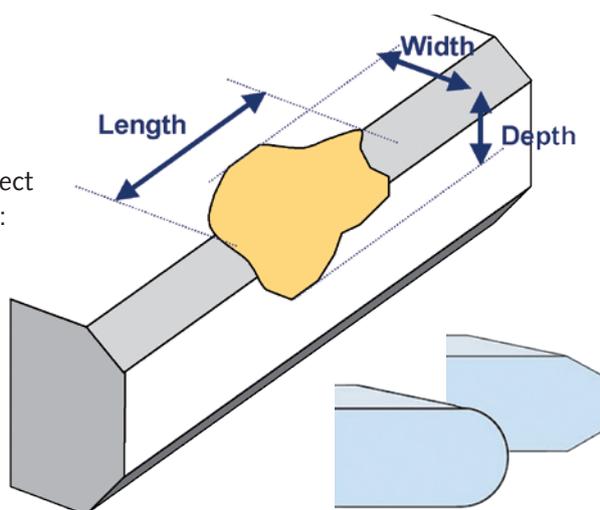
Edge defects are major causes of glass breakage during tempering or annealing processes, as panels with edge defects are not able to resist the enormous pressure and heat. Once the glass breaks inside the tempering oven, machine failure and high costs are usually the result.

But also at other stages of glass manufacturing and processing, critical edge defects can occur. They have to be detected before cost-intensive glass processing is performed on a glass panel, that is likely to break.

EDGE DEFECTS IN FOCUS

With high speed the edge sensors precisely detect local and global irregularities at the glass edges:

- Edge chips
- Edge cracks
- Bevel defects
- Scratches
- Surface and volume defects

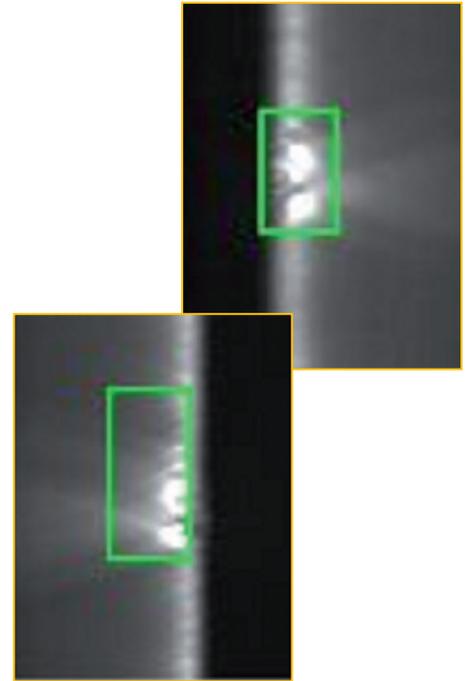


The Glass.edge sensors combine the latest illumination technology with high resolution CCD line cameras. The system's intuitive visualization software displays real-time microscope like defect images of all four edges of the glass sheet.

In addition, Glass.edge performs a high precision measurement and evaluation of the physical properties of the panel and also analyzes the edge conditions.

KEY FEATURES AND ADVANTAGES

- Industrial quality design with rugged, day-to-day production capability
- Automatic control of detector gain for optimal and equal sensitivity and automatic adaptation to different reflectivity
- 12 bit CCD cameras with improved sensitivity and highest resolution
- Superior detection of changes in surface quality thanks to dark-field illumination technology
- Light power monitoring to guarantee a constant and repeatable detection sensitivity
- Highly reliable and stable system performance of the industrial PCs used for evaluation and user interface
- Network capability for total yield management solutions
- Intuitive and easy to operate graphical user interface based on SEMI standard
- Gray-scale image storage and short-term database:
Review of all edge defects and measurement data of a panel
- Network Data Export: Easy integration into factory data management systems



Sample defects at glass edges inspected with Glass.edge

TECHNICAL DATA

For glass thickness	1.5 ... 5 mm (other thicknesses upon request)
Resolution across edge	Surface views 30 µm/pixel Edge view 25 µm/pixel
Resolution along edge	15 µm @ 75 mm/s Optional: High Speed Version 30 µm @ 300 mm/s
Data interface	Ethernet TCP/IP
Sheet transportation technology	Optional delivered with the system, For special requirements please contact our project team

ABOUT DR. SCHENK

Dr. Schenk GmbH, established in 1985, is an innovative high-tech company based in Munich, Germany. For more than 25 years now, the range of products and services offered by Dr. Schenk comprises comprehensive solutions for automated quality assurance and production process monitoring to the solar, flat glass, film and foil, converting, paper, optical media and semiconductor industries. In these areas Dr. Schenk continues to set new standards for the inspection of surfaces through the utilization of the latest technical advances in optics and electronics.

The company's primary objective is to achieve complete satisfaction of our customers on a long-term basis. This vision is realized by a perfect synergy between innovative solutions and practical ideas. Global sales and service facilities ensure local support, technical service, training and consulting at any phase of a project. From modular standard units to complex and highly customized systems - Dr. Schenk's high performance test and inspection products have precision in focus!

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