

- ▶ 90° telecentric light technology
- ▶ engineered for vertical and horizontal installation to fit any production line
- ▶ quality, dimension, anisotropy and more
- ▶ all kinds — float, heat-treated, laminated, IG unit
- ▶ AI technology included
- ▶ easy and transparent monitor display
- ▶ archive database, certificates
- ▶ smallest footprint ever



ALL-IN-ONE, INDUSTRY-LEADING  
GLASS INSPECTION FOR FLOAT,  
HEAT-TREATED, LAMINATED GLASS,  
AND IG UNITS

# Cutting-edge precision for glass quality inspection



The LineScanner is the solution for all quality inspections, including overall bow detection, of transparent flat glass products such as single sheets, insulating glass, automotive glass, processed glass, polycarbonate or film.

Best-of-class glass inspection with our advanced 90° telecentric light technology, engineered for seamless vertical and horizontal installation to fit any production line.

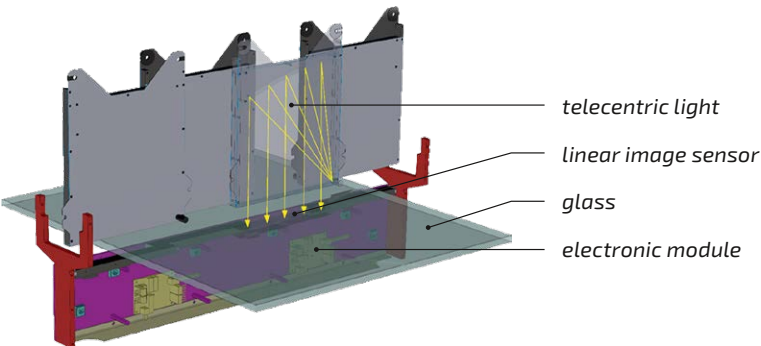
	LSC-V	LSC-H
Quality Check	●	●
Edge Chips	●	●
Sight Line Check	●	-
Dimension Check	●	●
Logo Position & Quality Check	●	●
Distortion Check	-	-
Anisotropy	●	●
White Haze	-	●
Load Control	-	●
Overall Bending Check	●	-
Glass Thickness	●	●
Glass/Coating Type & Thickness Recognition	●	●
Data Matrix Code Interpretation	●	●
Heaterline Check	-	●
Pinholes	-	●
Printing Position	-	●

## 90° telecentric light technology

This innovative system measures quality, dimensions, and anisotropy across all types of glass, including float, heat-treated, laminated, and IG units.

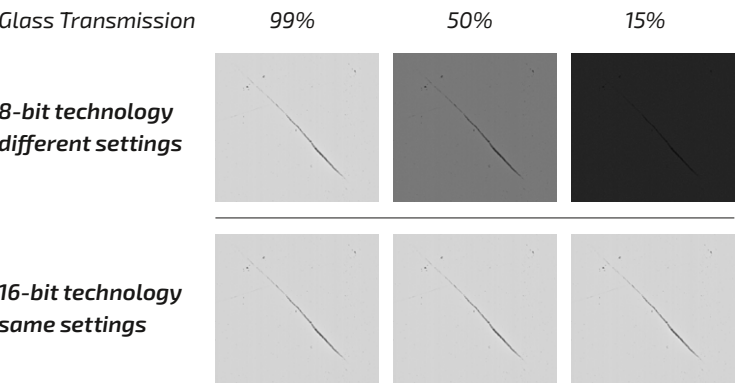
**Augmented by AI technology**, our solution offers easy and transparent monitoring, an archive database, and certification management. With the smallest footprint ever, it integrates effortlessly into your operations.

This sensor-based technology, combined with 90-degree parallel light technology, enables more precise inspections compared to camera-based systems.



## LineScanner operates with 16-bit technology

An increase to 65,536 grey values for homogenization of transmission levels and for detection of low-contrast defects (coating defects, ...)

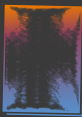
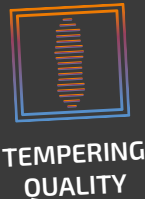


## Benefits of a LineScanner installation

### New possibilities for your vertical production

- ▶ glass quality control with **16-bit technology** (e.g. scratches, inclusions, coating defects, butyl defects in the visible area)
- ▶ **easy-to-use sensitivity settings** for fine adjusting quality
- ▶ frame clearance check with data link to your ERP system or fixed min./max. value
- ▶ angularity and layout inspection of built-in glazing bars with data link to your ERP system
- ▶ inspection of the entire insulating glass assembly with data link to your ERP system
- ▶ stamp position & quality inspection (optional)
- ▶ data matrix code interpretation (optional)
- ▶ fine adjustment of the scan results by brightness and contrast
- ▶ individual parameter settings (e.g. per customer, per order)
- ▶ **neural network with AI** for optimal error categorization
- ▶ new graphical user interface with many enhancements
- ▶ card login system to see statistics of error rates per employee (optional)
- ▶ **LineScanner Management Console** – web-based access to real-time LineScanner production assessments

Comprehensive quality inspection using advanced scanning technology



Perfect for vertical and horizontal setups, LineScanner guarantees precise checks for IG units and logos. Powered by AI, it classifies defects, distinguishing dust from scratches. Its compact, low-maintenance design features a user-friendly interface and automatically generates reports in Excel or PDF.



## Sensitivity Controls

As easy to use as a smartphone

Different types of glass have unique quality requirements. That's why the LineScanner comes with an innovative sensitivity control tool, ensuring perfect results every time!

- ▶ easy to use, with an unique approach for controls
- ▶ Wizard-based encoder calibration for glass length, with automatic adjustment of several encoders
- ▶ LineScanner provides sensitivity adjustment based on a single-screen solution
- ▶ simple, with no need for support
- ▶ reliable and easy to maintain



## LineScanner quality definitions

Customer specific LineScanner definitions

### Applicable to:

- ▶ per order item
- ▶ per order
- ▶ per customer
- ▶ per kind of glass (float, TSG/HSG, laminated glass)
- ▶ default

### Possibilities within a quality set:

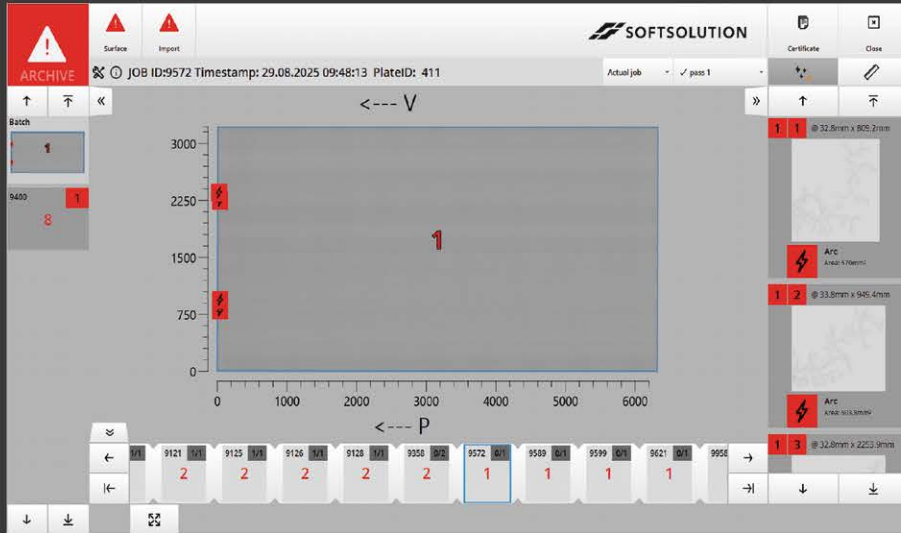
- ▶ different quality zones: main, outer, etc.
- ▶ custom quality zones based on DXF
- ▶ defect summaries
- ▶ tolerances, warnings, errors



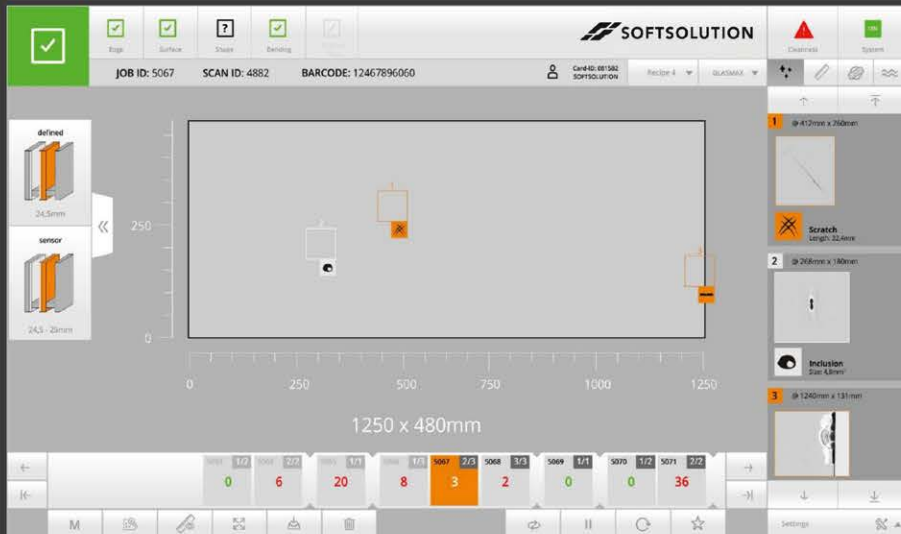
▲ Dimension control



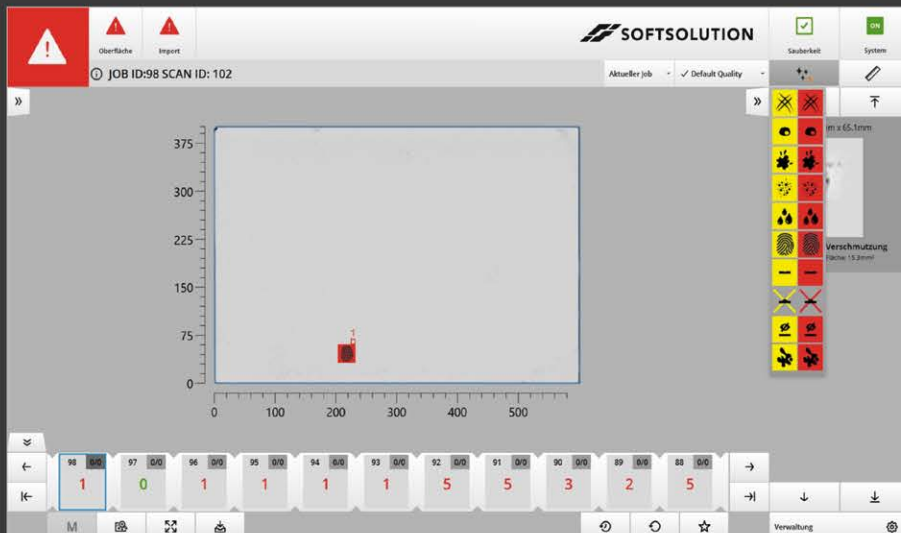
▲ Anisotropy



▲ Coating defects



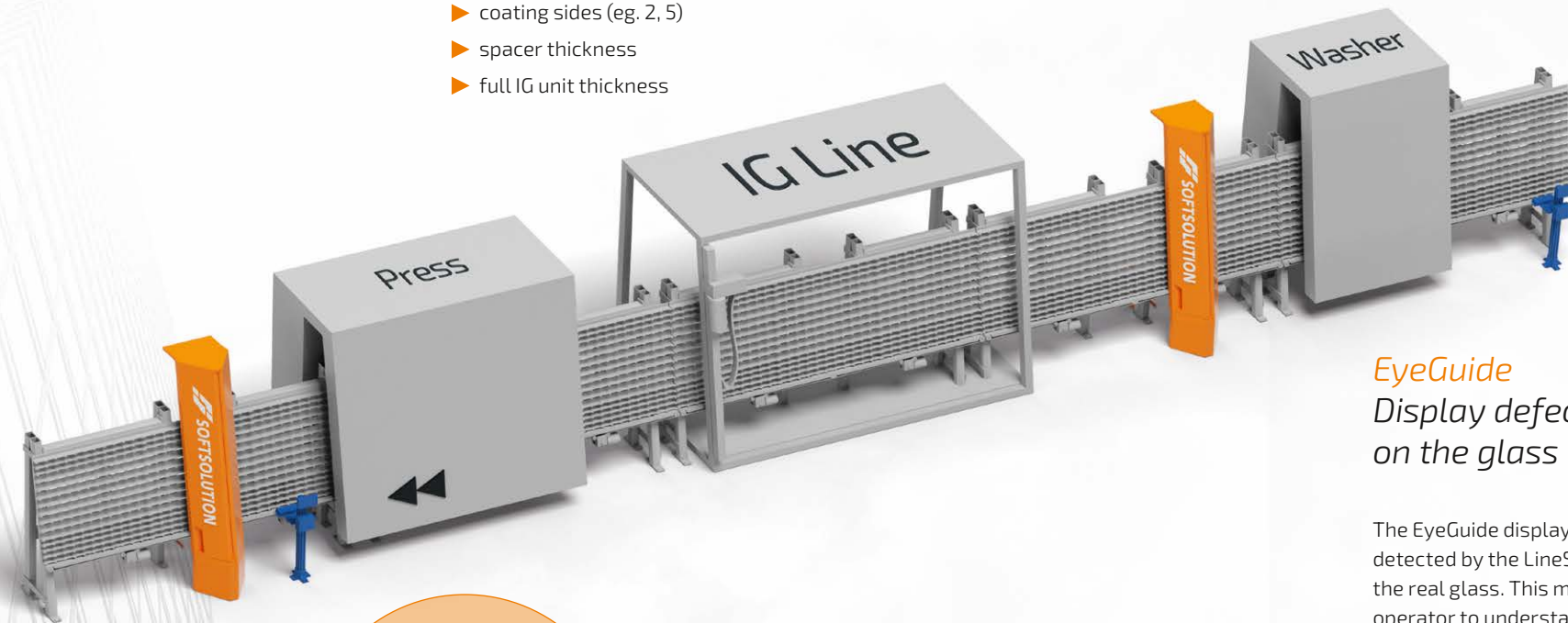
▲ Surface & Edge Quality



▲ Detecting fingerprints with AI

## Check of full build up of IG Unit

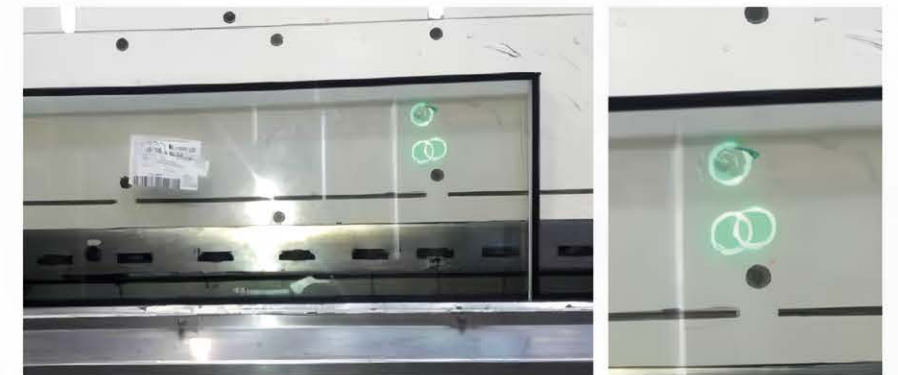
- ▶ Target/actual comparison of the insulating glass structure using a transfer file (data connection)
- ▶ every glass thickness
- ▶ coating sides (eg. 2, 5)
- ▶ spacer thickness
- ▶ full IG unit thickness



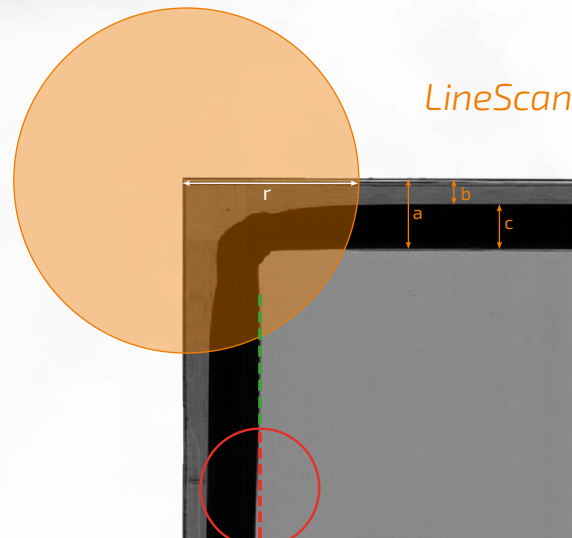
## EyeGuide

Display defects directly on the glass

The EyeGuide displays the defects detected by the LineScanner directly on the real glass. This makes it easy for the operator to understand the position of the defect.



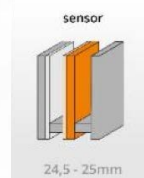
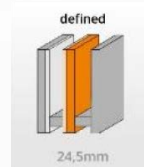
## LineScanner sight-line check



### Positions to be checked

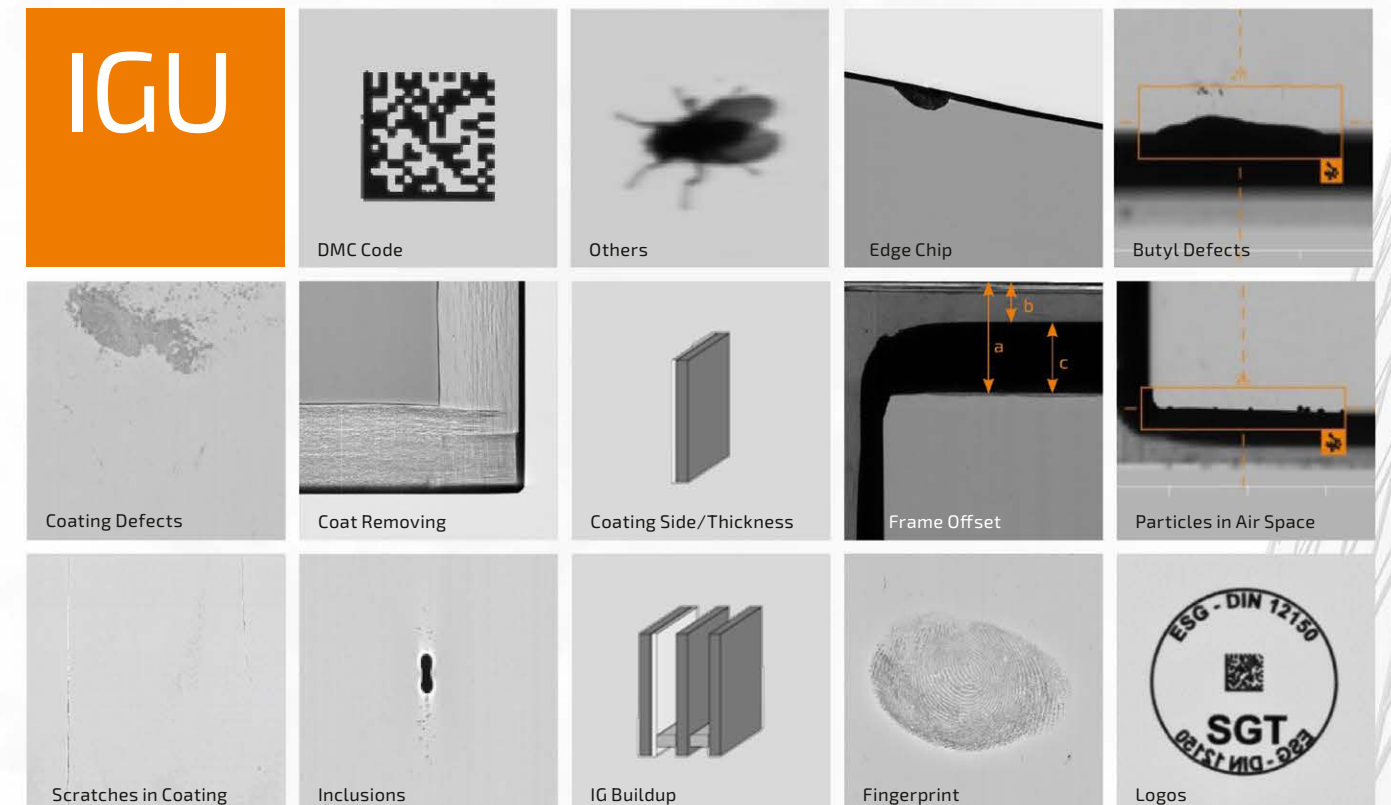
- a edge to inner contour
- b edge to outer contour
- c width of spacer
- r ignore area – radius to be defined

▲ Check angularity and layout of Georgian bars



## A comprehensive set of checks for the set up of an IG unit

LineScanner is capable of checking the build up of an IG unit. This ensures that each glass thickness, spacer distance, and coating side is manufactured correctly.





# High-precision measurement on vertical lines

The LineScanner, equipped with specially designed pneumatic glass encoders, enables precise measurements of glass, allowing both external and internal contours to be compared with order specifications.

This ensures an accurate inline good/bad evaluation for interior glass products such as shower doors and kitchen splashbacks.

GeneralQualityOuterInnerIG ComponentsDetailLogoPrintingBendingThicknessCoatingPolariskop

Cutouts

Drillhole

Countersink

Drillhole

Active

Yes

Tolerances for the diameter deviation

Warning

-

0.25

mm (Min: 0 Max: 50)

+

0.25

mm (Min: 0 Max: 50)

Error

-

0.5

mm (Min: 0 Max: 50)

+

0.5

mm (Min: 0 Max: 50)

Tolerances for the position deviation

Warning

+/-

0.25

mm (Min: 0.1 Max: 50)

Error

+/-

0.25

mm (Min: 0.1 Max: 50)

✓

✗

▲ Dimension settings

You can easily and clearly manage the tolerance settings for inner and outer contours as well as for drill hole diameter and position in the quality and dimension settings.

In addition to the scrap values, you also have the option of storing warning values, which can also be displayed in the data archive for each glass or documented for the customer via a certificate.

## Better glass quality through Artificial Intelligence

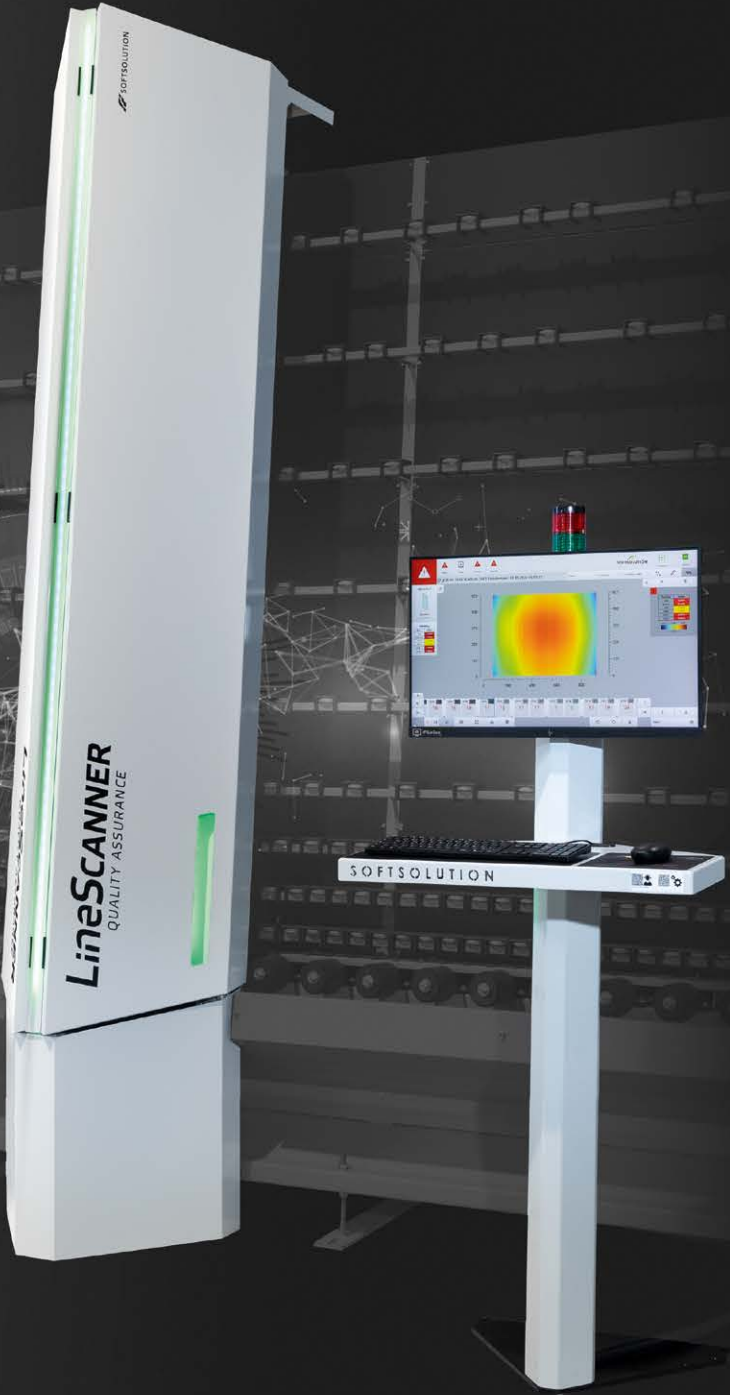
- ▶ system learns and adapts, and improves its future evaluations
- ▶ reduces false quality rejects

## Categories of Defects

- ▶ Warning and Error levels
- ▶ individual tolerances
- ▶ switch on/off
- ▶ incredible hit rate based on neural network technology

		scratches
		inclusions
		dirt
		dust
		water
		fingerprints
		edge defects
		dirt on frame & bars in viewable area (e.g. Butyl)

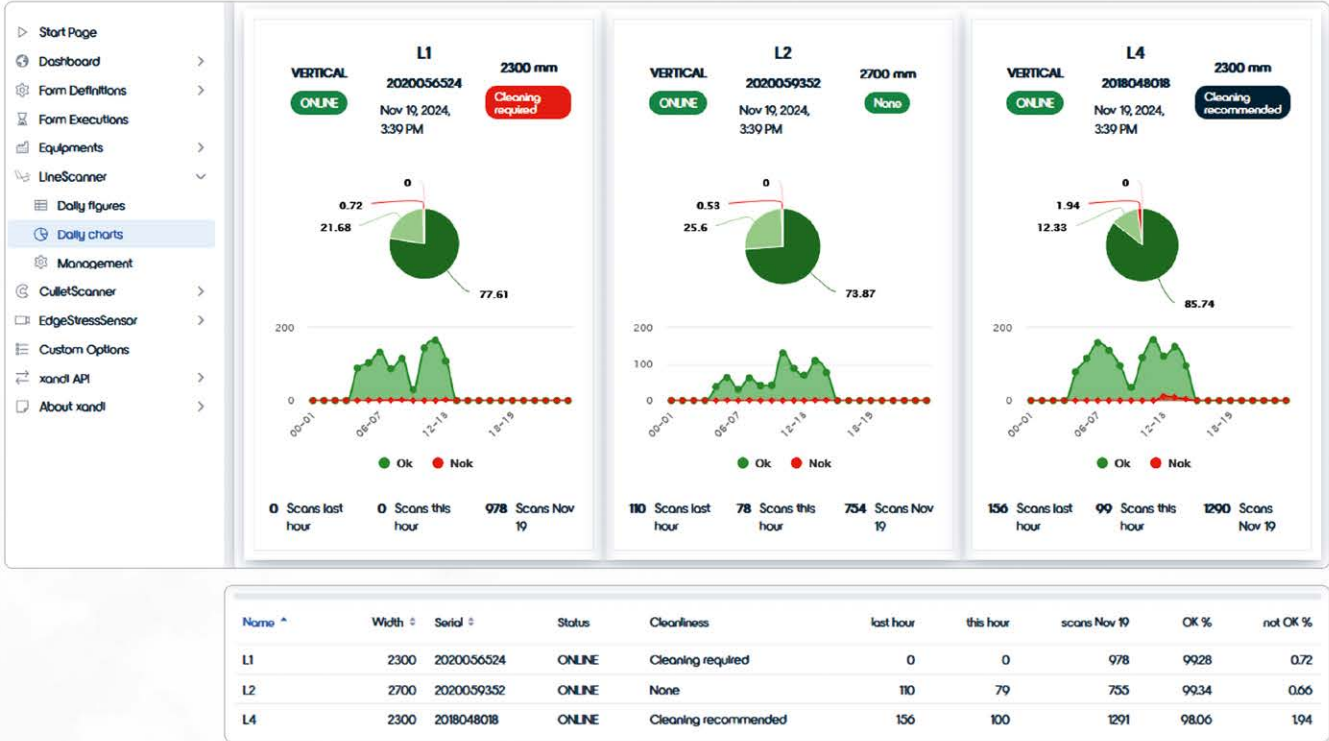
▲ Yellow = warning, red = defect





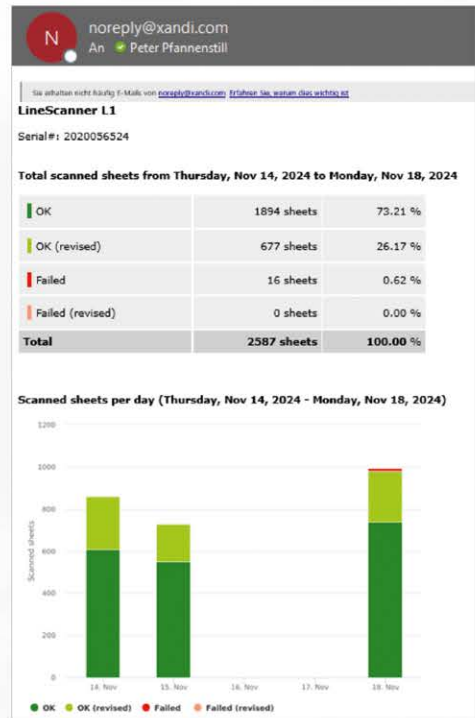
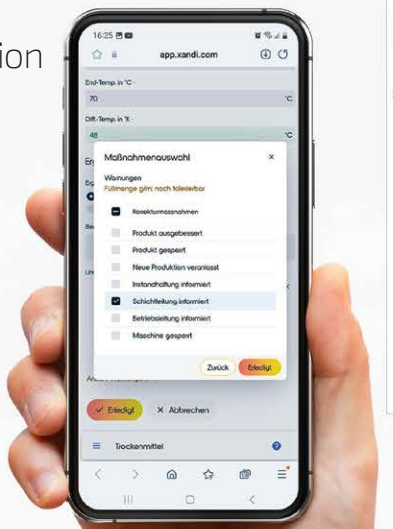
# glassquality LiveView

Real time machinery status



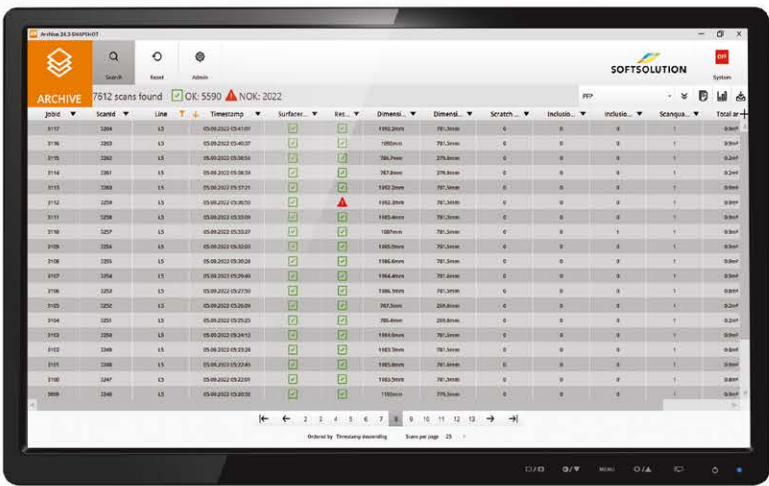
- accept data from LineScanner and Osprey
- real-time status of numerous inspection systems
- accessible via any mobile device — worldwide
- production overlook
- good / bad information

**xandi**  
LiveView realized with XANDI  
Web application that digitizes in-house production control



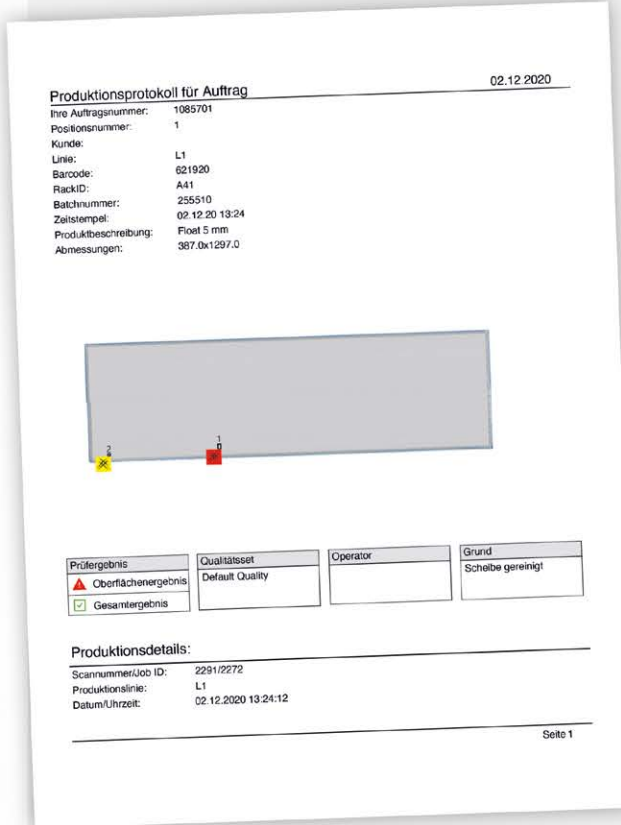
## Archive Database

- accepts data from LineScanner and Osprey
- lookup specific glasses/scans incl. staff evaluation of the glasses
- combine individual ERP data
- print certificates per glass/scan
- auto reporting based on schedules
- individual statistics to minimize critical workflows



▲ glassquality Archive Database

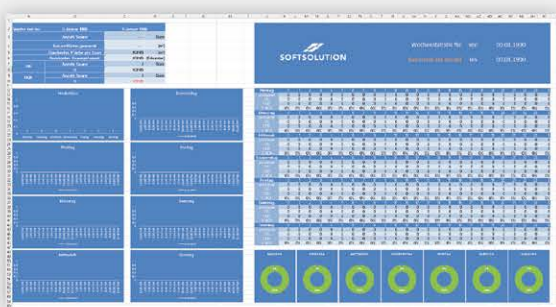
## Certificate per glass-out of data archive



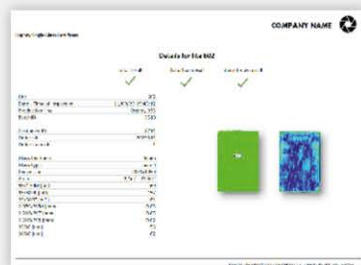
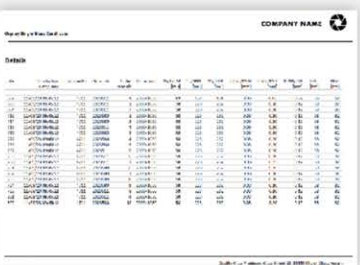
▲ Multiple lites

## Archive allows 3 different outputs

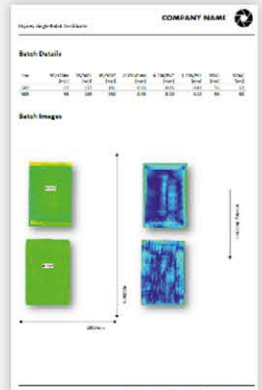
- Certificates**
  - Different reports to be used for certificates to be given to the client
- Excel based statistics**
  - Excel statistics based on templates; can extended by the customer individually
- Mass data export**
  - Data export in Excel or CSV format; available to be used for individual requirements



▲ Different statistics



▲ Single lite



▲ Batch



▲ Batch summary



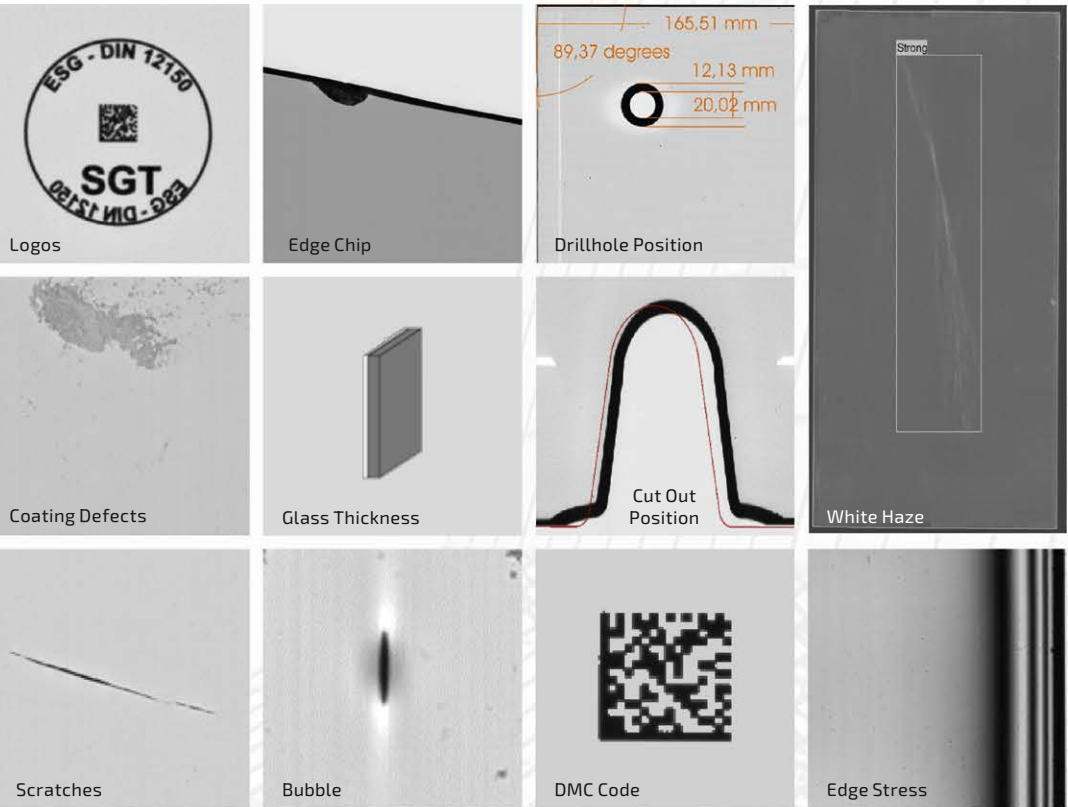
# LineScanner for glass quality and dimension control

## Inspection methods

- ▶ glass quality inspection
- ▶ IG inspection option
- ▶ dimensional inspection
- ▶ logo inspection
- ▶ archive and statistical analysis

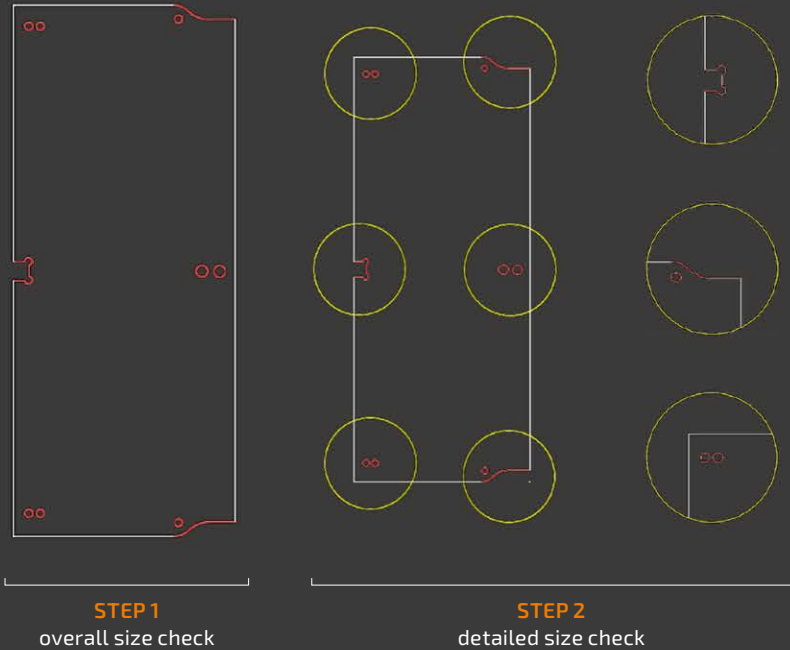


TSG



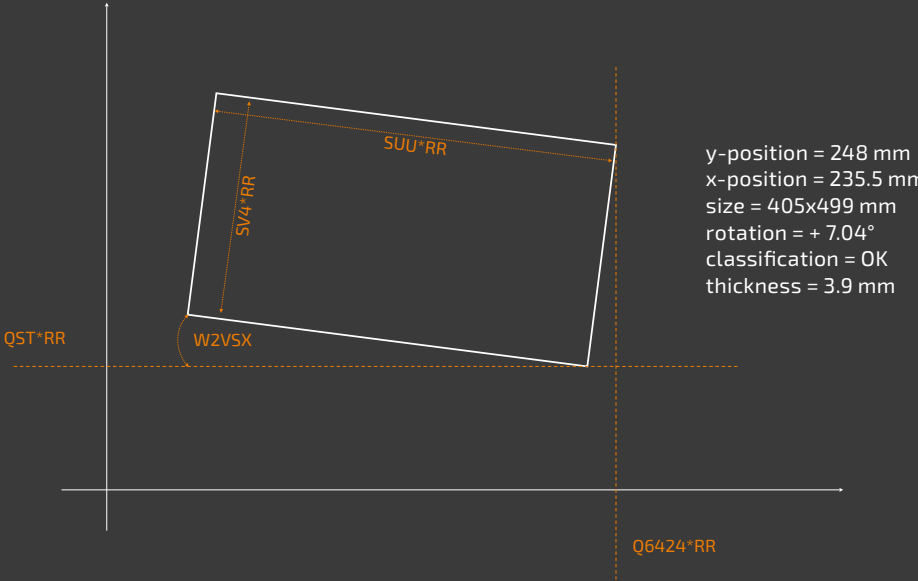
## LineScanner – dimension control

The LineScanner conducts a highly advanced dimensional inspection. It measures the overall size and position of all details, holes, and cutouts and thoroughly checks each critical feature. It verifies whether a drill hole has the correct distance to the nearest corner and ensures the diameter is accurate.



## Process control automation Inline-DXF-Generation

LineScanner provides precise information about the position and rotation of a glass placed on a horizontal conveyor. This information can be used for automatic handling, such as robots and unloading systems.







# BowScanner

OVERALL BOW

IDENTIFIES UNWANTED DEFLECTION OF LAMINATED OR TEMPERED GLASS

MINIMIZE GLASS BREAKAGE  
BOOST EFFICIENCY IN PROCESSING

- ▶ measures overall bow inline for each glass
- ▶ vertical installation
- ▶ BowScanner can be integrated into a vertical LineScanner
- ▶ testing of single panes
- ▶ provides measurements of all 4 edges and both diagonals
- ▶ real measurement, reliable and fast
- ▶ sensor accuracy at standstill  $\pm 0.01\text{ mm}$  or  $0.01^\circ$
- ▶ for tempered and laminated glasses

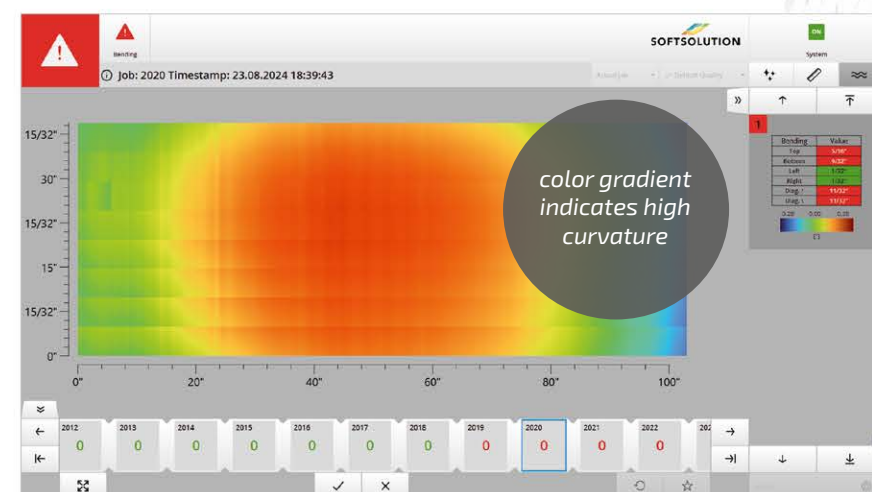
## BowScanner

*Deflection Measurement*  
Minimize Glass Breakage and Boost Efficiency in Processing

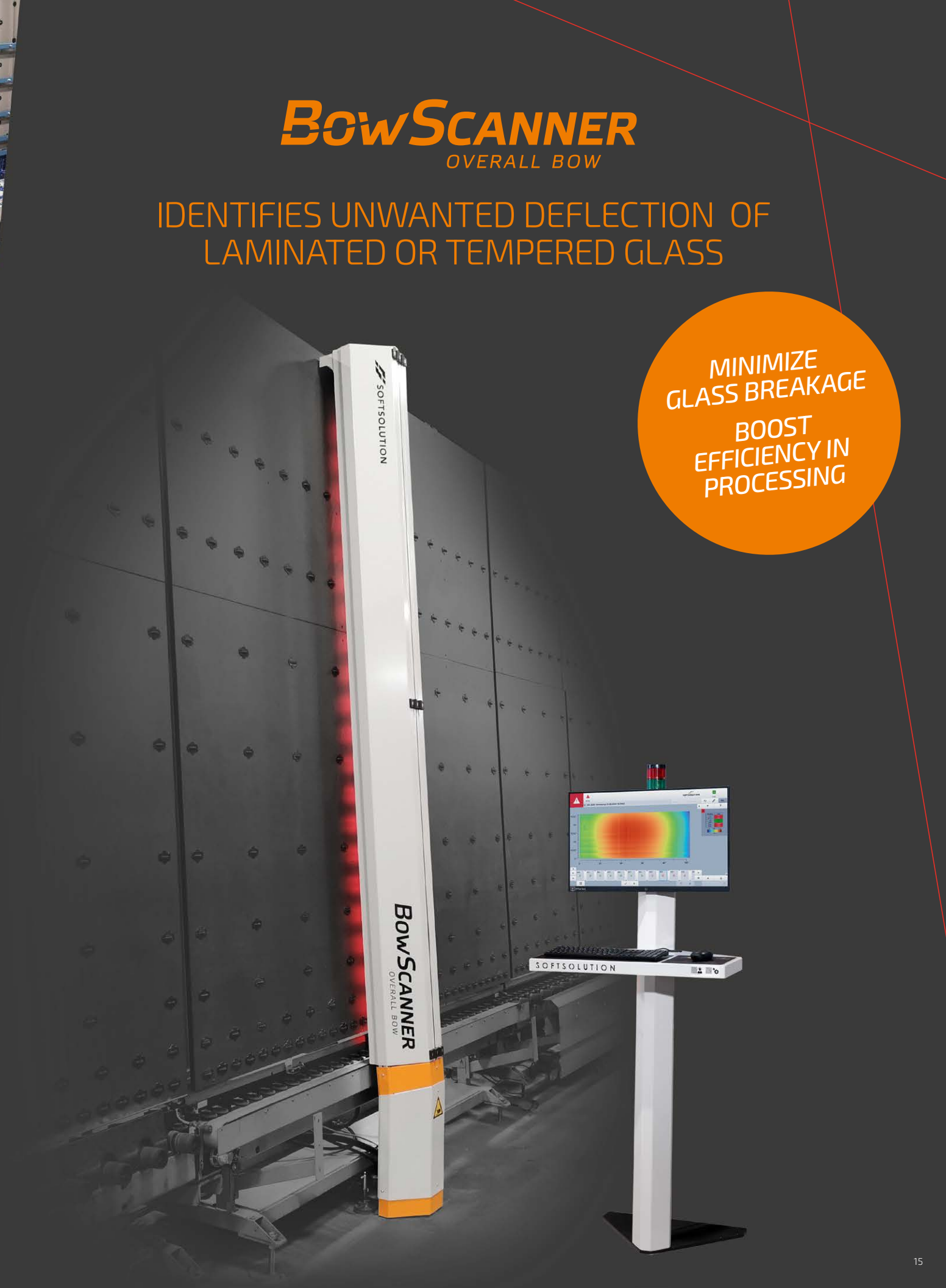


The LiteSentry-Softsolution BowScanner delivers valuable data, including total deflection for all edges and both diagonals. It displays the glass pane's surface profile, aiding effective analysis.

It optimizes workflows, reduces breakage risk, prevents that bowed glasses are further used for insulated glass units or laminats; therefore cuts downtime and costs for glass processing companies.

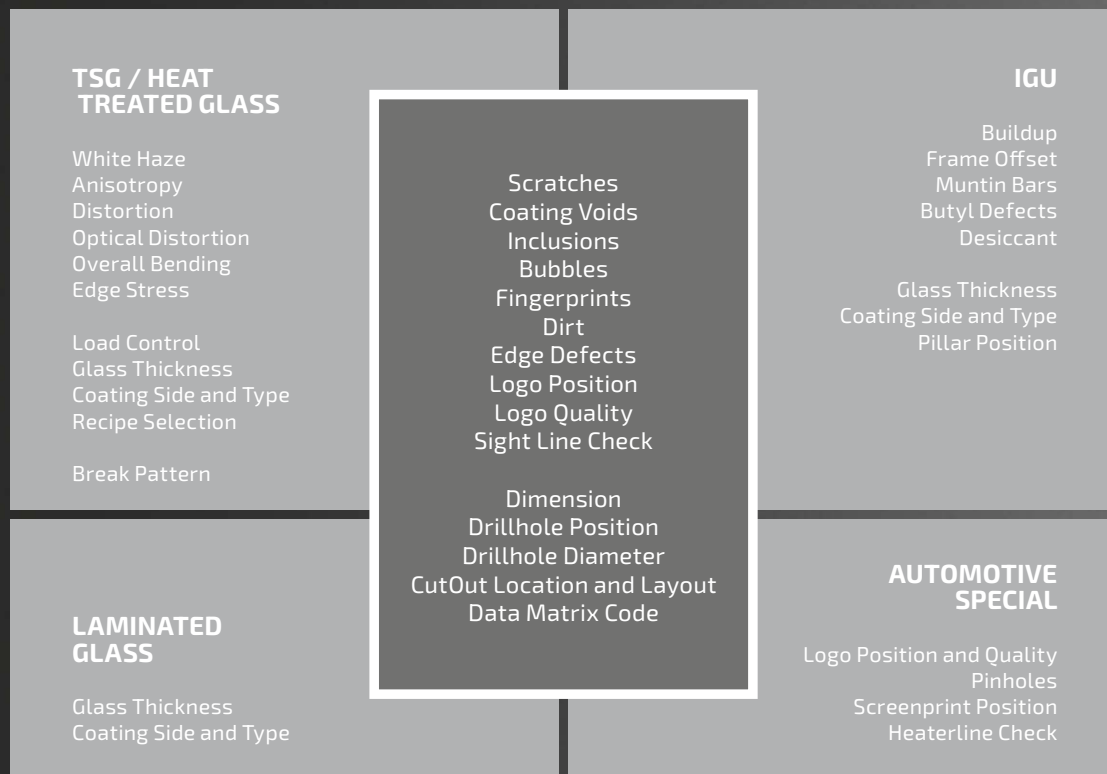


▲ BowScanner HMI



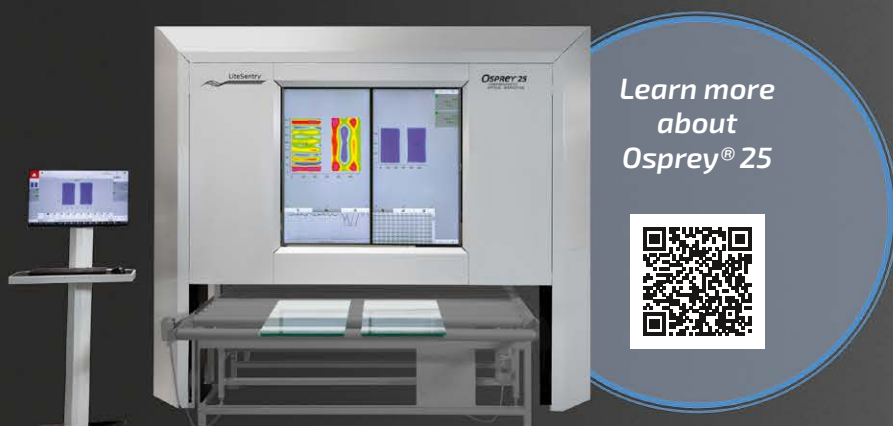


# Inspection Capabilities of Our Systems by Glass Type



## All Technologies Available

- ▶ 90° parallel-light system with sensor based technology
- ▶ bright-field & dark-field technology with camera-technology
- ▶ reflexion-technology with sensor and stray-light technology
- ▶ spectrometer, sensor-technology with polarized filters



Together, we are  
[www.glassquality.com](http://www.glassquality.com)



**Strainoptics**

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