SOFTSOLUTION

GLASS IQ

GLASS IQ

... AND QUALITY BECOMES VISIBLE


VirtualDigitizing LineScanner
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SOFTSOLUTION GLASS IQ

With an inside view, you can understand.

With an overall view, you can decide.

With a far-sighted view, you can control things.

We make **quality** visible.

As an innovative company, Softsolution specialises in automated quality assurance systems, electronic image capture and software development in the glass industry.

Advances based on customised solutions and innovative technologies are opening up new perspectives for our customers and partners – sustainably and with foresight around the world.

LineScanner

Quality inspections at the highest level

Page 6

LineScanner – experience the new quality of scan technology.

Flexible and space-saving in operation, the LineScanner can inspect all transparent flat glass products for the common defects of quality and dimension.

CulletScanner

Automatic fragmentation image analysis

Page 22

CulletScanner – convince yourself of our innovative technology.

Thanks to its unique and fully automated error detection, CulletScanner scans every fragmentation image with maximum resolution and analyses this precisely and completely within seconds.

VirtualDigitizing

Digital object data capture with maximum precision

Page 26

VirtualDigitizing – will change the way you work.

Fast and simple digitisation of templates, 2D objects and drawings without the need for a digitisation table – an intelligent solution for tomorrow's production.

SOFTSOLUTION GLASS IQ

Softsolution is setting new standards

Staying ahead of the competition means producing faster, more efficiently and more flexibly. These factors play an important role in the glass industry, where the exacting demands of customers and partners must be met. This is why we have devoted ourselves to the topic of glass for more than 15 years, specialising in quality assurance systems at the highest technical level in the glass industry.

Quality made in Austria

All our products are developed and produced at our location in Waidhofen/Ybbs in Austria – from individual components and software to the final finished product.

As an all-in supplier, our service covers the entire process from the beginning of the planning phase right through to the implementation and manufacture of our products.

Personal advice

We will assist you as a competent partner. At Softsolution, we attach great importance to the highest levels of quality and safety. Convince yourself of our range of products – we will be pleased to provide you with personal advice for customised solutions.

SEE IT - BELIEVE IT - GLASS IQ

A PRODUCT WITH MANY VERSATILE USES

LineScanner

Quality inspections at the highest level

The LineScanner is THE solution for all quality inspections of transparent flat glass products such as single sheets, insulating glass, automotive glass, processed glass, polycarbonate or film. LineScanner inspects your products with extreme precision for all defects in quality and dimension. Its flexibility as well as its simple operation and installation allow it to be put into operation quickly and easily with minimum space requirements.

The unique parallel light technology enables the LineScanner to be operated with the same setup to inspect single sheets as well as finished insulation elements both horizontally and vertically. A quality assurance system that excels with maximum flexibility and extreme ease of use. The LineScanner inspects flat glass products for optical defects like scratches, inclusions, edge chips, screen printing, bars as well as dimensional defects with regard to overall dimensions, drill hole diameter and position. Glass thickness, the coating side and element structure can be quickly and easily examined. Thanks to the use of specially developed glass encoders, the position and size of defects can be optimally displayed.

LineScanner – vertical orientation

LineScanner – horizontal orientation

Technical details:

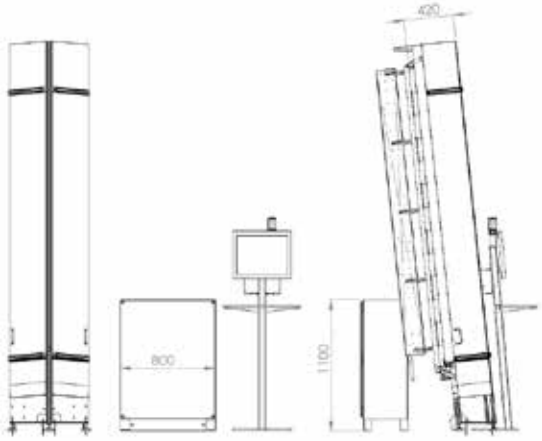
- Resolution 200 or 400 dpi (400 dpi = 0.0635 mm)
- Single sheet inspection or batch operation
- Maximum transport speed during the scan process 48 m/min
- Maximum glass/element strength 100 mm

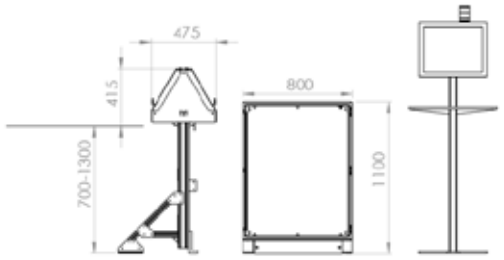
- Network connection required
- Windows 7 or higher, English or German operating system, English or German keyboard layout

- Ambient temperature between -10º and 45º Celsius
- Maximum glass temperature 70º Celsius

- Power supply – Europe: 230 V , 16 A, single phase , 50 Hz
- Power supply – US: 110 V , 16 A, single phase , 60 Hz

- Float, coloured/printed, laminated, toughened, heat-treated glass
- Clear glass with flat surface, 15-99 % transparency
- Inspection of rectangles and shapes of an type possible
- Glass with structured surfaces or opaque layers cannot be inspected





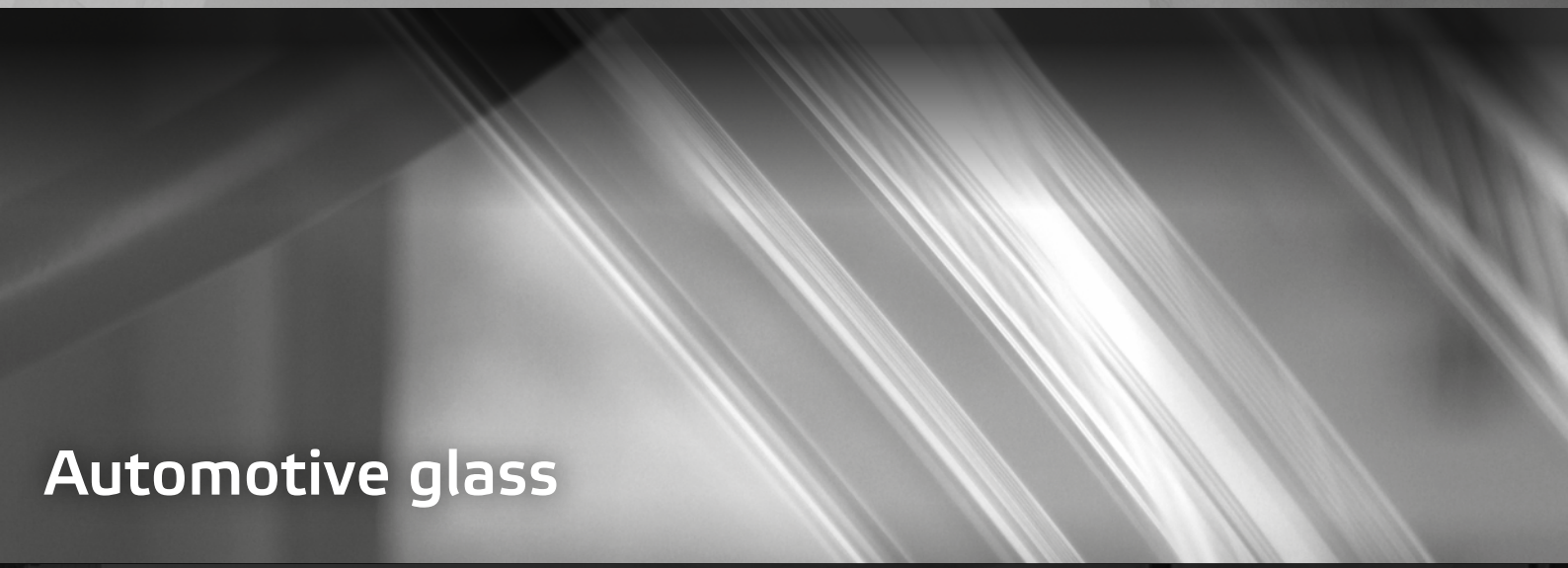
LineScanner

- Real scan technology
- Resolutions of up to 400 dpi and 16-bit technology

- Modular system
- Non-camera-based technology

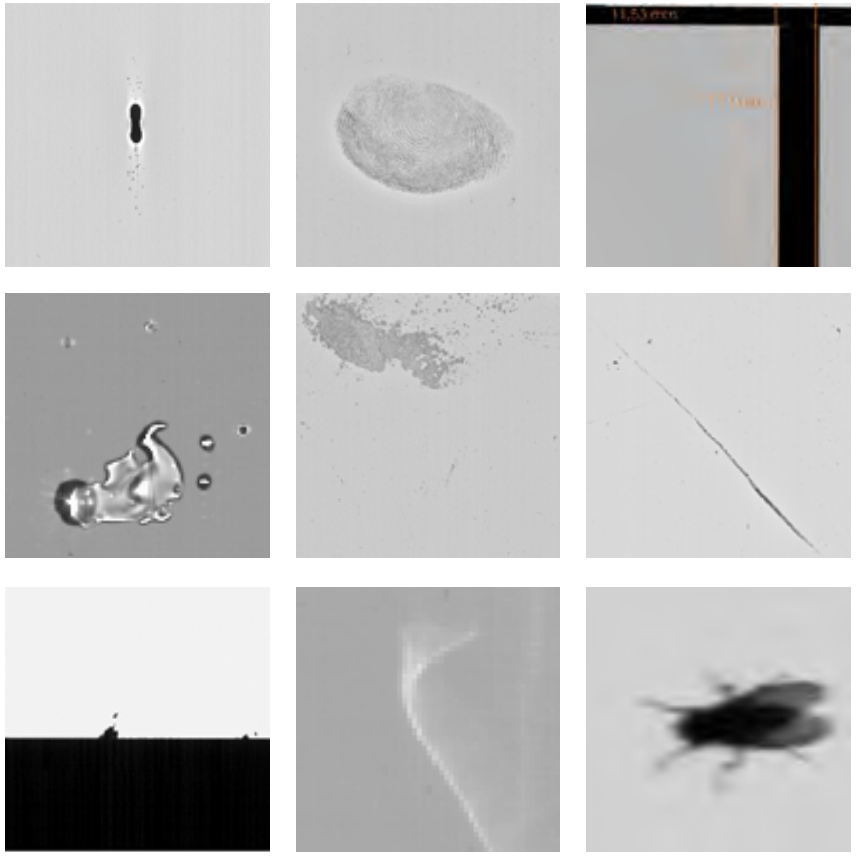
- Fast installation and simple operation
- Flexible and space-saving in operation

Areas of application:



Defects in **IG units**

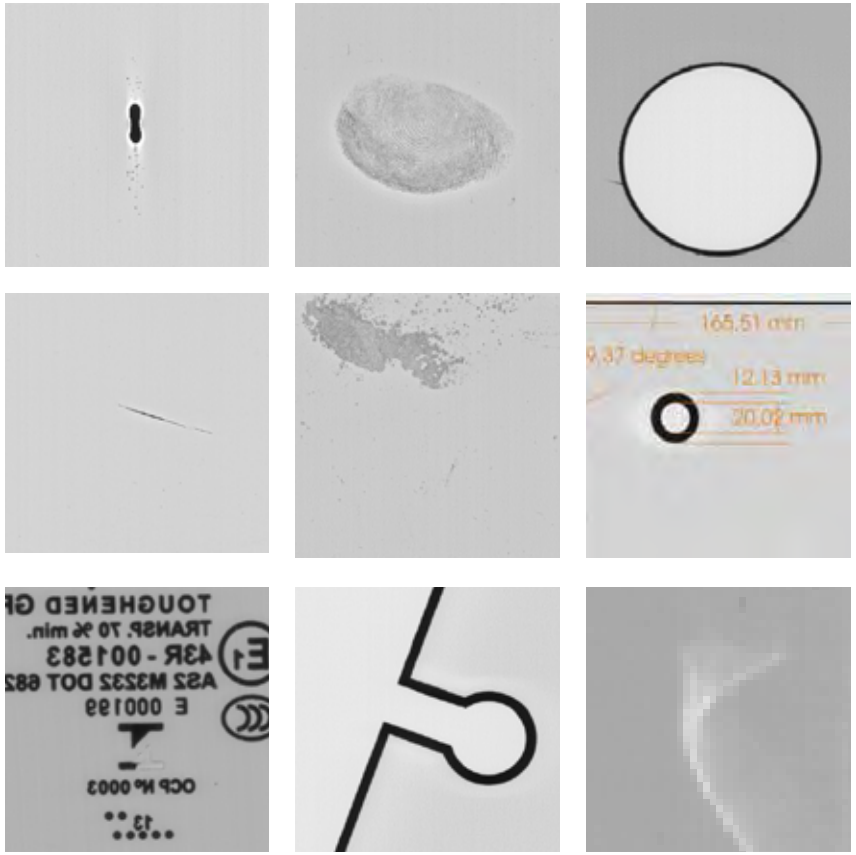
Insulated glass production is characterised by fully automated manufacturing processes. It is possible to achieve objective and in particular continuously 100% quality inspection for all glass at many different stages of production. Single sheets prior to assembly as well as bonded insulation glass units can be inspected precisely with the LineScanner. During inspection, any optical defects – in special butyl defects, the frame and frame structure – will be detected by the LineScanner exactly and completely.



- Scratches, inclusions, finger prints, coating voids
- Overall size, frame structure, frame offset
- Pair formation checking, element structure, butyl defects, spacer chips

Defects in **processed glass**

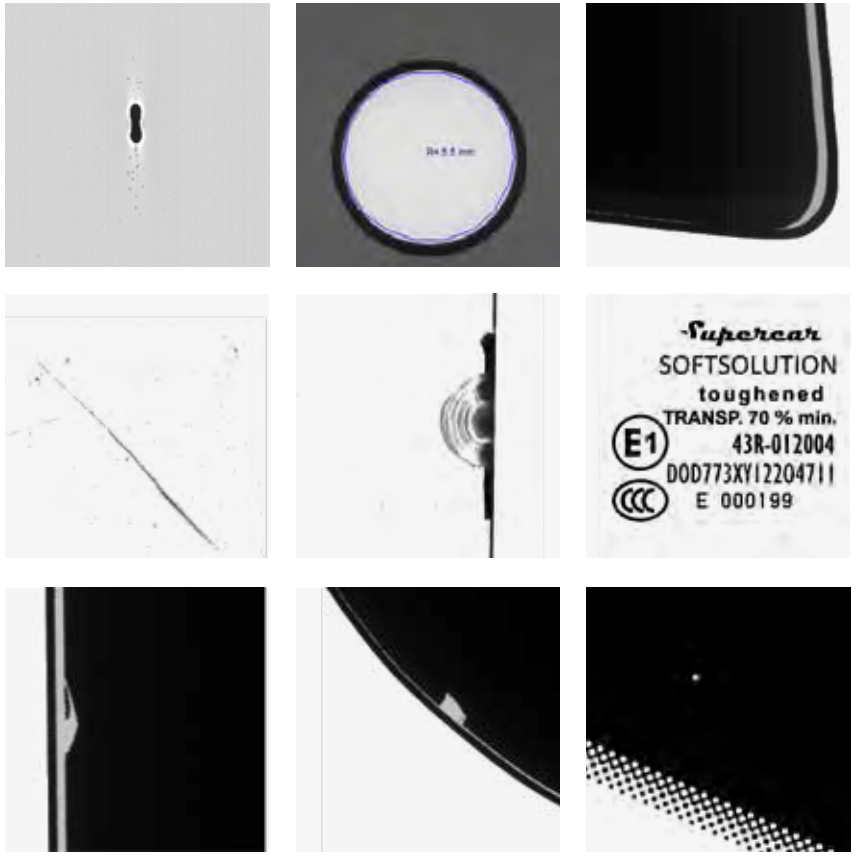
Processed glass in single sheets, whether toughened and/or laminated, demand the highest quality. The slightest defects in the glass are noticeable as soon as it is installed. Thanks to the LineScanner, optical defects can be quickly detected and avoided. Besides examining dimensions, there is an additional inspection of special cutout sections for fittings. The scope of inspection extends to position and diameter for simple drill holes and counterbores. The LineScanner recognises what type of glass is being inspected independently and fully automatically (single sheet, toughened glass or laminated glass) and accordingly applies different quality tolerances.



- Scratches, inclusions, finger prints, coating voids
- Overall dimensions, drill hole position and diameter (inner and outer)
- Cutout section inspection, glass type detection

Defects in **automotive glass**

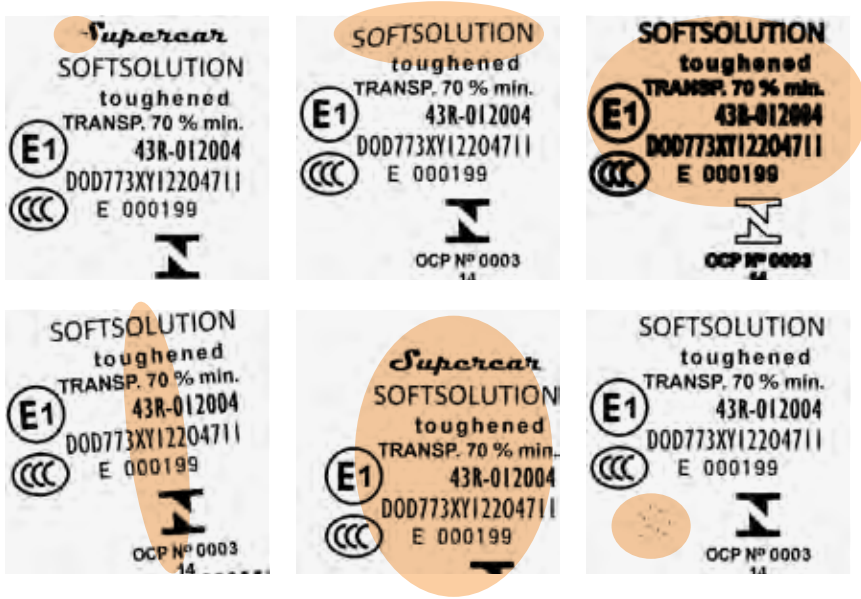
Automotive glass is one of the products of the flat glass industry that are subject to the highest quality standards. Besides aesthetics and safety, a sheet of automotive glass must demonstrate perfect quality. The LineScanner performs inspections of such sheets – precisely, flexibly and at the highest technical level. Thanks to its outstanding scanning performance and reliability, the LineScanner ensures exact defect detection at many different stages of production, helping to identify faults at an early stage. The LineScanner's specific characteristics based on its low floor-space requirements and its ability to inspect screen printing and logos, make it a comprehensive quality assurance system.



- Scratches, inclusions, coating voids, damage to edges
- Overall size, drill hole position and diameter
- Logo inspection for location and quality, screen printing position, screen printing errors

Flagging of defects **in logos**

Automotive glass must be in perfect condition before it is installed. Equipped with an integrated, optical inspection system, the LineScanner sets new standards in checking the quality, position and orientation of logos. Thanks to the LineScanner, defective logos can be identified quickly and precisely.



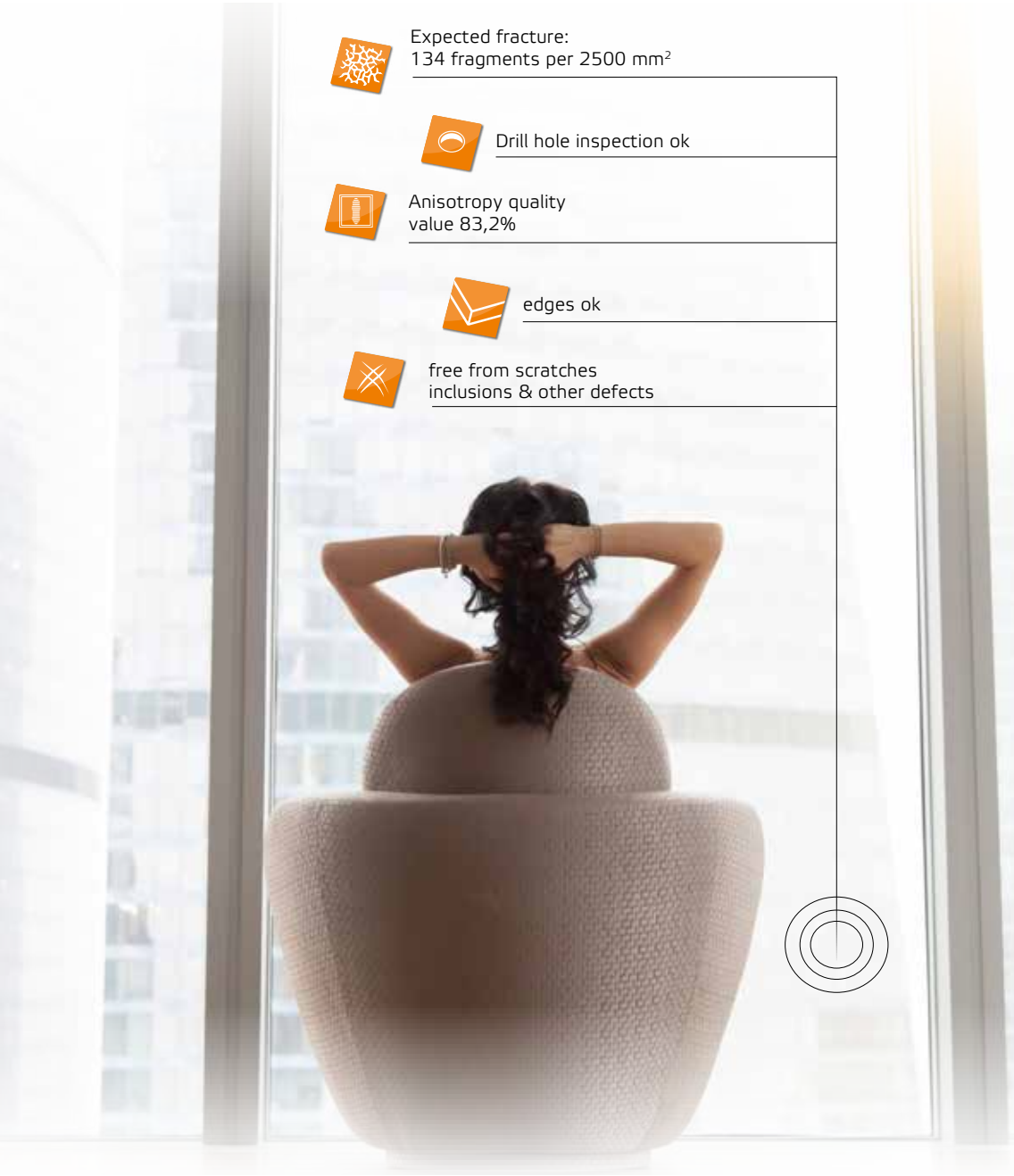
- Missing parts of the logo
- Distortion
- Weak or strong ink
- Rotation
- Dislocation
- Staining

LineScanner on a tempering furnace – **check for anisotropy/ isotropy and edge stress**

For the use of the LineScanner on a tempering furnace – which is now also able to check anisotropy and edge stress in addition to geometry, surface quality, edge quality and also DMC codes - we have created a real masterpiece in regards to a visual, non-destructive tempering quality check.

Isotropy/anisotropy proportion

To get an exact measurement of the distribution of tensions as well as the quality value for each pane, every pixel with a size of 0,12 x 0,12 mm is being measured. The result is an exact determination of the isotropic and anisotropic areas of a tempered lite together with a final quality result.



For a professional and comprehensive definition of the quality, it is also important to measure the edge stress along all edges of a specific lite. By doing so, the LineScanner determines the edge stress levels and provides a precise result regarding the expected fragmentation pattern.

Only this unique and telecentric approach, provided by the Softsolution LineScanner, can offer a solution that includes every combination of quality check possible all within a single quality inspection system.

The following values are being determined:

- Block median delay [nanometre]
- Worst block median delay [nanometre]
- Median of all block medians [nanometre]
- Deviation of all block medians [nanometre]
- Final Anisotropy/Isotropy quality level [%]

Available quality inspection packages

One hardware setup – **a range of software options.**

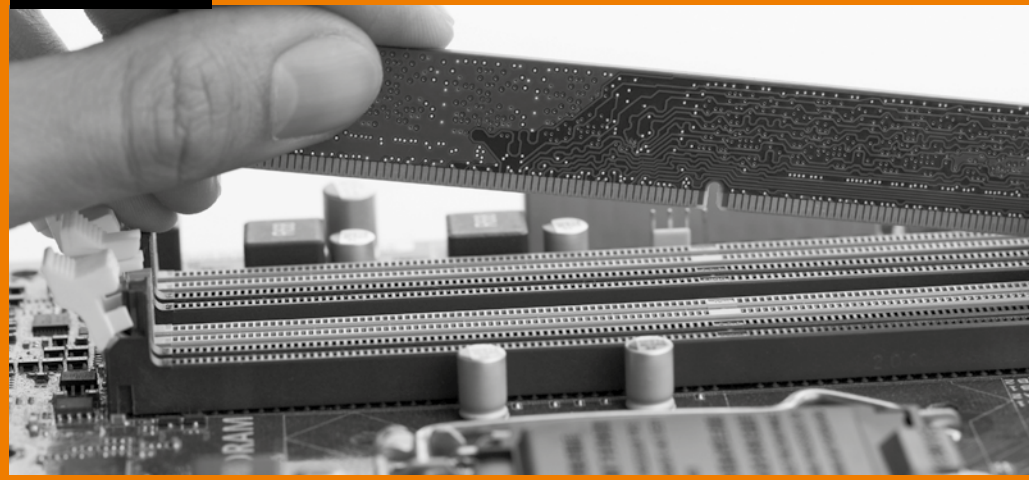
		 Processed glass	 IG units	 Automotive glass	 furnace
Quality inspection	Scratches, inclusions, finger prints, coating voids, spacer remnants	☑	☑	☑	☑
	Model editor	☐	☐	☑	☐
	Butyl defects, spacer chips, grid checking, grid alignment	☐	☑	☐	☐
Dimension checking	Butyl defects, spacer chips, grid checking, grid alignment	☑	☑	☑	☑
	Screen printing position	☑	☑	☑	☑
Standard logo inspection	Logo presence, logo positioning	☑	☑	☑	☑
Glass thickness and coating inspection	Logo alignment, logo quality	☐	☐	☑	☑
Glass thickness and coating inspection	Glass thickness, coating side	☑	☑	☑	☐
	Insulation glass element structure	☐	☑	☐	☐
Extended glass thickness and coating inspection	Glass thickness, coating side, check of overall bending	☑	☐	☑	☐
Integrated overall bending control	In sensor bar integrated overall bending control along the entire scan height	☑	☐	☑	☐
Anisotropy / isotropy and edge stress	Check of anisotropy / isotropy and edge stress	☑	☐	☐	☑

Sensitivity setting

Different types of glass have different quality requirements. Taking this as a starting point, the LineScanner has been equipped with a new technical function – **the sensitivity setting**.

Here, slide controls are used to store individual quality settings that are then drawn on as a new quality attribute. The new function makes it very easy to specify which defects are to be made visible to the operator with the help of the LineScanner and which are not. This revolutionary new development now makes the LineScanner as easy to operate as a smartphone.

16-bit technology



LineScanners from Softsolution have been equipped with **16-bit technology** as standard since the beginning of 2016.

This innovative technology makes it possible to use considerably more grey shades (65536 instead of 256) than before. It allows defects to be detected even more easily, in particular in dark glass (from 15% light transmission), meaning that it is no longer necessary to define different assessment criteria for different levels of glass transparency. It is not just the installation of the LineScanner that has been made significantly easier for the operator, but also maintenance – quality degradation as a result of dust in the working environment is a thing of the past.

Overall bending

Checking overall bending is a brand new development to be implemented in the LineScanner. This technology can initially only be installed for vertical production lines. **Overall bending** is checked for in this case at a specific, configurable height of the glass. This function from Softsolution sets completely new standards since curved glass can cause considerable problems in a fully automated insulation glass production line (for example, cullets in the press, faulty sensor information, loss in the level of gas filling through "loosening" of the glass element at places along the frame, etc.).

Technical details:

A sensor measures the distance between the individual sheet of glass and the sensor itself at intervals of 10-20 mm in the direction of transport. Measurement precisions is very much dependent on how smoothly the glass moves along the conveyor. The maximum measurement tolerance is +/- 0.4 mm. The sensor is freely configurable, the minimum distance to the conveyor unit being 300 mm.

Archive

Data capture and analysis made easy. Thanks to the **archive**, scanned glass items can be easily and quickly stored and archived in a MySQL database. This feature documents and archives all the work processes, quality settings and every single detail pertaining to a glass item. Furthermore, all the required data are available for subsequent analysis.

Die LineScanner archiving software is a standalone application that can be used to search for specific glass items in the database (for example by customer, barcode, order number, line item number, etc.) and to then provide a visual representation of them. Moreover, the database can be used to analyse a number of different statistics (e.g. production figures, target-actual statistics, errors per defect category, etc.).

Exact distance measurement

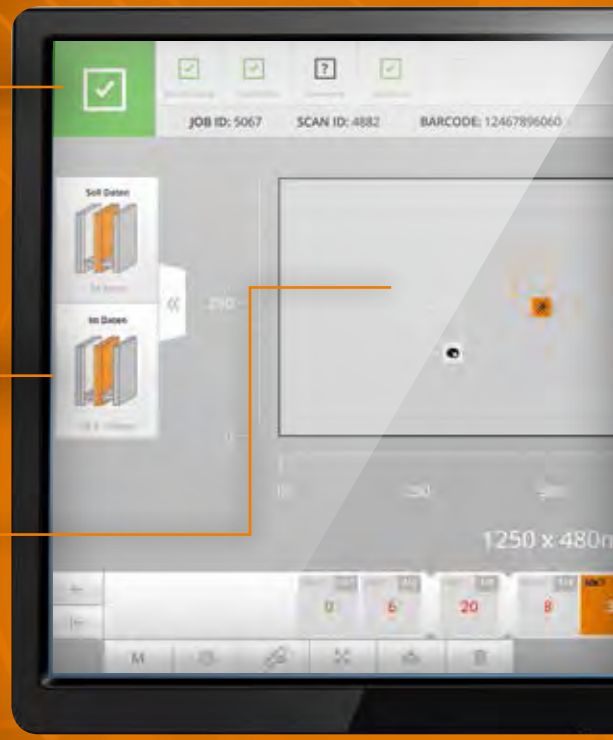
- Available as an option to the LineScanner, the EDM system is able to give you exact dimension information of your piece of glass.
- Accuracy +/- 0,25 mm independent of the glass length.
- No other system within the glass industry - without any high accurate and very expensive transportation solution - allows to check the dimensions of a glass with such an accuracy.
- Something you can only find for the LineScanner powered by SOFTSOLUTION.

NEW INTERFACE
NEW DESIGN
NEW PRODUCTIVITY

Overall result
scan information

Glass thickness and
sheet structure

Scan display
with defect position



SOFTSOLUTION GLASS IQ

System status
& cleanness

Defect summary with
additional information

Scan buffer, quality settings,
scan settings

CulletScanner

Automatic fragmentation image analysis

The CulletScanner from Softsolution scans every fragmentation image, whether architectural or automotive glass, with maximum resolution. Each fragment is viewed from a 90º angle and the entire fragmentation image of a test sheet is exactly and fully analysed within seconds.

CulletScanner is able to completely analyse the entire fragmentation image of a test sheet within seconds. Every fragment is identified and gauged. Exclusion areas along the outer edge as well as the impact point are of course included. Every scan of a fragmentation image is stored with maximum precision and definition. A printed certificate in PDF format is generated automatically showing all the analysis areas, additional information such as the relevant job, type of furnace etc. and of course an overall result.

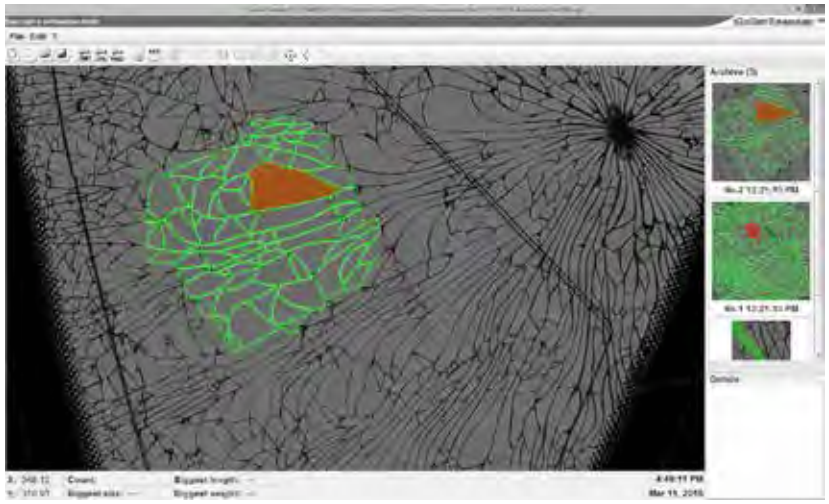
CulletScanner

- Fully automated fragmentation image analysis for different types of glass
- Precise calculation of length, surface area and weight of every single fragment
- Capture of the longest, largest and smallest fragments – many standards available

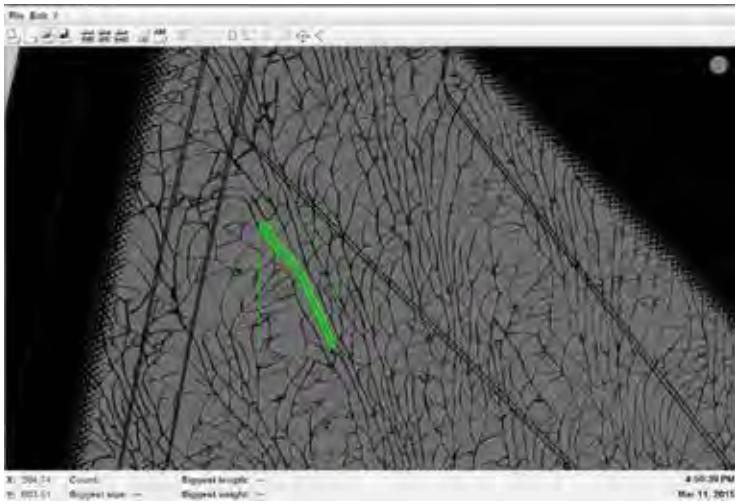
CulletScanner – automatic fragmentation image analysis

The CulletScanner analyses the entire sheet and finds those areas with the most, fewest, largest and longest fragments fully automatically. These positions are highlighted and analysed once more. The associated CulletScanner software provides all established, familiar standards in this field. (EN 12150, EN 1683, EN 14179, EN 14428, EN 31129.NFF, R 43, ANSI Z97.1-2004, CAN/CGSB-12.1M)

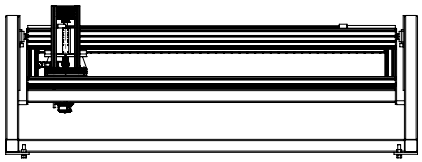
The status, position, size, length, surface area and weight are determined for every single fragment. The CulletScanner counts consistently, dependably and plausibly.

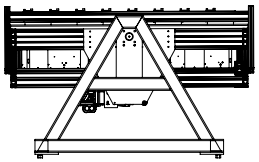


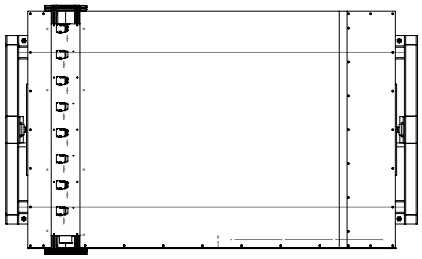
Fragmentation image analysis

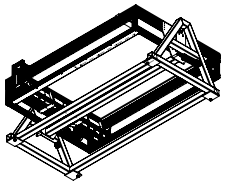


Fragmentation image analysis









Technical details:

- Individually configurable
- Standard table for glass sizes of 1100 x 360 mm

  * The CulletScanner can also be manufactured in any custom size
- Inspection of individual sheets
- Glass must have transparency of 15 – 99 %.

  - Screen-printed surfaces, structured glass and glass items with a similar surface cannot be processed.

- Maximum scanning speed: 20 metres / minute
- Glass thickness: 2.3 – 20 mm
- Power supply: 230 V, 16 A, 50Hz, single phase, separate neutral conductor and earthing
- Operating system: Windows 7 or higher

Custom size depending on customer requirements with the options of an electrically driven scan bridge and a swivel-mounted scan table

Based on real scanning technology with up to 400 dpi resolution, high-resolution image archiving, and no age-related deterioration in the quality of image information

Certificate printing, automatic counting and analysis for each separate fragment

Data storage in the form of a CulletScanner project, digital storage, access for years

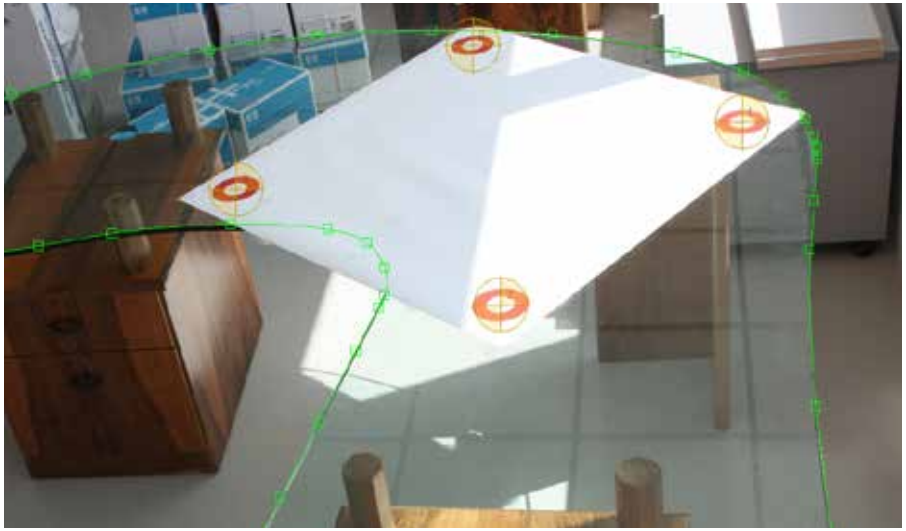
ALWAYS AS FLEXIBLE AS YOU ARE

VirtualDigitizing

Digital object data capture with maximum precision

VirtualDigitizing – a software application for flexible digitisation solutions for templates that can be used simply and quickly in any industry without the need for a digitisation table.

This results in an unprecedented reduction in workload and increased flexibility. VirtualDigitizing – will change the way you work.



VirtualDigitizing

- Fast and flexible digitisation solution for templates and 2D objects
- Automatic conversion of your digitised original to a DXF file
- Seamless documentation and IT-based archiving of your templates

Three steps to your digital template

With the help of a calibrated digital camera, a reference measure and the innovative VirtualDigitizing software (which includes contour detection), you can convert any template/pattern/object into a DXF file within a very short space of time (< 5 min).

This allows templates/patterns/objects from a few millimetres to several metres in size to be simply, flexibly and rapidly digitised.

Image capture

Photograph the template you wish to digitise, including four reference points. These points with crosshairs form the basis for the exact calculation of the template. Plexiglas plates as well as standard paper sizes (DIN A4, A3, A2, etc.) can be used to provide the scale – making Virtual Digitizing also suitable for small measurements on construction sites.

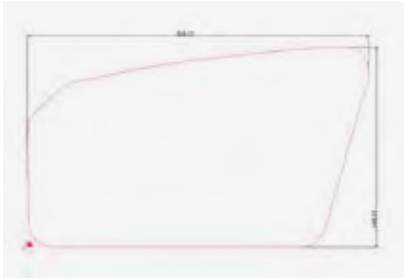
VirtualDigitizing

The digital image generated can be opened in the VirtualDigitizing software with a single click. Maximum ease of use means that the template edges can be defined manually or automatically beforehand, as can optional drill holes and cutout sections.

Digital template

VirtualDigitizing generates a high-precision, accurate DXF file that can be forwarded to all types of cutting equipment and to production immediately. Automatic contour smoothing means that no further editing is required before cutting. It can be used in all areas of production from the glass industry to water jet cutting.

Examples:





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