

# Engineering the Glass Age

Fast, Reliable, Efficient



Driven by Competence.  
Powered by Innovation.

**ISRA**  
VISION

# Expand the Limits of Quality of YOUR Glass Processing Cutting Edge Technology..... for YOUR Success

## Unique technology to meet highest quality demands

- Multi-mode, multi-view, multi-dimension technology  
... for highest efficiency
- State-of-the-Art lighting technology: from fluorescent to LED,  
up to 120.000 Cd/cm<sup>2</sup>, highest flash rates  
... to highlight all defects
- Latest, state-of-the art camera technology up to 12K/12 bit  
... to realize tiniest defects down to microns
- 640 MHz real-time processing performance  
... for precise classification
- Sophisticated software algorithms including advanced 2D/3D filtering  
... for best defect detection
- Image capture at 640 MHz bandwidth  
... for real-time results
- Multi-stage classifier engine  
... for validated results
- Reconfigurable FPGA processors  
... to ensure best performance
- Color processing in real-time  
... for evaluation of homogeneity and detection of low contrast defects
- Flexible architecture: from multiple views, merged views to moiré  
... unique performance
- Advanced optimization tools  
... to optimize production and ensure highest yield
- Over 100 standard components  
... to meet all specification needs
- Hybrid multi-processor systems with multi-core technology  
... to be ready for the future
- Complete turn-key, all-in-one systems  
... for highest quality demands
- Quality and yield management modules  
... for highest efficiency

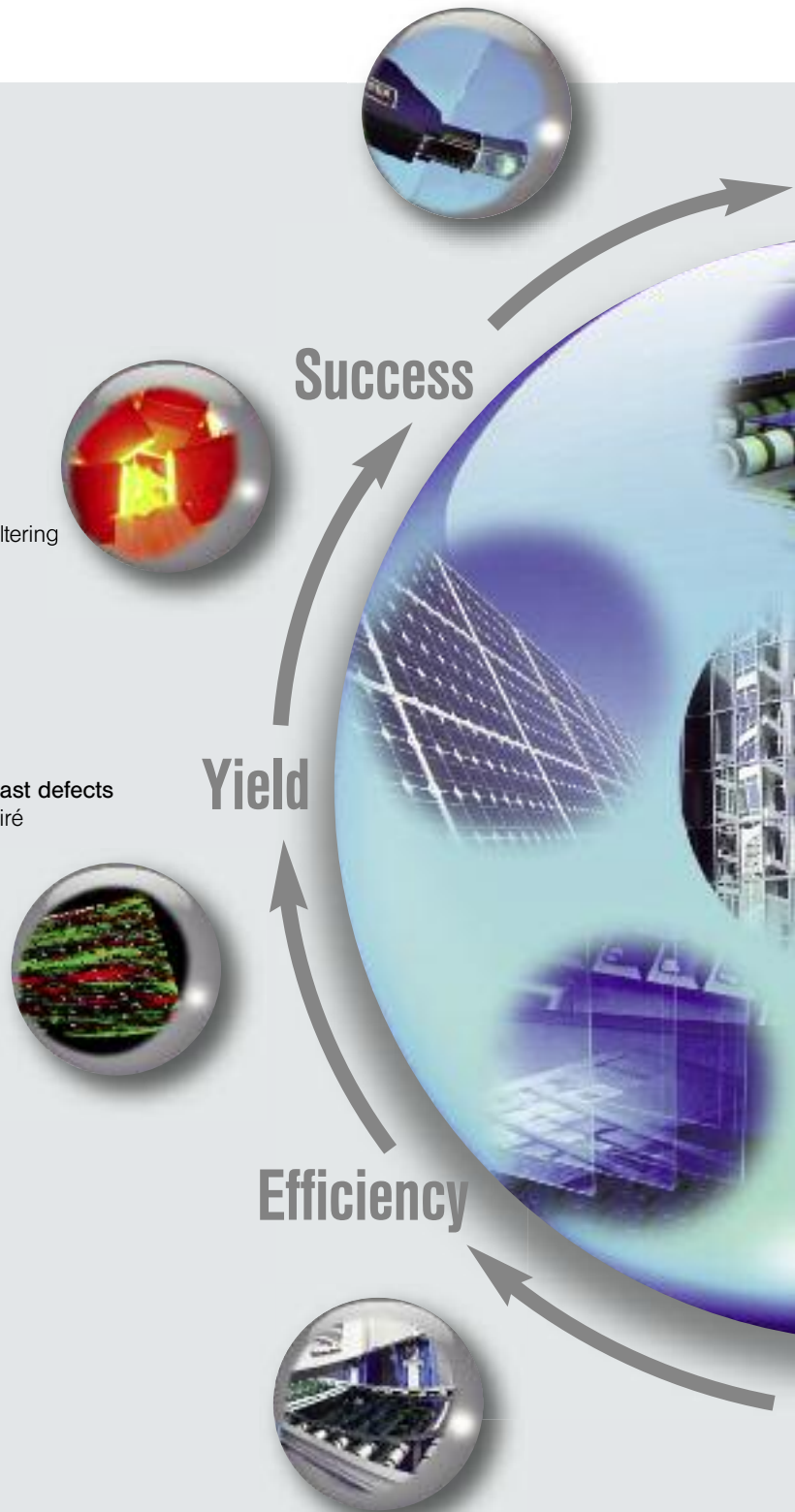
... and everything, for the future in glass processing.

**The best you can get.**

## Planned success – Global players already convinced

ASAHI +++ Cardinal +++ China Southern Glass +++ Daimler +++ Euroglas+++ Flabeg +++ Fuyao +++ Guangdong Float Glass +++Guardian +++ HanGlas +++ Kaveh Float +++ KCC +++ Korea Autoglass Corp. +++ Luo Yang +++ NEG +++ Nippon Sheet Glass+++ Pilkington +++ PPG +++ PT Mulia Glass +++ Rioglass+++ Saint-Gobain +++ Schott +++ Sekurit +++ Shandong +++ SISECAM +++ Splintex +++ Unitex Glass Ltd. +++ Weihai Blue Star +++ Yao Hua +++ Yaohua Glass +++ Zhejiang Glass +++ ... and more!

**Missed your name? Call us!**



# Future-Proof YOUR Production Quality

## Partner with the Leader in Global Surface Inspection

**NO.1**  
in Optical Glass  
Inspection

Leadership

Inspection

Gauging

Optimization

Quality

### Flawless glass products – guaranteed, no matter what kind of glass

A unique, proven, innovative and comprehensive portfolio of products for optical inspection of glass products, that can be applied to almost all production steps in the glass industry. These solutions, and the expertise to apply them, are available for everything from inspecting the glass ribbon through to the thinnest display glass; from completed windshields to complex coatings; even the 3D in-line inspection of curved mirrors and bent glass pieces. Our systems are relied upon at every step of the production process chain, not only for quality control, but also for a means of optimizing the processes themselves.

Today we focus on inspection and gauging applications such as

- Pattern inspection
- Edge inspection
- Defect detection
- Color inspection
- Silk-screen print inspection
- Coating inspection
- Size and geometrical control
- Thickness gauging
- Focal point measurement
- 3D form inspection
- Distortion measurement
- Lamination inspection

### The key objectives:

**Help make manufacturing both more productive AND cost-effective**

By employing the inspection systems, the tools for process monitoring and for yield optimization, not only are the defects detected, but also the solutions help pinpoint where and why the defects occurred. In this way, manufacturers are given important information enabling them to significantly improve their production and thereby achieve highest success.

- Improve quality with accurate and reliable defect detection
- Reduce manufacturing costs by increasing line yield
- Increase throughput, optimize production process
- Reduce process malfunctions and manual maintenance
- Validate against defined quality rules



# Unique Technology – The Key to the Future



## Advanced illumination techniques

to support all application needs. From metal halide illumination (HQI), fluorescent to ultra-bright, fast, switchable LEDs. No lighting demand stays open.

Some key data:

- Fluorescent: dimmable, 9300 lumen, 24000 hours operating time
- LED: flash-rates down to 500 nsec at 120.000 cd/cm<sup>2</sup>
- Multi-spectral



## State-of-the-art cameras

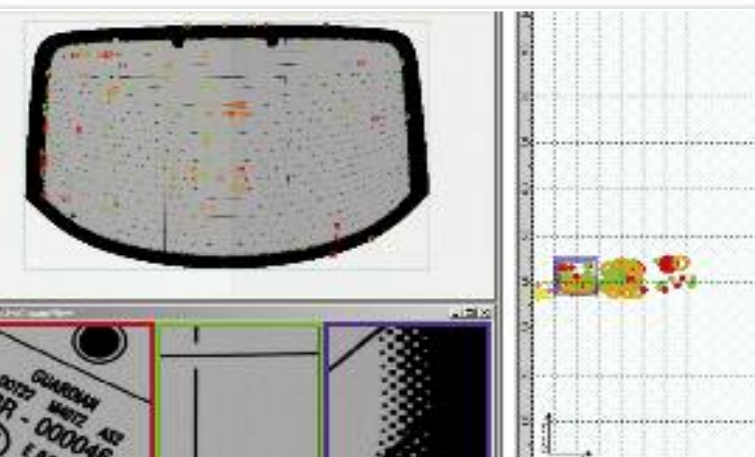
with up to 12k pixels, 12 bit resolution at highest data bandwidth for crystal clear surface images – in black and white, and color.

Key features:

- 640 MByte/sec data bandwidth
- Up to 12k pixel

## Hybrid multi-processor systems

based on multi-core and FPGA technology to ensure reliable detection results in real-time, including computing of 2D/3D filter algorithms to detect even pattern defects.

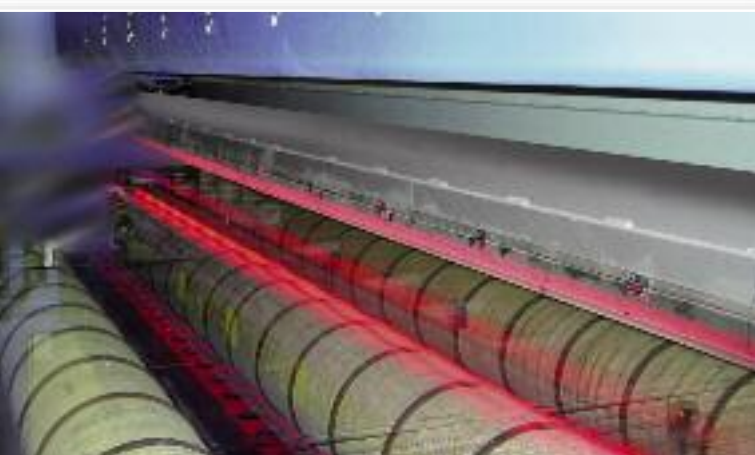


## Sophisticated software

Based on a standardized platform for best maintenance. Including configurable GUI's, calibration and service tools, advanced defect detection software, sophisticated learning classification, statistics and analysis, and process and yield management tools.

## All together ready-to-use and resulting in key application features such as

- Intuitive operation and easy-to-use
- Best performance in defect detection and classification
- Validated tools
- Efficient process optimization
- Highest quality and maximized yield



## TFT / super thin glass inspection at:

- 3000 mm inspection width
- 5 µm resolution
- 20 m/min line speed
- 8 bit b/w, 12k camera, 640 MPixel/s

## Ribbon and sheet glass defect inspection at:

- 2000 mm inspection width
- 0.1 mm resolution
- Highest line speed
- 8 bit b/w, 8k camera, 640 MPixel/s

# In-line Glass Inspection Solutions ...



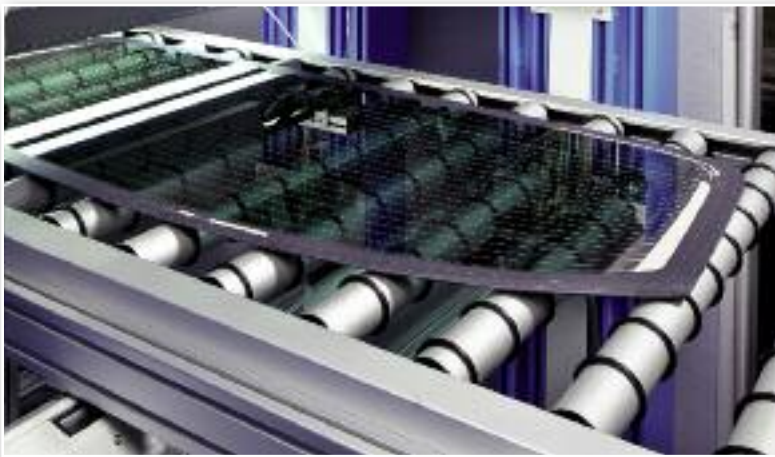
## Float glass inspection

- Real-time defect detection and discrimination
- Point defects and core size measurement
- Reflected and transmitted distortion
- Tiny tin defects
- Coating defects
- Thickness, stress, and width measurement
- Quality and yield management information



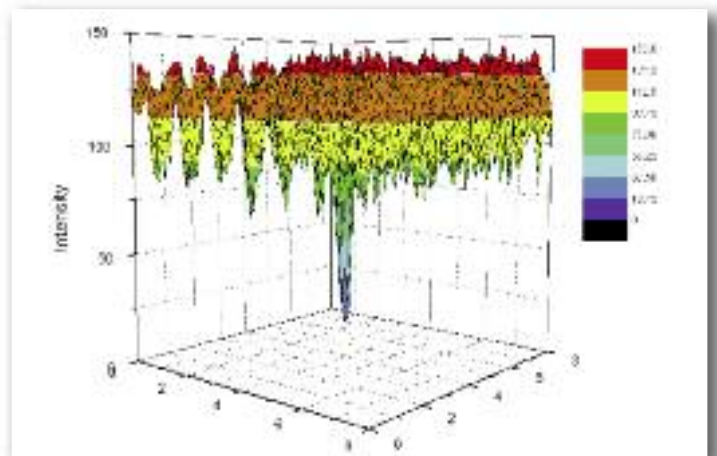
## Sheet glass inspection

- Surface defects
- Coating defects
- Distorting defects
- Edge defects
- Shape defects
- Multiple batch and position

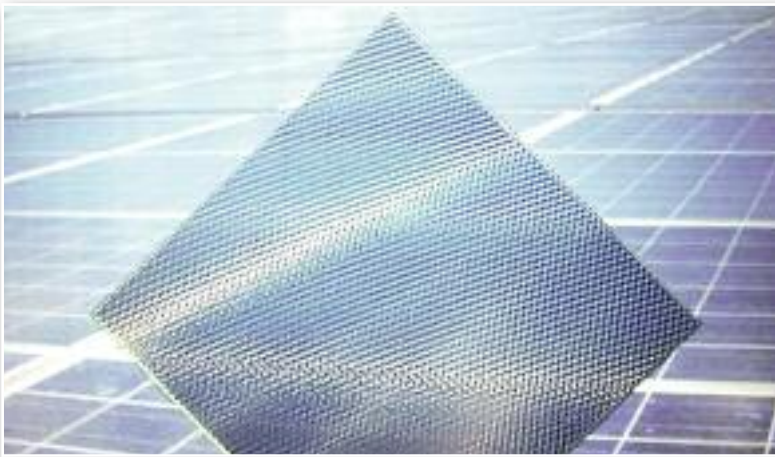


## Automotive glass inspection

- Complete 3D form
- Reflected and transmitted distortion
- Scratches and light-scattering defects
- Distorting defects
- Absorbing defects
- In-line silk-screen print defects
- Edge defects



# ... Along the Whole Production Chain



## Pattern and solar glass inspection

- Glass and structure defects
- Position, rotation, format
- Edge and shape defects
- Advanced quality grading
- Trend data and evaluation
- Extensive quality reports



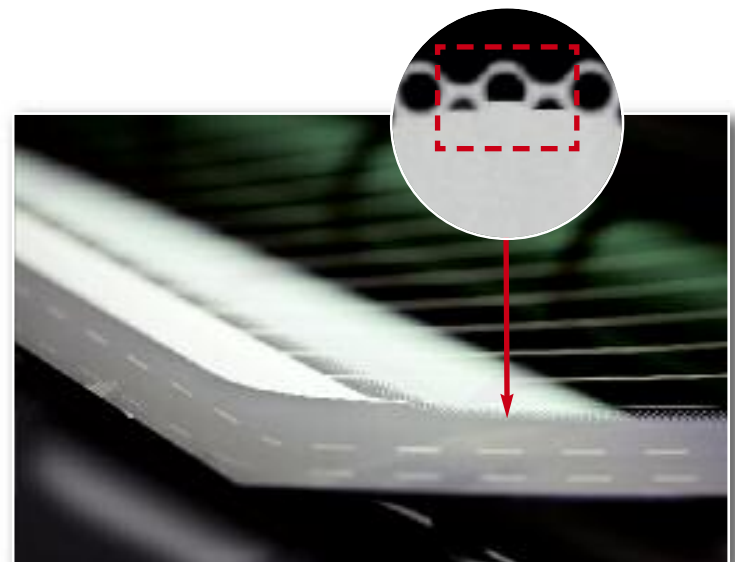
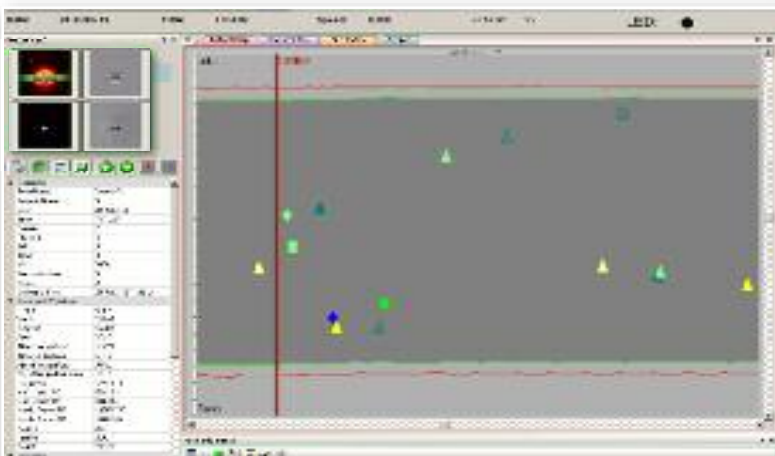
## Super thin glass inspection

- All-in-one camera system design
- Multi-view, multi-mode LED illumination
- Combination of 4 inspection tasks in one sensor:
  - Particle detection
  - Defect detection
  - Edge quality detection
  - Size measurement
- Zone display
- Quality grading



## Tube glass inspection

- Complete monitoring of product quality
- Earliest possible detection of process irregularities
- 100% robust defect detection and classification
- Real-time evaluation
- Alarm and sorting signals



# Detect the Defects

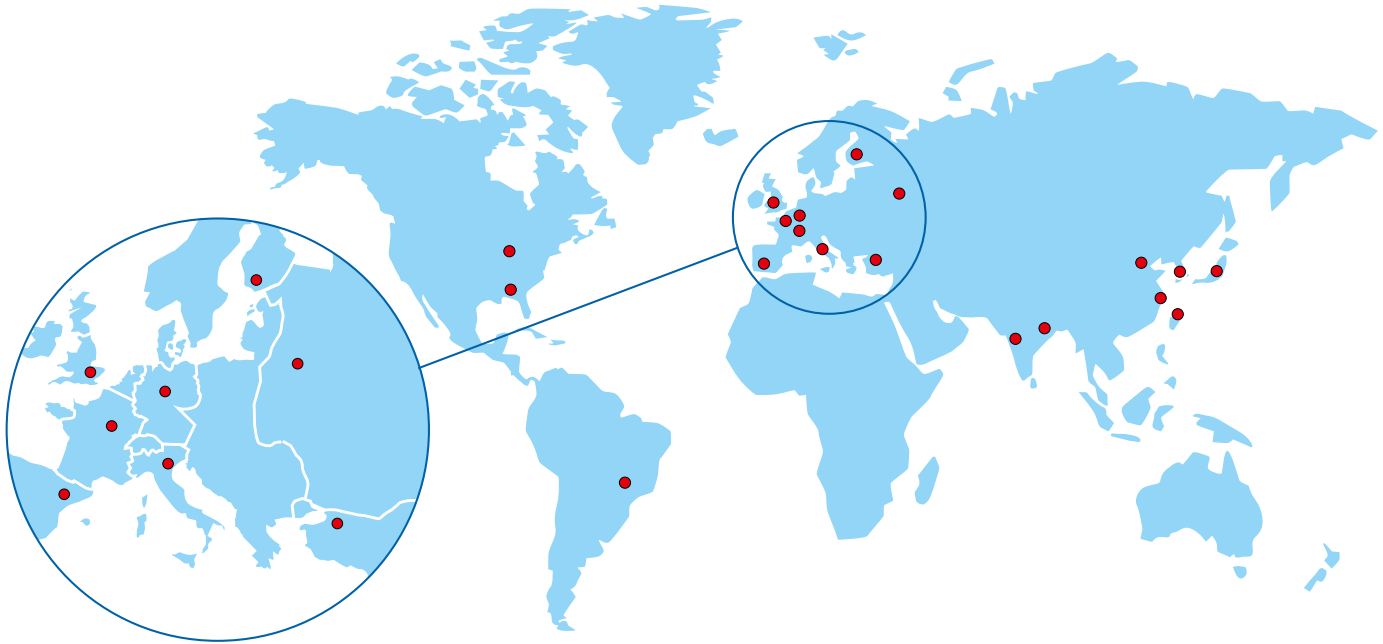
... Before YOUR Customer Does!



**Beyond  
Inspection**



# Innovations for Automated Optical Inspection of Glass



**We are the innovators in optical inspection.  
Best practice. Best system. Best service.**

For over two decades, ISRA VISION has become a leading manufacturer of highly accurate automated optical quality inspection systems.

More than 10,000 successful applications attest to our experience in the field of machine vision products – and our ability to innovate.

Today our products are installed and operating worldwide in such industries as solar glass, glass, plastics, foils, packaging, print and automation. It is our goal to set system standards for total process control in these industries.

Customers choose ISRA for the ability to develop products consistent with their requirements. More than 600 employees at locations worldwide are working to contribute to your success.

**Your global partner for surface inspection.**

We offer our experience and a highly qualified team of experts to design and implement solutions for advanced applications.

We assure that our mission continues beyond our shipping dock. Just challenge our Customer Support Center.

We guarantee excellence to our customers – from consulting to service, from tailored solutions, to worldwide support. We can make your business more competitive.

**Challenge us.  
Inspect to control – with ISRA VISION**

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The More You See...

