



Nickel sulfide inclusions:
Invisible danger, early control.

NiS Scanner



No.1 in Glass Inspection

When a Microscopic Inclusion Becomes a Business Risk

Nickel sulfide (NiS) inclusions are already present in the raw glass. During thermal tempering, their structure changes, which can later trigger spontaneous breakage in tempered safety glass (TG).

In facades and other safety-critical applications in particular, this creates considerable risks: unplanned replacement costs, time-consuming complaints, production downtime and open liability questions.

Today's Inspection Route: Late, Energy-Intensive and Costly

In the heat soak test (HST), glass that has already been expensively tempered is heat-loaded again for several hours. The aim is to ensure critical panes will break while still at the manufacturer's site. By that point, a substantial share of the added value has already gone into the glass. For your production, this means:

-  **Additional energy consumption** for thermal testing
-  **Long lead times** and additional logistical effort
-  **Manual process** instead of fully automated production
-  **Costs** for glass loss, cleaning and re-production
-  **Risk** of further high-value panes being damaged when one breaks
-  **Enormous costs** for re-manufacturing tempered glass panes

Detecting NiS Before the Glass Is Tempered

The Viprotron NiS Scanner inspects washed float glass before thermal tempering. Potential nickel sulfide inclusions are reliably detected optically, examined in detail and brought to a clear quality decision.

The high-precision scanner technology, operating in the micrometer range, is matched to equally precise conveyor technology. NiS inspection can therefore be integrated into the production process automatically, before further energy- and cost-intensive processing steps follow.

WASHING

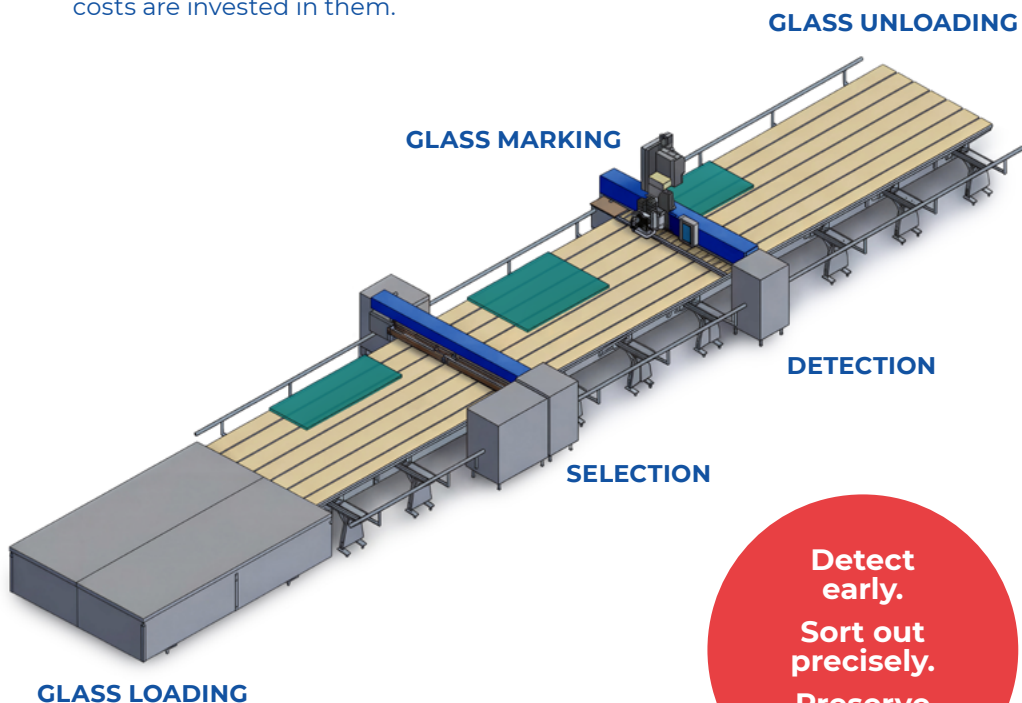
NiS SCANNER

TEMPERING

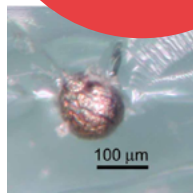
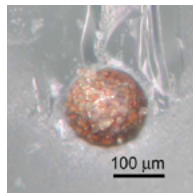
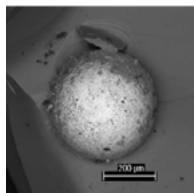
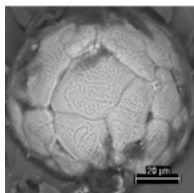
FURTHER PROCESSING

Quality Control Where It Makes Economic Sense

The NiS Scanner is designed for integration after washing and before thermal tempering. This helps you to identify potentially critical panes before further energy, production time and processing costs are invested in them.



**Detect early.
Sort out precisely.
Preserve resources.**



High-resolution nickel sulfide inclusions

Three Steps to an Early Quality Decision

1 | Select

A camera-based system analyzes the glass pane during horizontal transport and locates potential defect candidates.

2 | Identify

Suspect positions are then examined at high resolution in order to identify relevant nickel sulfide inclusions precisely.

3 | Assign & Mark

Each pane is given a DataMatrix code, through which the inspection result is documented and assigned to that specific pane.



Viprotron NiS Scanner

NiS Scanner Technical Specifications

Inspection principle: Optical detection without thermal stress

Detection range: NiS inclusions > 70 µm

Production direction: Horizontal

Glass types: Float glass, coated float glass

Coatings: Low-E, standard solar control coatings

More Process Reliability With Less Effort

The NiS Scanner detects critical nickel sulfide inclusions automatically before tempering. This moves the quality decision to an earlier production step – as the technical basis for less downstream thermal testing.

Your Concrete Benefits

- ✓ **Save the heat soak test:** The Viprottron NiS Scanner makes the classic heat soak test unnecessary. One NiS Scanner replaces up to four HST furnaces.*
- ✓ **Reduce multiple damage in the heat soak furnace:** When a pane affected by NiS breaks, at least three panes are usually rendered unusable – depending on how the breakage occurs, considerably more panes in a furnace batch can be affected.
- ✓ **Avoid expensive re-production:** Destroyed tempered glass panes have to be produced again completely – including cutting, edge processing, washing and renewed thermal tempering.
- ✓ **Cut energy, material and labor costs:** Every re-production consumes glass, machine capacity, working time and considerable amounts of energy in the tempering furnace all over again.
- ✓ **Reduce furnace cleaning and production downtime:** Glass breakage in the heat soak furnace causes additional cleaning work and can delay subsequent production.
- ✓ **Meet delivery dates more reliably:** Unplanned re-production and additional test runs lead to delays. Early NiS detection makes production and delivery easier to plan.
- ✓ **Avoid costs before they arise:** The NiS Scanner detects potentially critical inclusions before tempering – before further energy and added value are invested in the pane.
- ✓ **Reduce long batch processes:** Including the complete furnace cycle, the heat soak process takes around 8 to 16 hours and interrupts continuous production flow.
- ✓ **Integrate inspection automatically:** The horizontal inspection process enables a higher degree of automation and a clear, unambiguous assignment of a NiS inspection seal to each individual pane.

* The NiS Scanner is currently undergoing the approval procedure at the German Institute for Building Technology (DIBt). The aim is for glass inspected with the NiS Scanner to be treated as equivalent to a heat soak test (HST) carried out in accordance with EN 14179. Equivalence and corresponding marketing claims apply only once the general type approval (allgemeine Bauartgenehmigung, aBG) has been granted.

Developed on a Solid Base of Data

The NiS Scanner is built on more than ten years of research and development in cooperation with the Technical University of Darmstadt. Around 150 real nickel sulfide samples formed an exceptionally broad basis for developing and testing the technology. Research becomes industrial quality control!



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Your Partner for Predictable Glass Quality

Viprotron helps glass processors detect quality risks earlier and make their production more stable, more efficient and easier to document. German engineering, deep industry expertise and global service are the foundation for this.



Co-funded by
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on the basis of a decision
by the German Bundestag



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