Press information from Sensor Instruments

January 2021

Differentiating the tin side from the fire side in float glasses.

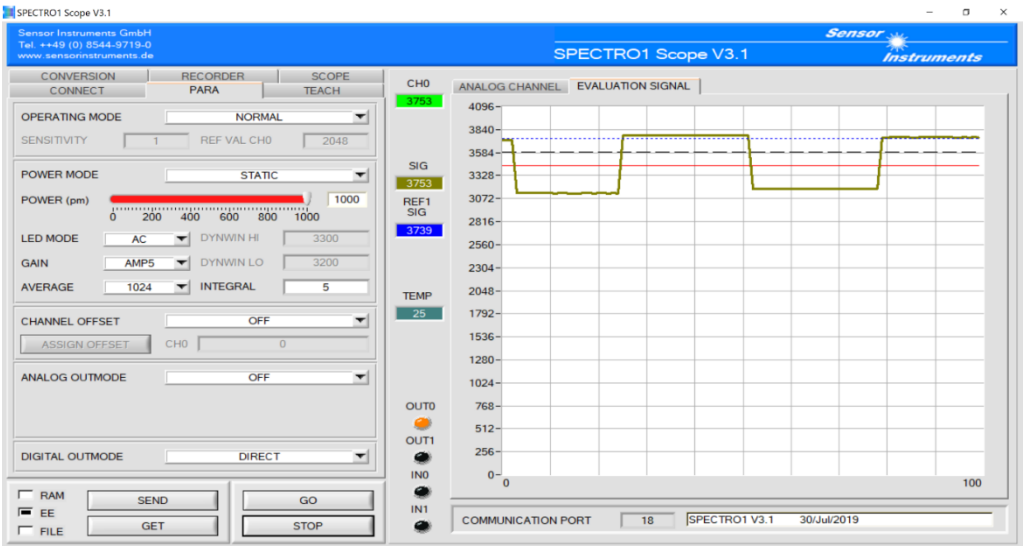
25/01/2021. Sensor Instruments GmbH: Float glasses develop their form, thickness and surface properties through the transport of the glass melt on liquid tin. The glass melt floats on the tin bath and develops a plane surface adapted to the tin bath (tin side). The glass surface facing away from the tin bath (fire side) is heated by a gas burner until a certain temperature profile develops so that the glass melt can cool gradually and thereby assume its later form.

When processing the float glass further, it is important to know where the tin side is located and where the fire side is located. Tin microinclusions can influence a number of issues such as the electrical resistance of the glass surface (the application of metal contact strips on a car rear window). It is also of decisive importance in other matters such as the application of further layers on the glass surface (e.g. nano layers) as to which side of the float glass is coated.

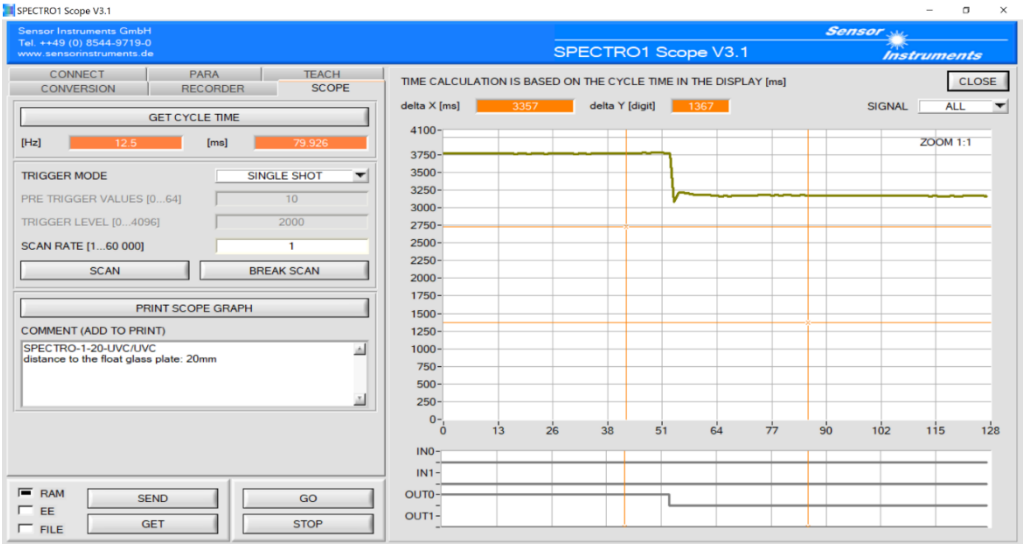
How can we differentiate reliably between the tin side and the fire side using optical means? The tin microinclusions on the glass surface facing towards the tin bath (during the production of float glass) influences not just the electrical resistance of the glass surface, but also results in a rougher surface with a lower gloss grade in comparison to the smooth glass surface polished by the gas burner on the opposite fire side.

How can this gloss grade be measured? Conventionally-available gloss grade meters cannot be used, as the white light used in these devices penetrates the float glass to be measured and the light is reflected from both sides of the glass. The measuring result cannot be assigned clearly to a single glass surface. The use of UVC light presents a remedy. Light in the deep UV wavelength range cannot penetrate glass and the reflection comes only from a single glass surface, thereby enabling clear assignment of the reflection.

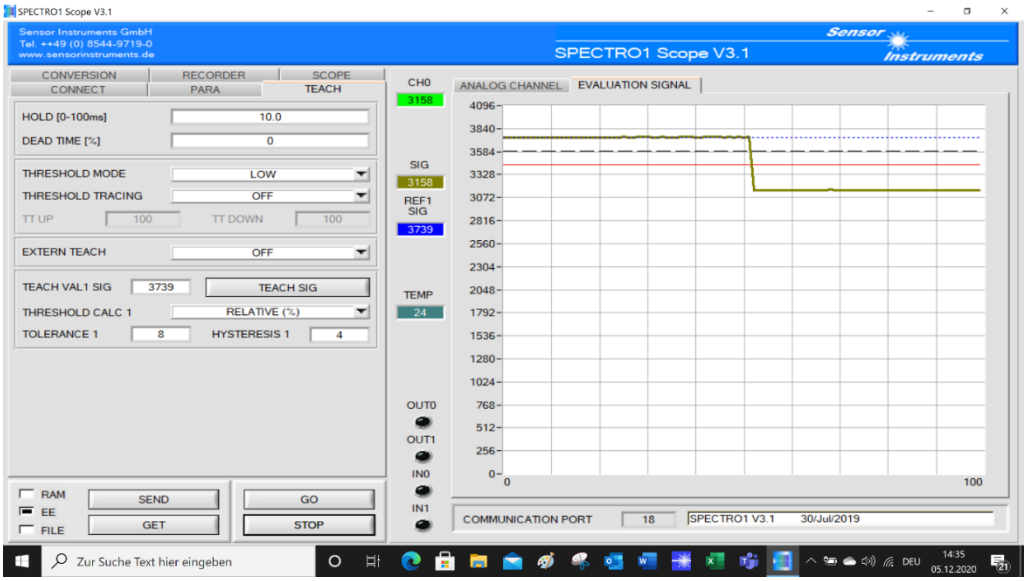
The **SPECTRO-1-20-UVC-DIL** UVC contrast sensor from Sensor Instruments GmbH permits control of the glass surface in terms of its tin or fire side. The distance to the surface of the glass is 20 mm. In addition to the digital outputs (e.g. fire side = 0V and tin side = +24V) the sensor is also fitted with an analogue voltage output (0V … +10V) and a current output (4mA … 20mA). USB, Ethernet and Profinet converters can be connected via the RS232 interface (provided by Sensor Instruments GmbH). The sensor is parametrized via the Windows® software. A monitoring software included in the scope of delivery enables continual recording of the measurement results on the PC; the trend of the measured values is displayed on the Windows® interface (GUI) in both graphical and numerical form.



Parametrization of the sensor via the Windows® - interface SPECTRO1 Scope V3.1

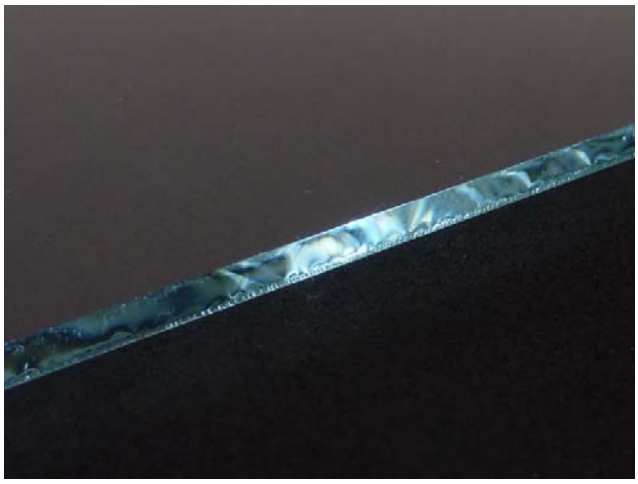


Sensor signal height on the fire side (left-hand section in the diagram): c. 3750, the digital output OUT0 = +24V and on the tin side (right-hand section in the diagram): c. 3200; the digital output OUT0 = 0V



Setting the switching thresholds and the switching behavior via the Windows® - interface SPECTRO1 Scope V3.1

SPECTRO-1-20-UVC-DIL sensor, aimed at the fire side of float glasses from a distance of 20mm


Float glass with a thickness of 3.5mm

SPECTRO-1-20-UVC-DIL sensor, aimed at the tin side of float glass

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