



• **SiBrickScan (SBS)** Oxygen Analysis in Silicon Ingots

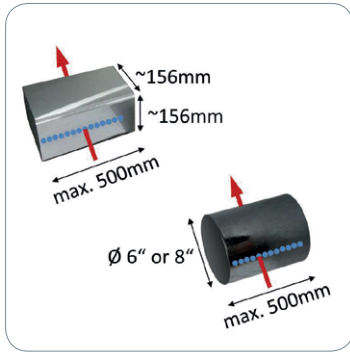
SiBrickScan (SBS) is a dedicated at-line system for the FT-IR quantification of interstitial Oxygen in complete Silicon ingots, resulting in a concentration profile along the longitudinal axis. Accessing this information without sawing wafers or test samples is a major and cost saving advantage.

- SBS version for 156x156 mm² square PV Si ingots
- SBS versions for 6" or 8" cylindrical ingots
- Industry compatible and robust design
- Intuitive and comfortable user interface
- Automated data evaluation
- Robust & precise linear drive
- Innovative high sensitivity beam path with included reference sample
- Liquid N₂ free infrared detector

Interstitial Oxygen quantification by FT-IR spectroscopy (ASTM/SEMI 1188) is a well-known and important analysis method, but limited to thin Si samples in the low mm range. SiBrickScan (SBS) overcomes this limitation and is the first commercially available system to determine the Oxygen gradient in complete ingots along their major axis without the need of time-consuming and destructive thin sample preparation. SBS makes smart use of a related infrared overtone absorption band combined with reliable and state of the art Bruker technology.

Get Valuable Information to Check and Optimize Product Quality:

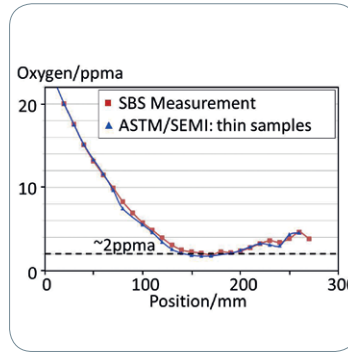
Knowing the Oxygen gradient of Si ingots enables important conclusions helping e.g. to control and optimize the Silicon crystallization process or to identify batches of bad raw material. Therefore SBS will help to save costs by optimizing product quality and reducing the amount of defective wafers. The random sampling of individual ingots does strongly reduce sample preparation efforts and provides relevant information much earlier.



Three different SBS versions are available for square standard PV ingots or for cylindrical ingots with either 6" or 8" diameter.



SBS loading doors are secured via interlock and can be widely opened to provide comfortable access for sample loading.



SBS results correlate perfectly with quantification according to ASTM/SEMI 1188, proving the accuracy of SBS analysis.

Dedicated SBS Versions for Different Ingots:

Choose your dedicated SBS version for square PV ingots, cylindrical 6" or 8" ingots. The ingot surface must be dry and free of oil and dust with a roughness of $\leq 10 \mu\text{m}$. For cylindrical ingots a possible metalized outer skin or thickness variations must be removed by grinding/polishing before analysis.

High Sensitivity and Accuracy:

For good quality ingots detection limits $< 2 \text{ppma}$ can be achieved and almost perfect correlation with ASTM/SEMI 1188 proves the high SBS accuracy. Depending on the individual production process, close to the impurity rich end of the ingot the quantification might not be possible. Contact your local Bruker representative to find out more.

Resolve the Oxygen Gradient by FT-IR Transmission:

In square PV ingots Oxygen can be quantified with lateral resolution of $\sim 12 \text{mm}$, well suitable for typical gradients. The lateral resolution for cylindrical ingots is $\sim 25 \text{mm}$ and can be optionally improved to $\sim 12 \text{mm}$.

Ease of Use and Reliability:

After manual ingot loading (e.g. via the customers lifting gear) and measurement start, the measurement procedure including ingot positioning and data evaluation is executed completely automatically. The analysis time is approximately 1 minute per measuring point on the ingot.

Satisfied SBS Customers:

Satisfied customers such as the well-known German photovoltaics manufacturer SolarWorld benefit from the added value provided by SBS ingot analysis.

Comfortable Analysis:



The intuitive graphical user interface is easy to use and optimized for the industrial environment. Simply load the ingot, choose the desired analysis recipe and start the measurement.



Robust mechanical stops (here: for square ingots) and a precise linear stage ensure the X-positioning accuracy of the ingot. For all SBS versions (square or cylindrical ingots) the support area is realized such that slipping or rolling of the ingot during the measurement is not possible.

Technologies used are protected by one or more of the following patents:
US 7034944; US 5923422; DE 19704598

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