LAYERWATCHER®

YOUR NON-DESTRUCTIVE PREFORM LAYER INSPECTION

Stop cutting and delaminating your preforms for the quality control of your barrier layer. The LayerWatcher® by INTRAVIS has been developed to inspect preform layers in an objective, quick and non-destructive way. Its game-changing measuring technology provides an indispensible tool for your quality inspection.

Focus on preform layers

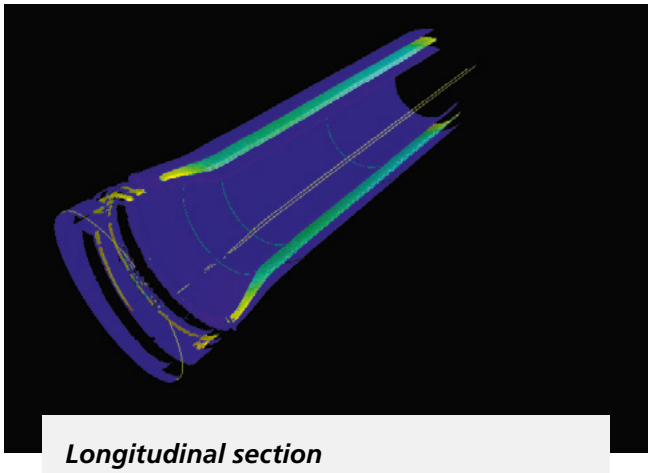
PRECISE LAYER MEASUREMENT

During the production of preforms, the quality management is an important task with different obstacles to overcome. One of the biggest is the inspection of invisible barriers within preforms. Up to now, the layer of preforms could only be measured manually and in a destructive way, which destroys the sample and provokes several errors and inaccuracies.

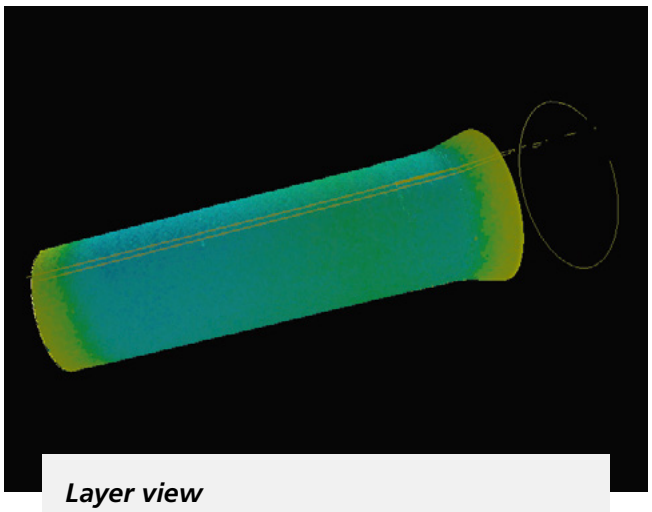
INTRAVIS took the challenge to develop a multi-layer preform measurement and inspection station that would be capable of measuring and reporting the position and distribution of core layer material in a non-destructive way.

The result is the LayerWatcher®, an offline inspection system for preforms. The LayerWatcher® measures the thickness and presence of different layers in clear and translucent preforms, doing this optically and thus non-destructively.

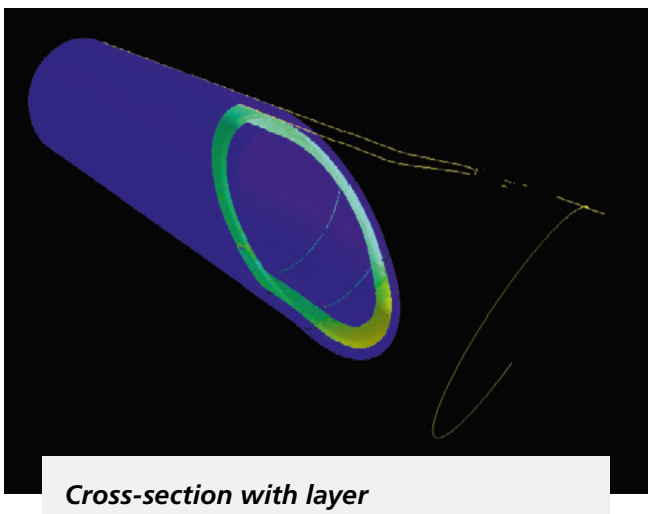
LayerWatcher®



Longitudinal section



Layer view



Cross-section with layer

INNOVATIVE MEASURING TECHNOLOGY

The LayerWatcher® is able to measure all layers of the entire preform thanks to its revolutionary OptoSonix® scan technology. It identifies the layers by their different optical characteristics.

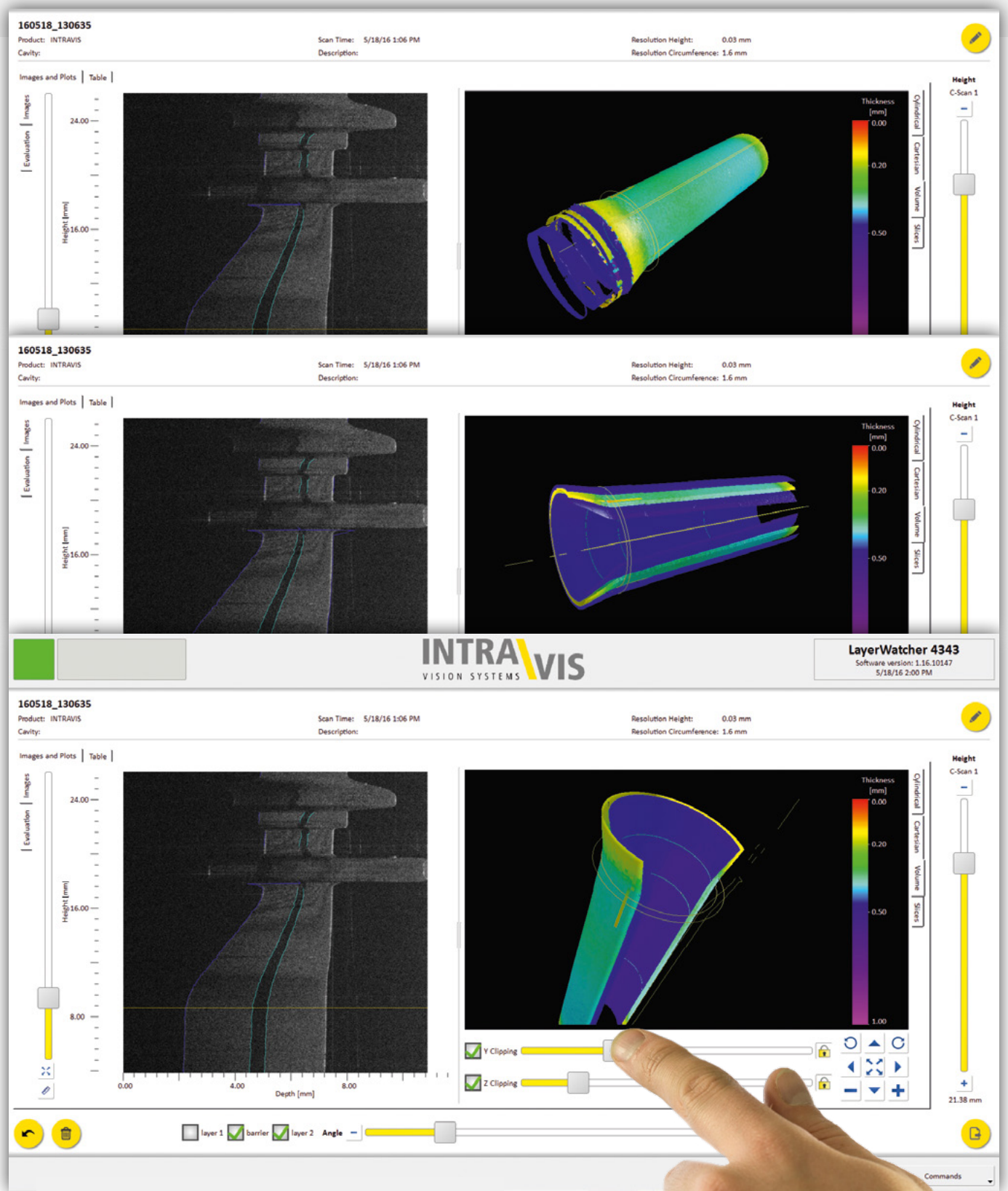
The measuring results are an accumulation of thousands of point positions within the preform layers. These positions have a minimum grid step of 0.2 mm and thus create a dense mesh that indicates the layer thicknesses. For layer thicknesses of at least 50 µm (micron) the LayerWatcher® has a measurement accuracy of +/- 10 µm.

In a second step, the data is processed and compressed into few clear parameters defining the characteristics of the layers: Where does the layer start? Where does it end? How thick is it in certain areas? According to these characteristics, the user can re-adjust the production process and define limits.

EASY USE

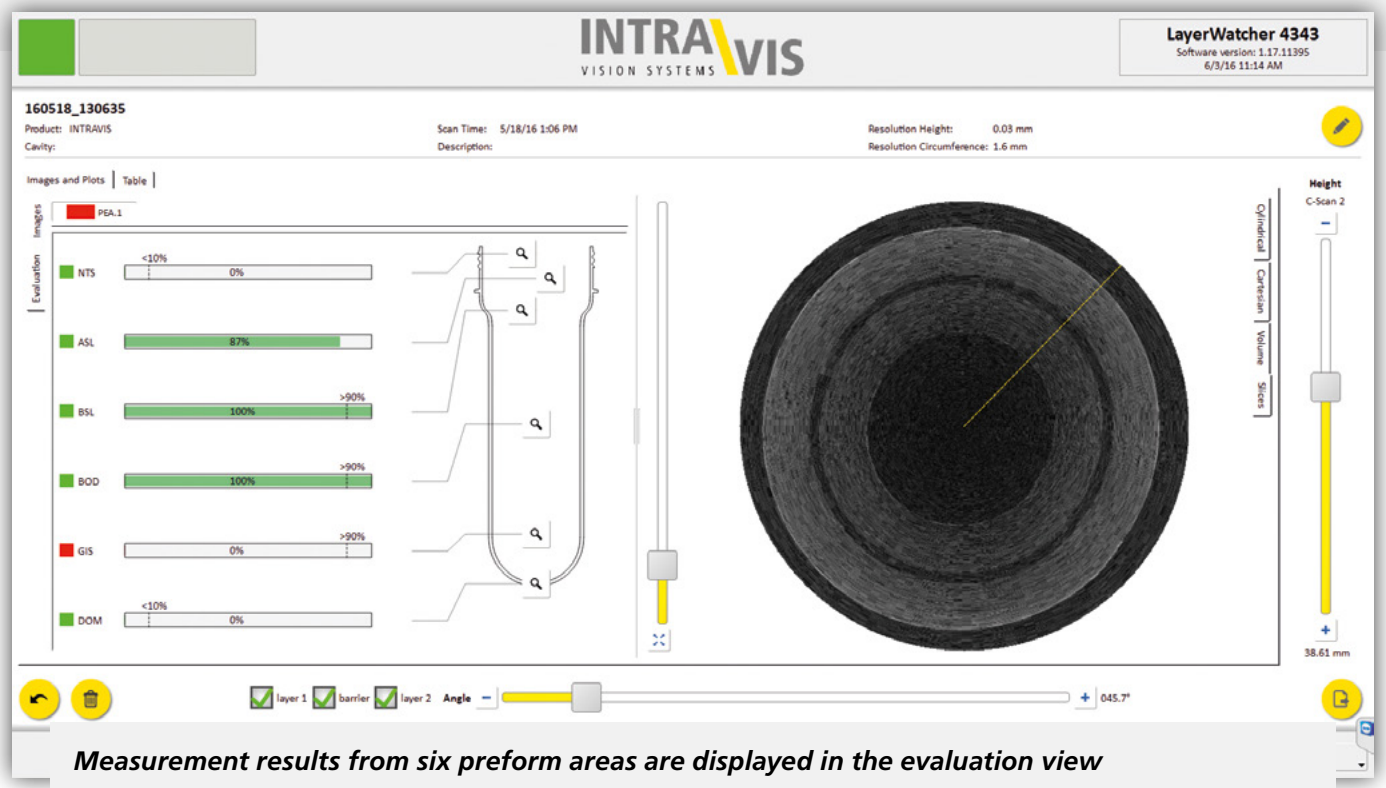
A set of preforms (e.g. a complete quality shot from production) is placed in the included bunker. The preforms are then transported, oriented and fed into a pocket wheel where each preform automatically is identiefied by its cavity number. Further, a mechanical handling grabs each single preform and will lead the preform to the measuring head where the inspection is carried out. Afterwards, the software processes the gathered image data and saves the measurement results for each preforms. The inspected preform is then ejected into the good part or bad part box, depending on the inspection result.

The intuitive light concept with colored light inside the inspection area indicates the current processing status: Green indicates operational readiness, Yellow the measuring mode and Red signals an alarm whereas Blue indicates a reference run, Cyan the preparation for operation and White signals an open door.

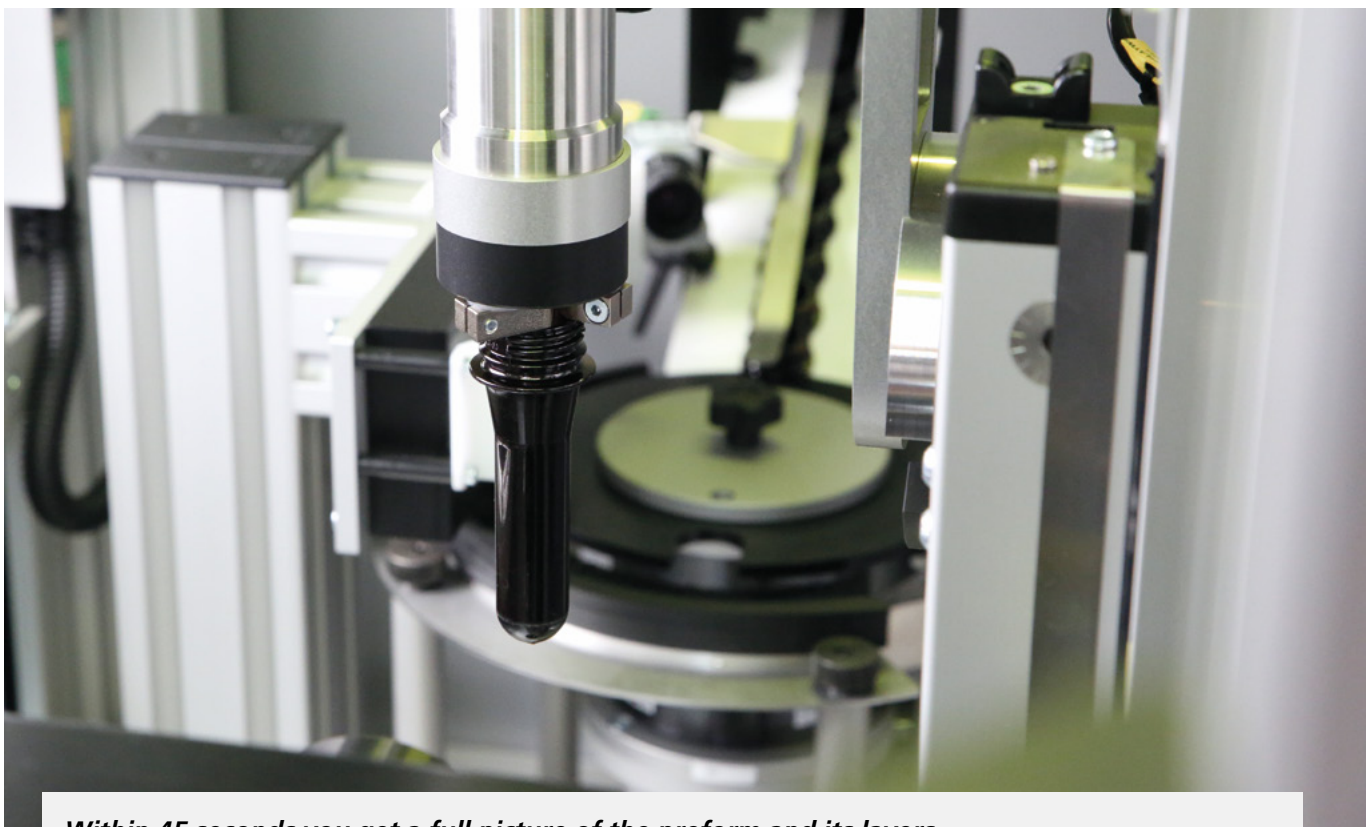


Easy and comprehensive interactive use

LAYERWATCHER®



Measurement results from six preform areas are displayed in the evaluation view



Within 45 seconds you get a full picture of the preform and its layers

SPECIFICATION FOR BARRIER DETECTION

A) Quantitative assessment of barrier layer thickness and radial placement as a function of axial distance from the top sealing surface (TSS) and the angle of rotation within the preform.

The 3D-barrier layer thickness distribution is captured in XML-format and retrievable on demand from the LayerWatcher®. Radial Coordinates of outer and inner PET envelope of preform (optical distance).

Resolution:

- For layer thicknesses of at least 50 µm the LayerWatcher® has a measurement accuracy of +/- 10 µm.
- 0.2 mm or better resolution of positional measurement of barrier layer characteristic (measurement grid density)

B) Key Barrier Quality Parameters. The vertical positions of the following measurements can be adjusted individually (marked by the **x** on the right hand illustration).

I. Inspection for 0 % coverage (Y/N) at:

- xNTS (Near Top Sealing Surface)
- betaDOM (Dome area for non-encapsulated barrier layer)

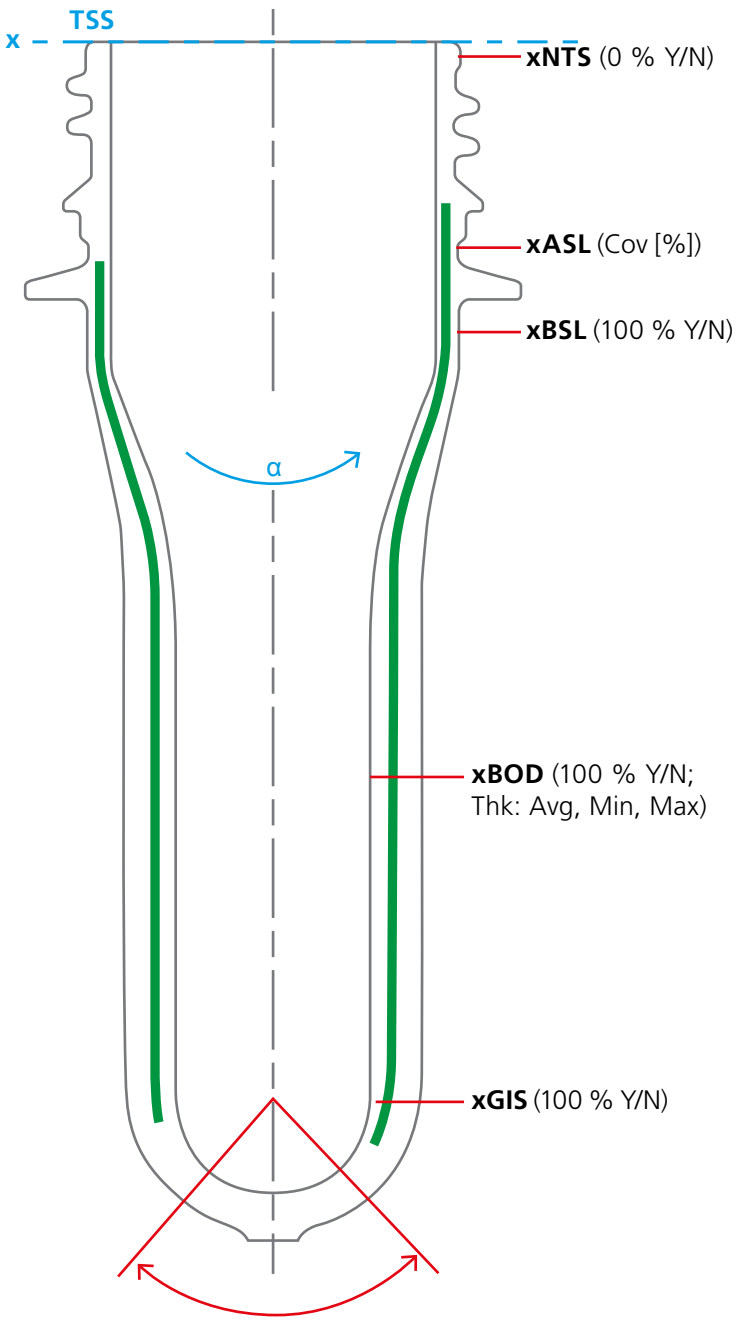
II. Inspection for 100 % coverage (Y/N) at:

- xBSL (Below Support Ledge)
- xBOD (Middle of Body)
- xGIS (Gear Gate Insert Split Line)

III. Coverage (%) at:

- xASL (Above Support Ledge)
- xBOD (Middle of Body)
- xTBDi (up to three additional user-defined axial positions)

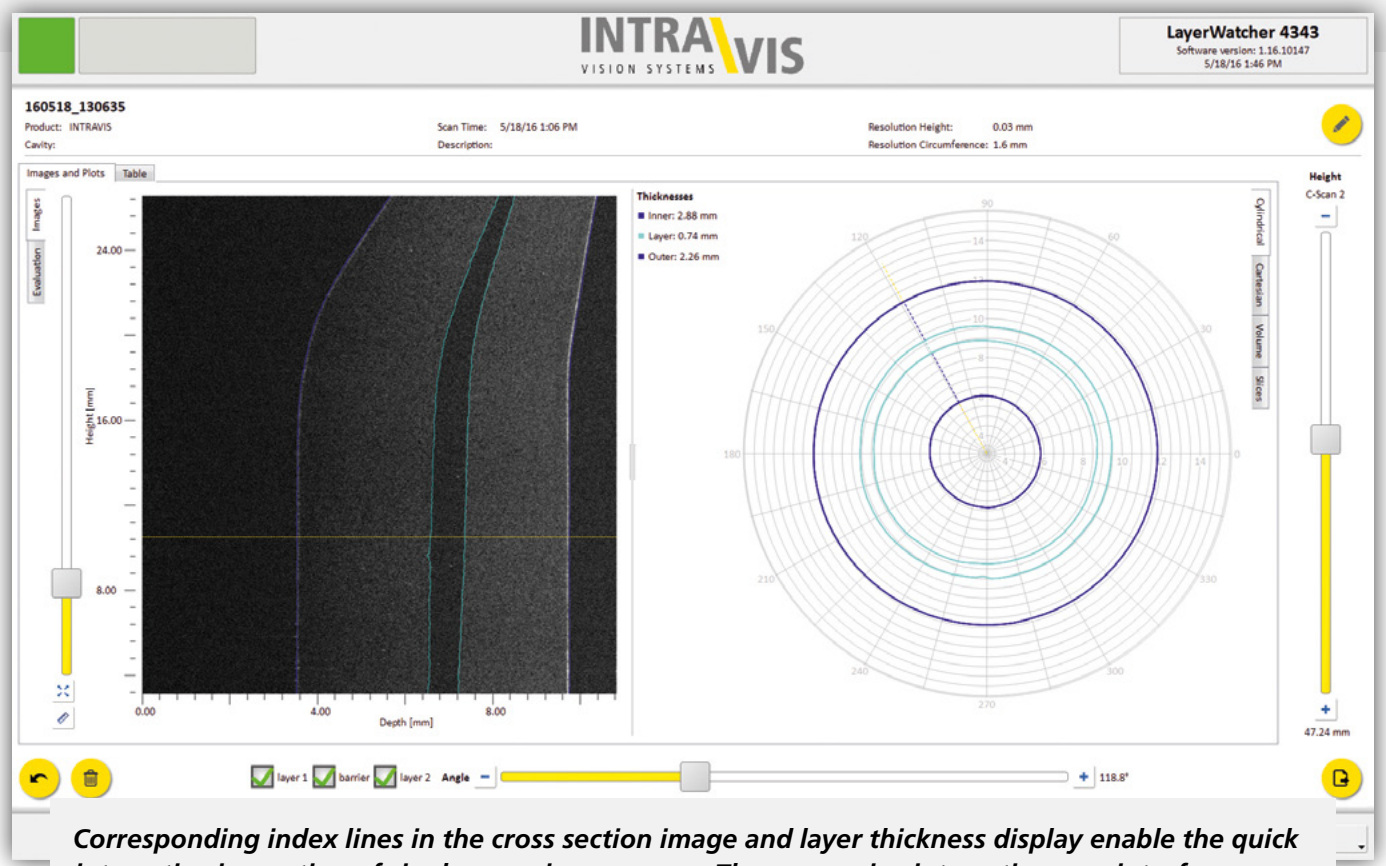
IV. Quantitative assessment of barrier layer thickness around the circumference at distinctive radial cross-sections:



- xBOD (Middle of Body): Avg, Min, Max around 360° circumference
- at up to 3 xTBDi other locations specified by user: Avg, Min, Max

LayerWatcher®

The measuring process is performed with the innovative OptoSonix® technology



Corresponding index lines in the cross section image and layer thickness display enable the quick interactive inspection of single conspicuous areas. The responsive interactive user interface provides a precise and quick overview

INSPECTION SPEED

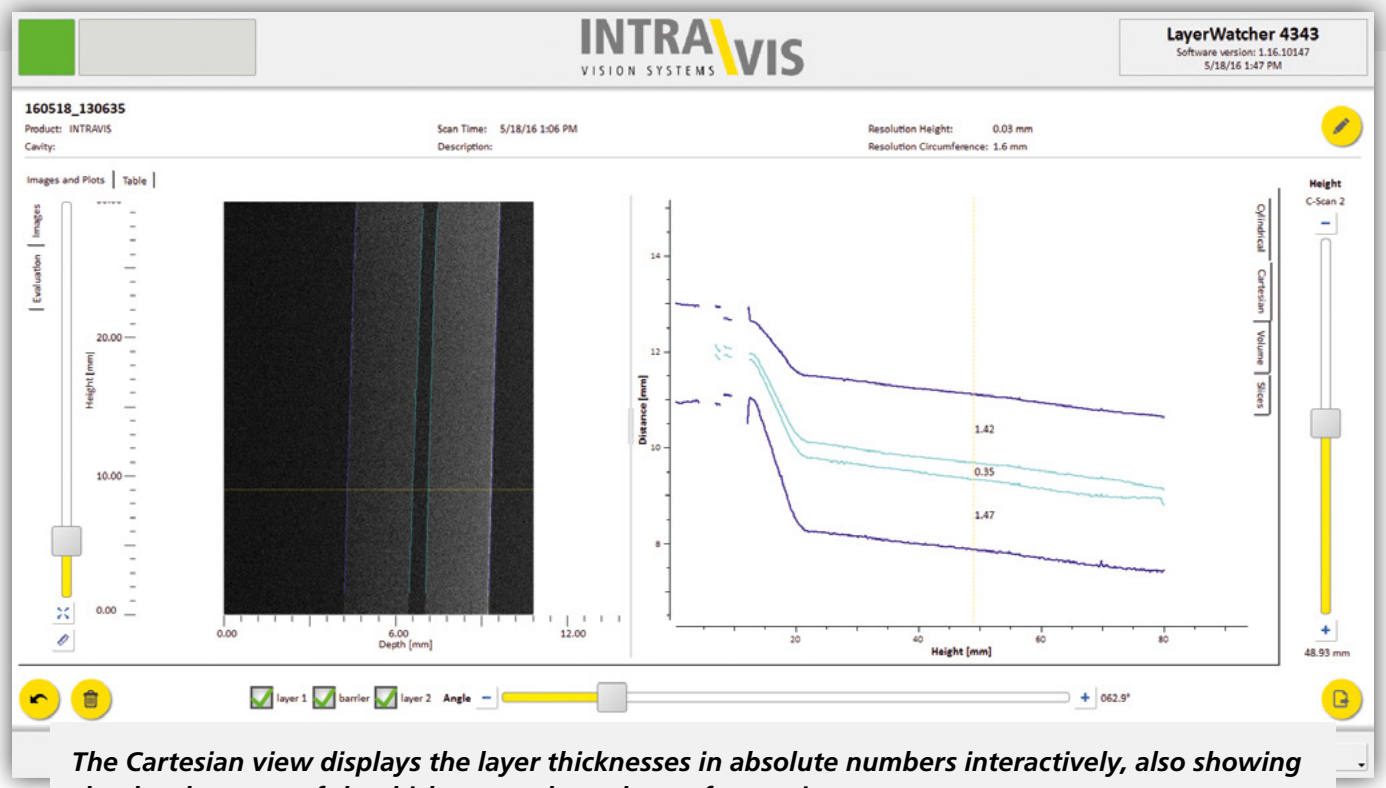
The inspection speed is 45 sec. / preform. The measured data is immediately displayed on the screen.

COMMON BARRIER/LAYER MATERIALS

The LayerWatcher® inspection technology is designed to inspect preforms of PET (polyethylene tereph-thalate), either monolayer (PET throughout the wall) or multi-layer with external (skin) layers of PET, making up outer and inner dimensions of the preform and one middle layer (core or barrier) of a barrier material.
PET may be any of the commercially available grades, high or low IV, homopolymer or copolymer.

Inspected common barrier materials include:

- Nylon MXD6 (from Mitsubishi and other suppliers)
- Honeywell Aegis® BarrierPro2
- EMS Chemie Grivory®
- Valspar ValOR®
- Amosorb™



The Cartesian view displays the layer thicknesses in absolute numbers interactively, also showing the development of the thicknesses along the preform axis

YOUR ADVANTAGES

- **Non-destructive** inspection method
- Find layer defects with an **objective and repeatable inspection** for presence and thickness of layers in **clear and translucent preforms**
- Intuitive **3D layer visualization**
- Inspection results of up to 100.000 location points within **45 seconds** (per preform)
- High precision layer inspection due to OptoSonix® Scan Technology
- Automatic **cavity number identification** for statistics and inspection reports of each preform
- **Automatic, exportable quality reports** with relevant data for every preform

WWW.INTRAVIS.COM

WE SOLVE PROBLEMS.
BEFORE THEY OCCUR.