

PETWall Profiler®

Agr®

Material Distribution Management System



In-the-Blowmolder Wall Thickness Profiling System for Statistical Process Control of Production

- On-line process monitoring with laboratory accuracy
- Sidewall thickness, profile monitoring to facilitate lightweighting
- Immediate, easily understood operator feedback
- Preventive maintenance and diagnostic tool for the blowmolder
- Compatible with Process Pilot® closed-loop software

PETWall Profiler® System

The PETWall Profiler® in-the-blowmolder material distribution management system offers the most comprehensive method for wall thickness measurement and blowmolder performance monitoring available today.

The PETWall Profiler® system, with its comprehensive measurement approach, provides a complete understanding of the bottle, including the base and finish areas. With this knowledge, container performance factors are continuously monitored on a per bottle basis. Given the close correlation of thickness distribution to section weight analysis, the implementation of a PETWall Profiler® system in a blowmolder eliminates the need for inefficient section weight analysis activities. Because the PETWall Profiler® system identifies small changes in material distribution that affect bottle performance, it offers manufacturers the ability to proactively manage the production process to a very fine degree, making it possible to eliminate distribution-related defects altogether.

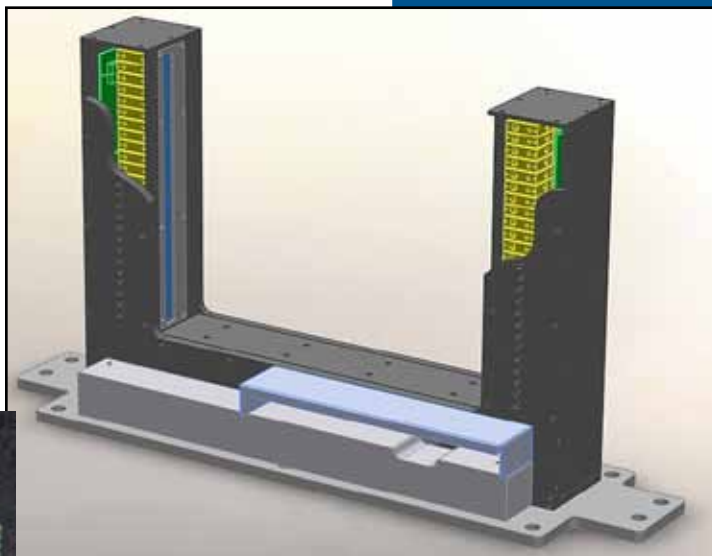
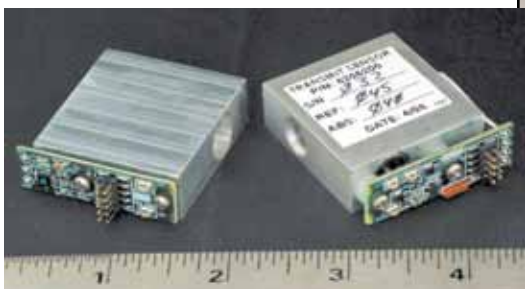
Total Sidewall Thickness Profile

The PETWall Profiler® system eliminates the measurement location issue with its unique total sidewall "profile" approach to distribution monitoring. LED based, miniaturized sensors permit configurations of up to 32 measurement locations depending on the size and shape of the container.

Sensors on the PETWall Profiler® system are positioned in a hermetically sealed, compact measuring unit that fits neatly inside of two-stage blowmolders. The symmetrical orientation and close proximity of sensors permits the PETWall Profiler® system to effectively track and monitor material shifts throughout the sidewall. This combined with a per bottle sampling rate of over 1000 measurements for each sensor, permits detection of even the slightest material movement.

On-Line Operation with Laboratory Precision

The PETWall Profiler® system incorporates a patented LED light technology for thickness measurement that offers low energy consumption, long life, and unprecedented measurement accuracy, rivaling results found in laboratory-based systems. Based on Agr's proven IR absorption measurement method, highly accurate and repeatable thickness measurements can be performed at production speeds on PET containers, regardless of shape, design and color.



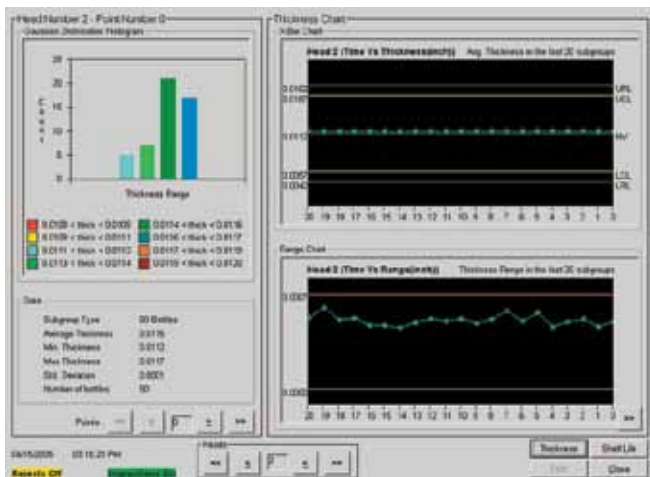
The PETWall Profiler® system is protected by one or more of the following approved or pending U.S. patents or foreign counterparts thereof: 6863860, 6985221, 7253892, 7378047, 7374713, WO-2008/027569

- Monitor material distribution changes anywhere on the bottle
- Improve blowmolder management and monitoring capabilities
- Reduce blowmolder downtime
- Proactively manage lightweighting projects
- Save energy and utility costs
- Dramatically reduce held product, scrap, and regrind

30%+ improvement in accuracy and repeatability over previous systems

Providing Critical Information

The PETWall Profiler® system provides a wealth of information that can be used to improve blowmolder efficiency and facilitate enhanced process management on a daily basis.



For Process Management

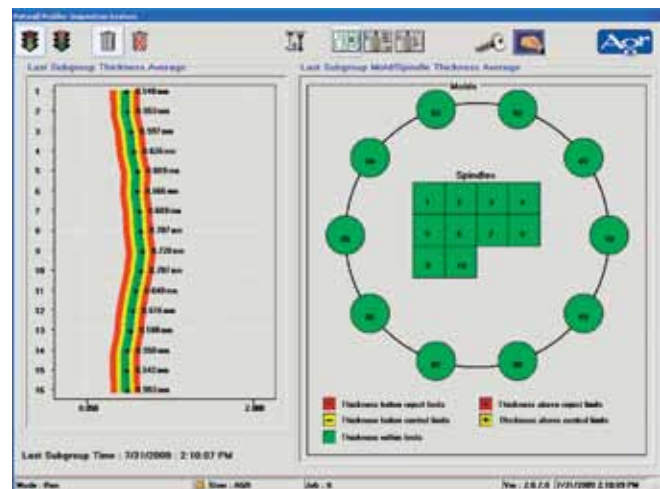
The PETWall Profiler® system provides shortened reaction time for detecting and solving production problems. Whether at setup and job change or during on-going production, the PETWall Profiler® system provides valuable, real-time feedback on the status of the blowmolder and the quality of every bottle including:

- Continuous feedback on thickness distribution
- Real-time data communication with blowmolder controls and other devices
- Multi-point feedback of material movement over the bottle sidewall
- Mold and spindle correlated thickness data
- On-going process reports identifying status and trends
- Seamless integration with Agr's Process Pilot™ closed-loop control software

For Blowmolder Management

The PETWall Profiler® system gives operators with varying levels of knowledge and experience a common tool that can be used to provide immediate feedback for blowmolder adjustment and management. Operators can see results to all blowmolder adjustments within seconds, leading to more efficient operation and reduced costs. In addition, the PETWall Profiler® system provides:

- Visual indications to help locate sources of problems
- Immediate feedback when a correction is made
- Reduced setup time and troubleshooting for job changes
- Faster learning curves for blowmolder operators
- Reduced scrap due to job change and routine operational adjustments
- Accelerated blowmolder troubleshooting
- Proactive management, eliminating rework and scrap



Seamless Integration into the Blowmolder

The PETWall Profiler® systems are designed to work seamlessly within your blowmolder, utilizing the blowmolder's timing signals and reject system without interfering with bottle production. Versions of the PETWall Profiler® system are available for a wide variety of the most common blowmolders in use today.

- **Best precision in the industry for on-line thickness measurement**
- **Over 1000 measurements per sensor**
- **No job change required**
- **Over 32,000 discrete measurement points per container**
- **Monitors 100% of production**

The **PETWall Profiler®** System Adds Value

Eliminate Section Weighting

With the PETWall Profiler® system, there is no longer a need for time-consuming and wasteful indirect measurement methods, like section weight analysis, to determine material distribution in a container. This system provides a comprehensive approach, directly measuring the sidewall at all critical locations. There is no interpretation required or risk of waiting for results. With the PETWall Profiler® system, you can monitor material distribution in real time, on every bottle.

Comprehensive Information of Bottle Quality

The PETWall Profiler® system continuously monitors the bottles you produce, offering an efficient method to manage the blowmolding process. Unlike other methods, this system lets you manage your blowmolder based on actual bottle quality, not arbitrary settings.

Effective Tool for Lightweighting

As bottles become lighter and production speeds increase, proper distribution is absolutely critical. The PETWall Profiler® system's ability to monitor distribution with high accuracy over the total sidewall of a container makes it an effective lightweighting tool to help ensure that even the lightest container meets design specifications.

Importance of Proper Distribution Management

Proper material distribution is critical to the manufacture and performance of PET containers. By closely monitoring and managing material distribution during the stretch blowmolding process, the efficiency of the blowmolder and the performance quality of bottles produced can be maximized, saving time, energy and money. The key to accomplishing this is tied to the ability to accurately measure material distribution over the entire sidewall of the bottle. The PETWall Profiler® system provides this capability and more.

AVAILABLE OPTIONS

- M-RULE shelf-life module - offers a means to predict CO₂ and O₂ bottle shelf-life performance characteristics, in real-time
- Vision inspection module - offers integrated random defect inspection for container base, seal surface and sidewall



Process Pilot® Blowmolder Closed-loop Control Software

The Process Pilot® control software works in conjunction with the PETWall Profiler® measurement system to provide a hands-free means to maintain the blowmolding process. The Process Pilot® program utilizes feedback from the PETWall Profiler® system to continually monitor and automatically adjust blowmolder settings, maintaining the blowmolding process at optimum levels without operator intervention.

Key PET Container Performance Areas

Creep _____
Gas Permeation _____
Burst _____
Stress Crack _____
Rigidity _____
Bottom Roll-out _____
Topload _____

