

Dimensional Sampling Gauge

Comprehensive measurement of: Finish Dimensions, Body Dimensions, ID/Bore, Pushup, Thickness and Weight

High-Precision, Automated Dimensional Measurement System for Containers

 Performs all dimensional measurements in one station Ergonomically designed to perform in the laboratory or on the sampling line

 Configurable with existing Agr Sampling Pressure Testers Measures complete inside finish profile, not just select points

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The **Agr** Dimensional Sampling Gauge is a high-precision system that performs a battery of critical measurements on bottles and similar containers. Designed for hands-off operation, the Dimensional Sampling Gauge provides rapid throughput while performing accurate and comprehensive measurement of container attributes, offering a means to significantly improve the productivity and throughput of your quality management program. The Dimensional Sampling Gauge can be configured to work either in the laboratory or as part of a sampling line on the production floor.

Modular Station Design

The Dimensional Sampling Gauge is designed with the versatility necessary for the test requirements of the packaging industry. The design incorporates a modular station approach that facilitates the measurement and handling of a wide range of bottle shapes and sizes. This approach permits configuration for automated laboratory applications or along the production line as part of an automated sampling station.

Precision Handling

The precision placement of containers on the stations affords the DSG with a dimensional accuracy and repeatability that far exceeds other automated measurement systems. The DSG utilizes a three-axis pick and place robot to select containers and precisely place them in each station. Throughput of 100 bottles per hour is facilitated by simultaneous measurement in all stations and a continuous flow of bottles through the system.

Optical Measurement

The optical measuring station incorporates two high-resolution telecentric cameras and companion light sources to perform imaging and measuring functions. The primary camera captures images of the overall bottle and provides for all body and wide-mouth jar measurements. A second camera, with a finely focused field of view, provides the detailed imaging required for precise measurement of finish attributes. All measurements are performed without moving the cameras. The design is user-friendly and affords easy access for lens cleaning and maintenance.

A rotary table is incorporated into the system to provide 360 degrees of sample rotation in front of the cameras, permitting measurement at any position around the circumference of the bottle. Vertical positioning is achieved in the same station. This method eliminates the need to position cameras during measurement and reduces this as a potential source of error.

The number of measurements performed in a test sequence does not affect measurement time and throughput since all optical finish measurements are performed simultaneously on the Dimensional Sampling Gauge.

ID/Bore Measurement

For ID/Bore measurement, the Dimensional Sampling Gauge is fitted with a high-precision bore gauging system designed to meet the requirements of the beverage industry, including those for wine and champagne bottles. Agr's Dimensional Sampling Gauge measures the complete inside finish profile and diameter. In addition, the depth can be easily programmed for measurement on multiple levels or a continuous vertical scan.





- No camera movement for additional accuracy
- Complete, full bottle capture through the cameras
- Adjustable container rotation (180° or 360°)
- Easy access for lens cleaning
- Simultaneous optical measurement



Pushup Measurement

The pushup gauge provides bottle pushup dimensional measurements. This precision measurement device is adjustable to work with all types of containers.

Weight Measurement

A weight measurement station, incorporating a high-accuracy scale, provides container weight information in addition to physical measurements. Weight data is correlated with other data gathered by the system.

Thickness Measurement

The DSG can be equipped with the Thickness 360TM module to provide high accuracy thickness measurement at multiple locations, including the container heel, shoulder and sidewall. Round and non-round containers can be measured with identical precision and no job change parts.

Easy Job Creation

Measurement routines are preprogrammed to permit an operator to easily setup and perform typical bottle measurements. Job setup is straight forward and intuitive yet provides the versatility to enable an operator to customize tests for the application at hand. Some of the many job creation tools include:

- Definable nominal values, limits and warning borders for each measurement criteria
- Symmetrical or individually defined limit and warning values
- Ability to set common measurements, such as H, E, diameter, etc., at multiple bottle locations
- Ability to view and test all adjustments in a live mode, with an actual bottle image to complete the setup process

Difficult Measurements

Knockout and flange, as well as other problematic attributes, can be easily measured and classified on the DSG. Utilizing metrics and their relationship with thread start and mold seam, the DSG can identify and accurately measure these attributes with unmatched precision.

> During setup, all adjustments are shown live on an actual bottle image



Over 30 different measurements

- Multiple external body dimensions
- Thickness
- Height
- Comprehensive finish measurements
- Lean/Bent neck
- Tilt
- Angles and radii
- · Summarizers for indirect measurement results
- Searchable "T" and "E"
- ID and taper depth to 90mm
- Locking angle
- Pushup/base clearance
- Weight

Plus

- high value algorithms
- Panel bulge and sink
- Knockout



· Cut label area



Advanced measurement tools on the DSG allow for evaluation of complex shapes and bottle designs







Automatic Performance Check

A built-in challenge target is available with the DSG for on-going verification of all measurements. System verification can be performed on demand or scheduled for routine automatic operation.

Designed for Simple Operation

Once test programs are defined, test start and job changes are easily accomplished. The operator simply selects the job, loads the bottles and initiates the test. When incorporated in a sampling line, bottles are automatically selected and loaded. The Dimensional Sampling Gauge performs all functions from that point on.

Continuous Operator Feedback

The Dimensional Sampling Gauge provides continuous feedback on tests in progress. Measured values are color coded to permit operators to easily identify measurements that fall outside of acceptable ranges. In addition,

the Dimensional Sampling Gauge offers the following:

- Simultaneous display of:
 - Measurement results
 - Live measurement image
 - Job and actual sample details
- Color coding of data
- Visualization of test results and min-max graph
- Manual mold number input
- Automatic capture from mold reader (OmniLab® version)
- Correlation of data into a single report

Small Bottle Version

The small bottle version of the DSG (DSG-P) provides high-precision, automated dimensional measurement designed specifically for small glass containers. The system provides 360° imaging, captured every 1°, which ensures complete bottle coverage. The DSG-P maintains a maximum throughput of 2 bottles per minutes.

Key component of Agr's OmniLab® automated laboratory system

The Dimensional Sampling Gauge can be configured to work together with the Agr Sampling Pressure Tester to provide a completely automated sampling line (OmniLab[®]) with capabilities for dimensional and weight measurement as well as pressure testing.



DSG is ideal for all types of containers that require precise dimensional measurement.



DSG-P provides dimensional and thickness measurement for small bottles.