Scalar technologies

SG S-Can

Lacquer Thickness Measurement System

Scalar Technologies Ltd. · 5 Bain Square · Livingston · West Lothian · U.K. · EH54 7DQ
tel: +44 (0) 1506 411806 · fax: +44 (0) 1506 416279
e-mail: enquiries@scalartechnologies.com · web: www.scalartechnologies.com

BACKGROUND

Process Measurement for Lacquer Coatings

Measurement and inspection systems play a vital role in the complex, can production environment. These systems provide information for the development of critical process control techniques and the development of Pass/Fail analysis for quality assurance purposes. Advances in manufacturing technology have placed progressively greater demands on these systems - shorter inspection cycles, higher resolutions, wider functionality, simpler user interfaces, increased data handling and storage.

Today's measurement and inspection systems are, by necessity, high technology products. Simplistically, test products still must separate good product output from bad, but in the increasingly demanding and complex production environment they are also expected to generate useful data that allows the process developer and line operator, to optimise the manufacturing process. To succeed in this aim, precise measurement and accurate determination of defects is paramount. In addition, variations within the manufacturing process must be recognised at the earliest possible opportunity so that the quality of production is maintained, wastage prevented and costs minimised.

Scalar Technologies state of the art measurement technology has been applied to the development of a new generation of high technology test and inspection equipment. The SG**S-Can** is specifically designed to address the increasingly complex needs of internal lacquer coating measurement in the canning industry. The SG**S-Can** is equipped with all the functional requirements of a modern measurement and inspection system, suitable for purpose in today's process development and manufacturing environments, exactly as required in the fast moving and highly competitive canning industry.

Scalar Technologies are specialists in the measurement of films and coatings. Despite coatings being deposited by a variety of methods, or ranging from relatively thick protective coatings to ultra thin optical coatings, Scalar technologies can measure and characterise these coatings. The Company applies state of the art optical measurement techniques in all its products, providing innovative approaches and solutions that cannot be addressed by more traditional methods.

SGS-Can System Overview

- A state-of-the-art measurement system, which uses advanced optical techniques and data processing technology for the rapid, accurate and comprehensive measurement of the lacquer coating on food and beverage cans.
- Equipped with a precision scanning sensor equally adept at scanning detailed sections or taking fixed point measurements on any area of the can. The scanning sensor utilises high resolution optics and a powerful digital signal processor, resulting in a comprehensive and fast measurement cycle.
- Measures lacquer coating thickness on all areas of the can including ***wall, dome, chine, neck*** and ***flange***.
- A software design that makes it easy to tailor the product to meet the individual needs of the user for either process development or production test.
- The capability of measuring a wide range of cans. Irregular shapes and next generation can styles such as 'bottle' cans can be also be accommodated.
- Provision of more than quality assurance. It provides real-time data to monitor process stability, identify problems and implement pre-emptive corrective action.

MEASUREMENT OPTIONS

Two standard measurement options are available for [SG]**S-Can**:

Mapping: The optical sensor scans the can under test to produce a highly detailed map image of the lacquer distribution and thickness across all areas of the can.

Production: The user defines a number of points on the can located at different positions to measure lacquer thickness as a quick test of production process stability.

The software architecture of [SG]**S-Can** is completely modular, database based and has been designed to meet then needs of both production and laboratory personnel. The system software database can be easily interfaced with existing production quality control software packages.

System Architecture

A system controller runs the [SG]**S-Can** user interface software for visualisation and storage of results, and control of the scanning sensor.

The modular design offers numerous advantages:

- Multi-processing of inspection and measurement data for fast cycle time combined with high-precision results.
- Fast enough to test more cans per hour than any previous test method: [SG]**S-Can** will never be a bottleneck!
- Ultra-high resolution mapping and measurement for process development.
- Multiple units can be controlled by a centralised host.
- Adaptable for future can shapes.

Set-up and Operation

SOFTWARE

[SG]**S-Can** is controlled by custom software developed by Scalar Technologies and is based upon industry standard platforms. The user interface software is quick to learn and easy to use, and has a password-protected structure to ensure system integrity.

The standard password system features three levels:

- **Operator**: all functions necessary for day-to-day measurements.
- **Manager**: additional functionality such as definition of measurement settings.
- **Administrator**: further functionality including system settings.

Numerous parameter sets can be defined, each containing details of can type, test profile, default scales for display outputs etc. Limits can be individually defined for each parameter set, lacquer-dependent limits and warning thresholds where appropriate.

Automatic comparison with the user-defined limits can be used to generate Pass/Fail decisions. “Good” samples can be sorted according to user-defined quality criteria, while “Bad” samples can be separated according to the class of failure.

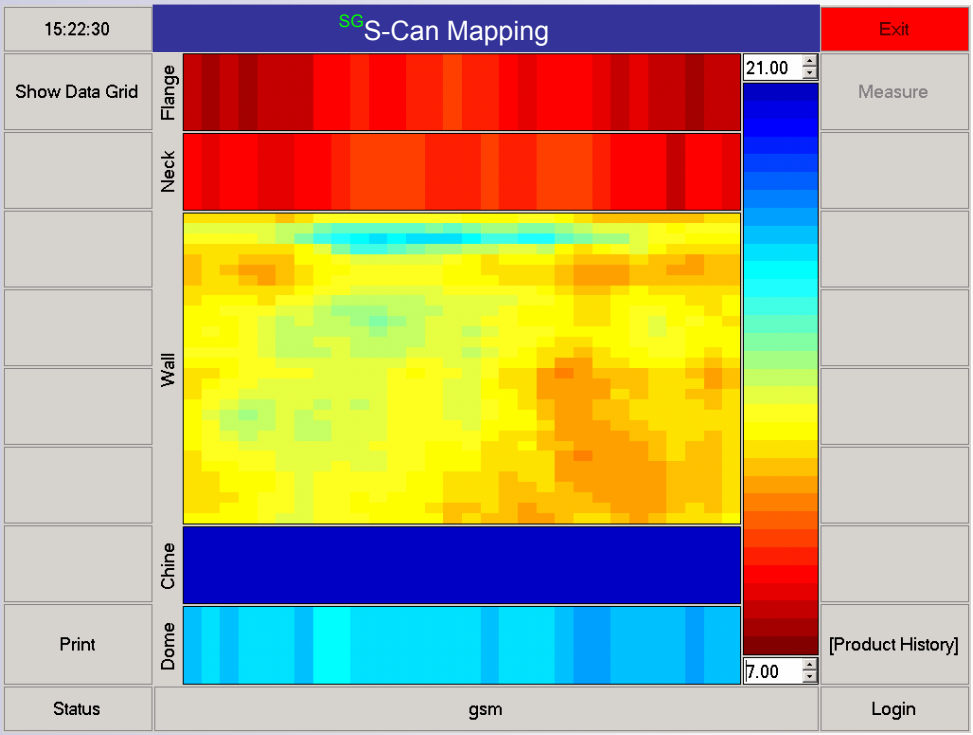
Results Display

Measurement results can displayed in a number of ways, including:

- Surface mapping (as shown below) including indication of defects.
- Data tables.
- Pass/Fail traffic light for the current can.
- Summary data e.g. the last 100 cans tested

Views can be defined according to user preference. A suppression function enables you to ignore measurements which are not considered to be significant.

Surface Mapping - Examples



History

Failure data can be viewed in the History window.

Data includes can maps showing position of defects plus surface map showing lacquer layer thickness variation. There are two options for storing data:

- **Automatic storage** of each failed can (default setting): defect data for the last 250 failed cans are available.
- **Manual storage:** data are stored for the current can.

Trend Diagrams

Trend diagrams are available for the majority of measurements, but only make sense after a number of cans have been tested. Trend diagrams help control the long term stability of the process: specific corrective action can be taken before substandard cans are produced.

Results Storage

Measured data can be saved to and retrieved from hard disk, CD-R or any network drive. SG**S-Can** is fully network-compatible using a standard Ethernet connection and results can be exported manually or automatically for use in external applications such as Microsoft™ Excel®. or Mini-Tab.

BENEFITS

General

SG**S-Can** is a state-of-the-art system, which uses advanced measurement and data processing technology for rapid, accurate and comprehensive measurement of lacquer layer thickness.

SG**S-Can** is much more than a quality assurance tool: It helps you to develop and characterise your coating process by producing detailed thickness contour maps of the coating. In addition, for production applications, it helps you to identify deviations in your process and trace the source of the problem so that pre-emptive corrective action can be taken to avoid the production of sub-standard cans.

Modular design for parallel inspection using multiple sensors and data processing, resulting in fast, real-time and precise measurement:

- Detailed measurement identifies the smallest variations in thickness.
- Coating defects are easily detected.
- User-definable settings for acceptable quality limits.
- Operator-friendly user-interface software based upon graphical user interface.
- Multiple units can be controlled from a single PC.
- Network compatible via standard Ethernet connection.
- Extensive options for storing, archiving and exporting measurement results.
- Comprehensive functionality as standard - measures flange, neck, wall, chine and dome on both Aluminium and Tin plated Steel cans.
- Proven technology backed by Scalar Technologies experienced development and engineering staff.
- Excellent R&R - offers true process control capability.
- Engineered for use in a high volume production environment: robust design, excellent build quality, self-calibrating, minimal maintenance requirements.

TECHNICAL DATA

General System Properties

Parameter	Specification
Compatible Can Types	Aluminium or Tin Plated Steel can with clear lacquer coating. Can Diameter 48 -100mm Can Height 40-170mm
Mains power	AC Input: 95-250V, 50-60 Hz Consumption: 100W max
Operator Interface (optional)	Touch screen display running Graphical User Interface
Package contents	SG**S-Can** is supplied with interconnect cables and software, ready for integration by the customer.
Requirements for host PC	Operating system: Windows® XP

Performance

Coating Layer Thickness	
Parameter	**Specification**
Measurement range	0.5 – 50µm (Higher ranges achievable in smoother areas such as the side wall)
Accuracy	0.1µm

Dimensions

Parameter	Specification
Height	695mm
Width	210mm
Depth	440mm

Maintenance

SG**S-Can** is virtually maintenance-free; however we do recommended that the system is thoroughly reviewed once a year. Any service includes a complete system check and, if required, cleaning of the optical components. Simplified servicing and maintenance is a core design consideration of the SG**S-Can** unit. As a result, parts can be replaced easily and quickly to minimise maintenance costs and unit down time.

For service support, training and spare parts, contact Scalar Technologies.

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