

## When it comes to gauging - Test & Invest

VOLUME 21

In the last issue, the front page introduced the Six Sigma quality initiative, a systematic approach using statistically based tools to drive process improvement. In this issue, the front page covers one very important factor in a successful Six Sigma implementation - how to get the best out of process measurement technology.

The foundation of process improvement through statistical analysis is accurate and believable data. All gauges are prone to error, but how much error? SPC practice has a way of classifying gauge capability known as Repeatability & Reproducibility. This approach measures and combines the effects of the two most important variables in gauge-based measurement - Gauge Variation and Appraiser Variation.

Gauge Variation is a measure of the errors caused by the gauge itself, its ability to measure the same thing a number of times without

variation. Appraiser Variation is the ability of a number of operators to measure the same thing with the same gauge without variation. This doesn't necessarily mean that operators are bad, it can be a measure of how easy a gauge is to use consistently. In other words, a measure of how good or bad the gauge design is. Put simply then, R&R tells the user if a gauge can be used by a number of operators to measure the same thing a number of times and get the same result.

R&R is expressed as a percentage, and

gauges are classified as follows:

R&R above 30% - Not Capable

R&R from 20% to 30% - Adequate

R&R from 10% to 20% - Good

R&R less than 10% - World Class

(World Class is a 'must have' to significantly attack process costs)

Without such a measure of capability, there is no real confidence in test results. Process adjustments, quality control, reject decisions and tooling life assessments are all based on imprecise data not fact.

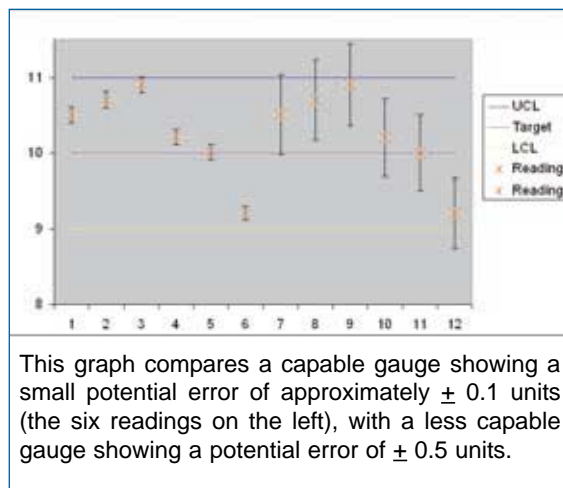
Consider the effect on lacquer cost for a 3 piece manufacturer who typically uses 200

tonnes of lacquer a year. If gauging is improved, a 10% reduction in coating usage is possible, saving \$80,000 per annum.

Capable gauges with world class R&R are the essential first step towards true process visibility. With this precise understanding of process performance,

the trends resulting from input variation can be monitored and earlier corrective action taken. This way, coating thickness can be controlled within tighter limits and usage reduced without risk of customer complaints.

Sencon have produced a CD containing an explanation of R&R and an MS Excel spreadsheet to help you get started with gauge capability assessment



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**SENCON**  
CONTROL DOWN THE LINE

**TEST & INVEST = RELIABLE & ACCURATE DATA = TIGHTER CONTROL = REAL SAVINGS**

# Sencon's Continuous Innovation

## This year there is a real explosion



### Litho<sub>4</sub> - On-line Lithographic inspection system for 2 piece cans

The Litho<sub>4</sub> combines a four camera system with state of the art computer processing techniques for the in-line 360° inspection of can decoration.

On pre-production trials the Litho<sub>4</sub> reduced the number of cans held for inspection by over 90% and eliminated customer complaints for the trial period.



### MLT - End Micro Leak Air Tester

This new unit tests for extremely small leaks and defects in beverage can ends (typically 0.1 cc at 15 lids per minute).

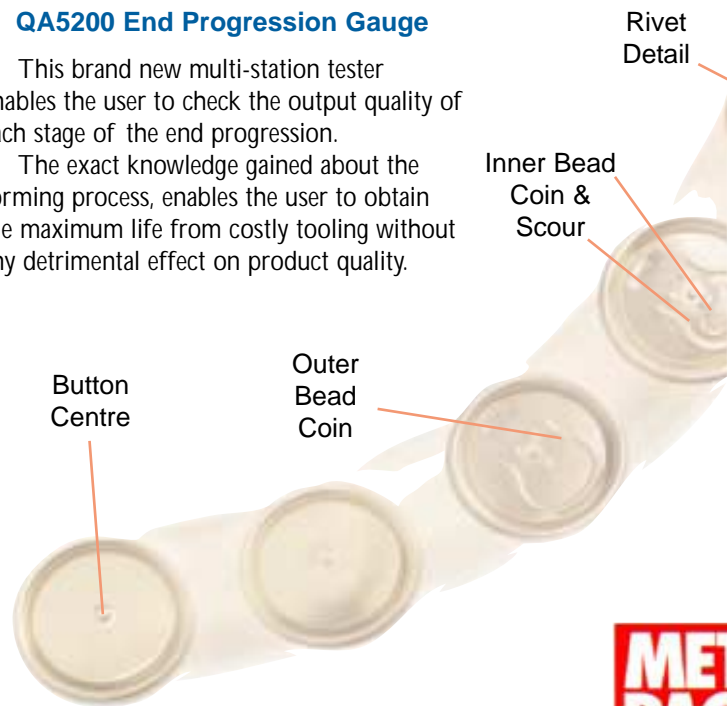
When run with the established ELTP in-line 100% light testing system, the MLT performs non-destructive sample tests automatically off-line.

This test guards against end leaks with no direct light path such as fractures and holes within the rivet.

### QA5200 End Progression Gauge

This brand new multi-station tester enables the user to check the output quality of each stage of the end progression.

The exact knowledge gained about the forming process, enables the user to obtain the maximum life from costly tooling without any detrimental effect on product quality.



### APC Software Systems

Highly cost effective systems for SPC and downtime monitoring are now available from the new modular Sentinel package developed specifically for canmaking by our partners APC. This scalable system has an entry level of a few hundred dollars, but can be extended to encompass the whole manufacturing enterprise.

This system gives a truly transparent view into the manufacturing process.



We are e

**Sencon has been continuous innovating. Our goal is to help filling industries reach class process improvement. These pages show examples of the new products, all time at Metpack 2000.**

# tion for Process Improvement

## n of new products to be launched



### SI9600 Coatings Thickness Gauge

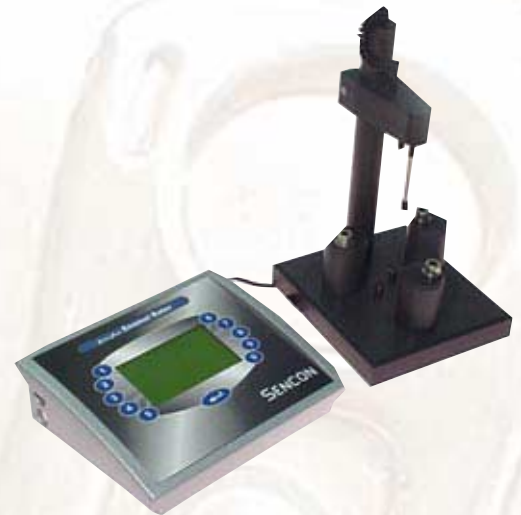
A manual or semi-automatic gauge for testing coating thickness. When combined with the SI9550 Hover Probe, the system measures coating thickness on flat sheet for 3 piece cans with a world class R&R rating.

The enclosure is IP65 rated, with specially designed recesses to protect cable connectors when the gauge is moved around the bench.

### SI9100 Semi- Automatic Enamel Rater

The new SI9100 uses the same IP65 enclosure as the SI9600 with all its advantages. It brings enhanced functionality to the updating of the highly successful SI9000+. Many hundreds of the SI9000+ have successfully served can makers throughout the world for years. Now, using the same connectors and data formats, the SI9100 provides a seamless upgrade for existing users.

Once a batch is started, the new Semi-Automatic Enamel Rater checks electrolyte level and body contact. It then starts the test, saves the results, calculates statistics and sends the reading to an SPC system. Such a system is QC lite which is provided free with the gauge. The operator only has to change cans to deliver accurate, reliable results.



### SC600 Flat Sheet Plain Margin Inspector

With the SC600, flat sheet can now be inspected on-line for lacquer splashes contaminating the margins, sheets which have translated by missing the side guides, feathering, and margins which are too wide or too narrow.

The unit works just as well on either wet lacquer at the exit of the coater, or on dried lacquer at the slitter.



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# The Right Sensor For The Job

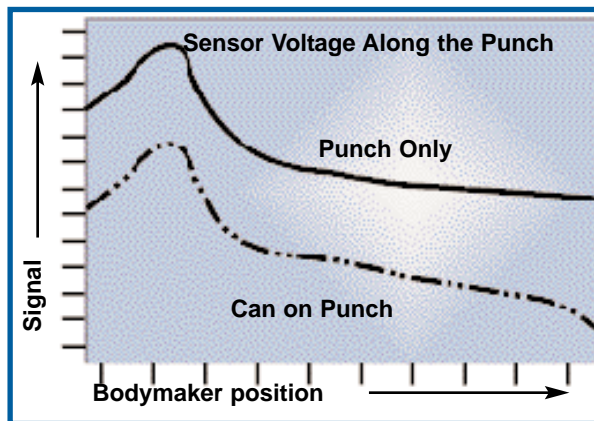
With constant pressure to reduce manufacturing and purchasing costs, short term decisions to save a few hundred dollars are easily made. In some of the harshest environments in the can making process you simply can't afford to fit inappropriate sensors to save money. The long term consequences of such decisions, in terms of replacement tooling and downtime costs, can be measured in thousands if not tens of thousands of dollars.

A good example of this is the bodymaking process. 'Fit for purpose' sensors are a necessity, because of the unique nature and difficulties in the wall ironing process. The time allowed to make the decisions needed to protect the machine is usually less than 100 milliseconds.

The first problem for the proposed sensor is the environment. Like any die based process, the sensor will be surrounded by metal, so it must be immune to the potential interference. With a cycle time generally about 200 milliseconds, the sensor must be robust enough to deal with heavy shocks and constant vibration. Finally, the

enclosure must be resistant to the combined effects of high temperature and high pressure coolant spray.

But the environment isn't the only problem. Because the can maker is constantly striving for more effective



tooling with longer life, he must experiment with new and improved punches. Steel, and nickel or cobalt based carbides are the usual materials, although some ceramics may be used. The nickel based carbides used in modern tooling present a particularly difficult problem, because their electromagnetic signature is so similar to that of aluminium. In addition, the signature varies significantly with

operating temperature, between individual punches (even from the same manufacturer), and along the length of the punch.

The ideal sensor for this application is a 'smart' device, able to calibrate itself to the punch and its individual signature. This will allow the operator to quickly changeover tooling without needing to change or adjust the sensor.. Once calibrated the sensor must be robust enough to handle the harsh environmental conditions, then reliably send a signal when a short can or tear off is sensed.

Sencon's unique range of Metal Discriminating Sensors and Bodymaker Control Modules are application specific, having been developed solely for exactly this environment. Standard features are incorporated to deal with all the problem areas specified above.

Additional options are available from the top of the range model, including fast control logic functions (eg airstrip, dome jam and backstop) and special outputs for high speed clutches.

## In Brief

### Winner of Palm Pilot Draw

The winner of the prize draw, run in conjunction with Sencon UK's survey of the European and Asian markets, was Mr. Phil Brooks from CarnaudMetalbox Poland. We will be forwarding his Palm Pilot to him straightaway. To everyone else who replied to our survey, many thanks. We hope your replies will help us to give you the products you really need in the future.

### Back Issues and Mailing List

We hope you have enjoyed this issue of News & Views. If this is the first time you have seen a copy, back issues can be downloaded as pdf files from our website addresses below. Click 'News' on the Home Page, then click 'Previous editions of News & Views'.

To be added to our mailing list just click the box at the top of the News & Views back issue page, or e-mail us at [sales@sencon.co.uk](mailto:sales@sencon.co.uk).

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