



Case Study

Constar putting Quality into bottles with Lighthouse Systems

*Increasing customer satisfaction through improved quality
systems*

Introduction

There is a lot more to plastic bottle production than you might expect and the closures (or caps to most of us) present a good number of challenges to those creating them in large quantities. Constar is one such company and it has been working closely with MES software provider, Lighthouse Systems, for several years to implement quality processes to improve the company's performance and to reduce customer complaints.

The relationship between the two companies dates back four years or so when Constar was looking for an alternative to its rather cumbersome, paper-based processes for quality control in its UK, European and USA facilities. The company looked at a number of options before choosing to work with Lighthouse and implementing its Shopfloor Online software in its European HQ in Sherburn-in-Elmet, North Yorkshire.

Lee Thomas, Quality Manager – Lab and Customer Services, comments, “The old, manual system was full of errors and we needed to put a stop to data falsification as a means of operators saving time by recording data ahead of schedule, or through the manipulation of recorded data. We were also looking for a system that would limit the

number of "forgotten" checks by providing visual reminders that checks are necessary at predetermined times.”

The new, automated approach was implemented to provide more accurate views of Constar's processes by delivering SPC data on which managers could base assertions and improve plant performance. The software was implemented within the closures department and then spread across the company to provide quality data regarding bottles and pre-forms. It was expected that Shopfloor Online would dramatically reduce errors in the logging of data and therefore provide more accurate information on the quality of production runs.

Thomas adds, “Improved availability and accuracy of quality data improves the level of service we are able to offer customers and therefore reduces the number and gravity of customer complaints we receive. The net of this is significant efficiencies across the board.”

Production process improvements

There are many similarities in the various production processes and as many differences. A first lift is performed in each area of the Constar business to provide quality data that will determine whether the

machines are fit for production. For this process, manual gauges are used to measure the products and the data collected is then passed electronically to the Lighthouse system where it can be analysed and managers can determine whether the production run is within certain, pre-specified quality parameters. Any out of spec measurements at this stage result in changes to the production machines and a repeat of the first lift process. Production only begins when all measurements are within the specification limits set by the customer.

The first lift for pre-forms is similar to the process for bottles but tends to check more parameters. The measurements here are carried out on a co-ordinate measurement machine (CMM) from Mitutoyo. The CMM outputs a text file which is picked up by Lighthouse's Shopfloor Online and cleared for production if the data meets the agreed criteria. This department also carries out running checks throughout the production process and at pre-determined intervals (21 day cycle).

Thomas comments, "Cavities deteriorate over time and we need to be sure that we spot the signs at the earliest possible stage, otherwise the waste is significant. The ability to check performance of the cavities at regular points means that we can blank those that are

under-performing without shutting down the machines and therefore keep production running. Only when a certain number of cavities are out of spec do we cease production on a machine and replace the equipment. Knowing the optimum time to do this is an essential part of our business."

The closures department is the most intense user of the Lighthouse quality systems. Here, they are used constantly, recording measurements and carrying out running checks via the CMM. It is also here that the greatest benefit has been felt.

Thomas explains, "Having SPC data readily available makes such a difference to us. The manual process would show a huge spread of results and that was resulting in a higher level of customer complaints, especially where tamper band quality was concerned. The tamper band cutting process is incredibly precise so that they release under a certain amount of pressure only. Because we can now monitor the SPC information we know when the tamper cutting blade needs to be replaced and can therefore prevent issues of bands not functioning correctly. The spread of results is now very fine and quality is markedly improved."

The closures being produced are tested every one and a half hours to check the accuracy of

the production process. Six closures are selected and measured to certify that the process should continue. An out of spec measurement will result in a production stoppage and remedial work being carried out. At this point the closures will be discarded back to the last good check. When you consider that 24 million are produced in a single week this one and a half hour window will equate to a significant number of closures to be discarded. Knowing about issues early through improved data visibility will help to reduce stoppages and product waste.

Also, the availability of more data and information throughout the production lifecycle of products means that when a customer complaint occurs, the cause of the problem can be identified and addressed quickly. The manual system did not allow problems to be identified as quickly or resolved so rapidly.

Shane Pennington from Constar US comments, "During my time here in Constar, the use of Lighthouse software has revolutionised quality assurance. With all testing data now being stored electronically we are able to, at any time, recall production data from previous runs to compare to a current process. The previous data recording on paper was full of many obstacles, and a

dedicated archive storage area quickly became a space issue."

Pennington continues, "Personally, it has allowed me to better use my time working with data rather than assembling the data. We are able to do real time comparison of products running on different machines at different times, even on machines running in different Constar locations. This allows our Process Techs to better centre our processes on a much larger scale than previously possible. Our Injection Department for example is able to monitor and control processes among numerous injection moulding machines and thus provide our blow moulding department with multiple parts run from different production machines and different production dates with similar quality characteristics- and that makes processing in the blow moulding department much more streamlined. The ease of comparing previous production runs has become one of the most beneficial aspects of Lighthouse. Prior to production start up we are able to recall data from previous production runs and verify process parameters are set accordingly to achieve the same production quality characteristic results as before. This minimises the time necessary for start up, and limits the amount of downtime experienced by process set up."

Room for further improvement

Constar has a focus on quality in all of its production processes and it is constantly looking for new ways to improve. One such way is the availability of production reporting directly from the Lighthouse systems. Once again, this will reduce the occurrence of operator errors therefore providing management with better quality reporting tools that are more timely and accurate.

Also, Constar is planning to extend integration of the Lighthouse systems to other machines on the Shopfloor. More specifically, it would like to link the Husky machines to Lighthouse so that production data flows seamlessly from one to the other. This will enable a tighter control of the production process and all measurements taken and it will ensure that data is stored for a longer period of time.

Shopfloor Online will also incorporate downtime information and scrap data for all production to give management a fuller view of the plant's performance. Combining this

information with the quality data and checks for all processes should provide a much clearer view of the entire process, enabling Constar to provide more complete feedback to customers and incur fewer customer complaints but deal more quickly and effectively with those that do occur.

Thomas concludes, "There are some great features within Shopfloor Online that we plan to exploit in the future. It is capable of delivering many benefits to us as an organisation and, in turn, to our customers. Having greater accuracy and visibility of quality data across the production process can only be a good thing and we will continue to strive to improve quality in every area of the business. Lighthouse will help us to achieve this goal."

Lighthouse Systems is one of the world's leading developers of Manufacturing Execution Systems (MES) with offices in London, Singapore, Australia and Rochester, NY. Lighthouse Systems Shopfloor-Online is web based modular software that provides real time visibility of the entire manufacturing operations environment. Applications include Maintenance Management, Concern Management, Quality, SPC, Downtime, OEE, Spoilage and Inventory Traceability. Shopfloor-Online is being used in a

wide range of industries with some of the biggest manufacturing companies; it is deployed in 15 languages in 28 countries.

For more information please call one of our offices or visit our web site www.lighthousesystems.com

UK Office

Lighthouse Systems Limited
Buchan Hill
Pease Pottage
Crawley
West Sussex
RH11 9AP
United Kingdom

Telephone +44 (0) 1293 605300
Email info@lighthousesystems.com

USA Office

Lighthouse Systems Incorporated
Building 3
6780 Pittsford-Palmyra Road
Fairport
NY 14450
USA

Telephone: +1 585 223 0600

Asia Office

Lighthouse Systems Pte Ltd
71 Bukit Batok Crescent
#07-10 Prestige Centre
Singapore 658071

Telephone: +65 6316 4370