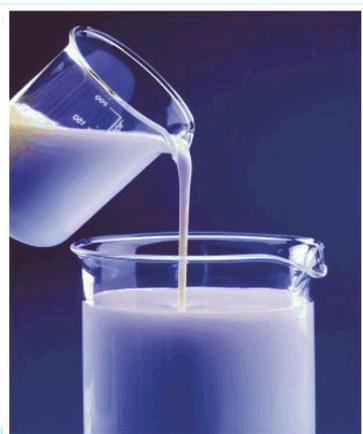


Using modelling techniques to reduce variability at Synthomer using MS2 Process Analysis

Synthomer is a world-class supplier of synthetic polymers to industries ranging from paints and adhesives to textiles, speciality papers and plastics. At its manufacturing plant at Stallingborough, it produces a wide range of synthetic latex products which are used in many types of industrial applications.

Achieving this consistently high quality means understanding the variability inherent in a modern, complex manufacturing process, and Synthomer selected the MS2 Process Analytics System from AJM Consulting to assist in the identification of causes of variability between multiple reaction vessels.



The various computer systems on site hold extensive sets of data relating to quality parameters, batch operations and process trends within reactors. To fully visualise the manufacturing characteristics of each batch it was necessary to integrate these data sets and the MS2 system was used for this and for subsequent data analysis.

The resulting visualisations provided the Synthomer engineers and chemists with the information they needed to implement process changes which have resulted in better understanding of the causes of variability between reactors, resulting in improved manufacturing performance.

Stuart Askham of Synthomer limited said: *"We initially asked AJM Consulting to investigate a process issue in which two reactors had differing characteristics which we did not fully understand. We had plenty of data, but interpreting it was a problem because it was derived from several systems and could not be integrated. The MS2 system integrated the data from our commercial, process control and plant historian systems and provided both an effective visualisation of the problem and an analysis of its cause, enabling us to implement changes which have resulted in increased consistency and quality. As a result, we are now implementing MS2 across the plant."*

Modelling for Chemistry of one of Chemistry Innovation's seven key priority areas. Through consultation with industry and academia, the Modelling for Chemistry priority seeks to focus on the modelling of chemical behaviour, material interactions and process performance to increase the productivity and value of research and innovation to industry.

Priority Manager, Dr Adrian Toland said: *"Chemistry Innovation has established an important new modelling group comprising industrial users, technology suppliers and academics that aims to promote awareness of the benefits of modelling techniques as well as proving practical advice and resources for stakeholders".*

Using modelling techniques to reduce variability at Synthomer using MS2 Process Analysis (2)

The MS2 Process Analysis System

MS2 is a sophisticated system which models the production process, both batch and continuous. It can be used to manage the production itself or, as is the case at Synthomer, to integrate and analyse data from other systems. A wide range of statistical analysis tools and visualisation methods have been developed to pinpoint critical process influences. The system incorporates powerful techniques such as multivariate principal component analysis and parallel co-ordinate visualisation.

Parallel co-ordinate visualisation

This technique provides a view of relationships between many diverse process variables, for instance quality parameters such as pH and viscosity, process parameters such as maximum pressure and temperature and calculated values such as time to peak exotherm or shift identity.

Principal Component Analysis

The complex multivariate analysis and visualisation tools needed for this powerful technique were developed in conjunction with the world-renowned Centre for Process Analytics and Control Technology at the University of Newcastle. PCA provides a method of reducing the apparent complexity of large data sets to identify the principal causes of variability. It is proven to provide substantial bottom line benefits in major organisations and, through MS2, is now available to all sizes of company.

Ease of Use

The MS2 Process Analysis System was developed by AJM Consulting with the aim of bringing advanced techniques within the reach of all companies, recognising the frequent need for low ownership cost and limited on-site personnel involvement. Technologies developed for and applied to large organisations are often just too complex and expensive for most process manufacturers and the philosophy behind the MS2 Process Analysis System is to make advanced technologies accessible and affordable with immense potential benefits to competitiveness.

The company was selected by Yorkshire Forward to receive a substantial research and development grant to enable it to build a suitable tool for any size of company. Available at several levels of cost and complexity and easily upgradeable, MS2 is now the ideal solution for process manufacturers needing better knowledge of their processes and therefore improved production performance.



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AJM Consulting is a member of:

