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Improving Performance in Complex Chemical Processing at Ciba

Ciba's Bradford site is one of the largest and most productive plants in the UK, with an output of over 250,000 tonnes of which 84% is exported. Together with its sister plant at Grimsby, it manufactures products used to enhance industrial processing in various industries such as papermaking, mining, oil extraction, wastewater treatment and textile processing.



These sites form part of the Ciba group, a leading global speciality chemicals company which is dedicated to producing high value effects for its customers' products. Highly innovative, Ciba brings new and creative thought to the processes and products of its customers in more than 120 countries.

Innovative process technologies are utilised to produce the advanced products made at these sites. To assist in improving understanding of the complexities involved, Ciba invested in the MS2 Process Diagnostics system and, with a team comprising in-house technologists augmented by specialists from AJM Consulting, has developed models which highlight causes of process variability.

"Our production processes at Bradford and Grimsby are world class and highly innovative. We constantly strive to improve the performance of these multiple step processes and, to achieve this, a deep understanding of the chemistry and interactions of the individual stages is required. We selected the MS2 Process Diagnostics system from AJM Consulting to assist in this because of its visualisation tools and integrated analysis techniques within the system.

The ease of use of the MS2 system has been much appreciated by our highly qualified technical staff, who have been able to identify significant events that have been caused by subtle interactions further up stream. This has enhanced our understanding of our processes, enabling us to focus our improvement efforts on the critical areas in our plants. We see this as a key tool to achieve the next level of performance in our journey to operational excellence."

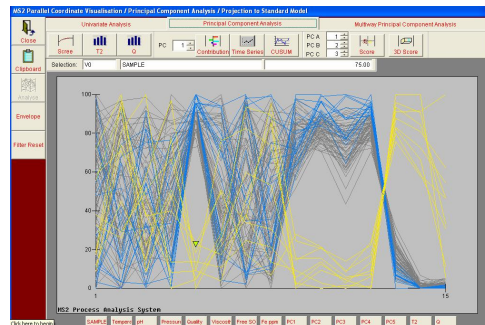
John Barratt, Head for Process Innovation and Development Centre 2

The MS2 Process Diagnostics System

MS2 is a sophisticated, integrated system which models the production process, either batch or continuous, to help identify the causes of variability which can affect issues such as quality and yield. A wide range of analysis tools and visualisation methods have been developed to pinpoint critical process influences. The system incorporates powerful techniques such as multivariate principal component analysis, Manhattan significant change detection and parallel co-ordinate visualisation.

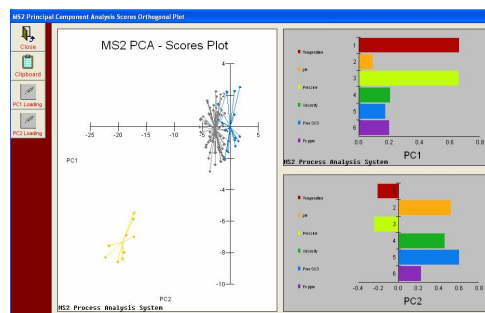
Parallel co-ordinate visualisation

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 (CPACT) 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 to bring advanced techniques within the reach of all companies, recognising the 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.

Latest Developments

AJM Consulting was selected to receive European Union funding, to enable it, in conjunction with CPACT, to design and build a unique tool, able to analyse existing data or monitor current production, by integrating to a wide range of process control or data historian systems.



Available at several levels of cost and complexity, and easily upgradeable, MS2 is ideal for all process manufacturers who need better knowledge of their processes to achieve improved production performance and a sustainable future.

AJM Consulting is working in conjunction with Newcastle University to continue development of the advanced MS2 system

This project is part-funded by the European Union Regional Development Fund

AJM Consulting is a member of:

- Institute of Measurement and Control
- Humber Chemical Focus
- Yorkshire Chemical Focus
- North East Process Industry Cluster
- Chemicals NorthWest
- CPACT



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