

**Our Clients include:**

- ABB
- Arthur D Little
- AEA Technology
- Aesica Pharmaceuticals
- A H Marks
- BP
- British Nuclear Fuels
- British Sugar
- Bridon
- British Paper & Board
- Cambridge Consultants
- Carbon Trust
- ConocoPhillips
- Centre for Process Innovation
- DEFRA
- DTI
- Eli Lilly
- Fibres Worldwide
- GlaxoSmithKline
- Hickson
- Holliday Pigments
- ICI
- Imerys
- J R Crompton
- Johnson Matthey
- Manro
- Newcastle University
- Norsk Hydro
- PICME
- Roche
- Rotork
- Scott Bader
- Sellafeld Ltd
- Servelec
- Severn Trent Water
- SIRA
- Spiritus Consulting
- Strategem Consulting
- Stepan
- STG
- Sulzer
- SWRDA
- Syngenta
- Synthomer
- Technical Absorbents
- Tensachem
- University of Sheffield
- University of Strathclyde

## Improving Quality at Aesica Pharmaceuticals using MS2 Process Diagnostics

Aesica Pharmaceuticals Ltd, the Active Pharmaceutical Ingredients company based in Cramlington, Northumberland, supplies customers on every continent. Since the 1970's it has been the supplier of choice for customers ranging from small start-ups to the global giants of the pharmaceutical industry, a position achieved through advanced technology and manufacturing excellence.



The Company's wide range of complex manufacturing processes is backed up by advanced analytical techniques. State of the art computer controlled production processes enables it to be responsive to customers' needs and highly flexible. cGMP excellence is a universal target and FDA audits have demonstrated that its standards are amongst the highest in the world.

Aesica is committed to maintaining its excellent quality and hence to a process of continual striving for improvement. To assist in developing their process knowledge to new levels of sophistication, the Company has now invested in the MS2 Process Diagnostics System from AJM Consulting to assist in gaining an ever-deeper understanding of the complexity of its processes. Developed by AJM Consulting, this system uses innovative algorithms and visualisation tools to identify the consequences of interaction of process variables and to pinpoint areas in which manufacturing performance can be improved still further.

*"The ability of the MS2 process Diagnostics system to co-display a multitude of variables simultaneously then quickly identify interactions has already proved to be very useful. Whilst confirming some previously held beliefs there have been some genuine surprises in some of the causes behind process variability. It is this ability to handle and analyse diverse data sets in a user-friendly format which I believe will yield significant benefit to our many processes"*

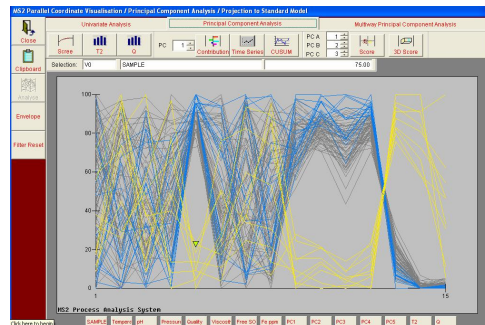
**John Budge, Aesica Pharmaceuticals Ltd**

## 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.

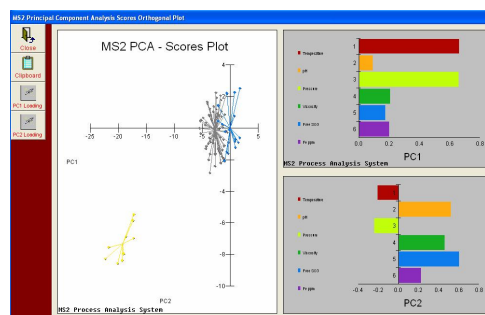
### Parallel co-ordinate visualisation

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.



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

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 a member of:

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



Website: [www.ajm.co.uk](http://www.ajm.co.uk)

Email: [cathy.oswin@ajm.co.uk](mailto:cathy.oswin@ajm.co.uk)

AJM Consulting Services Ltd, Europarc Innovation Centre, Grimsby, N E Lincs DN37 9TT  
Tel: 01472 500306 Fax: 01472 500307

AJM Consulting Services Ltd, Tamar Science Park, Plymouth, Devon PL6 8BX  
Tel: 01752 764232