Geometric Process Control
Breakthrough Innovation in Process Analysis and Control

Geometric Process Control represents the next generation of data analysis, process control, and alarm management. From facilitating R&D and formulation to making mature processes even more efficient, from removing bottlenecks to cracking previously-unsolvable process problems, GPC can provide significant value in an extensive array of applications. Give us a call today to discuss how these robust yet easy-to-use tools can improve your operations and strengthen your bottom line.

“Visual Explorer is an easy and intuitive tool for rapidly extracting information from complex data sets. The highly visual approach of the tool makes the presentation of findings easy allowing decisions to be quickly reached as to which development route to follow.”
Astra Zeneca International

“Visual Explorer showed us the real performance difference between two identical process units in a way that everyone could understand – and then told us how to change our operations to correct it”
INCO Clydach Refinery

“Improved Process Efficiency by 2% in the first 3 weeks of operation... Reduced plant start-up time by a factor of 6.”
Ineos Chlor

“Visual Explorer cut our process losses by 40% and de-bottlenecked part of our process—all for zero capital cost.”
Mallinckrodt

“You were able to tell us things we didn’t know about our process in under six hours that we had just spent three months trying to discover.”
Huntsman Petrochemicals

GPC, Visual Explorer, and Process Modeler are products of Curvaceous Software Ltd.
**Mallinckrodt Chemicals**

**Quality and Yield Advancements**

Mallinckrodt Chemicals, a Tyco Healthcare company in Staveley, UK, turned to Geometric Process Control to help improve the yield and quality levels of a particular chemical product.

Early in the process analysis phase, Visual Explorer helped identify viable operating zones that had never been explored. These new zones provided additional operational flexibility without adversely affecting quality. Deeper analysis revealed that throughput could be improved and bottlenecks relieved by reducing the inflow of a particular raw material. Although this was counter-intuitive, the discovery improved the efficient use of current capacity to such an extent that management decided to eliminate an anticipated $1 million capital expenditure to expand capacity.

Process Modeler was implemented to help operators keep the process set to achieve the desired quality and yield targets. Operators, armed with immediate guidance in the event of a problem, could quickly identify and resolve process issues before they escalated into serious quality or safety problems. Expert and novice operators alike became confident in the advice provided by Process Modeler because it made physical sense to them and consistently helped them to resolve process issues.

With initial quality and yield targets satisfied, GPC also helped eliminate the 24-hour delay between laboratory analysis and process adjustment, enabling Mallinckrodt to consistently meet quality specs and delivery timelines.

**Huntsman Petrochemicals**

**Elusive Operational Issues**

Huntsman Petrochemicals, in Wilton, UK, faced complications when analyzing its paraxylene process. The reaction section of the plant was subject to rate swings, the root causes of which were difficult to identify due to extensive heat transfers.

Analysis using Visual Explorer revealed reactor exit temperature was varying in sync with the rate swings. Visual Explorer helped identify that a dominant factor driving these swings was - to everybody's surprise - the wind speed! Within an hour and a half, the focus had shifted from vaporizer levels, previously believed to be the major contributing factor, to the weather. With the problem understood, heat inputs could be adjusted to account for changes in ambient conditions, thereby enabling operators to prevent the rate swings.

It was noted during initial analysis that one of two parallel-fired heaters was operating more efficiently than the other. The more efficient heater was refurbished less than a year beforehand, and the second was awaiting this treatment. Visual Explorer provided conclusive evidence that this maintenance procedure was well worth every penny.

Within six hours, Visual Explorer solved the rate swing problem, as well as a few other major production and efficiency issues - a strong return on investment. Huntsman continues to rely on these tools for process analysis.

**Ineos Chlor**

**More Reliable Alarms**

A manufacturing process at an Ineos Chlor facility located near Liverpool, UK, suffered frequent and substantial disturbances to its feedstock, which produced many undesirable by-products if several other settings were not quickly adjusted to compensate. Associated alarms were commonly ignored since such a high proportion of them were false. Hampering yield even further, the process was operated based on experience and a set of process limits from a series of rule-based decision support projects.

Historical operating data was examined offline using Visual Explorer to understand past performance and identify the relative strengths of GPC alarm management over the rule-based alarm system in place at the time. Following trial implementations, GPC alarm management brought false alarms from 49% to less than 10% during the very first test. Today, their false alarm rates are down around 2%.

After a few weeks of testing and validation, engineers became confident in Process Modeler's operating advice and Ineos Chlor implemented GPC in the control room for live commercial use.

In addition to dramatically reducing the frequency of false alarms, GPC also helped reduce plant start-up time by a factor of six. In total, the set of implemented GPC solutions provided Ineos Chlor with a total financial benefit of about $1.2 million per year.