GE Fanuc
Intelligent Platforms

GE Fanuc Batch Solutions

In today's competitive business environment, the pressure has never been higher to work faster, more efficiently and more consistently. Each batch run must be perfectly executed. Every aspect of production must be perfectly documented. And you must be able to repeat the "golden batch" time and time again. Meet these requirements and you'll achieve new levels of business and production success. Fail to meet these requirements and your business could suffer from lost customers, lost revenue and substantial penalties from regulatory agencies.

Delivering all the tools you need to build a complete monitoring, control, and analysis solution for batch applications, GE Fanuc's powerful batch software solutions can help you achieve new levels of efficiency, profitability and security throughout your entire production process. Through a robust set of tools, an open architecture and an easy-to-use graphical user interface, our Proficy Batch Execution and Proficy Batch Analysis applications can help transform your production processes into a powerful competitive advantage – whether you leverage them independantly or as part of a combined solution.

GE FANUC

GE Fanuc: Proven Results for Batch Industries

GE Fanuc has been providing proven solutions for companies in batch-related industries for decades. Our batch manufacturing applications are being utilized to realize higher levels of quality, conform to regulatory requirements and improve time to market for successful companies around the globe.

Life Sciences

GE Fanuc solutions enabled a major life sciences company to successfully consolidate the European production of its oral health care products, creating a center of excellence across the entire organization.

Results:

- Live in less than 12 weeks
- 75% increase in production
- 250% improvement in new product "time to market"

"We were able to reduce our batch cycle time by greater than 50%. Not only that, we were able to accomplish those improvements while the physical plant was still under construction." "Overall, we have increased our output capability by over 150%."
– Electrical Systems Engineer

Chemical

One of the world's largest chemical companies relies on GE Fanuc batch solutions to globalize their operations and achieve greater consistency across batches in different facilities around the world.

Results:

- Greater consistency across batches
- S88 standards are leveraged for plant to enterprise information transfer
- Common tool established to analyze process information

"We couldn't afford to develop a high level of skill sets to support our systems. We wanted to minimize the number of systems and leverage our higher skilled people across the sites."
– Process Information and Control Technology Center Coordinator.

Food and Beverage

A household name in juice production leverages GE Fanuc's batch solutions to integrate plant floor and business level systems and dramatically improve consistencies between batches.

Results:

- Live in less than 9 months
- 30-50% reduction in development time
- Recouped material deficiencies
- 70% increase in manufacturing schedule adherence

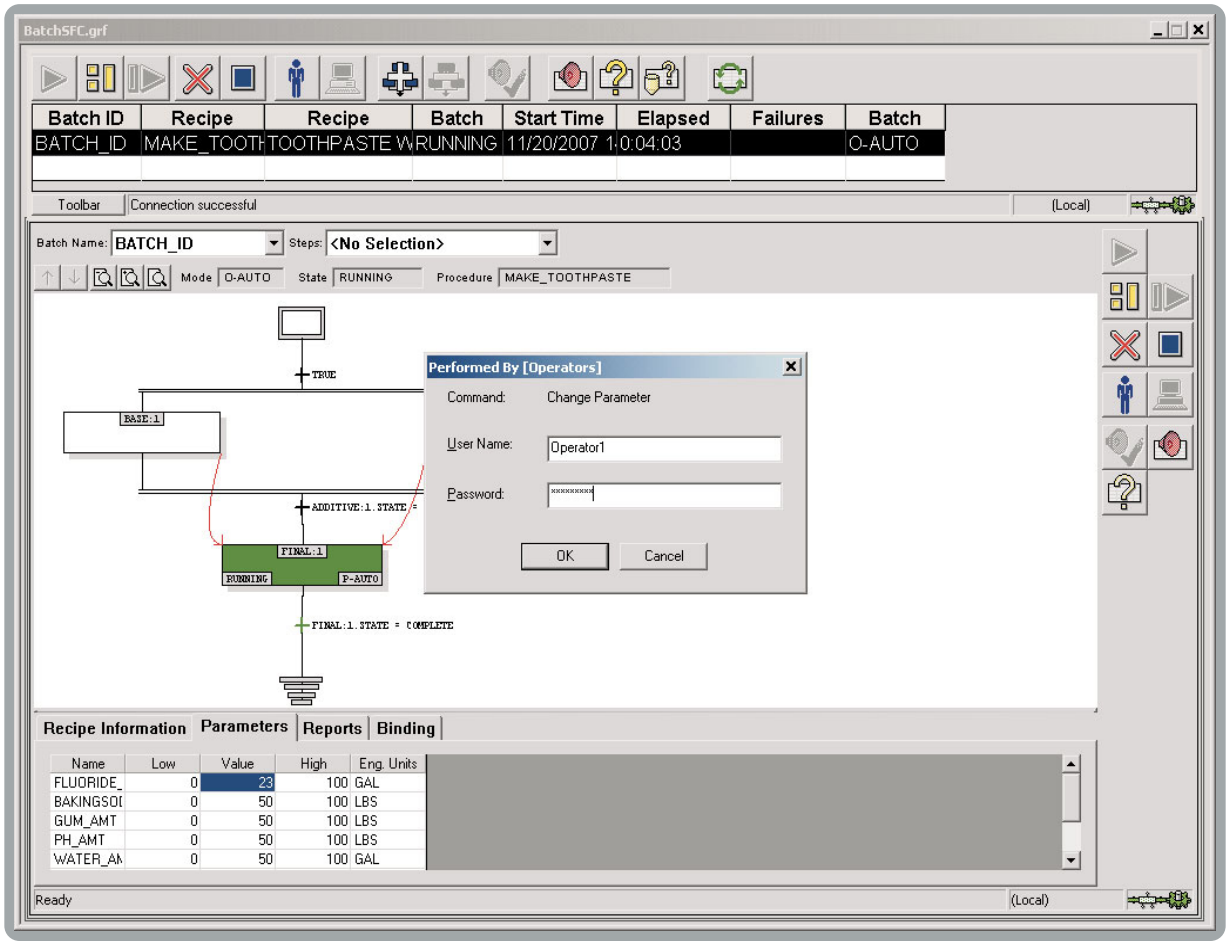
"We can deploy pre-programmed objects to gain time and cost savings in a variety of areas of the enterprise"
– National Manufacturing Systems Manager

Proficy Batch Solutions: Your Recipe for Success

Today's batch manufacturers are facing growing pressures from globalization, increased regulatory compliance, customer satisfaction demands and brand protection. The need to maximize and optimize your plant's operations while exceeding quality standards is what separates those who are surviving from those who are not.

GE Fanuc batch solutions can deliver the control, visualization and analysis capabilities needed to make significant improvements across your operations, allowing you to focus on minimizing variance and maximizing yields. Proficy Batch Execution and Proficy Batch Analysis can deliver many benefits to batch production environments.

- **Batch to Batch Consistency –** enabling you to achieve the golden batch time after time, and then allowing you to execute them repeatedly on a global scale.
- **Reduce Operational Costs –** by understanding raw material usage and loss, rework and scrap, you will be able to understand the variance in your process and take proactive steps to reduce it.
- **Increase Uptime –** by replacing custom batch systems with a proven batch platform from GE Fanuc, you'll help ensure your plant stays up and running at peak efficiency.
- **Run to Rate and Exceed Schedules –** meeting or exceeding schedules can be a key competitive differentiator, enabling you to produce and deliver quality products to your customers repeatedly and reliably.
- **Increase Return on Net Assets (RONA) –** delivering better results to your business and establishing your manufacturing site as a key contributor to a world-class operation.
- **Increase Production Agility and Flexibility –** empowering your business to react to the ever changing world around it, giving you a key competitive advantage for new marketing runs, new product introductions, more recipes and shorter runs.
- **Faster Changeover Times –** through recipe verification and execution, you can significantly improve your productivity.
- **Validation to 21 CFR Part 11 –** supporting your regulatory compliance initiative while helping you hit the quality parameters that are crucial to your business.
- **Improve Integration –** with unmatched MES integration to our Batch offering through our Production Management software suite.
- **Scalable Batch Management Platform –** a simple, easy to use, scaleable system with simple recipe front ends to a robust S88 capabilities – we can provide batch as a product, system, or solution.



Proficy Batch Client
This image reflects the Batch List and SFC ActiveX controls showing the Proficy Batch Execution 21 CFR 11 Signature Dialog that appears when an operator is changing a parameter.

Proficy Batch Execution

Proficy Batch Execution is packed with a wide range of powerful features that make it a best in class solution for your business.

S88 Batch Manufacturing Standards

Proficy Batch Execution separates the operation of equipment (equipment phase) from the procedure used to make a product (recipe). This means the process used for any product is defined within Proficy Batch Execution, and changes to the process do not change the control system. Speed, flexibility, agility, reliability and quality – they're all delivered by this cornerstone capability of Proficy Batch Execution.

Graphic Modeling

Setting up your batch control strategies is simple and straightforward with our ISA S88.01 compliant modeling of manufacturing operations. You define your Areas, Process Cells, Units, and Phases in the Proficy Batch Execution workspace. This simple, graphical, class based development environment allows you to browse directly to the process control system – no database is required.

Recipe Editors

Proficy Batch makes creating and managing your recipes easier than ever. With our Tabular Editor you can create your recipes in a simple spreadsheet style format, and with the click of a mouse, the system will automatically convert them into IEC 1131-3 sequential function charts. Defining your procedures, workflows, parameters, equipment, and connection requirements for each product that you will produce has never been easier. Class based recipes allow you to re-use recipe components. You can scale your recipes to tie them to equipment capacity at runtime. Manage a few recipes or a thousand, quickly and easily.

ActiveX Library

Proficy Batch Execution provides you with an ActiveX Library of objects that allow you to view and interact with your batch processes. These include a Batch List, SFC View, Unit Binding, Operator Prompts, Batch Add, Manual Phase Control, Recipe List, Active Phases, and Batch Alarm List. By providing your operators with visibility into your batch operations you are able to optimize your operations.

Patented Active Binding

GE Fanuc's patented Dynamic Unit Allocation™ technology provides for Active Binding and is a key feature of Batch Execution. With this technology, the system can dynamically select Units based on Capacity, Status, Priority, and Flow path. With Forced Binding you can bind a recipe to a unit at the creation of the recipe, at batch start, or on the fly during execution. This maximizes your productivity by allowing you to optimize the operation of your batch system.

Designed for CFR Part 11

With point of entry verification through Electronic Signatures in our Active X Controls and Recipe/Equipment Editors, you will have equipment and recipe auditing and version control. Your Batch Execution system provides centralized storage of E-Records with encrypted store and forward technology that will automatically provide you with a runtime and configuration audit trail. Password and user management is centrally administered through Windows based security.

Soft Phase Server

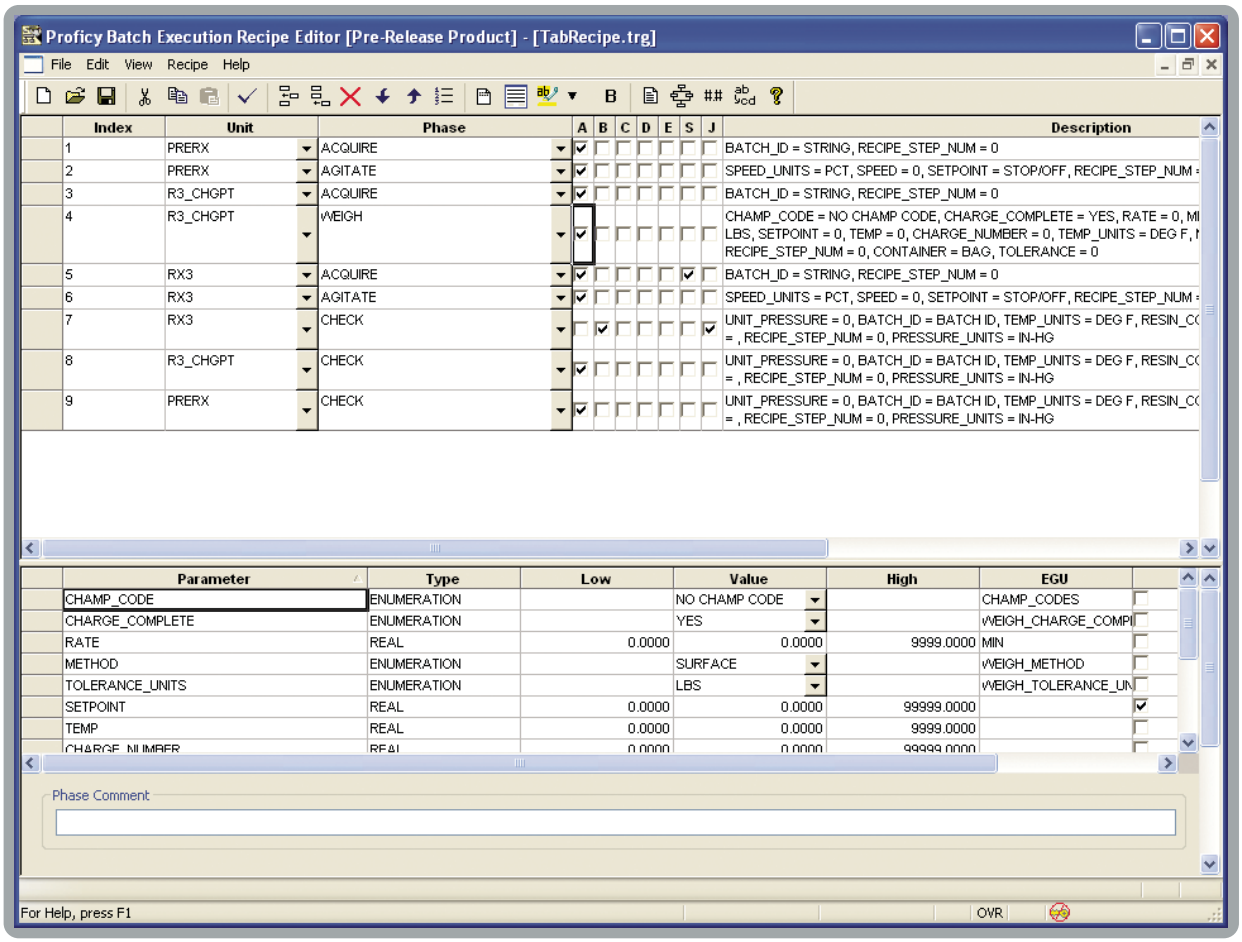
With Batch Execution you will get the industry's leading OPC soft phase solution. This provides a true Client/Server solution for distributing Soft Phase logic in the computer that then interfaces to the controller. Not only does it act as a Soft Phase Server, but it provides OPC Simulator capabilities as well. Just another example of the power and flexibility our Batch Solutions provide you.

Batch Direct

GE Fanuc developed our Batch Direct technology to provide a simpler interface between Batch Execution and the phase/equipment logic located in the controllers. It provides:

- Simplified and Flexible Phase/Equipment interface
- Ability to connect to existing systems without extensive control changes
- The ability to implement simpler phases in new systems
- Implementation technique for smaller systems that don't require full PLIs (Phase Logic Interfaces)
- Maintains the standard operational interface at the Batch Execution level

Batch Direct provides you with increased flexibility and capabilities to better run and manage your batch operations.



Tabular Recipe Editor

The new Tabular Recipe Editor, with its spreadsheet feel & style, allows engineers to be much more efficient in managing their batch operations.

Proficy Batch Analysis

Proficy Batch Analysis is a powerful solution to optimize your batch operations. Batch Analysis allows you to increase the overall quality and consistency of products and enables a better understanding and control of variation in your batches.

With Batch Analysis you can:
- Tightly interface to Proficy Batch Execution
- Track independent batches as Prescribed By ISA S88 Standards by procedure, operation or phases
- Extract and analyze relevant data in context by Crew, Batch, or Schedule
- Visualize and report on results with sophisticated yet easy to use reports, timelines, and trending comparisons

Batch Analysis provides you with a comprehensive set of tools and reports to allow you to analyze and optimize your batch operations. These include:
- Batch Search / Listing
- Batch Summary
- Batch Trend
- Batch Timeline
- Batch Cycle Time Analysis, Parameter Analysis

Batch Listing

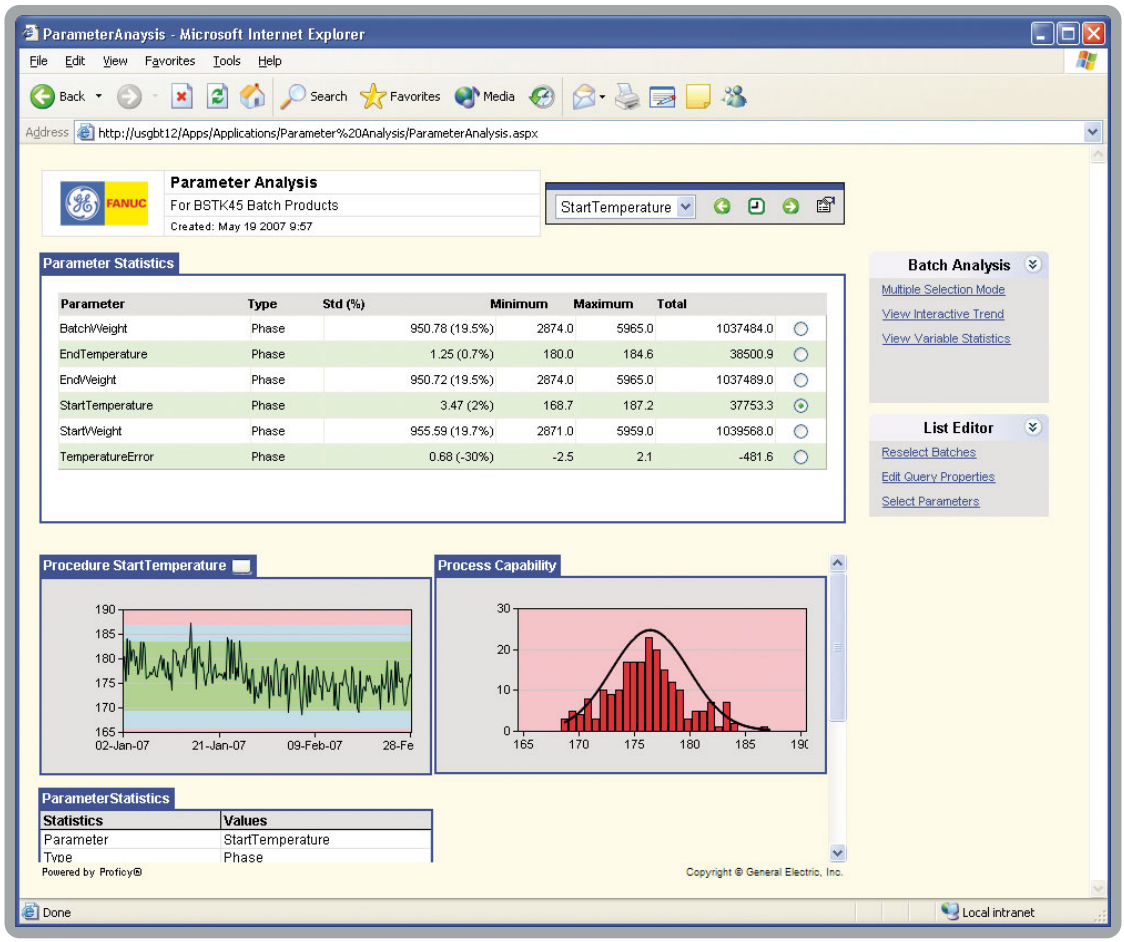
The Batch Listing shows the results of a Batch query and includes the batch name, status, conformance, time frame, unit, and other descriptive data. This allows you to select, compare, and analyze batches. You can even set a reference or base batch as the "Golden Batch" for future comparisons.

Batch Production Timeline

The Batch Production Timeline displays events for a given batch and overlays time on the X-axis. The interactive timeline allows you to drill down into a given event and examine the details behind it.

Batch Event Detail

The Batch Event Detail provides a detailed summary of a given batch, including start time, end time, initial and final weights (or other attributes), parameter summaries, specifications and limits, and time trending across variables.



Proficy Batch Analysis
Proficy Batch Analysis provides the visibility into your batch operation. It allows manufacturers to better understand and control variation in your batch production environment.

Cycle Time Analysis

Cycle Time Analysis provides a detailed summary and comparative analysis over a selected set of batches. This analysis provides a comprehensive statistical breakdown of each "step," including detailed information such as average, standard deviation, and minimum and maximum. By comparing procedures, operations, and phases across different batch runs or campaigns, you can easily identify variation in the process. Additionally, several charts showing process capability and time series trends are provided.

Multi Batch Timeline

The Multi Batch Timeline provides a time-centric overview of the batch and batch operations for each of the selected production runs. The timeline provides batch-centric time perspectives for each batch and its corresponding procedures, unit procedures, and operations.

Batch Summary

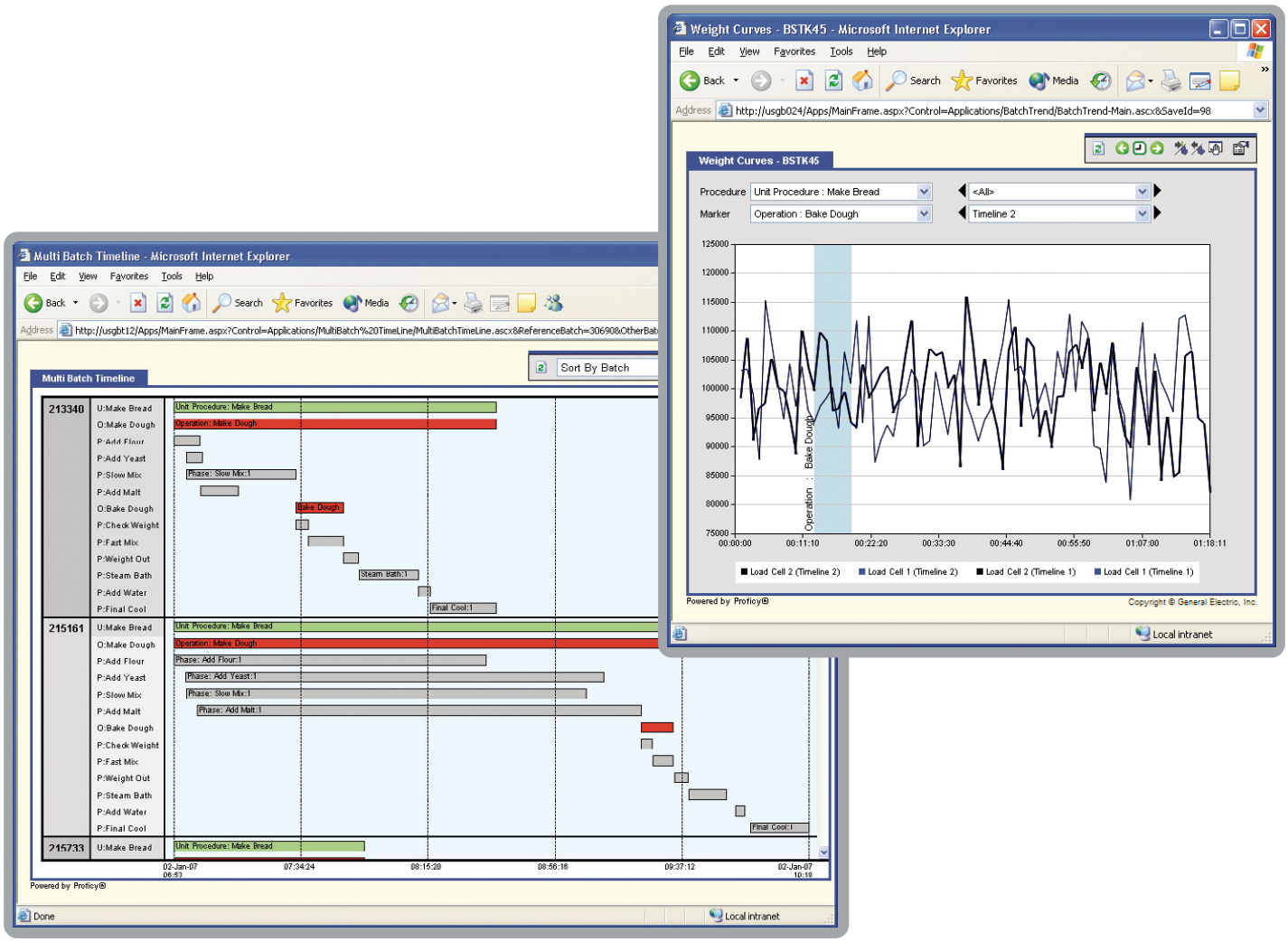
The Batch Summary provides a detailed report of batch genealogy, procedure details, and parameter details for a selected batch. It provides procedural and parameter summaries in "cross-tab" format listing parameters for each unit (Unit Procedure) and variable. Cells are color-coded according to conformance to specification limits.

Batch Trending

Batch Trending allows users to create and save comprehensive batch trends that provide context-based trending – plotting variables against one another at different stages of batch operations. Batch trends can accommodate and overlay many different batches on a single display. Batch variables and even data points from historians can be dynamically added to each chart, providing a powerful set of analytical capabilities. Easy-to-use dialogs allow you to quickly and easily modify the trends. Contextual display elements are provided to allow for highlighting and analyzing trends — including markers denoting where significant events occurred and confidence bands placing a plot "silhouette" around each line.

Batch Analysis Summary

The Batch Analysis solution provides tremendous value for a wide range of applications and industries. With Batch Analysis you can increase the quality and consistency of batch operations and reduce variability in your batch processes.



Batch Timeline

Understand and improve operations by comparing production runs and timelines, overlay trends and production events.

Proficy Batch Family

In today's batch manufacturing environment, quality and consistency are paramount to your success. GE Fanuc Batch Solutions, including Proficy Batch Execution and Proficy Batch Analysis, feature the proven products, systems and services needed to survive and thrive amidst today's growing quality, regulatory and profitability pressures.

Proficy Software Modules:

Real-Time Information Portal
Proficy Real-Time Information Portal

Plant Performance and Execution
Proficy Efficiency
Proficy Production
Proficy Tracker
Proficy Machine Tool Efficiency

Integrated Quality
Proficy Quality
Proficy Non Conformance Reporting
Proficy Shop Floor SPC

Process Solutions
Proficy Process Systems*
Proficy Batch Execution
Proficy Batch Analysis
Proficy RX™

Plant Data Repository
Proficy Historian

Asset Management
Proficy Remote Monitoring & Diagnostic
Proficy Change Management

HMI / SCADA
Proficy HMI/SCADA – iFIX*
Proficy HMI/SCADA – CIMPLICITY*
Proficy View – Machine Edition

Programming & Control
Proficy Logic Developer
Proficy Motion Developer – Machine Edition

GE Fanuc Support & Services:

GlobalCare Support
Professional Services
Training

GE Fanuc Intelligent Platforms Information Centers

Americas:
1 800 GE FANUC or 434 978 5100

Asia Pacific:
86 21 3222 4555

Europe, Middle East and Africa:
800 1 GE FANUC or 800 1 4332682
or 1 780 401 7717

Europe, Middle East and Africa (CNC):
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Additional Resources

For more information, please visit the GE Fanuc web site at:

www.gefanuc.com

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