

2410
3400
4100

ADVANTAGE SERIES



Intuition.

Perseverance.

Experimentation.

Knowledge.

All are critical elements of the formula leading to breakthroughs in chemical development. Today's process chemists face increasing pressure to quickly develop efficient, robust, and scalable chemical processes. They need to rapidly identify which synthetic routes are worth pursuing and which should be abandoned. By integrating synthesis with data collection and analysis, chemists can more quickly gain the process data they need to advance their projects through scale-up and into manufacturing.

THE ADVANTAGE SERIES PRODUCT SUITE FROM ARGONAUT

Argonaut Technologies has worked closely with chemists to produce the Advantage Series™ product suite—a family of easy-to-use process instrumentation tools that help chemists develop sound processes, while giving them full control over reaction conditions.

Designed to provide higher quality information and analysis to support the entire chemical development workflow, the Advantage Series provides unique capabilities that help chemists reduce the amount of experimentation needed to advance projects. As a comprehensive product suite, the Advantage Series enables process chemists to accelerate projects by:

- ◆ Mimicking large-scale reactions with bench-top reactors so chemists gain valuable process knowledge to expedite scale-up while saving precious material, minimizing waste, and reducing safety risks.
- ◆ Generating analytical data to help make early, informed decisions.
- ◆ Providing the value of automation while retaining the flexibility and ease-of-use of traditional methods.



*2410 Personal
Screening
Synthesizer
for rapid,
efficient reaction
screening*

2410

SCREENING



*3400 Process
Chemistry
Workstation
for reaction
optimization*

3400

OPTIMIZATION



*4100 Process
Scale-up Reactor
for improved
process validation*

4100

VALIDATION

ADVANTAGE SERIES

ADVANTAGE SERIES

2410

PERSONAL SCREENING SYNTHESIZER



The Advantage Series™ 2410 Personal Screening Synthesizer provides four individual reactors that allow process chemists to work at bench-scale to replicate the temperature profile, mixing, and data collection features of a larger-scale reactor. Designed to provide chemists with simple, more efficient, and less expensive process screening, the 2410 Personal Screening Synthesizer incorporates features that help chemists expedite the scaling of materials in larger-scale quantities.

Immediate data on the feasibility and safety of process scale-up. The 2410 Personal Screening Synthesizer provides *in situ* thermal control, with a thermocouple that sits in the reaction solution, as well as a separate thermocouple in the heating block, enabling chemists to view real-time thermal changes. Chemists can use this information early in the development cycle to determine the feasibility and safety risk of process scale-up in larger scale.

Simulate thermal and mixing conditions of large reactors. A magnetic stir bar can be adjusted to stir at any height, reproducing the mechanical overhead mixing of larger-scale equipment more precisely than bottom-stirring systems. To accurately replicate thermal conditions of large reactors, the 2410 Personal Screening Synthesizer can be adjusted to heat up or cool down at the same ramping rate as in production reactors.

Display and capture real-time thermal changes. Similar to the extensive monitoring available on full-scale production equipment, the 2410 Personal Screening Synthesizer provides chemists with control of thermal ramp rates, multiple setpoints, and immediate, real-time data on what is happening within the solution. Information is displayed on an easy-to-read, color screen, and can be transferred to a desktop computer via a removable memory card.



SCREENING

ADVANTAGE SERIES

3400

PROCESS CHEMISTRY WORKSTATION



The Advantage Series 3400 Process Chemistry Workstation is a modular, multi-reactor system that captures and documents synthetic methods in a simple and reproducible manner. Designed to leverage the intuition and knowledge gained through the years of experience by pharmaceutical process chemists, the 3400 Process Chemistry Workstation provides unique capabilities that facilitate automated reactions and analysis.

Enables chemists to work independently within a shared workspace. Four removable modular reactors, each operating autonomously under the control of the Argonaut Camile® software platform, form the core of the 3400 Process Chemistry Workstation. With independent start-and-stop capabilities, the reactors can be operated individually, allowing simultaneous experiments by multiple chemists. The modular design means chemists can perform prep and post-reaction work within their own fume hoods, and simply plug their reactor into any available position on the workstation.

Replicate experiments—across campus or around the world. Chemcorder™, a software feature within the 3400 Process Chemistry Workstation, offers the flexibility to create a chemical recipe with the simplicity of round bottom set-up. Manual and automatic options allow chemists to create or open existing recipes, and to duplicate reactions on another day, by another chemist, or in another laboratory. Automatic safety alarms and shutdown procedures provide assurance that the workstation can be left running unattended, whether overnight or throughout the weekend. An optional auto-sampler feature collects samples unattended.

Avoid future failures at kilo scale. With exceptional heating and cooling, the 3400 Process Chemistry Workstation replicates the performance of process scale-up reactors. Heat flow data and calorimetry calculations are automatically determined, providing an early assessment on safety while eliminating the need for complex, manual calculations. This information helps chemists determine early in the optimization phase which processes need further screening via a dedicated reaction calorimeter.



OPTIMIZATION

ADVANTAGE SERIES

4100

PROCESS SCALE-UP REACTOR



The Advantage Series 4100 Process Scale-up Reactor allows chemists to control critical reaction conditions such as temperature, reagent addition, and stirring speed through a simple computer interface. Ease of programming and the ability to adapt to new lab equipment provide the flexibility to meet the constantly changing demands of today's process development laboratories. Using the 4100 Process Scale-up Reactor, chemists can feel confident each reproducible experiment captures all reaction parameters for scale-up analysis.

Flexibility to meet chemist's needs. The 4100 Process Scale-up Reactor was designed to provide chemists with the flexibility to choose reactor type, reactor size, number of feeds, and the type and number of analytical probes to suit particular scale-up needs. The 4100 Process Scale-up Reactor easily captures heat flow and heat of reaction data, providing additional analytical utility.

Batch-to-batch consistency and reproducibility. Based on real-time analytical data, the 4100 Process Scale-up Reactor enables advanced monitoring and control of reaction conditions. The reactor's Camile software captures and stores real-time data, providing chemists with information needed to troubleshoot, evaluate safety, optimize recipes, and ensure batch-to-batch consistency and reproducibility between laboratories or research sites.



Camile Software

An innovative automation tool for the pharmaceutical and chemical research & development environment, Camile software has set the standard for powerful, state-of-the-art process development software for almost two decades. The new generation of Camile software includes an enhanced and easy-to-use interface, allowing the researcher to rapidly develop new processes, generate easy-to-read batch reports, as well as run experiments unattended—all through the click of a mouse.

VA L I D A T I O N

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ADVANTAGE SERIES

SERVICES, SUPPORT, AND CUSTOM APPLICATIONS

Services

Argonaut leverages its extensive experience automating process chemistry to offer a range of services that maximize the benefits of the Advantage Series product suite:

- ◆ Installation and training of end users
- ◆ Unsurpassed customer support via telephone, on-site visits, and service calls
- ◆ Assistance to customers with evaluation and development of custom applications

Support

All Argonaut service specialists have hands-on experience running the Advantage Series product suite, and can train chemists to use the instruments to meet their specific requirements. With a worldwide network of service and application specialists, Argonaut supports customers throughout North America, Europe, and Asia. Located in close proximity to customers, Argonaut experts can respond quickly to resolve chemistry application issues.

Custom Applications

Utilizing the power and flexibility of the Camile software, Argonaut's automation specialists can modify an existing Argonaut instrument or provide custom solutions to address any stage of the chemical development workflow, from screening to optimization, validation, and beyond. These skilled engineers can also integrate third-party sensors and analytical devices, such as HPLCs, or probes for measuring particle size, turbidity, and Raman scattering, to provide additional analytical information on scale-up parameters.



WHY ARGONAUT?

Most of the major worldwide pharmaceutical companies have chosen to use Argonaut products and services. By partnering with Argonaut, companies can take advantage of Argonaut strengths:

- ◆ Chemistry expertise. Argonaut employs Ph.D. and M.S.-degreed chemists and chemical engineers with first-hand industry experience in commercial process research and development laboratories. This experience enables them to provide practical advice to help chemists realize the benefits of automated technologies.
- ◆ Reputation for innovation. Argonaut products are developed in close collaboration with customers. Utilizing product development consortia and other strategic collaborations, Argonaut has developed innovative products that address the real issues that chemists face, are intuitive to use, and provide a strong return on investment.
- ◆ Intellectual property. To meet evolving customer needs and maintain its reputation for innovation, Argonaut invests in the development and licensing of intellectual property. Argonaut's intellectual property portfolio encompasses patented design features of the Advantage Series. Argonaut has also secured license rights to other industry-leading technologies that enable solutions for our customers' applications.



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