An Intelligent R&D Data Management Software Solution

Software to streamline R&D and Formulation workflows, strengthen product performance, and enhance collaboration

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Chemistry is Based on Continuous Product Improvement

Demand for new chemical products and formulations continues to grow, driven by the need for better performance, improved sustainability, and lower cost. Irrespective of whether an R&D team is developing a novel resin, coating, or polymer, or producing a next-generation food additive, petrochemical, or lithium-ion battery material, delivering on these critical requirements promises significant rewards in terms of revenue and profitability. Yet bringing a new chemical entity to market remains challenging, mainly due to the vast amounts of data and other knowledge that are generated along the way. Being able to efficiently access, analyze, and act on diverse sources of information is the key to R&D organization and enterprise success.

signals**Notebook**   signals**One**   ChemDraw

More Integrated Data Management is Essential for R&D and Formulation Success

For decades, project teams have worked in siloed data systems, using software solutions that are tailored to the specific requirements of different groups. When developing new chemical products and formulations, data is typically captured in Excel before being exported to a generic program for analysis and reporting. However, this outdated approach is now widely recognized to limit R&D productivity and result in lost profit margins since it presents several major tactical challenges:

- Collaboration and data-driven decision making are difficult since generic software programs do not provide optimal representation of critical product development information
- Timelines are often extended by the inaccessibility of scattered, non-scalable data, and product design feedback loops that take too long
- Regulatory risks, such as the European Union's Registration, Authorization and Restriction of Chemicals (REACH), are high because data cannot always be easily considered early in the process
- Siloed working increases the intellectual property (IP) risk and the associated likelihood of project failure
- Raw materials costs can over-run due to a lack of proper tools for importing relevant information from Enterprise Resource Planning (ERP) systems early on in the product development process

To overcome these issues and improve collaboration within multidisciplinary project teams, we have developed an integrated and intelligent R&D data management solution for specialty chemicals companies: Signals One. This empowers users to better conduct R&D workflows through more efficient data collection, organization, visualization, analysis, and collaboration, which can in turn accelerate new product development for higher revenue and profitability.

UNIFY   **SEARCH**   **COLLABORATE**   **ACCELERATE**
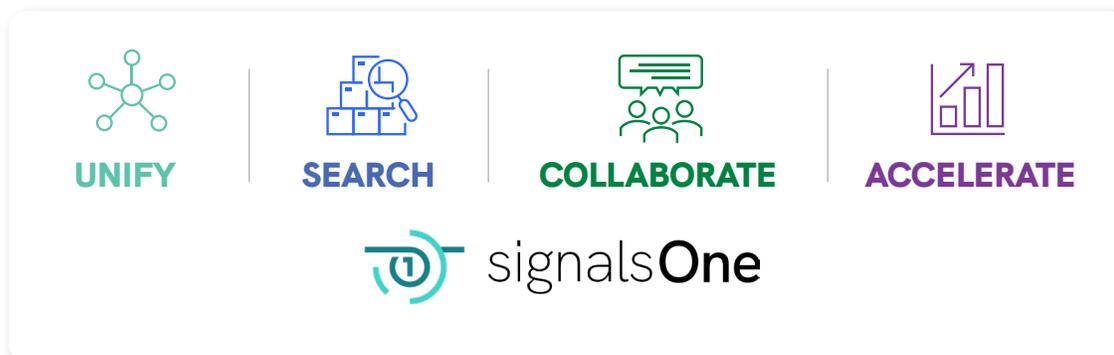
signals**One**

## Achieve Deeper Insights With Revvity Signals One

Revvity Signals One is an intelligent R&D and formulation data management solution that serves to streamline workflows and increase an organization's chances of success when developing new chemical products. Powered by ChemDraw® (our gold standard chemical drawing tool) and Spotfire® (our best-in-class data analysis and visualization software), Revvity Signals One provides an array of functionalities that have historically been unavailable as a single integrated platform. These include workflow and inventory digitization, a structured R&D database, and tools for formulation screening and optimization. In addition, Revvity Signals One offers broad compatibility with other systems, scientifically intelligent data analysis and visualization, and a cloud-based SaaS environment for improved collaboration.

Revvity Signals One empowers Specialty Chemicals Companies to boost profitability through productivity gains, revenue increases, and raw materials cost-savings

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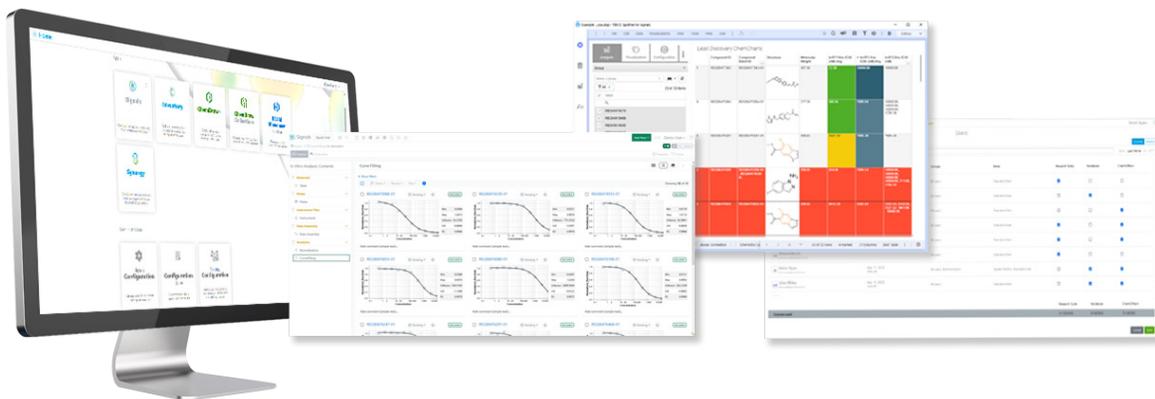
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Use Revvity Signals One for your R&D program to:

- Centrally capture, organize, and customize scientific experiments and related data
- Securely access data anytime, anywhere, on any device
- Search experiments, ingredients, and formulations across the enterprise
- Provide full traceability to all experiment related information and activities
- Manage the material information library and ingredient inventory
- Collaborate and share insights in a permission-managed environment
- Analyze and visualize data using advanced predictive modeling capabilities

Designed for Chemistry Related Applications

Revvity Signals One is based on two core components: Signals Notebook and Data Processing. These are seamlessly integrated with one another, and entirely hosted in the cloud, allowing multidisciplinary project teams to plan, execute, and analyze virtually any specialty chemical workflow with ease.

signals**Notebook**

Signals Notebook, our leading cloud-native electronic lab notebook (ELN), is at the heart of Signals One. Serving to digitize R&D workflows through data capture and organization, Signals Notebook does what Excel other similar tools cannot: helps scientists record and plan experiment narratives, manage materials, reuse data, and collaborate. With an almost limitless array of functionalities required for industrial chemistry, Signals Notebook lets users:

- Capture details of product synthesis, including how much material was produced and how much remains available
- Store information about the different types of chemical, mechanical, and electrical tests performed, including details of test development and optimization, experimental conditions, and equipment used
- Confirm that ingredients comply with the regulatory requirements of different geographies
- Access time stamps and other information required to submit a patent application
- Gather intelligence (e.g., cost) that can be used to justify the continuation of a project

Signals One is a fully self-service analytics and visualization software that lets users quickly make sense of all the information captured within Signals Notebook and determine how best to proceed. Compared to the established practice of copying data from Excel and pasting it into a generic statistical software package, which represents a cumbersome and error-prone way of working, Signals One lets users organize and analyze data faster and more reliably, with scientific intelligence, to dramatically increase the productivity of R&D teams.

A main benefit of Signals One is that it can significantly reduce the number of experiments required to be performed. For example, suppose the aim of a project is to investigate the impact of five different factors on a chemical formulation, and each of those factors has five different levels. Historically, researchers might have needed to plan and execute 3,125 possible experiments. Yet by using Signals One for Analysis of Variance (ANOVA) guided Design of Experiment (DOE), that number could theoretically be reduced in a matter of seconds to just 10 – 20 experiments, compared to hours or even days spent performing similar analyses with traditional methods.

Other advantages of Signals One include its capacity to:
- Determine which types of tests provide the most useful results
- Identify which new chemical products or formulations yield the desired outcomes, and which require further testing
- Include or exclude data on the fly, such as removing outliers to avoid skewing results
- Perform multiway comparative analyses to better understand how certain factors impact results
- Achieve sub-second responses irrespective of data volume
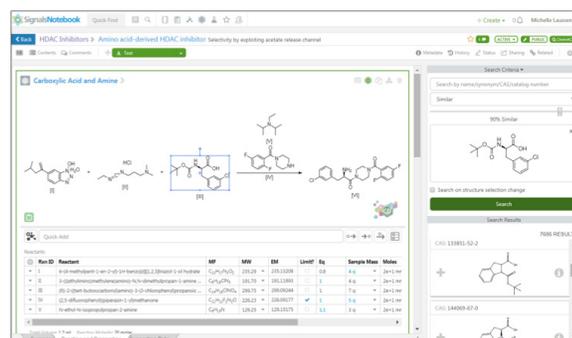
Search and add commercially available compounds to your reaction schemes easily with ChemACX directly in Signals Notebook.

Revvity Signals One lets users organize and analyze data faster and more reliably to increase the productivity of R&D teams

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Addressing Tactical Challenges Through Four Key Capabilities

Developing new chemical products and formulations is essential to meet global demand for the 'next big thing'. But to reap the rewards of developing a new product, R&D teams must be able to demonstrate improved performance, better green credentials, and/or more cost-effective manufacturing. At the same time, complying with regulations and maintaining IP protection is fundamental to avoid potentially catastrophic outcomes. Signals One empowers R&D teams to deliver on these goals through four key capabilities:

#1 – Increased team productivity

- Improve data-driven decision making with streamlined data analysis and visualization
- Shorten development timelines with a structured R&D database and more efficient screening and optimization processes
- Promote collaboration by leveraging the cloud

By making data accessible to every single member of a team, rather than to just a select few with the requisite training to extract actionable insights, Signals One increases team productivity to enhance the efficiency of developing novel products. Specifically, better organized data and more intuitive means of planning and executing tests help to prevent wasted time and reduce product development risks, while the capacity for cloud-based collaboration speeds up decision making to bring new chemical entities to market sooner.

#2 – Improved product performance

- Achieve faster, more reliable insights through better representation of critical R&D information
- Simplify screening and optimization processes

Product development processes based on the use of Excel make mining data difficult. By simplifying data capture, analysis, and visualization, the Revvity Signals One allows users to easily identify and implement ways of improving product performance, generating new ideas grounded in science. Also, greater clarity reduces the number of tests required to be performed, meaning that screening and optimization becomes less cumbersome.

Intelligent formulation increases quality and marketability

Imagine you sell one kiloton (kT) of a product every year at at a price target of $5/kg. Now, suppose that a data-driven formulation improvement can increase the quality and marketability of the product, resulting in a price premium of 15%. This leads to an increase in revenue of $750,000 per product per year, adding a significant price premium to your product.

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## #3 – Reduce new product development timelines

- Experience faster, easier ways of working
- Rationalize regulatory checks and accelerate the IP process

Historically, product development timelines have suffered as a consequence of R&D teams having limited means to quickly locate and understand key information. By digitizing R&D workflows and inventories, as well as providing a structured R&D database, Signals One promises to expedite workflows. In addition, further time savings can be realized as a result of simplified regulatory checks and an accelerated IP process.

#4 – A better decision-making environment

- Benefit from easier data sharing and enhanced transparency
- Access new information as soon as it becomes available

Almost every aspect of Signals One is designed to support better decision making. Key features include provision of a structured R&D database, digitization of R&D workflows, and the capacity for data access protection, as well as advanced data analysis and visualization, easier means of checking regulatory compliance, and mechanisms for accelerating the IP process. In addition, cloud-based collaboration helps to ensure that projects remain on track.
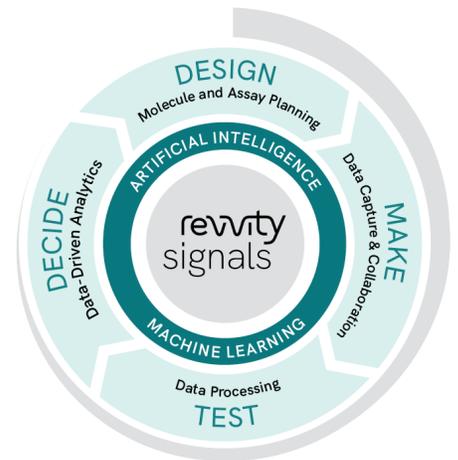
One Team, One Goal – Harmonized Alignment for Scientific Excellence

The Enterprise Customer Experience team delivers a wide range of services for designing, deploying, and managing an informatics solution that aligns with your organization's R&D Informatics needs. Service offerings include:

- Implementation Services
- Validation Services
- Consulting & Design Services
- Configuration & Integration Services
- Education Services

We understand technology and the science of our customers. We apply that expertise to delivering solutions that meet and exceed customer expectations.

200
Professional Services Staff Globally

75%
Advanced Scientific or Technology Degrees

350
Projects Completed per Year
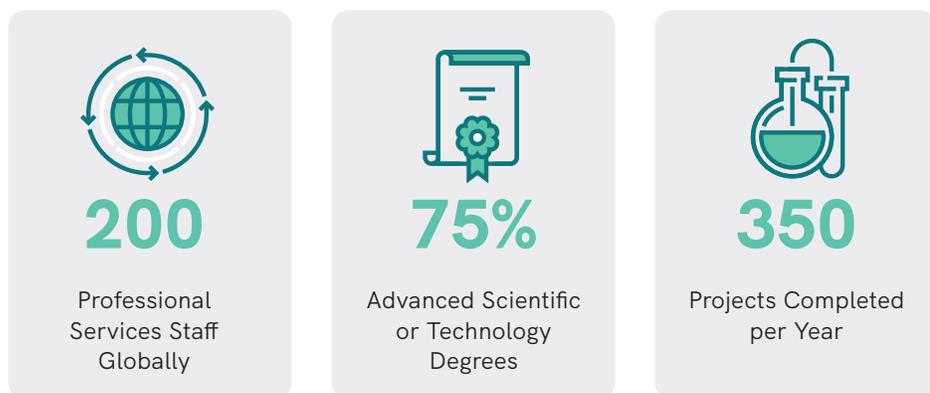
Conclusion

Achieving R&D success when developing new chemical products and formulations requires closer collaboration between multidisciplinary project teams. Outdated practices for data analysis and visualization can mean that critical insights go overlooked, leading to project failure. By providing a better decision-making environment, the Signals One empowers R&D and Formulation teams to improve product performance more rapidly and thus reduce development timelines. Whatever the aim of your industrial chemistry project, leveraging Signals One can help you attain a better product, higher revenue, and increased profitability.

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To learn more about Signals One and how it can streamline R&D and formulation workflows, strengthen product performance, and enhance collaboration,
visit: revvitysignals.com/solutions/chemicals-and-materials

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