



High-tech manufacturing, Spotfire & AWS innovation as a force multiplier

Translate insights into action, every day.

In a world where geopolitical uncertainty, financial market instability, and inflation are mounting concerns, manufacturers are focusing more than ever on driving innovation. It's imperative to innovate quickly and understand where operations can become more efficient. It's no surprise that leaders' top business priority is to improve their manufacturing processes with substantial investments in infrastructure modernization, technology partnerships, the strategic recruitment of AI, and data scientists and machine learning to speed up innovation.

Spotfire & AWS facilitate and improve decision-making and provide a competitive advantage by enabling users to analyze and act on information in real time. It's an enterprise solution designed to foster collaboration between business professionals and data scientists on every level of the digital factory.

Some of the largest semiconductor manufacturers and numerous other high-tech manufacturers rely on Spotfire software to:



Let's explore the many ways that Spotfire & AWS can work together to help you make better, faster decisions.

Key challenges in high-tech manufacturing

In today's hypercompetitive global business climate, innovation is essential. To meet a rapidly changing set of challenges, manufacturers need to evolve from reactive problem-solving toward proactive, predictive, and adaptive management.

By gaining insight into machines, processes, products, and factories, managers can performance-tune their productive capabilities to deliver better, faster, and more efficient results. Industry 4.0 technology has made it possible to remotely monitor factory equipment, detect anomalies in complex processes, prevent equipment breakdowns, and react to supply chain disruptions in real time.

Manufacturers can collect more data than ever before. Many of them struggle to translate that data into insights that matter and then operationalize that knowledge in ways that reduce costs, improve operations, enhance quality, and increase profitability.

Spotfire® Visual Analytics software closes the gap between insight and action by embedding powerful analytics into the tools and processes that operational leaders use every day. Together with AWS, Spotfire delivers powerful action-oriented intelligence to manufacturing leaders, exactly where and when they need it.

How Spotfire creates value for high-tech manufacturers

Spotfire helps high-tech manufacturers meet their core business objectives and deliver better product outcomes. Here are some of the ways that today's manufacturing leaders use Spotfire analytics to improve operations:

Digital manufacturing intelligence: By monitoring and analyzing industrial processes in real time, production teams can spot irregularities, deviations, and flaws, enabling them to initiate remedial action quickly and decisively. Innovative high-tech manufacturers are using Spotfire® Data Science capabilities to leverage the power of AI for quality management—identifying nonconformances with automated visual inspections and correcting upstream issues promptly. They're using Spotfire to fuel continuous improvement, ensuring consistent quality and reliability of manufacturing processes.

Process optimization: Today's high-tech manufacturing leaders use Spotfire analytics to improve the effectiveness of their manufacturing processes and enhance product design using Design of Experiments (DoE). Spotfire enables researchers and practitioners to plan, design, and analyze experiments in a controlled, scientifically valid manner. With Spotfire software, manufacturers can structure and analyze experimental data and identify significant factors, interactions, and optimal settings. High-tech manufacturers use the Spotfire platform to deliver Wafer Map Analytics, Trellised Wafer Maps, and similar tools that help them maintain high quality, achieve maximum throughput, reduce waste, increase profitability, and mitigate risk.

Anomaly detection: Embedded real-time analytics from Spotfire and AWS enable operators with real-time alerts, helping them to identify anomaly deviations in temperature, pressure, or other key parameters. That helps manufacturers reduce waste and costs using neural networks and other advanced technologies with autoencoder and long short-term memory (LSTM). Spotfire® Streaming analytics enables production managers to evaluate streaming data in real time, monitor the status of machinery and equipment, anticipate breakdowns with real-time data analytics, and increase overall equipment effectiveness (OEE) through predictive maintenance and automated decision support.

Supply chain optimization: Recent years have exposed numerous weaknesses in global supply chains. Spotfire analytics helps high-tech manufacturers develop and maintain smarter supply chains, detecting fluctuations in real time and enabling operations leaders to proactively respond to changing customer and supplier demands. Managers can monitor supplier performance, respond quickly, and optimize logistics with data-driven decisions. High-tech manufacturers use Spotfire capabilities to bring the power of AI to inventory management, demand forecasting, and strategic sourcing & logistical choices. Spotfire software powers predictive scheduling, material & vehicle routing, linear programming, and genetic algorithms.

Advanced process control (APC): Using digital twin technology with sensor & metrology data analytics, manufacturing leaders can fine-tune and control production processes in real time. Many use Spotfire analytics to predict the properties of wafers based on production parameters, leveraging millions of parameters to model product digital twins for yield evaluation and identify the process parameters responsible for yield loss, perform root cause analysis, and evaluate test results on the final product.

Sustainability & energy: High-tech manufacturers use Spotfire visual analytics to improve sustainability metrics with advanced power management. By understanding and quantifying the impact of a variety of production parameters on overall energy usage, they can optimize output, efficiency, and quality while achieving significant cost savings via intelligent energy monitoring.

Overlay analysis: The Spotfire platform puts advanced data science capabilities directly into the hands of front-line manufacturing leaders, empowering them to diagnose pattern fidelity and layer-to-layer overlay alignment, predict potential problems before they occur, and adjust processes before predicted bad wafers fail. Spotfire software helps high-tech manufacturers with predictive yield analysis, product optimization, product quality improvements, and downtime reduction.

Infrastructure cost reduction: The Spotfire platform enables high-tech manufacturers to reduce their total cost of ownership (TCO), helping them identify ways to reduce hardware resources and find alternative approaches that offer both technological flexibility and cost savings. Reduced infrastructure leads to improved ESG and sustainability metrics as well because it decreases waste, emissions, and resource usage.



Spotfire: Ideal for high-tech manufacturing

The end-to-end, enterprise-class Spotfire analytics platform enables everyday business users to make discoveries through immersive visual exploration and advanced analytics applications. By packaging predictive analytics, streaming analytics, and embedded analytics capabilities in a single decision and control environment, Spotfire software delivers capabilities at scale for analysis of data at-rest and data in-motion.

Spotfire analytics combines both historical and real-time data in a single view, enabling production personnel to identify issues and act quickly to prevent them from becoming major problems. The platform's predictive capabilities make it possible to spot many issues before they occur.

High-tech manufacturers apply Spotfire advanced AI capabilities to real-time machine sensor data and images, enabling them to automate the detection of process and product anomalies. Using Spotfire embedded analytics with IoT and streaming data, operators can receive real-time alerts, recommendations, or even fully automated decisions.

Spotfire: Flexible deployment, powerful results

Spotfire software can be deployed on-premises, in the cloud, and within hybrid environments. It supports a myriad of data sources and files, including streaming data from sensors and equipment. High-tech manufacturers can tap into the power of edge devices, glean valuable information from an ever-wider array of data sources.

Spotfire integrates the end-to-end data process into a single platform. From data prep to analysis and visualization, it streamlines and standardizes data management and analytics workflows within a single platform. Using **Spotfire® Mods**, line-of-business users can easily add low-code custom visualizations and analytics apps that enhance the overall analytics experience.

Perhaps most importantly, high-tech manufacturers can achieve extraordinarily rapid time to value with Spotfire analytics. The platform offers templates, visualizations, and dedicated solutions specifically designed for the industry, such as **Wafermap Pattern Recognition** and **Anomaly Detection**.

Spotfire software accelerates actionable decisions, empowering teams to rapidly embed powerful analytics into their everyday business processes. Spotfire brings visual analytics, streaming analytics, and data science capabilities together in a seamless experience, delivering immersive, smart, and real-time analytics. Now, using best-of-breed analytics capabilities, every organization can discover the richest insights for smarter data-driven decision-making from any kind of data.

Spotfire + AWS: Better together

Spotfire users in high-tech manufacturing benefit from using the platform with AWS. Here are some reasons Spotfire and AWS are better together:

Innovation & industry leadership: Spotfire & AWS help high-tech companies identify, develop, and bring new products to market by streamlining data preparation and analysis, integrating a broad array of data sources, and enabling data-driven decisions. Together, AWS and Spotfire keep you on the leading edge of innovation.

Cost savings: The latest release of Spotfire software helps manufacturers save approximately 30 percent in infrastructure costs when moving key components from an AWS Windows Virtual Machine to an AWS Linux OS Virtual Machine. Spotfire leverages horizontal and vertical autoscaling for dramatically reduced resource usage.

AWS for data on the edge: AWS offers IoT services and solutions to connect and leverage IoT-connected devices. Spotfire enables analyzing and presenting IoT data using its AWS different services connectors. Using the Spotfire platform, manufacturers can easily couple these with other services to add data-driven alerts to their applications.

Robust Spotfire capabilities, complemented by the AWS platform, open the door to innovation and continuous improvement. High-tech manufacturing companies throughout the world are using Spotfire software to drive higher profitability, efficiency, and quality.



Spotfire in action

When US-based manufacturer Hemlock Semiconductor (HSC) wanted to optimize market share and maintain its edge in a highly competitive global market, it turned to Spotfire® Visual Analytics software to help improve quality, control costs, reduce energy consumption, and identify potential new business models. [Read the case study](#) to learn more about how Spotfire predictive analytics helped HSC stay on the leading edge of innovation.

When Massachusetts-based STMicroelectronics wanted to increase operational performance, increase organizational agility, and improve data governance, the company deployed Spotfire software across its 12 production facilities worldwide. Today, the platform enables the company's engineering teams to develop their own field-level analyses, improving operational efficiency and speeding time to resolution for manufacturing issues. [Read the STMicroelectronics case study](#) to learn more about its success story.

Want to put the power of Spotfire and AWS to work for your company? Learn more by visiting www.spotfire.com, or peruse our [Spotfire for Manufacturing Intelligence](#) page to learn how Spotfire software can directly benefit your high-tech manufacturing business.

Join our [Spotfire Community](#) to explore how your industry peers are leveraging Spotfire.



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Spotfire® goes beyond basic rearview dashboards to offer a single visual analytics platform for data exploration and real-time decisions. Backed by point-and-click, no-code data science, Spotfire allows even the non-developer to analyze both data-at-rest and data-in-motion, together, for faster time-to-insight and better business outcomes.

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