



Texmark Chemicals deploys IIoT at the edge in showcase Refinery of the Future

Texas toll manufacturer Texmark Chemicals is a crucial link in the petroleum product supply chain, and because it works with regulated hazardous materials, safety is a top priority. So it turned to HPE and Aruba to build a Refinery of the Future featuring advanced IIoT capabilities. The results: better process analytics, increased up-time, uninterrupted productivity, satisfied customers, and safer workers.

TREND

AT A GLANCE

BUSINESS CHALLENGE

IT CHALLENGE

SOLUTION

RESULT

Hot demand for a hot product

Demand for dicyclopentadiene (DCPD), a polymer precursor for everything from ink to boats, is growing worldwide. But DCPD manufacturing processes involve flammable materials requiring stringent safety measures — and as demand increases, so does the complexity of the supply chains that rely on it.

The ink in a printer. The hull of a fiberglass boat. A bathtub. Manufacturing these products as well as many others including insecticides, paints, varnishes, fragrances, and rubber goods, requires the polymer precursor dicyclopentadiene (DCPD) or a derivative of it.

Manufacturers like DCPD because it makes products tough, able to resist heat and corrosion. Worldwide demand for DCPD is growing, driven by the producers of resins and plastics and the needs of the marine and construction industries. In the United States and Europe, the uptick is coming from recovering economies. In the Asia Pacific region, the product is needed by a growing plastics industry. Demand also is rising in Latin America and Africa.

But manufacturing and supplying DCPD and related products isn't simple. Its manufacture involves heat — lots of it — and highly reactive chemicals, making safety a top priority. And as demand for DCPD grows, the global supply chain becomes increasingly complex, requiring ever more stringent controls, granular visibility, uninterrupted productivity, and regulatory oversight.

“The types of products demanded by customers in the chemical industry can change on a dime, and each product must meet stringent quality requirements. That makes it critical to monitor plants with advanced sensing equipment and distributed control systems.”

David McNiel, President, Texmark Chemicals



4.9%

Compound annual growth rate worldwide in DCPD market

\$838M

Global market by 2023

A Petro-Chemical industry benchmark for quality and safety

Texmark Chemicals of Texas is a leading producer of DCPD, and an industry benchmark for quality and safety.

Texmark Chemicals, Inc., is a Texas Petro-Chemical processing and manufacturing company that provides custom contract manufacturing (tolling) of specialty and high volume chemicals to many of the world's leading chemical companies. Texmark is the #1 merchant producer of DCPD in North America, a polymer precursor used to make everything from inks to bathtubs. Direct access to the Houston Ship Channel allows Texmark to ship and receive products by ship and barge, as well as by rail and truck. With its advanced equipment and strict process controls, Texmark has been an industry leader in quality and safety for more than 50 years.

“Texmark makes chemicals for the world. For nearly 50 years, we have been the benchmark of quality in our industry. At Texmark, safety and people come first – our employees, our customers, and our neighbors.”

David Smith, Founder and Owner, Texmark Chemicals



53
Employees

1962
Year Founded

#1

Merchant producer of DCPD in North America and a top producer of DCPD worldwide

Stay safe, drive efficiency, satisfy customers

Safety and operational efficiency are essential when dealing with flammable, highly regulated materials.

Texmark's first business priority is safety. Many of the materials the company works with are hazardous, flammable, or both, and are heavily regulated. Texmark must ensure its workers adhere to Process Safety Management (PSM) procedures at all times, and that its facility is managed in ways that put worker and community safety first.

As a contract manufacturer, Texmark must be prepared to adapt to customer requirements, which can change with little advance warning.

And it must continually drive plant efficiency and productivity. Historically, Texmark has depended on physical inspections of process equipment to ensure all systems remain in working order. However, these plant walk-downs can be time-consuming and labor-intensive. Texmark has 130 pumps in its plant, and spends nearly 1,000 hours a year on walk-downs and vibration analysis.

Depending solely on physical inspections also carries risk, because it relies on employees who — based on years of experience — can tell if a pump is starting to malfunction by recognizing slight variations in its noise and vibrations. But what happens if an employee with that skill is out sick, or reaches retirement age? Texmark needs ways to institutionalize that type of intelligence and insight.

“The global business environment in the petrochemical industry is very, very competitive. We’re constantly seeking ways to compete more effectively. And any approach we take must also align with our commitment to ethics, safety, and community.”

Doug Smith, CEO, Texmark Chemicals

6

Product lines requiring safe manufacture

> 50

Leading chemical companies
rely on Texmark products

Multiple

Lightning strikes each year resulting in
infrastructure outages

Not just “any old” IoT will do

IoT holds the promise of benefiting Texmark’s production streams in a multitude of ways. But specialized manufacturing needs more than one-size-fits-all solutions.

Texmark’s vision for next-generation worker safety, production and asset management hinges on the emerging promise of the Industrial Internet of Things (IIoT): sensed devices combined with advanced analytics software to generate insights, automate its environment, and reduce the risk of human error.

IIoT requires robust connectivity, architected to support gathering data from a range of IIoT devices. That connectivity must be cost-effective, however — and hard-wiring a manufacturing plant can be prohibitively expensive.

In addition, any technology installed in Texmark’s plant must be ruggedized and meet the company’s operational standards for safety: equipment operating at Texmark’s edge must be designed to ensure it cannot be a source of ignition.

Another key IIoT challenge Texmark must address is data latency. Transmitting data takes time, and in IIoT seconds often count. Texmark requires an IIoT architecture that eliminates the need to transmit device data over a WAN, but instead supports analytics at the edge to deliver real-time visibility into equipment and processes.

35K

Person-hours per year spent monitoring plant

> \$1M

Inspection program costs

“Pumps are the life-blood of our business. If a critical pump goes down, it may shut down the entire operation.”

Doug Smith, CEO, Texmark Chemicals



Hand in hand with HPE on the IIoT journey

Texmark is undertaking a three-phase IIoT journey, combining HPE and Aruba solutions with services from HPE Pointnext and HPE partners to create an industry-leading Refinery of the Future.

Texmark launched a multi-phase project to implement an end-to-end IIoT solution. It selected HPE and Aruba to support the project with technology, expertise and HPE's extensive ecosystem of partners.

Phase 1 and 2 established the digital foundation by enabling edge-to-core connectivity. Aruba deployed a secure wireless mesh network with Class 1 Div 1 access points and ClearPass for secure network access control. Aruba beacons provide location-based services for plant safety and security purposes. The wireless solution cost about half of what it would have cost to deploy a hardwired network.

For its edge analytics, Texmark selected the HPE Edgeline Converged IoT platform, an industrialized solution that supports robust compute capabilities. HPE Pointnext implemented the system as an HPE Micro Datacenter, which integrates its compute and networking technology within a single cabinet. HPE also upgraded Texmark's plant control room to enable seamless edge-to-core connectivity and high-speed data capture and analytics, and to meet Texmark's safety and security standards. The Edgeline system runs Texmark's Distributed Control System software, integrating its operations technology and IT into a single system.

Phase 3 builds on the foundation established by these technology solutions to support Texmark's use cases: predictive analytics, advanced video analytics, safety and security, connected worker, and full lifecycle asset management.

SOLUTION RECIPE

Rugged devices, real-time data

Designed to meet the specific demands of the oil and gas and manufacturing markets, HPE's IIoT architecture supports edge analytics for real-time, actionable manufacturing and process insights, and is bundled with services from HPE Pointnext and HPE partners to accelerate time-to-value.

HPE Hardware
HPE Edgeline EL4000 Converged Edge System
Aruba Mobile First Network
Aruba BLE beacons

HPE Software
Aruba ClearPass Policy Management
Aruba AirWave network management
Aruba Meridian location-based cloud services

Transformation Solution
Intelligent Spaces
Mobile First Campus
Micro Datacenter

HPE Pointnext
HPE Micro Datacenter
HPE Datacenter Consulting

HPE Partners
Aruba
HPE Labs
OSIsoft
National Instruments
PTC
Accenture
Deloitte
Intel
CB Technologies

“We’re building a refinery of the future that combs through data and reveals how the entire plant is interconnected. It becomes like a living, breathing organic plant that knows how it should operate; if any part falls out of line, it flags for intervention.”

Linda Salinas, Plant Manager, Texmark Chemicals

A showcase refinery of the future

Automated worker safety, facility condition monitoring, and predictive maintenance bring transformational innovation, efficiency, and protection.

Texmark's new IIoT solution will help make its workers even safer. It can monitor fluid levels, for example, reducing the risk of spills. It can alert Texmark immediately if a system starts to malfunction, enabling the company to respond before workers or production are endangered. And in the event of an emergency, it can help protect workers by ensuring Texmark knows their precise location and movements within the facility.

Other benefits will improve the company's bottom line. Texmark can use data from IIoT sensors to identify which systems require hands-on evaluations, for example, so it can conduct physical inspections in a more focused and efficient manner.

The new IIoT solution makes it easier for the company to plan inspections and maintenance. To work on distillation columns, Texmark must often take systems off-line and erect costly scaffolding. Improved maintenance planning will reduce these associated costs by at least 50%.

Texmark can also leverage IIoT data gathered during research pilots to quickly determine project feasibility, streamlining its business development timelines.

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target for safety incidents and unplanned outages

100%

Satisfaction of customer SLAs

50%

Reduction in planned maintenance costs



“Texmark is a leader in innovation, and from the beginning — when my dad founded this company — we embraced ideas that were ahead of their time. Now HPE has given us the opportunity to do that again. This innovative IIoT technology will help us become safer, more competitive, and better at everything we do.”

Doug Smith, CEO, Texmark Chemicals

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