



## **Improving chemical production quality and yield by minimizing process inefficiencies**

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How a multinational manufacturer of Ethylene Dichloride implemented process-based Industrial AI to increase production yield by €1.7M in less than 12 months

## About the company

The manufacturer, founded in 1978, has 17 production sites spread across Europe. What started as a business that delivers construction projects for industrial manufacturers, turned into a worldwide chemical manufacturing business, employing over 3,500 employees worldwide.

**Industry:**

Chemicals

**Employees:**

Over 3,500

**Company turnover in 2018:**

Over €1.4B

## The Challenge

The manufacturer turned to Seebo to solve a number of process inefficiencies that were impacting production yield and quality. Process inefficiencies included the formation of undesired side products, and losses during separation of the desired products from the reaction mixture. They were also looking to prevent future inefficiencies from happening and affecting the production line.

## Traditional AI vs. Process-based Industrial AI

Before diving into how Seebo combats these challenges with its Process-Based Industrial AI, it's important to gain an understanding of the differences between traditional AI vs. Process-Based Industrial AI.

While both traditional AI and Process-Based Industrial AI analyze the raw data generated from the production line (OT data), traditional AI will apply unsupervised machine learning algorithms to the raw OT data, leading to a flood of alerts and many false-positives.

Process-Based AI, on the other hand, will contextualize the OT data by adding business data from IT systems into the dataset, together with the specific production process flow context, thus building a process-based data model. Then, it applies process-based supervised machine learning algorithms, which are able to clear the noise of false-positives and pinpoint actionable insights.

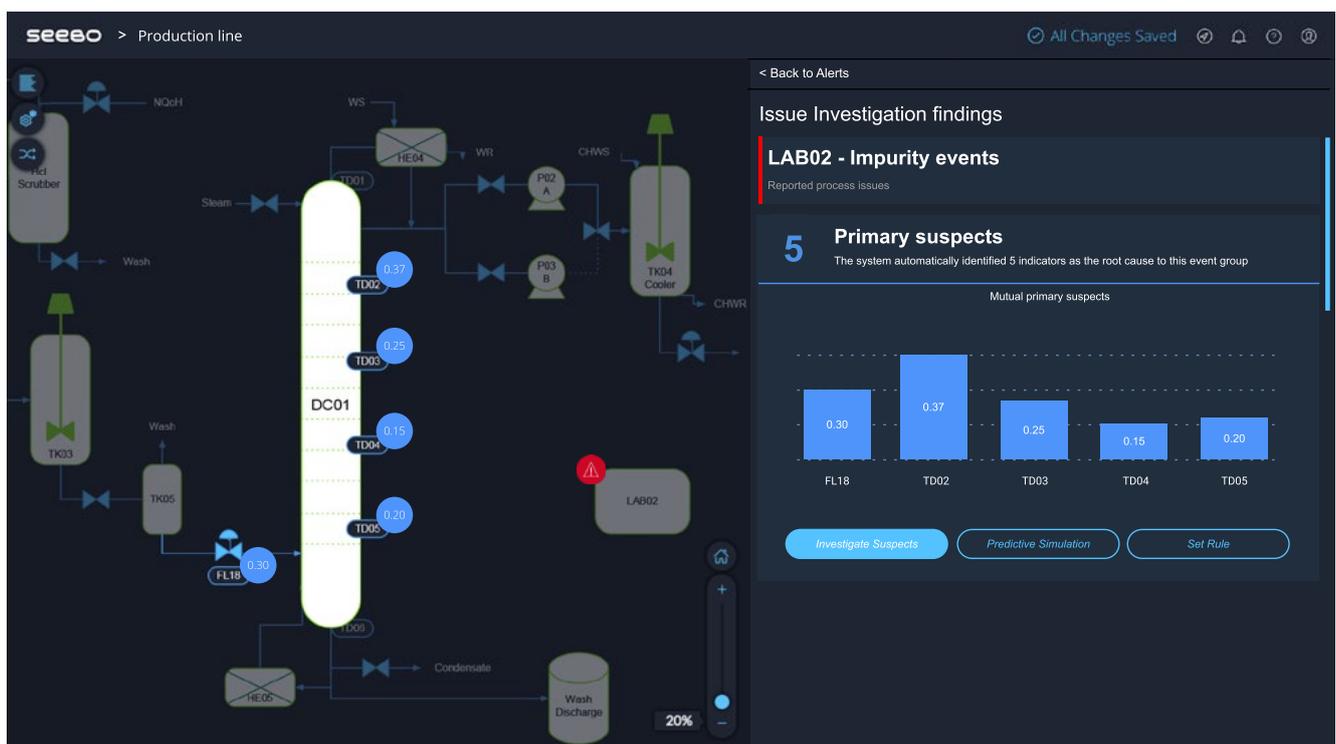
# The Opportunity

The manufacturer had all-too-often seen the formation of side products reach a level higher than the desired spec (6 PPM instead of 2PPM). In such cases, the manufacturer was forced to sell the lower-grade product at a much lower price to countries with less stringent regulations.

# The Solution

Together with the customer's process engineers, the Seebo manufacturing excellence team modeled the customer's production line using the Seebo Digital Twin Modeler, together with the IT (SAP) and OT (OSI PI historian) data sources - generating a specific process-based data schema of the production line. This modeling phase was performed over the duration of 3 weeks, and the integration to the specific data sources took a further 2 weeks.

Seebo then configured the solution dashboards to present predictive insights alongside the digital twin model - providing the process engineers with complete and visual context of the predictive insights. The customization process lasted just 2 weeks.



Later, the solution applied the Seebo supervised machine learning algorithms on the real-time data, based on the process-based data schema. At this stage, insights for root cause analysis were automatically derived and presented to the process engineers within the Seebo digital twin dashboards. The dashboard taught of 5 primary suspects causing this issue, and identified that the combination of different temperature measurements around the installation column, with the flow rate to the distillation column, were the major factors causing the formation of undesired side products.

Both values (flow rate and temperature) were within their respective allowed ranges, so they were not alerted by the factory control system.



After understanding the cause of the problem, the client used Seebo's Predictive Simulation capabilities to analyze different scenarios. By predicting production performance under different simulated parameters that affected the process disturbance, the client was able to determine the best set points to determine the optimum process value.

The Seebo solution applied predictive analytics to anticipate future occurrences of similar issues, enabling the customer to prevent them from happening again.

In the Seebo dashboard, the production team was able to see warning alerts with the statistical probability of the process inefficiency happening again.

When investigating further, they discovered a high probability of another side product formation event taking place. By having the ability to see the expected behavior of the temperature and flow, the manufacturer was able to prevent the issue, and by doing so, improve production yield and quality.



## Summary

Within 10 months of deploying the Seebo solution, the manufacturer gained **€1.7M** by increasing the yield and quality of the produced Ethylene Dichloride.

New process inefficiencies are continually discovered and mitigated. For example, the Seebo solution identified the root cause of a disturbing factor, which caused excessive high pressure in one of the pumps. Resolving this issue minimized the occurrences of high pump pressure, and thus the need to stop and clean the line.

**€850K/YEAR**

**HIGHER SALES PRICE**

due to higher  
quality product

**€450K/YEAR**

**INCREASED YIELD**

due to higher  
quality product

**€400K/YEAR**

**INCREASED THROUGHPUT**

to higher  
quality product



Seebo is a pioneer in process-based Industrial AI, with solutions to predict and prevent disruptions in manufacturing due to quality and downtime issues.

Using the Seebo Industrial IoT Platform, we infuse the customer's production line processes and knowhow, together with data from OT and IT systems, into machine learning – without requiring the customer to master data science. This enables us to deliver solutions for Predictive Quality, Predictive Maintenance, and Condition Monitoring with unmatched accuracy and simplicity.

The Seebo Industrial IoT Platform combines visual, code-free tools for Process and Data Modeling, Automated Root Cause Analysis, Predictive Analytics and Digital Twin Visualization. These tools enable us to tailor our solutions to clients' specific needs, and to easily adapt the solutions post deployment.

Manufacturers across industries – including Grundfos, Stanley, Procter & Gamble, Ralph Lauren, and many more – use Seebo to increase overall equipment effectiveness (OEE), minimize maintenance costs, and continually improve quality.

Founded in 2012, the company has raised over \$22M from top VC firms, and was named a Gartner Cool Vendor in the Internet of Things for 2017.

*You can learn more by visiting our website: [www.seebo.com](http://www.seebo.com)*

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