With improved autonomy measures in place, chemical manufacturers can transform their facilities to exceed production and safety goals.

To learn more about getting started, contact a Microsoft autonomous systems expert or download our e-book: Get started with autonomous systems: A manufacturer’s use case selection guide.

Production and quality assurance account for 47% of modern AI implementations.

Seasoned chemists and engineers can teach their best practices to the AI. The AI can then perfect those methods inside a simulated environment where it combines, adapts, and revises techniques to test millions of transition scenarios.

With a supporting AI, new hires and less seasoned chemical professionals can confidently perform more advanced tasks on the factory floor.

By testing potential variables inside a simulated environment, autonomous systems can reduce calibration time from months to days.

Simulated environments create ideal testing conditions for new methodologies and formulas without risking operator safety.

A more controlled and predictable chemical reaction delivers a more consistent final product.

Reductions in out-of-spec polymers and wasted resources help ensure a more sustainable and efficient operation.

1. With a regular rotation of different oil-based products processing through its reactors, Fabrikam, Inc. must regularly adapt its reactors to create the correct synthetic polymers. Every product within Fabrikam’s wheelhouse requires a unique balance of chemicals to produce—a balance that, if not measured correctly, can cost the manufacturer millions in out-of-spec product and potential safety hazards.

With an autonomous system in place, Fabrikam, Inc. can quickly pivot its production needs to better meet shifts in demand while reducing unwanted chemical reactions.

2. Autonomous systems in action

Manufacturers that adopt autonomous systems can increase production by 20%.

³ of chemical processors saw at least 2x improvement after adopting an AI.

72% saw performance increase 5x after adoption.

37% saw 2x increase in productivity.

"Experience and skills of a plant's operators usually determine profit margin and safety level of a plant …. Within a few weeks of training, [our autonomous system] could deliver a set of operational sequences equivalent to highly experienced operator's know-how."

Pitak Jongsuwat, Physics Model Technology Engineer for Chemicals Business, SCG

As a result, plant performance is significantly delayed while operators calibrate settings to changeover reactors and equipment to optimally produce new products.

Autonomous systems offer chemical processing facilities a powerful AI equipped to assist, advise, or execute any number of tasks.

By testing reactor optimizations inside a simulated environment, an autonomous system can try millions of options in a single day so it can easily make decisions in the real world—drastically reducing calibration time and offering engineers, chemists, and operations managers a rapid and accurate solution for optimizing reactor performance.

This approach can:

- Decrease reactor calibration time
- Reduce out-of-spec production
- Improve training times
- Drive facility performance

Chemical processing is a balance of competing variables and goals. Traditionally, plant operators calibrate chemical reactors manually over the course of months to adjust for changing production needs—testing and tweaking multiple settings to achieve their optimization goal for that period.

Sources:
1. SCG optimizes chemical plant operations with Microsoft autonomous systems. Microsoft. 2020
2. Chemical companies ready to seize AI opportunities. Accenture. 2018