



Product capabilities

Case Study



More safety and efficiency in liquid ammonia sampling

From a notification to a collaboration with Yara Sluiskil, Netherlands

Introduction

In the demanding world of the chemical industry, Yara Sluiskil, part of the global Yara International, is known for its pursuit of operational efficiency and sustainability. Central to its production process is the sampling of liquid ammonia, a task that is essential yet comes with various challenges.

The challenge facing Yara Sluiskil was complex and multifaceted. As a major producer of fertilizers, safely and efficiently sampling liquid ammonia, a crucial raw material, was a necessity.

This case study illustrates how Yara Sluiskil and Swagelok collaborated to redefine the standards for safe and efficient ammonia sampling in the industry. Additionally, it provides insight into the impact of this successful partnership, which contributes to a chain reaction of innovation and improvement throughout Yara's organization.

Who is Yara Sluiskil?

Yara Sluiskil is the largest production facility of the Norwegian company Yara International, with nearly 17,000 employees worldwide. Yara operates in 52 countries and has been selling its products in over 160 countries since 1929. From its current location in the Gent-Terneuzen Canal Zone, the company produces nitrogen-containing fertilizers and industrial chemicals, such as Air1® and NOxCare®, which can capture harmful nitrogen oxides (NOx). Additionally, Yara Sluiskil produces CO₂ for bubbles in soft drinks and beer, dry ice used, for example, for storing vaccines, or CO₂ as a growth agent in horticulture. The factories are among the most efficient and reliable in the world, with safety being a top priority.

The raw materials used by Yara include natural gas (methane), air, and water. Solid materials such as dolomite stone and gypsum serve as fillers for the fertilizer granules. Yara's mission is simple yet ambitious: to responsibly feed the world and protect the planet.



Overview of Yara Sluiskil



The ammoniak dilemma

The challenge facing Yara Sluiskil was complex and multifaceted. As a major producer of fertilizers, sampling liquid ammonia (a crucial raw material) is a necessity. However, the existing system for this sampling was outdated and inefficient. Points of concern included:

Inefficiency: The old system was time-consuming and labor-intensive. Collecting samples took a lot of time, resulting in delays in the analysis process.

Safety Risks: Working with liquid ammonia carries significant risks. The old system had multiple connections that needed to be manually tightened, increasing the chance of leaks and exposure to hazardous substances.

Lack of visual control: The existing method provided little to no visual control over the sampling process. This lack of visibility made it difficult to ensure the quality and consistency of the samples.



The solution

The Swagelok ammonia sampling minimizes the operator's exposure to potentially hazardous materials and environmental impacts. Thanks to the glass-fitting design, samples can be taken without exposing the technician, while visual confirmation of process steps remains possible. The closed- Sample Fixtures controls the release of ammonia into the environment, and sampling can be installed at the sampling point

Yara and Swagelok

The optimization of liquid ammonia sampling at Yara Sluiskil started in 2019 when Swagelok Netherlands came into consideration through a notification to Yara. The process of collaboration and innovation between the two companies unfolded as follows:

Initial discovery and demonstration

The first encounter with Swagelok's technology began with a notification in 2019 that their solution for liquid ammonia sampling had potential for Yara. Wilco Landkroon, Field Engineer & Trainer at Swagelok Netherlands, visited the site to demonstrate the product, originally developed for the American market.



Geared Valve



PLC/Touch Screen Controls

Test setup and trial phase

In 2021, several sessions were held for the installation of a test setup. With the involvement of Swagelok Company and the Dutch distributor, the test setup was installed. For this purpose, Matt Dixon, Technical Leader of Swagelok Company, was specially flown in to personally demonstrate the operation of this innovative test setup. Subsequently, the trial phase commenced, during which the new system was compared to the old method of sampling. This provided Yara with the opportunity to immediately see the benefits, such as the improved speed and safety in the sampling process.

Unique collaboration and development

Sampling liquid ammonia is a complex process that requires precision, safety, and speed. The sampling system was originally only available in the United States.

For this reason, Swagelok took the initiative to facilitate a prototype for the European market, in the form of a test setup. This marked the beginning of a unique pilot project aimed at further developing and refining the ammonia sampling system.

This phase was crucial for adapting the system to Yara's specific needs. The collaboration was strengthened by Swagelok's provision of a prototype, which gave Yara the opportunity to test the device in a practical setting and provide valuable feedback.



Closed loop sampling



Time, safety en innovation



Efficiency improvement:

The new sampling system from Swagelok provided a faster method for collecting ammonia samples, significantly reducing the time required for sampling and analysis. This resulted in a more efficient workflow and faster responses to quality controls.



Increased safety:

By focusing the design on minimizing exposure to ammonia and reducing manual connections, the safety risks were drastically reduced. The new system decreased the risk of leaks and other incidents, creating a safer working environment for the employees.



Ease of use and visual control:

With improvements in user-friendliness and the introduction of more effective visual control mechanisms, the sampling process became more transparent and consistent. This resulted in better quality assurance and a more user-friendly experience for the operators.

With the improved system, Yara can now use residue tubes in addition to moisture analyses for further testing in their laboratory, such as testing for oil or metals in the samples, contributing to better quality control of the medium. Additionally, the collaboration between Yara and Swagelok allows for the sharing of feedback and knowledge, improving efficiency, reducing risks, and fostering innovation. It is no longer a customer-supplier relationship but a partnership of knowledge sharing.



Expertise team at Yara Sluiskil

The road to innovation for Yara

The collaboration between Swagelok and Yara is an impressive example of how shared expertise and focused collaboration can lead to significant improvements in industrial processes. The benefits of this collaboration extend beyond the borders of Yara.

Other Yara locations around the world, including Australia, Norway, and Germany, have shown interest in the innovative ammonia sampling system developed by Swagelok, inspired by the success at Yara Sluiskil, Netherlands.

This growing interest has led to the formation of a 'community of practice' within Yara, where knowledge and experiences are shared through a specially set up SharePoint site. This community serves as a knowledge hub, where Yara's global locations have access to valuable insights and best practices from the project. The impact of the collaboration between Yara and Swagelok Netherlands has thus set off a chain reaction of innovation and improvement throughout the entire organization of Yara.

This development not only highlights the effectiveness of the system but also underscores the power of collaboration and knowledge sharing within a global network. The collaboration with Swagelok Netherlands has resulted in a solution that not only meets current needs but also provides a future-proof strategy for the complex challenges of ammonia sampling. This is clear evidence that when organizations like Yara and Swagelok join forces, they can not only improve their own operations but also have a positive impact on the broader industry.

