



Röhm

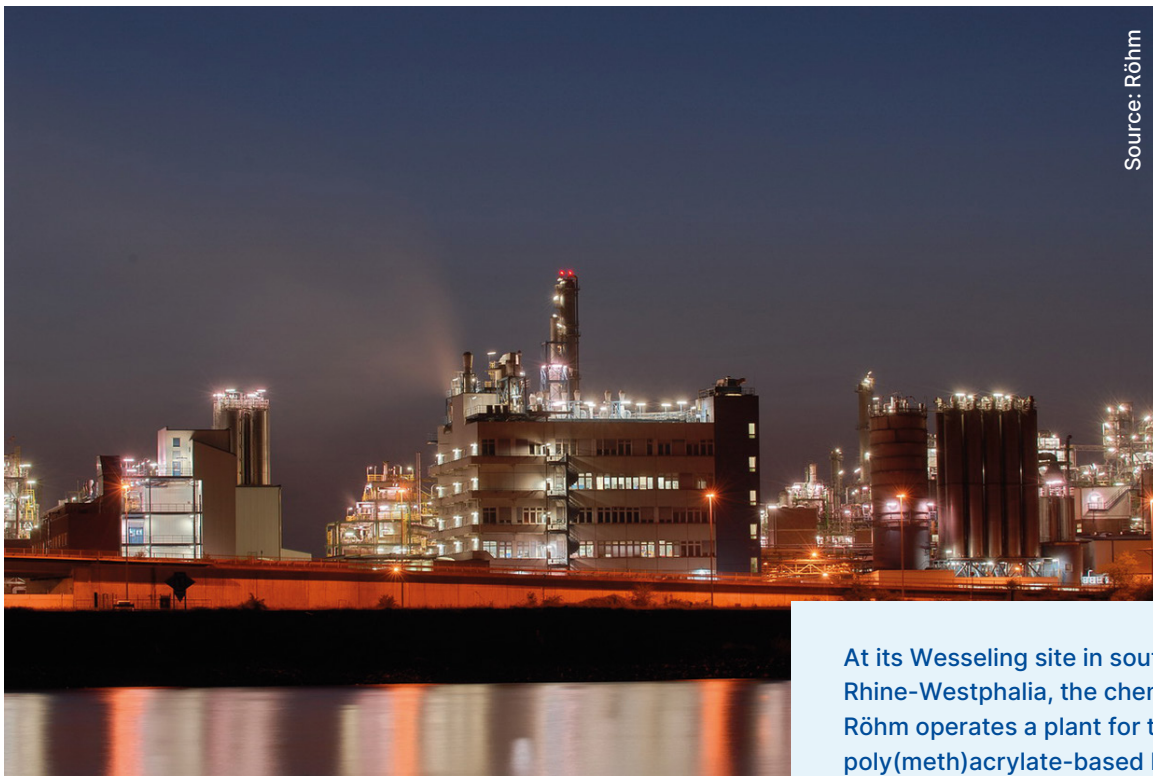
Flexible Process Control in Chemical Production

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bürkert
FLUID CONTROL SYSTEMS

Air control and electrical signals from a robust ATEX control cabinet

An electropneumatic automation system was assembled for a pearl polymerisation plant, housed in a robust ATEX control cabinet. The intrinsically safe valves and valve output modules from Bürkert are fully integrated into the SIMATIC ET 200iSP system from Siemens.



Source: Röhm

At its Wesseling site in southwestern North Rhine-Westphalia, the chemical company Röhm operates a plant for the production of poly(meth)acrylate-based binders. These are deployed, for example, in solvent-based coatings and paints, road markings and for pharmaceutical applications.

About Röhm

Röhm is one of the world's leading manufacturers in the area of methacrylate chemistry, supplying customers in high-growth markets such as the automotive industry, construction and medical technology. Röhm serves a global market with its MERACRYL® methacrylates and PMMA moulding compounds under the PLEXIGLAS® brand. The high-quality products support a wide range of applications – from paints, coatings, car tail lights, medical devices, aircraft windows and displays in household appliances to road markings. Some 2,900 employees worldwide contribute to the company's success. With production and research facilities in Europe, North America and China, the company combines regional presence with global expertise, creating added value for its customers.

In the batch process, around 40 products are manufactured across three pearl polymerisation operation (PP operation) production lines, using suspension polymerisation. The objective is to process various formulations and control the actuators for the consecutive production steps accordingly. Polymerisation reactors play a central role in this process. Two of these reactors needed to be replaced as part of a modernisation programme.

Modular system for the central control unit

The entire production area is designated as a potentially explosive atmosphere zone, and the components for pneumatic and electrical control were previously housed in a relatively large, double-sealed and additionally covered control cabinet within the plant. The pilot valves for controlling the pneumatic rotary actuators were located decentrally and were also showing their age. Additionally, the previous solution had proven to be highly prone to contamination. In PP operation, the atmosphere is very dusty, and the dust tends to clump together, forming greasy residues that require regular cleaning. "We wanted not only to replace the large control cabinet with a more compact solution but also reduce the amount of cabling and the number of pilot valves on-site", explains Jens Peter Rönn, EMSR (electrical measurement, control and regulation technology) Operations Engineer at Röhm.

The EMSR specialists looked at and compared the various options available, ultimately opting for a solution proposed by Bürkert on the basis of the fluidics company's experience with many similar projects. The solution allows for a high signal density in a very compact space. Air control and electrical signals are provided by a compact, ATEX- and IEC-Ex-certified control cabinet, which is located directly in the plant and occupies very little space.



Type 8650 electropneumatic automation system, deployed in a compact, turnkey ATEX control cabinet.

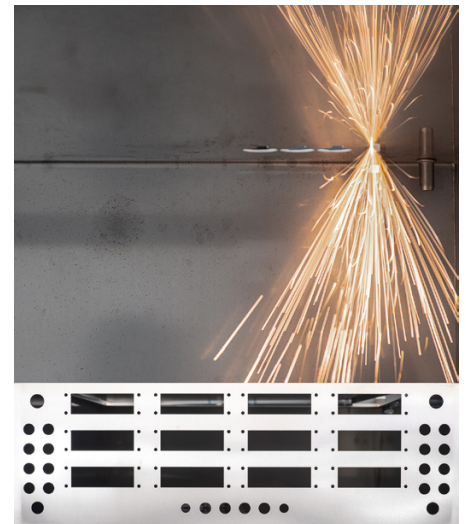
“The complete integration of intrinsically safe valves and valve output modules from Bürkert into the SIMATIC ET 200iSP system from Siemens is currently unrivalled, as there is no other system that offers such a high channel density and flexibility – both electrically and pneumatically.”

Jens Peter Rönn, EMSR (electrical measurement, control and regulation technology)
Operations Engineer

A complete, certified solution, robustly housed

The electropneumatic automation system is designed for use in Zone 1/21 and was delivered by the Bürkert Systemhaus in Menden as a certified and full turnkey solution. The stainless steel control cabinet, which is 1,400 mm wide, 1,200 mm high, and 450 mm deep, houses 56 3/2-way valves and 16 5/2-way valves. The valves are intrinsically safe and hot-swappable, which means they can be replaced during live operation. The cabinet includes SIMATIC I/O modules for 160 NAMUR digital inputs and 64 analog inputs (2-wire HART and HART 4–20 mA). The electropneumatic automation system communicates with the higher-level controller via the Profibus DP and is therefore seamlessly integrated into the Siemens control environment.

The stainless steel control cabinet was customised for the application by equipping it with a double door seal for dust-tight protection to ensure that it withstands harsh environmental conditions and remains clean inside. This removes the need for a pressure overlay, which would have required additional hardware. The cabinet's robustness has now been thoroughly demonstrated in practical application. Two of them have been in operation since the beginning of this year alongside replaced reactors, and three more are due to be integrated in the near future.



The use of a modern laser cutting system for control cabinet manufacturing allows for precise, clean cuts on the housing.



The double door seal keeps out any dust, making a pressure overlay redundant.

Simple installation

The installation within the production line was very straightforward. Only the power supply, compressed air supply and Profibus line had to be installed on site. The compressed air was supplied via a central inlet in the control cabinet and directed to the distribution manifold for the Type 8650 valve islands. This simplifies the installation in the plant. "Our workshop technicians handled it well; the system is easy to operate", says Jens Peter Rönn. Nonetheless, Bürkert's service team are on hand to assist with installation and commissioning if required.

The system is not only impressive from a technical perspective. Jens Peter Rönn is also grateful for the strong and cooperative collaboration. One example of this is the subsequent installation of special quick exhaust valves for safety-critical tasks, where valves need to switch much faster than the actual process requires. "Bürkert responded swiftly, with no procedural delays", notes Rönn. The chemical company is keen to draw on this expertise for future projects.

Benefits at a glance



Compact solution:

ATEX and IEC-Ex-certified control cabinet that is directly integrated into the system and takes up very little space.



Easy integration:

The electropneumatic automation system communicates with the higher-level controller via the Profibus DP and is therefore seamlessly integrated into the Siemens control environment.



Certified, turnkey solution:

Only the power supply, compressed air supply and Profibus line need to be installed on site.



Intrinsically safe and hot-swappable:

The valves can be replaced during live operation.



For harsh environmental conditions:

A double door seal keeps the interior of the control cabinet dust-free.



Safe components:

Quick exhaust valves for increased safety can be easily retrofitted.

RÖHM

“When we wanted to replace two reactors in the PP operation as part of our modernisation efforts in 2020, we decided to renew the signal level as well, as the existing technology was proving to be outdated and spare parts were becoming very difficult or impossible to get hold of.”

Jens Peter Rönn, EMSR (electrical measurement, control and regulation technology) Operations Engineer



Source: Röhm



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