



Production in traditional natural oil distillation increased more than ten-fold

Control valves from Schubert & Salzer as the basis for the automation

An application report by Armin Hofmann and Heiko Renn



The traditional East Tyrolean company Brüder Unterweger GmbH has been distilling essential oils for natural cosmetics for more than one hundred years – this being mainly manual work at the beginning. The highly complex distillation process had to be drastically expanded and made more efficient so that the increasing demand could be met and the high quality requirements of the production of natural oil and cosmetics adhered to. This was why Unterweger started the Industry 4.0 showcase project with the automation specialists Micado. The control and shut-off valves from Schubert & Salzer Control Systems also had an important role to play.

“We recorded the relevant process parameters such as the temperature, pressure readings and filling levels during each of the distillation steps with the assistance of sensors.“, was the explanation provided by Armin Hofmann, Project Manager at Micado, on the subject of plant automation. The sensor data generated has been entered into a computer control system in real time for further processing. The experience and skills of the Unterweger employees were therefore transformed into expressive data.

Quality of the shut-off and control valves decisive for new distillation plants

Armin Hofmann: “We were still searching for compact and lightweight shut-off valves and high-precision control valves for the planned distillation plants in an ex-environment in the scope of the Industry 4.0 project at Brüder Unterweger. The valves are an important part of the plants. The entire process shall come to a standstill should they not operate reliably or become worn too fast.“

At this point of the project, Schubert & Salzer came in. Heiko Renn from the Technical Sales department at Schubert & Salzer: “Our cooperation with Micado already started in 2016. Armin Hofmann contacted us by telephone and explained the requirements. The reliability of the valves was an important aspect but the specifications of the SIL certification also had to be implemented according to Micados requirements. The certified explosion protection was last but not least also important as the sensors and actuators are installed in an ex-zone 1. It was now on us, to



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recommend the right valves to Micado, that they could install in their Industry 4.0 plant.“ Looking back on more than thirty years of experience, Renn was soon able to make a recommendation as to which valves would be up to the demanding challenges.

Angle seat control valve type 7020 – finely tuned in close cooperation

“The star of the plants is our angle seat control valve type 7020 with the explosion-protected 8049-ExPro positioner. This is a pneumatic control valve in an extremely compact angle seat design. All of the wetted components are made of high-quality

stainless steel, which is an absolute necessity when taking the abrasive application at Brüder Unterweger into account“, says Renn.

In the case of valves such as the pneumatic 7020 series, the special focus is always on the quality of the seals. If the valve seals were to fail, then Unterweger would have to bring the plants to a halt – resulting in production losses. The enormous reliability of the angle seat control valve type 7020 was therefore another criterion for fitting the plants with Schubert & Salzer technology. “We obviously also considered other valve manufacturers but were fully convinced by the reliability and precision of the Schubert & Salzer products”, said Project Manager Hofmann. “Schubert & Salzers availability on-site is a great benefit. That made a sustainable impression on us and especially the critical fine-tuning is much simpler.“

Hofmann was able to assert direct influence on the required parameters of the required valves in direct contact with the Schubert & Salzer Design and Technology Department. Not through an anonymous hotline, but with a direct extension number that brought him to the valve professionals in the Engineering Department.

Sales Consultant Renn: “Our close and trusting cooperation has enabled us to supply reliable and high-precision control valves among others for the Micado project at Gebrüder Unterweger. Our pneumatic three-way valves, the so-called type 7081 3/2-way valve is perfect choice for the high cycle performance required. Like our pneumatic shut-off valve type 7010, its stainless steel design makes it perfectly suitable for the aggressive oils and alcohols that Unterweger uses.“

Data recording, Industry 4.0 control: this is how the automated distillation process works at Brüder Unterweger

A fractioning distillation is used by Unterweger to separate the natural oils that comprise numerous components. The precursor is hereby heated up to the boiling temperature in stages, this temperature being that of the lowest boiling components (fraction). The separate distillate is collected in replaceable collecting vessels. This is the exact point, the automatic fractioning of the natural oils, where the two-way and three-way valves and the angle seat control valve with digital positioner from Schubert & Salzer have been installed. After the distillation of the lowest boiling fraction has been completed, the valve stops the flow and the plant automatically switches to the next collecting vessel. It then increases the temperature to the next highest boiling temperature of the components and the valve enables the next batch to run into the new vessel.

The new automation solution and the reliable valves from Schubert & Salzer enable the plant to run a complete batch distillation with a standard number of ten fractions over a number of days fully autonomously.

Production increased more than ten-fold

“The challenge was to specify the fine nuances in the distillation process with data, to ensure a precise and safe run of the entire plant with the assistance of the valves from Schubert & Salzer.



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This is the only possibility of enabling the plant control system to make full use of its benefits, this being a maximum output of the highest quality”, says Hofmann.

Natural cosmetics and the essential oils they contain are full in trend and there is a significant increase in demand. This was the reason why Unterweger already had to expand the production with three new distillation plants after just one year. In cooperation with Micado and with the valves from Schubert & Salzer, Brüder Unterweger has been able to increase the production more than ten-fold during the past two years.

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About MICADO AUTOMATION GmbH

Permanently increasing production rates in the industry is coming along with a demand for improving efficiency of production processes. Micado works on pinpoint automation solutions together with its customers. They do not focus on developing special machines only, Micado also does so with regard to automation in the process technology. “Before the project got started, experts told us that it would not be possible to automate such a complex process in an economically sustainable manner. We did not face the challenge with levity, but with the full trust in our know-how. It is exactly this innovative spirit paired with teamwork and ambition that characterises Micado. That is the pillar for the implementation of such complex projects such as this one“, says Andeas Dorer (Technical Director).