Customer Success Story:
LEVACO Chemicals GmbH

Market segment
Manufacturer and industrial

Replacing all-rounder materials with specialist solutions

Homogenizing amine condensate using polyamide filter cartridges

Location:
Leverkusen, Germany

Challenge:
Improving production conditions and the quality of base materials for pigments and fillers through advanced filtration

Solution:
Melt-blown LOFTREX™ Nylon filter cartridges made from ultrapure polyamide 6 fibers with a retention rating of 100 µm at 90% efficiency

Result:
The advanced solution doubles the service life of the filters and increases process reliability through fast and reliable availability

"Levaco has thoroughly tested our filter cartridges and finally identified them as the solution to the problem. As a solution provider, this is of course particularly important to us. After all, a project is only really successful if both our customers and their customers are satisfied."

Jenö Inderfurth,
sales engineer,
Eaton's Filtration Division

Background

Being shatter-resistant, torsional-resistant and heat-resistant, phenolic resin has been a popular product in industrial applications for decades. This material is a thermosetting plastic—a type of plastic that cannot be deformed after it has been cured—and is still in use today as a filter material as it demonstrates the high level of temperature and pressure resistance that is necessary for the demanding task of filtering media that is often aggressive. However, less and less phenolic resin is being produced due to negative impact of the production process on the environment.

While this is good for the environment, it brings with it a number of challenges for users. For example, in the chemicals industry entire supply chains can depend on critical processes that use phenolic resin filter cartridges. Due to the decreasing availability of the material, prices are rising, and delivery times of up to 20 weeks are now becoming the norm. Levaco, a company based in Leverkusen, Germany has also had to contend with this growing challenge.

In order to prepare its production processes for the future and to reduce its ecological footprint, the former member of the Bayer Group started looking for alternatives early on. The chemical company found everything it was looking for at Eaton. The filtration specialist was able to offer Levaco a solution that can outperform phenolic resin filter cartridges, both in terms of cost and environmental impact.

The LEVACO Chemicals GmbH headquarters and production facility are located at Chempark Leverkusen, Germany. The company's range of products includes specialties such as dispersants, emulsifiers, wetting agents, defoamers and superabsorbent polymers. These products are used in a variety of industries including agrochemical, fiber manufacturing, paints and coatings, sugar and foods, paper, mining, cable and construction.

Moreover, Levaco is engaged in the contract production of specialty chemicals for well-known chemical companies.

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The Coating Solutions division primarily serves customers from the paint, coatings and ink industries, but wood preservatives, industrial coatings and pigment preparations can also be optimized using the chemicals from this division. Pigment preparations, for example, determine the colors, effects and durability of coatings. For many chemical manufacturing processes, filters are an indispensable part of the production.

Challenge

One of the intermediate products in the Coating Solutions division is an amine condensate agglomerated with dichloroethane. Filter cartridges made from phenolic resin have long been an essential process component in the manufacture of this product. This gel-like fluid also serves as a base material for pigments and fillers. It particularly helps to improve the protective properties of paints and coatings, which are essential for many industrial application such as shipbuilding.

To achieve the desired consistency, the amine condensate is mixed with water. This produces inhomogeneous agglomerates, which have a negative influence on product quality. "The filter cartridges are therefore primarily used in the process to distribute the particle sizes evenly, so that a homogeneous product can be produced," explains Jenö Inderfurth. The sales engineer is a specialist in chemical companies for Eaton's Filtration Division and also knows the Chempark industrial park in Leverkusen, where Levaco is located, like the back of his hand. "The company has been our customer for many years and also purchases filter bags for filling plants," says Inderfurth. As a well-known and valued supplier to the company, he was the one to receive the inquiry about the production of amine condensate.

In addition to the poor availability and the resulting price increases for the phenolic resin filter cartridges that had been used up to that point, the environmental impact of these cartridges also motivated Levaco to search for alternatives.

Solution

However, the exceptional properties of phenolic resin filter cartridges did not make it easy to find an alternative. "They can do almost anything," says Inderfurth. "High temperature and pressure resistance, strong chemical resistance — all this is standard for phenolic resin." For this reason, filter cartridges made from this all-rounder material have been the standard for a long time.

Inderfurth suggested polyamide as a possible alternative: "Polyamide can withstand greater pressure and higher temperatures than polyester or polypropylene, for example," explains Inderfurth. The available filter ratings are approximately equal to those for phenolic resin and may even be better in some cases. LOFTREX Nylon filter cartridges were therefore good for the company's application. The melt-blown filter cartridges made from polyamide can withstand high operating temperatures of up to 248 °F and a differential pressure of up to 36 psi at ambient temperatures. The filters are made from a polyamide 6 polymer material using efficient melt-blown technology. The result is a powerful and durable filter cartridge made of a fine-pored material. Its particularly smooth surface also significantly reduces fiber migration. This is also beneficial for the process at Levaco as any filter fibers that are released form impurities which can reduce the product quality.

Eaton's filtration engineers chose LOFTREX Nylon filter cartridges with a retention rating of 100 µm to provide the ideal homogenization of the amine condensate. This turned out to be the right choice: "With optimized differential pressure and flow rate, Levaco can use the same filter cartridges for up to five batches of the product," says Inderfurth. A total of 75 filter cartridges are in use at the company, spread across a 50-cartridge housing and a 25-cartridge housing. Together, they enable a high throughput of 44 gpm. "By using a number of filter cartridges in parallel, the excellent performance of the filter cartridges very quickly begins to have noticeable economic benefits," says Inderfurth.

The service life of the new polyamide filter cartridges is about double that of the old phenolic resin filter cartridges. "For Levaco, this means that product quality remains the same, while considerably fewer consumables are required," says Inderfurth. "As polyamide is an easily available filter material, unlike phenolic resin, we can also provide short delivery times without any problems."

After Levaco's coating experts contacted Eaton with a request for new filter media, it took less than two weeks for them to receive the first sample shipment for testing. Following trial runs, Eaton received the order for the filter cartridges a few months later.

Result

Inderfurth praises the company's vision: "Levaco knew that sourcing phenolic resin cartridges will not get any easier and opted to find an alternative at an early stage. The environmental aspect was really important to those responsible."

Together with Eaton, the company was able to develop a sustainable concept at an early stage that ensures the future of its production processes through implementing a powerful alternative to the filter cartridges that have previously been used.

The fact that this process was so straightforward is mainly due to the confident relationship between the solution provider and the customer. "Filtration always requires a lot of testing," says Inderfurth. "Levaco has thoroughly tested our filter cartridges and finally identified them as the solution to the problem." The new filter cartridges now help to maintain the consistently high product quality that Levaco customers are accustomed to. Homogenized with the LOFTREX Nylon filter cartridges, the amine condensate gives the end products precisely the desired properties. "As a solution provider, this is of course particularly important to us," Inderfurth emphasizes. "After all, a project is only really successful if both our customers and their customers are satisfied."

Suitable for a wide range of applications: The **LOFTREX Nylon** filter cartridge product range includes a wide variety of lengths and pore sizes. In its production processes, Levaco uses filter cartridges with a retention rating of 100 µm.

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