Customer Success Story:
BvL Oberflächentechnik GmbH

Market segment:
Parts cleaning

Gradually on track toward maximum cleanliness

Location:
Emsbüren, Germany

Challenge:
To be able to operate efficiently in order to reduce the quantity of water and energy consumed by industrial cleaning systems as much as possible.

Solution:
In cleaning systems, Eaton's TOPLINE™ bag filter housings equipped with HAYFLOW™ filter elements deliver optimum cleaning results consuming significantly lower volume of water.

Result:
A bag filtration solution makes cleaning systems operate more efficient thanks to reliable performance, low personnel costs and low levels of consumption.

"In order to guarantee the best possible quality, we rely on Eaton as a partner for all filtration tasks. In addition to the high-performing components, we also receive expert consulting services at all times."

Bernhard Sievering, managing director at BvL Oberflächentechnik GmbH

Background

Rail transport system parts need to be clear of the residue that is collected during operation if they are to be maintained properly. Rail companies that value the reliability and quality of their products have counted on BvL Oberflächentechnik for decades when it comes to cleaning. The company, which has around 170 employees and a tradition of over 150 years in mechanical engineering, is one of the leading manufacturers of industrial cleaning systems and supplies customers from all over the world from Emsbüren in Niedersachsen, Germany. In addition to the automotive industry and its suppliers, foundries and mechanical engineering, BvL also provides turntable and basket washing systems, through-feed and large-parts systems as well as systems which involve high-pressure processes and rotary cycle systems to manufacturers and operators of rail transport systems and other sectors.

Challenge

Ensuring that treated parts are cleaned reliably and consistently is of the utmost importance when carrying out water-based industrial cleaning - this is also the case at Schweizerische Südostbahn AG (SOB, Swiss Southeast Railway). In order to maintain the trains used in central, eastern and southern Switzerland, train parts were cleaned at the Service Center in Samstagern (Canton of Zürich) using a manual part washing chamber for large parts. A high-pressure water jet was also used to manually clean parts. However, this method is time-consuming, uses up a significant amount of both water and energy and is manually intense.

As the demands placed on maintaining and cleaning parts efficiently are increasing, SOB searched for alternative solutions and as a result, turned to the specialists at BvL. The cleaning experts were able to offer not only the best technology, but also a system that was tailored with precision to the space available. "The challenge was to deliver high quality in a confined space," recalls BvL managing director Bernhard Sievering.

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Like many existing buildings within the railway infrastructure, the Service Center in Samstagern has a very limited amount of space on its premises. BvL therefore developed a tailor-made, completely redesigned cleaning system which, from a technological point of view is based on the Pacific TA model, but requires significantly less space.

"Overall, our experts were able to reduce the space required for the system by around 15 percent," says Bernhard Sievering. In this context, the loading concept of the system has also been modified: One of the two loading trucks on which the parts to be cleaned are guided into the system, now has half the operating length. The BvL concept is complemented by a system for using high-pressure cleaners to perform additional manual cleaning. If necessary, it can be used for large parts, which cannot otherwise be cleaned due to the limited space available.

Solution

The efficiency of the system, both in terms of personnel costs and in terms of water and energy consumption, was of particular importance for SOB. Most of the benefits that the Pacific large-parts system brought to the table were able to be retained as part of the solution tailored to SOB. As part of the approach taken to efficiency and to protecting the environment, in addition to the option to halve the operating length, there is also the option to individually adjust the operating height to the parts to be cleaned. By reducing the operating dimensions, the cleaning performance can be intensified, and the process time shortened, thus making the cleaning system more cost-effective.

Another factor that contributes to both quality and the environmental aspect is the ability to filter the water used for cleaning, which can then be reused several times. BvL has relied on Eaton's expertise in this area for years. Eaton's Filtration Division is the main supplier of BvL filtration solutions.

"The HAYFLOW filter elements used in BvL systems offer up to 65 percent more filter area in a compact TOPLINE housing," explains Alexander Bachmann, applications engineer in Eaton's Filtration Division. "The filter elements can be replaced in just a few simple steps." Compared to standard filter bags, they have been developed for higher flow rates. Due to their long service life, which means they do not need to be replaced very often, these filter elements are used not only in water treatment processes but also for many other tasks, such as in metal working or to manufacture paints and varnishes.

The Service Center in Samstagern values these benefits too. In order to provide the necessary level of flexibility, the system must always be ready for use. The SOB cleans up to 70 of the extremely heavy components on the individually adapted system every year. In addition, there are other large parts as well as numerous small parts. "In order to ensure not just quality but also flexibility when operating the cleaning system, we have selected filter elements which do not need replacing very often. In addition, they are impressive when it comes to performance because they exceed the service life of standard filter bags made from needle felt by five times," adds Alexander Bachmann.

Alternatively, HAYFLOW Q™ filter elements can be inserted into the same filter housings to enhance performance. The DURAGAF™ Extended Life filter material that was used acts as a high-performance pre-filter and depth filter and the additional, precision-woven cover layer made from nylon monofilament offers an absolute retention rate of 10 µm as a final filter.

The inlet at the top of the TOPLINE housing significantly saves on space compared to filter solutions that have the inlet on the non-filtration side – this means the Eaton bag filtration solution also contributes to the smaller system footprint that SOB has demanded from BvL.

The design also provides a better seal, reduces the amount of product lost, and makes it simple and easy to replace the filter bag.

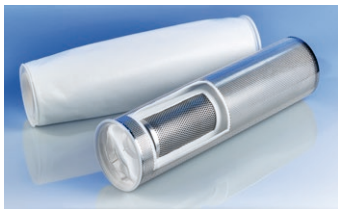
"Components such as axle bearing caps and tensile locking beams are cleaned in our system not only with significantly higher cleaning performance, but also with much less effort and time demanded from employees," explains Bernhard Sievering regarding the benefits for rail customers. The environment also benefits because the cleaning fluid of the system can be guided through the full-flow filtration in the cycle. Sensors on the cleaning system and a comparison with the reference pressure also allow the operator to forecast consumption in a smart way. The current level of soiling and the filter bag change time, the remaining pump run time and the number of washing cycles are displayed. This information helps ensure that preventive maintenance can be carried out and a suitable stock of spare parts can be put in place.

The manual cleaning chamber and the large-parts system are both able to use the same source of cleaning fluid. "In this way, we can take the water required, which can be significant in manual cleaning processes, from the existing system and use it many times in the circulatory system," says Bernhard Sievering, explaining the systemic approach. "Another reason why the high-quality filtration of the industrial water is of essential importance for the overall system and the associated saving of resources."

Result

Despite all the modifications, BvL's engineering processes were completed in a very short time and within just six months of the order being made, the system was ready for operation at SOB.

In its use in Switzerland, with the adjustable chamber size and filter media from Eaton, BvL ensures that the parts to be serviced are cleaned safely and reliably using the minimal amount of water and energy. The bag filters from the filtration specialist help to achieve flawless and defined results with minimum effort and maximum convenience for the personnel. Manual cleaning is virtually a thing of the past and in all areas of production, maintenance and servicing, hours worked, water and energy were all reduced. "When it comes to cleaning, we are the specialists. In order to guarantee the best possible quality, we rely on Eaton as a partner for all filtration tasks," says Bernhard Sievering about the collaboration with the filtration experts. "In addition to the high-performing components, we also receive expert consulting services at all times."



Eaton's **HAYFLOW filter elements** with retention rates of between 1 and 100 µm reliably separate out unwanted particles.

To meet process requirements, Eaton's **TOPLINE bag filter housings** can either be used as a single housing or connected in a parallel arrangement.

North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altlußheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

Greater China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Asia-Pacific
100G Pasir Panjang Road
#07-08 Interlocal Centre
Singapore 118523
Tel: +65 6825-1668

For more information, please email us at *filtration@eaton.com* **or visit** *www.eaton.com/filtration*

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