



**Success Story:**  
Metal Part Cleaning

**Market Served**  
Precision Metalworking

## High-efficiency Eaton filtration solution – an economic and environmental win-win

**Location:**  
Germany

**Problem:**  
Inefficient filtration of part washing fluids creates quality issues, high operating costs, and negative environmental impacts.

**Solution:**  
Replace existing filtration system with Eaton TOPLINE™ bag filter vessels equipped with Eaton HAYFLOW™ Model Q filter bags.

**Results:**  
Improved filtration maintains fluid quality over a significantly extended life-cycle reducing operating costs and minimizing environmental impacts.

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*“This customer’s experience is a clear demonstration of the fact that with the right choice of filtration technologies, economics and ecology don’t have to be at odds.”*

Wim Callaert,  
Product Management  
(Software & HW Bags / Cartridges)

### Background

A major German manufacturer of transmissions, drivetrain and chassis components was facing global competition and rising quality expectations from its customers on one hand, and increasingly stringent environmental regulations and soaring disposal costs on the other. The manufacturer’s products, which are used in automotive, truck, off-road, railroad, marine and helicopter applications, contain high-precision parts that must be kept scrupulously clean during manufacturing and assembly operations.

That requires state-of-the-art washing systems at various stages during the manufacturing process to remove machining debris, cutting fluids and other contaminants. The washing processes do more than simply clean parts, though: they also impact part quality by

producing specific surface conditions required for subsequent operations on the components. All of these washing operations generate large quantities of washing fluids that have to be either de-contaminated and re-used, or disposed of in an environmentally responsible way, leaving the manufacturer with what appeared to be a choice between economy and ecology.

### Challenges

The challenge was to find a solution that satisfied both the need for reduced operating costs and the need to operate in an environmentally friendly and sustainable manner. The manufacturer was already using a filtration system to clean their washing fluids, but the technology of that legacy system simply was not up to the task of meeting today’s requirements.

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## Solution

Eaton worked with the customer to replace their legacy system with up-to-date technology that was able to clean the fluids more effectively allowing the fluids to be re-used many more times than the previous system allowed. The system also retains the contaminants more effectively in the filtration media to reduce the environmental impact of their disposal.

The solution supplied by Eaton is divided into two stages. In the first stage, raw, oily and dirty contaminants are isolated with a coarse gravity-type oil separator. The remaining fluid is then cleaned again in a fine bag-type filter and, if necessary, any remaining oily residues or micro particles are adsorbed in an additional operation.

Eaton engineers worked with the customer and system builder to find the most efficient filter elements for the system. Based on practical testing, the customer replaced their previously-used filter bags with Eaton HAYFLOW-Q™ filter element, with magnets and deflectors in Eaton TOPLINE™ bag filter vessels.

The HAYFLOW-Q filter element consists of Eaton's proven DURAGAF™ extended-life filter material with precision-woven nylon monofilament media. The DURAGAF extended-life material acts as a high-capacity pre- and depth-filter while the outer nylon mesh covers the needle felt and provides a final filter retention at 10 µm.

The Eaton HAYFLOW-Q filter elements are inserted into the Eaton TOPLINE filter vessels which use a side inlet and flow through the top design.

This produces minimum headroom of unfiltered liquid for easy bag change-out while providing optimum sealing of the filter bag.

Eaton also offered the customer a system option based on LOFPLEAT-HF™ cartridges which use pleated media construction to provide high total surface area allowing one cartridge to replace several standard elements. This system uses an "inside-out" flow path to achieve higher debris holding capacity while retaining the quick, easy change-out typical of cartridge-type filtration systems.

In the final analysis, the customer chose to stay with bag-type filters since their personnel had extensive experience with that technology.

## Results

The customer's new Eaton-supplied filtration system has positively impacted quality by providing more consistently clean fluids for the various washing processes used in their production operations. High-efficiency filtration has also reduced the amount of fluid that has to be purchased annually by significantly increasing the number of times each batch of fluid can be re-cycled through the system.

In addition, longer duty cycles mean that less fluid is eventually disposed of. That, along with the more efficient containment of contaminants achieved by the HAYFLOW-Q filter bags, means the customer's environmental impact is minimized at the same time their profitability and competitiveness are enhanced.

Or, as Wim Callaert, Product Manager for Filter Bags and Bag Filter Housings of Eaton's Filtration Division observed, "This customer's experience is a clear demonstration of the fact that with the right choice of filtration technologies economics and ecology don't have to be at odds."



Eaton's HAYFLOW™ Model Q Elements – High capacity extended life needle felt with ultrafine nylon mesh outer cover



Eaton's LOFPLEAT™ HF Series – High Flow Capacity Filter Cartridge