



## Return-line filters deliver reliable performance to keep mining equipment working on schedule

**Location:**

Europe

**Challenge:**

Protect equipment exposed to harsh environmental and operating conditions with reliable hydraulic filtration products that meet stringent certification requirements and are delivered on schedule to support 24/7 fixed service intervals. Any unplanned equipment downtime can be critical to mine operation and potentially to worker safety.

**Solution:**

Eaton® TEF 70, 320, 406 and 952 return-line filters in combination with the corresponding O1.E filter elements have replaced competitive filters as standard equipment on loaders, haul trucks, anchoring trucks, drill trucks and other mobile equipment produced by one of Europe's largest mining machinery manufacturers.

**Result:**

Prior filtration related issues have been minimized and the reliable stocking and delivery service provided by their Eaton distributor has created stable, long-term business relationship with the equipment manufacturer and their customers.

*The Eaton TEF return-line filters have reduced filter element usage by up to 40-percent compared to the filters originally used by the manufacturer.*

**Background**

The company is one of Europe's largest producers of mining machinery and equipment used in extracting copper, coal and other raw materials with 2,500 employees and annual revenue of about 15 billion EUR. Their equipment is essential to mining operations and unscheduled downtime can disrupt production and potentially create safety issues.

Because of the critical nature of the equipment, maintenance is performed on a fixed schedule regardless of the amount of time in service. This means the hydraulic filters are in service for a certain length of time between changes and that the filter elements must be available at the maintenance site when needed regardless of the time of day or day of the week.

In addition, the filters must meet stringent quality and performance standards mandated both by the manufacturer and governmental regulations covering the mining operations. Finally, the customer requires reliable maintenance services and products.

**Challenge**

The filter elements are designed for the typical used fluid (ISO VG 32 and 46) in an operating temperature range of 68 to 158 °F, working pressures up to 145 psi and flow rates between 26 and 106 gal/min.

The filters originally specified by the manufacturer did not perform at an acceptable rate which lead to more frequent replacement outside of scheduled service intervals and extended maintenance downtime, all of which negatively impacted mine productivity. Finding a more suitable replacement required extensive certification testing plus inventory and delivery arrangements for the new products.



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## Solution

Customer engineers worked with Eaton technicians to specify and certify Eaton TEF return-line filters in four different sizes to accommodate the whole range of mining vehicles then in production. Certification testing was carried out by the machine manufacturer under the supervision of the chief foreman responsible for maintenance of the machines used in a large copper mine. Data was collected on the service life of the filters, oil cleanliness and machine failures.

With a working pressure up to 145 psi, the Eaton TEF tank-top mounted return filter makes servicing simple. When the 01.E filter element is changed a detachable connection between the filter head and bowl keeps dirty fluid from draining back into the reservoir. The return filter is equipped with visual and electrical differential pressure indicators to monitor their performance.

Eaton TEF return-line filters are now standard equipment on the company's mining vehicles and Eaton TEF filter elements are specified as replacement parts. The elements are stocked and delivered on schedule via Eaton distributors.

## Result

The Eaton TEF return-line filters have reduced filter element usage by up to 40-percent compared to the filters originally used by the manufacturer. Subsequent testing continues to confirm the superior performance of Eaton TEF filters and they continue to be standard equipment on the company's mining vehicles.

Eaton has established a long-term business relationship with the company and many of its mining customers based on the performance of Eaton TEF return-line filters on the company's vehicles. There have been no reported filtration failures since changing to Eaton TEF filters. The company also is using other Eaton filtration products for high and mid-pressure applications on their vehicles with similarly uniform results.



Eaton's return line filters of the **TEF series** are suitable for a working pressure up to 145 psi. It's simple and practical design eliminates fittings and is easy to service. When changing the filter element, a detachable connection between the filter head and the filter bowl prevents a flow back of dirty oil into the tank.



Eaton's **01.E filter elements** are used in TEF return-line filters and are ideal to protect system components and reduce oil contamination. They provide trouble-free operation when filtering abrasive fluids, cooling lubricants or water-based fluids and are designed to achieve cleanliness class requirements.

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