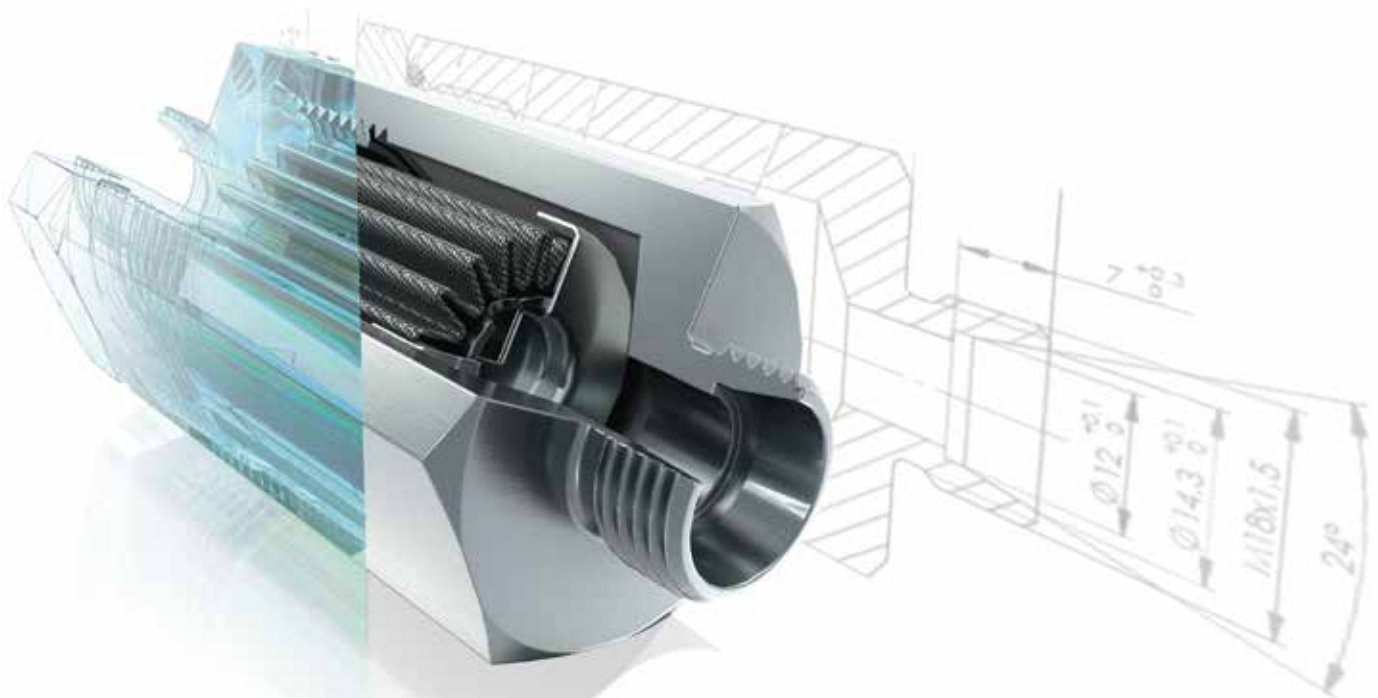


HYDRAULIC FILTERS

Extra Protection for Sensitive Hydraulic Components

Particles of dirt can damage sensitive components if they enter hydraulic systems. Stauff is addressing this risk with its SFIS series of high-pressure inline safety filters. Just like fittings, they are integrated directly into the line. Offering an additional level of protection, they improve machine availability in premium agricultural applications, among others.



Source: Stauff/Cadera Design

In terms of its construction, the SFIS is not designed as a traditional filter housing, but rather as a compact line element. Typical installation positions are between hydraulic screw-to-connect couplings, connectors, hoses, valve blocks and other components. This series is therefore suitable both for original equipment as well as for retrofitting existing systems.



Source: Dusan Kostic - stock.adobe.com

Agricultural machines on which the attachments are frequently changed represent a typical installation scenario for the filters.

The purity of hydraulic oil is an important factor in ensuring the operational safety of mobile and stationary hydraulic systems. By contrast, contaminated or stale oil is the main cause of their failure. A filtration concept in which the type of filter, including pressure filters, return-line filters and offline and bypass filters, selected as required and correspondingly positioned, ensures the purity of the oil in closed systems. Tank filler breathers or desiccant breathers on the oil tank secure the open points on the system.

However, there is nonetheless a certain risk when coupling and uncoupling lines: even if flat-face couplings are designed in such a way as to minimise the ingress of air and dirt, this residual risk cannot be fully eliminated in dusty or contaminated environments. The risk of contamination also increases with the number of coupling procedures – as are sometimes required in mobile applications with frequent equipment changes.

Inline safety filters, like the Stauff SFIS high-pressure series, reduce this residual risk. They are integrated directly into the line as an additional level of protection, and protect downstream components from locally entrained dirt or residue that remains after assembly, maintenance or repair work.

Unlike traditional system filters, they are not used for permanent fine filtration of the entire volumetric flow, but rather for the targeted capture of critical particles before they reach sensitive components. These components include, above all, control, regulating and throttle valves, as well as valve blocks, proportional functions and hydro motors. Filters can also be inserted into the return



SFIS filters protect sensitive components from particles of dirt.

line in applications with hydraulic attachments where, acting as the last level of protection, they prevent particles from the attachment re-entering the line circuit of the base vehicle.

INLINE SAFETY FILTERS: AN INTEGRAL PART OF THE HYDRAULIC LINE

In terms of its construction, the SFIS is not designed as a traditional filter vessel, but rather as a compact line element. Similarly to a connector or fitting, it is integrated directly into tube and hose lines. Typical installation positions are between hydraulic screw-to-connect couplings, connectors, hoses, valve blocks and other components. This series is therefore suitable both for original equipment as well as for retrofitting existing systems.

Two different connection schemes are available for their installation: one option is integrating them into a tube using a fitting, cutting ring and union nut, while another option works with a female thread and can be combined with couplings, hose ends or cartridge assemblies in a modular manner. This is beneficial from a design point of view: inline filters can be integrated with ease into existing line concepts at the planning stage as well as retrofitted, as required.

HYDRAULIC FILTER CONSTRUCTION AND KEY TECHNICAL DATA

SFIS inline filters are designed as durable high-pressure components. Their housing is made of carbon steel with a zinc-nickel coating for enhanced corrosion protection. The manufacturer uses NBR (Perbunan) as the standard seal, although alternative materials are available on request. Their maximum operating pressure is up to 250 bar, the permitted temperature range is -20 degrees Celsius to 100 degrees Celsius, but briefly up to 120 degrees Celsius. Their resistant design offers a triple safety reserve based on the maximum operating pressure. This series is suitable for mineral oil-based hydraulic and lubricating



These high-pressure safety filters are integrated directly into the hydraulic line.

Source: Stauff



The filters are accommodated in carbon steel housings.

Source: Stauff

oils as well as for biodegradable fluids, following approval.

The filter element inside is made of a stainless steel 1.4301 star-fold wire mesh. The direction of flow runs from outside inwards through the filter packet. Folding within the filter increases the effective filter surface, reduces the differential pressure, and increases the dirt absorption capacity. This thus differentiates the design from simple disc-like solutions with a

small effective surface, which clog up more quickly and are more sensitive to flow conditions.

Users can select from two standard filter fineness grades: 60 micrometres and 100 micrometres. The series is thus designed for coarse particle protection. In principle, the stainless steel wire mesh filter elements can be cleaned. Replaceable or non-replaceable inserts can be used, depending on the version and size. From an economical perspective, with smaller sizes it often makes sense to replace the complete unit than to supply separate spare parts.

In terms of maintenance, these filters differ from traditional filters with a clogging indicator. The status of the SFIS is not visible from outside. It therefore makes sense to perform an inspection during pending service work, say when changing hoses and couplings, or after a known accident within the system. Designers should therefore select the installation site from a filtration standpoint, as well as ensuring good accessibility should service be needed.

ADDITIONAL SAFETY FOR PREMIUM AGRICULTURAL MACHINERY

Agriculture is a typical installation scenario. Tractors and self-drive machines work with hydraulic attachments, which need to be regularly coupled and uncoupled for transport and use. During these procedures, the surfaces of couplings and ends of hoses are exposed to dust, soil and moisture. This also applies to construction machinery or municipal vehicles, possibly with sweeping or mowing functions. If an inline safety filter is positioned directly downstream of the coupling, any entrained particles can be captured locally before they enter valve blocks or other sensitive functions. OEMs in the premium segment, in particular, are making the most of this possibility to increase the availability of their machines. (dm)

INFO

Fail-proof hydraulic systems in mobile machinery

Stauff is completing its Stauff Line with the new series of filters. Stauff Line represents a complete in-house developed and produced programme for hydraulic line systems. "This concept means that we are taking de facto shared responsibility for the availability of the entire hydraulic system," explains Hartmut Reich, Product Manager Filtration at Stauff Germany. "Against this background, we do not consider aspects, such as oil purity, filtration or monitoring, as an addition, but rather as an important and integral part of our understanding of quality."

Stauff defines the installation locations, filter fineness levels and volumetric flows together with users. It advises on the design of lines and filtration concepts to ensure that this additional protection level can be included in the layout at an early stage, rather than subsequent more complex retrofitting. The aim is to ensure the maximum availability of the entire system. Stauff is targeting these new filters particularly at OEMs in the premium segment, who wish to improve the reliability of their machines.