

Water Absorbing Filter Elements

EXAPOR® AQUA

Quick and efficient dewatering of hydraulic and lubrication oils

Water in hydraulic and lubrication oils may have the following causes:

- Radiator leakage
- Environment humidity
- Spray-water
- Fresh oil

Already small quantities of free water in oil can lead to acidification. Corrosion of surfaces at components can be the result. Due to free water the oil characteristics changes, e.g. decreased load-carrying capacity, reduced temperature resistance. In order to avoid economic damage, the oil must be protected against free water or existing water must be withdrawn as fast as possible.

Large water quantities can be withdrawn by oil change, flushing of the system or with dewatering units.

On systems with hygroscopic (materials that absorb water are described as hygroscopic) oils or with permanent water entry through seals (e.g. hydraulic excavator used in water constructions) ARGO-HYTOS off-line filters and filter units with EXAPOR® AQUA filter elements can be installed permanent in the system, in order to withdraw water. To withdraw remaining water quantities, e.g. after new filling, the ARGO-HYTOS EXAPOR® AQUA elements in portable off-line filter units also can be used during operation of the system.

EXAPOR® AQUA filter elements are applicable in different ARGO-HYTOS filter units. Depending on the operating situation the water absorption amounts to approx. 1300 ml/element. The combination of water-



Filling unit
FA 016



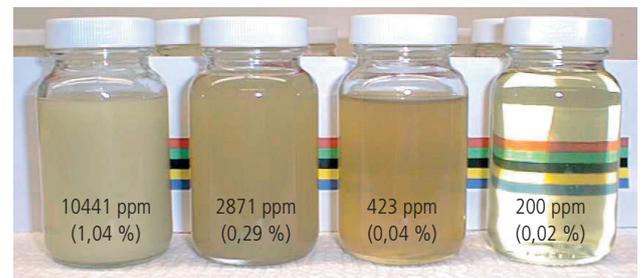
Oil service unit
FNA 008/016

absorbing filter layers with micro-filter material in the EXAPOR® AQUA also permits the use in hydraulic and lubrication systems with high requirements to the oil cleanliness.

Simply the cooled down oil sample can be judged optically. As long as a turbidity is visible in the cooled down oil, the water content will be unacceptably high. If the cooled down oil sample appears clear, the water content usually lies in the permissible range. An exact measurement of the water content is made by an oil sample analysis in the laboratory (e.g. water content regulation after the Karl Fischer method in accordance with DIN 51777).

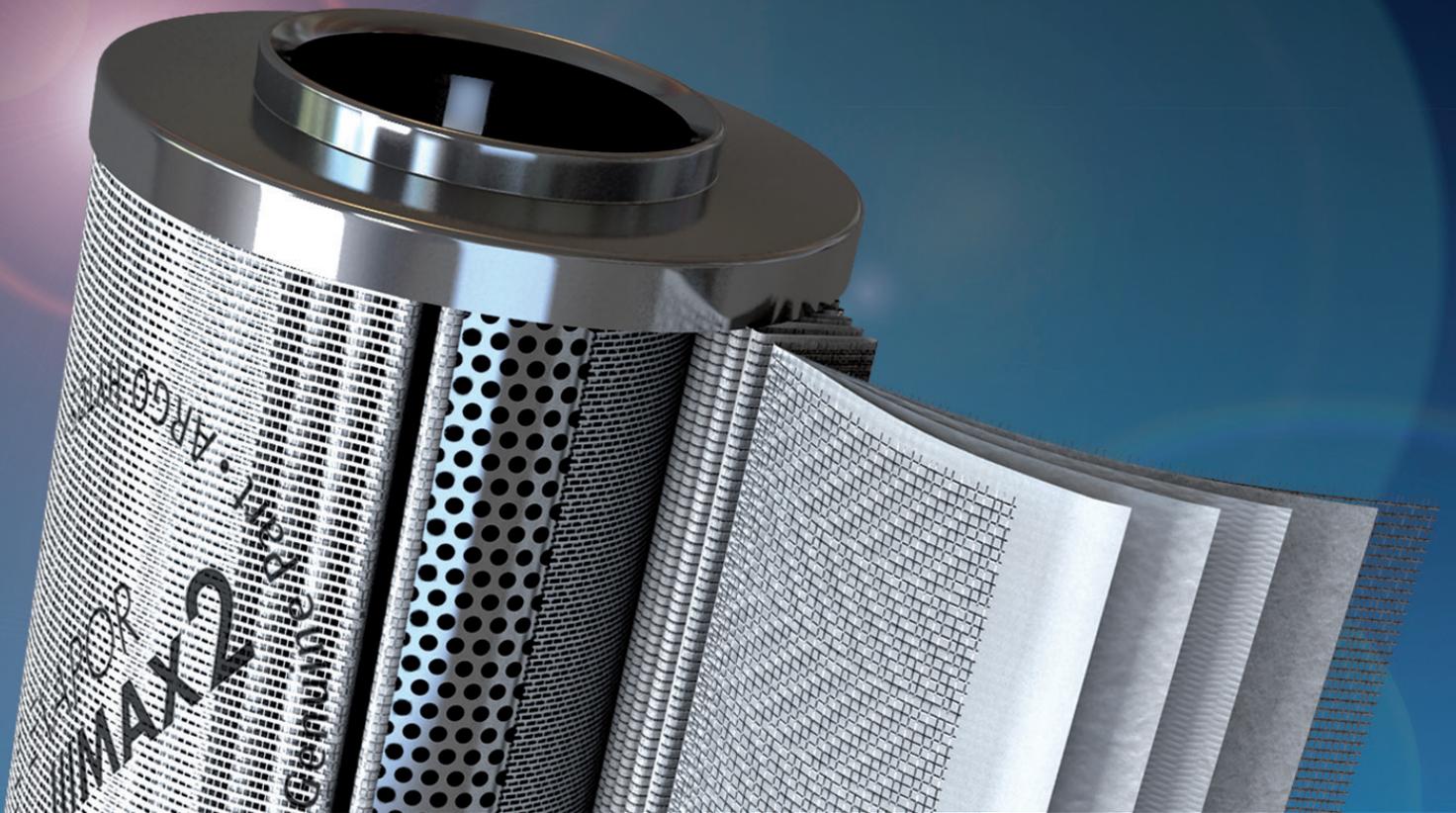


EXAPOR® AQUA filter elements



Oil samples with varying water content

EXAPOR® AQUA Filter element	Water capacity per element at $v = 30 \text{ mm}^2/\text{s}$	Filter fineness	Dirt-holding capacity (values in g test dust ISO MTD according to ISO 16889)	Applicable in ARGO-HYTOS filter units
Y7.1220-05	350 ml	8E-A $\beta_{90(c)} \geq 200$	64 g	FA 016, FNA 008, FNA 016, FAPC 016 (with filter element size V7.1220)



Innovation in Filtration

EXAPOR[®]
///MAX2

The new generation of filter elements

ARGO-HYTOS sets the standard with the introduction of EXAPOR®MAX 2

Higher machine availability, longer service intervals and lower operating costs. These were the development goals for the new generation of filter elements.

With the introduction of **EXAPOR®MAX 2**, ARGO-HYTOS is opening a new chapter in filtration for hydraulic and lubrication systems.

The structure of the specially developed 3-layer filter material was designed for optimum performance, using glass and polyester fibers of different finenesses combined with an improved hybrid support fabric (patent pending) made of stainless steel and polyester. This sets the standard for:

- **Pressure loss**
- **Dirt holding capacity**
- **Flow fatigue stability**

The plastic sleeve used on the **EXAPOR®MAX 2** for the first time offers the following benefits:

- **Custom label**
- **Protection from damage**
- **Improvement of flow fatigue stability**

For the user, these improvements bring:

- **Extended service intervals**
- **Higher operational reliability**
- **Improved oil cleanliness**
- **Increased performance**
- **Positive element identification**
- **Reduced operating and maintenance costs**



Focus on user benefits

Extended service intervals

Higher dirt holding capacity and improved flow fatigue stability are of particular importance in achieving extended service intervals.

The new performance-oriented structure of the filter material makes a substantial contribution to improving dirt holding capacity, reducing pressure losses and improving the differential pressure stability. The improved hybrid support fabric (patent pending) dissipates electrostatic charge completely, gives the best possible flexural strength while reducing pressure losses. The plastic sleeve shrunk onto the filter bellows ensures that it tightly fits the edges of the hole, which has a positive effect on flow fatigue stability. These improvements make a substantial contribution to increasing the life of the filter elements.

Higher operational reliability

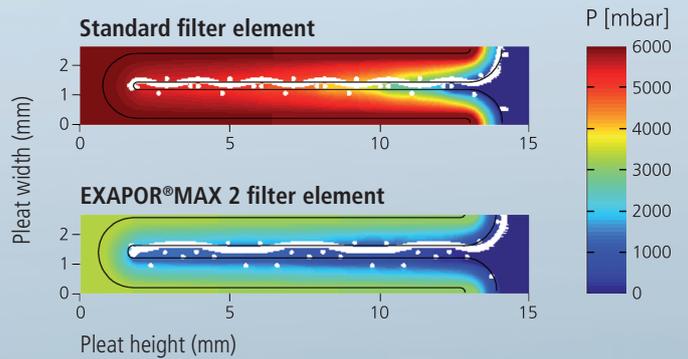
When used on existing machinery with fixed service intervals, **EXAPOR®MAX 2** filter elements bring greater operational reliability, minimizing the risk of sudden machine downtimes as well as reducing downtime caused by time-consuming and expensive maintenance work.

Improved oil cleanliness

A high degree of oil cleanliness has a positive effect on both the life of components and that of the hydraulic medium itself. To meet rising standards, in the new generation of filter elements the filter fineness has been improved to 10 $\mu\text{m(c)}$ compared with 12 $\mu\text{m(c)}$ previously. The **EXAPOR®MAX 2** filter elements are available in filter finenesses of 5 $\mu\text{m(c)}$, 10 $\mu\text{m(c)}$ and 16 $\mu\text{m(c)}$.

Increased performance

The factors that influence pressure loss could be worked out with the aid of calculations and flow simulations, and the structure of the filter material optimized accordingly. The result is a reduction in pressure losses in the pleat of up to 50 % and up to 40 % in the filter element. Conversely, this means that at a constant pressure loss the **EXAPOR®MAX 2** filter elements can achieve a flow rate that is up to 65 % higher. The substantial reduction in pressure losses allied to an improved dirt holding capacity leads to an increase in power density, so that, depending on the application, smaller filters could be used.



Positive identification of elements

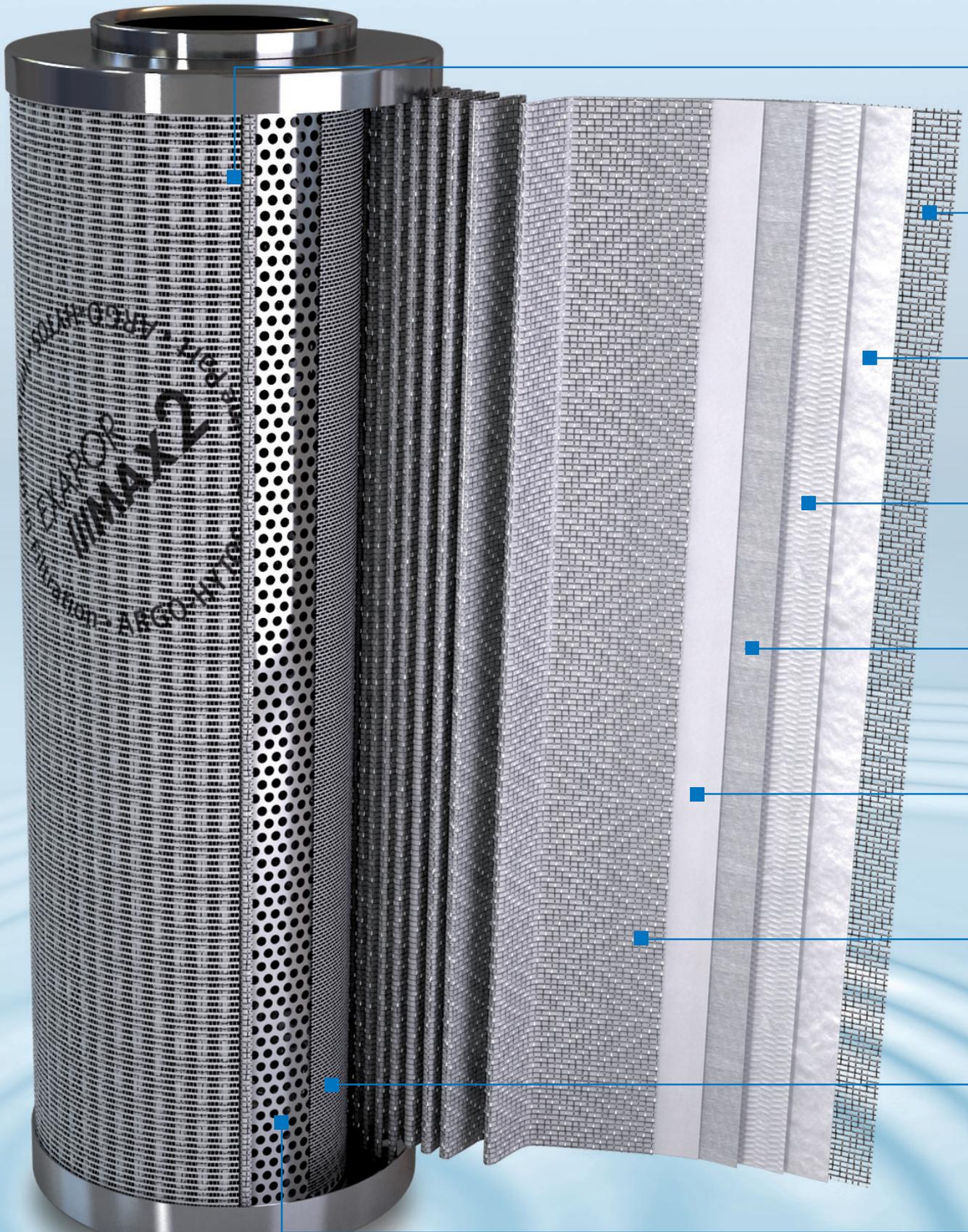
The plastic sleeve used on the **EXAPOR®MAX 2** filter elements can be printed as required. This substantially improves positive identification and is an important feature for building up and securing a strategic spare part business.



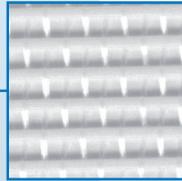
Reduced operating and maintenance costs

These innovations work together to reduce operating and maintenance costs and bring about an improvement in the productivity and economy of machinery and plant.

Schematic construction

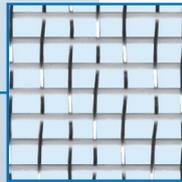


Schematic construction



Plastic sleeve **NEW**

Custom label, damage protection, improved flow fatigue stability



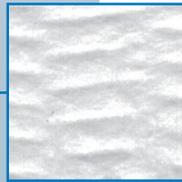
Hybrid support fabric (patent pending) **NEW**

Protection of filter materials from external mechanical damage, prevents electrostatic charge, keeps the pleats open for the free flow of hydraulic medium.



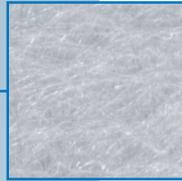
Pre-filter layer **NEW**

Separation of coarse particles, increase in the dirt holding capacity



Fine filter layer **NEW**

Separation of fine particles, improvement of oil cleanliness



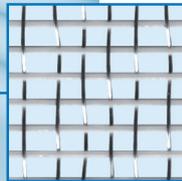
Protective fleece **NEW**

Protection of the fine filter layer, improved differential pressure and flow fatigue stability



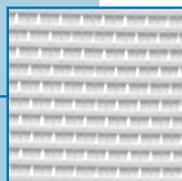
Safety fabric

Additional protection of the filter elements with a differential pressure stability of 160 bar



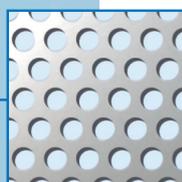
Hybrid support fabric (patent pending) **NEW**

Support of the filter materials, keeping the pleats open for free flow of medium. Prevents build-up of electrostatic charges, improved flow fatigue stability



Woven sleeve

Fine wire mesh provides additional support for the pleated filter material with filter elements that have a differential pressure stability of 160 bar



Perforated core

Full surface support of the pleated filter material, ensuring collapse pressure stability

Improvements

Overview of the improvements in EXAPOR®MAX 2 filter elements

