Innovative Element Technology
for installation in HYDAC filters

- Quick Selection -
High Quality Element Technology for Hydraulic Oils and Lubricants

Design
As the core of the filter, it is the filter element which performs the actual filtration and/or dewatering function in the housing. Elements consist of several pleated filtration and support layers which are placed as a cylinder around or inside the stabilizing support tube. The pleats are sealed by the end-caps. Depending on the type of filter, flow direction through the filter elements is from the outside to the inside, or from the inside to the outside. Depending on the filter material, the filter mesh pack is encased in an additional outer plastic wrap.

Innovation
Stat-Free® technology
With the new Stat-Free® filter elements, HYDAC has for the first time succeeded in combining excellent electrostatic characteristics with filtration performance. Unprecedented low charge generation in the filter element and in the fluid in the system is achieved with a new type of filter mesh pack and element design.

Innovation
HELIOS pleat geometry
Helios doubles the available area for incident flow and its small support pleats prevent collapsing of the filter mesh pack (compression of the pleats) even under high hydraulic loads.

In comparison to a standard pleat design, Helios achieves a significant reduction in flow velocity between the pleats and this is maintained even under the most adverse conditions.

Innovation
Outer wrap printed with customer logo
Since the outer wrap can be printed with the customer logo, it acts as an advertising medium for the OEM and guarantees security of the spares business. At the same time, the user can be certain of obtaining an original spare part. Particular benefit: the logo remains perfectly legible even in the contaminated condition.

The outer wrap with its multicoloured design and improved diffuser effect ensures optimised flow over the pleat tips.

The tried-and-tested outer wrap which is in highly tear-resistant plastic has elliptical perforations in the Optimicron® element. The shape of these pores (patent pending) improves the angle of incidence onto the filter pleats.

Installation and element types
- In inline filters to API 614 (element type "A")
- In return line filters/inline filters (element type "R")
- In return line filters to DIN 24550 (element type "RN")
- In inline filters (element type "D")
- In inline filters to DIN 24550 (element type "DN")
- In inline filters, but with return line filter element (element type "RD")
- In inline filters MFX (element type "MX")
- In inline filters to DIN 24550 (element type "RM")
- In suction filters (element type "RS")
Multipass Filter Efficiency Data to ISO 16889

The contamination retention and particle filtration performance of an element (with the exception of: paper P, P/HC, wire mesh W, W/HC, V and Superabsorber AM) are established in the multipass test to ISO 16889. This procedure with its precisely defined test conditions and a standard test dust (ISO MTD) enables the performance data of different elements to be compared.

Explanation of the Multipass Test

The multipass test is an idealised hydraulic circuit, in which the filter element under test is subjected to a constant flow rate. The size and number of contamination particles are determined before and after the element. The ratio of the number of particles of a certain size (and larger) before the filter to the number of particles of a certain size after the filter indicates the filtration performance, what is known as the $\beta_{x(c)}$ value. The "x" stands for the particular particle size being considered. A $\beta_{x(c)}$ value of 200 or above is considered (according to DIN 24550) to be absolute filtration. It is important that the $\beta_{x(c)}$ values remain at absolute level over a wide differential pressure range and do not fall as the element contamination and operating time increase. The filtration rating is determined from the $\beta_{x(c)}$ value (see illustration).

Performance features

Owing to their high performance standard, HYDAC absolute elements protect the functions of important and expensive hydraulic components and increase their service life.

The most important performance features are:
- High particle separation ($\beta_{x(c)}$ values)
- High particle separation over a wide differential pressure range
  (high $\beta_{x(c)}$ value stability)
- High contamination retention capacity
- High pressure stability values
- Low initial differential pressure
- Good flow fatigue strength
- Good water retention capacity (for water-absorbing filter material)

Dynamic Multipass Test = Hydraulic Load Cycle Test (HLCT)

The new dynamic Multipass Test provides application-orientated characteristics of filtration performance data (field measurements) and relates directly to real work cycles. It is based on different flow profiles for selected HYDAC key applications derived from years of field experience. The Hydraulic Load Cycle Test establishes a direct association of the particular flow profiles to the filter designs and filter media used.

Performance features

- Flow rate pulsation parameters tailored to the user
  - Flow acceleration
  - Holding times at $Q_{\text{min}}$ and $Q_{\text{max}}$
  - Pulsation frequency
- Selection of test fluid according to
  - Application-specific oil type
  - Operating temperature
  - Operating viscosity
- Test contamination and contamination addition technique selected according to the following criteria
  - Both test dust alternatives (ISO MTD and ISO FTD)
  - Alternative types of test contamination which are more relevant to applications
  - Both options for adding contamination (discontinuous/continuous)
- Method of introducing contamination is appropriate to the application
  (e.g. with reference to operating conditions of the machine, discontinuous addition of contamination during maintenance or oil change)
- Upstream contamination concentration is tailored to requirement
- Simple result display
  - $\beta$-values and $\beta$-value stability plotted for the entire duration of the test
  - Cleaning cycles only with specific reference to the application
    - Example: Filter element 0160 D... e.g. cleaning cycles for different operating conditions (cold start, commissioning system pump, for various load conditions of the filter element)
  - Direct reference to application-specific flow rate

### NEW and ESSENTIAL dynamic parameters:

Flow rate acceleration number (VB number) (for each cm² filter area)

$$K'_{\text{vb},i-3} = \frac{\text{d}Q}{\text{d}t} \left( \frac{Q_i - Q_{i-1}}{t_{i} - t_{i-1}} \right) \frac{A_{\text{eff}}}{A_{\text{ef}}} \left[ \text{l/min} \times \text{cm}^2 \right]$$

With:
- \(\text{d}Q/\text{d}t\) Flow rate difference between $Q_i$ and $Q_{i-1}$ [l/min]
- $A_{\text{eff}}$ Effective filtration area [cm²]
- $t_{i}$ Time difference between $t_i$ and $t_{i-1}$ [min]

Example: Filter element 0160 D...
### Optimicron® Power
- **Name:** ON/PO
- **Filter material:** Synthetic fibre, multi-layered with support
- **Filtration rating:** 5, 10, 20 µm
- **Collapse stability:** 10 bar
- **Flow direction:** from the outside to the inside
- **Plastic wrap:** yes
- **Element type:** A, R
- **Element category:** Single use element
- **Brochure no.:** 7.213./..

### Optimicron® Pulse
- **Name:** ON/PS, OH/PS
- **Filter material:** Glass fibre, single-layer with support
- **Filtration rating:** 3, 5, 10, 20 µm
- **Collapse stability:** 20 / 210 bar
- **Flow direction:** from the outside to the inside
- **Plastic wrap:** yes
- **Element type:** D
- **Element category:** Single use element
- **Brochure no.:** 7.222./..

### Optimicron® Pulp & Paper
- **Name:** ON/PP
- **Filter material:** Glass fibre, multi-layered with support
- **Filtration rating:** 5 µm
- **Collapse stability:** 10 bar
- **Flow direction:** from the outside to the inside
- **Plastic wrap:** yes
- **Element type:** R
- **Element category:** Single use element
- **Brochure no.:** 7.223./..

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The right filter element for every application.

**Optimicron®** Please note: Ongoing conversion from Betamicron® (BN4HC) to Optimicron® (ON)!

- **Name:** ON
- **Filter material:** Glass fibre, multi-layered with support
- **Filtration rating:** 1, 3, 5, 10, 15, 20 µm
- **Collapse stability:** 20 bar
- **Flow direction:** from the outside to the inside
- **Plastic wrap:** yes
- **Element type:** D, R
- **Element category:** Single use element
- **Brochure no.:** 7.224../..

**Betamicron®**

- **Name:** BN4HC, BH4HC
- **Filter material:** Glass fibre, multi-layered with support
- **Filtration rating:** 3, 5, 6, 10, 20, 25 µm
- **Collapse stability:** 20 / 210 bar
- **Flow direction:** from the outside to the inside
- **Plastic wrap:** yes
- **Element type:** D, D, DN, MX, R, RD, RN
- **Element category:** Single use element
- **Brochure no.:** 7.210../..

**Mobilemicron®**

- **Name:** MM
- **Filter material:** Synthetic fibre, multi-layered with support
- **Filtration rating:** 8, 10, 15 µm
- **Collapse stability:** 10 bar
- **Flow direction:** from the outside to the inside
- **Plastic wrap:** yes
- **Element type:** MX, R, RD, RK
- **Element category:** Single use element
- **Brochure no.:** 7.211../..

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Better Quality, Performance and Efficiency.

**ECOMICRON®**
- Name: ECON2
- Filter material: Glass fibre, multi-layered with support
- Filtration rating: 3, 5, 10, 20 µm
- Collapse stability: 20 bar
- Flow direction: from the outside to the inside
- Plastic wrap: yes
- Element type: MX, R
- Element category: Single use element
- Brochure no.: 7.212../..

**Stainless steel wire mesh**
- Name: W, W/HC
- Filter material: Stainless steel wire mesh
- Filtration rating: 25, 50, 100, 200 µm
- Collapse stability: 20 bar
- Flow direction: from the outside to the inside (D, DN, R, RN) from the inside to the outside (RS)
- Plastic wrap: no
- Element type: D, DN, R, RN, RS
- Element category: can be cleaned to prolong service life
- Brochure no.: 7.215../..

**Stainless steel fibre**
- Name: V
- Filter material: Metal fibre
- Filtration rating: 3, 5, 10, 20 µm
- Collapse stability: 210 bar
- Flow direction: from the outside to the inside
- Plastic wrap: no
- Element type: D, R
- Element category: can be cleaned to prolong service life
- Brochure no.: 7.216../..

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Innovation in every pleat.

**Paper**
- Name: P, P/HC
- Filter material: Cellulose fibre
- Filtration rating: 10, 20 µm
- Collapse stability: 10 bar
- Flow direction: from the outside to the inside (R) from the inside to the outside (RS)
- Plastic wrap: no
- Element type: R, RS
- Element category: Single use element
- Brochure no.: 7.214../..

**Aquamicron®**
- Name: AM
- Filter material: Superabsorber
- Filtration rating: 40 µm
- Collapse stability: 10 bar
- Flow direction: from the outside to the inside
- Plastic wrap: no
- Element type: R
- Element category: Single use element
- Brochure no.: 7.217../..

**Betamicron® / Aquamicron®**
- Name: BN4AM
- Filter material: Glass fibre with Superabsorber
- Filtration rating: 3, 10 µm
- Collapse stability: 10 bar
- Flow direction: from the outside to the inside
- Plastic wrap: no
- Element type: R
- Element category: Single use element
- Brochure no.: 7.218../..

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The graph below shows the filtration performance of different filtration ratings e.g.: Optimicron®.

Filtration performance

The bypass valve curves apply to mineral oil with a density of 0.86 kg/dm³. The valve differential pressure changes proportionally to the density (others on request).

Bypass valve curves

Example:
Filtration rate: 10 µm
→ \( \beta_{10} = 400 \)