HYDAC INTERNATIONAL

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. These mesh packs 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.

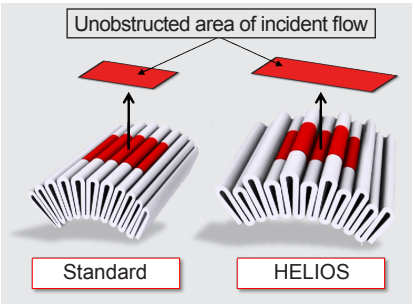
Innovation
Stat-Free® technology

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 element mat 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 versions

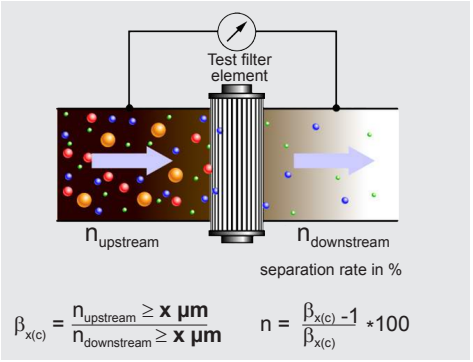
- In inline filters to API 614 (element version "**A**")
- In return line filters/inline filters (element version "**R**")
- In return line filters to DIN 24550 (element version "**RN**")
- In inline filters (element version "**D**")
- In inline filters to DIN 24550 (element version "**DN**")
- In inline filters, but return line filter element (element version "**RD**")
- In inline filters MFX (element version "**MX**")
- In return line suction filters RKM (element version "**RK**")
- In suction line filters (element version "**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 calculated 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 $\beta_{x(c)}$ values remain at absolute level over a wide differential pressure range and do not fall as the element contamination and operating time increase. The degree of separation is determined from the $\beta_{x(c)}$ value (see illustration).



$$\beta_{x(c)} = \frac{n_{upstream} \geq x\ \mu m}{n_{downstream} \geq x\ \mu m} \qquad n = \frac{\beta_{x(c)} - 1}{\beta_{x(c)}} * 100$$

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 level of particle separation ($\beta_{x(c)}$ values)
- High level of particle separation over a wide differential pressure range (high $\beta_{x(c)}$ value stability)
- High contamination retention capacity
- High burst pressure values
- Low initial pressure difference
- Good flow fatigue strength
- Good water retention capacity (for water-absorbent filter materials)

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 ripple parameters adjusted to suit the user**
  - Flow rate acceleration
  - Retention times at Q_{min} and Q_{max}
  - Pulsation frequency
- **Test fluid selected according to**
  - oil type for specific application
  - Operating temperature
  - Operating viscosity
- **Test dirt and type of dirt addition selected on basis of following aspects**
  - Both test dirt alternatives (ISO MTD and ISO FTD)
  - Other test dirt varieties with greater practical relevance
  - Both options for dirt addition (discontinuous/continuous)
    Type of dirt addition adjusted to suit application
    (e.g. in relation to machine's operating conditions, discontinuous dirt addition for maintenance or oil change)
  - Adjusted upstream dirt concentration
- **Simple presentation of results**
  - β values and β value stability spread out across entire duration of test
  - Cleaning cycles only with specific reference to 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

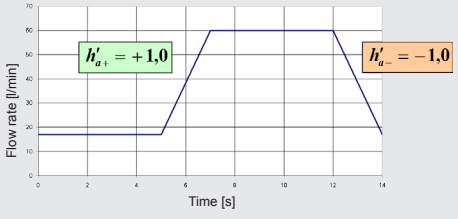
NEW and ESSENTIAL dynamic parameters:

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

$$h'_{a(+/-)} = \frac{\left(\frac{dQ}{dt}\right)}{A_{eff}} = \frac{\left(\frac{Q_2 - Q_1}{t_2 - t_1}\right)}{A_{eff}} = \frac{a_Q}{A_{eff}} \qquad \left[\frac{l}{min^2 \cdot cm^2}\right]$$

With:

dQ	Flow rate difference between Q_2 and Q_1	[l/min]
dt	Time difference between t_1 and t_2	[min]
A_{eff}	Effective filtration area	[cm²]



Example: Filter element 0160 D...

A large choice of filter elements.

Optimicron® Power

- **Designation:** ON/PO
- **Filter material:** plastic fibre, multi-layer support
- **Filtration rating:** 5, 10, 20 µm
- **Collapse stability:** 10 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** yes
- **Element version:** A, R
- **Element type:** single-use element
- **Brochure no.:** 7.213../..

Optimicron® Pulse

- **Designation:** ON/PS, OH/PS
- **Filter material:** glass fibre, single-layer support
- **Filtration rating:** 3, 5, 10, 20 µm
- **Collapse stability:** 20 / 210 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** yes
- **Element version:** D
- **Element type:** single-use element
- **Brochure no.:** 7.222../..

Optimicron® Pulp & Paper

- **Designation:** ON/PP
- **Filter material:** glass fibre, multi-layer support
- **Filtration rating:** 5 µm
- **Collapse stability:** 10 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** yes
- **Element version:** R
- **Element type:** single-use element
- **Brochure no.:** 7.223../..

	AFLD	AFLS	DF	DF... M P	DF...M A DF... MHA	DF...Q E DF...MHE	DFDK	DFDKN	DFF	DFFX	DFM	DFN	DFNF
Optimicron® Power	A	A											
Optimicron® Pulse			D		D	D			D	D			
Optimicron® Pulp & Paper													
Optimicron®			D	D	D	D	D		D	D	D		
Betamicron®			D	D	D	D	D	DN	D	D	D	DN	DN
Mobilemicron®													
Ecomicron®													
Stainless steel wire mesh			D	D	D	D	D	DN	D	D		DN	DN
Paper													
Metal fibre			D	D	D	D	D		D	D			
Aquamicron®													
Aquamicron®/ Betamicron®													

The right filter element for every application.

Optimicron®

Caution: Ongoing conversion from Betamicron® (BN4HC) to Optimicron® (ON)!

- **Designation:** ON
- **Filter material:** glass fibre, multi-layer support
- **Filtration rating:** 1, 3, 5, 10, 15, 20 µm
- **Collapse stability:** 20 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** yes
- **Element version:** D, R
- **Element type:** single-use element
- **Brochure no.:** 7.224../..

Betamicron®

- **Designation:** BN4HC, BH4HC
- **Filter material:** glass fibre, multi-layer support
- **Filtration rating:** 3, 5, 6, 10, 20, 25 µm
- **Collapse stability:** 20 / 210 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** yes
- **Element version:** D, DN, MX, R, RD, RN
- **Element type:** single-use element
- **Brochure no.:** 7.210../..

Mobilemicron®

- **Designation:** MM
- **Filter material:** plastic fibre, multi-layer support
- **Filtration rating:** 8, 10, 15 µm
- **Collapse stability:** 10 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** yes
- **Element version:** MX, R, RD, RK
- **Element type:** single-use element
- **Brochure no.:** 7.211../..

	DFP	DFPF	DFZ	FLN	FLND	FMMD	HDF	HDFF	HFM	LF	LFF	LFM	LFN
Optimicron® Power													
Optimicron® Pulse			D										
Optimicron® Pulp & Paper													
Optimicron®	D	D	D		D	D	D	D	D	D	D	D	
Betamicron®	D	D	D	DN	D / DN	D / DN	D	D	D	D	D	D	DN
Mobilemicron®													
Ecomicron®													
Stainless steel wire mesh				DN	D / DN	D / DN				D	D		DN
Paper													
Metal fibre	D	D	D							D	D		
Aquamicron®													
Aquamicron®/ Betamicron®													

Better Quality, Performance and Efficiency.

Ecomicron®

- **Designation:** ECON2
- **Filter material:** glass fibre, multi-layer support
- **Filtration rating:** 3, 5, 10, 20 µm
- **Collapse stability:** 10 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** yes
- **Element version:** MX, R
- **Element type:** single-use element
- **Brochure no.:** 7.212../..

Stainless steel wire mesh

- **Designation:** W, W/HC
- **Filter material:** **stainless steel wire mesh**
- **Filtration rating:** 25, 50, 100, 200 µm
- **Collapse stability:** 20 bar
- **Flow direction**: outside to inside (D, DN, R, RN)
  inside to outside (RS)
- **Plastic shell:** no
- **Element version:** D, DN, R, RN, RS
- **Element type:** cleanable to some extent
- **Brochure no.:** 7.215../..

Stainless steel fibre

- **Designation:** V
- **Filter material:** metal fibre
- **Filtration rating:** 3, 5, 10, 20 µm
- **Collapse stability:** **210 bar**
- **Flow direction:** outside to inside.
- **Plastic shell:** no
- **Element version:** D, R
- **Element type:** cleanable to some extent
- **Brochure no.:** 7.216../..

	LFNF	LPF	LPF...GGA	LPF.../-TH	MDF	MFM	MFM...L	MFM.../-OIU	MFX	NF	NFD	RF
Optimicron® Power												
Optimicron® Pulse												
Optimicron® Pulp & Paper										R	R	
Optimicron®		D			D	D	D	D		R	R	R
Betamicron®	DN	D	RD	RD	D	D	D	D	MX	R	R	R
Mobilemicron®			RD	RD					MX			
Ecomicron®									MX	R	R	
Stainless steel wire mesh	DN	D			D					R	R	R
Paper										R	R	R
Metal fibre					D					R	R	R
Aquamicron®										R	R	
Aquamicron®/ Betamicron®										R	R	R

Innovation in every pleat.

Paper

- **Designation:** P, P/HC
- **Filter material:** cellulose fibre
- **Filtration rating:** 10, 20 µm
- **Collapse stability:** 10 bar
- **Flow direction**: outside to inside (R)
  inside to outside (RS)
- **Plastic shell:** no
- **Element version:** R, RS
- **Element type:** single-use element
- **Brochure no.:** 7.214../..

Aquamicron®

- **Designation:** AM
- **Filter material:** superabsorber
- **Filtration rating:** 40 µm
- **Collapse stability:** 10 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** no
- **Element version:** R
- **Element type:** single-use element
- **Brochure no.:** 7.217../..

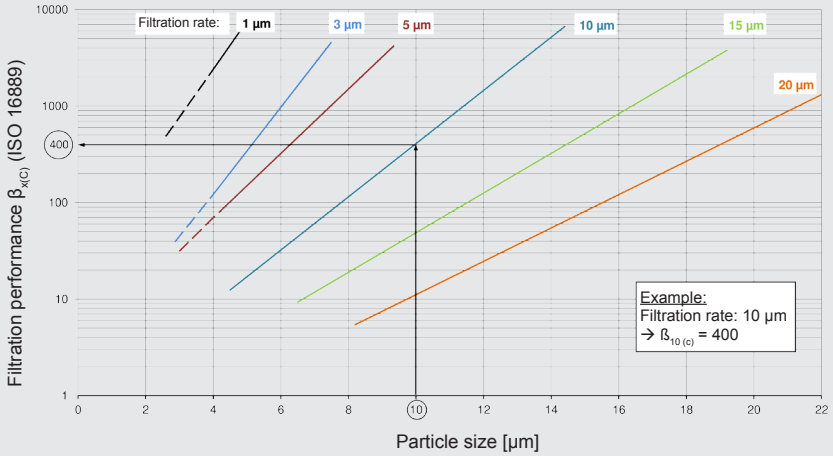
Betamicron® / Aquamicron®

- **Designation:** BN4AM
- **Filter material:** glass fibre with superabsorber
- **Filtration rating:** 3, 10 µm
- **Collapse stability:** 10 bar
- **Flow direction:** outside to inside.
- **Plastic shell:** no
- **Element version:** R
- **Element type:** single-use element
- **Brochure no.:** 7.218../..

	RFD	RFL Cast/weld	RFLD Cast/weld	RFLN	RFLND	RFM	RFN	RFND	RKM	SF	SFF	SFM
Optimicron® Power		R	R									
Optimicron® Pulse												
Optimicron® Pulp & Paper												
Optimicron®	R	R	R			R						
Betamicron®	R	R	R	RN	RN	R	RN	RN				
Mobilemicron®						R			RK			
Ecomicron®						R						
Stainless steel wire mesh	R	R	R			R				RS	RS	RS
Paper	R	R	R			R				RS	RS	RS
Metal fibre	R	R	R									
Aquamicron®	R	R	R			R						
Aquamicron®/ Betamicron®	R	R	R			R						

Filtration performance

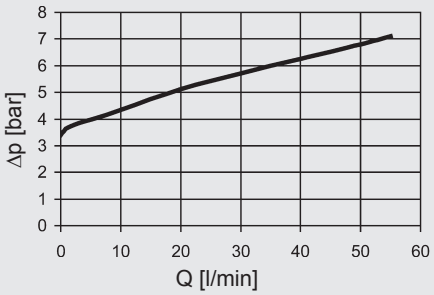
The illustration shows the filtration efficiencies for various filtration ratings, with Optimicron® used as an example:



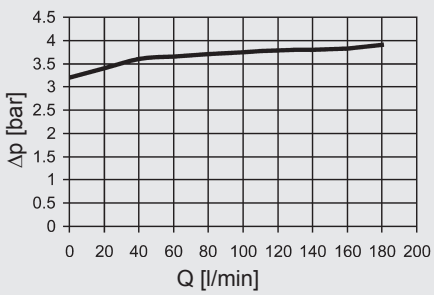
Bypass valve curves

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). (others on request)

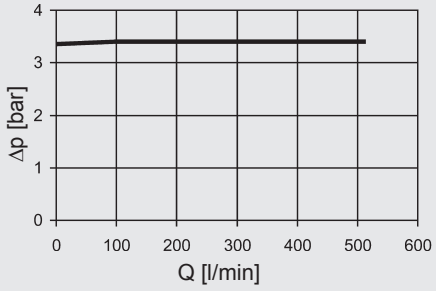
30



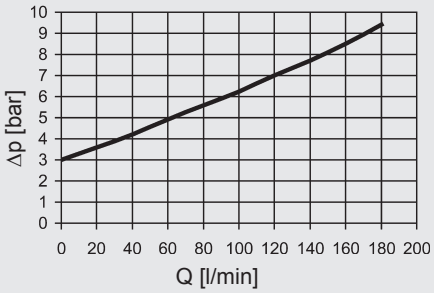
75, 160, 165, 185, 240, 280



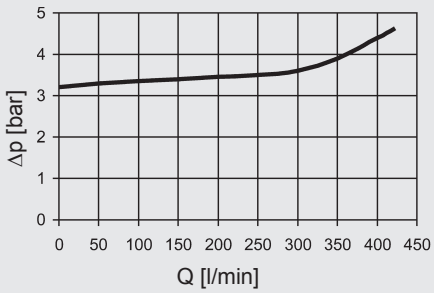
660, 850, 1700



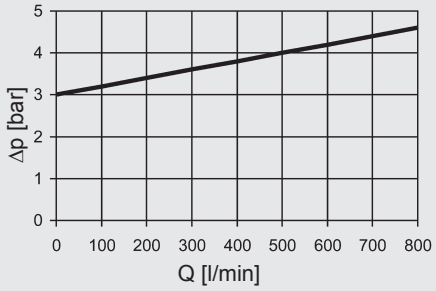
60, 90, 110, 140, 150



210, 270, 330, 500, 750



950, 1300, 2600



NOTICE
The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department. For applications or operating conditions not described please contact the relevant technical department.
All technical details are subject to change without notice.

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