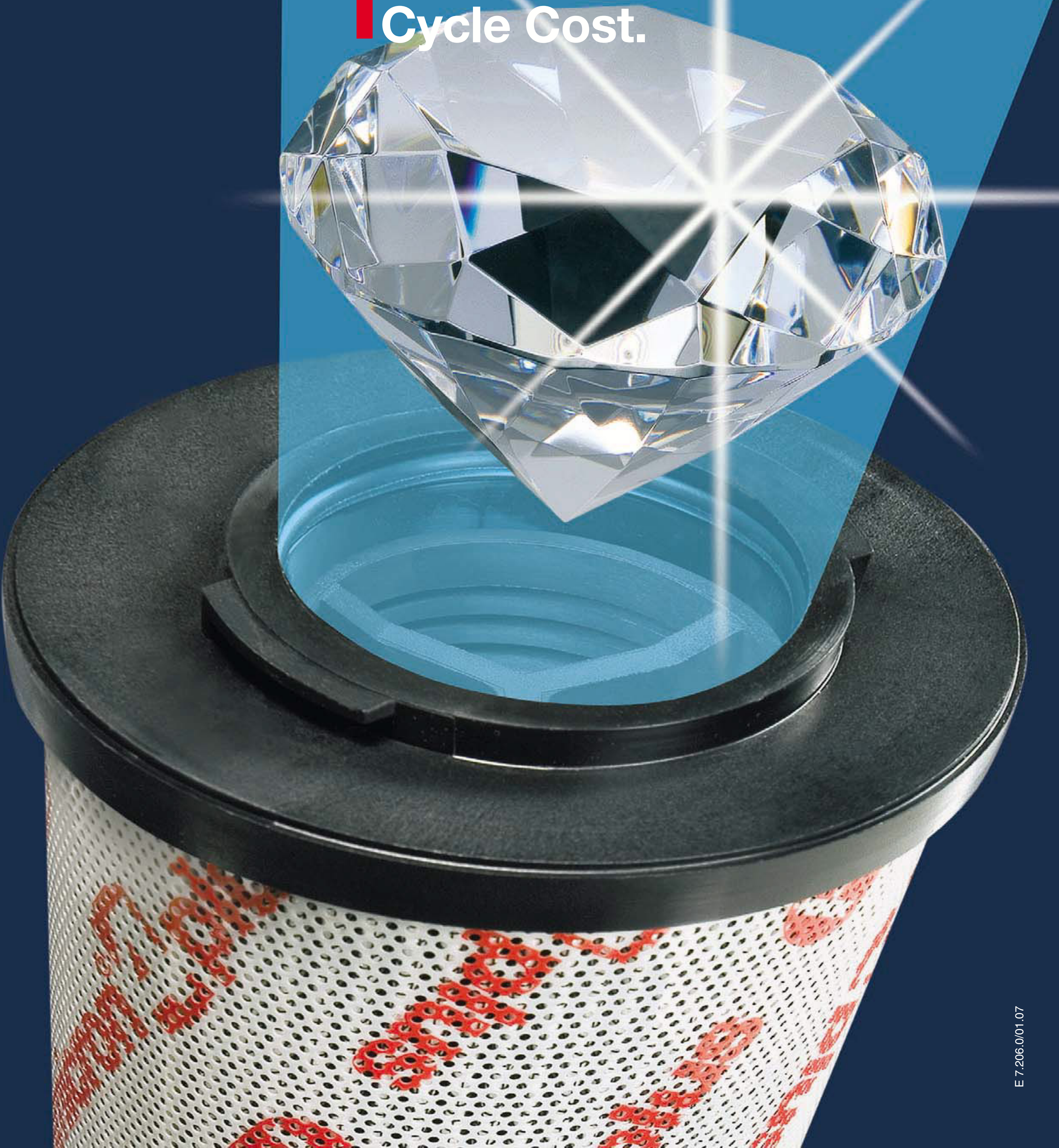
HYDAC INTERNATIONAL

Filter Elements Betamicron®4. For Reduced Life Cycle Cost.



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Attach

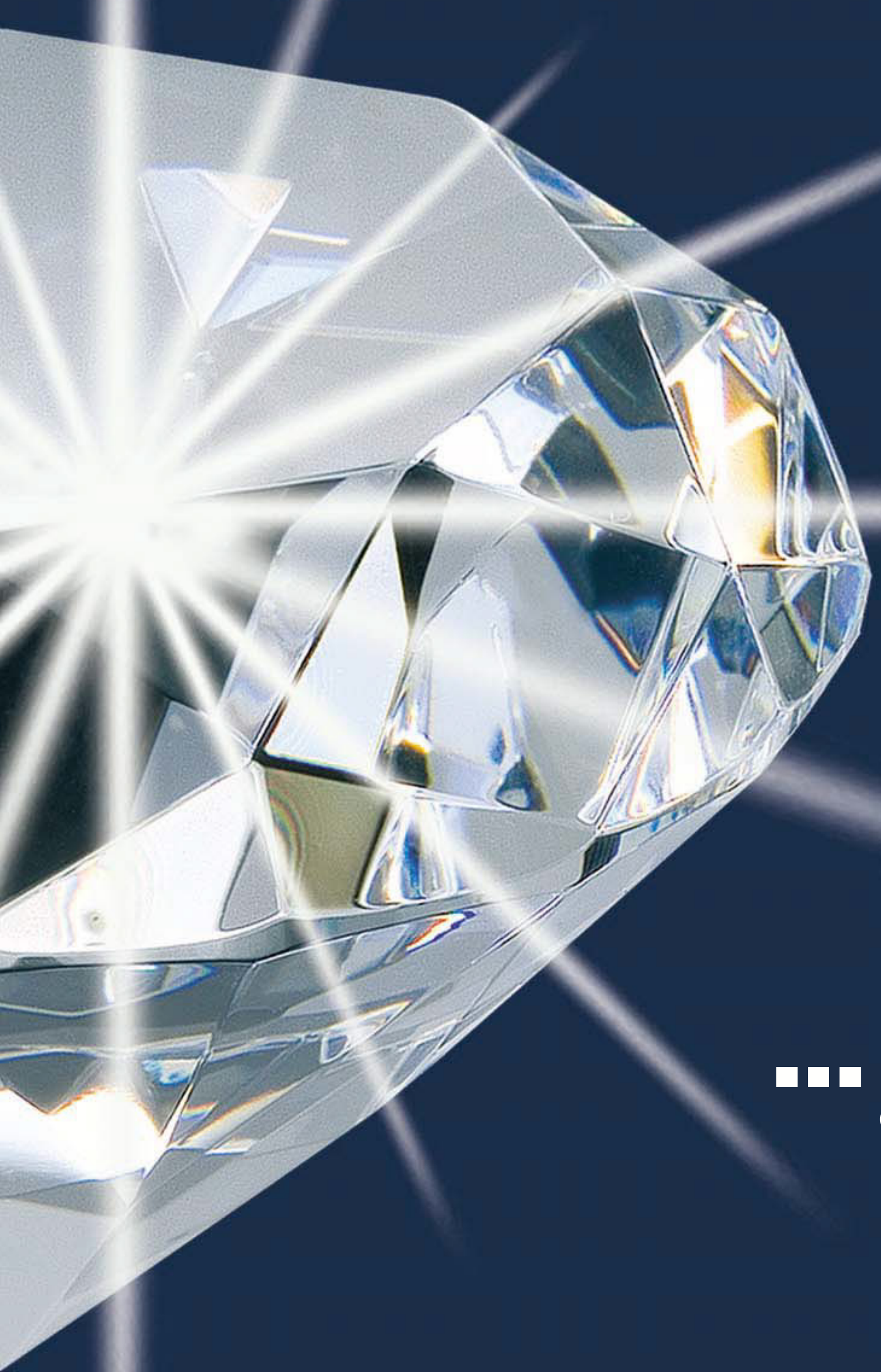
■■■ **Improved operational reliability**

■■■ **Longer maintenance intervals**

■■■ **Reduced energy cost**

■■■ **Longer system service life**

Importance to...



- Better component protection
- Reduced downtime cost
- Reduced operating cost
- Reduced shipping and waste disposal cost

Good. Better. Betamicron®4

Already with the previous Betamicron®3 technology you were always on the safe side: High and in particular long-term-stable fluid cleanliness for hydraulic and lubrication systems. The new generation **Betamicron®4** goes one better: **Excellent performance data for reduced Life Cycle Cost.**

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Better in

The key innovations of generation 4 are:

- Optimized mat structure with newly developed filter media and additional drainage layer
- Improved performance data (particle separation, contamination retention, Δp/Q characteristics)
- Patented process for longitudinal seam bonding
- Element is fully discharge-capable
- Use of spiro lock seam support tubes
- Outer envelope made of plastic (previously metal)

Technical data:

- Collapse burst pressure: Low pressure differential stability: 20 bar (BN4HC); High pressure differential stability: 210 bar (BH4HC)
- Filter ratings: 3, 5, 10, 20 µm

Quality, Performance and Efficiency.

Performance data:

Contamination retention capacity in g

Established in line with the multipass test ISO 16889

Return flow elements (R)				
	Betamicron BN4HC			
Size	3 µm	5 µm	10 µm	20 µm
30	2,6	2,9	3,5	4,0
60	5,7	6,3	7,6	8,6
75	10,3	11,4	13,7	15,5
90	12,2	13,5	16,2	18,3
110	12,0	13,3	16,0	18,1
150	20,4	22,6	27,2	30,8
160	18,6	20,7	24,9	28,1
165	18,7	20,7	24,9	28,2
185	25,6	28,4	34,1	38,6
210	50,7	56,2	67,6	76,5
240	29,3	32,5	39,1	44,2
270	78,4	86,9	104,5	118,2
280	62,3	69,0	83,0	93,9
330	38,4	42,6	51,2	57,9
480	62,3	69,0	83,0	93,9
500	58,9	65,3	78,6	88,9
660	87,1	96,5	116,1	131,3
750	147,1	163,0	196,1	221,9
850	112,1	124,2	149,5	169,1
950	130,0	144,1	173,3	196,1
1200	179,1	198,5	238,8	270,1
1300	181,0	200,7	241,4	273,1
1700	229,8	254,7	306,4	346,6
2600	369,4	409,4	492,5	557,2

Pressure elements (D)								
	Betamicron BN4HC				Betamicron BH4HC			
Size	3 µm	5 µm	10 µm	20 µm	3 µm	5 µm	10 µm	20 µm
30	4,6	5,1	5,4	5,6	3,0	2,9	3,2	3,7
35	7,2	8,1	8,6	8,8	– – –			–
55	14,0	15,8	16,6	17,2	– – –			–
60	6,5	7,3	7,8	8,0	4,6	4,5	5,0	5,7
75	21,6	24,3	25,7	26,5	– – –			–
95	27,6	30,9	32,7	33,7	– – –			–
110	13,8	15,5	16,4	16,9	10,1	9,9	10,9	12,4
140	18,1	20,3	21,5	22,2	13,3	13,0	14,3	16,3
160	19,8	22,2	23,5	24,3	12,9	12,6	13,9	15,9
240	32,3	36,3	38,4	39,6	21,6	21,1	23,2	26,5
280	70,6	79,3	83,9	86,6	48,1	47,1	51,8	59,1
330	47,2	53,1	56,1	57,9	34,6	33,9	37,2	42,5
500	76,9	86,5	91,5	94,4	57,5	56,3	61,8	70,5
660	102,2	114,9	121,5	125,4	76,8	75,2	82,6	94,3
990	154,5	173,7	183,7	189,5	111,8	109,4	120,2	137,2
1320	209,9	236,0	249,6	257,5	153,8	150,7	165,5	188,8

Δp/Q gradient coefficients in mbar/l/min

Flow rate established in line with ISO 3968

Return flow elements (R)				
	Betamicron BN4HC			
Size	3 µm	5 µm	10 µm	20 µm
30	68,4	43,9	26,8	14,7
60	26,8	18,3	10,9	6,9
75	22,0	14,2	8,1	4,4
90	14,9	10,1	6,7	3,2
110	14,9	9,4	6,0	3,2
150	8,9	6,0	4,0	1,9
160	9,5	5,9	3,8	2,9
165	11,2	7,8	4,5	2,4
185	8,9	6,1	3,3	1,8
210	3,9	2,6	1,8	1,1
240	6,2	3,8	2,6	1,8
270	2,5	1,7	1,1	0,7
280	3,1	2,2	1,6	1,0
330	4,2	2,7	1,7	1,2
480	3,1	2,2	1,6	1,0
500	3,0	1,9	1,3	0,8
660	1,9	1,2	0,8	0,5
750	1,3	0,9	0,6	0,4
850	1,5	1,0	0,7	0,4
950	1,2	0,8	0,5	0,4
1200	1,0	0,8	0,5	0,3
1300	0,8	0,6	0,4	0,3
1700	0,7	0,5	0,3	0,2
2600	0,4	0,3	0,2	0,1

Pressure elements (D)								
	Betamicron BN4HC				Betamicron BH4HC			
Size	3 µm	5 µm	10 µm	20 µm	3 µm	5 µm	10 µm	20 µm
30	63,9	43,3	22,8	11,3	91,2	50,7	36,3	19,0
35	23,6	19,0	14,8	9,3	– – –			– –
55	13,7	11,0	8,1	4,8	– – –			12,2
60	28,9	20,4	13,2	7,9	58,6	32,6	18,1	
75	9,3	7,5	5,3	3,1	– – –			–
95	7,5	6,0	4,1	2,4	– – –			–
110	14,9	10,7	6,6	3,7	25,4	14,9	8,9	5,6
140	12,8	8,2	4,8	2,9	19,9	11,3	8,1	4,3
160	13,1	8,8	4,6	3,5	16,8	10,4	5,9	4,4
240	8,2	6,1	3,6	2,3	10,6	6,8	3,9	2,9
280	4,0	3,1	1,7	1,3	5,7	3,4	1,8	1,6
330	5,4	3,9	3,0	1,7	7,7	4,5	2,8	2,0
500	3,3	2,4	1,5	1,1	4,2	2,6	1,5	1,2
660	2,5	1,8	1,1	0,8	3,3	1,9	1,0	0,9
990	1,6	1,2	0,7	0,5	2,2	1,3	0,8	0,6
1320	1,2	0,9	0,5	0,4	1,6	1,0	0,6	0,4
1500	1,1	0,8	0,6	0,4	1,4	0,8	0,6	0,5

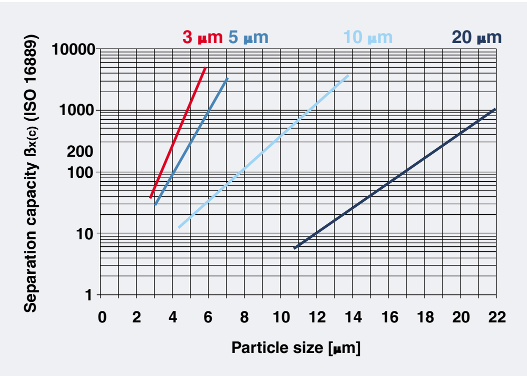
Betamicron®4. Top-clas

Optimized three-layer filter mat structure with new glass fibers

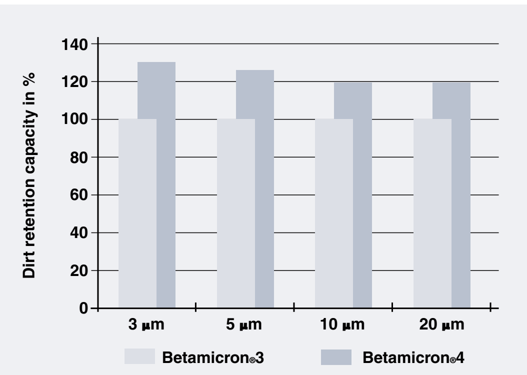
Absolutely new filter media were developed for the new Betamicron®4 filter elements. Due to the 3-stage structure, highest contamination retention and separation capacity are ensured.
As a result of the integration of an additional drainage layer, the fluid flow is directed in an optimum way, and particularly favorable Δp/Q characteristics are achieved.

Longer element service life and energy cost savings due to particularly low pressure losses across the element

Better component protection and longer system service life due to improved separation capacity (with filter ratings 3 and 5 µm)



Longer element service life and lower operating costs due to increase in the contamination retention capacity by up to 30 %



Patented longitudinal seam bonding method

Due to an innovative bonding process of the longitudinal seam, a completely tight integration of open filter mat ends is ensured, even in the case of varying loads. A particle transition from the dirt to the clean side is reliably prevented.

High operational reliability, even under dynamic loads, due to tight longitudinal seam bonding.

Zinc-free structure

To prevent the formation of zinc soap, which occurs mainly when water-containing fluids (HFA/HFC) and bio-oils are used, no zinc-containing components are employed.

High operational reliability, because elements cannot be blocked as a result of the formation of zinc soap

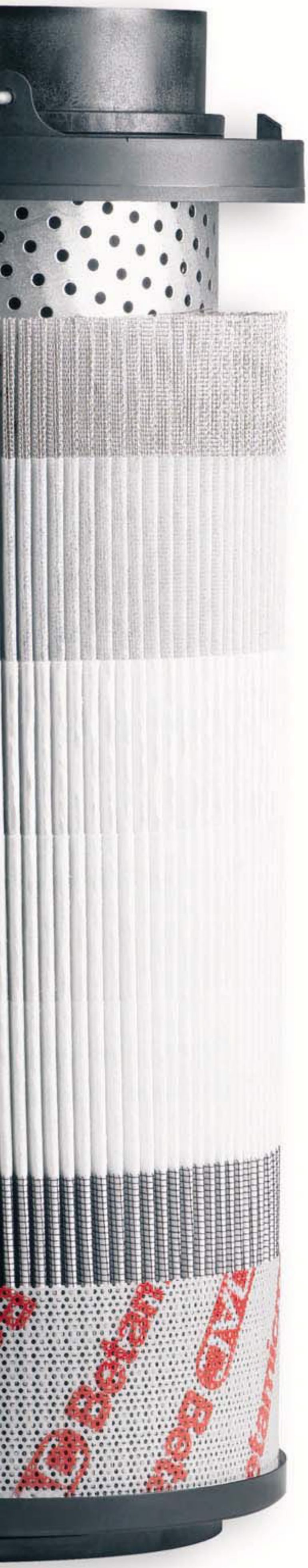
Savings in storage costs, because the filter elements can be used universally

Use of spiro lock seam support tubes

The metal tube provided inside the element for stabilization purposes is designed as spiro lock seam tube, which offers unchanged stability while significantly reducing the element weight.

Reduced shipping and waste disposal costs due to weight reduction by up to 30 %

s Filter Element Technology.



Protection of the filter mat through outer envelope

The star-shaped pleated filter mat is enclosed by a stable envelope made of plastic. This envelope distributes the incoming fluid evenly over the mat (diffusor). Moreover, the fluid does not flow directly through the mat, which protects it from pulsating flows. In this way, the element reaches extremely high flow fatigue strength values. Moreover, the mat is naturally protected against mechanical damage, e.g. when elements are being installed. Because the outer envelope allows customer logos to be imprinted, it can be used as advertising medium for OEMs, thus ensuring spare parts business. At the same time, the user can rely on the fact that he will always get a genuine spare part.

High operational reliability, because the sensitive filter mat is protected against direct fluid flows and pulsation

Low energy consumption, because due the uniform distribution of the fluid (diffusor effect), a particularly low Δp is achieved across the element

Ease of handling, because the compact element is protected against damage in transit and during its installation

Protection against product piracy through "brand labeling"

The figure shows elements with customer logo, which are increasingly used across all industrial sectors.

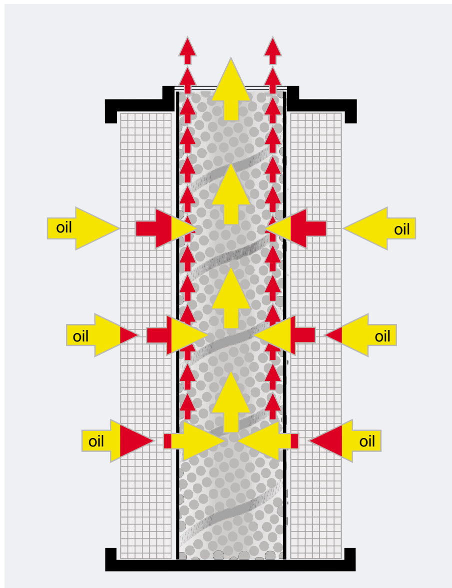
Particularly advantageous: The logo is also perfectly legible when the filter is dirty, that is, when the element is actually changed. "Brand labeling" by HYDAC will result in an enormous increase in your spare parts business and improve the process quality through the use of genuine spare parts.

Use of electrically conductive plastics and innovative filter media

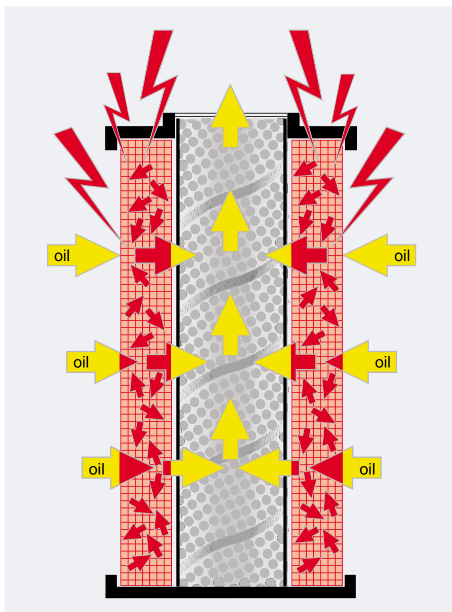
Due to a complete revision of the materials used, e.g. conductive plastics, full discharge-capability of the filter elements was achieved.

Charging of the filter elements during operation was therefore reduced to an absolutely uncritical level. This means that risks such as sudden sparking and the subsequent formation of black carbon or sludging of the oil are reliably eliminated.

High operational reliability, because the filter element is fully discharge-capable



Discharge on a discharge-capable element



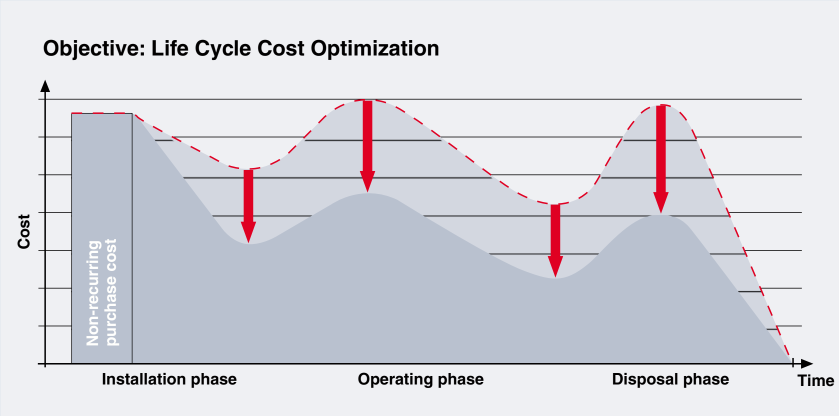
No discharge on an element, which is not discharge-capable

Betamicron®4 Reduces Life Cycle Cost.

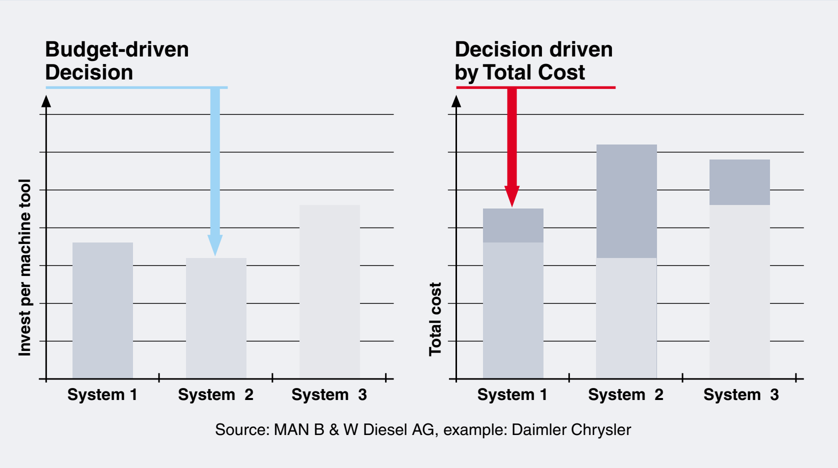
Life Cycle Cost – what does this mean?

The term **Life Cycle Cost** is today a dominating topic among suppliers, machine builders and end customers. We understand by this the total cost of a system, machine or component from the procurement through to its scrapping.

The reduction of Life Cycle Cost is one of the **mega trends** in mechanical engineering. The objective is to make product costs transparent beyond the purchase price over the entire lifecycle, thus creating a better basis for the customer's buying decision.
Big end customers set this trend.
Leading car makers, for example, require binding information about the Life Cycle Cost and derived variables – e.g. for machine tools for 10 years, for presses even for up to 30 years. Decisions on new investments by machine manufacturers are based on the machine price and the Life Cycle Cost calculation offered.



Cost curve during the total lifecycle of the machine / system



Winner in the system properties

This changed and holistic understanding of cost by end customers naturally results in new challenges that machine manufacturers have to take. For system concepts, subsystems and components used must also stand the test with regard to their influence on the Life Cycle Cost.

Betamicron® 4 elements are the winners in the "Life Cycle Cost contest"

The table summarizes it:
Betamicron®4 elements result in a minimization of, for example, the following types of cost:

	Optimized mat structure	Optimized longitudinal seam	Zinc-free structure	Spiro lock seam support tubes	Protective envelope	Discharge capability
	minimized					
Energy	●					
Personnel	●	●			●	●
Logistics			●	●		
Failure	●	●	●		●	●
Production	●	●				●
Repair	●	●	●		●	●
Maintenance	●	●	●		●	●
Spare parts	●	●	●		●	●
Waste disposal				●		

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