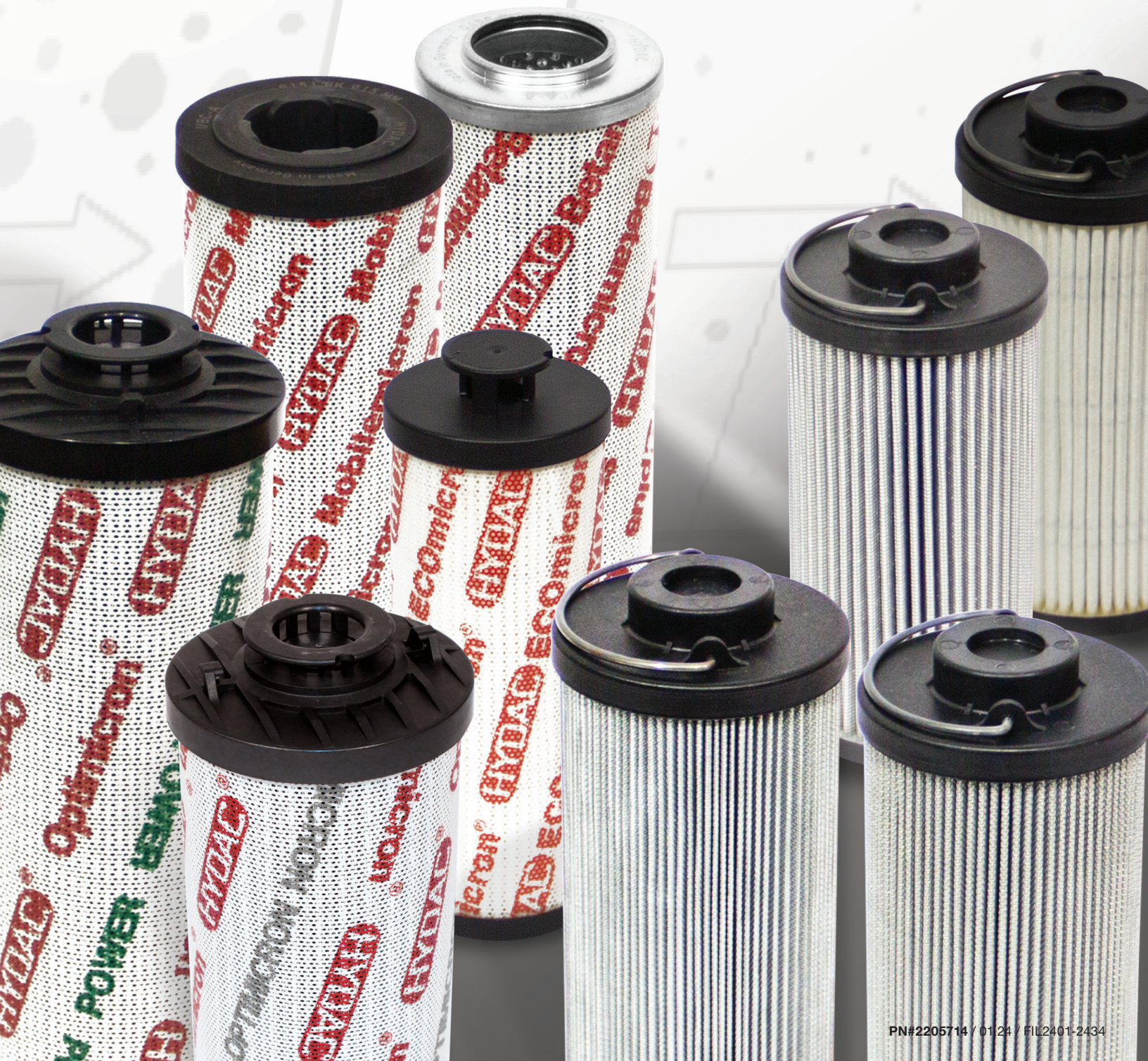


Innovative Element Technology

for installation in HYDAC Filters

QUICK SELECTION GUIDE



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 Stat-Free® filter elements, HYDAC combines superior electrostatic characteristics with filtration performance. Unprecedented low charge generation in the filter element, and in the fluid throughout the system, is achieved with exclusive filter mesh pack and element design. (For oils with conductivity less than 500 pS/m)



Innovation

Stat-X® technology

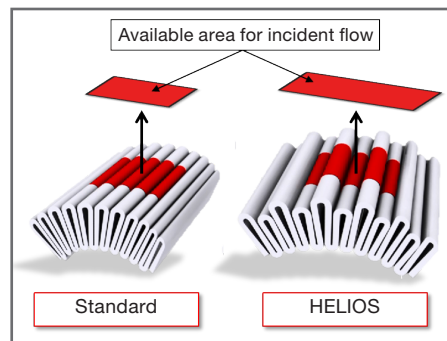
The Stat-X technology works at even lower conductivity levels than the Stat-Free technology. Is suitable for critical and Cold Start Applications.

Innovation

HELIOS pleat geometry

Helios technology doubles the available area for incident flow. 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, which is maintained even under the most adverse conditions.



Innovation

Outer wrap printed with customer logo

Custom-printed outer wrap acts as an advertising medium and secures the spares business. At the same time, the user can be certain of obtaining an original high quality spare part including a logo that remains perfectly legible even in the contaminated condition.

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

Optimicron® elements include tried-and-tested outer wraps, made of highly tear-resistant plastic with elliptical perforations. The shape of these pores (*patent pending*) improves the angle of incidence onto the filter pleats.



Installation and element types

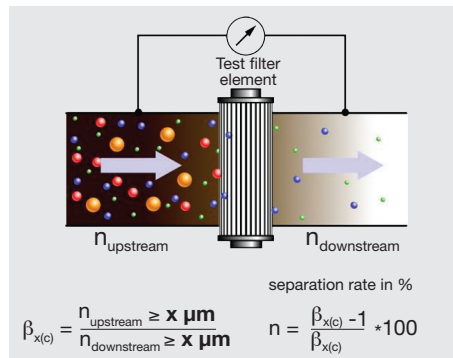
- In inline filters to API 614 (element type **A**)
- In return line filters/inline filters (element type **R**)
- In return line filters to DIN 24550 (element type **RN**)
- In inline filters (element type **D**)
- In inline filters to DIN 24550 (element type **DN**)
- In inline filters, but with return line filter element (element type **RD**)
- In inline filters MFX (element type **MX**)
- In return line & suction boost filter RKM (element type **RK**)
- 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 water removal AM) are derived from ISO 16889 multipass test results. ISO 16889 defines the test conditions and specifies the standard test dust (ISO MTD) allowing for the comparison of the performance data of various elements under an even playing field.

Explanation of the Multipass Test

The multipass test is an ideal condition 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 (also known as beta value or beta rating). 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 (depth) 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).

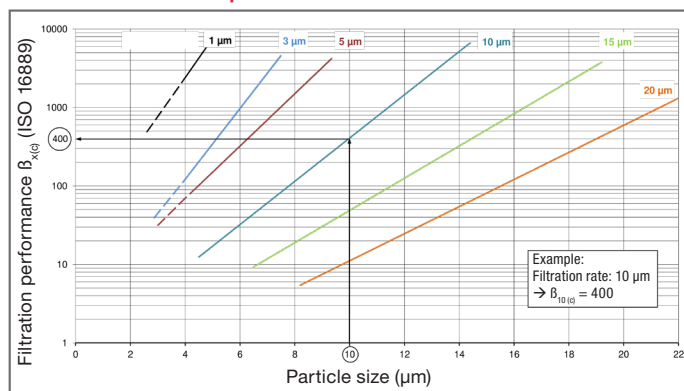


Performance features

HYDAC standard high performance absolute elements effectively protect the functions of critical hydraulic components and increase their service life. 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 (dirt holding capacity)
- High pressure stability values
- Low initial differential pressure
- Good flow fatigue strength
- Good water retention capacity (for water-absorbing filter material)

β - values for Optimicron



Dynamic Multipass Test = Hydraulic Load Cycle Test (HLCT)

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

Performance features

- **Flow rate pulsation parameters tailored to the user**
 - Flow acceleration
 - Holding times at Q_{min} and Q_{max}
 - Pulsation frequency
- **Selection of test fluid in accordance with**
 - Application-specific oil type
 - Operating temperature
 - Operating viscosity
- **Test contamination and contamination additive technique selection in accordance with the following criteria**
 - Test dust alternatives (ISO MTD and ISO FTD)
 - Alternative test contamination, more relevant to applications
 - Contamination adding options (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**
 - β -values and β -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

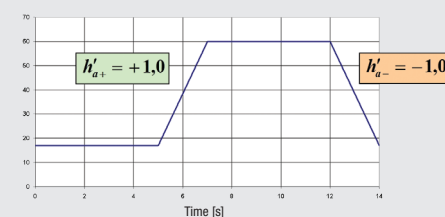
NEW & ESSENTIAL dynamic parameters:

Flow rate acceleration number (VB no.) (for each cm^2 filter area)

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

With:

$\frac{dQ}{dt}$ Flow rate difference between Q_2 & Q_1 [l/min]
 $t_2 - t_1$ Time difference between t_1 and t_2 [min]
 A_{eff} Effective filtration area [cm^2]



Example: Filter element 0160 D...

An extensive offering of filter elements.

Optimicon®

- Name: ON
- Filter material: Glass fiber, multi-layered with support
- Filtration rating: 1, 3, 5, 10, 15, 20 µm
- Collapse stability: 290 psid (20 bar)
- Flow direction: outside to inside
- Plastic wrap: yes
- Element type: D, R
- Element category: Single use element
- Unique features: New standard, optimized approach to filter performance



Optimicon® Power

- Name: ON/PO
- Filter material: Synthetic fiber, multi-layered with support
- Filtration rating: 5, 10, 20 µm
- Collapse stability: 145 psid (10 bar)
- Flow direction: outside to inside
- Plastic wrap: yes
- Element type: A, R
- Element category: Single use element
- Unique features: Optimized filter performance for PowerGen Industry, Stat-Free®



Stat-X®

- Name: XSX
- Filter material: Hybrid fiber construction, multi layered support
- Filtration rating: 3, 5, 10, 20 µm
- Collapse stability: 290 psid (20 bar)
- Flow direction: outside to inside
- Plastic wrap: yes
- Element type: D, R
- Element category: Single use element
- Unique features: ESC and ESD protection, optimized for cold start and critical systems applications



	AFLD	DF	DF..Q E DF..MHE	DFDK	DFE	DFFX	DFN	DFP	DFZ
Optimicon®		D	D	D	D	D		D	D
Optimicon® Power	A								
Stat-X®		D	D	D	D	D		D	D
Betamicon®		D	D	D	D		DN	D	D
Mobilemicon®									
ECOmicon®									
Stainless Steel Wire Mesh		D	D	D	D	D	DN		
Paper									
Metal Fiber		D	D	D	D	D		D	D
Aquamicon®									
Aquamicon®/ Betamicon®									

The right filter element for every application.

Betamicon®

- Name: BN4HC (*select elements, consult HYDAC*), BH4HC
- Filter material: Glass fiber, multi-layered with support
- Filtration rating: 3, 5, 6, 10, 20, 25 µm
- Collapse stability: Low collapse 290 psid (20 bar) / High collapse 3045 psid (210 bar)
- Flow direction: outside to inside
- Plastic wrap: yes
- Element type: D, DN, MX, R, RD, RN
- Element category: Single use element
- Unique features: High efficiency, absolute (*depth*) filtration



Mobilemicron®

- Name: MM
- Filter material: Synthetic fiber, multi-layered with support
- Filtration rating: 8 (*optional*), 10, 15 µm
- Collapse stability: 145 psid (10 bar)
- Flow direction: outside to inside
- Plastic wrap: yes
- Element type: MX, R, RK
- Element category: Single use element
- Unique features: Low ΔP/flow rate (psi/gpm), ideal for mobile cold start applications



ECOMICRON®

- Name: ECON2
- Filter material: Glass fiber, multi-layered with support
- Filtration rating: 3, 5, 10, 20 µm
- Collapse stability: 145 psid (10 bar)
- Flow direction: outside to inside
- Plastic wrap: yes
- Element type: MX, R
- Element category: Single use element
- Unique features: Environmentally friendly, all plastic



	FLN	FLND	HDF	HDFE	HFM	LF	LFN	LPE	MFM	MFH
Optimicon®		D	D	D	D	D		D	D	
Optimicon® Power										
Stat-X®		D	D	D	D	D		D	D	
Betamicon®	DN	DN	D	D	D	D	DN	D	D	MX
Mobilemicron®										MX
ECOMICRON®										MX
Stainless Steel Wire Mesh	DN	DN				D	DN	D		
Paper										
Metal Fiber						D				
Aquamicon®										
Aquamicon®/ Betamicon®										

Better quality, performance, and efficiency.

Wire Mesh Elements

- Name: W, W/HC
- Filter material: Wire mesh
- Filtration rating: 25, 74, 149 µm
- Collapse stability: 290 psid (20 bar)
- Flow direction: outside to inside (D, DN, R, RN); inside to outside (RS)
- Plastic wrap: no
- Element type: D, DN, R, RN, RS
- Element category: Can be cleaned & reused (up to 5x's, refer to service guide)
- Unique features: Low ΔP/flow rate (psi/gpm)



Metal Fiber Elements

- Name: V
- Filter material: Stainless steel metal fiber
- Filtration rating: 3, 5, 10, 20 µm
- Collapse stability: 3045 psid (210 bar)
- Flow direction: outside to inside
- Plastic wrap: no
- Element type: D, R
- Element category: Can be cleaned & reused (up to 5x's, refer to service guide)
- Unique features: High collapse, low ΔP/flow rate (psi/gpm)



Aquamicron®

- Name: AM
- Filter material: Water removal media
- Filtration rating: 40 µm
- Collapse stability: 145 psid (10 bar)
- Flow direction: outside to inside
- Plastic wrap: no
- Element type: R
- Element category: Single use element
- Unique features: Free water removal



	NF	NFD	RF	RFD	RFL Cast / Weld	RFLD Cast / Weld	RFM	RFN	RKM	SF
Optimicron®	R	R	R	R	R	R	R			
Optimicron® Power					R	R				
Stat-X®	R	R	R	R	R	R	R			
Betamicron®			R	R		R	R	RN		
Mobilemicron®							R		RK	
ECOMICRON®	R	R					R			
Stainless Steel Wire Mesh	R	R	R	R	R	R	R			RS
Paper	R	R	R	R	R	R	R			RS
Metal Fiber	R	R	R	R	R	R				
Aquamicron®	R	R		R	R	R	R			
Aquamicron®/ Betamicron®	R	R	R	R	R	R	R			

Innovation in every pleat.

Betamicon® / Aquamicon®

- Name: BN4AM or BN/AM
- Filter material: Glass fiber with water removal
- Filtration rating: 3, 10 µm
- Collapse stability: 145 psid (10 bar)
- Flow direction: outside to inside
- Plastic wrap: no
- Element type: R
- Element category: Single use element
- Unique features: Combination particle/water removal



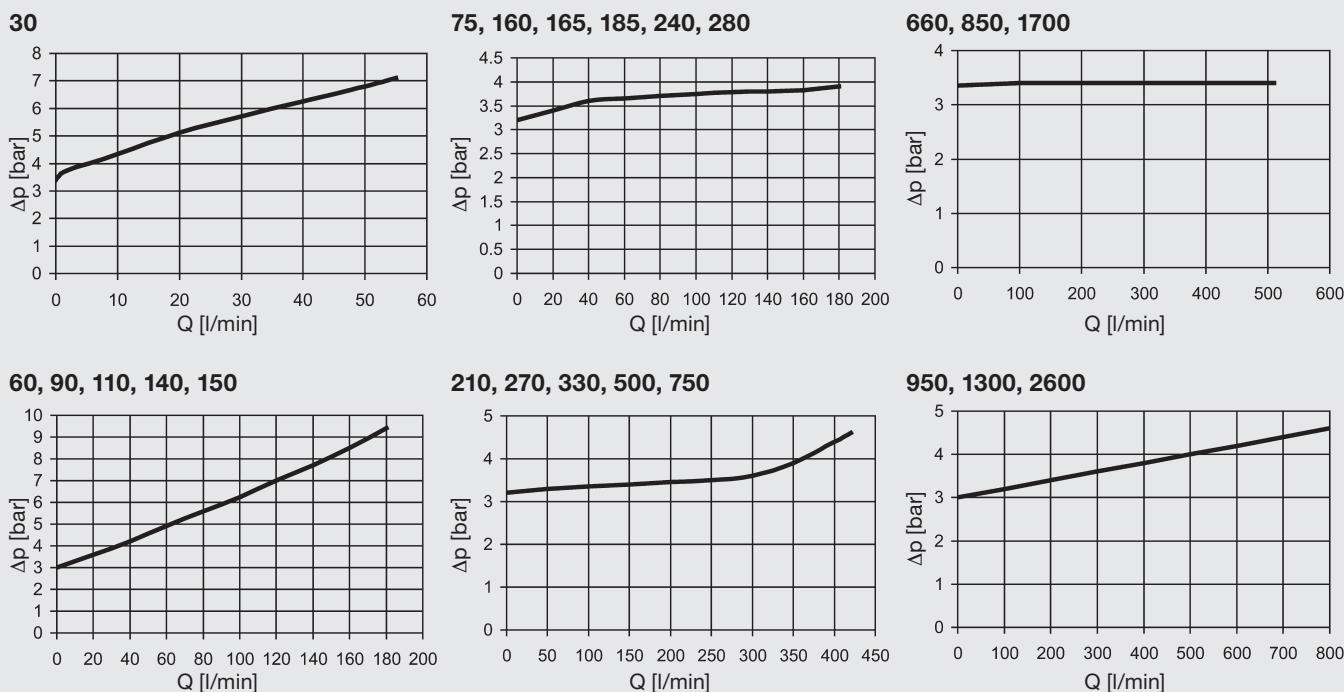
Polyester Elements

- Name: P, P/HC
- Filter material: Cellulose fiber
- Filtration rating: 10, 20 µm
- Collapse stability: 145 psid (10 bar)
- Flow direction: outside to inside (R); inside to outside (RS)
- Plastic wrap: no
- Element type: R, RS
- Element category: Single use element
- Unique features: Low ΔP /flow rate (psi/gpm)



Bypass valve curves

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





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