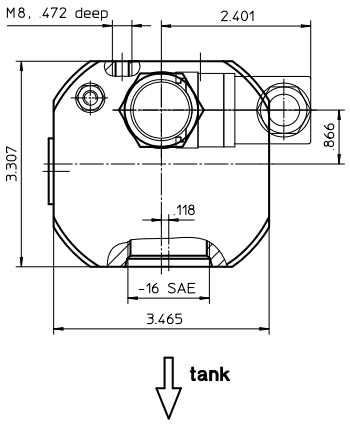
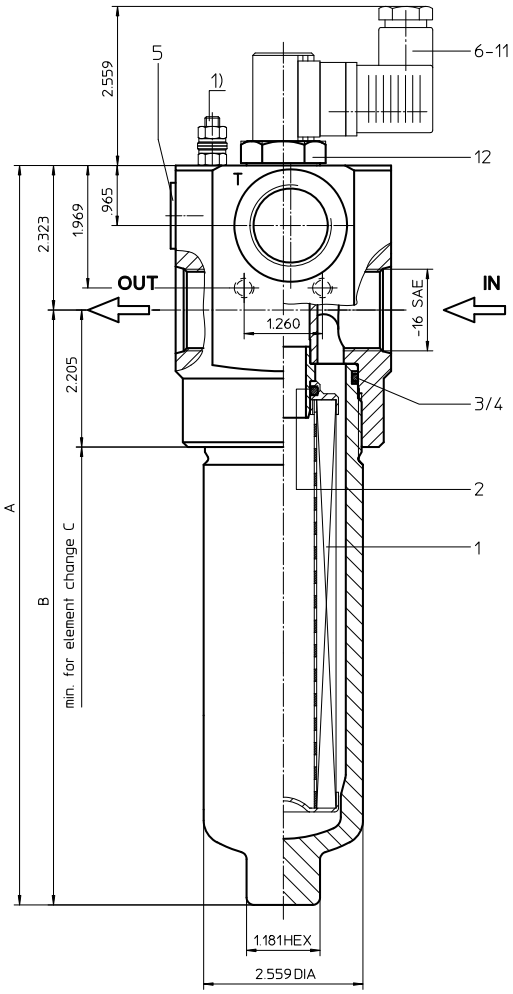
Series HPV 60-150
6000 PSI





Dimensions:

type	HPV 60	HPV 90	HPV 150
connection	-16 SAE		
A	9.33	11.88	16.18
B	7.00	9.56	13.85
C	10.63	13.19	17.52
weight	14.30 lbs.	15.40 lbs.	17.60 lbs.
volume tank	.08 Gal.	.10 Gal.	.16 Gal.

1) Connect the stand grounding tab to a suitable earth ground point.

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter
Series HPV 60-150
6000 PSI

Description:

Pressure filter series HPV 60-150 have a working pressure up to 6000 PSI. Pressure peaks can be absorbed with a sufficient safety margin. The HPV filter is in-line mounted.

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside. Filter elements are available down to 5 $\mu m_{(c)}$. Finer filtration is available upon request.

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.

Eaton filter elements are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Eaton filter elements are available up to a pressure resistance of Δp 2320 PSI and a rupture strength ofΔp 3625 PSI.

The internal valve is integrated into the filter head. The differential pressure valve diverts the contaminated fluid to the tank when the element is clogged. During cold start, the differential pressure valve will divert the fluid to the tank until the system warms up.

1. Type index:

1.1. Complete filter: (ordering example)

HPV.	90.	10VG.	HR.	E.	P.	-.	UG.	5.	-.	D2.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPV = pressure filter with differential pressure-valve

2 **nominal size:** 60, 90, 150

3 **filter-material and filter-fineness:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass

4 **filter element collapse rating:**
30 = Δp 435 PSI
HR = Δp 2320 PSI (rupture strength Δp 3625 PSI)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **process connection:**
UG = thread connection

9 **process connection size:**
5 = -16 SAE

10 **filter housing specification:**
- = standard

11 **internal valve:**
D1 = differential pressure-valve Δp 51 PSI
D2 = differential pressure-valve Δp 102 PSI

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electric, see sheet-no. 1615
VS5 = electronic, see sheet-no. 1619

To add an indicator to your filter, use the corresponding indicator data sheet to find the indicator details and add them to the filter assembly model code.

1.2. Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to company standard

2 **nominal size:** 60, 90, 150

3 - 7 see type index-complete filter

.

Technical data:

design temperature:	14 °F to +212 °F
operating temperature:	14 °F to +176 °F
operating medium	mineral oil, other media on request
max. operating pressure:	6000 PSI
test pressure:	8580 PSI
process connection:	thread connection
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.
Classified under ATEX Directive 2014/34/EC according to specific application (see questionnaire sheet-no. 34279-4).

Pressure drop flow curves:

Filter calculation/sizing

The pressure drop of the assembly at a given flow rate Q is the sum of the housing Δp and the element Δp and is calculated as follows:

$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$
$\Delta p_{housing}$ = *(see Δp = f (Q) - characteristics)*

$$\Delta p_{element}(PSI) = Q\ (GPM)\ x\ \frac{MSK}{1000}\left(\frac{PSI}{GPM}\right) x\ \nu\,(SUS)\ x\ \frac{\rho}{0.876}\left(\frac{kg}{dm^3}\right)$$

For ease of calculation our Filter Selection tool is available online at www.eatonpowersource.com/calculators/filtration/

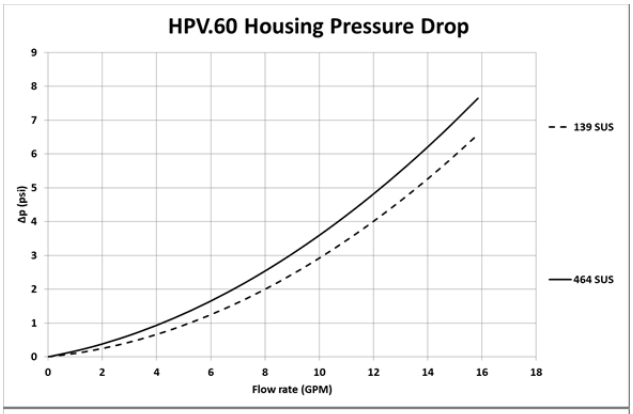
Material gradient coefficients (MSK) for filter elements

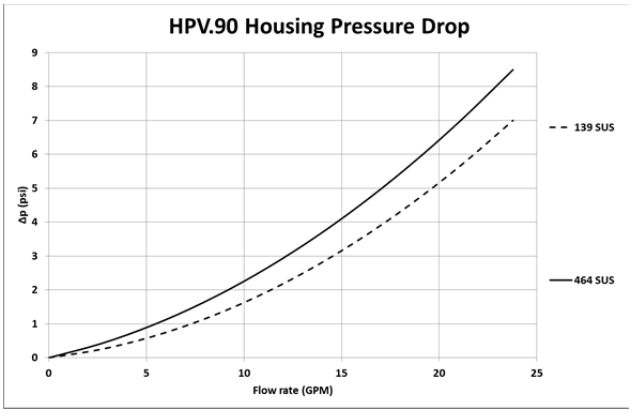
The material gradient coefficients in PSI/GPM apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

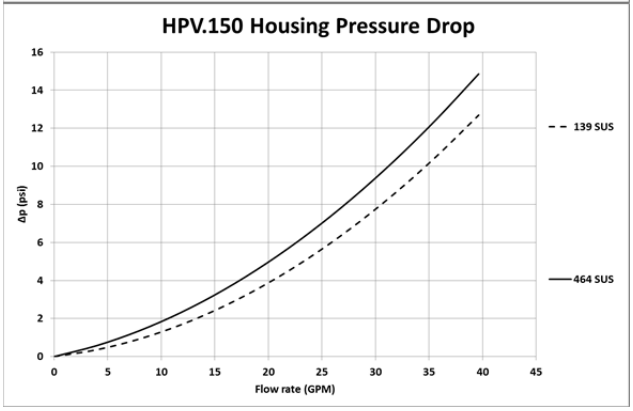
HPV	VG					G		
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G
60	6.748	4.685	2.999	2.577	1.760	0.2002	0.1868	0.1280
90	4.059	2.818	1.804	1.550	1.059	0.1210	0.1130	0.0774
150	2.422	1.681	1.076	0.925	0.632	0.0723	0.0675	0.0462

Δp = f(Q) – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.

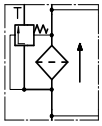




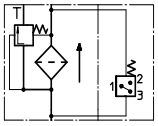


Symbols:

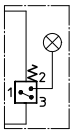
without indicator



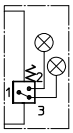
with electric indicator AE 30 and AE 40



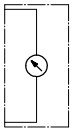
with visual-electric indicator AE 50 and AE 62



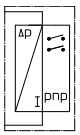
with visual-electric indicator AE 70 and AE 80



with visual indicator AOR/AOC



with electronic clogging sensor VS5



Spare parts:

item	qty.	designation	dimension HPV 60	HPV 90	HPV 150	article-no.	
1	1	filter element	01E.60…	01E.90…	01E.150…		
2	1	O-ring	22 x 3,5			304341 (NBR)	304392 (FPM)
3	1	O-ring	54 x 3			304657 (NBR)	304720 (FPM)
4	1	support ring	61 x 2,6 x 1			304660	
5	1	screw plug	½ BSPP			304678	
6	1	clogging indicator visual	AOR or AOC			see sheet-no. 1606	
7	1	clogging indicator visual-electric	AE			see sheet-no. 1615	
8	1	clogging sensor electronic	VS5			see sheet-no. 1619	
9	1	O-ring	15 x 1,5			315357 (NBR)	315427 (FPM)
10	1	O-ring	22 x 2			304708 (NBR)	304721 (FPM)
11	1	O-ring	14 x 2			304342 (NBR)	304722 (FPM)
12	1	screw plug	20913-4			309817	

item 12 execution only without clogging indicator or clogging sensor

Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

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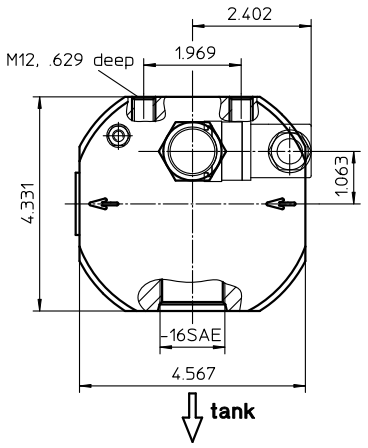
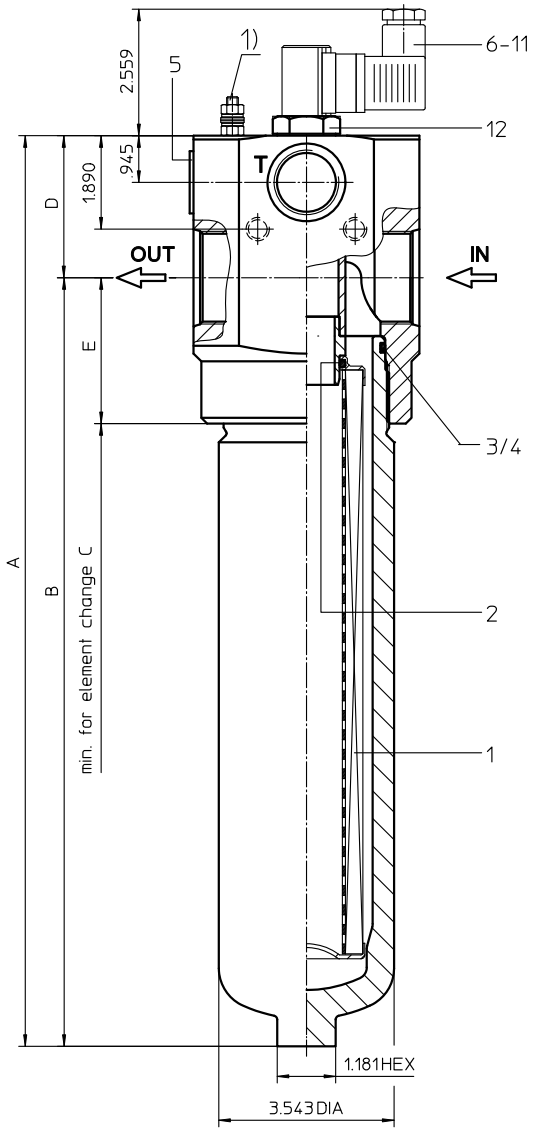
Series HPV 170-450
6000 PSI



Dimensions:

type	HPV 170		
connection	-16SAE	-20SAE	-24SAE
A	13.26	13.26	13.46
B	10.35	10.35	10.43
C	13.77	13.77	13.77
D	2.91	2.91	3.03
E	2.87	2.87	2.95
weight	30 lbs.	32 lbs.	33 lbs.
volume tank	0.18 Gal.		
type	HPV 240		
connection	-16SAE	-20SAE	-24SAE
A	15.23	15.23	15.43
B	12.32	12.32	12.40
C	15.74	15.74	15.74
D	2.91	2.91	3.03
E	2.87	2.87	2.95
weight	33 lbs.	35 lbs.	36 lbs.
volume tank	23 Gal.		
type	HPV 3610		
connection	-16SAE	-20SAE	-24SAE
A	18.38	18.38	18.58
B	15.47	15.47	15.55
C	18.89	18.89	18.89
D	2.91	2.91	3.03
E	2.87	2.87	2.95
weight	37 lbs.	39 lbs.	40 lbs.
volume tank	0.31 Gal.		
type	HPV 450		
connection	-16SAE	-20SAE	-24SAE
A	22.51	22.51	22.71
B	19.60	19.60	19.68
C	23.03	23.03	23.03
D	2.91	2.91	3.03
E	2.87	2.87	2.95
weight	42 lbs.	44 lbs.	45 lbs.
volume tank	0.42 Gal.		



1) Connect the stand grounding tab to a suitable earth ground point.

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter
Series HPV 170-450
6000 PSI

Description:

Pressure filter series HPV 170-450 have a working pressure up to 6000 PSI. Pressure peaks can be absorbed with a sufficient safety margin. The HPV filter is in-line mounted.

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside. Filter elements are available down to 5 $\mu m_{(c)}$. Finer filtration is available upon request.

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.

Eaton filter elements are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Eaton filter elements are available up to a pressure resistance of Δp 2320 PSI and a rupture strength ofΔp 3625 PSI.

The internal valve is integrated into the filter head. The differential pressure valve diverts the contaminated fluid to the tank when the element is clogged. During cold start, the differential pressure valve will divert the fluid to the tank until the system warms up.

1. Type index:

1.1. Complete filter: (ordering example)

HPV.	360.	10VG.	HR.	E.	P.	-.	UG.	7.	-.	D2.	AE
1	2	3	4	5	6	7	8	9	10	11	12

1 **series:**
HPV = pressure filter with differential pressure-valve

2 **nominal size:** 170, 240, 360, 450

3 **filter-material and filter-fineness:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass

4 **filter element collapse rating:**
30 = Δp 435 PSI
HR = Δp 2320 PSI (rupture strength Δp 3625 PSI)

5 **filter element design:**
E = single-end open

6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)

7 **filter element specification:**
- = standard
VA = stainless steel

8 **process connection:**
UG = thread connection

9 **process connection size:**
5 = -16 SAE
6 = -20 SAE
7 = -24 SAE

10 **filter housing specification:**
- = standard

11 **internal valve:**
D1 = differential pressure-valve Δp 51 PSI
D2 = differential pressure-valve Δp 102 PSI

12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electric, see sheet-no. 1615
VS5 = electronic, see sheet-no. 1619

To add an indicator to your filter, use the corresponding indicator data sheet to find the indicator details and add them to the filter assembly model code.

1.2. Filter element: (ordering example)

01E.	360.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

1 **series:**
01E. = filter element according to company standard

2 **nominal size:** 170, 240, 360, 450

3 - 7 see type index-complete filter

.

Technical data:

design temperature:	14 °F to +212 °F
operating temperature:	14 °F to +176 °F
operating medium	mineral oil, other media on request
max. operating pressure:	6000 PSI
test pressure:	8580 PSI
process connection:	thread connection
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.
Classified under ATEX Directive 2014/34/EC according to specific application (see questionnaire sheet-no. 34279-4).

Pressure drop flow curves:

Filter calculation/sizing

The pressure drop of the assembly at a given flow rate Q is the sum of the housing Δp and the element Δp and is calculated as follows:

$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$
$\Delta p_{housing}$ = *(see Δp = f (Q) - characteristics)*

$$\Delta p_{element}\,(PSI) = Q\,(GPM)\ x\ \frac{MSK}{1000}\left(\frac{PSI}{GPM}\right) x\ \nu(SUS)\ x\ \frac{\rho}{0.876}\left(\frac{kg}{dm^3}\right)$$

For ease of calculation our Filter Selection tool is available online at www.eatonpowersource.com/calculators/filtration/

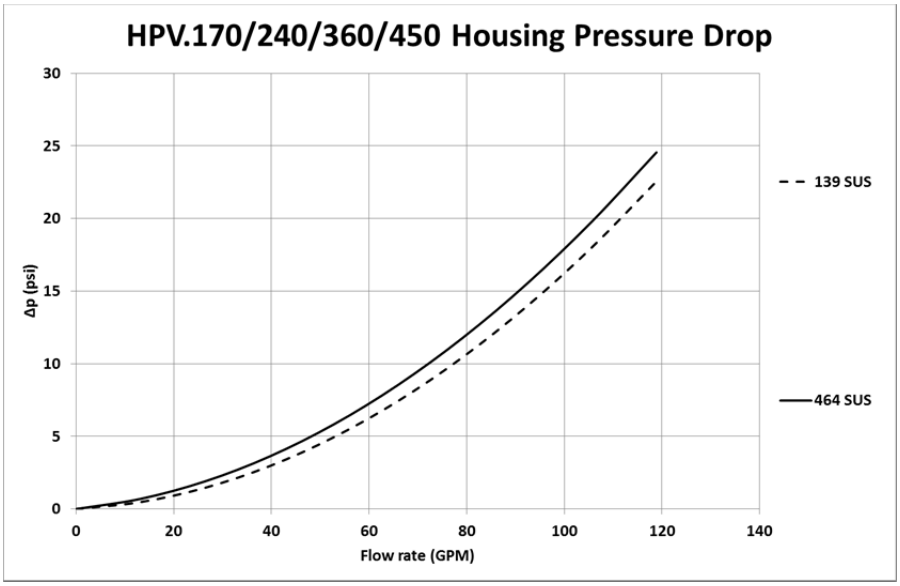
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in PSI/GPM apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

HPV	VG					G		
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G
170	2.714	1.884	1.206	1.036	0.708	0.0839	0.0783	0.0537
240	2.092	1.452	0.930	0.799	0.546	0.0651	0.0607	0.0416
360	1.530	1.062	0.680	0.584	0.399	0.0475	0.0444	0.0304
450	1.126	0.782	0.500	0.430	0.294	0.0349	0.0326	0.0223

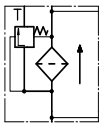
Δp = f(Q) – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm³. The pressure drop changes proportionally to the density.

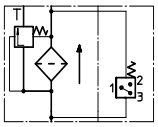


Symbols:

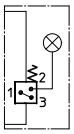
without indicator



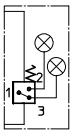
with electric indicator
AE 30 and AE 40



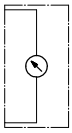
with visual-electric indicator
AE 50 and AE 62



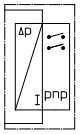
with visual-electric indicator
AE 70 and AE 80



with visual indicator
AOR/AOC



with electronic clogging sensor
VS5



Spare parts:

item	qty.	designation	dimension				article-no.	
			HPV 170	HPV 240	HPV 360	HPV 450		
1	1	filter element	01E.170…	01E.240…	01E.360…	01E.450…		
2	1	O-ring	34 x 3,5				304338 (NBR)	304730 (FPM)
3	1	O-ring	75 x 3				302215 (NBR)	304729(FPM)
4	1	support ring	81 x 2,6 x 1				304581	
5	1	screw plug	¾ BSPP				308529	
6	1	clogging indicator visual	AOR or AOC				see sheet-no. 1606	
7	1	clogging indicator visual-electric	AE				see sheet-no. 1615	
8	1	clogging sensor electronic	VS5				see sheet-no. 1619	
9	1	O-ring	15 x 1,5				315357 (NBR)	315427 (FPM)
10	1	O-ring	22 x 2				304708 (NBR)	304721 (FPM)
11	1	O-ring	14 x 2				304342 (NBR)	304722 (FPM)
12	1	screw plug	20913-4				309817	

item 12 execution only without clogging indicator or clogging sensor

Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

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