

# PFH

## High Pressure In-Line Filter Assemblies

Hy-Pro's PFH14, PFH55, and PFH167 pressure filters are designed to protect sensitive components in hydraulic circuits. Install the series upstream of specific components or directly after the pressure pump in smaller systems to minimize risk of failure and costly system downtime.

Ideal for use as a power unit pump discharge filter or a pilot filter, and to protect components that are sensitive to particulate contamination and require clean pressurized fluid for reliable operation, such as servo valves.

**Max Operating Pressure: 6090 psi (420 bar)**

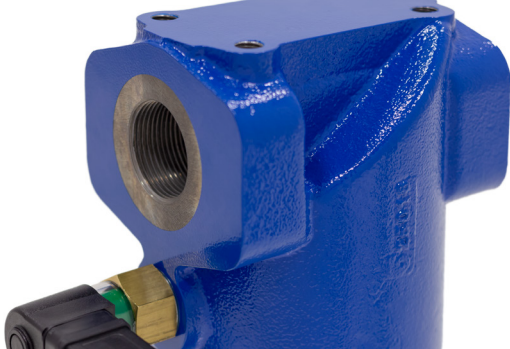


[hyprofiltration.com/](http://hyprofiltration.com/)



## Dynamic Filter Efficiency

Hydraulic applications see dynamic flow changes on a regular basis. Dynamic Filter Efficiency testing takes the ISO16889 Multi-Pass testing even further with variable flow shifts to ensure your filter elements stand up to real world conditions and maintain the highest capture and retention rates in the industry.

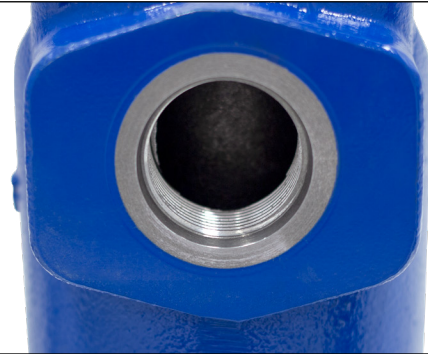


## Industrial duty.

Standard mounting holes for optional brackets, aluminum ID tags, a variety of indicator options, and standard drain ports make the PFH the ideal choice for heavy duty hydraulic filtration.

## Unique applications.

With available nickel plating, the PFH14, PFH55 and PFH167 are ideal choices for rough duty, high water contamination applications. Media options include wire mesh, water removal, and Dualglass to address even the most unique contamination. A reverse flow check valve option enables usage in reversing hydrostatic drive systems.

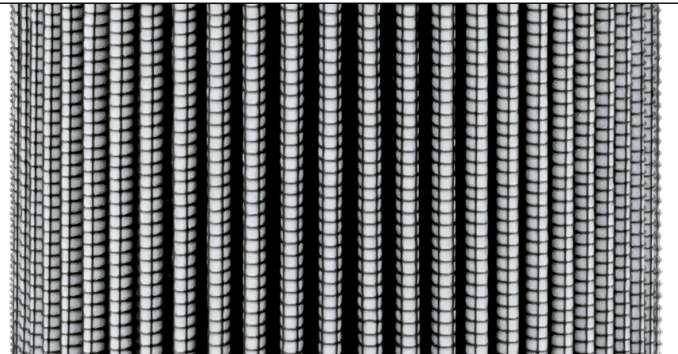


## Minimize the mess.

The PFH series comes standard with bowl drains to minimize mess during servicing. The circumferential o-ring bowl seal eliminates leaking and weeping.

## Extend the life of your element.

Unique internal flow paths provide low resistance to flow, resulting in a low housing pressure drop. Hy-Pro's advanced filter media delivers lower operating ISO Codes to eliminate internally generated contamination meaning your filter will have an incredibly long service life to protect your sensitive components better than ever.

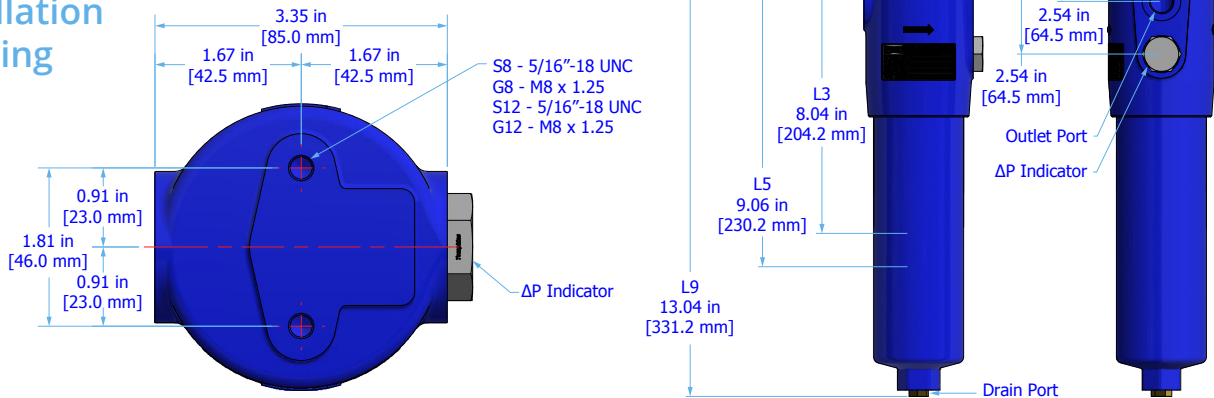


## The ideal choice for hydraulics.

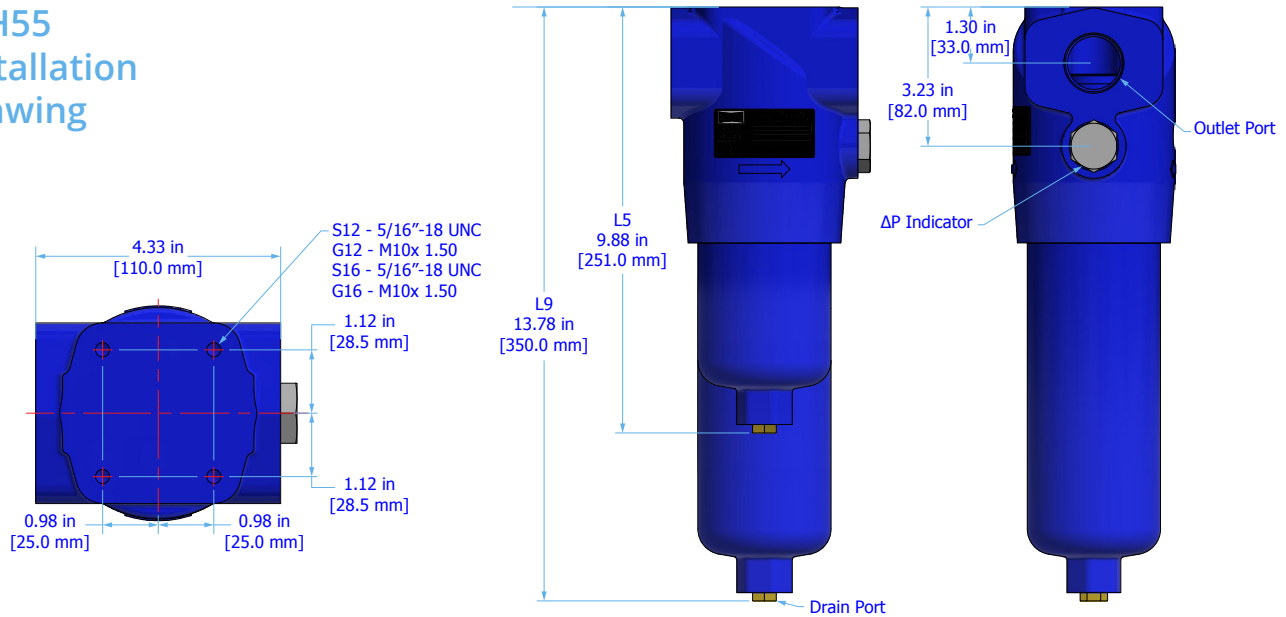
Use the PFH as the main high pressure filter(s) in a hydraulic system or upstream of sensitive components as a pilot filter to protect your valves and actuators. The PFH series is engineered to provide lower operating ISO Codes than what is required for compliance with hydraulic component manufacturers' warranties.

# PFH Installation Drawings

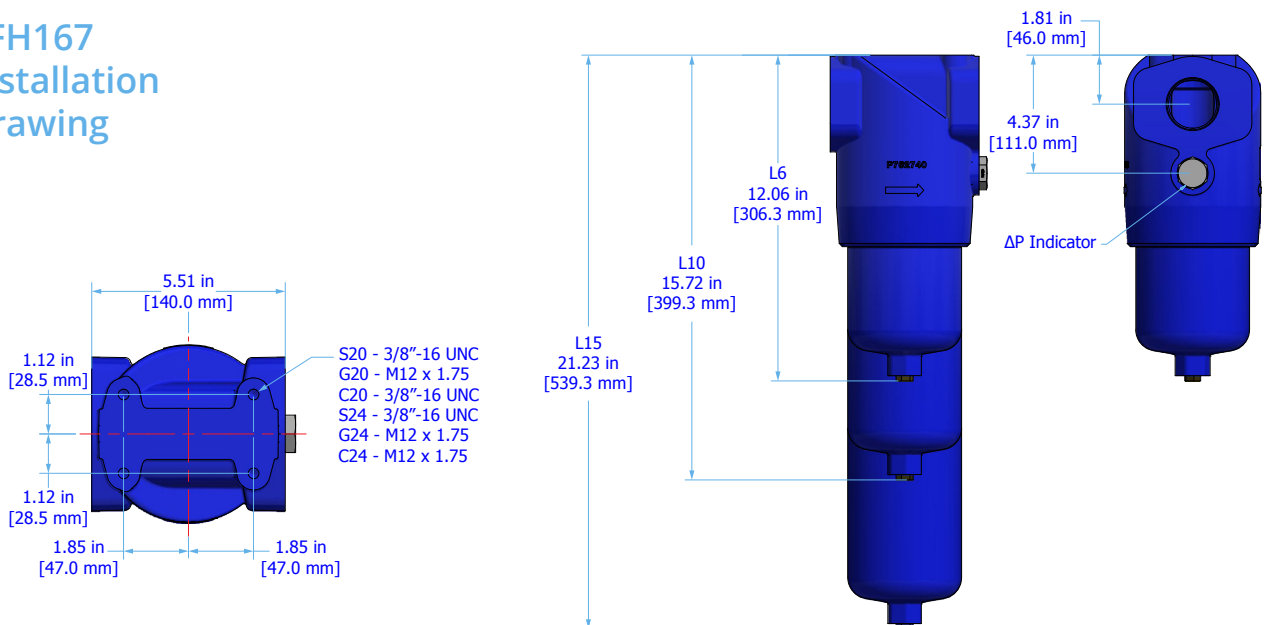
## PFH14 Installation Drawing



## PFH55 Installation Drawing



## PFH167 Installation Drawing



Bowl Torque 37 ft-lbs [50N-m]

# PFH Sizing Guide

## Filter Assembly Sizing Guidelines

Effective filter sizing requires consideration of flow rate, viscosity (operating and cold start), fluid type and degree of filtration. When properly sized, bypass during cold start can be avoided/minimized and optimum element efficiency and life achieved. The filter assembly differential pressure values provided for sizing differ for each media code, and assume 32 cSt (150 SUS) viscosity and 0.86 fluid specific gravity. Use the following steps to calculate clean element assembly pressure drop.

## Sizing recommendations to optimize performance and permit future flexibility

- To avoid or minimize bypass during cold start the actual assembly clean  $\Delta P$  calculation should be repeated for start-up conditions if cold starts are frequent.
- Actual assembly clean  $\Delta P$  should not exceed 10% of bypass  $\Delta P$  gauge/indicator set point at normal operating viscosity.
- If suitable assembly size is approaching the upper limit of the recommended flow rate at the desired degree of filtration consider increasing the assembly to the next larger size if a finer degree of filtration might be preferred in the future. This practice allows the future flexibility to enhance fluid cleanliness without compromising clean  $\Delta P$  or filter element life.
- Once a suitable filter assembly size is determined consider increasing the assembly to the next larger size to optimize filter element life and avoid bypass during cold start.
- When using water glycol or other specified synthetics, we recommend increasing the filter assembly by 1~2 sizes.

Step 1: Calculate  $\Delta P$  coefficient for actual viscosity

### Using Saybolt Universal Seconds (SUS)

$$\Delta P \text{ Coefficient} = \frac{\text{Actual Operating Viscosity}^1 \text{ (SUS)}}{150} \times \frac{\text{Actual Specific Gravity}}{0.86}$$

### Using Centistokes (cSt)

$$\Delta P \text{ Coefficient} = \frac{\text{Actual Operating Viscosity}^1 \text{ (cSt)}}{32} \times \frac{\text{Actual Specific Gravity}}{0.86}$$

Step 2: Calculate actual clean filter assembly  $\Delta P$  at both operating and cold start viscosity

$$\text{Actual Assembly Clean } \Delta P = \text{Flow Rate} \times \Delta P \text{ Coefficient (from Step 1)} \times \text{Assembly } \Delta P \text{ Factor (from sizing table)}$$

# PFH Sizing Guide

## Filter Sizing<sup>1</sup>

Filter assembly clean element  $\Delta P$  after actual viscosity correction should not exceed 10% of filter assembly bypass setting. See page 22 for filter assembly sizing guidelines & examples. For applications with extreme cold start condition contact Hy-Pro for sizing recommendations.

$\Delta P$ Factors <sup>1</sup>	Series	Length	Units	Media						**W
				1M	3M	6M	10M	16M	25M	
PFH14	L3		psid/gpm	2.709	2.286	1.772	1.589	1.555	1.497	0.270
			bard/lpm	0.049	0.042	0.032	0.029	0.028	0.027	0.005
	L5		psid/gpm	2.071	1.748	1.355	1.215	1.189	1.145	0.206
			bard/lpm	0.038	0.032	0.025	0.022	0.022	0.021	0.004
	L9		psid/gpm	1.075	0.907	0.703	0.630	0.617	0.594	0.107
			bard/lpm	0.020	0.017	0.013	0.011	0.011	0.011	0.002
PFH55	L5		psid/gpm	0.944	0.797	0.617	0.554	0.542	0.522	0.094
			bard/lpm	0.017	0.015	0.011	0.010	0.010	0.010	0.002
	L9		psid/gpm	0.580	0.497	0.423	0.383	0.374	0.368	0.066
			bard/lpm	0.011	0.009	0.008	0.007	0.007	0.007	0.001
PFH167	L6		psid/gpm	0.536	0.452	0.350	0.314	0.308	0.296	0.053
			bard/lpm	0.010	0.008	0.006	0.006	0.006	0.005	0.001
	L10		psid/gpm	0.326	0.275	0.213	0.191	0.187	0.180	0.032
			bard/lpm	0.006	0.005	0.004	0.003	0.003	0.003	0.001
	L15		psid/gpm	0.205	0.200	0.155	0.139	0.136	0.131	0.024
			bard/lpm	0.004	0.004	0.003	0.003	0.002	0.002	0.000

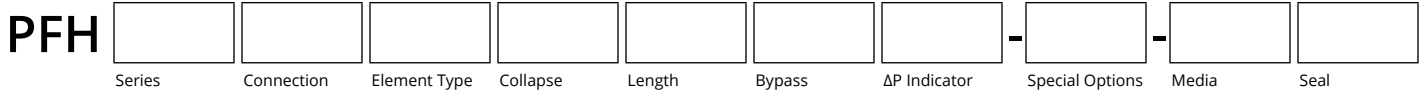
Max flow rates and  $\Delta P$  factors assume  $\mu = 150$  SUS, 32 cSt. See filter assembly sizing guideline for viscosity conversion formula on page 22 for viscosity change.

# PFH Specifications

Dimensions	See Installation Drawings on page 225 for model specific dimensions.			
Weight	<b>PFH14</b> L3: 7.9 lbs (3.6 kg) L5: 9.2 lb (4.2 kg) L9: 13.2 lb (6.0 kg)	<b>PFH55</b> L5: 14.5 lb (6.6 kg) L9: 18.2 lb (8.3 kg)	<b>PFH167</b> L6: 34.6 lb (15.7 kg) L10: 39.2 lb (17.8 kg) L15: 43.9 lb (19.9 kg)	
Operating Temperature	-20°F to 250°F (-29°C to 121°C)			
Operating Pressure	<b>PFH14</b> 6090 psi (420 bar) max	<b>PFH55</b> 6090 psi (420 bar) max	<b>PFH167</b> 6090 psi (420 bar) max	
Burst Pressure	<b>PFH14</b> > 11,600 psi (800 bar)	<b>PFH55</b> > 11,600 psi (800 bar)	<b>PFH167</b> > 11,600 psi (800 bar)	
Flow Fatigue Rating	<b>PFH14</b> 2,000,000 cycles at 0-300 bar per NFPA T3.10.5.1, R2 2000	<b>PFH55</b> 2,000,000 cycles at 0-300 bar per NFPA T3.10.5.1, R2 2000	<b>PFH167</b> 2,000,000 cycles at 0-300 bar per NFPA T3.10.5.1, R2 2000	
ΔP Indicator Trigger	73 psid (5 bard)			
Element Collapse Rating	<b>HP***N</b> 450 psid (31.0 bard) max	<b>HP***H</b> 3000 psid (206.8 bard) max		
Integral Bypass Setting	<b>PFH14</b> 90 psid (6.2 bard)	<b>PFH55</b> 90 psid (6.2 bard)	<b>PFH167</b> 90 psid (6.2 bard)	
Materials of Construction	<b>Head</b> Spheroidal "cast iron"	<b>Bowl</b> Cold extruded steel	<b>Exterior Coating</b> Powder coated	
Media Description	<b>M</b> G8 Dualglass, our latest generation of DFE rated, high performance glass media for all hydraulic & lubrication fluids. $\beta_{x_{CQ}} \geq 4000$	<b>A</b> G8 Dualglass high performance media combined with water removal scrim. $\beta_{x_{CQ}} \geq 4000$	<b>SF</b> Dynafuzz stainless steel fiber media $\beta_{x_{CQ}} \geq 4000$	<b>W</b> Stainless steel wire mesh media $\beta_{x_{CQ}} \geq 2$
Replacement Elements	To determine replacement elements, use the selected codes from the following page below:			
	<b>Series Code</b>	<b>Filter Element Part Number</b>	<b>Example</b>	
	14	HP53[Collapse Code] L [Length Code] - [Media Selection Code][Seal Code]	HP53HL5-10MB	
	55	HP152[Collapse Code] L [Length Code] - [Media Selection Code][Seal Code]	HP152NL9-16MV	
	167	HP419[Collapse Code] L [Length Code] - [Media Selection Code][Seal Code]	HP419NL15-3AB	
Fluid Compatibility	Biodegradable and mineral based fluids. For high water based or specified synthetics consult factory.			



# PFH Part Number Builder



Series	<b>14</b>	Nominal flow rate up to 15 gpm (57 lpm) <sup>1</sup>
	<b>55</b>	Nominal flow rate up to 35 gpm (132 lpm) <sup>1</sup>
	<b>167</b>	Nominal flow rate up to 95 gpm (360 lpm) <sup>1</sup>

Connection	<b>PFH14</b>		<b>PFH55</b>		<b>PFH167</b>	
	<b>G12</b>	¾" G thread (BSPP)	<b>C16</b>	1" Code 62 flange (6000 psi)	<b>C20</b>	1.25" Code 62 flange (6000 psi)
	<b>S8</b>	½" SAE	<b>G16</b>	1" G thread (BSPP)	<b>C24</b>	1.5" Code 62 flange (6000 psi)
	<b>S12</b>	¾" SAE	<b>S12</b>	¾" SAE	<b>G20</b>	1.25" G thread (BSPP)
			<b>S16</b>	1" SAE	<b>G24</b>	1.5" G thread (BSPP)
					<b>S20</b>	1.25" SAE
				<b>S24</b>	1.5" SAE	

Element Type	<b>PFH14</b>		<b>PFH55</b>		<b>PFH167</b>	
	<b>53</b>	HP53 filter element	<b>152</b>	HP152 filter element	<b>419</b>	HP419 DIN standard filter element

Collapse Rating	<b>H</b>	3000 psid (206.8 bard) – High collapse element with no housing bypass
	<b>N</b>	450 psid (31.2 bard) – Core-in element with housing bypass

Length	<b>PFH14</b>		<b>PFH55</b>		<b>PFH167</b>	
	<b>3</b>	3" (10 cm) nominal element	<b>5</b>	5" (13 cm) nominal element	<b>6</b>	6" (15 cm) nominal element
	<b>5</b>	5" (13 cm) nominal element	<b>9</b>	9" (23 cm) nominal element	<b>10</b>	10" (25 cm) nominal element
	<b>9</b>	9" (23 cm) nominal element			<b>15</b>	15" (38 cm) nominal element

Bypass	<b>6</b>	90 psid (6.2 bard) bypass
	<b>X<sup>2</sup></b>	No bypass

ΔP Indicator	<b>Indicator Options</b>		<b>Thermal Lockout</b>		<b>Surge Control</b>		<b>Reset</b>	
	<b>D</b>	Visual / Electrical (DIN 43650)	No	No	No	Auto		
	<b>DX</b>	Electrical switch only (DIN 43650)	No	No	No	Auto		
	<b>T</b>	Visual / Electrical (DIN 43650)	Yes	No	No	Manual		
	<b>V</b>	Visual	No	No	No	Auto		
	<b>X</b>	No indicator (port plugged)	-	-	-	-		

Special Options	<b>C<sup>3</sup></b>	Reverse flow check valve
	<b>M2</b>	Mounting bracket
	<b>N<sup>4</sup></b>	Nickel plated internal components for high water applications (non-bypass only)

Media Selection	<b>G8 Dualglass</b>		<b>G8 Dualglass + water removal</b>			
	<b>1M</b>	β <sub>3</sub> ( <sub>C1</sub> ) ≥ 4000	<b>3A</b>	β <sub>4</sub> ( <sub>C1</sub> ) ≥ 4000		
	<b>3M</b>	β <sub>4</sub> ( <sub>C1</sub> ) ≥ 4000	<b>6A</b>	β <sub>6</sub> ( <sub>C1</sub> ) ≥ 4000		
	<b>6M</b>	β <sub>6</sub> ( <sub>C1</sub> ) ≥ 4000	<b>10A</b>	β <sub>11</sub> ( <sub>C1</sub> ) ≥ 4000		
	<b>10M</b>	β <sub>11</sub> ( <sub>C1</sub> ) ≥ 4000	<b>25A</b>	β <sub>22</sub> ( <sub>C1</sub> ) ≥ 4000		
	<b>16M</b>	β <sub>16</sub> ( <sub>C1</sub> ) ≥ 4000				
	<b>25M</b>	β <sub>22</sub> ( <sub>C1</sub> ) ≥ 4000				

### Dynafuzz stainless fiber

<b>3SF</b>	β <sub>4</sub> ( <sub>C1</sub> ) ≥ 4000
<b>6SF</b>	β <sub>6</sub> ( <sub>C1</sub> ) ≥ 4000
<b>10SF</b>	β <sub>11</sub> ( <sub>C1</sub> ) ≥ 4000
<b>25SF</b>	β <sub>22</sub> ( <sub>C1</sub> ) ≥ 4000

### Stainless wire mesh

<b>25W</b>	25μ nominal
<b>40W</b>	40μ nominal
<b>74W</b>	74μ nominal
<b>149W</b>	149μ nominal

Seals	<b>B</b>	Nitrile (Buna)
	<b>V<sup>3</sup></b>	Fluorocarbon
	<b>E-WS<sup>5</sup></b>	EPR seals + stainless steel support mesh

<sup>1</sup>Maximum recommended flow rate based on velocity through port and internal flow path. Consult sizing guidelines or consult factory for sizing based on flow rate, viscosity, temperature, filter media selection.

<sup>2</sup>Only available when paired with "H" high collapse element.

<sup>3</sup>Must be paired with Bypass option "6". Not compatible with Special Option "N".

<sup>4</sup>When selected, automatically adds nickel plating to filter element. For replacement elements, add "-N" to end of filter element part number. Not available on PFH840 series.

<sup>5</sup>For all up to date option details and compatibilities, please reference our Contamination Solutions Price List or contact customer service.



# Filtration starts with the filter.

**Lower ISO Codes: Lower Total Cost of Ownership** Hy-Pro filter elements deliver lower operating ISO Codes so you know your fluids are always clean, meaning lower total cost of ownership and reducing element consumption, downtime, repairs, and efficiency losses.

**DFE Rated Filter Elements** DFE is Hy-Pro's proprietary testing process which extends ISO 16889 Multi Pass testing to include real world, dynamic conditions and ensures that our filter elements excel in your most demanding hydraulic and lube applications.

**Upgrade Your Filtration** Keeping fluids clean results in big reliability gains and upgrading to Hy-Pro filter elements is the first step to clean oil and improved efficiency.

**Advanced Media Options** DFE glass media maintaining efficiency to  $\beta_{3[\mu]} > 4000$ , Dualglass + water removal media to remove free and emulsified water, stainless wire mesh for coarse filtration applications, and Dynafuzz stainless fiber media for EHC and aerospace applications.

**Delivery in days, not weeks** From a massive inventory of ready-to-ship filter elements to flexible manufacturing processes, Hy-Pro is equipped for incredibly fast response time to ensure you get your filter elements and protect your uptime.

**More than just filtration** Purchasing Hy-Pro filter elements means you not only get the best filters, you also get the unrivaled support, training, knowledge and expertise of the Hy-Pro team working shoulder-to-shoulder with you to eliminate fluid contamination.



**Want to find out more? Get in touch.**

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