



PETRO INDUSTRIAL



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Athalon™ Filters

For hydraulic and lubrication oils
Beta_{x(o)} ≥ 2000 Rated Stress Resistant filter
Technology (SRT)



Filtration. Separation. Solution.SM

Keeping Fluids the Cleanest, L

The Ultimate in Filter Performance

Pall's Athalon™ hydraulic and lube oil filters combine Beta_{x(c)} ≥ 2000 rated, stress-resistant filter technology and a full range of housings to provide the greatest overall filter performance and value available in industry today.

Laid Over Pleat (LOP) Filter Media Geometry

- ▶ Maximizes filtration area
- ▶ Increases flow handling capability
- ▶ Reduces filter element size

Stress-Resistant Filter Medium

- ▶ Improves fluid cleanliness consistency
- ▶ Improves performance in 'real world' conditions

Anti-Static Construction

- ▶ Minimizes static charge generation
- ▶ Prevents damage to filter element, housing, or fluid due to static discharge

Coreless/Cageless Construction

- ▶ 60% lighter than comparable filter elements with cores
- ▶ Reduces disposal costs (filter elements are incinerable, shreddable or crushable)

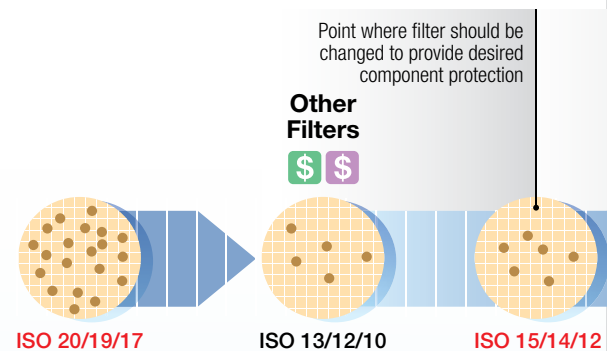
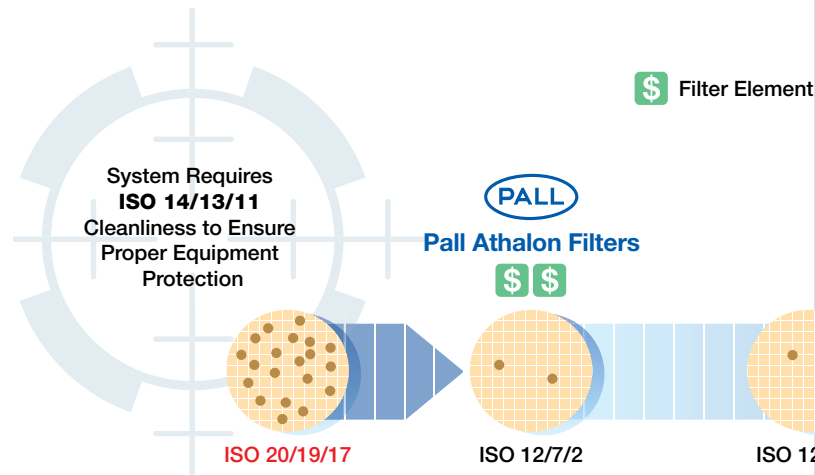
Simple to Install and Inexpensive to Maintain

- ▶ Common port and mounting interfaces and cover servicing makes maintenance quick and easy to perform with the minimum of basic tools

Athalon™





Consistent Filtration Performance

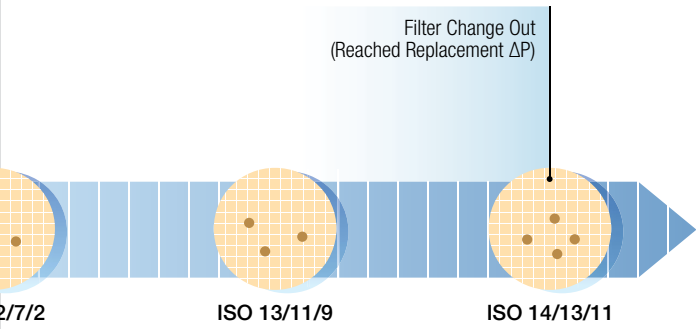


- At installation, both filters clean the fluid to an acceptable cleanliness level
- The Athalon filter will reach target cleanliness quicker due to its high $\beta_{x(c)} > 2000$ efficiency rating
- Athalon's low clean differential pressure contributes to a lower energy consumption of the system
- Over time, the fluid cleanliness level deteriorates for the 'other' filter due to its lower CST performance. The filter continues to operate, but with increased risk to equipment failure and a higher energy requirement
- The Athalon filter continues to maintain the required fluid cleanliness, maintaining system protection

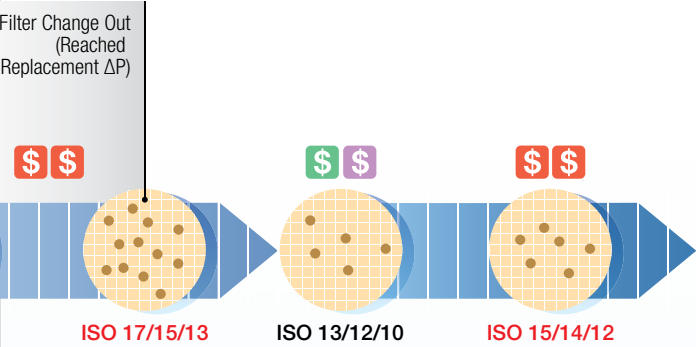
Longest, for the Greatest Value

Performance Throughout a Long Service Life

Cost  Energy Cost from Higher ΔP  Component Wear Cost



- Eliminate Contamination Induced **Downtime** ✓
- Eliminate Contamination Related **Costs** ✓



- In the system with the 'other' filter, fluid cleanliness continues to deteriorate, increasing the risk of equipment failure
 - In addition, pressure drop across the 'other' filter rises to the point where the filter needs to be changed
 - The Athalon filter continues to maintain the required fluid cleanliness due to its more consistent performance
 - With a new 'other' filter installed, clean up begins again. By having to clean up the system again, the service life of the 'other' filter will be reduced
 - The Athalon filter keeps the fluid at or better than the target fluid cleanliness for the full life of the filter element
 - The Athalon filter is eventually changed on indication at a clean fluid cleanliness level
- At no time can you assess the fluid condition with the naked eye. All bottle samples look the same.



Athalon Filter Elements

Beta_{x(c)} ≥ 2000 Rated Stress-Resistant Filters

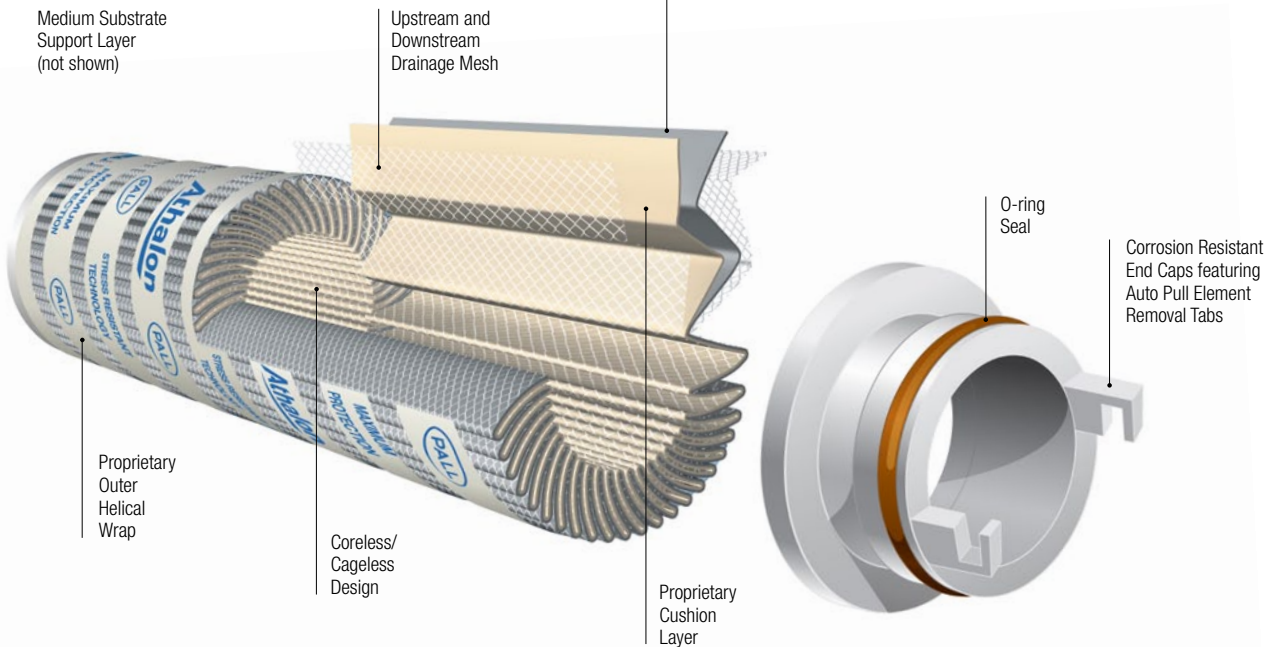
Over the years, Pall's continuous media development program has made many advances in the state-of-the-art in fluid clarification.

Athalon filters represent another industry first for lube and hydraulic filters with an unequalled Beta_{x(c)} ≥ 2000 removal efficiency rating. This enhanced performance ensures equipment protection and extends component and fluid life.

'Setting new standards in filter element design'

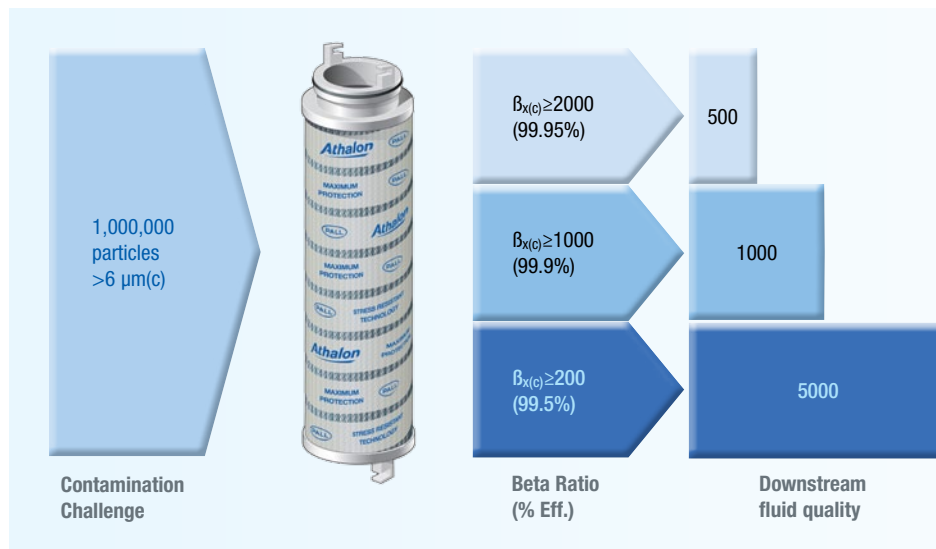
Beta_{x(c)} ≥ 2000 rated Stress Resistant media Technology in a Laid-Over Pleat configuration:

Inert, inorganic fibers securely bonded in a fixed, tapered pore structure with increased resistance to system stresses such as cyclic flow and dirt loading.



Athalon™

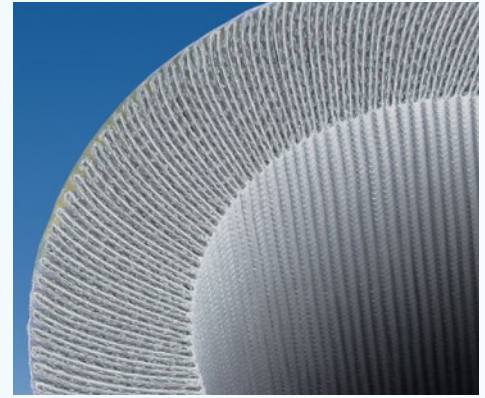
Why Beta_{x(c)} ≥ 2000?



Athalon Filters

- 10x better efficiency compared to the common performance standard filter with $\beta_{x(c)} \geq 2000$ rating
- Significantly fewer passes required to reach target cleanliness level
- Reduces equipment maintenance and unscheduled downtime costs

The Athalon Design Advantage



Laid-over Pleating

- ▶ Allows more filtration area to be packed into a given filter element envelope
- ▶ Creates uniform flow distribution through the filter element
- ▶ Protects against pleat collapse and bunching

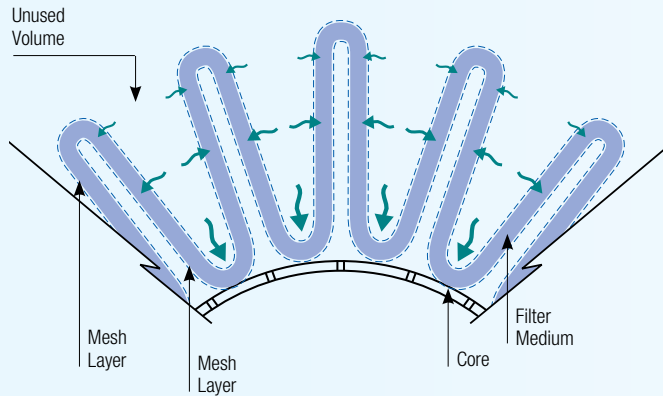


Figure 1. Conventional pleated filter element construction, showing Non-uniform flow distribution in a traditional fan-pleat filter.

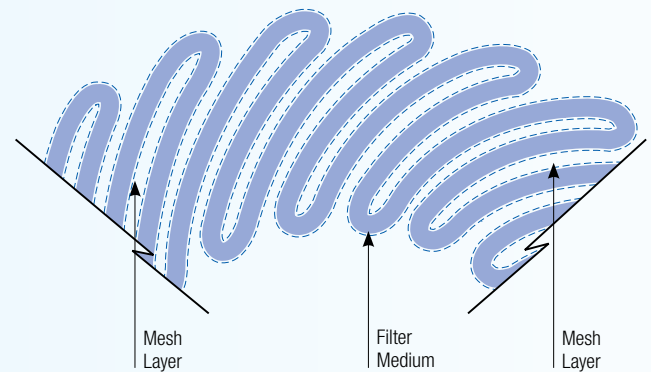


Figure 2. Ultipleat filter element construction, showing uniform flow distribution.

Beta_{x(c)} ≥ 2000 Stress-Resistant Technology

- ▶ Maximum control of damaging particles
- ▶ Consistent, superior performance over the full service life of the filter
- ▶ The ultimate protection against contaminant induced costs

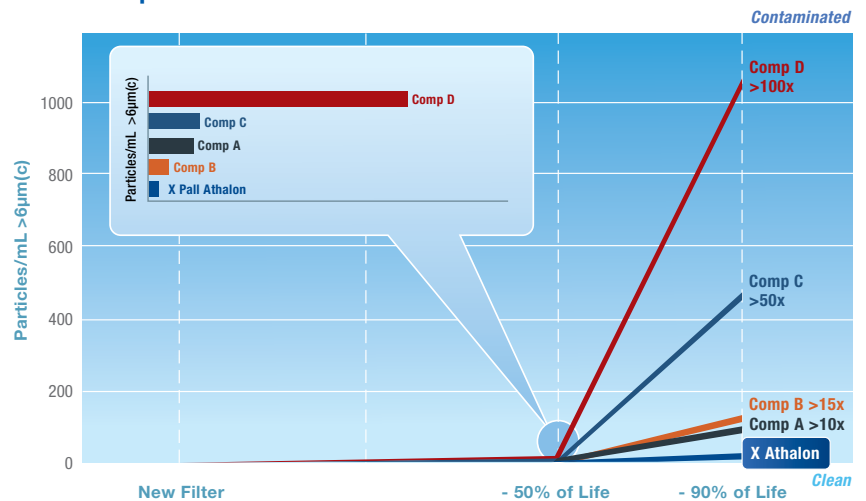
Giving customers what they pay for

A critical measure of a filter's performance is its ability to sustain fluid cleanliness throughout its service life.

This graph compares an Athalon 7µm(c) rated filter to competitors' products with equivalent ratings.

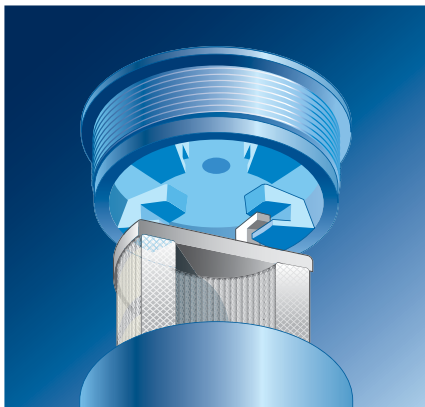
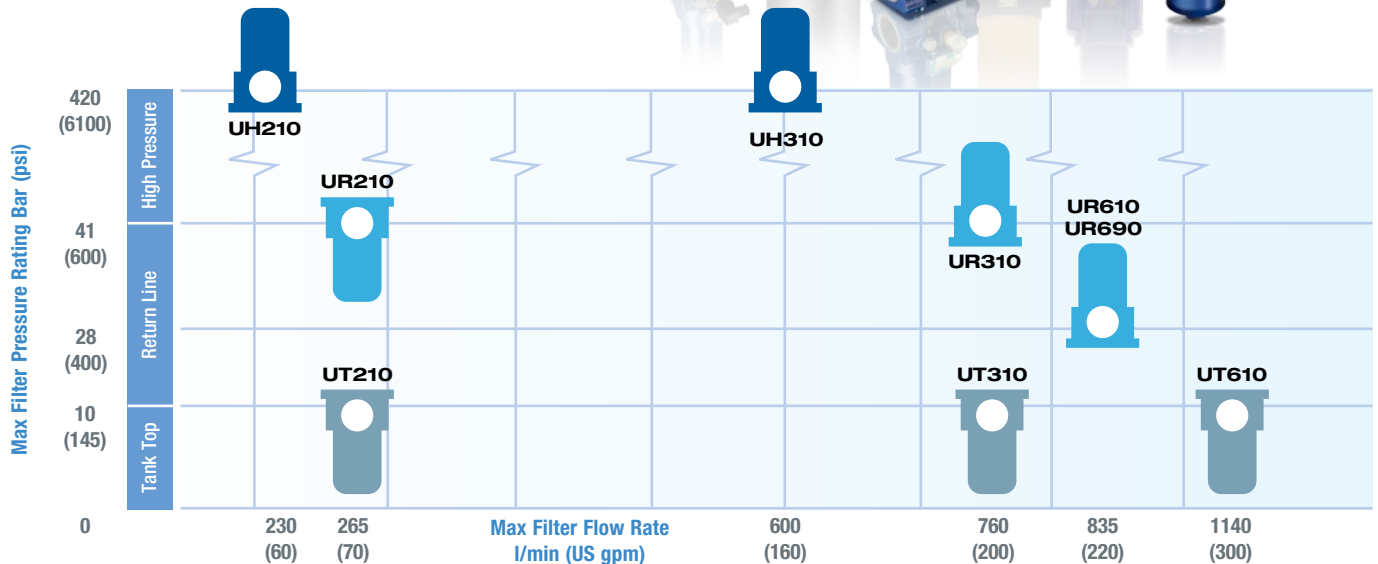
While all filters provide good fluid cleanliness early in service life, only Athalon filters produce sustained fluid cleanliness over the life of the filter.

Comparative Performance



The Athalon Series of Housings

- ▶ High pressure, return line, and in-tank filter designs
- ▶ Pipe, flange, and manifold connection options
- ▶ Simplex and duplex configurations
- ▶ Pressures to 420 bar (6100 psi)
- ▶ Flows up to 1500 l/min (400 USgpm)



Athalon Auto-Pull mechanism

- When the filter cover is unscrewed, tabs on the filter element endcaps lock into hooks in the cover
- As the cover is removed, the filter element is automatically pulled from the tube, eliminating the need to handle or forcefully pull the element from the housing



Cover Service for safer handling

- Cover service makes filter element change simple, quick and safer for operators
- The filter element is withdrawn as the cover is unscrewed.



Predictable Element servicing

- Athalon filters can be fitted with Pall's Deltadyne™ electrical or mechanical differential pressure indicators, or on tank-top mounted filters, a visual pressure gauge.
- Activation gives early warning of the need for filter change

Athalon Element Specifications

Element Collapse/Burst Rating (ISO 2941)

10 bard (150 psid)

Flow vs. Pressure Drop (ISO 3968)

See appropriate Ultipleat SRT housing literature.

Fluid Compatibility (ISO 2943)

Compatible with petroleum oils, water glycols, water-oil emulsions, and high water containing fluids. Fluorocarbon seals are standard, enabling use with industrial phosphate esters, diesters, and specified synthetics.

Flow Fatigue (ISO 3724)

Contact factory; filter element pleats are fully supported, both upstream and downstream to achieve excellent fatigue cycle life.

Fabrication Integrity (ISO 2942)

Fabrication integrity is validated and assured during the manufacturing process by numerous evaluations and inspections including Bubble Point testing.

Temperature Range

Fluorocarbon seals: -29°C (-20°F) to +120°C (+250°F)

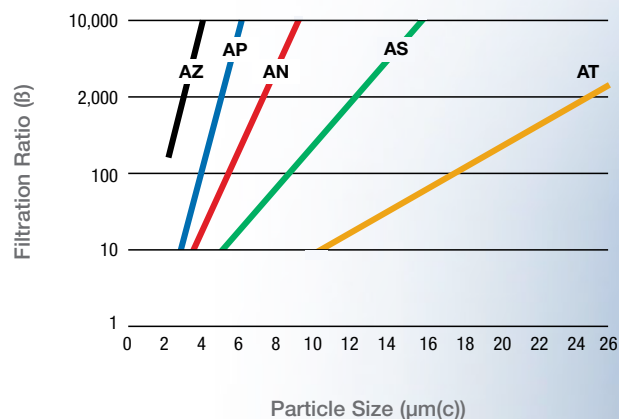
Note: Maximum 60°C (140°F) in water based fluids.

Other seal materials available on application

Quality Control

All filter elements are manufactured by Pall to exacting procedures and strict quality controls. Filter elements are checked against rigorous ongoing validation test protocols within Pall Corporation. Pall is accredited to ISO 9001 and QS 9000.

Multi-pass filter ratings (per ISO 16889)



Cleanliness Code Ratings

Code	$\beta_{x(c)} \geq 2000$ per ISO 16889	CST Rating*
AZ	3	07/04/01
AP	5	11/08/03
AN	7	13/09/04
AS	12	15/11/06
AT	25	16/14/08

* CST: Cyclic Stabilization Test to determine filter rating under stress conditions, based on SAE ARP4205

Note these ISO codes are laboratory measurements under standard conditions. Cleanliness measured in actual operation will depend on operating conditions and sampling method.





0293 Series Non-Corroding Reservoir Breather Filter

The Pall 0293 disposable air breather is used to prevent damaging airborne contamination from entering fluid system reservoirs.

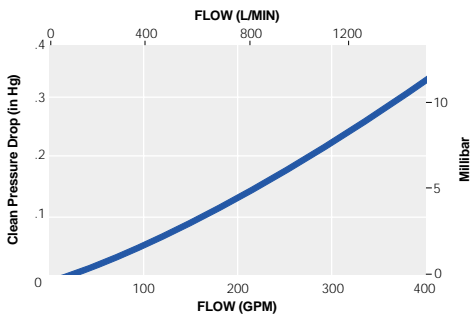
Notes and Specifications

Filtration Rating:	3 micrometers in air
Materials of Construction:	Cap and shroud—polyamide Filtration medium—oleophobic resin-bonded filter fibers
Method of Construction:	Epoxy resin potted
Vacuum Indicator Minimum Operating Pressure Setting:	1.1" Hg differential (37 bar)
Vacuum indicator is not a disposable unit. Remove prior to breather unit disposal.	
Temperature range:	-4 to + 160°F (-20°C to +70°C)
Filtration Medium Collapse Pressure:	15 psid (1 bar) minimum
Breather assembly supplied with blanking plug. Order reusable vacuum indicator separately.	

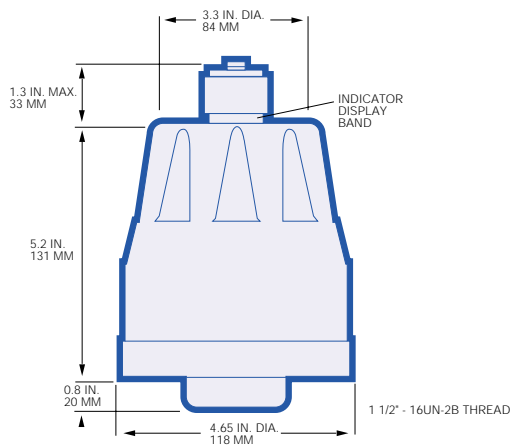


Pressure Drop Information

Figure 1. Clean Element Pressure Drop



Dimensional Drawing

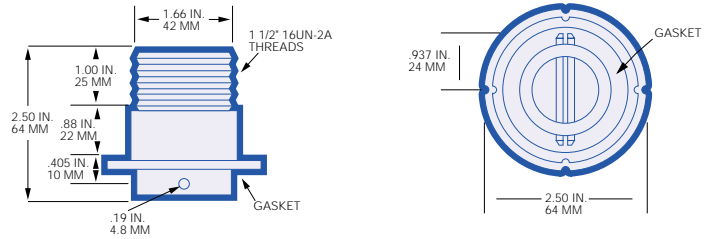




Air Breather Filter Accessories

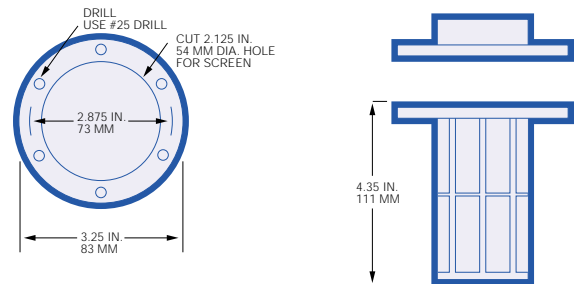
Air Breather Filter Adapter

The air breather filter adapter HD7500-RFC is compatible with standard reservoir fill port cap mounting flanges with a 2.875" diameter bolt circle. To install, remove original filter breather cap, leaving the strainer in place, and install adapter and air breather filter.



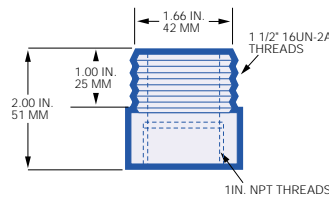
Reservoir Fill Port Assembly

The reservoir fill port assembly HD7500-RFK is used for new installations. The mounting flange and nylon mesh screen attaches to the reservoir top with six (6) self-tapping 10-30 x 1/2" screws. Air breather filter adapter HD7500-RFC and air breather filter element HC0293SEE5 are then attached.



Pipe Adapter

The pipe adapter AAS9500-BFH connects a Pall air breather filter to a 1" pipe mounted on the reservoir. Appropriate plumbing is completed by the user.



Ordering Information

Product	Part Number
Air breather filter element	HC0293SEE5
Vacuum indicator	HC0293D004
Air breather filter adapter	HD7500-RFC
Reservoir fill port assembly	HD7500-RFK
Pipe adapter	AA9500-BFH

The PCM500 Fluid Cleanliness Monitor is a portable diagnostic monitoring device that provides a measurement of system fluid cleanliness.

As the successor to the popular PCM400, the new improved PCM500 uses proven mesh blockage technology to report accurate, reliable, 3 part ISO 4406 cleanliness codes for most types of fluids, in many types of environment.

With the PCM500 you can:

- Monitor contamination levels in mineral, synthetic, or water based fluids. Results are unaffected by the presence of water, air, or dark fluids
- Get accurate, 3 part* ISO 4406 cleanliness code results in under 6 minutes and to quickly take preventative action
- Upload real-time results directly to mobile devices for analysis and action
- 'Pass off' cleanliness of new builds quickly and confidently
- Protect your systems from catastrophic failure by detecting abnormal fluid cleanliness conditions quickly

The PCM500 can be permanently installed to monitor critical applications (including component test facilities) or used as a portable device for routine condition monitoring of various fluid systems

PCM500 Monitor Features

- Proven mesh blockage technology provides accurate 3-part* ISO 4406, AS 4059 Table 1 (NAS 1638) or AS 4059 Table 2 cleanliness codes
- Self cleaning procedure between each test ensures optimum accuracy of results
- Compact, robust, fully self contained portable design (fluid sampling pump included)
- Simple to use, color touch screen interface
- Long battery life for extended operation in remote locations
- Measurement of fluid cleanliness, temperature, viscosity, and optional water content.

*3 part code measured at 4 µm, 6 µm and 14 µm (c) per ISO 16889.

New: PCM500 Series Fluid Cleanliness Monitor



PCM500 Fluid Cleanliness Monitor

Operation

The color LCD touch screen allows simple menu driven input of sample identification, monitor configuration and data output.

The HD screen displays real time data and test results which are automatically stored for subsequent trending and evaluation. An optional bluetooth connected printer allows the operator to produce a hard copy of the test results if required.

All ancillary components for high and low pressure on-line sample monitoring are contained within the unit, with sufficient internal power to complete up to 35 tests between charges. (AC power can be used if preferred).

For further protection and ease of transport, the PCM500 is supplied in a robust flight case.



Specifications

Power supply:	90-260 VAC or integral 12 VDC Lithium Ion battery
Battery life:	Typically 35 samples
Temperature Range:	10 °C to 80 °C (50 °F to 176 °F) (dependent on fluid type)
Compatibility:	Water glycols, aqueous solutions. Petroleum and synthetic oils (hydraulic lubricating, dielectric, etc.), fuels, industrial phosphate esters.
Seals:	Fluorocarbon
Operating Viscosity:	1.5 to 450 cSt (30 to 2,200 SUS)
Pressure:	0 to 315 bar (4570 psi) max
Monitoring range:	ISO 4406: <11/9/7 to 23/21/17 SAE AS 4059 Table 1 Class 1 to 12 (derived from NAS 1638) SAE AS 4059 Table 2 >4 µm 1A to 12A, >6 µm 1B to 12B >14 µm 1C to 12C
Water in Oil % RH:	± 2% at 5 to 95% RH (PCM500W)
Accuracy:	± 1/2 ISO 4406 Code
Communication Ports:	3 x USB's (Data Acquisition, PC Setup, Printer), Ethernet and RS232C (PLC Control)
Enclosure:	IP 65 (NEMA 4)
Weight:	11 kg (24 lb)
Dimensions:	400 x 260 x 250 mm (15.8 x 10.2 x 10 inches)



Real time data is displayed during test to show progress



Multiple test data can be stored and displayed for subsequent analysis and download

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Ordering information

Please select from the following part number options only.

Without Water Sensor	With Water Sensor
PCM500 M A	PCM500W M A
PCM500 M B	PCM500W M B
PCM500 M D	PCM500W M D
PCM500 U B	PCM500W U C
PCM500 U C	PCM500W U D
1 2	1 2

References 1 2 refer to tables below.

Table 1: Fitting Type

Code	Description
M	¼" BSPP Female Swivel fitting to metric test point
U	¼" NPT fitting and end cap

Table 2: Power Lead

Code	Description
A	UK Power Lead
B	European Power Lead
C	USA Power Lead
D	Australian Power Lead

Printer Kit and Accessories

PCM500-PRT

