

BALDWIN HYDRAULIC FILTERS

Performance

PURE

BALDWIN
FILTERS®

a CLARCOR company





Fluid systems must be maintained.

As the sophistication of hydraulic systems and components has increased, so has the importance of system maintenance. Perhaps the easiest and most cost effective way to lower maintenance expense and help insure trouble-free system operation is through proper filtration.

Today, hydraulic systems run at high pressures and faster cycle times than ever before, causing greater system stress and increased sensitivity to contamination. Contaminants cause the majority of failures and can affect hydraulic systems in several ways, including:

- Corrosion from acids that form due to fluid breakdown and mixing of incompatible fluids.
- Increased internal leakage, which lowers pump, motor and cylinder efficiency and decreases the ability of valves to control flow and pressure accurately.
- Sticking of parts due to sludge or silting — a collection of fine particles in critical areas.
- Seizure of parts or components caused by excessive amounts of contaminants sticking in close-tolerance parts.

With the demands on today's hydraulic systems, maintaining system cleanliness through proper filtration is essential to insure maximum efficiency and reliability.





Baldwin: The Basics of Hydraulic Filtration

Many factors determine the proper hydraulic filter to be installed:

- the type of fluid used and the system operating pressure.
- the amount of fluid flow required for system operation.
- the amount of restriction (resistance to fluid flow) caused by the filter.
- the amount of contaminant the filter needs to hold to meet service interval expectations.
- the level of filtration (fluid cleanliness level) required by the specific application.



In addition to these factors, Baldwin takes into account that hydraulic systems are using more filters than ever. Increased sophistication and the use of sensitive, close-tolerance components often require strategic location of several filters instead of just one. For example:

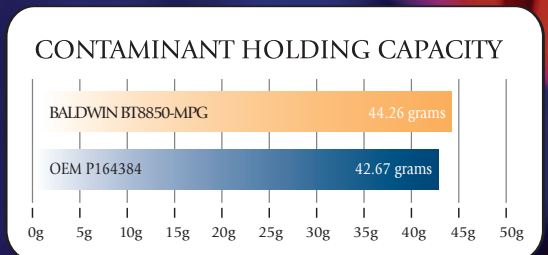
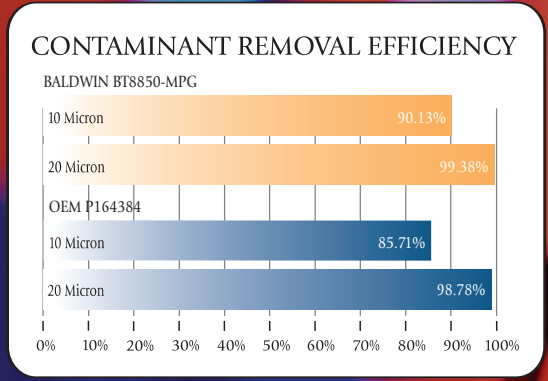
- **Suction side filters** — strainers or other filters clean the fluid before it reaches the pump.
- **Pressure side filters** — high pressure filters placed after the pump and before critical components, such as directional controls or actuators.
- **Return line filters** — filters placed after critical components to clean the fluid of any system wear contamination before it is returned to the reservoir.

Pure Performance: tested time & again

ISO 16889 and ISO 4572 are industry standard multi-pass filtration performance tests for determining the contaminant holding capacity, contaminant removal efficiency and pressure loss.

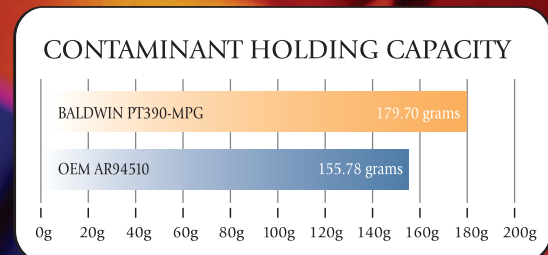
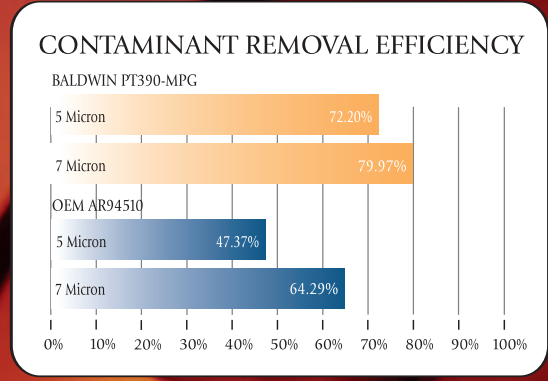
Baldwin hydraulic filters mean pure performance, system protection and hours of trouble-free hydraulic system operation.

Baldwin vs. OEM



ISO 16889 Test: Flow Rate - 20 GPM;
 Test Fluid - Mil H5606; Temperature - 100 °F;
 Contaminant - ISOMTD/5206M (Medium Test Dust);
 Terminated Pressure - 25 PSID.

Baldwin vs. OEM



ISO 16889 Test: Flow Rate - 19 GPM;
 Test Fluid - Mil H5606; Temperature - 100 °F;
 Contaminant - ISOMTD/5059M (Medium Test Dust);
 Terminated Pressure - 75 PSID.

Baldwin filters help improve system cleanliness

Improving system fluid cleanliness levels, providing better cold start performance and meeting service interval expectations are the primary objectives in the design of Baldwin hydraulic filters. To accomplish these goals, Baldwin Filters utilizes two types of filtration media:

- **Cellulose Media** — The original and most common media used in hydraulic fluid filtration is made of natural fibers. These twisted fibers are large and irregular – creating more resistance to flow or pressure drop. This causes larger contaminant particles to become concentrated on the surface of the media, increasing restriction and limiting holding capacity. Although cellulose media comes in many efficiency grades, most cellulose hydraulic and transmission filters range from 15 to 40 microns.
- **Synthetic Media** — The applications using synthetic media have grown rapidly since the late 1970s. Synthetic media is the choice in higher pressure, heavy-duty mobile hydraulic and transmission applications. These man-made glass fibers are uniform in size and shape. Their aerodynamic characteristics present the least possible resistance to flow, while removing contaminants from fluid.

Synthetic media elements may cost slightly more, but offer significant performance advantages. These advantages include:

- Lower restriction especially during cold start situations
- Improved efficiency (at smaller micron sizes) to protect sensitive controls
- Extended equipment life.



Hydraulic Filters Now Critical Components

The hydraulic filter, which was once nonexistent in hydraulic systems, has now become a critical component. In fact, few other areas of filtration have changed as rapidly as hydraulics.

Reasons for this are:

- Hydraulic systems are replacing other types of power transmission. To improve safety and efficiency, equipment designers are using hydraulics to replace belts, chains, cables and other methods of transferring power.
- Hydraulic systems are becoming more demanding. Most new hydraulic equipment is designed to be easier to operate and maintain. This often requires closer tolerances, faster cycle times, higher pressures, extended service intervals and more complex systems — all placing more demands on the filter.



Baldwin filters meet the requirements.

A hydraulic filter has many different performance requirements. To insure that Baldwin filters meet or exceed OE and customer requirements, Baldwin's engineers perform many analyses and tests — both before the filter is added to the line and after. The requirements include:

- **Capacity** — This is the amount of contaminants the filter media can hold before the media pores begin to plug, creating a predetermined increase in pressure drop through the filter.
- **Efficiency** — The Beta rating indicates how efficient a filter is at removing specific sized contaminants.
- **Flow Restriction** — This is the measurement of the pressure drop through a clean filter at a specific flow rate and viscosity.
- **Minimum Collapse** — This is a measurement of a cartridge filter or a spin-on element's ability to withstand a pressure differential between the dirty side and the clean side of the filter. The pressure differential may be the result of pressure fluctuations, a plugged filter, low fluid viscosities at low temperatures, or a combination of all of them.
- **Burst Pressure** — This measurement is a spin-on hydraulic filter's ability to withstand an elevated pressure. The burst pressure must be higher than the setting of the pressure regulating device in the hydraulic system.
- **Fatigue Life** — This is a test performed on a spin-on filter to determine the filter's ability to survive in a system with a pressure cycle alternating from low to high pressure.



*“Meeting OE and
Customer
Requirements...”*

“Test after Test”



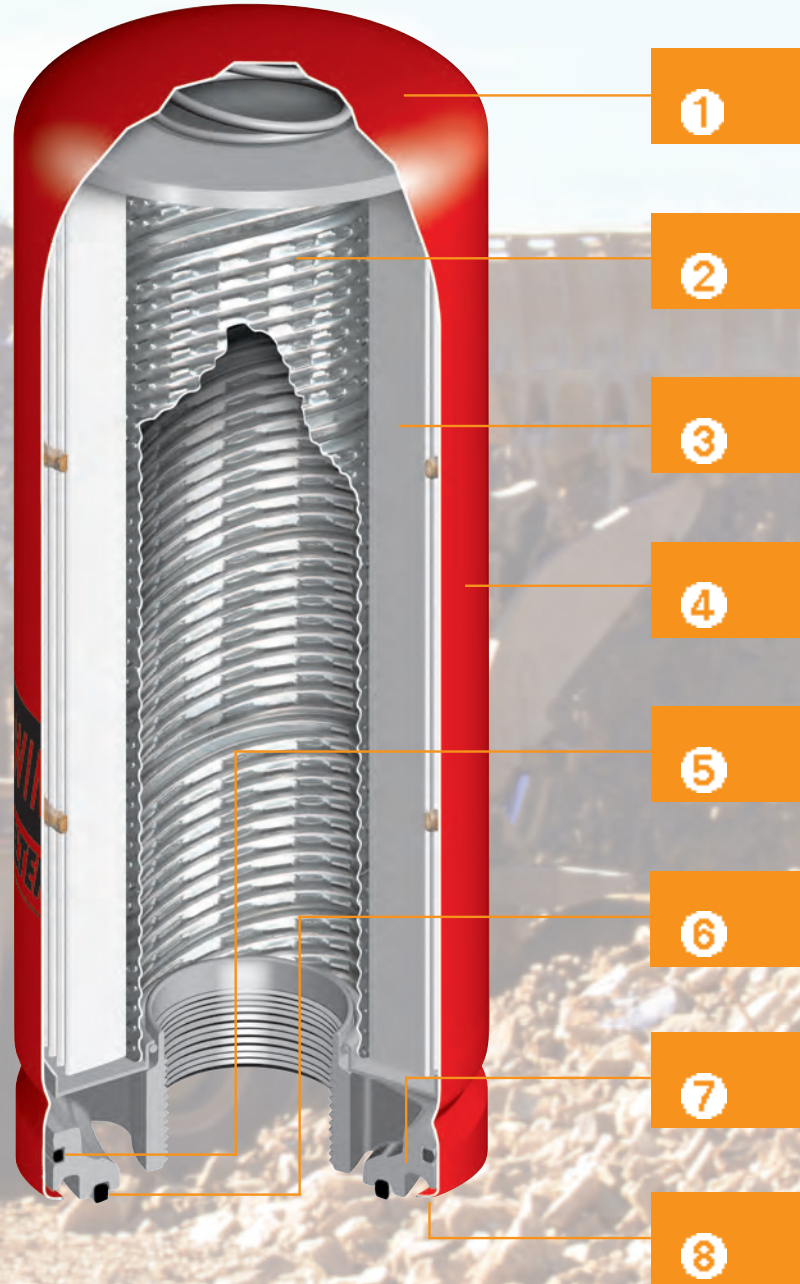
PureForce® Filtration Products from Baldwin

With the demands on today's hydraulic systems, maintaining system cleanliness through proper filtration is essential to insure maximum efficiency and reliability.

To improve system cleanliness, Baldwin Filters introduces its PureForce hydraulic filter product line, a new alternative for medium-pressure hydraulic assemblies.

Baldwin's PureForce product line brings many advantages, including the ability to consistently outperform the leading competitor. Baldwin PureForce filters, bases and self-housed indicators all work together to protect hydraulic systems.

The PureForce product line allows users to customize filtration systems to meet their needs by using a combination of bases, indicators and a selection of quality Baldwin hydraulic filters.



- 1 **Heavy-Duty, All-Metal Housing** is built to handle the stress and punishment of sophisticated, modern hydraulic systems.
- 2 **High Strength Spiral Lowered Centertube** helps prevent collapse caused by a sudden difference between internal and external pressure.
- 3 **High Efficiency Media**, either synthetic or cellulose, is designed to meet or exceed the requirements designated by the OEM.
- 4 **Seamless Canister Design** provides highest possible integrity.
- 5 **Integral Housing Seal** prevents leakage.
- 6 **Heavy-Duty O-Ring Seal** requires only 1/2 turn after gasket contact, for easier installation.
- 7 **Heavy-Duty Baseplate** is constructed of aluminum, offering the strength and durability necessary for 500 psi hydraulic systems.
- 8 **L-Lock Hem** joins the canister and baseplate to protect against high-pressure surges.

Baldwin Filters...known for Quality!



Baldwin is the industry leader in heavy-duty filters. Our multi-million dollar research and testing facility anticipates an ever-increasing demand for filters that meet or exceed original equipment specifications.



Long before the industry adopted the philosophy, Total Quality Management guided our manufacturing and distribution processes. Baldwin continues to earn preferred vendor status, such as the TS 16949 and ISO 9001 certification.



We're committed to giving our customers the best products and services in the filter marketplace. It's a commitment based on continued engineering of our production facilities, ongoing training of our employees, and refinement of already sophisticated research operations.



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