Protecting Today’s Engines
Heavy-duty protection

Clean air is critical to the performance and life of your engine. For efficient combustion, a modern diesel engine requires several thousand times as much air as it does fuel. Under normal operating conditions, to burn one gallon of fuel you have to clean 15,000 gallons (57,000 liters) of air. Add a turbocharger to that engine, and air consumption requirements increase by 20% or more.

Proper air filtration is important because a small amount of dirt can cause a tremendous amount of engine damage. The purpose of the air filter is to promote long system life by keeping damaging contaminants away from sensitive engine components.

To improve dust holding capacity and air flow, Baldwin Filters uses two proven methods to separate and stabilize the pleated media.

- **PermaPleat®** — an embossing process that forms dividers between pleats which prevents bunching and insures uniform air flow.
- **Beading** — a continuous bead of adhesive around the circumference of the filters metal wrap, either inner or outer, to lock the pleat tips in place and prevent movement.

Baldwin Filters offers more than 2,200 air filters – the majority of which feature our PermaPleat construction. Baldwin filters supply the necessary protection for all engines.

Maximum performance

Baldwin Filters designs and manufactures heavy-duty air filters to the specifications established by engine and equipment manufacturers.

ISO 5011 testing shows that Baldwin filters meet the requirements determined by the manufacturer in contaminant removal efficiency and contaminant holding capacity. The following product comparisons illustrate Baldwin’s superior performance.

Contaminant Removal Efficiency

<table>
<thead>
<tr>
<th>Filter</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baldwin RS3518</td>
<td>99.97%</td>
</tr>
<tr>
<td>P527682</td>
<td>99.95%</td>
</tr>
</tbody>
</table>

Contaminant Holding Capacity

<table>
<thead>
<tr>
<th>Filter</th>
<th>Capacity (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baldwin RS3518</td>
<td>3362g</td>
</tr>
<tr>
<td>P527682</td>
<td>3365g</td>
</tr>
</tbody>
</table>

Radial Seal Air

- **Heavy-Duty Radial Seal Gasket and End Cap**, formed from a special urethane compound, will not degrade under temperature extremes, changes in restriction or vibration.
- **Flexible Outer Edges** allow deflection for easy insertion and removal in housings which have minimal clearance.
- **PermaPleat Construction** provides even pleat spacing to prevent bunching and ensure maximum element life.
- **Spiral Glue Binding** provides added pleat stability to optimize media effectiveness.
Heavy-duty protection

Improved high-performance engines and new emission standards have had a significant impact on the development of oils and oil filters. As manufacturers continue to develop more sophisticated engines, new classifications of oils will continue to be developed.

These new oils play a vital part in protecting engines by reducing friction and wear, cooling engine parts, sealing combustion chambers, cleaning engine components and inhibiting corrosion. Lube filters also play a critical role in protecting engines by removing damaging contaminants from the oil.

Lube filters trap oil contaminants in two ways:

- Some particles adhere to the filter media as the oil flows through the filter. These particles attach themselves to the media surface without plugging the media pores.
- Other particles are trapped in the filter media by the pressure of the oil as it flows through the filter.

Baldwin Filters has been making lube filters for over seventy years. With more than 650 lube filters for most heavy-duty and automotive applications, Baldwin has the coverage and quality you demand.

Maximum performance

Baldwin lube filters are manufactured to meet or exceed the original equipment specifications established by engine manufacturers.

The following data illustrates how Baldwin filters compare to the competition. The results of ISO 4548-12 laboratory test, performed per Cummins Engineering Standard 10765, prove Baldwin Filters’ High Velocity Dual-Flow® design is superior in contaminant removal efficiency and contaminant holding capacity.

![Contaminant Removal Efficiency Chart]

![Contaminant Holding Capacity Chart]

High Velocity Dual-Flow Lube

Heavy-Duty, All-Metal Housing provides unequaled burst- and pulse-withstanding strength.

Steel Coil Spring keeps its shape, maintaining a positive load pressure on the elements.

Spiral Wound Louvered Centertube with fluted ribs allows for maximum flow and adds strength to resist pressure surges.

Patent Pending Design provides maximum contaminant holding capacity and contaminant removal efficiency, while minimizing flow restriction during operation and cold start-ups.

High Velocity Dual-Flow Nozzle uses a venturi-type cone to balance the flow between the elements, taking advantage of the positive filtering properties of each.

Heavy-Duty Steel Retainer and End Cap are welded together to prevent the post seal from dislodging.

Heavy-Duty Steel Baseplate is joined to the can with a J-lock seam, reducing the possibility of leakage due to high pressure.
Heavy-duty protection

As hydraulic systems are becoming more sophisticated, the hydraulic filter has become a critical component. With the need for closer tolerances, faster cycle times, higher pressures and extended service intervals, more demand is being placed on the hydraulic filter.

Proper filtration starts with selecting the right filter based on the original equipment manufacturer’s recommendations, which include:

- 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 be able to trap and hold in order 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. Baldwin offers more than 850 hydraulic filters to meet these needs.

Maximum performance

Baldwin filters are manufactured to meet or exceed original equipment specifications established by equipment manufacturers.

ISO 16889 tests show Baldwin Filters exceeds the standards for contaminant removal efficiency and contaminant holding capacity. The following product comparisons illustrate Baldwin’s superior performance.

![Contaminant Holding Capacity](image)

![Multi-Pass Average Efficiencies](image)

Medium Pressure Hydraulic

- Heavy-Duty All-Metal Housing is built to handle the stress and punishment of sophisticated, modern hydraulic systems.
- Spiral Seamed Centertube helps prevent collapse caused by a sudden difference between internal and external pressure.
- High Efficiency Media, either synthetic or cellulose, is designed to meet or exceed the requirements demanded by the OEM.
- Heavy-Duty Baseplate is constructed of aluminum, offering the strength and durability necessary for 500 psi/3450 kPa hydraulic systems.
- Integral Housing Seal prevents leakage.
- Heavy-Duty O-Ring Seal requires only 1/2 turn after gasket contact, for easier installation.
- L-Lock Hem joins the canister and baseplate to protect against high-pressure surges.
Heavy-duty protection

Dirty fuel is a fact of life. Even with the development of cleaner-burning fuels, contaminants are still a major concern when it comes to fuel systems.

Baldwin fuel filters protect sensitive fuel system components, such as injection pumps and injectors, from damaging contaminants, which include:

■ Water — destroys lubricative properties of your fuel, damaging fuel system components and resulting in fuel flow stoppage at cold temperatures.

■ Fungus and Bacteria — plug fuel filters, feed on hydrocarbons and spread rapidly in the presence of moisture.

■ Precipitates (non-combustible materials) — settle out of the fuel causing few problems.

■ Particulates (black, tar-like contaminants) — plug fuel filters quickly.

■ Wax — adds energy to diesel fuel; however, during cold weather, wax thickens and gels - slowing or stopping fuel flow.

Baldwin Filters offers more than 650 different fuel filters, coalescers and fuel/water separators to fit most applications.

Maximum performance

Baldwin Filters manufactures high quality fuel filters designed to perform according to the specifications established by engine and equipment manufacturers.

SAE J905 and ISO 19438 tests show Baldwin filters meet the minimum standards for contaminant removal efficiency and contaminant holding capacity. The following product comparisons illustrate Baldwin’s performance.

### Contaminant Holding Capacity

<table>
<thead>
<tr>
<th>Baldwin BF7904-D</th>
<th>7.9 g</th>
</tr>
</thead>
<tbody>
<tr>
<td>35746</td>
<td>7.3 g</td>
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</table>

### Multi-Pass Average Efficiencies

<table>
<thead>
<tr>
<th>Particle Size (microns)</th>
<th>Baldwin BF7904-D</th>
<th>35746</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1μm</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>&gt;2μm</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>&gt;3μm</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>&gt;4μm</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>&gt;5μm</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>

### Series II Fuel/Water Separators

- **Raised Keys** eliminated for universal fit on multiple fuel bases.
- **Wave Spring** (Series II only) provides installation resistance for proper fit.
- **Pliable Elastomeric Internal Seal** replaces hard plastic material, providing a positive sealing surface.
- **Centertube** helps prevent collapse caused by a sudden difference between internal and external pressure.
- **Highly Effective HydroShield™ Media** repels water and other contaminants, while assisting in the removal of water from the fuel.
- **Heavy-Duty Housing** provides unequaled burst- and pulse-withstanding strength.
- **Removable, Self-Venting Drain Valve** adds versatility for universal fit with OE bowls and sensors.
**Heavy-duty protection**

Poor cooling system maintenance causes an estimated 40% of all premature engine failures. Coolant filters protect your engine by trapping contaminants and distributing Supplemental Coolant Additives (SCAs) into your cooling system. Baldwin offers coolant filters with two SCA formulations to meet specific engine needs.

- **Balanced Treatment for Ethylene Glycol (BTE™)** is a direct replacement for DCA2 and is designed for systems operating with 30 to 60% ethylene/propylene glycol solutions.
- **Balanced Treatment Additive (BTA PLUS™)** is a direct replacement for DCA4 and can be used in systems with antifreeze levels ranging from 0 to 60% ethylene/propylene glycol solutions.

Coolant filters are available without SCAs if the use of liquid BTE or BTA PLUS additives is preferred.

If your equipment does not currently have a coolant filter, Baldwin offers a remote-mount coolant filter base (CFB5000), which can be added to your system.

Baldwin’s FleetStrip™ Coolant Test Kit (CTK5029) measures freeze point, nitrite and molybdate in conventional antifreeze to help you maintain proper SCA levels.

Use Baldwin’s full line of cooling system maintenance products — cooling system cleaner, liquid additives, coolant test kits and filters — to keep your engine running at peak performance.

**Maximum performance**

Baldwin Filters uses the latest technology in cooling system care. Patented coolant filters containing Controlled Release Supplmental Coolant Additives protect diesel engine cooling systems for one year, 150,000 miles (240,000 Kilometers) or 4,000 hours of service.

The following tests illustrate Baldwin’s superior performance.

**Controlled Release Coolant**

1. **Epoxy Coated Housing** reduces the possibility of corrosion during extended service intervals.
2. **Spring Protector** isolates dissimilar metals to prevent corrosion.
3. **Injection Molded Plastic Chamber** contains Controlled Release Coolant Pellets, which are located upstream of the filter media.
4. **Controlled Release Coated Pellets** diffuse SCAs into the system when exposed to heat and coolant flow.
5. **Synthetic Media** is designed to withstand heat and degradation from long-term exposure to coolant flow.
6. **SCA Diffusion Control Orifice** meters diffusion of SCA chemical into the coolant flow — maintaining proper system balance.
7. **Flow Control Orifice** meters flow of the coolant through the filter.
8. **Heavy-Duty Baseplate** made from stamped steel, is designed to withstand extended service intervals.
9. **Double-Rolled Tuck Lock Seam** prevents coolant leaks.
Today’s heavy-duty engines are designed for increased fuel economy and extended maintenance intervals, all while meeting stringent emissions standards.

The most cost effective way to lower maintenance expenses and help ensure trouble-free system operation is through proper filtration.

Baldwin Filters has designed a lube filter for the Detroit™ DD13®, DD15® and DD16® that delivers the protection required for these sophisticated engines.

As part of Baldwin’s commitment to providing the best filtration products, the P7505 lube filter was subjected to numerous lab tests, both standard and non-standard, and over one million miles of over-the-road testing.

Baldwin’s P7505 performed so well in lab testing that in an attempt to find the maximum collapse pressure of the filter in cold environments, the housing lid fractured, yet the filter was undamaged.

Baldwin subjected the P7505 to many “worst case” scenario tests, including cold start testing where the engine was cooled to -10°F (-23°C) with no engine block heater used. The engine continued to start and the test filters showed no damage.

Additional lab tests show Baldwin’s P7505 outperformed other lube filters designed for this engine series. Specifically, the black polyamide beads withstood flow fatigue, hot oil soak and thermal cycling tests better than competitive offerings. The Baldwin filter completed each test with all beads intact, while competitive filters failed the flow fatigue and thermal cycling tests. All P7505 components have consistently passed extremely rigorous testing - in the lab and in the field.

The lab tests, in combination with extensive field testing, show Baldwin’s P7505 provides the performance expected of Baldwin-designed products and meets the requirements of this demanding application.