



INFORMATION RELEASE MEMO

Fluids

CATERPILLAR INTRODUCES CAT[®] BIO HYDO[™] ADVANCED INCLUDING FREQUENTLY ASKED QUESTIONS

Cat Bio HYDO Advanced represents a significant performance breakthrough in biodegradable hydraulic oil technology. Cat Bio HYDO Advanced is a combination of premium additives and base stock designed to provide an environmentally friendly hydraulic fluid that has the drain interval of a premium performance hydraulic fluid.

Developed for use in any environment, Cat Bio HYDO Advanced provides superior performance across a wide temperature range and many applications, including: Construction, Forestry, Dredging, Ports, and Tunnel Boring.

This oil has been developed with an optimized formulation that meets exacting environmental and performance standards. It has been subjected to severe qualification tests in order to ensure superior protection and life for Cat hydraulic systems. Cat Bio HYDO Advanced offers enhanced value to the customer and can be recommended in any application where Cat Bio HYDO has been used in the past.

Frequently Asked Questions

What are the major benefits of using Cat Bio HYDO Advanced?

Cat Bio HYDO Advanced is a high performance, long life, environmentally friendly hydraulic oil. Cat Bio HYDO Advanced was developed, tested and approved by Caterpillar to meet the same high standards as all Genuine Cat Parts.

- **Environmentally Friendly** – Biodegradable and non toxic, allows for use in environmentally sensitive areas. Manufactured from > 90% renewable raw material; allows you to meet your sustainability goals.
- **6000-Hour Drain Intervals** – Provides extended oil-change intervals when used with Cat S•O•SSM Services oil analysis program.
- **Enhanced Wear Protection** – Provides maximum long lasting anti-wear protection for high-pressure piston, vane, and gear hydraulic pumps. Excellent

filterability, fast air release, and exceptional anti-corrosion properties provide additional protection to the hydraulic system.

- **Seal Compatibility** – Cat Bio HYDO Advanced is highly compatible with the seals used in Cat hydraulic systems. This means fewer leaks and lower maintenance costs.
- **Wide Temperature Range** – Excellent low temperature flow characteristics and high temperature viscosity allows for use in wide temperature range.
- **Eco-Labeling**– Cat Bio HYDO Advanced has been awarded a number of eco-labels, including the EU Flower. The EU Flower is the only eco-label that covers all aspects of sustainability, including product performance, toxicology, environmental protection, and the utilization of renewable resources.

Why is Cat Bio HYDO being replaced?

In order to keep up with modern environmental regulations and technological improvements to Cat hydraulic systems, the new Cat Bio HYDO Advanced hydraulic oil has been designed to exceed the BF-1 specifications required by the previous Cat hydraulic systems and meet the higher demands of the new BF-2 specifications. This new oil represents a significant performance breakthrough in bio hydraulic oil technology.

Why is it named Cat Bio HYDO Advanced?

Cat Bio HYDO Advanced provides the same combination of protection and extended drain interval capability as Cat HYDO Advanced.

How many oil changes will it take before the full benefits of Cat Bio HYDO Advanced will be realized?

The number of oil changes until full optimal performance is achieved will depend on how clean the system is and how much of the previous fluid remains in the hydraulic system after hydraulic oil change.

Is Cat Bio HYDO Advanced exclusively and only available through Cat dealers?

Yes, Cat Bio HYDO Advanced will only be available through the Cat dealer network.

What viscosity ranges are available?

Cat Bio HYDO Advanced is available in ISO grade 46 which has a wide ambient operating temperature. We are promoting Cat Bio HYDO Advanced as the preferred oil in environmentally sensitive applications.

Ambient Operating Temperature Range

Viscosity	Celsius Temperature Range	Fahrenheit Temperature Range
Cat Bio HYDO Advanced	-30°C minimum to 45°C maximum	-22°F minimum to 113°F maximum

Is there a Cat spec available?

Cat Bio HYDO Advanced meets Caterpillar spec BF-2. Caterpillar oil specifications can be downloaded from <http://www.cat.com/parts/oils/oil-specifications>.

Testing & Evaluation

What was done to demonstrate better component/machine protection?

Extensive lab and field testing were completed to validate Cat Bio HYDO Advanced. Testing demonstrated exceptional wear protection, oil stability, and extended drain intervals.

What other oils are acceptable in my machine’s hydraulic system where environmental considerations are required?

Cat Bio HYDO Advanced is the best product for all Cat machine hydraulic systems where environmental considerations are required. No other fluid in the Cat line-up offers the same combination of protection and extended drain capability for hydraulic systems coupled with biodegradability, low toxicity and sustainable raw material sources.

Can I use Cat Bio HYDO Advanced on competitor machines?

Yes, Cat Bio HYDO Advance passes Vickers 35VQ25 vane pump test and meets DIN ISO 15380 (HEES) standard. Reference “Typical Characteristics” table below for more information. Consult the equipment manufacturer to determine if Cat Bio HYDO Advanced is an acceptable hydraulic fluid for the application.

Typical Characteristics *	Cat Bio HYDO Advanced
Viscosity Grade	ISO 46
Density (ASTM D4052)	0.886
<i>Vickers Vane Pump Test (35VQ25)</i>	<i>Pass</i>
FZG (ASTM D5182)	12
4 Ball (40kg/30min/600rpm/93°C) (ASTM D4172)	<0.32 mm
Flash Point, °C (ASTM D92)	> 280
Pour Point, °C (ASTM D97)	-45
Dynamic Viscosity (Brookfield, ASTM D2983)	3040 mPa·s @ -30°C 1300 mPa·s @ -20°C
<i>Viscosity</i> mm ² /s @ 40°C (ASTM D445) mm ² /s @ 100°C (ASTM D445) Viscosity Index (ASTM D2270)	44.3 8.6 177
<i>Foam Test **</i> Seq. 1 ml. (ASTM D892) Seq. 2 ml. (ASTM D892) Seq. 3 ml. (ASTM D892)	0/0 0/0 0/0
Zinc, ppm. (ASTM D4951)	<1
Air Release @ 50°C (ASTM D3427)	<1 minute
Rust Protection (ASTM D665 A and B)	Pass
Copper Strip Corrosion 3 hr @ 150°C (ASTM D130)	1A
Oxidation stability, hours (Dry TOST, ASTM D943)	>4,000

* The values shown are typical values and should not be used as quality control parameters to either accept or reject product. Specifications are subject to change without notice.

** New oil, as received, with 0.1% water by volume added.

Is Cat Bio HYDO Advanced backward compatible, i.e. Can I use it in older equipment?

Yes. Cat Bio HYDO Advanced can be used in any Caterpillar machine, current or non-current.

How will Cat Bio HYDO Advanced help my owning and operating costs?

Cat Bio HYDO Advanced was developed, tested and approved by Caterpillar to meet the same high standards as all Genuine Cat Parts. The features and benefits of Cat Bio HYDO Advanced support lower owning and operating costs because of better component protection, fewer oil changes, improved filtration, less oil to buy and dispose of and less downtime. Also because the Cat Bio HYDO Advanced is biodegradable there will be reduced environment clean up costs if spillages occur.

Can I mix Cat Bio HYDO Advanced with other hydraulic oils?

To achieve optimum performance and environmental compliance with Cat Bio HYDO Advanced, it is necessary to minimize residual oil contamination of the hydraulic system. Although Cat Bio HYDO Advanced is chemically compatible with Cat Bio HYDO and most mineral oils, large amounts of these residual fluids may adversely affect the hydraulic system performance or environmental compliance when using Cat Bio HYDO Advanced. It is important to remember that mixing of oils of different types and from different suppliers may result in reduced levels of protection and in some cases filter blocking due to fluid incompatibility. It is recommended that the users seek advice from a Cat dealer prior to oil changes to address concerns about compatibility.

Guideline for Conversion from Mineral Hydraulic Fluid to Cat Bio HYDO Advanced

1. The machine should be operated under normal conditions for ½ hour to warm the oil to operating temperature.
2. Collect an oil sample and perform S•O•S analysis and record concentrations of Mg, Ca, Zn, and P.
3. Depressurize the hydraulic system and drain the system using standard maintenance and safety procedures.
4. Drain the system fully including all cylinders, accumulators, lines and filter housings. Check the tank and clean if required. Install new filters.
5. Fill the system with sufficient Cat Bio HYDO Advanced to ensure full circulation to all components.
6. Start the machine and operate the hydraulic system with light or no load at slow speeds without end stroking for 20 minutes. If equipped, use the bleed valve to bleed the air out of the cylinders. Monitor the differential pressure across the filter as Cat Bio HYDO Advanced may act as a solvent to remove sludge / contaminants which may be present in the system. Replace with new Cat filters as necessary.
7. Take oil sample from the machine, record concentrations of Mg, Ca, and Zn and drain the system.

8. Repeat the flushing procedure until the desired level of residual mineral oil is achieved. A drop in concentration of additive metals such as Zn, Ca, or Mg can be used to estimate the remaining mineral oil content.
9. Fill the system with Cat Bio HYDO Advanced to the recommended fluid level.
10. After the conversion is completed there could be air present in the oil caused by the new oil filling previously drained lines and cylinders. The machine should be allowed 8 hours to de-aerate before use.
11. Collect an oil sample and perform S•O•S analysis to confirm the residual oil content.
12. Obtain an oil sample after 50-100 hours of operation after conversion to Cat Bio HYDO Advanced to check the residual content of mineral oil. The level permissible may vary depending on the regional regulatory authority limits for environmental sensitive areas.

Will my Cat hydraulic oil filter interval change?

The Cat hydraulic oil filter change interval will remain at the current 500 hours except in the applications for which a longer interval has been approved. Cat filters are strongly recommended.

What are the recommended drain intervals for Cat Bio HYDO Advanced?

Standard: 3,000 hours
Extended¹: 6,000 hours

¹Provided that the oil is:

- Monitored with Cat S•O•S oil analysis program every 500 hours.
- Filter change interval is 500 hours.
- Cat hydraulic filters are strongly recommended.

What are the S•O•S Services guidelines for Cat Bio HYDO Advanced?

General S•O•S services guidelines must be used. When biodegradable hydraulic oils are used, special attention should be given to Total Acid Number readings (TAN) and water contamination levels. Below are condemnation limits for TAN and Water content for Cat Bio HYDO Advanced:

- Total Acid Number – 2.0 mgKOH/g.
- Water – 0.1%.

If excessive water contamination is detected, the water can be removed by using a filtration unit equipped with water absorbing filter cartridges. The system and the water absorbing cartridges are available from Cat dealers. Consult with your Cat dealer or Contamination Control Tool Catalog for the part numbers.

My Cat machine currently has Cat Bio HYDO in the Hydraulic system. How long should I wait until I add Cat Bio HYDO Advanced?

Wait until the next scheduled oil change unless the local regulation calls for the oil with renewable content.

Are labels available for bulk tank and machine compartments to indicate they are filled with Cat Bio HYDO Advanced?

Yes. Labels will be available in the 4Qtr of 2009.

What is the contamination level that I should treat?

The recommended cleanliness target for Cat machines operating in the field is ISO 18/15 or cleaner.

What will I need to do to set up my S-O-S lab to handle Cat Bio HYDO Advanced analysis?

No additional testing equipment is required. Be sure to have correct reference information.

Is there a need for pre-dilution of the S-O-S sample?

No.

Availability & Distribution

When will Cat Bio HYDO Advanced be officially released?

- EAME June 2009
- Americas North July 2009

When will Cat Bio HYDO Advanced be used as factory fill at all Cat manufacturing plants worldwide?

Cat Bio HYDO Advanced is currently being phased in as the preferred factory fill fluid in Cat manufacturing plants. It is expected that by the end of 2009, all facilities filling machines with Cat Bio HYDO will be filling machines with the new Cat Bio HYDO Advanced.

Can I still order Cat Bio HYDO after the release of Cat Bio HYDO Advanced?

No. Cat Bio HYDO has been discontinued. Cat Bio HYDO Advanced improves upon all of the advantages of the previous product. Cat Bio HYDO Advanced also offers enhanced value to the customer and is recommended for use in any application where Cat Bio HYDO has been used in the past.

Will ordering Cat Bio HYDO Advanced be any different?

Ordering and delivery will be the same as current Cat oil products.

What are the part numbers for Cat Bio HYDO Advanced?

Package Type	Part Number
EAME/Canada	
20 Liter Pail	341-2442
208 Liter Drum	341-2443
1,000 Liter Tote*	341-2444
Americas North (US)	
5 Gallon Pail	339-3249
55 Gallon Drum	339-3250

Note: 1,000 Liter tote not available in Canada.

How is Cat Bio HYDO Advanced different than industrial bio hydraulic oils?

Cat Bio HYDO Advanced represents a significant breakthrough in bio hydraulic fluid technology. It is formulated to provide high level of performance, be compatible with seals and materials used by Caterpillar in hydraulic systems while at the same time meeting exacting environmental standards. No other oil meets all of these criteria in a single package.

Health & Safety

Does using Cat Bio HYDO Advanced pose a health risk?

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin, or respiratory irritation. Always observe good hygiene measures. Read and understand the Material Safety Data Sheet (MSDS) before using this product. For a copy of the MSDS, visit the following website: www.catmsds.com.

Contact Information

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