

Cat[®] Bio HYDO[™] Advanced



High Performing, High Bio-based Content

Cat[®] Bio HYDO[™] Advanced is a synthetic ester based hydraulic fluid with >90% bio-based content (per ASTM D6866 test method). It has the drain interval of premium mineral-based oil. Developed for use in a wide range of applications and conditions, Cat Bio HYDO Advanced provides superior performance across a wide temperature range. Example of applications include: Construction, Forestry, Dredging, Ports, Tunnel Boring.

Benefits

Environmental Recognition

- EU Flower eco-label certified
- USDA BioPreferred[®] listed

Extended Drain Intervals

- Excellent oxidation stability
- Comparable to premium mineral-based hydraulic oils

Exceptional System Protection

- Superior wear protection
- Corrosion resistance
- Fast air release







Low Foaming Formula Protects Components and Provides Better Hydraulic Control

Good foam control and fast air release are important properties of hydraulic fluid.

Air trapped in hydraulic oil reduces system response and causes “sponginess” of controls. Trapped air also accelerates oil degradation. Excessive air and foam can lead to cavitation (collapsing air bubbles) and damage to hydraulic components.

Cat Bio HYDO Advanced releases air very quickly and special additives keep the hydraulic fluid clear of foam, even when it becomes contaminated with engine oil.

| Foaming Test Results (Contamination with 5% mineral oil) | | | |
|--|---|---|---|
| After 1 Minute | | After 5 Minutes | |
|  |  |  |  |
| Competitive Formulation | Cat Bio HYDO™ Advanced | Competitive Formulation | Cat Bio HYDO™ Advanced |

Features

Long Life – Cat Bio HYDO Advanced outperforms the previously recommended Cat Bio HYDO and competitive brands. In fact, Cat Bio HYDO Advanced performance is comparable to premium mineral-based hydraulic oils. Like Cat HYDO Advanced, Cat Bio HYDO Advanced can be taken up to a 6,000 hour drain interval with S•O•SSM Fluid Analysis.

Biodegradability – >90% bio-based content (ASTM D6866) - fluid biodegradability to OECD 301B is 80% after 28 days.

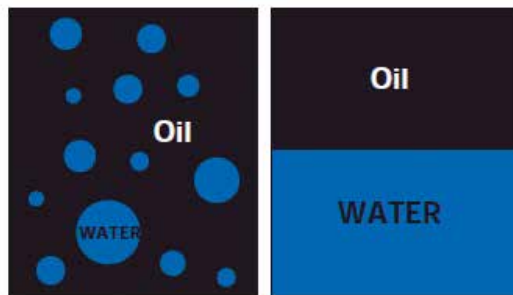
Wide Temperature Range Protection – maintains consistent wear protection throughout the entire temperature range, -22°F (-30°C) – 113°F (45°C). From cold start through to operating temperature, Cat Bio HYDO Advanced gives you the best system protection.

Improved Flow Through Filters – retains its ability to flow through filters even when water is present.

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.

Component Protection – specially developed additives form a protective layer on wear surfaces, reducing wear in hydraulic pumps and other components. Cat Bio HYDO Advanced provides excellent corrosion protection to steel and bronze components, even at high temperatures.

Emulsifiers – are additives designed to hold and disperse water contamination so that it does not harm mobile hydraulic systems. Cat Bio Hydo Advanced has emulsifier technology which is specifically designed to separate or “emulsify” water as shown below, rather than allowing the water droplets to combine together and flow through the system. If not emulsified, the free water drawn through the system can damage pumps and other components. This is due to the lack lubrication between metal contact surfaces when water is present rather than oil. If this free water freezes, it can cause even more serious damage due to the expansion of water as it changes from a liquid to a solid. Avoid oils whose specifications indicate that they “separate,” “shed” or “release” water, such as many industrial hydraulic oils that are identified as “AW” or anti-wear hydraulic fluid.



Cat HYDO

Industrial Hydraulic Oil

Typical industrial hydraulic oils separate water and oil, which can cause valve sticking or excessive wear on your hydraulic system. Cat HYDO disperses small amounts of water throughout the oil to ensure proper lubrication.

Sustainable Development

Caterpillar is working to make it easier for you to reach your sustainable development goals. Cat Bio HYDO Advanced is formulated to provide the performance and protection of a premium hydraulic fluid. The environmental considerations of this product have been recognized by a number of environmental organizations.

Eco-labeling organizations serve as a guide for consumers looking for solutions that support sustainable development. Products are evaluated and certified with an eco-label when certain criteria are met.

Cat Bio HYDO Advanced has been awarded a number of ecolabels, including the EU Ecolabel. The EU Ecolabel is the only ecolabel that covers all aspects of sustainability over the entire life cycle of the product, including product performance, toxicology, pollution mitigation, and the utilization of renewable resources.

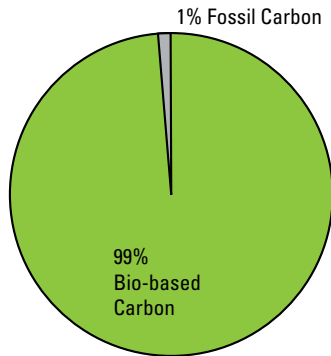


Cat Bio HYDO Advanced is listed in the US Department of Agriculture BioPreferred® program. Cat Bio HYDO Advanced qualified for listing in this program based on its bio-based content (Per ASTM D6866) its biodegradability (per: EPA 560/6-82-003, and OECD 301 B, C, D).

Positive CO₂ Balance

Cat Bio HYDO Advanced uses 99% bio-based carbon (per ASTM D6866 test method). Unlike fossil carbon, bio-based carbons are derived from renewable sources.

Some competitive biodegradable hydraulic fluids are composed of more than 90% fossil carbon, giving them a negative CO₂ balance.



Cat Bio HYDO Advanced carbon content

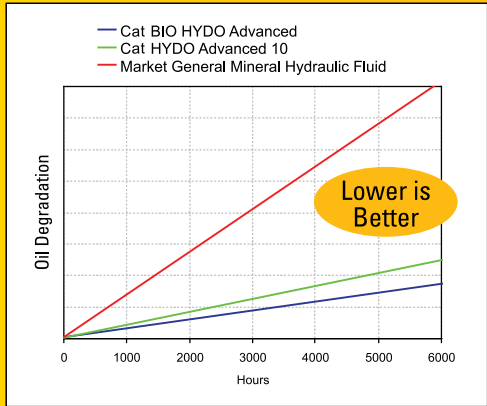
Long Drain Intervals

In the past, switching from a premium mineral-based hydraulic fluid to a synthetic ester fluid meant shorter drain intervals and increased operation cost.

Cat Bio HYDO Advanced is different. It performs like a premium mineral-based hydraulic fluid.

Even during severe applications, Cat Bio HYDO Advanced can be taken up to 6,000 hours with S•O•S Fluid Analysis.

In testing, Cat Bio HYDO Advanced demonstrated performance similar to that of Cat HYDO Advanced and outperformed a competitive bio-based hydraulic fluid by three times.



A lower oil degradation rate gives you more hours of oil life.

| English Volume (gal) | Metric Volume (L) | Part Number |
|----------------------|-------------------|-------------|
| 5 | -- | 339-3249 |
| 55 | -- | 339-3250 |
| -- | 5 | 143-3218 |
| -- | 20 | 341-2442 |
| -- | 208 | 341-2443 |
| -- | 1000 | 395-3196 |

Cat Bio HYDO Advanced Typical Characteristics¹

| Characteristics | Cat Bio HYDO Advanced (HEES) | Typical Environmentally Friendly Synthetic Ester HEES Hydraulic Oil ² | Typical Premium Industrial Hydraulic Oil ² , HVL ² or HV ² | Benefits of Cat Bio HYDO Advanced |
|---|------------------------------|--|---|---|
| Oxidation Stability Test, ASTM D493 (Longer is better) | More than 3,000 hours (Dry) | Less than 500 hours (Dry) | 2,000 hours | Long Drain Interval Results in Reduced Owning & Operating Cost |
| Long Drain Interval Capability | Yes | No | No | |
| Suitable for Use in Environmentally Sensitive Areas | Yes | Yes | No | Low Environmental Impact |
| Renewable Content, ASTM D6866 | >80% | >50% | None | |
| Viscosity at 100°C, ASTM D445 | 8.6 cSt | 8.1 – 9.0 cSt | 8.0 cSt | Excellent Wear Protection and Wide Operating Temperature Range Cat Bio HYDO Advanced is Recommended for Ambient Temperatures from -30°C to +45°C |
| Viscosity at 40°C, ASTM D445 | 44.3 cSt | 46 cSt | 46 cSt | |
| Viscosity Index, ASTM D2270 (Higher is better) ³ | 176 | 150 – 180 | 140 | |
| Viscosity at 100°C, ASTM D445 During Use After Shear ³ | 8.6 cSt | 9 cSt | 6.6 cSt | |
| Pour Point, ASTM D 97 | -45°C | -36°C | -36°C | |
| Brookfield Viscosity at -20°C ASTM D2983 | 1,227 cP | 2,500 cP | 2,500 cP | |
| Brookfield Viscosity at -30°C ASTM D2983 | 3,039 cP | – | – | |
| FZG Gear Test, DIN 51534, Fail Stage ⁴ (Higher is better ⁴) | >12 | 12 | 11 | |
| 4-Ball Wear Test, ASTM D4172 | 0.35 mm | – | – | |
| 35VQ25 Total Wear, mg (Lower is better) | 25 mg | <90 mg | <90 mg | |
| Air Release at 50°C (ASTM D3427) (Lower is Better) | 1 minute | 7 min – 13 min | 7 min – 13 min | Faster Air Release Reduces Cavitation Damage |
| Copper Strip Corrosion, ASTM D130, 3 Hours (1A is better than 1B, 1A at 150°C is better than 1A at 100°C) | 1A at 150°C | 1B at 100°C | 1B at 100°C | Best in Class Corrosion Protection |
| Corrosion Protection, ASTM D665B | Pass | Pass | Pass | |

¹The 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.

² Not recommended for use in Cat Hydraulic systems.

³ High viscosity index oils containing viscosity modifier additives will become thinner during use, this will reduce the level of protection.

⁴ In addition to high FZG rating, the oil must demonstrate excellent protection to hydraulic pumps and motors, excellent corrosion protection, and compatibility with metals and seals.

CAT DEALERS DEFINE WORLD-CLASS PRODUCT SUPPORT.

We offer you the right parts and service solutions, when and where you need them.

The Cat dealer network of highly trained experts can help you maximize your equipment investment.

BUILT FOR IT.™

