

# Cat<sup>®</sup> Bio HYDO<sup>™</sup> Advanced



## High Performing, Environmentally Friendly

Cat<sup>®</sup> Bio HYDO<sup>™</sup> Advanced is an environmentally friendly hydraulic fluid that has the drain interval of premium mineral-based oil. 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, Tunnel Boring.

### Benefits

#### Environmentally Friendly

- Non-toxic formula
- Readily biodegradable
- EU Flower eco-label certified

#### Extended Drain Intervals

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

#### Exceptional System Protection

- Superior wear protection
- Corrosion resistance
- Fast air release
- Exceeds Caterpillar<sup>®</sup> BF-2 requirements



**CATERPILLAR<sup>®</sup>**



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<br>(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•S<sup>SM</sup> Fluid Analysis.
- Biodegradable** – readily biodegradable and non-toxic, so that it can be used in environmentally sensitive areas without concern.
- 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.



## 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, while safeguarding the environment. This has 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.

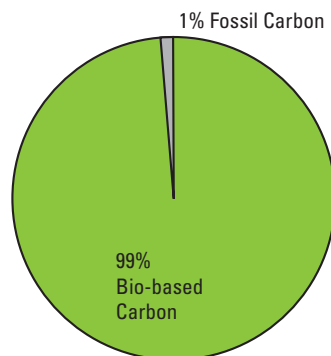
Cat Bio HYDO Advanced has been awarded a number of eco-labels, including the EU Flower. The EU Flower is the only eco-label that covers all aspects of sustainability, including product performance, toxicology, environmental protection, and the utilization of renewable resources.



## Positive CO<sub>2</sub> Balance

Cat Bio HYDO Advanced uses 99% bio-based carbon. Unlike fossil carbon, bio-based carbons are derived from renewable sources. This means that Cat Bio HYDO Advanced is carbon neutral.

Some competitive biodegradable hydraulic fluids are composed of more than 90% fossil carbon, giving them a negative CO<sub>2</sub> balance.



Cat Bio HYDO Advanced carbon content

Cat Bio HYDO Advanced is currently available in these sizes. Contact your local Cat Dealer to place an order.

| Package Size   |           |
|----------------|-----------|
| English        | Metric    |
| 5 Gallon       | 20L Pail  |
| 55 Gallon Drum | 208L Drum |

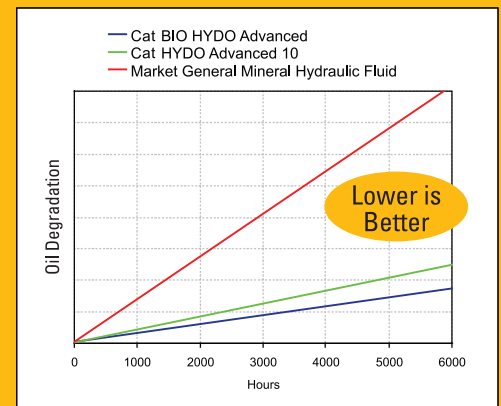
## Long Drain Intervals

In the past, switching from a mineral-based hydraulic fluid to a biodegradable fluid meant shorter drain intervals and increased operation cost. This was true even for synthetic bio-fluids.

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.**

## Cat Bio HYDO Advanced Typical Characteristics<sup>1</sup>

| Characteristics                                                                                           | Cat Bio HYDO Advanced (HEES) | Typical Environmentally Friendly Synthetic Ester HEES Hydraulic Oil <sup>2</sup> | Typical Premium Industrial Hydraulic Oil <sup>2</sup> , HVLP <sup>2</sup> or HV <sup>2</sup> | 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<br><br>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) <sup>3</sup>                                               | 176                          | 150 – 180                                                                        | 140                                                                                          |                                                                                                                                                         |
| Viscosity at 100°C, ASTM D445 During Use After Shear <sup>3</sup>                                         | 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 <sup>4</sup> (Higher is better <sup>4</sup> )                        | >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                                                                                         |                                                                                                                                                         |

<sup>1</sup> 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.

<sup>2</sup> Not recommended for use in Caterpillar Hydraulic systems.

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

<sup>4</sup> 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.

