



Biodegradable  
Recyclable

# United Bio Lube

Enabling Compliance with White House Executive Orders  
13101, 13123, 13134, 13148, 13149

Sustainable  
Renewable



Contact: Jeffrey S. Marth  
Email: jMarth@UnitedBioLube.us

www.UnitedBioLube.us

Phone: (650) 213 - 9979  
Fax: (650) 223 - 0305

A Green Chemistry Company

Enabling U.S. Oil Independence

## Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46

### Product Information

**Military Government Industry Transportation Marine Agriculture**

**United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** is a non-hazardous, biobased hydraulic fluid engineered for **Original Equipment Manufacturers (OEMs)** and used in **Military, Manufacturing, Construction, Forestry, Marine, and Agriculture** industries.

**Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** is a **100% Ultimate<sup>3</sup> Biodegradable** hydraulic fluid made from **U.S.D.A. sponsored High Oleic Base Stocks (HOBS)<sup>1</sup>** and processed with patented **Stabilized™<sup>2</sup>** chemistry for high performance and fluid longevity.

**Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** allows governments, manufacturers, and companies to:

- Gain substantial performance enhancements in Hydraulic Power Systems
- Reduce overall impact and footprint on the environment
- Lower toxic exposures to workers
- Meet compliance with Green Purchasing regulations.

Safe, reliable, affordable, and available in all quantities today, Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is setting new industry standards for:

- Performance
- Environmental Protection
- Worker Health & Safety
- Economic Sustainability



### Drop In Replacement For Petroleum Fluids - ISO 46

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 meets and exceeds **Military Specifications for high quality fluids, Federal Specifications A-A-50354** superseding **MIL-H-46001D**.

United Bio Lube's **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** meets and exceeds **OEM's Requirements & Specifications**, including:

- Very little wear was encountered (0 - 25mg = PASS) in accelerated biobased tests using industry standard **Pump Stand Tests** at pressures and temperatures ranging from **2000 to 3000 psi** and **150 to 210 °F**:
  - **Denison T-5D**
  - **Vickers 20VQ**
  - **Vickers 35VQ-25 (M-2950-S)**
  - **V-104C (ASTM D-2882)**
- Anti-Wear performance exceeds the **Load Stage 12** in the **FZG (DIN 51354)** requirements for **US Steel 136, DIN 51524, and GM (LS-2)**.

## Multi-Grade, Energy Conserving Hydraulic Fluids

The super high **Viscosity Index (VI=216)** of the **Stabilized™ HOBS** allows Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 to be **Energy Conserving** in pump startup mode while providing improved load protection to reduce wear during pump operation. The high Viscosity Index makes these products lighter and more **Energy Efficient** at room temperatures up to 40 °C. At high loads and operating temperatures above 60 °C, the Stabilized™ HOBS provides a heavier, more protective, full **Fluid Film** viscosity than mineral and synthetic based formulas.

Incorporating the super high viscosity index of the **Stabilized™ High Oleic Base Stocks (HOBS)** into the formula yields **Multi-Grade** synthetic base oil performance by boosting the viscosity index to synthetic levels. Multi-Grade performance allows one Bio Hydraulic Fluid to replace two or more ISO Grade products and **Reduce Inventory**.

## Multi-Purpose Hydraulic Applications

- Proven field testing shows **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** provides the highest level of quality performance in a wide variety of **Transportation** and **Stationary** type equipment operating in broad ranges of environmental conditions.
- Multi-Purpose applications include Mobile and Stationary hydraulic **Vane, Piston,** and Gear-type **Pumps**.
- Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is compounded with a **Zinc-free Ash-less additive system** that meets or exceeds requirements for **GL-3 Gear Oils** in **Reduction Units** and **Gear Sets**.
- Recommended for use in Marine Environments.

Highly inhibited against moisture, Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 prevents **Rusting** and **Corrosion** in both **Fresh** and **Sea** water applications passing both A & B sequences of the **ASTM D-665 Turbine Oil Rust Test**.

- Recommended for use in hydraulic systems where **Low Toxicity,** high **Flash Point,** and **Biodegradability** properties are required or desired.

**Note:** Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 can be tailor designed to gain efficiencies in specialized applications.

### Recommended for Heavy Duty Hydraulic Systems:

- Aggregate
- Agricultural Products
- Air Compressors
- Articulated Trucks
- Backhoe Loaders
- Compactors
- Concrete Equipment
- Cranes
- Drills
- Dump Trucks
- Engines/Power Systems
- Excavators
- Forest Products
- Forklifts
- Integrated Toolcarriers
- Lifts
- Mining Equipment
- Motor Graders
- Off-highway Trucks/Tractors
- On-highway Trucks
- Paving Equipment
- Pipelayers
- Scrapers
- Skid Steer Loaders/ASV
- Shoring Equipment
- Sprayer
- Telehandlers
- Track Type Loaders / Crawlers
- Track Type Tractors / Dozers
- Trenching
- Underground Equipment
- Utility Vehicles
- Waste Incinerators
- Water Equipment
- Welders
- Wheel Dozers
- Wheel Loaders
- Work Tools

# Advanced Equipment Protection

Engineered for today's advanced processing machines and equipment, Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is designed to deliver a measurable Return On Investment by:

1. **Reducing machine Wear and Failure by:**

- Reducing Friction & Fatigue
- Reducing Pitting & Micro-pitting
- Reducing Scoring, Scratching, Welding
- Reducing Corrosion & Rust
- Improving Heat Transfer
- Inhibiting Foam
- Inhibiting Gum, Sludge, Varnish
- Removing foreign or wear particles from critical contact areas

2. **Reducing machine Maintenance cycles**

3. **Reducing overall system Down-time**

Industrial machinery and equipment operating under high stress will benefit from improved **Fluid Film Strength, Oxidation Stability, Shear Stability, Heat Stability, Hydrolytic Stability, Anti-Foam, Anti-Corrosion, Anti-Rust,** and **Anti-Wear Extreme Pressure** properties. These properties minimize the rates of wear on hydraulic system Components, Seals, and Fluid in processing equipment and machines.

Collectively, these system wide performance improvements can lead to a positive **Return On Investment** in capital equipment as measured by:

- Longevity of Components and Parts
- Improved Machine Operability
- Extended Machine Service Life
- Improvements in Plant Safety
- Improvements in Productivity
- Consolidation of Fluid Inventories

## Tribological Qualities, Properties, and Features

### Proven Leader In Fluid Stability

Stability is what defines a [premium quality hydraulic fluid](#). Stability is the most notable **quality** of United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 made from **Stabilized™<sup>2</sup> HOBS<sup>1</sup>** and **Bio Corrosion Inhibitor (BCI™)** chemistries.

The overall stability of United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is a function of four main qualities: **Oxidation Stability, Mechanical Shear Stability, Hydrolytic Stability,** and **Combustion Stability.**

Made from **Stabilized™<sup>2</sup> HOBS<sup>1</sup>**, Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 shows performance improvements over petroleum in nearly all physical properties:

### Superior Lubricity

**United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** is formulated to outperform petroleum based products. The natural **Fluid Film** of this high viscosity fluid has proven in laboratory and field tests to outperform petroleum fluids in terms of **Lubricity.**

Greater lubricity leads to:

- Less Wear
- Less Energy Consumption
- Lower Operating Temperatures

## Oxidation Stability

Oxidation Stability is the most important quality affecting **Operation** and **Service Life** of **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46**. The properties of any type of hydraulic fluid can be expected to change with time. Factors most influencing change include:

- **Mechanical Stress** and **Cavitation**, which can break down and reduced fluid viscosity.
- **Oxidation** and **Hydrolysis** which cause:
  - Chemical Changes
  - Formation of Volatile Components
  - Insoluble Materials
  - Corrosive Products

Patented **Stabilized™<sup>2</sup> High Oleic Base Stocks (HOBS)**<sup>1</sup> technology keeps Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 from breaking down and forming Acidic Residues harmful to rubber seals, gaskets, and other elastomers.

Bench tests measuring **Oxidation Stability** indicate United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is superior in comparison with the leading petroleum based Synthetic brands, non-stabilized Commercial Vegetable Oils (i.e. Rapeseed, Canola, Soy), and Mineral Oils in terms of the longest **RBOT** time of 260 minutes and the lowest **Acid Number < 0.4** in the industry.

Enhanced chemical stability prevents the formation of varnish deposits and thickening of gums and sludge.

### Superior ASTM D-2272, Rotary Bomb Oxidation Test (RBOT)

Superior Oxidation Stability is measured by **ASTM D-2283** and **ASTM D-2272 RBOT** testing methods, yielding a **RBOT** time of **260!**

RBOT testing validates patented Stabilized™ High Oleic Base Stocks (HOBS) technology naturally prevents Oxidation from occurring in Bio Hydraulic Fluid formulas. Stabilized™ technology provides Bio Hydraulic Fluid formulas with an extremely high resistance to chemical breakdown, or Thermal Degradation.

### Neutralization Number

**ASTM D-974, "Standard Test Method for Acid and Base Number by Color-Indicator Titration"** is another method used to measure Oxidation Stability. A **Neutralization Number** measuring less than **0.4** for United Bio Lube's **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** is one of the lowest in the industry!

## Super High Viscosity Index

**Natural Fluid Film Strength** prevents viscosity breakdown under high-shear conditions.

The super high shear stable **Viscosity Index = 216** of Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 made from Stabilized™ High Oleic Base Stocks (HOBS) naturally provides very high **Fluid Film** strength yielding superior **Lubricity, Load Carrying Capacity**, and **Mechanical Shear** characteristics for optimum protection of all critical gears, bearings, and components.

The shear stable **Viscosity Index** allows pumps to be safely started at low ambient temperatures where the flow properties of conventional straight grade petroleum based hydraulic fluids often cause problems. The high Viscosity Index of **Stabilized™ HOBS** improves operating reliability over a wide range of pump output pressures.

The high Viscosity Index (i.e. VI = 216) reduces friction between moving parts resulting in less heat generated. **Less Heat** means **Less Energy Consumption** and **Lower Risk of Leaks**.

Conversely, at higher operating temperatures, the high Viscosity Index maintains the proper viscosity required to minimize internal pump Leakage and Wear.

## Extreme Temperature Protection

**United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** withstands high and low temperature variations and swings.

### Cold Fluid Temperature Reliability

A very low **Pour Point = -39 °C, -38.2 °F** and improved low temperature fluidity both contribute to improved **Energy Efficiency**.

Patented **Stabilized™** technology incorporates advanced **Cold Flow** properties to maintain fluidity for improved cold temperature **Starting** and **Pumpability**.



### High Fluid Temperature Reliability

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is engineered for long term, High Temperature operation. The higher **Flash Point = 243 °C, 469 °F**, superior Viscosity Index, and greater Oxidation Stability allow this fluid to function in very high temperatures without breaking down and reducing viscosity.

Note: Petroleum-based hydraulic fluid temperatures above 180 °F will damage most seal compounds and accelerate degradation of fluid. When temperatures are too high, the fluid's viscosity drops below the required value and the hydraulic system's components begin to wear due to inadequate lubrication as a result of excessive thinning of the lubricating Fluid Film.

Patented **Stabilized™<sup>2</sup>** chemistry maintains Shear Stability, Oxidation Stability, and Fluid Film thickness at extremely high temperatures and Fluidity and cold flow Pumpability at severely low temperatures.

## Anti-Wear (AW) - Extreme Pressure (EP) Protection

The purpose of **Anti-Wear** additives is to maintain lubrication during conditions of **Boundary Lubrication**.

A **Zinc-free additive package** provides Anti-Wear (AW) - Extreme Pressure (EP) performance protects critical gears, bearings, and components from Wear and Fatigue. System components remain protected from wear and fatigue while operating under heavy loads in rugged service.

### Very High Load Carrying Capacity

**Anti-Wear (AW)** and very high **Load Carrying Capacity** characteristics combine to reduce Pitting and Scoring without hurting any of the soft Yellow metals often found in hydraulic pumps.

The combination of Lubricity, Anti-Oxidation, and Load Carrying Capacity protects metal pump bearings, gears, and other components from **Scuffing, Galling, Scoring, Scratching, Pitting, and Fatigue**.

United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 meets and exceeds major **Original Equipment manufacturers (OEMs)** hydraulic pump Anti-Wear protection requirements. Anti-Wear (AW) additives have been thoroughly Tested and Qualified against the most stringent and demanding Military and Industrial hydraulic fluid standards.

Extensive 3rd Party, independent laboratory testing shows and validates **United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46**, made from **Stabilized™ HOBS**, truly **outperforms** conventional petroleum hydraulic fluids in **Accelerated 4-Ball EP Wear Tests** measuring Load Carrying Capacity.

Natural **Lubricity** and **Load Carrying Capacity** combine to keep machinery and equipment in top working condition while operating under heavy loads, extreme temperatures, and high pressures.

## Resistance Against Foaming

United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 **resists foaming** and **Air Entrainment** through the use of **Anti-Foam** agents. Anti-Foam agents are surface-active chemicals designed to prevent foam by lowering the surface tension of air bubbles. This change in surface tension causes air bubbles to either collapse or rupture.

Anti-Foaming and Air Release properties make Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 highly resistant to Foaming, Aeration and Cavitation; thereby eliminating **Sponginess** and **Fading** hydraulic system responses.

Anti-Foaming additives prevent **Reservoir Overflow**, **Overheating**, and **Contact** between adjacent metal surfaces.

In addition to preventing Foaming, Aeration and Cavitation, United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 prevents many other common problems due to Foaming:

- Increased machine operating temperatures
- Inadequate lubrication due to reduced fluid flow
- Loss of Fluid Film between mating surfaces
- Increased Oxidation of fluid
- Increased gear and bearing noise
- Erratic operation

**Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** passes the ASTM D 892, "Foaming Characteristics of Lubricating Fluids" test method with **Zero Foam**.

Note: Abnormal noise in hydraulic systems is often caused by Aeration or Cavitation.

## Bio Corrosion Inhibitors (BCI™)

Patented **Bio Corrosion Inhibitors (BCI™)** effectively inhibit both the **corrosion** of Yellow metals and **rusting** of Ferrous metals.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 with **BCI™** chemistry prevents corrosion and rust from occurring on the surface of metals in both **Fresh Water** and **Salt Water** environments.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 with **BCI™** chemistry meets and exceeds **U.S. Military** Anti-Rust and Anti-Oxidation requirements for hydraulic systems used in all types of military, industrial, and farming machinery and equipment.

Anti-Corrosion and Anti-Rust protection reduces formation of **deposits** on the surface of metal parts and components.

No other competitive lubricant company has this advanced **BCI™** technology offering.

### Anti-Rust Protection

Rust is a chemical reaction between water and ferrous metals.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 prevents rusting in both Fresh & Salt water environments. This is demonstrated by passing results in both **A & B** sequences of the **ASTM D 665, "Turbine Oil Rust Test"**.

### Anti-Corrosion Protection

Corrosion is a chemical reaction between chemicals, usually acids, and yellow metals. There are many types of industrial hydraulic systems that have parts made of Non-Ferrous, or Yellow metals, i.e. Copper, Brass or Bronze.

**BCI™** chemistry prevents acids and other corrosive agents from reacting with the metal surfaces of non-ferrous Yellow metals.

**BCI™** is not chemically reactive to Yellow metals as demonstrated by the **ASTM D 130, "Copper Strip Corrosion Test"**.

## Water Resistant

### Superior Hydrolytic Stability

Highly resistant to moisture, **United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** with **Bio Corrosion Inhibitors (BCI™)** exhibits excellent Hydrolytic Stability in the presence of water.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 has the ability to **Emulsify** water and **Suspend** and **Disperse** other contaminants, i.e. **Gum, Varnish, and Sludge**, thereby preventing the formation of **Deposits** on metal surfaces. Components remain free from harmful, deteriorating deposits.

To boost Hydrolytic Stability, Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 with **BCI™** chemistry is compounded with **Demulsifiers, Detergents, and Dispersants**. Demulsibility properties readily separate out water from the fluid. Collectively, these safe additive agents act to inhibit the formation of Rust and Corrosion while enhancing fluid **Filterability**.

Superior Hydrolytic Stability prevents damage to **Pumps, Hydraulic Valves, Actuators,** and the **Circulating System** operating in humid or wet climates.

Note: Water contamination of hydraulic fluids accelerates the aging of the fluid, reduces **Lubricity, Filterability, and Seal Life**, and leads to Corrosion and Cavitation. At high temperatures, emulsified water can be turned into steam at the contact points of highly loaded parts in the system.

## Seal Conditioning

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is formulated to provide Seal Conditioning for **Longer Seal Life** and to **Reduce Fluid Leakage** from the system.

## Combustion Stability

### Extremely Low Volatility

The extremely **Low Volatility** of **Stabilized™ HOBS** increases the **Flash Point** and **Fire Point** safety features of Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46.

Low Volatility prevents surface molecules from vaporizing into exhaust air. Noticeably, there is no **Off-Gassing** of harmful toxic vapors when working near or handling these safe, biodegradable fluids.

United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 do not contain and will not Off-Gas any harmful fumes, including Volatile Organic Compounds (VOCs), Phenols, or Chlorides.

Extremely low Volatility leads to:

- Lower Evaporation rates
- Less Make-up fluid
- No Off-Gassing of harmful vapors and fumes
- Higher Flash Point = 243 °C, 469 °F
- Higher Fire Point = 268 °C, 514 °F

# System Conversion and Fluid Installation

Conversion procedures are much easier with Bio Ultimax Hydraulic Fluids. No engineering design changes are necessary.

To convert a system, simply drain and recharge.

For proper biodegradability, at least 90% of the mineral oil based fluid should be removed from the system. Most of the fluid can be removed by draining the reservoir and lines.

## Flushing

Flushing is not necessary for compatibility, but if you choose to flush, only use Bio Ultimax fluids as a flushing fluid.

## Top Filling

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 may also be used as a **top fill** (with compatible fluids) until the existing fluid is converted in the maintenance schedule.

## Fluid Change Over Procedure

There are 3 basic steps to installing Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 in any hydraulic system:

1. Drain existing fluid from reservoir and total system such as Pumps, Lines and Hoses.
2. Change out filters, if necessary.
3. Refill system with Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46.

It's that simple.

## Extended Drain Intervals

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 yields extended oil drains based on oil analysis. The ability of Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 to extend drain intervals and excel in performance is subject to operating conditions and maintenance practices.

Note: It is recommended systems be drained prior to installing Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46. Small amounts of contamination (lines, residue) with existing petroleum fluids being replaced are acceptable. Excessive fluid contamination with petroleum based fluids will minimize this products Quality, Performance, and Biodegradability effectiveness.

# Compatibility with Existing Fluids and Materials

## Compatible with Seals, Elastomers, and Coatings

**United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid** is compatible with hydraulic system materials and components designed to operate on mineral oil based and most synthetic based hydraulic fluids.

In addition, Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 has been tested and have shown to be compatible with mineral oil based and most synthetic based fluids.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is compatible with the same filters, seals, hoses, and accumulator bladders.

One of the most widely used elastomers in the industry for mineral oil based hydraulic systems is **Buna-N Low Nitrile Rubber** (NBR-L). United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is fully compatible with Buna-N Low Nitrile Rubber and other commonly used Elastomers.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 can operate in Static, Mid-Dynamic, and Dynamic areas of hydraulic systems that contain the following materials:

### **ISO 1629 Description (Trade Names)**

**NBR** - Medium to High Nitrile Rubber (Buna N, > 30% Acrylonitrile)

**NBR-L** - Low Nitrile Rubber (Buna N, < 30% Acrylonitrile)

**FPM** - Fluoroelastomer (Viton)

**AU** - Polyurethane (Adiprene, Millathane)

**PTFE** - Polytetrafluoroethylene (Teflon)

**CR** - Polychloroprene (Neoprene)

## Compatible with Mineral Oil based Hydraulic Fluids

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 has been tested and have shown to be compatible with Mineral Oil based and most Synthetic based fluids.

## Compatible with Synthetic Polyalphaolefin based Hydraulic Fluids

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 has been designed to directly replace synthetic Polyalphaolefins (PAOs) and Semi-Synthetic PAO and mineral oil blends.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is fully compatible with synthetic Polyalphaolefins (PAOs) and Semi-Synthetic PAO and mineral oil blends. These are the most widely used synthetic lubricants in the world lubricant market and generally are formulated to meet the same hydraulic systems compatibility requirements as mineral oil based fluids.

## Compatible with Synthetic Ester based Hydraulic Fluids

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is highly compatible with systems designed to use Synthetic Esters.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is compatible with most synthetic esters based fluids and depending on selection of esters they may be considered biodegradable.

## Compatible with Phosphate Ester based Hydraulic Fluids

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is compatible with some, but not all Phosphate Ester fluids.

Testing is recommended before conversion. Seal compatibility should also be considered because Butyl rubber is the most compatible elastomer with phosphate esters. Butyl rubber has poor compatibility with mineral oils

## Made From Renewable Resources

**United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** is formulated from **U.S.D.A.** sponsored **High Oleic Base Stock (HOBS)**<sup>1</sup> and processed with **Stabilized™**<sup>3</sup> technology for high performance, longevity, Anti-Oxidation, Anti-Wear, Cold Flow Technology, reduced fluid thickening, and lower deposits.

**Stabilized™ HOBS** is compounded with an environmentally friendly **Zinc-free additive system** that meets **API Service Classifications GL-3** for an **Ashless** type gear lubricants.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is formulated to outperform petroleum based hydraulic fluids. The natural fluid film of this high viscosity product has proven in laboratory and field tests to outperform petroleum based hydraulic fluids in terms of natural **Lubricity**.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is setting new industry standards for performance, worker health & safety, and environmental protection.

Industrial companies can help ensure worker health safety and begin lowering their environmental impact through the use of Bio Hydraulic Fluids in all types of hydraulic applications throughout their sites and facilities.



## Safe, Non-Hazardous, and Environmentally Friendly

**Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** has an additional benefit of being non-toxic to humans. Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is recommended when maintenance of a hygienic atmosphere in manufacturers processing plants is a critical concern. Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is safe for use in all types of equipment and machinery used in manufacturing and other industries.

Safe from contaminants, grown from renewable agricultural resources, High Oleic Base Stocks are naturally ultra-high purity base fluids. †In contrast, most competitive mineral oils are manufactured by refining, a solvent-based process that retains contaminants from a crude-oil source. Refinery generated contaminants can lead to acid development and premature aging of fluid.

Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is safe for employees and safe for the environment. Bio Hydraulic Fluid - ISO 46 is formulated with non-hazardous, non-toxic additives to help prevent contamination of workers.

Listed in the **USDA's BioPreferred** program, Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is preferred over petroleum hydraulic fluids when there is incidental contact with the fluid, or when direct exposure to the environment is likely.

## Advanced Safety Features

- Compliments **Hazard Analysis and Critical Control Point (HACCP)**.
- Compliments **Good Manufacturing Practice (GMP)** protocols.
- **U.S.D.A.** certified **Ultimately Biodegradable**.
- **O.S.H.A.** certified Worker-friendly.
- Approved by **Navy Medical** as non-toxic.
- **Fire resistant** - High Flash Point.
- **Extremely Low Volatility** - No off-gassing of harmful Fumes.



# UBL's Quadruple Bottom Line

## 1. High Performance

- ✔ Meets or exceeds **Military Specifications** for high quality fluids, **Federal Specifications A-A-50354** superseding **MIL-H-46001D**
- ✔ Highest **Oxidation Stability** in the industry! **RBOT = 260**.  
Patented **Stabilized™<sup>2</sup>** chemistry prevents Oxidation from occurring.
- ✔ Super High **Viscosity Index = 216** (ASTM D-2270)  
Viscosity @ 40 C = 43.8 (ASTM D-445)  
Viscosity @ 100 C = 9.67 (ASTM D-445)
- ✔ **Extreme Pressure (EP) Anti-Wear** additives.
- ✔ Excellent **Hydrolytic Stability** (ASTM D-2619).  
**Water Resistant.** Rapidly separates from water.  
Passes ASTM D-1401 Demulsification Test. Demulsifies water for improved lubricity in humid conditions.  
**Demulsibility** properties prevent formations of emulsions (i.e. Gum, Varnish, and Sludge).
- ✔ **Bio Corrosion Inhibitors** prevent rusting and decay.  
Meets ASTM D-665 Salt Water Rust Prevention Test.  
Meets ASTM D-130 Copper Corrosion Test.  
Protects metal integrity.
- ✔ **Zero Foam** in Foam Sequence Tests (I, II, III).  
Prevents damage caused by insufficient lubricant film due to Aeration, or Air Entrapment.
- ✔ **Chemically compatible** with all types of seals and coatings.  
Non-corrosive. Will not deteriorate Yellow metals.  
No acidic residues to bind moving parts.  
No gum or varnish deposits.
- ✔ Long lasting service life.
- ✔ **High Temperature Operation.**  
**Fire resistant.** The extremely low volatility of HOBS increases this product's flash point and fire safety features.  
High Flash Points prevent smoking and ignition.  
Meets ASTM D-92 Flash Point = 243 °C, 469 °F  
Meets ASTM D-92 Fire Point = 268 °C, 514 °F
- ✔ **Low Temperature Operation.**  
Meets ASTM D-97 Pour Point = -39 °C, -38.2 °F  
Advanced **Cold Flow** Technology
- ✔ Advanced **Energy Conserving** formula.



## 2. Health & Occupational Safety

- ✔ **High Oleic Base Stocks, HOBS** are the purest Base Oils in the marketplace providing the highest level of hygienic protection against contamination; such safety standards are inherently unattainable in pure synthetic lubricants and mineral oils.
- ✔ Compliments **Hazard Analysis & Critical Control Point (HACCP)** systems.
- ✔ **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** does not contain any chemical listed as a carcinogen or potential carcinogen by **OSHA, IARC Monographs** or **National Toxicology Program**.
- ✔ **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** has no known hazards. This product is considered Non Hazardous when handled properly and used for intended purpose.
- ✔ The extremely **Low Volatility** of HOBS increases this product's flash point and fire safety features. **Flash Point = 243 °C, 469 °F.**
- ✔ No off-gassing of harmful volatile vapors.
- ✔ Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 contains no solvents or waxes.
- ✔ Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is **Safe, Non-Hazardous**, and **O.S.H.A.** certified **Worker Friendly**.

NFPA CODE: HEALTH: 1 FIRE: 1 REACTIVITY: 0

HMIS CODE: HEALTH: 1 FIRE: 1 REACTIVITY: 0

## 3. Environmental Compliance & Protection

- ✔ **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** is preferred over petroleum fluids in applications where there is a direct danger of polluting the air, water, soil, or work environment through loss of the lubricant.
- ✔ United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 has the highest U.S.D.A. rating of **Ultimate Biodegradable**.
- ✔ Meets and exceeds the **Acute Toxicity (LC-50)** criteria adopted by the **U.S. Fish & Wildlife Service** and the **U.S. EPA requirements 560/6-82-002, 560/6-82-003**.
- ✔ Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 is an **Environmentally Responsible** fluid formulated from **Renewable** agricultural plant resources.
- ✔ Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 contains **No Lead** or other **Heavy Metals: No Zinc, No Antimony, No Barium**.
- ✔ Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46 contains **No Chlorine, or Phenols**.
- ✔ Fully **Recyclable, Re-refinable**, and **Sustainable**.
- ✔ **Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46** eliminates storage and disposal of hazardous waste.

## 4. Return On Investment - ROI

### United Bio Lube's Bio Ultimax™ AW 1000 Hydraulic Fluid - ISO 46:

- ✔ Yields a return on capital investment through system-wide improvements.
- ✔ Provides longer Service Life than conventional hydraulic fluids.
- ✔ Improves equipment performance.  
Less money spent on repairs, replacement parts, and costly down-time.
- ✔ Enables compliance with environmental regulations.
- ✔ Reduces toxic exposures to workers.
- ✔ Reduces hazardous materials handling and storage costs.
- ✔ Helps begin to secure national energy needs.
- ✔ Promotes a **Renewable U.S. Bio Economy**.



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<sup>1</sup>**Ultimate Biodegradation** (Pw1) within 28 days in **ASTM D-5864 Aerobic Aquatic Biodegradation of Lubricants**.

<sup>2</sup> **High Oleic Base Stocks (HOBS)** are specialized Soy, Corn, Sunflower, and Canola vegetable oils containing high levels of **Oleic Acid**. HOBS are renewable lubricants engineered to replace petroleum basestocks. Economically sustainable, HOBS is America's solution to petroleum based oils. Moreover, HOBS supports **U.S. Farmers**, protects workers and their environment, and reduces dependency on foreign oil.

<sup>3</sup>**Stabilized™** is Renewable Lubricants Inc.'s trademarked, proprietary, and patented **Anti-Oxidant, Anti-Wear, and Cold Flow Technology**. Stabilized™ technology enables HOBS to perform as a high performance formula in high and low temperature applications, reducing oil thickening and deposits.

**For assistance, please call (650) 213 - 9979**

