

ENVIRON™ AW HYDRAULIC FLUIDS

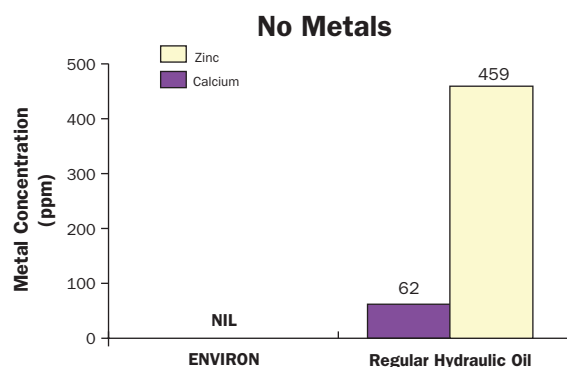
Introduction

Petro-Canada's ENVIRON AW hydraulic fluids are non-toxic, inherently biodegradable and recyclable and are therefore particularly suited for hydraulic applications in environmentally sensitive locations. ENVIRON AW hydraulic fluids are robust anti-wear straight grade hydraulic fluids designed for use in both mobile and stationary heavy duty hydraulic systems.

ENVIRON AW starts with a 99.9% pure, crystal clear base oil. By removing the impurities that can hinder the performance of competitive conventional oils, and blending in our specialty additives, ENVIRON AW delivers exceptional performance.

Features and Benefits

- **Reduce occurrence of waste water contamination by metals**
 - Transition metal content in ground water or waste water streams is a concern because it bio-accumulates in the food chain. ENVIRON AW does not contain metal based additives.

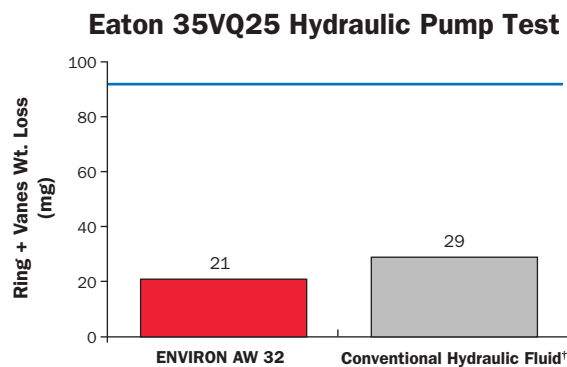


ENVIRON is metal free and therefore does not contaminate ground water and waste water streams with transition metals.

- **Non-toxic and very low odour**
 - Not acutely toxic to fish, daphnia or algae according to the United Nations Globally Harmonized System (GHS) criteria
 - ENVIRON AW contributes to a cleaner, safer and more pleasant work environment
- **Recyclable**
 - Can be recycled and reclaimed, unlike vegetable oil based products, which have to be incinerated or land farmed
- **Inherently biodegradable**
 - Greater than 30% biodegradability within a 28 day period according to OECD 301B (vs. 20% minimum for inherently biodegradable classification)
- **Excellent anti-wear, rust and corrosion protection**
 - Designed to meet or exceed the performance requirements of conventional anti-wear hydraulic oils

What is the HT difference?

Petro-Canada Lubricants starts with the HT purity process to produce water-white, 99.9% pure base oils. The result is a range of lubricants, specialty fluids and greases that deliver maximum performance for our customers.



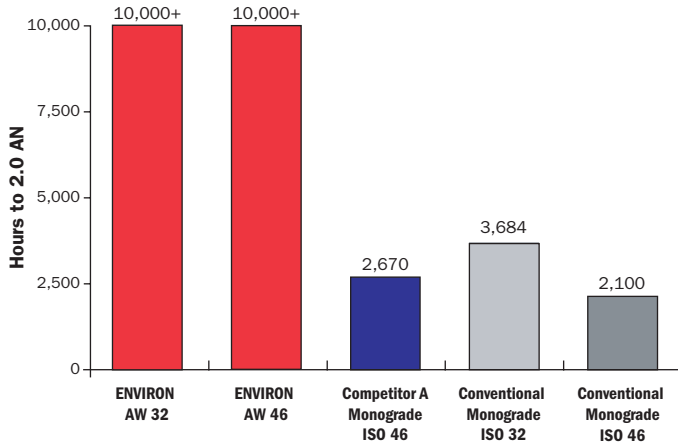
*90mg represents the maximum wear allowed as per Eaton's Brochure (03-401-2010)

†Average of 13 hydraulic fluids tested

ENVIRON provides excellent wear protection.

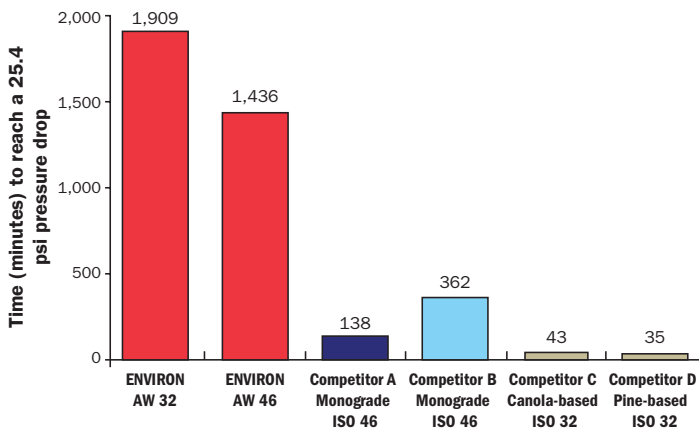
- **Superior oxidation and thermal stability compared to competitive vegetable oil based products and conventional hydraulic oils**
 - Longer oil life, which extends the time between oil changes
 - Helps reduce sludge and varnish deposits to ensure smooth, reliable operation of hydraulic valves and actuators

Longer-Lasting Performance Oxidative Stability, ASTM D943



Note: The results for the Conventional Monogrades are an average of several competitive products

Longer-Lasting Performance Oxidative Stability, RPVOT, ASTM D2272



ENVIRON AW has greater resistance to oxidation and retains its fresh oil properties longer for fewer hydraulic fluid changes

- **Excellent water separability and hydrolytic stability allows oil to be reused**
 - ENVIRON AW separates readily from water without loss of performance additives
- **Excellent resistance to foaming**
- **Excellent air release performance**

Applications

Petro-Canada's ENVIRON AW hydraulic fluids are formulated for use within environmentally sensitive areas as well as for use in industrial manufacturing plants.

ENVIRON AW 32, 46, 68 are approved for use against the following hydraulic equipment manufacturer's specifications:

- Denison HF-0
- Eaton Brochure 03-401-2010

ENVIRON AW is approved for use by the following OEMs:

- Eaton (Vickers)
- Parker Hannifin (Denison)
- Engel (AW 46)
- Krauss Maffei (AW 46)

In addition, ENVIRON AW is recommended for use in equipment manufactured by: Sauer-Danfoss, Racine, Oilgear, Hydreco, Dynex and others.

ENVIRON AW fluids are suitable for use in Bosch-Rexroth equipment and they meet the requirements of DIN 51524 Part 2 HLP and ISO 6743/4 Type HM (ISO 11158). ENVIRON AW fluids meet the WGK (German Water Hazard Classification) of 1.

ENVIRON AW fluids are also NSF H2 listed (no allowable food contact).

ENVIRON AW fluids can be used in hydraulic pumps with silver bearings such as Lucas pumps because they will not displace the silver in these bearings, as they do not contain zinc-based anti-wear additives.

The high oxidation stability and wear protection performance of ENVIRON AW fluids make it well suited for use in severe applications such as injection molding machines where the OEM recommends a zinc-free hydraulic fluid.

Typical Performance Data

| PROPERTY | TEST METHOD | ENVIRON AW | | |
|--|--------------|--------------|--------------|--------------|
| | | AW 32 | AW 46 | AW 68 |
| Flash Point, COC, °C / °F | D92 | 216/421 | 233/451 | 242/468 |
| Kinematic Viscosity, cSt @ 40°C | D445 | 31.7 | 45.4 | 69.3 |
| cSt @ 100°C | | 5.7 | 6.8 | 9.1 |
| SUS @ 100°F | | 163 | 234 | 359 |
| SUS @ 210°F | | 45 | 49 | 57 |
| Pour Point, °C / °F | D5950 | -42 / -44 | -33 / -27 | -33 / -27 |
| Rust Prevention, Procedures A & B, 24 h | D665 | Pass | Pass | Pass |
| Copper Corrosion 3Hr @ 100°C / 212°F | D130 | 1b | 1b | 1b |
| Air Release @ 50°C / 122°F, Minutes | D3427 | 2.0 | 2.5 | 4.7 |
| Water Separability @ 54°C / 129°F, oil-water-emulsion (minutes) | D1401 | 40-40-0 (10) | 40-40-0 (10) | 40-40-0 (20) |
| Oxidation Stability, Hours to 2.0 AN | D943 | 10,000+ | 10,000+ | 10,000+ |
| Hydrolytic Stability, Copper Loss, mg/cm ² ¹ | D2619 | Pass | Pass | Pass |
| Dielectric Breakdown Voltage, kV | D877 | 58 | 51 | 46 |
| Vickers 35VQ25 Vane Pump Test | D6973 | Pass | Pass | Pass |
| Denison Hybrid Pump Test, T6H20C | TP-30533 | Pass | Pass | Pass |
| Biodegradability, % | CEC L-103-12 | >50 | >50 | >50 |
| | OECD 301B | >30 | >30 | >30 |
| Aquatic Acute Toxicity ² | OECD 201 | >10,000 | >10,000 | >10,000 |
| | OECD 202 | >10,000 | >10,000 | >10,000 |
| | OECD 203 | >1,000 | >1,000 | >1,000 |

The values quoted above are typical of normal production. They do not constitute a specification.

¹ Measuring hydrolytic stability (D2619), the copper loss limit is 0.2 mg/cm².

² According to GHS, a substance is "not environmentally toxic" if LC₅₀ and EC₅₀ values for OECD 201, 202 and 203 are >100 mg/L.

To order product or to learn more about how Petro-Canada Lubricants
can help your business visit: **lubricants.petro-canada.com**
or contact us at: **lubecsr@petrocanadalsp.com**



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