

HYDREX™ EXTREME WIDE TEMPERATURE HYDRAULIC FLUID

Introduction

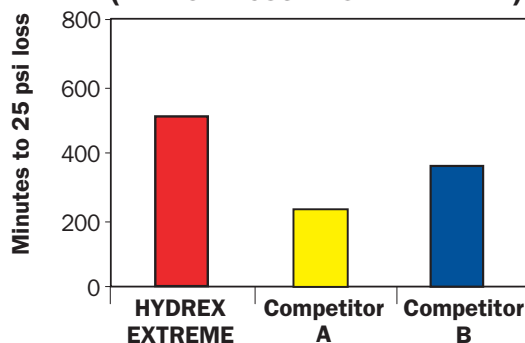
Petro-Canada's HYDREX EXTREME is a premium quality, high performance hydraulic fluid designed for extremely wide temperature protection for high and severe low temperatures.

HYDREX EXTREME hydraulic fluid starts with the HT purity process to produce 99.9% pure base oils. These crystal-clear fluids are free of impurities that can hinder the performance of competitive conventional oils. HYDREX EXTREME is specially formulated to deliver enhanced oxidation and shear stability as well as antiwear protection to mobile equipment and industrial machinery. Drawing from a few decades of formulating experience, Petro-Canada utilizes specially selected additives to provide a hydraulic fluid that lasts longer and has an extremely wide operating temperature range.

Features and Benefits

- **Wide temperature protection**
 - Outstanding low temperature flow characteristics allow start-up as low as -48°C (-54°F) to operating temperatures as high as +76°C (169°F) for mobile equipment and +68°C (+154°F) for industrial machinery
 - May eliminate seasonal change-outs to help reduce inventory costs, downtime and chance of misapplication
- **Exceptional oxidation stability**
 - Longer oil life helps extend time between oil changes reducing downtime and costs
 - Helps reduce sludge build-up that can lead to wear and shorter filter life
 - Helps reduce harmful varnish deposits to ensure smooth reliable operation of hydraulic valves and actuators

Oxidation Life Comparison (RPVOT Test - ASTM D2272)



HYDREX EXTREME hydraulic fluid provides stronger resistance to oxidative breakdown vs the competition

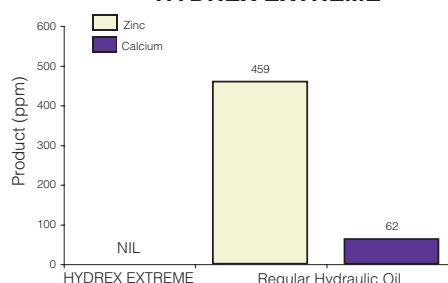
- **Excellent anti-wear characteristics**
 - Helps extend equipment life for reduced maintenance and downtime
- **Contains no heavy metals such as barium or zinc to help minimize environmental effects including waste water contamination**
- **Inherently biodegradable**
 - Greater than 40% biodegradable within a 28 day period
- **Exceptional wet and dry filterability**
- **Excellent rust and corrosion protection**
- **Excellent water separability and hydrolytic stability**

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.



HYDREX EXTREME



Applications

Petro-Canada's HYDREX EXTREME hydraulic fluid is recommended for vane, gear and axial piston hydraulic pumps over an extremely wide range of operating temperatures. It is suitable for applications where systems must be started up at very low temperatures but have higher temperatures during operation. It is also suitable for use in bucket trucks operating around power lines or in bucket truck hydraulic systems requiring extreme low temperature pumpability.

HYDREX EXTREME is suitable for use in equipment manufactured by:

- Eaton Vickers
- Denison
- Sauer-Danfoss
- Bosch-Rexroth
- Racine
- Oilgear
- Hydreco
- Dynex
- Liebherr
- Others

Typical Performance Data

| PROPERTY | ASTM TEST METHOD | HYDREX EXTREME |
|--|------------------|-------------------------|
| Start-up Temperatures ¹ , °C (°F) | – | -48 (-54) |
| Operating Temperature Range ² , °C (°F) | | |
| Mobile Equipment | – | -35 to +76 (-31 to 169) |
| Industrial Machinery | – | -35 to +68 (-31 to 154) |
| Density, kg/L at 15°C (60°F) | D4052 | 0.852 |
| Viscosity, cSt at 40°C (SUS @ 100°F) | D445 | 33.6 (165) |
| cSt at 100°C (SUS @ 210°F) | | 13.0 (70.4) |
| cP at -45°C (-49°F) | D2983 | 2985 |
| Viscosity Index | D2270 | 404 |
| Flash Point, °C (°F) | D92 | 141 (285) |
| Pour Point, °C (°F) | D5950 | -54 (-65) |
| Rust Test, Procedure A&B, 24 hours | D665 | Pass |
| Water Separability, 54°C (129°F) | D1401 | 40-40-0 (30) |
| Dielectric Breakdown Voltage, kV | D877 | 52 |
| Biodegradability, % | OECD 301B | > 40 |
| Oxidation stability, Hours to 2.0 TAN | D943 | 8000+ |
| RPVOT, minutes | D2272 | 539 |
| Air Release, 50°C, minutes | D3427 | 4.9 |

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

¹ Start-up is defined by the temperatures at which the oil viscosity is 10,000 cP.

² Operating temperature limits are determined by the equipment manufacturer. Petro-Canada has chosen to define the upper operating temperature to be the after-shear oil viscosity of 10 cSt (at 40°C) for mobile equipment and 13 cSt (at 40°C) for industrial machinery, while the lower operating temperature to be the fresh oil viscosity of 750 cP for both mobile and industrial machinery.

These ranges are only an approximation and the operator should always check the viscosity requirements as specified by their equipment manufacturer.

Please refer to TB-1290 for more information on lubricant & hydraulic fluid shear stability. Mobile equipment typically refers to machinery that encompasses a transmission and braking system to allow and prohibit movement. Industrial machinery is typically stationary, with hard piping and auxiliary components in place.

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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