



LUBRICANTS

Powerflow® NZ HE Hydraulic Oil

(Replaces Ecoterra HVI Hydraulic Oil)

Phillips 66® Powerflow NZ HE Hydraulic Oil is a high-quality, high viscosity index, zinc-free antiwear hydraulic oil developed for use in mobile equipment operating over a wide temperature range. It is particularly recommended for use in off-road equipment manufactured by Hitachi, John Deere and others. It passes the visual “no sheen” requirements of the U.S. EPA Static Sheen Test, and is classified as inherently biodegradable by the OECD Test Method 301B.

Powerflow NZ HE Hydraulic Oil is formulated with a zinc-free antiwear additive package to provide excellent wear protection for hydraulic pumps and motors, and to protect hydraulic system components against rust and corrosion. It has excellent oxidation resistance and thermal stability at high temperatures to minimize deposit formation and provide long service life. It also has excellent low-temperature properties for cold start-ups. This fluid has excellent water-separating properties to minimize the formation of emulsions, and is resistant to excessive foam buildup that can cause poor or sluggish hydraulic system response.

Powerflow NZ HE Hydraulic Oil has a high viscosity index and low pour point for use over a wider temperature range than conventional antiwear hydraulic oils. Its high viscosity index helps maintain oil viscosity at operating temperatures and reduce energy (power) loss caused by internal oil leakage in the hydraulic system, resulting in up to 6% higher system efficiency compared to conventional single-grade hydraulic oils.

Powerflow NZ HE Hydraulic Oil meets the performance requirements of all major hydraulic pump manufacturers, and is recommended for use in all types of high-pressure, high-speed hydraulic pumps. It also meets the performance requirements of Hitachi Advanced Hydraulic Oil, and is fully compatible with the Hitachi fluid and with Hitachi seals and hoses.

Applications

- Off-road mobile construction and forestry equipment, such as backhoes, bulldozers, crawlers, excavators, skid-steer loaders and motor graders, where the manufacturer recommends a zinc-free hydraulic oil
- Hitachi construction equipment with 5,000-hour service intervals
- Industrial and mobile equipment operating in cold weather or in locations subject to wide temperature fluctuations
- Bucket trucks (cherry pickers) used for servicing electrical power lines
- Hydraulic hoists and service station lifts

Powerflow NZ HE Hydraulic Oil meets the requirements of the following industry and OEM specifications:

- Bosch Rexroth RE 90220, Type HVLP
- DIN 51524 Part 3, Antiwear Hydraulic Oils, Type HVLP
- Parker Hannifin (Denison) HF-0, HF-1, HF-2
- Eaton-Vickers M-2950-S, I-286-S
- German Steel Industry SEB 181222
- Hitachi Advanced Hydraulic Oil (for use in dry systems only) (ISO VG 46)
- ISO 11158:1997, Family H (Hydraulic Systems), Type HV

**High-Efficiency,
High VI, Zinc-
Free Antiwear
Hydraulic Oil
for Off-Road
Equipment;
Separates
from Water;
Inherently
Biodegradable**

KEEPING THE
WORLD
RUNNING
SMOOTHLY. 



- U.S. Steel 127
- U.S. EPA/U.S. Coast Guard Static Sheen Test, Federal Register Vol. 58, No. 41

Features/Benefits

- High VI to reduce internal oil leakage and increase hydraulic system efficiency by up to 6% compared to conventional single-grade hydraulic oils
- Excellent oxidation resistance and thermal stability
- Protects against rust and corrosion (reduced sludge and deposit formation)
- Excellent water-separating properties
- Excellent wear protection for hydraulic pumps and motors
- Improved product compatibility with traditional zinc-based products
- Good filterability
- Inherently biodegradable
- Non-toxic to aquatic organisms
- Suitable for year-round use

Powerflow® NZ HE Hydraulic Oil

| Typical Properties | | |
|---|-----------|-----------|
| ISO Grade | 32 | 46 |
| Specific Gravity @ 60°F | 0.861 | 0.865 |
| Density, lbs/gal @ 60°F | 7.17 | 7.21 |
| Color, ASTM D1500 | 0.5 | 0.5 |
| Flash Point (COC), °C (°F) | 210 (410) | 218 (424) |
| Pour Point, °C (°F) | -54 (-65) | -51 (-60) |
| Viscosity | | |
| cSt @ 40 °C | 32.0 | 46.0 |
| cSt @ 100 °C | 6.6 | 8.6 |
| SUS @ 100 °F | 150 | 214 |
| SUS @ 210 °F | 47.9 | 54.5 |
| Viscosity Index | 168 | 168 |
| Acid Number, ASTM D974, mg KOH/g | 0.22 | 0.22 |
| Copper Corrosion, ASTM D130 | 1a | 1a |
| Demulsibility, ASTM D1401, minutes to pass | 10 | 10 |
| Dielectric Strength, ASTM D877, kV ⁽¹⁾ | 35 | 35 |
| Foam Test, ASTM D892, Seq. I, mL | 0/0 | 0/0 |
| FZG Scuffing Test, ASTM D5182, Failure Load Stage | 12 | 12 |
| Oxidation Stability, TOST, ASTM D943-04, hours | >7000 | >7000 |
| Rust Test, ASTM D665 A&B | Pass | Pass |
| Aquatic Toxicity, Rainbow Trout, OECD 203 1-12, 1000 mg/L, 96 hours, LC50 | Non-toxic | Non-toxic |
| Biodegradability in 28 days, OECD 301B, % | 20 - 59 | 20 - 59 |

⁽¹⁾Note: At the point of manufacture

Health & Safety Information

For recommendations on safe handling and use of this product, please refer to the Safety Data Sheet via <http://www.phillips66.com/EN/products/Pages/MSDS.aspx>.