



Ecoterra® HVI-E Hydraulic Oil

Ecoterra HVI-E 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 and in wet environments. It is specially formulated to emulsify readily with water to maintain effective lubrication in the presence of water. It is particularly recommended for use in off-road equipment manufactured by Hitachi, John Deere and others, operating under conditions where an emulsifiable hydraulic oil is specified or preferred.

Ecoterra HVI-E Hydraulic Oil is formulated with an ashless (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 will emulsify readily with water, and is resistant to excessive foam buildup that can cause poor or sluggish hydraulic system response.

Ecoterra HVI-E 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.

Ecoterra HVI-E 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 where an emulsifiable hydraulic oil is recommended, and is fully compatible with the Hitachi fluid and with Hitachi seals and hoses.

Applications

- Hitachi excavators with 5,000-hour service intervals
- Off-road mobile construction and forestry equipment, such as backhoes, bulldozers, crawlers, excavators, skid-steer loaders and motor graders, where the manufacturer recommends an emulsifiable ashless, zinc-free hydraulic oil

**High-Efficiency,
High VI,
Zinc-Free
Antiwear
Hydraulic Oil For
Off-Road
Equipment;
Emulsifies With
Water**

CONTACT INFORMATION

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Ecoterra HVI-E Hydraulic Oil meets the requirements (except demulsibility) of the following industry and OEM specifications:

- Bosch Rexroth RE 90220, Type HVLP
- DIN 51524 Part 3, Antiwear Hydraulic Oils, Type HVLP
- Eaton-Vickers M-2950-S, I-286-S
- German Steel Industry SEB 181222
- Hitachi Advanced Hydraulic Oil
- ISO 11158:1997, Family H (Hydraulic Systems), Type HV
- Parker Hannifin (Denison) HF-0, HF-1, HF-2
- U.S. Steel 127

Features/Benefits

- Zinc-free formulation
- High VI to reduce internal oil leakage and increase hydraulic system efficiency by up to 6% compared to conventional single-grade hydraulic oils
- Excellent wear protection for hydraulic pumps and motors
- Excellent oxidation resistance
- Protects against rust and corrosion
- Emulsifies readily with water
- Good filterability
- Good foam resistance
- Suitable for year-round use

Typical properties are average values only and do not constitute a specification. Minor variations that do not affect product performance are to be expected during normal manufacture, and at different blending locations. Product formulations are subject to change without notification.

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Typical Properties

ISO Grade	46
Specific Gravity @ 60°F	0.867
Density, lbs/gal @ 60°F	7.22
Color, ASTM D1500	0.5
Flash Point (COC), °C (°F)	224 (435)
Pour Point, °C (°F)	-48 (-54)
Viscosity,	
cSt @ 40°C	46.0
cSt @ 100°C	8.4
SUS @ 100°F	234
SUS @ 210°F	54.4
Viscosity Index	161
Acid Number, ASTM D974, mg KOH/g	0.32
Copper Corrosion, ASTM D130	1b
Demulsibility, ASTM D1401, 30 minutes @ 54°C,	
Emulsion, ml	80
Free Water, ml	0
Foam Test, ASTM D892, Seq. I, ml	0/0
FZG Scuffing Test, ASTM D5182, Failure Load Stage	12
Oxidation Stability, RPVOT, ASTM D2272, minutes	>500
Rust Test, ASTM D665 A&B	Pass

Health and Safety Information

For recommendations on safe handling and use of this product, please refer to the Material Safety Data Sheet via <http://w3apps.phillips66.com/NetMSDS>.

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