



LUBRICANTS

AN HF SINCLAIR BRAND

# TECH DATA

## ENVIRON™

### HYDRAULIC FLUID S

## INTRODUCTION

Petro-Canada Lubricants ENVIRON Hydraulic Fluid S is a premium ashless environmentally acceptable lubricant<sup>1</sup> that is compliant with 2013 US EPA Vessel General Permit (VGP) and Swedish Standard SS 155434, RISE SP listed. Its carefully selected biodegradable, minimally toxic and non-bioaccumulative chemistry makes it particularly suited for use in hydraulic systems operating in environmentally sensitive areas. ENVIRON Hydraulic Fluid S is designed for year-round use in both mobile and stationary hydraulic systems including those operating in low and high temperature extremes.

## FEATURES & BENEFITS

### Biodegradable\*

- ENVIRON Hydraulic Fluid S exceeds the minimum requirement of 60% biodegradation within 28 days tested per OECD 301B test protocol

### Minimally-toxic

- Ashless (free of metal-based additives) formulation is not acutely toxic to algae, daphnia and fish per OECD 201, 202 and 203 test protocols

### Non-bioaccumulative

- Free of any components that have the potential to build-up in the tissues of organisms over time

### Wide temperature capabilities

- Superior low temperature flow properties allow hydraulic systems to start up at temperatures as low as -40°C / -40°F. ENVIRON Hydraulic Fluid S does not thicken and gel upon standing at low temperatures
- High viscosity index provides excellent lubrication film and component protection at high operating temperatures
- Avoids the need for seasonal changeouts and provides reliable operation at low and high temperature extremes

### Superior shear stability

- Designed to provide stay-in-grade performance throughout the oil life and maintain consistent lubrication at high operating temperatures

### Excellent water separability and water tolerance

- Rapid water separation helps maintain effective lubrication, protects components against rust and corrosion and extends equipment life. This helps overcome the challenges of smaller fluid reservoirs in mobile equipment
- Superior hydrolytic stability delivers longer fluid life in the presence of water and provides greater resistance against fluid degradation and the formation of corrosive acids
- Allows water to be separated and drained off when operating in wet and/or humid conditions

### Superior oxidation and thermal stability

- Enables extended drain intervals and reduced maintenance
- Reduces sludge and varnish deposits to ensure smooth, reliable operation of hydraulic valves and actuators

### Excellent foaming resistance and air release

- Rapid air release improves system efficiency and responsiveness
- Ensures uninterrupted lubricating film to protect equipment

### Excellent anti-wear, rust and corrosion protection

- Delivers excellent anti-wear properties and robust rust and corrosion protection for extended equipment life and reliable performance

<sup>1</sup>Environmentally acceptable lubricant (EAL) as defined in the 2013 US EPA Vessel General Permit (VGP).

\*Each individual chemical component (present at a mass fraction  $\geq 5$  wt.% in the formulation) should have a biodegradability  $> 60\%$  within 28 days when tested per OECD 301B. The total mass fraction of chemical components with a biodegradability  $\leq 60\%$  is restricted at  $< 5$  wt.%.

To take full advantage of the performance and environmental benefits of ENVIRON Hydraulic Fluid S, and to mitigate potential incompatibility with the incumbent fluid, follow the conversion procedure in technical bulletin TB-1284.

## APPLICATIONS

ENVIRON Hydraulic Fluid S is designed for use in both mobile and industrial hydraulic systems, particularly those operating in environmentally sensitive areas including marine, wetland, forestry, mining, construction and public utility operations.

ENVIRON Hydraulic Fluid S 32 and 46 are compliant with the following standards and specifications:

- 2013 US EPA Vessel General Permit (VGP)
- Swedish Standard SS 155434, RISE SP listed

- Danfoss Vickers (formerly Eaton Vickers) E-FDGN-TB002-E, successfully rated
- DIN 51524 Part 3 HVL P
- ISO 11158 HV
- ISO 15380 HEPR

These fluids are suitable for use in equipment manufactured by Bosch Rexroth, Parker Denison, Danfoss, Oilgear, Hydreco, Dynex and others.

## TYPICAL PERFORMANCE DATA

Property	Test Method	ENVIRON Hydraulic Fluid S	
		32	46
Start-up Temperature <sup>1</sup> , °C / °F	-	-40 / -40	-34 / -29
Operating Temperature <sup>1</sup> , °C / °F Mobile Equipment Industrial Equipment	-	-20 to 77 / -4 to 171 -20 to 67 / -4 to 153	-13 to 91 / 9 to 196 -13 to 80 / 9 to 176
Density, kg/L @ 15°C	ASTM D4052	0.845	0.857
Kinematic Viscosity @ 40°C, cSt @ 100°C, cSt	ASTM D445	30.62 6.55	46.18 8.95
Viscosity Index	ASTM D2270	177	178
Pour Point, °C / °F	ASTM D5950	-51 / -60	-48 / -54
Flash Point, COC, °C / °F	ASTM D92	227 / 441	223 / 433
Water Separability @ 54°C / 129°F, Oil-Water-Emulsion, ml (minutes)	ASTM D1401	40-40-0 (5)	40-40-0 (10)
Foam, Sequence I, ml/ml Foam, Sequence II, ml/ml Foam, Sequence III, ml/ml	ASTM D892	10/0 20/0 50/0	10/0 30/0 50/0
Copper Corrosion, 3 h @ 100°C / 212°F	ASTM D130	1a	1a
Rust Prevention, Procedures A & B, 24 h	ASTM D665	Pass	Pass
Air Release @ 50°C / 122°F, minutes	ASTM D3427	2.6	5.0
RPVOT, minutes	ASTM D2272	1251	943
Oxidation Stability, hours - Dry	ASTM D943M	> 5500	> 5500
Four-Ball Wear Scar Diameter, mm	ASTM D4172	0.40	0.40
FZG Failure Load Stage	ASTM D5182	11	11
V104C Vane Pump Test	ISO 20763	Pass	Pass
Hydrolytic Stability Total Acidity of Water Layer, mg KOH/g Copper Strip Weight Loss, mg/cm <sup>2</sup> Copper Strip Appearance	ASTM D2619	< 3.0 0 1b	< 3.0 0 1b
Elastomer Compatibility, NBR 2, 100°C, 168 h	ISO 1817	Pass	Pass

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

<sup>1</sup> Operators should always refer to their equipment manufacturer's recommendations regarding the operating temperature ranges and fluid viscosity requirements.

Petro-Canada Lubricants recommendations are approximate and based on the below:

- Start-up temperature is defined as the temperature at which the fluid dynamic viscosity is 10,000 cP.
- The lower limit of operating temperature range for both mobile and industrial machinery is defined as the temperature at which the fresh fluid dynamic viscosity is 750 cP. The upper limit of operating temperature range is defined as the temperature at which the after shear kinematic viscosity of the fluid is 10 cSt for mobile equipment and 13 cSt for industrial equipment.

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Committed to the disciplined operation of our business.



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