

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

Greenplus Hydraulic Fluid ES

Developed by Greenland Corporation
Calgary, Alberta, Canada

In accordance with

ISO 14034:2016

**Environmental management —
Environmental technology verification (ETV)**



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Vancouver, BC, Canada

Verification Body
GLOBE Performance Solutions
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Performance claim

When tested for acute lethality on trout, Greenplus Hydraulic Fluid ES, manufactured by Greenland Corporation, will achieve an LC50 at least as high as 40,000 ppm when the hydraulic fluid is added to water in the test ratio and tested in accordance with Section 5 of Environment Canada’s EPS1/RM/9 July 1990, as amended May 1996.

Performance conditions

Greenplus Hydraulic Fluid ES was tested in accordance with Section 5 of Environment Canada’s EPS1/RM/9 July 1990, as amended May 1996. The normal, “static” test method was judged appropriate for testing this hydraulic fluid because it more closely resembles the conditions which would result from a spill of the oil into a waterway.

The normal mixing procedures for this test procedure require only initial thorough stirring, with no further mixing within the 96 hours of the test. During this time any water-soluble elements (toxic or non-toxic) in the test substance would leach out into the water.

Technology description and application

Greenplus Hydraulic Fluid ES (Figure 1 below) has been developed by Greenland Corporation to provide high performance hydraulic fluid characteristics (Table 1 below) while minimizing the risk of damage to the environment, from leaks and spills, as well as the chemical hazard posed to equipment operators and mechanics. The manufacturing process starts with a vegetable-oil base stock and uses only additives that contain no petroleum or mineral oils and no heavy metals.

Figure 1:
Greenplus Hydraulic Fluid ES



Table 1:
Specifications for Greenplus Hydraulic Fluid FS

Grade (ISO)	46
Specific Gravity g/cm ³ @ 15°C	0.91
Kinematic Viscosity:	
40°C	42 cSt
100°C	6.1 cSt
100°F	210 SUS
210°F	56 SUS
Viscosity Index	239
Flash Point	279°C / 534°F
Pour Point	-36°C / -33°F
pH	7.0 - 7.2
LC50 (PPM)	> 40,000

Greenplus Hydraulic Fluid ES is used in all standard and many specialty hydraulic fluid applications. It is used preferentially by environmentally responsible hydraulic equipment operators working in food processing and in environmentally sensitive locations such as watershed areas, waterways, parks and other recreational areas, as well as in general construction and other specialized applications.

Verification

This verification was first completed in March 1998 and considered valid for subsequent periods of three (3) years each between renewals. Verification of the performance claim was carried out by J.K. Engineering, Calgary, Alberta using test data generated by Maxxam Analytics, Edmonton, Alberta and applying the Canadian ETV Program's General Verification Protocol (updated June 2012). This ETV renewal is considered to meet the equivalency of an ETV verification completed using the International Standard *ISO 14034:2016 Environmental management -- Environmental technology verification (ETV)*.

What is ISO 14034:2016 Environmental management – Environmental technology verification (ETV)?

ISO 14034:2016 specifies principles, procedures and requirements for environmental technology verification (ETV), and was developed and published by the *International Organization for Standardization (ISO)*. The objective of ETV is to provide credible, reliable and independent verification of the performance of environmental technologies. An environmental technology is a technology that either results in an environmental added value or measures parameters that indicate an environmental impact. Such technologies have an increasingly important role in addressing environmental challenges and achieving sustainable development.

For more information on the Greenplus Hydraulic Fluid ES please contact:

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