



## CLARION® GREEN BIO

Date 12/13

**DESCRIPTION:** Clarion Green BIO are a series of readily biodegradable anti-wear hydraulic fluids formulated with premium high oleic natural esters derived from renewable resources and zinc free ashless additives to provide protection for demanding hydraulic systems, especially those operating in environmentally sensitive areas.

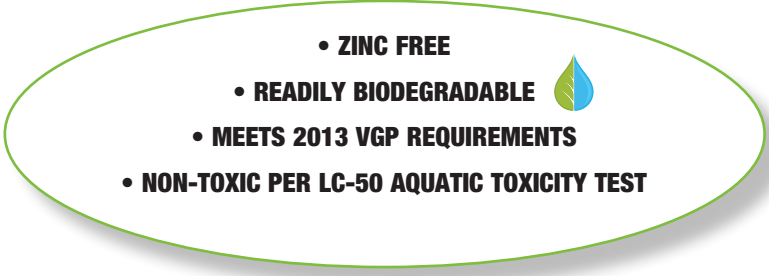

Clarion Green BIO hydraulic fluids are zinc free. Zinc compounds are regulated as priority pollutants under provisions of the Clean Water Act and SARA Title 313.

- BENEFITS:**
- Readily biodegradable
  - Non-toxic in acute aquatic toxicity test (LC-50)
  - Zinc free ashless formulation
  - Provide outstanding rust and corrosion protection.
  - Contain inhibitors to minimize foaming and air entrainment.
  - Provide premium anti-wear protection to pumps, motors and other hydraulic components
  - Meets Eaton (formerly Vickers) M-2950-S, I-286-S
  - Meets Coast Guard Vessel General Permit (December 2013) requirements for biodegradable lubricants

**APPLICATIONS:** Clarion Green BIO hydraulic fluids offer anti-wear protection to vane, piston and gear pumps, motors, valves and other hydraulic circuit components when used in accordance with the manufacturer's recommendations. Recommended for hydraulic system applications operating in environmentally sensitive areas where the use of a zinc free, ashless, low aquatic toxicity readily biodegradable fluid is desired such as:

- Marine — Marine Vessels, Offshore and Inshore Rigs, Tugs, Dredges, Dock Equipment, Cranes, Pile-Drivers, Marine Construction Equipment
- Forestry — Scalpers, Excavators, Wheel Loaders
- Construction & Mining — Bulldozers, Graders, Backhoes, Conveyors, Crawlers, Hole Drillers
- Oil & Gas Exploration — Oil and Gas Drilling Rigs

Fluid monitoring through Lubealert CPM Oil Analyses is recommended to maximize the service life of Clarion Green BIO hydraulic fluids. Moisture content should be maintained at less than 500 ppm.

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- ZINC FREE
  - READILY BIODEGRADABLE 
  - MEETS 2013 VGP REQUIREMENTS
  - NON-TOXIC PER LC-50 AQUATIC TOXICITY TEST


(Continued)



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## TYPICAL PROPERTIES:

CLARION® GREEN BIO			
ISO VIS Grade	32	46	68
Material Code	633580009	633581009	633582009
Gravity, ASTM D 4052, °API	27.17	23.6	21.52
Flash Point, ASTM D 92 (COC) °C (°F)	200 (392)	212 (413)	256 (492)
Viscosity,			
ASTM D 445, cSt at 40°C	34	46	69
cSt at 100°C	8.1	10.2	13.4
Viscosity Index, ASTM D 2270	223	218	200
Pour Point, ASTM D 97, °C (°F)	-36 (-33)	-30 (-22)	-33 (-27)
Color, ASTM D 1500	L0.5	L1.0	L3.0
Copper Corrosion, ASTM D 130,			
3 hrs at 100°C	1B	1B	1B
Rust Test, ASTM D 665 A	Pass	Pass	Pass
Four Ball Wear, ASTM D 4172,			
at 40 kg, mm	0.31	0.31	0.33
Foam Test, Seq. I, ml	0-0	0-0	0-0
Seq. II, ml	20-0	20-0	20-0
Seq. III, ml	0-0	0-0	0-0
Total Acid Number, ASTM D 974,			
mg KOH/g	0.26	0.29	0.78
Water Separability, ASTM D 1401,			
at 130°F	40/40/0/30	40/40/0/30	40/40/0/30
Dielectric Strength, ASTM D 877,			
KV, minimum	35	35	35
RPVOT, ASTM D 2272, minutes	260	205	110
 Biodegradability, Modified Sturm,			
OECD 301B, %	>60	>60	>60
Vickers 35VQ 25 Pump	—	Pass	—
Vickers V-104C Pump,			
Total Ring & Vane Loss (mg)	—	1.5	—