

# CLARION® Green Bio



## OVERVIEW



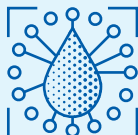
- Readily biodegradable anti-wear hydraulic fluids formulated with premium high oleic natural esters derived from renewable resources.
- Formulated with zinc-free, ashless additives. Zinc compounds are regulated as priority pollutants under provisions of the Clean Water Act and SARA Title 313.
- Provide protection for demanding hydraulic systems, especially those operating in environmentally sensitive areas.

## FEATURES & BENEFITS




- Meet EPA Vessel General Permit (December 2013) requirements for Environmentally Acceptable Lubricants (EAL).
- Non-toxic in acute aquatic toxicity test (LC-50).
- Readily biodegradable.
- Zinc-free, ashless formulation with outstanding rust and corrosion protection.
- Contain inhibitors to minimize foaming and air entrainment.
- Premium anti-wear protection for vane, piston, and gear pumps, motors and other hydraulic components.
- Meet Eaton (formerly Vickers) M-2950-S, I-286-S.

## APPLICATIONS




- 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.
- 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 Analysis is recommended to maximize service life. Moisture content should be maintained at less than 500 ppm.

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

## PROPERTIES



## Typical Properties for CLARION® Green Bio:

ISO VIS Grade	32	46	68
Material Code	633580009	633581009	633582009
Gravity, °API ASTM D4052	27.17	23.6	21.52
Flash Point, (COC) °C (°F) ASTM D92	200 (392)	212 (413)	256 (492)
Viscosity ASTM D445			
cSt @ 40°C	34	46	69
cSt @ 100°C	8.1	10.2	13.4
Viscosity Index, ASTM D2270	223	218	200
Pour Point, °C (°F) ASTM D97	-36 (-33)	-30 (-22)	-33 (-27)
Color, ASTM D1500	L0.5	L0.5	L0.5
Copper Corrosion, ASTM D130			
3 hrs @ 100°C	1B	1B	1B
Rust Test, ASTM D665A	Pass	Pass	Pass
Four Ball Wear ASTM D4172			
@ 40 kg, mm	0.31	0.31	0.33
Foam Test ASTM D892			
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 D974			
mg KOH/g	0.26	0.29	0.78
Water Separability ASTM D1401			
@ 130°F	40/40/0/30	40/40/0/30	40/40/0/30
Dielectric Strength ASTM D877			
KV, minimum	35	35	35
RPVOT ASTM D2272 minutes	260	205	110
 Biodegradability			
OECD 301B, %	>60	>60	>60
Vickers 35VQ 25 Pump	—	Pass	—
Vickers V-104C Pump,			
Total Ring & Vane Loss (mg)	—	1.5	—

CLARION® is a registered trademark of CITGO Petroleum Corporation. All other registered trademarks or trademarks are the property of their respective owners.