



# Comparison of EnBio MP46 with a Leading Bio/Synthetic Blend and Two Leading Mineral Oils

Fluid Type	EnBio MP46	Bio/Synthetic Blend	Mineral Oil	Mineral Oil
Kinematic Viscosity 40°C, cSt	48.6	46.6	47	46
Kinematic Viscosity 100°C, cSt	9.9	8.0	8.3	6.7
Viscosity Index	194	144	152	98
<b>Four-Ball Wear Test; ASTM D4172; 75°C, 1200rpm, 40 kg load, 1 Hour</b>				
Wear Scar (mm)	0.32	0.37	0.48	0.53
Coefficient of Friction	0.05	0.09	0.12	0.11
<b>Sonic Shear Stability; ASTM 5621</b>				
Kinematic Viscosity (New Fluid) 40°C, cSt	48.6	46.6	47	46
Kinematic Viscosity (Sheared Fluid) 40°C, cSt	48.7	43.4	45.1	42.8
% Loss	-0.05	6.9	4.2	6.9
<b>KRL Shear Stability Test; CEC L-45-T-93; 20 Hours</b>				
Kinematic Viscosity (New Fluid) 100°C, cSt	9.87	8.0	8.4	6.71
Kinematic Viscosity (Sheared Fluid) 100°C, cSt	9.84	6.9	7.4	5.48
% Loss	0.02	13.8	11.8	18.3
<b>Vane Pump Test; ASTM D 7043; 2000 psi, 150° F, 100 Hours, 1200 rpm</b>				
Ring Wear (mg)	1.1	9.7	28.4	3.1
Vane Wear (mg)	0.7	0.6	2.8	0.6
Total Wear (mg)	1.8	10.3	31.2	3.7
Total Hydraulic Efficiency (%)	83.9	76.0	72.2	70.2



## Comparison of EnBio MP46 with a Leading Synthetic and Mineral Oil

Fluid Type	EnBio MP46	Bio/Synthetic Blend	Mineral Oil
Kinematic Viscosity 40°C, cSt	48.6	46	46
Kinematic Viscosity 100°C, cSt	9.9	9.1	6.7
Viscosity Index	194	185	102
Four-Ball Wear Test; 1 Hour @ 30 kg; Wear Scar (mm)	0.29	0.32	0.4
FZG Fail Stage; A8.3/90	>12	>12	12
Pour Point (°C)	-45	-27	-21
Sonic Shear Stability; ASTM 5621; 40°C; % Viscosity Loss	0.01	5.62	7.12
KRL Shear Stability Test; CEC L-45-T-93; 20 Hours; % Viscosity Loss	0.2	15.7	18.6
Coefficient of Friction	0.05	0.09	0.12
Oxidation Stability; ASTM D943 (Hours)	>5000	>5000	>2000
Vickers Vane Pump Test; 2000psi, 150° F, 100 Hours; Wear Ring and Vanes (mg)	2	<50	25
Biodegradation; OECD301B	Readily Biodegradable	Readily Biodegradable	Not Biodegradable
Sludge Prevention	Excellent	Fair	Good
Low Temperature Fluidity	Very Good	Good	Good
Mineral Oil Solubility	Poor	Good	Excellent
Thermal Oxidation Stability	Excellent	Excellent	Good
Hydrolytic Stability	Excellent	Poor	Fair
Impact on Environment	Minimal	High (little better than mineral oil)	High
Clean Up After Spill on Concrete	Easy- only requires water. No stain	Difficult, even with degreaser. Stain remains	Difficult even with degreaser. Stain remains
Clean Up After Spill on Tarmac	Easy- only requires water. No stain	Difficult, even with degreaser. Stain remains	Difficult even with degreaser. Stain remains
Spill on Flora	Does NOT cause Necrosis	Causes Necrosis	Causes Necrosis
Sheen When Spilled on Water	NO	YES	YES