

METATRON™ 601

DESCRIPTION AND APPLICATION:

Metatron™ 601 is a semi-synthetic, multi-grade, non-detergent, rust and oxidation inhibited, anti-wear oil that is specially formulated for use in mobiles such as aerial bucket trucks, off road forestry equipment, and industrial hydraulic systems that are subjected to wide variations in ambient and system operating temperatures and in applications requiring the use of high dielectric strength oil.

COMPOSITION AND PERFORMANCE CHARACTERISTICS:

Metatron™ 601 is blended from the finest quality solvent refined, severely hydro-finished 100% paraffin base oils and polyalphaolefin (PAO), synthetic base fluids available. This unique combination provides the **Metatron™ 601** with the following advantages:

1. Excellent Low Temperature Properties
2. Superior Oxidation Stability
3. Excellent Resistance to Thermal Degradation
4. High Viscosity Index
5. Excellent Film Strength
6. Superior Operating Temperature Reduction
7. Compatibility With All Types of Seals and Coatings

ADDITIONAL PERFORMANCE PROPERTIES:

Blended into these 100% paraffin base oils and polyalphaolefin base fluids is a highly specialized performance additive package and an extremely shear stable type viscosity index improver.

The highly specialized performance additive package provides the **Metatron™ 601** with not only a high dielectric strength of 45 kilovolts, but also the following performance benefits:

1. Exceptional anti-wear protection
2. Extended pump life
3. Extended bearing life
4. Enhanced thermal and oxidative stability
5. Superior hydrolytic stability
6. Excellent demulsibility characteristics
7. Excellent rust and corrosion protection
8. Excellent anti-foaming and air release properties
9. Reduced sludge, varnish and deposit formation

10. Improved durability of non-ferrous parts
11. Reduced filter blockage
12. Enhanced filterability
13. Enhanced compatibility with existing fluids
14. Enhanced fluid life
15. Enhanced seal life
16. Reduced system maintenance

The extremely shear stable polymer viscosity index improver provides the **Metatron™ 601** with a viscosity index of 150. This extremely high viscosity index allows the **Metatron™ 601** to exhibit low temperature viscometrics that permit pumps to be safely started at low ambient temperatures where the flow properties of a conventional straight grade hydraulic fluids might cause problems. Conversely, when the hydraulic equipment reaches operating temperature, the high viscosity index of **Metatron™ 601** allows it to have the proper viscosity needed in order to minimize internal pump leakage and wear.

ADDITIONAL ANTIWEAR PROTECTION WITH MICRON MOLY:

The trend among hydraulic pump builders is to make their units more compact by employing higher system pressures and higher pump speeds. This often results in conditions of thin film lubrication that can result in excessive pump wear.

To prevent this wear a hydraulic fluid must contain an effective anti-wear additive package. Though **Metatron™ 601** contains an exceptional anti-wear additive package that lasts longer than most conventional anti-wear additive packages found in conventional hydraulic oils, this exceptional anti-wear package will also disappear over a period of time. To fortify these anti-wear capabilities of **Metatron™ 601**, **Micro Moly™** is further blended into the product.

Micro Moly™ is a liquid soluble type moly that plates itself to the sliding and rubbing surfaces of the hydraulic system. This plating action forms a long lasting solid lubricant film that is able to withstand pressures up to 500,000 pounds per square inch. Once plated to the sliding and rubbing surfaces, **Micro Moly™** not only produces a smooth finished surface, but also reduces friction between moving parts. This results in less heat being generated, which in turn reduces operating temperatures and downtime.

MANUFACTURERS REQUIREMENTS AND SPECIFICATIONS:

Metatron™ 601 meets and exceeds the following specifications and manufacturers requirements: Hagglands Densison HF-O, Vickers M2950-S, Rexnord, Commercial Shearing HD 2/900, Commercial Hydraulics, Cincinnati Millicron P-68, US Steel 126, 127 and 136 and AF Nor E 48-603, Altec and Pittman.

TYPICAL PROPERTIES:

SAE Grade	5W-20
ISO Grade	32
API Gravity 60°F	33.3
Specific Gravity 60°F	.8588
Viscosity Cst 40°C (ASTM D-445)	36.00-39.00
Viscosity Cst 100°C (ASTM D-445)	6.5-7.0
Viscosity SUS @ 100°F (ASTM D-2161)	184-199.1
Viscosity Index (ASTM D-2270)	153
Brookfield Viscosity (ASTM D-2983)	
cP 0°F/-17.78°C	1135
cP -20°F/-29°C	3810
cP -30°F/-34°C	7,300
Flash Point F/C (ASTM D 92)	420°/215.56°
Fire Point F/C (ASTM D-92)	455°/235°
Pour Point F/C (ASTM D-97)	-54°/-48°
Stable Pour Point (FTM 203) F/C	Below -40°/Below -40°
Rust Test (ASTM D-665)	
Procedure A (Distilled Water)	Pass
Procedure B (Salt Water)	Pass
Copper Strip Corrosion Test	
3 hours (ASTM D-130)	1a
Four Ball Wear Test (ASTM D-4172)	
1hr/40kg/130°F	
Mean Scar Diameter, mm	.45
Four Ball Wear Test (ASTM D-4172)	
1hr/20kg/130°F	
Mean Scar Diameter, mm	.27
Four Ball EP Test (ASTM D-2783)	
Weld Point, kg	126
Load Wear Index	26.2
Falex Continuous Load (ASTM D-3233)	
Failure Load, lbs.	1250
Conradson Carbon Residue (ASTM D-189)	
% Residue	0.3
Foam Test (ASTM D-892)	
Sequence I	0/0
Sequence II	0/0
Sequence III	0/0
FZG Gear Test (ASTM D-5182)	
Load Stage Pass	12
Hydrolytic Stability (ASTM D-2619)	
Copper Wt. Loss, mg/cm ²	.01
Acidity of Water, mg/KOH	0.05
Demulsibility (ASTM D-1401)	
Oil-Water-Emulsion	40-40-0
4Time, min.	15

TYPICAL PROPERTIES CONTINUED

Denison Filterability Test	
Time, w/o water (sec)	112
Time w/water (sec)	146
Oxidation Stability Test (ASTM D-943)	
Hours to TAN of 2	4000+
Sludge Tendencies (ASTM D-4310)	
Total Sludge, mg	36
Total Copper, mg	22
Total Iron, mg	0.1
Thermal Stability Test	
Cincinnati Milicron Method	
168 hr/135°C, copper/steel Catalyst	
Sludge (mg/100 ml)	3.9
Condition of copper rod	1
Condition of iron rod	1
Air Release (ASTM D-3427)	
Time, (min @122°F)	0.5
Aniline Point °F/°C (ASTM D-611)	220°F/104.4°
Total Acid Number (ASTM D-664)	0.5-0.9
Vickers Pump Wear Test (ASTM D-2882)	
Mg Wt Loss	12
Denison T5D-042 Pump Test	
In wear, vane	.0094
Vickers 35VQ25 Pump Test	
Total Wt. Loss Vane, mg	5
Total Wt. Loss Ring, mg	11
Total Wt. Loss, mg	
Dielectric Strength (ASTM D-887)	45KV