METATRON™ 690

MULTIGRADES SAE 75W-90 AND 85W-140

DESCRIPTION :

Metatron™ 690 is a multipurpose thermally stable and thermally durable gear lubricant that is recommended for use in all types of enclosed industrial and automotive gear drives where an extreme pressure characteristics are needed.

COMPOSITION AND PERFORMANCE PROPERITIES :

Metatron™ 690 is blended from the finest high quality severely solvent refined, severely hydrofinished high viscosity index 100% pure paraffin base oils available. Blended into these 100% pure paraffin base oils is a highly specialized non-corrosive thermally stable and thermally durable multifunctional extreme pressure additive package the provides the **Metatron™ 690** with the following performance advantages :

1. Enhanced thermal and oxidative stsability and durability to handle operatating temperatures of 149°C to 177°C (300°F to 350°F).
2. Excellent extreme pressure properties to protect the gears and bearings from excessive wear and fatigue.
3. Prevention of the formation of sludge and carbon deposits that erode the seals.
4. Excellent seal compatibility.
5. Enhanced protection of copper, brass and bronze components from corrosion.
6. Non-corrosivity to brass, bronze and other non-ferrous metal parts.
7. Excellent protection of components from rust and corrosion in dry conditions and in the presence of moisture.
8. Excellent resistance to water and moisture.
9. Excellent water separatibility characteristics
10. Enhanced gear, bearing and seal cleanliness.
11. Excellent resistance to foaming.

In addition to this non-corrosive multifunctional extreme pressure additive package **Metatron™ 690** Multigradecontains a non-silicone base antifoam agent. This allows the **Metatron™ 690** Multigrade to be used in gear box applications on paint lines and gear box other applications that require the use of a non-silicone containing gera lubricant.

MUTIGRADE PERFORMANCE :

Metatron™ 690 Multigrades contain an extremely shear stable polymer-type viscosity index improver. This extremely shear stable polymer-type viscosity index improver provides the **Metatron™ 690** with a high viscosity index. These polymers expand as temperature rises and contract as the temperature is lowered allowing the **Metatron™ 690** to exhibit low temperature properties that gears and bearings to be safely started at low ambient temperatures and to have the proper viscosity needed at operating temperature and high ambient temperatures in order to minimize wear. This temperature selectiveness also enhances the **Metatron™ 690** Multigrades high temperature oxidation stability

THERMAL STABILITY AND DURABILITY :

The trend among automotive and industrial gear drive manufacturers is to operate the equipment at higher speeds, loads, power densities and increased torque. This trend has resulted in automotive and industrial gear drives being subjected to higher operating temperatures. These higher operating temperatures have resulted in today's gear lubricants being subjected to extreme thermal stress.

Therefore it is important that a gear lubricant possess thermal stability and durability characteristics. Gear lubricants that do not possess these properities rapidly oxidize and decompose when subjected to high temperatures, resulting in the formation of sludge, varnish, and carbon deposits on the gears, bearings and seals, abraded seals, premature seal hardning and brittleness, and a loss of the gear lubricant's extreme pressure additive chemistries ability to protect against excessive wear, spalling and overall distress to the gears and bearings.

Metatron™ 690 severely solvent refined, severely hydrofinished high viscosity index 100% pure paraffin base oils and thermally stable and thermally durable multifunctional extreme pressure additive package enables the **Metatron™ 690** to resist oxidation and thermal stress at operating temperatures 38° (100°F) to 65° (150°F) higher than conventional gear lubricants. This results in :

1. A vast reduction in the formation of deposits.
2. Better heat transfer.
3. Excellent protection the the gears and bearings even under the most extreme thermally stressed operating conditions.
4. Less wear to gears, bearings and seals
5. Increased oil seal life
6. Lower operating temperatures
7. Less energy consumption
8. Longer lubricant life
9. Less equipment downtime
10. Longer equipment life
11. Reduced maintenance costs

MICRO MOLY PROTECTION:

Most types of gearing are designed to operate under hydrodynamic lubrication conditions. That is a full fluid oil film must separarte the metal surfaces of the gears and bearing during operation. However, during periods of cold start up, extremely high operating temperatures or high shock loading conditions this full fluid film can be destroyed. Unless a boundry lubricant is present in the gear lubricant when this full fluid film is destroyed, excessive wear can take place.

Metatron™ 690 contains a proven friction reducer and boundary called **Micro Moly™**. **Micro Moly™** is a liquid soluble type of moly that plates itself to the metal surfaces of the gears and bearings. Once plated, **Micro Moly™** forms an indestructible long lasting solid lubricant film that is capable of withstanding pressures up to of 500,000 psi. This solid lubricant film once plated to the gears and bearings will reduce friction, vibration and wear, thus extending equipment life.

Micro Moly™ also provides a smooth finish surface on all of the moving surfaces of the gear drives. This smooth finish minimizes the action of cold welding and vibration, which can occur during start up after the gears have been standing idle and during periods of high shock loading. This in turn lessens starting loads and peak power demand, thus resulting in a realistic power cost savings.

TENACITY TO STICK AND CLING TO GEARS:

Metatron™ 690 contains adhesive-cohesive additives that allows the product to tenaciously stick and cling to the gears and bearings. This ensures that the **Metatron™ 690** to retain a fine film that “stays put” on the metal surface of the gears and bearings regardless of how thoroughly it is wiped away.

LIMITED SLIP AND POSITRACTION REAR END PERFORMANCE:

Metatron™ 690 contains the proper additive system that allows the product to properly function and lubricate limited slip, positraction, and high offset hypoid gear rear ends and differentials.

MANUFACTURERS REQUIREMENTS AND SPECIFICATIONS:

Metatron™ 690 multigrade meets and exceeds the following specifications and manufacturer’s requirements: API Service classifications GL-5, MT-1 and PG-2, United States Military Specification MIL-PRF-2105E, SAE J2360, Mack GO-H, Clark MS-8 Rev 1, Ford Specifications M2C119A, M2C108C, M2C158-A; General Motors Specifications 9985476, 9985049; Damiler-Chrysler; John Deere J11D, Rockwell Standard O-76A & O-76B; Eaton-Fuller’s Lubricant Specifications,White Motors MS0016, Volvo, Volkswagen.

TYPICAL PROPERTIES:

SAE Grade	75W-90	85W-140
Specific Gravity @ 15°C (60°F)	.882	.8816
Viscosity cSt @ @ 40°C ASTM D-445	120-130	255-270
Viscosity @ 100°C ASTM D-445	16.00-18.00	27.00-32.00
Brookfield Viscosity ASTM D-2893		
cP @ -12°C	---	60,000
cP @ -40°C	140,000	---
Viscosity Index ASTM D-2270	140	120
Flash Point °C (°F) ASTM D-92	227° (440°)	229° (445°)
Fire Point °C (°F) ASTM D-92	243° (470°)	249° (480°)
Pour Point °C (°F) ASTM D-97	-43° (-45°)	-32° (-25°)
Rust Test (ASTM D-665)		
Procedure A (Distilled Water)	Pass	Pass
Procedure B (Salt Water)	Pass	Pass
Copper Strip Corrosion Test ASTM D-130	1A	1A
Four Ball E.P. Test ASTM D-2783		
Weld Point, kgs.	315	315
Load Wear Index	55	55
Four Ball Wear Test ASTM D-4172		
Scar diameter, mm.	0.25	0.25
Timken E.P. Test ASTM D-2782		
Ok Load, lbs.	65	65
Failure Load, lbs.	70	70
Falex E.P. Continuous Load ASTM D-3233		
Failure Load, lbs.	2500	2500
FZG A/8.3/90 ASTM D-5182		
Failure Load	13^{TH}	13^{TH}
Oxidation Test ASTM D-2893		
% Viscosity increase after 312 hours @95°C	3%	3%
L-60-1 Thermal Oxidation Test ASTM D-5704		
% Viscosity Increase	30%	30%
Demulsibility Test ASTM D-2711		
Free Water, ml	81	81
% Water in oil	1	1
Emulsion, ml	Trace	Trace
Foam Tendency Test ASTM D-892		
Sequence I	0/0	0/0
Sequence II	10/0	10/0
Sequence III	0/0	0/0