



LE PRODUCTS
MANUFACTURED
UNDER AN ISO
9001:2000
CERTIFIED QUALITY
SYSTEM

6105-6120, 6520 MONOLEC® HYDRAULIC OIL

Meets the demands of present day hydraulic systems, including Denison, Rexroth and Vickers Pump manufacturer requirements.

LE's MONOLEC® Hydraulic Oils are designed for long life and excellent lubrication in high speed hydraulic pumps and motors. They are formulated with high natural VI select paraffinic base oils as well as rust and oxidation inhibitors. They contain MONOLEC®, LE's exclusive wear-reducing additive as well as other special additives. These lubricants effectively lubricate moving parts, protect metal surfaces from corrosion and transmit power smoothly.

USER BENEFITS:

- **Eliminates "Fade and Chatter"** - Agitation and moisture can cause foaming in ordinary oil and result in "fade" or "chatter". A powerful antifoaming agent breaks up the foam to eliminate midday "fade" or "chatter" to provide smooth, constant power flow.
- **Water Separation Ability** - Demulsibility of the oil causes the water to separate from the oil so that the water can be drained off.
- **Prevents Plugged Orifices and Valve Gumming or Sticking** - Carefully selected high VI paraffinic base oils offer superior oxidation resistance and hold any viscosity change to an absolute minimum as the ambient and operation temperatures change. This natural oxidation resistance is further fortified with oxidation inhibitors to maximize heat transfer and prevent plugged orifices and gumming or sticking of valves.
- **Prevents Rust and Corrosion** - The lubricant film and special rust and corrosion inhibitors control rust which can be caused by water condensation or leakage.
- **MONOLEC Reduces Wear** - LE's exclusive wear-reducing additive MONOLEC, plus other antiwear additives give maximum protection against wear, scuffing or galling. They support the tough film strength provided by naturally high VI base oil.
- **Protects Seals and Hoses** - These lubricants keep seals and hoses from hardening, cracking and rupturing, thus preventing or minimizing leaks.
- **Reduced Sludge and Varnish Formation** - Because of the superior oxidation resistance, hydraulic systems stay cleaner and operate smoothly.
- **Less Oil Consumed** - Superior oxidation resistance and wear-reducing characteristics provide extended oil life. This means less makeup oil and extended drain intervals.
- **Lower Maintenance Costs and Less Downtime** - Save you time and money in changing oil and cleaning systems. Reduced wear, sludge and varnish formation and extended oil life means less failures, downtime and replacement parts and labor.



AVAILABLE GRADES:

Product	ISO Grade	Equiv. SAE Grade
6105	ISO 22	
6110	ISO 46	
6120	ISO 68	SAE 20
6520	---	5W-20

TYPICAL APPLICATIONS:

- Construction equipment hydraulics
- Well service equipment hydraulics
- Forklifts servicing freezer environments
- Utility service boom trucks
- In plant station - any hydraulic systems

WHAT IS MONOLEC®?

MONOLEC is LE's exclusive wear-reducing additive which has proven its extraordinary performance in thousands of applications. It is an invaluable component in LE's Industrial Oils, Engine Oils and other LE lubricants bearing the MONOLEC tradename.

MONOLEC creates a single molecular lubricating film on the metal surface, vastly increasing film strength without affecting tolerances. LE's MONOLEC allows opposing surfaces to slide by one another with greatly reduced friction, heat and wear.

**LUBRICATION
ENGINEERS, Inc.**

Leaders in Lubricants



LE's MONOLEC® Hydraulic Oils Greatly Outperform Commercial Hydraulic Oils In Three Critical Tests.

	Test	Upper Limits for "Acceptable" Performance	LE's MONOLEC® Hydraulic Oil	Commercial Oil		
				A	B	C
1. In this test, a sample of the test oil and preweighted copper test rods are heated in a beaker at 135°C for 168 hrs. At the end of this time period, the amount of sludge and the weight loss of the copper test rod are determined.	Cincinnati Milacron Thermal Stability Sludge, mg Copper wt. loss, mg	25 10	5 Nil	148 8	270 5	120 7
2. In this test an oil sample is reacted with a controlled flow of oxygen in the presence of water and an iron-copper catalyst at 95°C. The test is continued until the measured total acid number (TAN) of the oil reaches 2.0 mg KOH/GM. The sludge forming tendencies are measured by weighing the oxidation by-product residue formed during the test. And metal attack is measured by the weight loss of the catalyst metal.	Oxidative Stability, ASTM D-943 Sludge, mg Copper, mg Iron, mg	200 5 50	44 20 1	290 195 3	450 270 10	380 170 7
3. This test measures the relative stability of hydraulic fluids in the presence of water and a copper test specimen while rotating at 93°C for 48 hours.	Hydrolytic Stability, ASTM D-2619 Copper wt. loss, mg Acidity of water layer, mg KOH	0.2 4.0	0.05 Nil	0.8 3.5	0.5 2.8	1.4 4.5

PHYSICAL CHARACTERISTICS - TYPICAL:

	6105	6110	6120	6520
ISO Grade	22	46	68	---
Equivalent SAE Grade	---	---	20	5W-20
Gravity, °API	33.1	31.2	30.6	31.7
Viscosity				
SUS @ 100°F	110.9	240.4	348.9	169.6
SUS @ 210°F	40.03	48.82	55.13	46.79
cSt @ 40°C	21.21	46.77	67.56	33.29
cSt @ 100°C	4.17	6.84	8.69	6.24
Viscosity Index	95	95	95	135
Flash Point, °F (°C)	375 (190)	415 (212)	435 (224)	385 (196)
Pour Point, °F (°C)	-33 (-36)	-27 (-33)	-22 (-30)	-44 (-42)
Color	Red	Red	Red	Red

PERFORMANCE TEST REQUIREMENTS:

Copper Corrosion,				
ASTM D-130	1b	1b	1b	1b
Rust Test,				
ASTM D-665B	pass	pass	pass	pass
Oxidation Test, hrs.,				
ASTM D-943	2600	2600	2600	2600
Water Separation, ASTM D-1401				
ml oil-ml water-ml emulsion (mins.)	40-40-0 (5)	40-40-0 (5)	40-40-0 (5)	40-40-0 (5)
Fire Resistant Fluid	No	No	No	No
Dielectric Strength,				
ASTM D-877, KV	38	38	38	38

MEETS PERFORMANCE REQUIREMENTS OF:

Rexroth	Denison HF-O
AFNOR 48-600	David Brown ET-33
U.S. Steel 126/127	DIN 51524 & 51525
USDA H2	
Vickers I-286-S (Industrial) and M-2950-S (Mobile)	
Cincinnati Machine P-69 (6120) and P-70 (6110)	

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