

# Product Information



## Monolec® Syn Industrial Oil

(9032-9150 & 9220-9460)

### Versatile Synthetic Provides Cool, Clean Performance

Monolec Syn Industrial Oil (9032-9150, 9220-9460) is designed to prolong equipment life by combating the effects of high temperatures, contamination and loads that accelerate wear. It is a versatile synthetic lubricant that meets or exceeds the requirements of gearboxes, air compressors, vacuum pumps, hydraulic systems, and roll mill bearings found in the textile, plastic, rubber and paper industries. It is formulated with high-viscosity 100 percent synthetic base oil and a specially developed additive package for applications running at extreme temperatures. The additive package provides outstanding thermal stability and rust and oxidation resistance as well as wear resistance as pressures and temperatures rise. A foam suppressant completes the package. The base oil and additive formulation works synergistically to reduce wear, extend oil drain intervals, reduce oil consumption, and practically eliminate deposits and sludge formation, all while providing excellent compatibility with seals.



### Beneficial Qualities

#### *Provides Reliable,*

#### *Wear-Resistant Service*

- Increases equipment reliability, reducing replacement and repair costs
- Features extremely high natural viscosity index
- Maintains viscosity in service
- Maintains performance in high and low temperatures
- Exhibits outstanding oxidation and thermal stability
- Controls corrosive and scuffing wear

#### *Ensures Clean,*

#### *Moisture-Resistant Operation*

- Keeps application clean and running at peak efficiency

- Eliminates carbon deposits, sludge and varnish
- Will not harm seals and plastics
- Protects metal surfaces from moisture
- Provides superior rust protection
- Is completely nonfoaming in service

#### *Reduces Oil Consumption*

- Extends drain intervals due to outstanding oxidation resistance
- Requires less make-up oil due to low volatility
- Reduces environmental impact with less waste oil for disposal
- Is compatible with other lubricants, making conversion easy

### Proprietary Additive

LE's proprietary additives are used exclusively in LE Monolec Industrial Oil.

**Monolec®** wear-reducing additive creates a single molecular lubricating film on metal surfaces, vastly increasing oil film strength without affecting clearances. An invaluable component in LE's engine oils, industrial oils and many of its other lubricants, Monolec allows opposing surfaces to slide by one another, greatly reducing friction, heat and wear.





## Monolec® Syn Industrial Oil

	<u>9032</u>	<u>9046</u>	<u>9068</u>	<u>9100</u>	<u>9150</u>
<b>Color</b>	Green	Green	Green	Green	Green
<b>ISO VG / SAE Grade</b>	32 / -	46 / 20	68 / -	100 / 40	150 / 50
<b>Relative Density @ 60°F/60°F, ASTM D1298</b>	0.848	0.852	0.855	0.858	0.857
<b>Viscosity @ 100°C, cSt, ASTM D445</b>	6.1	8.1	10.8	14.9	20.6
<b>Viscosity @ 40°C, cSt, ASTM D445</b>	32.3	46.8	68.0	100.0	152
<b>Viscosity Index ASTM D2270</b>	140	145	148	155	157
<b>Flash Point °C (°F), (COC), ASTM D92</b>	246 (475)	249 (480)	244 (470)	243 (470)	243 (470)
<b>Pour Point °C (°F), ASTM D97</b>	-57 (-71)	-51 (-60)	-45 (-49)	-42 (-44)	-39 (-38)
<b>Rust Test 4 hrs @ 60°C, DI H<sub>2</sub>O, ASTM D665A</b>	Pass	Pass	Pass	Pass	Pass
<b>Rust Test 4 hrs @ 60°C, Sea H<sub>2</sub>O, ASTM D665B</b>	Pass	Pass	Pass	Pass	Pass
<b>Copper Corrosion 3 hrs @ 100°C, ASTM D130</b>	1b	1b	1b	1b	1b
<b>Oxidation by RPVOT @ 150°C, minutes, ASTM D2272</b>	1,203	1,203	1,203	1,203	1,203
<b>Four-Ball EP Weld Point kgf, ASTM D2783</b>	200	200	200	200	200
<b>Four-Ball Wear @ 75°C, 1,200 rpm, 40 kgf, 60 minutes, mm wear, ASTM D4172</b>	0.40	0.40	0.40	0.40	0.40
<b>Ash—Sulfated %, ASTM D874</b>	0.06	0.06	0.06	0.08	0.08
<b>Acid Number mg KOH/g, ASTM D664</b>	0.25	0.25	0.25	0.25	0.25
<b>Emulsion Characteristics @ 54°C, oil-water-emulsion/minutes, ASTM D1401</b>	40-40-0/5	40-40-0/5	40-40-0/5	40-40-0/5	40-40-0/5
<b>Foaming Characteristics @ 24°C/93.5°C/24°C, 3 sequences, ml of foam/time to break, ASTM D892</b>	0/0;0/0;0/0	0/0;0/0;0/0	0/0;0/0;0/0	0/0;0/0;0/0	0/0;0/0;0/0
<b>Evaporation 22 hrs @ 100°C, % loss, ASTM D972</b>	0.77	0.77	0.76	0.76	0.76



## Monolec® Syn Industrial Oil

	<b>9220</b>	<b>9320</b>	<b>9460</b>
<b>Color</b>	Green	Green	Green
<b>ISO VG</b>	220	320	460
<b>Relative Density @ 60°F/60°F, ASTM D1298</b>	0.864	0.867	0.868
<b>Viscosity @ 100°C, cSt, ASTM D445</b>	27.0	36.5	47.6
<b>Viscosity @ 40°C, cSt, ASTM D445</b>	221	321	461
<b>Viscosity Index ASTM D2270</b>	157	160	161
<b>Flash Point °C (°F), (COC), ASTM D92</b>	243 (470)	243 (470)	241 (465)
<b>Pour Point °C (°F), ASTM D97</b>	-33 (-27)	-27 (-17)	-24 (-11)
<b>Rust Test 4 hrs @ 60°C, DI H<sub>2</sub>O, ASTM D665A</b>	Pass	Pass	Pass
<b>Rust Test 4 hrs @ 60°C, Sea H<sub>2</sub>O, ASTM D665B</b>	Pass	Pass	Pass
<b>Copper Corrosion 3 hrs @ 100°C, ASTM D130</b>	1b	1b	1b
<b>Oxidation by RPVOT @ 150°C, minutes, ASTM D2272</b>	1,149	1,133	1,130
<b>Four-Ball EP Weld Point kgf, ASTM D2783</b>	200	200	200
<b>Four-Ball Wear @ 75°C, 1,200 rpm, 40 kgf, 60 minutes, mm wear, ASTM D4172</b>	0.31	0.31	0.31
<b>Ash—Sulfated %, ASTM D874</b>	0.06	0.09	0.05
<b>Acid Number mg KOH/g, ASTM D664</b>	0.25	0.25	0.25
<b>Emulsion Characteristics @ 82°C, oil-water-emulsion/minutes, ASTM D1401</b>	40-40-0/10	40-40-0/15	40-40-0/15
<b>Foaming Characteristics @ 24°C/93.5°C/24°C, 3 sequences, ml of foam/time to break, ASTM D892</b>	0/0;0/0;0/0	0/0;0/0;0/0	0/0;0/0;0/0



## Performance Requirements Met or Exceeded

- AGMA 9005-D94 (OS)
- USDA H2

## Typical Applications

- Air compressors (reciprocating & rotary)
- Bearings (oil-lubricated)
- Chains (including dryer chains)
- Gearboxes
- Hydraulic systems
- Vacuum pumps
- Worm Gears (9460)
- Also suitable for use as:
  - ◊ Circulating oil
  - ◊ AGMA R & O Gear Oil

## Changeover Procedures

Because of the excellent cleaning action of LE's Monolec Synthetic Industrial Oil – which dissolves, loosens and removes any existing deposits – certain routine procedures are recommended when changing a compressor from another type of lubricant. Basically, all compressor and downstream parts that will be in contact with the oil should be as clean as practical before the changeover. Detailed changeover procedures are available upon request.



Monolec® is a registered trademark of Lubrication Engineers, Inc.

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LE operates under an ISO 9001 Certified Quality System.

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