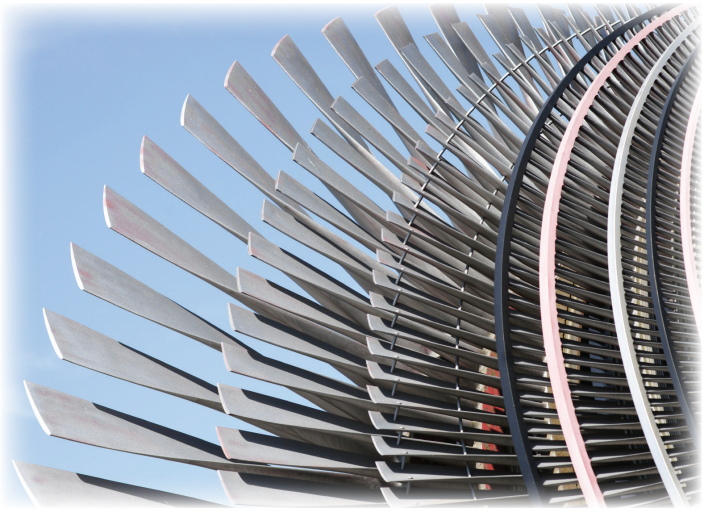
# Product Information

# Monolec® Turbine Oil (6461-6463)

## *Premium Oil Boosts Turbine Performance*



Highly effective for steam, hydro and gas turbine applications, Monolec Turbine Oil (6461-6463) reduces varnish, reduces water contamination, lengthens equipment life and extends drain intervals. It is a premium, high-performance turbine oil with excellent water separation characteristics, rust and oxidation inhibitors, and improved wear-reducing properties. Its proprietary formula consists of select low-volatility paraffinic base fluids enhanced with a synergistic mix of high-performance additives.

Certain turbine applications – including gear-driven turbines or those in which a hydraulic control system and turbine share the same oil – require oil with anti-wear properties. Unlike many anti-wear additives that decrease the oxidation resistance of turbine oils, the proprietary wear-reducing additive in Monolec Turbine Oil provides increased protection against wear with no negative effect on the oxidation life of the oil.

## Beneficial Qualities

***Reduces Varnish & Deposits in Gas & Steam Turbines***

- Exhibits excellent thermal stability
- Has rapid air release properties
- Resists formation of varnish and sludge

***Reduces Water Contamination in Steam & Hydro Turbines***

- Separates readily from water
- Provides excellent resistance to foaming
- Imparts superior rust protection

***Lengthens Equipment Life***

- Protects moving parts, due to its high film strength
- Enhances wear-reducing properties without affecting R & O inhibitors
  - Protects thrust plates in bearings

***Extends Drain Intervals***

- Provides long-term oxidation resistance and thermal stability
- Is easily filtered for long-term oil cleanliness

## Available Grades

- ISO 32 (6461)
- ISO 46 (6462)
- ISO 68 (6463)

## Proprietary Additive

LE's proprietary additives are used exclusively in LE lubricants. Monolec Turbine Oil contains Monolec.

**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.

# Technical Data

# Monolec® Turbine Oil

| | 6461 | 6462 | 6463 |
|---|---|---|---|
| **Color** | Amber | Amber | Amber |
| **Color** ASTM D1500 | 1 | 1 | 1 |
| **ISO VG** | 32 | 46 | 68 |
| **Relative Density** @ 60°F/60°F, ASTM D1298 | 0.864 | 0.868 | 0.872 |
| **Viscosity** @ 100°C, cSt, ASTM D445 | 5.140 | 6.820 | 8.830 |
| **Viscosity** @ 40°C, cSt, ASTM D445 | 29.73 | 46.12 | 69.10 |
| **Viscosity Index** ASTM D2270 | 95 | 95 | 95 |
| **Flash Point** °C (°F), (COC), ASTM D92 | 228 (442) | 234 (455) | 238 (460) |
| **Pour Point** °C (°F), ASTM D97 | -30 (-22) | -30 (-22) | -24 (-11) |
| **Low Temperature Stability** FTM 3458 | Pass | Pass | Pass |
| **Rust Test** 4 hrs @ 60°C, Sea $H_20$, ASTM D665B | Pass | Pass | Pass |
| **Copper Corrosion** 3 hrs @ 100°C, ASTM D130 | 1b | 1b | 1b |
| **Oxidation by RPVOT** @ 150°C, minutes, ASTM D2272 | 915 | 915 | 915 |
| **Oxidation by TOST** hours, ASTM D943 | >5,000 | >4,000 | >4,000 |
| **Panel Coker** mg, FTM 3462 | 134 | 134 | 134 |
| **Four-Ball Wear** @ 75°C, 1,200 rpm, 40 kgf, 60 minutes, mm wear, ASTM D4172 | 0.42 | 0.42 | 0.42 |
| **Ash—Sulfated** %, ASTM D874 | 0.05 | 0.05 | 0.05 |
| **Acid Number** mg KOH/g, ASTM D974 | ≤0.15 | ≤0.15 | ≤0.15 |
| **Emulsion Characteristics** @ 54°C, oil-water-emulsion/minutes, ASTM D1401 | 40ml-40ml-0ml/5 | 40ml-40ml-0ml/5 | 40ml-40ml-0ml/5 |
| **Filterability** wet, Stage I, ISO 13357 | Pass | Pass | Pass |
| **Foaming Characteristics** @ 24°C/93.5°C/24°C, 3 sequences, ml of foam / time to break, ASTM D892 | 0/0, 0/0, 0/0 | 0/0, 0/0, 0/0 | 0/0, 0/0, 0/0 |
| **Air Release** 9.0-90.0 cSt @ 40°C: 50°C, minutes, ASTM D3427 | 3.0 | 5.3 | 11.2 |

## Performance Requirements Met or Exceeded

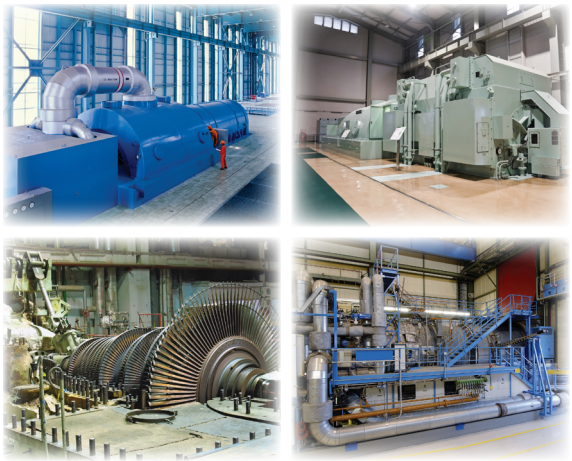
- Alstom
- Cincinnati Machine
- DIN 51524 Part 1
- General Electric
- ISO 8068 (L-TSA & L-TGA)
- MIL-H-17672D 2075 TH
- Siemens
- Solar Turbine
- USDA H2
- Westinghouse

## Recommendations

- Monolec Turbine Oil is suitable for all mainline and peaking turbine applications.

## Typical Applications

- Mainline steam, hydro and gas turbine generators
- Circulating oil systems
- Centrifugal compressors
- Other long-service-life applications



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