Product Information

Duolec® Industrial Gear Oil

(1601-1610, 1302, 1304)

High-Performance Oil Delivers Superior Lubrication in High-Temperature, High-Load Applications

Duolec Industrial Gear Oil (1601-1610, 1302, 1304) is a high-performance industrial gear oil with ISO grades ranging from ISO VG 46 to 1500. Designed for use in any industrial gear or bearing application that requires a thermally stable, extreme pressure/antiscuff lubricant, it maintains performance even after filtration.

Duolec Industrial Gear Oil contains Duolec, LE's dual-acting additive that provides both wear-reducing and EP protection, and is fortified with a shear stable tackifier to provide adhesion to metal during use.

Beneficial Qualities

Maintains Performance in Extreme Conditions

- Possesses high film strength
- Remains stable despite high temps
- Resists oxidation and sludge formation
- Provides wear-reducing and EP/antiscuff protection

Adheres to Metal

- Contains shear-stable tackifier that allows oil to adhere to metal components
- Remains tacky during high shear use

Resists Moisture

- Separates readily from water, continuing to provide effective lubrication
  - Ordinary gear oils will emulsify and foam, causing increased friction and poor lubrication

Filterable

- Contains no solids that can be removed during filtration
- Remains within viscosity grade after filtration

Proprietary Additive

LE's proprietary additives are used exclusively in LE lubricants. Duolec® Industrial Gear Oil contains Duolec.

Duolec® dual-acting additive imparts synergistic properties to lubricants, providing both wear-reducing and extreme pressure protection. The result of revolutionary technology designed specifically for use in LE gear lubricants, Duolec increases oil film strength and is temperature-activated to provide a protective layer that smooths metal surfaces and minimizes the effects of any contact, thereby reducing friction and preventing surface wear.

Technical Data

Duolec® Industrial Gear Oil

	1601	1602/1302*	1603	1604/1304*	1605	1606	1607	1608	1609	1610
Color	Purple	Purple/Amber	Purple	Purple/Amber	Purple	Purple	Purple	Purple	Purple	Purple
ISO VG	46	68	100	150	220	320	460	680	1000	1500
AGMA Grade	1 EP	2 EP	3 EP	4 EP	5 EP	6 EP	7 EP	8 EP	8A EP	9 EP
Relative Density ASTM D1298	0.864	0.874	0.881	0.882	0.884	0.886	0.887	0.889	0.892	0.893
Viscosity @ 100°C, cSt, ASTM D445	7.35	9.25	11.8	15.8	20.8	27.0	35.0	46.4	61.6	84.0
Viscosity @ 40°C, cSt, ASTM D445	48.30	71.40	105.0	157.5	231.0	336.0	483.0	714.0	1,050	1,575
Viscosity Index ASTM D2270	113	105	101	103	105	107	109	112	116	122
Flash Point °C (°F), (COC), ASTM D92	210 (410)	210 (410)	210 (410)	210 (410)	210 (410)	210 (410)	210 (410)	210 (410)	210 (410)	210 (410)
Pour Point °C (°F), ASTM D97	-30 (-22)	-27 (-17)	-24 (-11)	-21 (-6)	-18 (0)	-18 (0)	-15 (-5)	-12 (10)	-12 (10)	-9 (16)
Rust Test 4 hrs @ 60°C, Sea $H_2 0$, ASTM D665B	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Copper Corrosion 3 hrs @ 100°C, ASTM D130	1a	1a	1a	1a	1a	1a	1a	1a	1a	1a
FE-8 Bearing Wear D-7.5/80-80, roller loss, mg, DIN ISO 51819-3	-	-	-	<10	<10	<10	<10	<10	<10	<10
FZG Scuffing Load Capacity Fail Stage A/8.3/90, ISO 14635-1	12+	12+	12+	12+	14+	14+	14+	14+	14+	14+
Timken OK Load lb (kg), ASTM D2782	-	-	-	75 (34)	75 (34)	75 (34)	75 (34)	75 (34)	75 (34)	75 (34)
Four-Ball Wear @ 75°C, 1200 rpm, 40 kgf, 60 minutes, mm wear, ASTM D4172	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Emulsion Characteristics @54°C or 82°C**, mL oil/mL water/mL emulsion-minutes, ASTM D1401	40/40/0-10	40/40/0-10	40/40/0-10	40/40/0-10	40/40/0-15	40/40/0-15	40/40/0-15	40/40/0-20	40/40/0-20	40/40/0-25
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	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	0/0,0/0,0/0	0/0,0/0,0/0

**ISO 46 and 68 oils tested at 54°C; all others at 82°C.

Performance Requirements Met or Exceeded

- ANSI/AGMA 9005-F16
- AIST 224 (US Steel 224)
- DIN 51517-3 CLP
- ISO 12925-1 CKD
- USDA H2

Typical Applications

- Enclosed gearboxes
- Bowl mills / pulverizers
- Homogenizers
- Planetary gears
- Oil lubricated bearings

* 1302 & 1304 are undyed. All other ISO grades can be made available as undyed versions, contingent on a 10-drum minimum order.

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LE operates under an ISO 9001 Certified Quality System.
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