

Compressor Oil Technical Data Sheet

Compressors are widely used throughout industry and a quality lubricant is critical for reliable performance. There are several types of compressors, and Zschimmer & Schwarz offers synthetic ester base fluids that can be formulated into high quality lubricants for different compressor applications.

In most compressors and pumps, the fluid film is in the hydrodynamic regime, so the fluid viscosity is the most important factor in providing adequate lubrication. High quality synthetic esters are preferred when the application demands clean operation, elevated temperature, extended drain or other advanced performance characteristics.

Air compressor lubricants encounter a severe oxidizing environment because compression increases both the temperature and availability of oxygen. All compressor grade synthetic esters have excellent oxidative stability and low volatility so they reduce varnish buildup and minimize organic vapors in the compressed gas.

Reciprocating and rotary vane compressors take advantage of the inherent lubricity and solvency of diesters and trimellitates while rotary screw and centrifugal fluids benefit from the extreme oxidative stability of polyol esters. Refrigeration grades (SRL) have optimized miscibility with the refrigerant gas and must remain fluid at low temperature.

Synthetic Ester	Chemistry	Viscosity @40 °C(cSt)	Viscosity @100 °C(cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
Lexolube 2I-214	Polyol	6	2	125	190	-60
Lubricit DIOA	Diester	9	3	145	215	-70
Lubricit DIDA	Diester	13	4	145	220	-55
Lubricit TMP C9	Polyol	21	5	140	285	-30
Lexolube FG-22 HX1*	Polyol	22	5	140	250	-50
Lubricit DTDA	Diester	22	5	150	245	-55
Lexolube 2X-109	Diester	27	5	140	260	-60
Lexolube FG-46 HX1*	Polyol	46	8	135	270	-45
Lexolube PQ-68*	Polyol	68	9	105	250	-30
Lexolube FG-68 HX1*	Polyol	68	10	125	290	-45
Lubricit 9505	Diester	88	13	150	325	-65
Lubricit 3010	Trimellitate	135	13	80	280	-30
Lubricit DPE 89*	Polyol	310	23	90	300	-10
Lubricit 3013/1	Trimellitate	320	20	70	290	-30
Lexolube FG-350 HX1*	Polyol	350	24	85	300	-20
Lexolube CLG-460	Complex	460	43	135	285	-25
Lexolube CP-460LC	Complex	460	46	150	290	-25

Features

- ▶ Thermal/oxidative stability
- ▶ Low volatility
- ▶ High flash point
- ▶ Clean performance
- ▶ Low temperature fluidity
- ▶ Long service life

Applications

- ▶ Air compressors
- ▶ Refrigeration/SRL
- ▶ Flooded rotary screw
- ▶ Rotary vane
- ▶ Reciprocating
- ▶ Centrifugal

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Engine Oil Technical Data Sheet

Synthetic esters have long been used in high performance synthetic engine and racing oils because of their low NOACK volatility, thermal stability and additive compatibility. They also balance seal swell and solubilize sludge, soot and other oxidation byproducts. Zschimmer & Schwarz offers several synthetic ester base fluids for engine lubrication.

The automotive industry continues to demand lower viscosity motor oils that provide better fuel efficiency under more severe conditions all while expecting longer drain intervals. Engine oils must flow in the dead of winter to lubricate on startup and survive the engine's heat on a hot summer day. High quality synthetic esters combined with PAO and Group III mineral oils deliver advanced performance for the next generation of synthetic engine oils.

Diesters and polyol esters are particularly favored for two stroke engines oils that require an environmentally friendly, clean burning fuel additive that provides excellent lubricity without leaving residues.

Synthetic Ester	Chemistry	Viscosity @40 °C(cSt)	Viscosity @100 °C(cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
Lubricit DIOA	Diester	9	3	145	215	-70
Lubricit DOS	Diester	12	3	150	235	-55
Lubricit DIDA	Diester	13	4	145	220	-55
Lexolube 3I-310	Polyol	14	3	120	230	-65
Lubricit TMP C810	Polyol	19	4	140	270	-45
Lubricit TMP C9	Polyol	21	5	140	285	-30
Lubricit DTDA	Diester	22	5	150	245	-55
Lexolube 2X-109	Diester	27	5	140	260	-60
Lubricit PE 49	Polyol	33	6	150	315	-45
Lexolube PQ-68	Polyol	68	9	105	250	-30
Lubricit 9505	Diester	88	13	150	325	-65
Lubricit 2-EHD/1	Diester	93	14	145	310	-40
Lubricit 9522	Complex	160	21	140	310	-55
Lexolube CLG-460	Complex	460	43	135	285	-25
Lexolube CQ-3000	Complex	3000	290	230	320	-20

Features

- ▶ Thermal/oxidative stability
- ▶ Low NOACK volatility
- ▶ Low temperature fluidity
- ▶ Seal swell
- ▶ Long drain interval
- ▶ Additive solubility

Applications

- ▶ Synthetic engine oils
- ▶ Racing oils
- ▶ New ultra low viscosity grades
- ▶ Two stroke lubricant additives
- ▶ Environmentally friendly oils

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HX-1 Esters for Food Processing Technical Data Sheet

Food processing lubricants are nonfood compounds that can be used in applications where incidental food contact is possible. In the 1970's, the USDA recognized that a food processing factory requires operational fluids that are not intended to be part of the food. These include pesticides, sanitizers, and cleaning compounds as well as lubricants. USDA published a "white book" of acceptable nonfood compounds that were safe if used properly. Acceptable lubricants for incidental food contact are listed in the **H1** category.

The USDA stopped publishing this list in 1998. Today NSF International and InS Services have assumed a prominent role, providing third party confirmation that **H1** registered food processing lubricants are safe for their intended use.

The HX-1 category is used for ingredients such as base oils and additives that can be used to formulate an **H1** lubricant. To be clear, HX-1 ingredients and **H1** lubricants are for incidental food contact only. They are not food additives and cannot be intentionally added to food.

Synthetic Ester	Chemistry	Viscosity @40°C(cSt)	Viscosity @100C(cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
Lexolube IPO	Oleate	5	2	n/a	175	-25
Lexolube NBS	Stearate	6	2	200	195	20
Lexolube GT-855IG	Glyceryl	15	4	135	235	-15
Lexolube 3N-310	Polyol	19	4	140	270	-45
Lubricit 5399	Polyol	21	5	140	285	-30
Lexolube FG-22 HX1*	Polyol	22	5	140	250	-50
Lexolube FG-46 HX1*	Polyol	46	8	135	270	-45
Lubricit TMP C18-VEG	Oleate	46	9	190	325	-45
Lubricit GMO-VEG	Oleate	50	9	145	290	0
Lexolube FG-68 HX1*	Polyol	68	10	125	290	-45
Lexolube FG-100 HX1*	Polyol	100	12	120	300	-35
Lexolube FG-220 HX1*	Polyol	220	19	95	300	-25
Lubricit 9537	Polyol	300	22	90	300	-5
Lubricit 9526	Complex	330	45	185	320	-40
Lexolube FG-350 HX1*	Polyol	350	24	85	300	-20
Lexolube CG-3000	Complex	3000	290	230	320	-20

Features

- ▶ Thermal/oxidative stability
- ▶ Low volatility
- ▶ High flash point
- ▶ Clean performance
- ▶ Low temperature fluidity
- ▶ Long service life

Applications

- ▶ Compressor oils
- ▶ Chain oils
- ▶ Grease
- ▶ Gear oils
- ▶ Adjuvant- lubricity additive

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Hydraulic Fluid Technical Data Sheet

Hydraulic fluids are essentially incompressible liquids that transfer power through a piping system. During operation, the system operates under pressure so the viscosity of the fluid must be high enough to minimize leakage. Conversely, high viscosity hurts flow properties and efficiency as viscous heating of the fluid becomes significant. Since hydraulic fluids may operate over a range of temperatures, the pour point and viscosity index are important. The fluid provides lubrication to the pump and valves and helps to prevent corrosion of metal parts. It must also be compatible with elastomeric sealing materials. The fluid may need to perform under conditions that can cause oxidation, hydrolysis, or contamination, and it should not be toxic or harmful when leaked or discarded.

Hydraulic systems are commonly used in transportation and industrial applications, and the service conditions vary significantly. Water or mineral oil fluids are adequate for many uses, and synthetic esters are used when biodegradability, fire resistance, or other advanced performance characteristics are required. International Standards Organization (ISO) classifies fire resistant synthetic ester fluids in the HFDU category.

Synthetic Ester	Chemistry	Viscosity @40 °C(cSt)	Viscosity @100 °C(cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
Lubricit 2-EHO	Monoester	8	3	190	215	-40
Lubricit DINA	Diester	11	3	140	220	-60
Lexolube 3I-310	Polyol	14	3	120	230	-65
Lubricit TMP C9	Polyol	21	5	140	285	-30
Lubricit DTDA	Diester	22	5	150	245	-55
Lubricit NGDO	Polyol	24	6	200	270	-60
Lexolube 2X-109	Diester	27	5	140	260	-60
Lubricit PE 49	Polyol	33	6	150	315	-45
Lubricit TMP THCFA	Polyol	37	7	155	300	-15
Lubricit TMP C18	Polyol	46	9	190	325	-45
Lubricit PE 418	Polyol	66	12	185	340	-35
Lexolube PQ-68	Polyol	68	9	105	250	-30
Lubricit 9526	Complex	330	45	185	320	-40
Lexolube CP-460LC	Complex	460	46	150	290	-25
Lexolube CG-3000	Complex	3000	290	230	320	-20

Features

- ▶ High flash and fire point
- ▶ Excellent lubricity
- ▶ Biodegradability
- ▶ Seal swell
- ▶ Wide temperature performance

Applications

- ▶ Fire resistant (HFDU) oils
- ▶ Mobile machinery
- ▶ Marine (VGP) hydraulics
- ▶ Environmentally friendly oils
- ▶ Food processing

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Metalworking Technical Data Sheet

Lexolube and Lubricit Synthetic Esters are widely used in metalworking, aluminum rolling and related applications. They are effective boundary lubricants in straight oils and water based systems. Synthetic esters have low VOC and a favorable toxicological profile so they are worker friendly and environmentally responsible.

Mulsifan products are non-ionic emulsifiers which are excellent for soluble oils and semi-synthetic fluids. They are low foaming and hard water stable.

Phosphetal phosphate esters are non-staining emulsifiers and corrosion inhibitors that improve lubricity and are particularly useful in aluminum machining applications.

Synthetic Ester	Chemistry	Viscosity @40 °C(cSt)	Viscosity @100 °C(cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
Lexolube IPP	Monoester	5	2	n/a	165	12
Lexolube IPO	Monoester	5	2	n/a	175	-25
Lubricit 2-EHL	Monoester	5	2	n/a	185	-25
Lexolube NBS	Monoester	6	2	200	195	20
Lubricit 2 EHC	Monoester	6	2	150	195	-30
Lubricit 2 EHO	Monoester	8	3	190	215	-40
Lexolube EHP	Monoester	9	3	165	220	0
Lubricit 2-EHS	Monoester	10	3	170	220	5
Lexolube HS-S	Monoester	11	3	165	225	5
Lexolube B-109	Monoester	17	4	160	230	5
Lubricit NGDO	Polyol ester	24	6	200	270	-60
Lubricit TMP THCFA	Polyol ester	37	7	155	300	-15
Lubricit TMP C18	Polyol ester	46	9	190	325	-45
Lubricit GMO	Glycerol monooleate	51	9	145	290	5
Lubricit PE 418	Polyol ester	66	12	185	340	-35
Lubricit PE 118	PE monooleate	115	14	125	320	-15
Lubricit 9538	Complex ester	140	22	180	290	-20
Lubricit 9526	Complex ester	330	45	185	320	-40
Lexolube CLG-460	Complex ester	460	43	135	285	-25
Lexolube CP-460LC	Complex ester	460	46	150	290	-25
Lexolube CQ-3000	Complex ester	3000	205	180	300	-15
Lexolube CG-3000	Complex ester	3000	290	230	320	-20

Synthetic Ester features

- ▶ Long tool life
- ▶ Worker friendly
- ▶ Biodegradability
- ▶ Hydrolytic stability
- ▶ Extreme pressure

Mulsifan emulsifiers

- ▶ Mulsifan 200 MO
- ▶ Mulsifan 400 DO
- ▶ Mulsifan L61 DO
- ▶ Mulsifan CO-25 TL

Classes

- ▶ Straight Oils
- ▶ Soluble Oils
- ▶ Synthetic
- ▶ Semi-Synthetic

Phosphetal phosphate esters

- ▶ Phosphetal PP-6
- ▶ Phosphetal C810-4
- ▶ Phosphetal TDA-9
- ▶ Phosphetal OAX

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Textile and Fiber Technical Data Sheet

Synthetic esters are used in the textile industry to lubricate the machinery and the fibers themselves. Fibers move through textile processing equipment at very high speeds, creating the opportunity for friction that will cause wear on stationary parts, and can snag and break the fibers. A good lubricant will reduce heat, friction and wear on high speed spindles and bearings, allowing the machines to be run faster with less down time.

Clothing, carpet and other textiles are appearance based products, so the color, look and feel are critical in the textile industry. Lubricants cannot interfere with the appearance of the finished product so they must wash or bake off cleanly and leave no residues that affect dyeing or other post-processing steps. A textile lubricant should not absorb into or stain the fiber or form varnish on the machine.

Different operations and fiber types require specific lubricants, so a variety of esters are used in the textile industry. The fiber lubricant is typically either a neat ester or an aqueous emulsion. Zschimmer & Schwarz has a long history of providing ingredients for both neat esters and spin finish emulsions for the textile industry and can recommend the appropriate solution for any type of fiber lubrication

Synthetic Ester	Chemistry	Viscosity @40 °C(cSt)	Viscosity @100 °C(cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
Lexolube IPP	Monoester	5	2	n/a	165	12
Lexolube NBS	Monoester	6	2	200	195	20
Lexolube 2I-214	Polyol ester	6	2	125	190	-60
Lexolube EHP	Monoester	9	3	165	220	0
Lubricit 2-EHS	Monoester	10	3	170	220	5
Lexolube 3I-310	Polyol ester	14	3	120	230	-65
Lexolube B-109	Monoester	17	4	160	230	5
Lubricit TMP C9	Polyol ester	21	5	140	285	-30
Lubricit PE 49	Polyol ester	33	6	150	315	-45
Lubricit TMP THCFA	Polyol ester	37	7	155	300	-15

Synthetic ester features

- ▶ Excellent Lubricity
- ▶ Washes clean
- ▶ Non-Staining
- ▶ Low smoke
- ▶ Low absorption
- ▶ Narrow boiling range
- ▶ High temperature stability

Textile emulsifiers

- ▶ Mulsifan 300 DL- HLB 8.2
- ▶ Mulsifan 400 DL- HLB 10.0
- ▶ Mulsifan 400 DO- HLB 8.3
- ▶ Mulsifan 400 MHCFA- HLB 13.2
- ▶ Mulsifan 400 ML- HLB 13.3
- ▶ Mulsifan 400 MP- HLB 14.3
- ▶ Mulsifan 600 DO- HLB 10.3

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