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LUBRICANTS

lexolube
synthetic esters

Low Viscosity Synthetic Esters

Z&S Formulation Component Options



ZSCHIMMER & SCHWARZ



Low Viscosity – Low Volatility – High Flash Point Synthetic Ester Fluids

1. Synthetic Esters for Transformer and Dielectric Applications
2. Synthetic Esters for Multipurpose EV Lubricant/Coolants
3. Synthetic Esters for “0W” Engine Oils
4. Synthetic Esters for Hybrid Hydraulic Vehicles

Z&S Synthetic Esters are tailor-made to meet the requirements of next generation fluids that must balance cost and performance:

- Viscosity
- Sustainability
- Environmental regulations
- Oxidative and Hydrolytic stability (long life)
- Volatility
- High flash point (fire safety)
- Energy efficiency (VI and CoF)
- Metal and Polymer Compatibility



Product Selection Criteria

1. Synthetic Esters for Transformer and Dielectric Applications
 - ▶ KV40 from 14-35 cSt to meet IEC 61099
 - ▶ Flash points >250°C
 - ▶ Fully saturated for long life in an open system exposed to some air
2. Synthetic Esters for Multipurpose EV Lubricant/Coolants
 - ▶ KV40 from 2-9 cSt (options below 10 cSt), KV100 <2.5 cSt.
 - ▶ Low pour points less than -20°C as these systems will be in outdoor mobile systems
 - ▶ Fully saturated and Oleates included, as cost is probably a major factor. Systems are sealed for life.
3. Synthetic Esters for “0W” Engine Oils
 - ▶ KV40 from 5-46 cSt as these will be minor blend components (1-20%) likely mixed with PAO or Group III oils.
 - ▶ High VI esters could reduce the need for polymers in order to achieve HTHS viscosity @ 150°C (SAE J300)
 - ▶ Balancing low viscosity with low volatility. Low Pour Point (< -25°C) is important.
 - ▶ Fully saturated for long life in an open sump system exposed to air
4. Synthetic Esters for Hybrid Hydraulic Vehicles
 - ▶ KV40 from 9-46 cSt. Fluids ISO 22-46 with high VI are most likely candidates.
 - ▶ Low pour points less than -20°C as these systems will be in outdoor mobile systems
 - ▶ Fully saturated and Oleates included, as cost is probably a major factor. Systems are sealed for life.



1) Synthetic Esters for Transformer and Dielectric Oils

Product Name	Chemical Class	KV, cSt @40°C	KV, cSt @100°C	Viscosity Index	Pour Point, °C	Flash Point, °C	Dielectric Breakdown Voltage, kV ASTM D-1816 2mm	Dielectric Breakdown Voltage, kV IEC 60156 2.5mm
LEXOLUBE 3I-310	POE	14	3.4	120	-65	230	>45	>75
LEXOLUBE 3Q-310	POE	18	4.0	120	-65	250	>45	>75
LEXOLUBE 3N-310	POE	20	4.4	140	-40	260	>45	>75
LUBRICIT TMP C9	POE	21	4.6	140	-50	275	>45	>75
LUBRICIT PE 510/1	POE	22	4.7	135	-45	285	>45	>75
LEXOLUBE PQ-25	POE	25	5.0	134	-55	265	>45	>75
LEXOLUBE 2X-109	Diester	27	5.4	135	-60	250	>45	>75
LUBRICIT TF 9559	POE	29	5.3	120	-50	270	>45	>75
LEXOLUBE PQ-32	POE	32	6.0	130	-45	260	>45	>75

Please inquire about tailor-made products that can be made to fit your exact performance requirements!



1) Z&S Low Viscosity Esters for Transformer Dielectric Coolants and other Applications

Product Name	Chemical Class	Saturated/ Unsaturated	KV, cSt @40°C	KV, cSt @100°C	Viscosity Index	Pour Point, °C	Flash Point, °C	Biobased, Wt. %	Dielectric Breakdown Voltage, kV ASTM D-1816 2mm	Dielectric Breakdown Voltage, kV IEC 60156 2.5mm	NOACK Volatility Wt. %	Specific Gravity
LEXOLUBE 3I-310	Polyol Ester	Saturated	14	3.4	120	-65	230	0	>45	>75	14	0.96
LEXOLUBE 3Q-310	Polyol Ester	Saturated	18	4.0	120	-65	250	82	>45	>75		0.95
LEXOLUBE 3N-310	Polyol Ester	Saturated	20	4.4	140	-40	260	84	>45	>75	5	0.94
LUBRICIT TMP C9	Polyol Ester	Saturated	21	4.6	140	-50	275	0	>45	>75	3	0.94
LEXOLUBE POE-22	Polyol Ester	Saturated	22	4.7	140	-40	270	74	>45	>75	4	0.94
LUBRICIT PE 510/1	Polyol Ester	Saturated	22	4.7	135	-45	285	38	>45	>75	3	0.98
LUBRICIT DTDA	Diester	Saturated	23	4.9	145	-55	245	0	>45	>75	9	0.91
LEXOLUBE PQ-25	Polyol Ester	Saturated	25	5.0	134	-55	265	0	>45	>75	4	0.98
LEXOLUBE 2X-109	Diester	Saturated	27	5.4	135	-60	250	0	>45	>75	9	0.91
LUBRICIT TF 9559	Polyol Ester	Saturated	29	5.3	120	-50	270	0	>45	>75	3	0.97
LEXOLUBE POE-32	Polyol Ester	Saturated	32	6.0	130	-50	265	31	>45	>75	2	0.95
LEXOLUBE PQ-32	Polyol Ester	Saturated	32	6.0	130	-45	260	0	>45	>75	3	0.97

Dielectric Constant: ASTM D150
All Esters in this chart have a DC of 3.3 ± 0.3



1) Visit:

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Dielectric Coolants Technical Data Sheet

Synthetic esters provide excellent thermal conductivity, oxidative stability, and fire resistance, making them the preferred base fluid for dielectric coolant applications.

Single phase dielectric coolants must have low viscosity and low volatility combined with high dielectric strength and high electrical resistivity. Synthetic esters are environmentally friendly alternatives to mineral oils and fluorocarbons that can be used as immersion coolants to significantly improve heat removal and reduce energy consumption compared to air cooling.

When used as fire resistant transformer fluids or EV battery thermal control fluids, esters deliver long life, low deposit formation and good materials compatibility. Synthetic ester base stocks are the high-performance choice for modern transformers and increasingly sophisticated EV batteries that can meet the demands of IEC, UL and Factory Mutual approval standards.

Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
LEXOLUBE 3I-310	Polyol	14	3.4	120	230	-85
LEXOLUBE 3Q-310	Polyol	18	4.0	120	250	-85
LEXOLUBE 3N-310	Polyol	20	4.4	140	260	-40
LUBRICIT TMP C9	Polyol	21	4.6	140	275	-50
LEXOLUBE POE-22	Polyol	22	4.7	140	270	-40
LUBRICIT PE 510/1	Polyol	22	4.7	135	285	-45
LUBRICIT DTD A	Diester	23	4.9	145	245	-55
LEXOLUBE PQ-25	Polyol	25	5.0	134	265	-55
LEXOLUBE 2X-109	Diester	27	5.4	135	250	-80
LEXOLUBE PQ-32	Polyol	32	6.0	130	260	-45
LEXOLUBE POE-32	Polyol	32	6.0	130	265	-50

Features

- Thermal/oxidative stability
- Low volatility
- No deposit formation
- High thermal conductivity
- Low temperature fluidity
- High flash point/fire resistance
- Long service life
- Readily Biodegradable
- High dielectric strength
- Low dissipation factor
- High DC resistivity

Applications

- IEC 61099 synthetic ester transformer fluids
- Low GWP immersion computing coolants
- Multifunctional electric vehicle battery coolants and lubricants
- IEC 61100 K3-class fire resistant transformer fluids
- UL EOU/EOVK and FM 6399 approved transformer fluids
- Capacitors
- High voltage cables
- Switchgear
- Tap changers

Please inquire about additional tailor-made products that can be made to fit your exact performance requirements.

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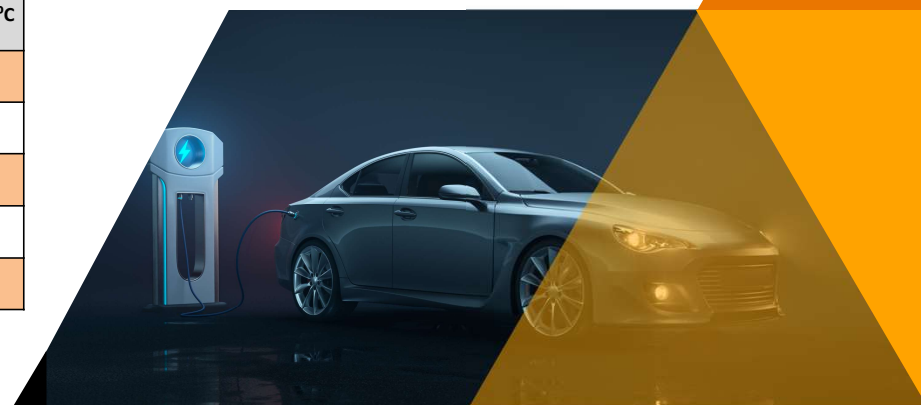
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2) Ultra-Low Viscosity Synthetic Esters for Multipurpose EV Lubricant/Coolants

Ref #	Product Name	KV, cSt @20°C	KV, cSt @40°C	KV, cSt @100°C	Dielectric Breakdown Voltage, kV ASTM D-1816 2mm	Dielectric Breakdown Voltage, kV IEC 60156 2.5mm	Pour Point, °C	Flash Point, °C
ULV-1	LUBRICIT EXP 23016A	2.6	1.8	0.8	>45	>75	<-80	115
ULV-2	LUBRICIT EXP 23016B	3.8	2.6	1.1	>45	>75	<-80	140
ULV-3	LUBRICIT EXP 23016D	4.0	2.7	1.0	>45	>75	-77	135
ULV-4	LUBRICIT EXP 23016C	4.5	2.9	1.2	>45	>75	-80	150
ULV-5	LUBRICIT 2-EH iC9	5.8	3.6	1.4	>45	>75	-75	150



Please inquire about tailor-made products that can be made to fit your exact performance requirements!



2) Z&S Low Viscosity Esters for Multipurpose EV Lubricant/Coolants and other Dielectric Applications

Ref #	Product Name	Chemical Class	Saturated/Unsaturated	KV, cSt @20°C	KV, cSt @40°C	KV, cSt @100°C	Pour Point, °C	Flash Point, °C	DBV, kV ASTM D-1816 2mm	DBV, kV IEC 60156 2.5mm	Dielectric Dissipation Factor ASTM D924	Biobased Wt. %	NOACK Volatility
ULV-1	LUBRICIT EXP 23016A	Monoester	Saturated	2.6	1.8	0.8	<-80	115	>45	>75	<0.03	0	100
ULV-2	LUBRICIT EXP 23016B	Monoester	Saturated	3.8	2.6	1.1	<-80	140	>45	>75	<0.03	0	100
ULV-3	LUBRICIT EXP 23016D	Monoester	Saturated	4.0	2.7	1.0	-77	135	>45	>75	<0.03	0	100
ULV-4	LUBRICIT EXP 23016C	Monoester	Saturated	4.5	2.9	1.2	-80	150	>45	>75	<0.03	50	100
ULV-5	LUBRICIT 2-EH iC9	Monoester	Saturated	5.8	3.6	1.4	-75	150	>45	>75	<0.03	0	100
LV-6	LUBRICIT EXP 23038C	Diester	Saturated	6.2	3.6	1.1	<-80	135	>45	>75	<0.03	0	100
LV-7	LUBRICIT EXP 23018A	Diester	Saturated	7.2	4.3	1.6	-20	175	>45	>75	<0.03	0	100
LV-8	LUBRICIT iC9-9	Monoester	Saturated	7.7	4.7	1.7	-75	145	>45	>75	<0.03	0	100
LV-9	LUBRICIT EXP 23018D	Monoester	Saturated	7.9	4.8	1.7	-70	175	>45	>75	<0.03	0	100
LV-10	LEXOLUBE IPP	Monoester	Saturated	8.6	5.0	2.0	12	170	>45	>75	<0.03	85	93
LV-11	LUBRICIT EXP 23018B	Diester	Saturated	8.7	5.2	1.8	-20	190	>45	>75	<0.03	0	66
LV-12	LUBRICIT 2-EHL	Monoester	Saturated	8.7	5.2	1.8	-25	185	>45	>75	<0.03	55	60
LV-13	LEXOLUBE IPO	Monoester	Unsaturated	9.1	5.3	2.0	-25	175	>45	>75	<0.03	88	85
LV-14	LUBRICIT 2-EHC	Monoester	Saturated	10.1	5.7	2.0	-25	180	>45	>75	<0.03	59	60
LV-15	LEXOLUBE 2I-214	Polyol Ester	Saturated	10.0	5.7	1.9	-70	190	>45	>75	<0.03	0	62
LV-16	LUBRICIT EXP 23018C	Diester	Saturated	10.7	6.0	2.0	-15	192	>45	>75	<0.03	0	50
LV-17	LUBRICIT DOA	Diester	Saturated	14.6	7.6	2.3	-50	215	>45	>75	<0.03	0	36
LV-18	LUBRICIT EXP 23018E	Diester	Saturated	15	7.7	2.1	-50	195	>45	>75	<0.03	0	
LV-19	LUBRICIT EXP 23018F	Monoester	Saturated	15	7.8	2.3	-80	200	>45	>75	<0.03	0	
LV-20	LUBRICIT 2-EHO	Monoester	Unsaturated	15	8.2	2.7	-40	220	>45	>75	<0.03	65	20
LV-21	LUBRICIT NGC810	Polyol Ester	Saturated	15	8.2	2.5	-30	205	>45	>75	<0.03	73	
LV-22	LUBRICIT NG 710	Polyol Ester	Saturated	15	8.3	2.5	-50	210	>45	>75	<0.03	62	33



Dielectric Constant: ASTM D150
All Esters in this chart have a DC of 3.3 ± 0.3

DBV = Dielectric Breakdown Voltage: ASTM D1816 2mm gap
Power Factor/ Dielectric Dissipation Factor: ASTM D924

2) Visit:

www.zslubes.com

for additional information about these and other product options.



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Monoesters Technical Data Sheet

Monoesters are manufactured from naturally occurring long chain fatty acids, primarily derived from renewable fats and seed oils. These simple ester molecules have a polar ester group that is attracted to metal surfaces while the hydrocarbon tail provides a lubricious layer that reduces friction and provides boundary lubrication. Monoesters have a low viscosity, high viscosity index (VI), good thermal stability and excellent biodegradability. These esters have an outstanding health and safety profile and some are popular ingredients for personal care products and cosmetics.

Isopropyl and other branched esters (covered under US pat. 7,008,000) give outstanding hydrolytic stability and are preferred for water-based metalworking and textile applications. Monoesters are also used as lubricity additives in mineral oil and synthetic hydrocarbon lubricants to improve EHL and boundary lubrication.

The low viscosity and high polarity of monoesters facilitate the removal of residual lubricant by washing after processing, important for metalworking and textile applications where surfaces must be free of residue that would impact plating, painting or dyeing.

Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
LUBRICIT 2-EH iC9	Saturated	3.5	1.4	n/a	150	-75
LUBRICIT iC9-9	Saturated	4.5	1.7	n/a	145	-75
LUBRICIT 2-EHL	Saturated	5.0	1.8	n/a	185	-25
LEXOLUBE IPP	Saturated	5.0	2.0	275	170	10
LEXOLUBE IPO	Unsaturated	5.5	2.0	215	175	-25
LUBRICIT 2-EHC	Saturated	6.0	2.0	165	180	-25
LEXOLUBE NBS	Saturated	6.5	2.2	195	195	20
LUBRICIT 10L	Saturated	7.0	2.3	170	195	20
LUBRICIT 2-EHO	Unsaturated	8.0	2.7	190	220	-40
LUBRICIT 2-EHC16	Saturated	8.5	2.6	165	210	0
LUBRICIT 2-EHS	Saturated	10	2.9	170	220	5
LEXOLUBE HS-S*	Saturated	11	3.0	130	225	5
LUBRICIT TDS	Saturated	16	4.2	170	240	0

Features

- Lubricity/boundary lubrication
- Low viscosity
- Low smoke
- Thermal stability
- Renewable/biodegradable
- Worker friendly

Applications

- Metalworking
- Textile
- Oilfield
- Grease
- Bio-based lubricants
- Environmentally friendly lubricants

Please inquire about additional tailor-made products that can be made to fit your exact performance requirements.

*Certain methods and uses may be covered by one or more awarded or pending patents held by Zschimmer & Schwarz worldwide

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3) Synthetic Ester Base Stocks for “0W” Engine Oils Components for Energy/Resource Conserving Grades

Product Name	Chemical Class	Saturated/ Unsaturated	KV, cSt @40°C	KV, cSt @100°C	Viscosity Index	Pour Point, °C	Flash Point, °C
LEXOLUBE 2I-214	Polyol Ester	Saturated	5.7	1.9	130	-70	190
LUBRICIT DOA	Diester	Saturated	7.6	2.3	120	-50	215
LUBRICIT DIOA	Diester	Saturated	9.0	2.7	150	-60	215
LUBRICIT 2-EHAZ	Diester	Saturated	11	3.1	150	-70	215
LUBRICIT DIDA	Diester	Saturated	14	3.6	145	-60	230
LUBRICIT TMP C810	Polyol Ester	Saturated	20	4.4	140	-40	260
LUBRICIT PE 510/1	Polyol Ester	Saturated	22	4.7	135	-45	285
LEXOLUBE PQ-25	Polyol Ester	Saturated	25	5.0	134	-55	265
LUBRICIT DTDA/1	Diester	Saturated	27	5.4	135	-60	250
LEXOLUBE PQ-32	Polyol Ester	Saturated	32	6	130	-45	260



Please inquire about tailor-made products that can be made to fit your exact performance requirements!



3) Z&S Low Viscosity Esters for “0W” Engine oils, Transmission fluids and other Applications

Product Name	Chemical Class	Saturated/ Unsaturated	KV, cSt @40°C	KV, cSt @100°C	Viscosity Index	Pour Point, °C	Flash Point, °C	Biobased Wt. %	NOACK Volatility	Specific Gravity	Metal working	Grease	Compressor Oil	Engine Driveline	Hydraulic Fluid	Textile, Fiber	Dielectric Coolant
LEXOLUBE IPO	Monoester	Unsaturated	5.3	2.0	215	-25	175	88	85	0.86	MW	GR		ED	HF		
LEXOLUBE 2I-214	Polyol Ester	Saturated	5.7	1.9	130	-70	190	0	62	0.92	MW	GR	CO	ED		TF	
LUBRICIT DOA	Diester	Saturated	7.6	2.3	120	-50	215	0	36	0.93	MW	GR	CO	ED			
LUBRICIT 2-EHO	Monoester	Unsaturated	8.2	2.7	190	-40	220	65	20	0.87	MW	GR		ED	HF		
LUBRICIT NGC810	Polyol Ester	Saturated	8.2	2.5	135	-30	205	73		0.91		GR		ED			
LUBRICIT DIOA	Diester	Saturated	9.0	2.7	150	-60	215	0	27	0.92	MW	GR	CO	ED			
LUBRICIT NGDP/1	Polyol Ester	Saturated	9.0	2.6	115	-30	205	0		0.92				ED			
LUBRICIT 2-EHAZ	Diester	Saturated	11	3.1	150	-70	215	40		0.92	MW	GR	CO	ED			
LUBRICIT DINA	Diester	Saturated	11	3.1	150	-60	220	0		0.92	MW	GR	CO	ED	HF		
LUBRICIT DOS	Diester	Saturated	12	3.2	150	-58	235	41		0.91	MW	GR	CO	ED			
LUBRICIT DIDA	Diester	Saturated	14	3.6	145	-60	230	0	18	0.92	MW	GR	CO	ED			
LEXOLUBE 3Q-310	Polyol Ester	Saturated	18	4.0	120	-65	250	82		0.95		GR		ED			DC
LUBRICIT TMP C810	Polyol Ester	Saturated	20	4.4	140	-40	260	84	5	0.94	MW	GR	CO	ED			
LUBRICIT DIDS	Diester	Saturated	21	4.7	155	-50	240	48		0.91	MW	GR	CO	ED			
LUBRICIT TMP C9	Polyol Ester	Saturated	21	4.6	140	-50	275	0	3	0.94	MW	GR	CO	ED	HF	TF	DC
LUBRICIT PE 510/1	Polyol Ester	Saturated	22	4.7	135	-45	285	38	3	0.98		GR	CO	ED	HF		DC
LEXOLUBE PQ-25	Polyol Ester	Saturated	25	5.0	134	-55	265	0	4	0.98		GR	CO	ED			DC
LUBRICIT DTDA/1	Diester	Saturated	27	5.4	135	-60	250	0	9	0.91	MW	GR	CO	ED	HF		
LEXOLUBE PQ-32	Polyol Ester	Saturated	32	6	130	-45	260	0	3	0.97		GR	CO	ED	HF		DC
LUBRICIT 9515	Polyol Ester	Saturated	46	8.2	150	-35	280	0		0.91			CO	ED	HF		



3) Visit:

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for additional information about these and other product options.



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Engine and Driveline Technical Data Sheet

Synthetic esters are high performance base stock components used in the formulation of synthetic engine, transmission and racing oils due to their low NOACK volatility, thermal stability and compatibility with mineral oil and PAO base oils. Their polar nature conditions seals, improves additive solubility and reduces deposit formation solubilizing sludge, soot and other oxidation byproducts. Synthetic esters provide shear stable high viscosity index which enhances operating efficiency and fuel economy.

The global automotive industry continues to demand lower viscosity motor oils that provide better fuel efficiency under more severe conditions, while maintaining wear protection and long drain intervals. Engine and transmission oils must flow under cold weather conditions to lubricate on startup and also provide lubricating film strength under high temperature/high shear conditions. 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 component that provides excellent lubricity and inhibits deposit formation.

Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
LUBRICIT DIOA	Diester	9	2.7	150	215	-60
LUBRICIT DOS	Diester	12	3.2	150	235	-58
LUBRICIT DIDA	Diester	14	3.6	145	230	-60
LEXOLUBE 3I-310	Polyol	14	3.4	120	230	-65
LUBRICIT TMP C810	Polyol	20	4.4	140	260	-40
LUBRICIT TMP C9	Polyol	21	4.6	140	275	-50
LUBRICIT PE 510/1	Polyol	22	4.7	135	285	-45
LUBRICIT DTDA	Diester	23	4.9	145	245	-55
LUBRICIT DTDA/1	Diester	27	5.4	135	250	-60
LUBRICIT 9515	NPG	46	8.2	150	280	-35
LEXOLUBE PQ-68	Polyol	68	8.6	100	250	-30
LUBRICIT 9505	Dimer	68	13	150	325	-30
LUBRICIT 2-EHD/1	Dimer	93	13	140	310	-40
LUBRICIT 9522	Complex	140	19	145	310	-50
LEXOLUBE CLG-460	Complex	460	40	135	285	-20
LEXOLUBE CQ-3000	Complex	3000	205	180	300	-15

Features

- ▶ Thermal/oxidative stability
- ▶ Low NOACK volatility
- ▶ Shear stable high viscosity index
- ▶ Low temperature fluidity
- ▶ Additive solubility
- ▶ Lubricity
- ▶ Deposit and sludge control

Applications

- ▶ Synthetic engine oils
- ▶ Racing oils
- ▶ New ultra low FE viscosity grades
- ▶ Two stroke lubricant additives
- ▶ Environmentally friendly oils
- ▶ Transmission fluids
- ▶ Dual purpose coolant/lubricants for electric vehicles

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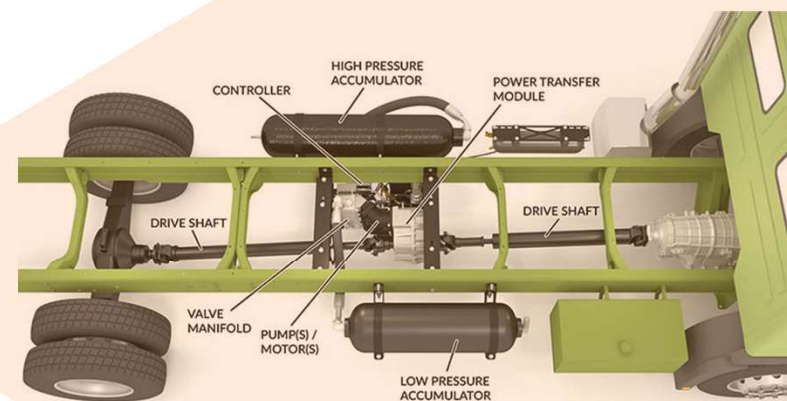
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lexolube
synthetic esters

4) Synthetic Esters for Hydraulic Hybrid Systems

Product Name	Chemical Class	Saturated/ Unsaturated	KV @40°C	KV @100°C	Viscosity Index	Pour Point, °C	Flash Point, °C
LUBRICIT DIOA	Diester	Saturated	9.0	2.7	150	-60	215
LUBRICIT DINA	Diester	Saturated	11	3.1	150	-60	220
LEXOLUBE 3I-310	Polyol Ester	Saturated	14	3.4	120	-65	230
LUBRICIT TMP C810	Polyol Ester	Saturated	20	4.4	140	-40	260
LUBRICIT TMP C9	Polyol Ester	Saturated	21	4.6	140	-50	275
LUBRICIT NGDO	Polyol Ester	Unsaturated	24	5.8	200	-30	260
LEXOLUBE PQ-25	Polyol Ester	Saturated	25	5.0	134	-55	265
LUBRICIT DTDA/1	Diester	Saturated	27	5.4	135	-60	250
LEXOLUBE PQ-32	Polyol Ester	Saturated	32	6.0	130	-45	260
LUBRICIT 9515	Polyol Ester	Saturated	46	8.2	150	-35	280
LUBRICIT TMP C18	Polyol Ester	Unsaturated	46	9.4	190	-45	325

Please inquire about tailor-made products that can be made to fit your exact performance requirements!



4) Z&S Synthetic Esters for Hydraulic Hybrid Vehicle Systems and other Applications

Product Name	Chemical Class	Saturated/ Unsaturated	KV @40°C	KV @100°C	Viscosity Index	Pour Point, °C	Flash Point, °C	Biobased Wt. %	NOACK Volatility	Specific Gravity	Metal working	Grease	Compressor Oil	Engine Driveline	Hydraulic Fluid	Textile, Fiber	Dielectric Coolant
LEXOLUBE 2I-214	Polyol Ester	Saturated	5.7	1.9	130	-70	190	0	62	0.92	MW	GR	CO	ED	HF	TF	
LUBRICIT DOA	Diester	Saturated	7.6	2.3	120	-50	215	0	36	0.93		GR	CO	ED	HF		
LUBRICIT 2-EHO	Monoester	Unsaturated	8.2	2.7	190	-40	220	65	20	0.87	MW	GR			HF		
LUBRICIT DIOA	Diester	Saturated	9.0	2.7	150	-60	215	0	27	0.92		GR	CO	ED	HF		
LUBRICIT NGDP/1	Polyol Ester	Saturated	9.0	2.6	115	-30	205	0		0.92	MW			ED	HF		
LUBRICIT DINA	Diester	Saturated	11	3.1	150	-60	220	0		0.92		GR	CO	ED	HF		
LUBRICIT DIDA	Diester	Saturated	14	3.6	145	-60	230	0	18	0.92		GR	CO	ED	HF		
LEXOLUBE 3I-310	Polyol Ester	Saturated	14	3.4	120	-65	230	0	14	0.96		GR		ED	HF	TF	DC
LUBRICIT TMP C810	Polyol Ester	Saturated	20	4.4	140	-40	260	84	5	0.94		GR	CO	ED	HF		
LUBRICIT PGDO	Diester	Unsaturated	21	5.5	215	-30	280	100		0.90	MW				HF		
LUBRICIT TMP C9	Polyol Ester	Saturated	21	4.6	140	-50	275	0	3	0.94		GR	CO	ED	HF	TF	DC
LUBRICIT PE 510/1	Polyol Ester	Saturated	22	4.7	135	-45	285	38	3	0.98		GR	CO	ED	HF		DC
LUBRICIT DTDA	Diester	Saturated	23	4.9	145	-55	245	0	9	0.91		GR	CO	ED	HF		DC
LUBRICIT NGDO	Polyol Ester	Unsaturated	24	5.8	200	-30	260	80		0.90	MW	GR	CO		HF		
LEXOLUBE PQ-25	Polyol Ester	Saturated	25	5.0	134	-55	265	0	4	0.99		GR	CO		HF		DC
LUBRICIT DTDA/1	Diester	Saturated	27	5.4	135	-60	250	0	9	0.91		GR	CO	ED	HF		
LUBRICIT TF 9559	Polyol Ester	Saturated	29	5.3	120	-50	270	0	3	0.97					HF		DC
LEXOLUBE PQ-32	Polyol Ester	Saturated	32	6.0	130	-45	260	0		0.97		GR	CO	ED	HF		DC
LUBRICIT 9515	Polyol Ester	Saturated	46	8.2	150	-35	280	0		0.91	MW		CO	ED	HF		
LUBRICIT TMP C18	Polyol Ester	Unsaturated	46	9.4	190	-45	325	85	3	0.91	MW	GR		ED	HF		



4) Visit:

www.zslubes.com

for additional
information about
these and other
product options.



LUBRICANTS

Hydraulic Fluid Technical Data Sheet

Hydraulic fluids are essentially incompressible liquids that transmit power from a pump to a motor or actuator through a piping system. During operation, the system operates under pressure and the viscosity of the fluid must be high enough to minimize leakage and protect the pump from wear. Conversely, high viscosity hurts flow properties and efficiency at low temperatures if viscous drag 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 must be formulated to guard against oxidation, hydrolysis and deposit formation, and it should not be toxic or harmful if accidentally discharged.

Hydraulic systems are commonly used in both mobile and stationary applications, therefore fluids must be designed to perform over a wide range of temperature and pressure service conditions. Synthetic esters offer shear stable, high viscosity index fluidity for excellent pump efficiency. They are preferred when biodegradability, fire resistance, wide temperature range, or other advanced performance characteristics are required. The International Standards Organization (ISO) classifies fire resistant synthetic ester fluids in the HFDU category, and several LEXOLUBE and LUBRICIT products can be used to achieve a Factory Mutual fire resistance certification. Several Z&S synthetic ester products are on the EU EcoLabel LuSC list and/or the NSF HX-1 list of acceptable components that can be selected to formulate H1 food grade lubricants.

Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Viscosity Index	Flash Pt. (°C)	Pour Pt. (°C)
LUBRICIT 2-EHO	Monoester	8	2.7	190	220	-40
LUBRICIT DINA	Diester	11	3.1	150	220	-60
LEXOLUBE 3I-310	Polyol	14	3.4	120	230	-65
LUBRICIT TMP C9	Polyol	21	4.6	140	275	-50
LUBRICIT DTDA	Diester	23	4.9	145	245	-55
LUBRICIT NGDO	Polyol	24	5.8	200	260	-30
LUBRICIT DTDA/1	Diester	27	5.4	135	250	-60
LUBRICIT TMP C18	Polyol	46	9.4	190	325	-40
LUBRICIT PE 418	Polyol	66	12	185	330	-20
LEXOLUBE PQ-66	Polyol	66	8.6	100	250	-30
LUBRICIT 9526	Complex	330	45	185	320	-40
LEXOLUBE CP-460LC	Complex	460	46	160	290	-25
LEXOLUBE CG-3000	Complex	3000	290	235	310	-20

Features

- High flash and fire point
- Excellent lubricity
- Biodegradability
- High viscosity index/pump efficiency
- Wide temperature range performance
- Low varnish/deposit formation

Applications

- Fire resistant (HFDU) fluids
- Mobile machinery
- Marine (VGP) hydraulics
- Tractor transmission hydraulic fluids
- Food processing (HX-1)
- Environmentally friendly oils (LuSC)

Please inquire about NSF food grade and additional tailor-made products that can be made to fit your exact performance requirements.

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