

ZSCHIMMER & SCHWARZ

Z&S LUBRICANT COMPONENTS

YOUR PREMIER SOURCE FOR SYNTHETIC ESTERS & METALWORKING ADDITIVES

EsterTec synthetic esters

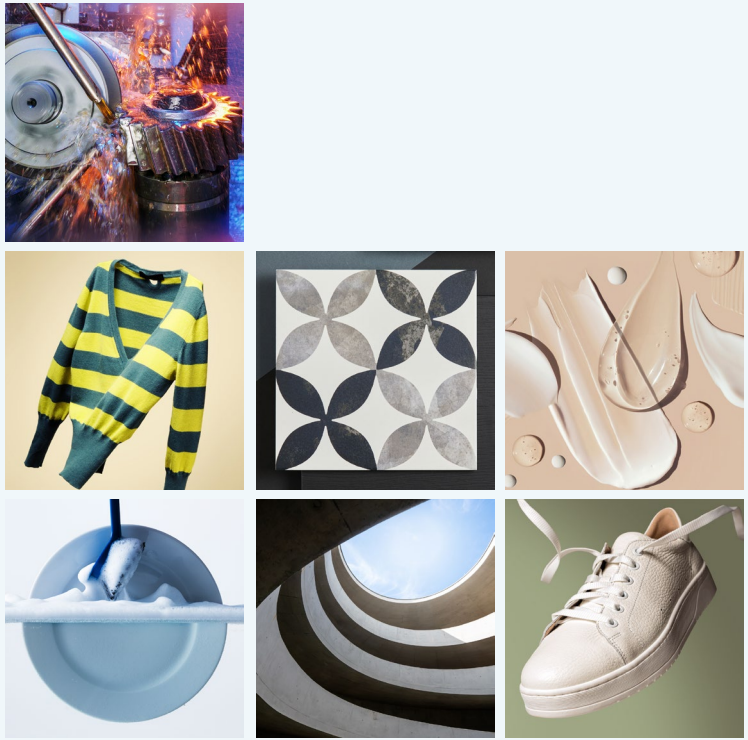
LUBRICIT synthetic esters

lexolube synthetic esters

2026

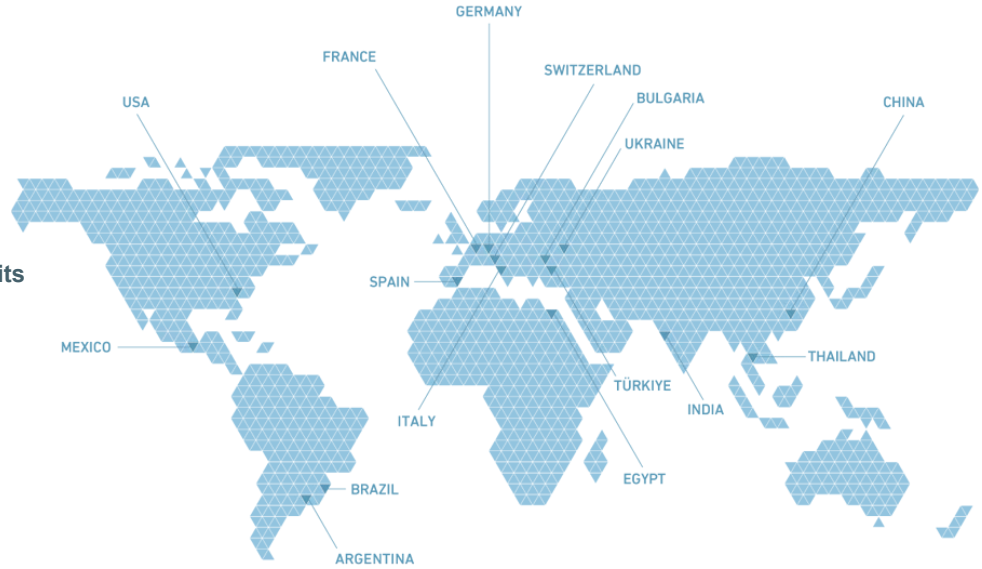
Z&S Business Divisions

- Lubricants
- Leather Auxiliaries
- Fiber & Textile Auxiliaries
- Ceramic Auxiliaries
- Personal Care
- Cleaning Specialties
- Industrial Specialties



Zschimmer & Schwarz Group – Company Profile

28 subsidiaries
in 17 countries
on 5 continents
with 21 production units



- Lubricant Components
- Industrial Specialties
- Fibre/Textile Auxiliaries
- Personal Care
- Ceramic Auxiliaries
- Cleaning Specialties
- Leather Auxiliaries



1894

Foundation of the company in Chemnitz, Germany

1909

First in-house production



1959 - 2019

Rapid globalisation. New company headquarters in Oberlahnstein.



ISO 9001 ISO 14001 ISO 50001

2021

Joining the United Nations Global Compact

UN GLOBAL COMPACT

2020-26

Z&S Commitment to Sustainability

ecovadis GOLD | Top 5% Sustainability Rating JAN 2026

ecovadis SILVER | Top 15% Sustainability Rating JAN 2026

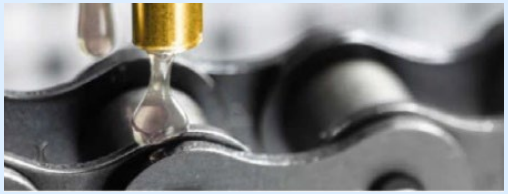
ecovadis BRONZE | Top 35% Sustainability Rating JAN 2026

Z&S Lubricant Components

- Offering the world’s most extensive line of synthetic ester base stocks for industrial, marine, transport and dielectric applications

- Explore our broad portfolio of high-performance lubricant base stocks and metalworking additives, or request a tailor-made product that meets your specific formulation needs

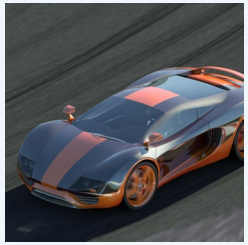






Applications for Z&S Synthetic Esters

- Metalworking fluids
- Hydraulic fluids
- Grease
- Compressor fluids
- Transformer oils
- Bearing lubricants
- EALs for environmentally sensitive applications
- Engine oils
- Transmission fluids
- Gear oils
- Drilling muds
- H1 lubricants for food processing
- Multifunctional dielectric/coolant/ lubricants





Synthetic Esters Provide Performance Features that Petroleum Cannot Deliver

- Fire resistance – less hazardous
- Low volatility – high flash point
- Enhanced lubricity
- Minimize deposit formation
- Extreme low temperature operation
- High VI for fluid energy efficiency
- Dielectric fluids with high water tolerance

- Factory Mutual certification
- EU EcoLabel
- USDA BioPreferred
- NSF HX-1 for Incidental food contact
- IEC/UL dielectric fluid certification
- VGP/VIDA/EAL compliant

Z&S AT Lab Testing Capabilities:

Ready to Support your Formulation Development Program

- High and low temperature viscosity, pour point.
- Flash and fire point
- Foam tendency, Air release, Demulsibility
- Oxidative stability with DSC, RPVOT
- Deposit formation with Pan test and Panel Coker test
- Volatility by TGA (NOACK) and VOC methods
- Hydrolytic stability
- Copper corrosion
- Friction, Wear and Extreme Pressure measurements
- Material compatibility, seal swell testing
- Dielectric properties
- Thermal Conductivity








Manufacturing Sites

ZS Lubricants Division Manufacturing

- Milledgeville, GA, USA (2005)
  - Synthetic esters, Surfactants, EP/AW
- Tricerro, Italy (2016)
  - Synthetic esters
- Ivey, GA, USA (2019)
  - Synthetic esters, Surfactants
- Future production in Lahnstein, Germany



Ivey manufacturing – QEC process

- Quality, Efficiency, Consistency
- Equipment designed for challenging, lubricant grade Synthetic Esters
- Accurate charging and temperature control for fast cycles
- Reduced losses in evaporation, filtration
- Less waste to process
- Significant efficiency improvement
- Automated process control leads to lower product variability





Z&S Italiana – Tricerro Technologies

- Sulfation
- Sulfonation
- Amidation
- Quaternarization
- Compounding & Blending
- Esterification
  - New esterification line built in 2016
  - Dedicated vessels for finishing/refining
  - On-line process control testing







Manufacturing synthetic esters to optimize performance

- QUALITY RAW MATERIALS
  - Food safety standards
    - Select products are also Kosher/Halal
  - Color, odor, viscosity, etc.
- ACCURATE REACTOR CHARGING
  - Efficient use of raw materials
  - Short cycle times
  - Viscosity control
  - Product consistency
- ESTERIFICATION KNOW-HOW
  - Low acid value
  - Low water content
  - Tight specifications
  - Filtration
- FORMULATED FLUIDS
  - Blending
  - Additive treatment
  - Drumming and Private labelling

PRODUCT LINE OVERVIEW

Product Name Brands

- Synthetic Esters (LEXOLUBE ®, LUBRICIT ®)
- VSP Synthetic Esters (ESTERTEC®)
- PEG/PPG Esters (MULSIFAN ®)
- Phosphate Esters (PHOSPHETAL™)
- Phosphonates (CUBLEN ®)
- Amides (PURTON ®)
- Emulsion Polymers for Metal forming (SYNTRAN ®)

lexolube synthetic esters

LUBRICIT synthetic esters

EsterTec synthetic esters

Performance Characteristics

SYNTHETIC ESTER BASE OILS

- Boundary lubrication
- Thermal and oxidative stability
- Low volatility/high flash point
- Wide temperature performance
- Low sludge or deposit formation
- Energy efficient
- Biodegradable
- Environmentally and worker friendly

ALKOXYLATE ESTERS (PEG/PPG)

- Non-ionic emulsifiers
- Hard water stable
- Boundary lubrication

PHOSPHATE ESTERS & AMIDES

- Emulsifier/Co-emulsifiers
- Corrosion inhibitors
- Non-staining

ESTER CHEMISTRY

Design Options

”Chemistry tailor-made”

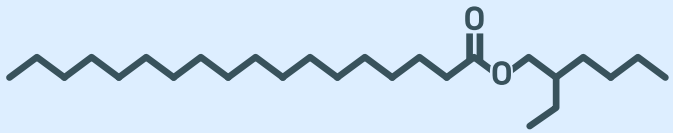
Synthetic Ester Types for Lubricant Applications

- Mono Esters
- Diesters
- Polyol Esters
- Complex Esters
- Aromatic Esters
- Glyceryl Esters
- Polymeric Esters
- Vicinal Secondary Polyol Based Esters



Monoesters

- Typically made from natural fatty acids and mono-alcohols
- 60-90% renewable
- Low viscosity
- Excellent lubricity
- Low odor and color
- Environmentally and worker friendly
- Can be designed for excellent hydrolytic stability
- Biodegradable



- FIELDS OF APPLICATION
  - Metalworking
  - Textile lubricants
  - Aerosol products
  - Adjuvants
  - Oil field drilling mud
  - Biobased lubricants
  - HX-1 grades available

Monoesters

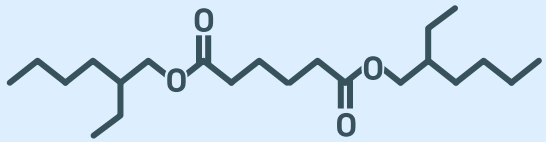


Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Pour Pt. (°C)
LUBRICIT 2-EH iC9	Saturated	3.5	1.4	-75
LUBRICIT iC9-9	Saturated	4.5	1.7	-75
LUBRICIT 2-EHL	Saturated	5.0	1.8	-25
LEXOLUBE IPP	Saturated	5.0	2.0	10
LEXOLUBE IPO	Unsaturated	5.5	2.0	-25
LUBRICIT 2-EHC	Saturated	6.0	2.0	-25
LEXOLUBE NBS	Saturated	6.5	2.2	20
LUBRICIT 10L	Saturated	7.0	2.3	20
LUBRICIT 2-EHO	Unsaturated	8.0	2.7	-40
LUBRICIT 2-EHC16	Saturated	8.5	2.6	0
LUBRICIT 2-EHS	Saturated	10	2.9	5
LEXOLUBE HS-S	Saturated	11	3.0	5
LUBRICIT TDS	Saturated	16	4.2	0

- FIELDS OF APPLICATION
  - Metalworking
  - Textile lubricants
  - Aerosol products
  - Adjuvants
  - Oil field drilling mud
  - Biobased lubricants
  - HX-1 grades available

Diesters

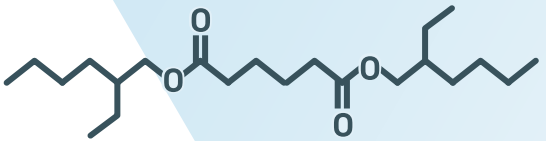
- Typically made from dibasic acid and mono-alcohol
- Not usually bio-based
- Low to medium viscosity
- Excellent lubricity
- Very low pour point
- Excellent oxidative stability
- Low odor and color
- Biodegradable



- FIELDS OF APPLICATION
  - Engine oils
  - Compressor oils
  - Hydraulic fluids
  - Gear oils
  - Grease
  - Bearings
  - Seal swell additives

Diesters

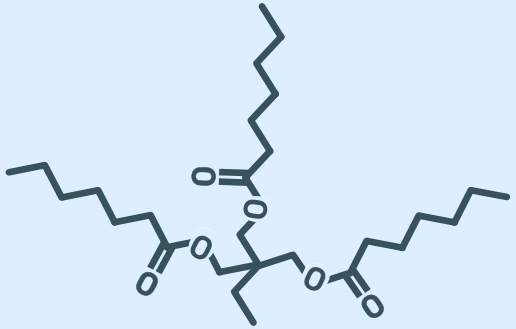
Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Pour Pt. (°C)
LEXOLUBE 2I-214/1	NPG	5.5	1.9	-70
LUBRICIT DOA	Diacid	8	2.3	-50
LUBRICIT NGC810	NPG	8	2.5	-30
LUBRICIT NG 710	NPG	8.5	2.5	-50
LUBRICIT NGDP/1	NPG	9	2.6	-30
LUBRICIT DIOA	Diacid	9	2.7	-60
LUBRICIT 2-EHAZ	Diacid	11	3.1	-70
LUBRICIT DINA	Diacid	11	3.1	-60
LUBRICIT DOS	Diacid	12	3.2	-60
LUBRICIT DIDA	Diacid	14	3.6	-60
LUBRICIT NGDC	NPG	18	4	0
LUBRICIT DIDS	Diacid	21	4.7	-50
LUBRICIT PGDO	PG	21	5.5	-30
LUBRICIT DTDA	Diacid	23	4.9	-55
LUBRICIT NGDO	NPG	24	5.8	-30
LUBRICIT DTDA/1	Diacid	27	5.4	-60
LUBRICIT 9515	NPG	46	8.2	-35
LUBRICIT 2-EHD	Dimer	83	13	-40
LUBRICIT 9505	Dimer	88	13	-30
LUBRICIT 2-EHD/1	Dimer	93	13	-40



- FIELDS OF APPLICATION
  - Engine oils
  - Compressor oils
  - Hydraulic fluids
  - Gear oils
  - Grease
  - Bearings
  - Seal swell additives

Polyol esters

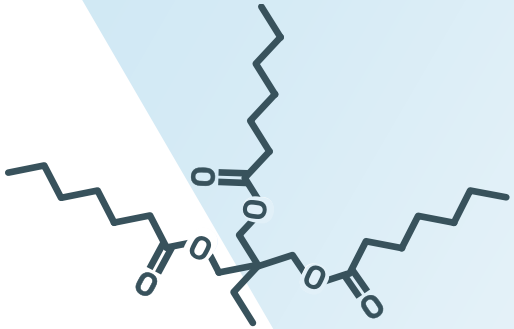
- Made from neo-polyol and mono-acid
- Can be bio-based
- Low to high viscosity
- Low volatility / High flash point
- Low pour point
- Long drain intervals
- Outstanding oxidative stability
- Most are readily biodegradable



- FIELDS OF APPLICATION
  - Compressor oils
  - Fire resistant hydraulic fluids
  - Oven chain oils
  - Bearing lubricants
  - Gear oils
  - Grease
  - HX-1 products available

Polyol esters

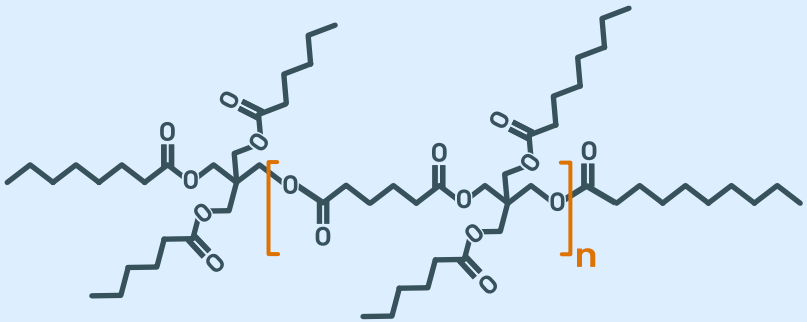
Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Pour Pt. (°C)
LEXOLUBE 2I-214/1	NPG	5.5	1.9	-70
LUBRICIT NG 710	NPG	8	2.5	-50
LEXOLUBE 3I-310	TMP	14	3.4	-65
LUBRICIT TMP C810	TMP	20	4.4	-40
LUBRICIT TMP C9	TMP	21	4.6	-50
LUBRICIT PE 510/1	PE	22	4.7	-45
LUBRICIT NGDO	NPG	24	5.8	-30
LEXOLUBE PQ-25	PE	25	5.0	-55
LUBRICIT PE 4810	PE	32	6.1	-5
LUBRICIT TMP C18	TMP	46	9.4	-40
LUBRICIT TMP iC9	TMP	50	7.0	-35
LUBRICIT PE 418	PE	66	12	-20
LEXOLUBE POE-68HT	DPE	68	10	-40
LEXOLUBE PQ-68	PE	68	8.6	-30
LUBRICIT PE iC18	PE	145	18	-30
LEXOLUBE POE-220HT	DPE	220	19	-25
LUBRICIT DPE 89	DPE	305	23	-15
LEXOLUBE POE-350HT	DPE	350	25	-15



- FIELDS OF APPLICATION
  - Compressor oils
  - Fire resistant hydraulic fluids
  - Oven chain oils
  - Bearing lubricants
  - Gear oils
  - Grease
  - HX-1 products available

Complex esters

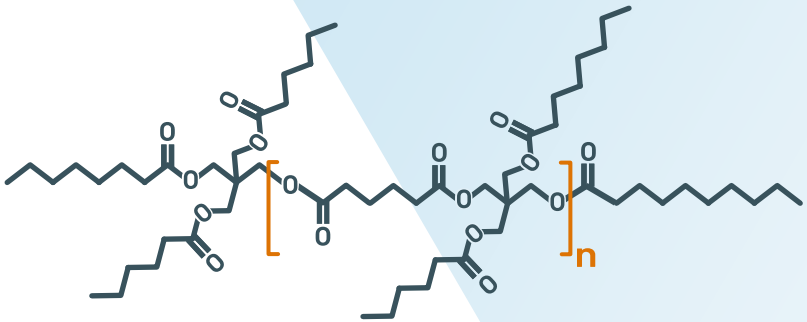
- Capped polymeric ester based on both polyacids and polyols
- Can contain high biogenic content
- Very high viscosity possible
- Low volatility/High flash point
- High viscosity index
- Antiwear/Extreme pressure
- Can be biodegradable



- FIELDS OF APPLICATION
  - Compressor oils
  - Gear oils
  - Grease
  - Thickening
  - Metal protection
  - HX-1 products available

Complex esters

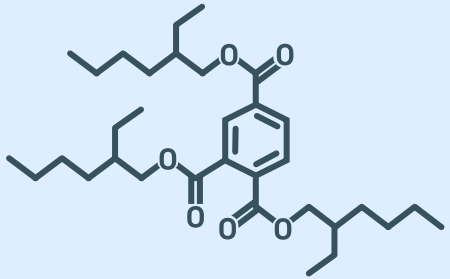
Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Pour Pt. (°C)
LEXOLUBE CPE-70	Polyol	68	11	-15
LUBRICIT 9522	Dimer	140	19	-50
LUBRICIT 9538	Dimer	140	22	-20
LEXOLUBE CPE-220	Polyol	220	30	-15
LUBRICIT 9526	Polyol	330	45	-40
LUBRICIT 9538/1	Dimer	330	45	-40
LUBRICIT 9552	Trimer	350	35	-40
LEXOLUBE KL-435	Dimer	435	38	-30
LEXOLUBE CLG-460	Polyol	460	40	-20
LEXOLUBE CP-460LC	Polyol	460	46	-25
LUBRICIT 9468/1	Dimer	475	55	-35
LEXOLUBE CPE-1000	Polyol	1000	96	-20
LEXOLUBE CQ-3000	Polyol	3000	205	-15
LEXOLUBE CG-3000	Polyol	3000	290	-20



- FIELDS OF APPLICATION
  - Compressor oils
  - Gear oils
  - Grease
  - Thickening
  - Metal protection
  - HX-1 products available

Aromatic esters

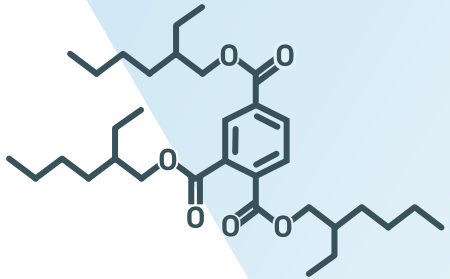
- Made from aromatic anhydrides and mono-alcohols
- Not bio-based
- High viscosity
- Low viscosity index
- Low volatility / High flash point
- Reduced varnish
- Stable against oxidation & hydrolysis
- Long fluid life



- FIELDS OF APPLICATION
  - Compressor oils
  - Gear oils
  - Grease
  - Oven chain lubricants
  - Plasticizers

Aromatic esters

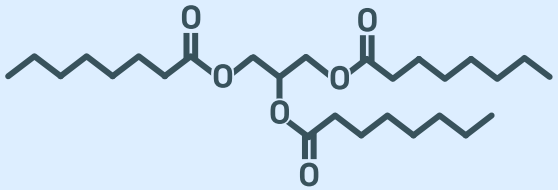
Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Pour Pt. (°C)
LUBRICIT 3810	TM	52	8.1	-50
LUBRICIT 3090/1	TM	115	12	-15
LUBRICIT 3010	TM	135	13	-40
LEXOLUBE 4PM-114	PM	170	16	-30
LUBRICIT 3013	TM	185	17	-30
LUBRICIT 2026	TM	195	17	-35
LUBRICIT 3023/1	TM	220	16	-25
LUBRICIT 3013/1	TM	320	20	-30



- FIELDS OF APPLICATION
  - Compressor oils
  - Gear oils
  - Grease
  - Oven chain lubricants
  - Plasticizers

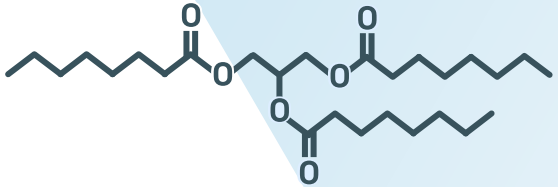
Glyceryl esters

- Made from glycerol reacted with mono-acids
- High biogenic content
- Fast biodegradability
- Low aquatic toxicity
- Available as mono-, di-, or triesters
- Can be HX-1 food grade
- Excellent as friction modifier additives



- FIELDS OF APPLICATION
  - Friction modifier additives
  - EAL/EcoLabel lubricants
  - Biobased fluids

Glyceryl esters

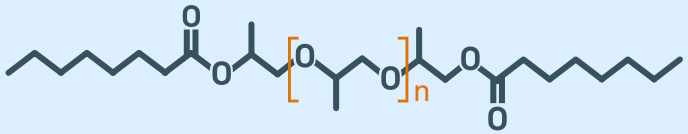


Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Pour Pt. (°C)
LEXOLUBE GT-855 IG	Saturated	15	4	-15
LUBRICIT GTO	Unsaturated	40	8.5	-25
LUBRICIT 9504	Unsaturated	42	6.1	5
LUBRICIT GMO	Unsaturated	50	9	0
LUBRICIT GMO-VEG	Unsaturated	50	9	0
LUBRICIT GMT	Unsaturated	75	10	-20
LUBRICIT GMIS	Saturated	129	13	0
LUBRICIT GTL	Saturated	Solid	4.6	45

- FIELDS OF APPLICATION
  - Friction modifier additives
  - EAL/EcoLabel lubricants
  - Biobased fluids

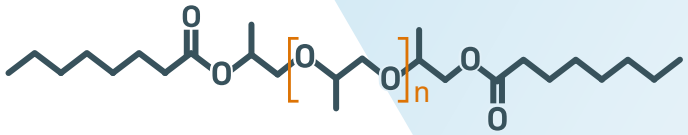
Polymeric esters

- Made from polyglycol capped with mono-acids
- Very high viscosity
- High viscosity index
- Low volatility / High flash point
- Stable against oxidation & hydrolysis
- Not miscible with polyol esters



- FIELDS OF APPLICATION
  - Grease
  - Thickeners
  - Tackifiers

Polymeric esters

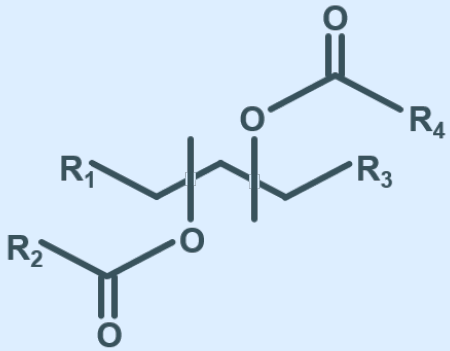


Synthetic Ester	Chemistry	Viscosity @ 40°C (cSt)	Viscosity @ 100°C (cSt)	Flash Pt. (°C)	Pour Pt. (°C)
LEXOLUBE Z-100	PGA	960	80	285	5
LEXOLUBE Z-6000	PGA	1600	120	285	0

- FIELDS OF APPLICATION
  - Grease
  - Thickeners
  - Tackifiers

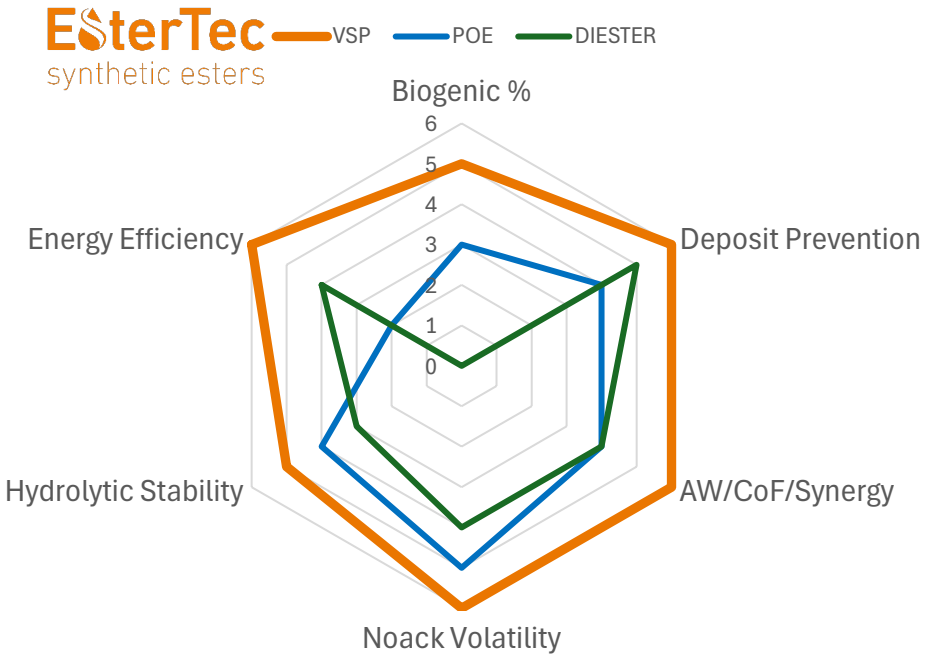
Vicinal Secondary Polyol based esters - VSP

- Made from vicinal secondary polyols and biogenic fatty acids
- Exceptional hydrolytic stability
- Energy efficient based on high viscosity index, excellent lubricity and low density
- Low volatility / High flash point
- Low deposit forming tendency
- Steric hindrance improves oxidative stability
- Long fluid life



- FIELDS OF APPLICATION
  - Industrial lubricants
  - Engine/Driveline oils
  - Metalworking fluids
  - Grease
  - Marine oils
  - Dielectric fluids

All the Performance Advantages Expected from a Standard Diester or Polyol Ester, Plus…



Standard POE Features

- Low Pour Point
- High Flash Point
- Low Foam Tendency
- Good Demulsibility
- Not Corrosive to Copper
- Good Oxidative Stability
- Strong Dielectric Properties
- Good Thermal Conductivity
- Clear with Low Odor & Color

EsterTec
synthetic esters

The VSP Molecular Technology Platform.
Exceptional Performance in a Wide Viscosity Range

Product Name	ESTERTEC 2N-1416	ESTERTEC 2LN-1418	ESTERTEC 2L-1425	ESTERTEC 2G-1432	ESTERTEC 7GX-1446	ESTERTEC 7GX-1468	ESTERTEC 7GX-14100	ESTERTEC 8LX-14150
KV100, cSt	3.6	4.1	5	7	9	11	14	18
KV40, cSt	16	18	25	32	46	68	100	150
Viscosity Index	115	125	140	180	165	155	145	130
Pour Point, °C	-60	-40	-25	-50	-40	-40	-35	-35
Density	0.895	0.893	0.890	0.890	0.900	0.915	0.925	0.935
NOACK volatility, %	9	7	3	1	<1	<1	<1	<1
Biodegradability	Readily	Readily	Readily	Readily	Readily	Readily	Inherently	Inherently
Biogenic Content, %	55	58	63	72	62	50	42	30
Oxidative Stability	☑	☑	☑	☑	☑	☑	☑	☑
Hydrolytic Stability	☑	☑	☑	☑	☑	☑	☑	☑
Friction/Wear Reduction	☑	☑	☑	☑	☑	☑	☑	☑
Energy Efficiency Advantage	☑	☑	☑	☑	☑	☑	☑	☑
Cost/Performance Advantage	☑	☑	☑	☑	☑	☑	☑	☑

☑ = Equal or Better than standard synthetic esters

BENEFITS OF SYNTHETIC ESTERS

Synthetic Ester Design Considerations

- **DETERMINE CRITICAL APPLICATION PERFORMANCE REQUIREMENTS**
  - Low cost – Oleates, natural fatty acids, commodity raw materials
  - High viscosity – Dipentaerythritol, complex esters or polymeric
  - High viscosity index – Linear structures, long chain fatty acids
  - Thermal stability – Polyols, branched acids, fully saturated components
  - Biodegradability – Natural fatty acids, less branching
  - Food contact – Ingredients with detailed information on toxicity, NSF listed
  - Dielectric strength – High purity, low water and acidity





- **ZS BUILDS THE ESTER FROM COMPONENTS THAT WILL DELIVER THE CUSTOMERS DESIRED PROPERTIES**

Esters as base oil blend components reduce deposits and sludge

- **BLENDS OF PAO AND POE**
  - All fluids were ISO 68
  - Tested 20 hours at 260ºC
- **RESULTS**
  - 6-7% evaporation for all samples
  - 5% POE significantly reduces deposits



Hydraulic fluids

- Synthetic Esters provide excellent thermal and oxidative stability
- Low sludge formation
- Fire resistance (“Less Hazardous“ HFDU fluids)
- Low volatility
- Very low compressibility
- High VI provides improved energy efficiency
- Typical viscosity grades – ISO 32, 46, 68
- Good lubricity





Oven chain oils

- Synthetic Esters provide excellent thermal and oxidative stability
- Typical viscosity grades (ISO 68-460)
- 97% synthetic ester, 3% additives
- Polyol esters – up to 275ºC
  - Best oxidative stability, very clean, low varnish
- Aromatic esters – up to 250ºC
  - Higher evaporation, softer deposits
- Complex esters – up to 225ºC
  - Better lubricity and antiwear, low evaporation





Grease

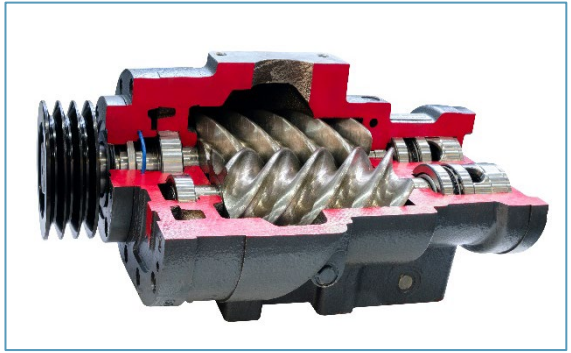
- Synthetic Esters allow wide temperature range performance
- Typically formulated with non-soap thickener (urea, silica, etc.)
- Polyol esters: up to 240ºC
  - Best oxidative stability, very clean, low varnish
- Arctic grease: down to -60ºC
  - Low viscosity diester or polyol ester
- Bio-based esters: -20 to +175ºC
  - Excellent lubricity
  - Recommended for environmentally sensitive areas





Air Compressor Oils

- Synthetic Esters offer deposit control and long life
- Excellent thermal/oxidative stability
- POE used in combination with PAO or Group III MO
- Reciprocating and rotary vane compressors
  - Diesters and Aromatic esters for lubricity and solvency
- Rotary screw and centrifugal compressors
  - Polyol esters for oxidation stability
- NSF HX-1 Polyol esters
  - For compressors in food processing plants

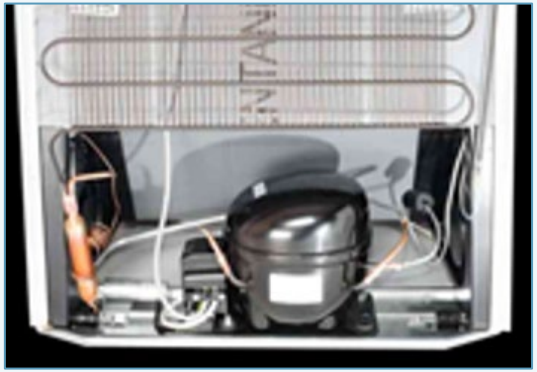




Refrigeration Compressor Oils

- Optimal solubility/compatibility with HFC, HFO and HC refrigerant gases
- Reciprocating, rotary vane and centrifugal compressors
  - High purity polyol esters for long life
- Excellent thermal and hydrolytic stability
- High thermal conductivity
- Excellent electrical resistivity
- Provides wear protection and noise reduction
- Long life

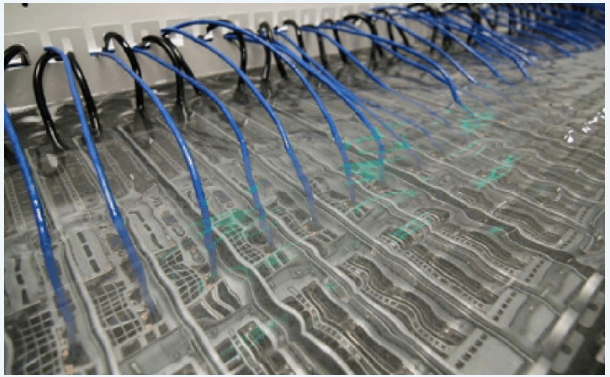




Synthetic Transformer Oils and Dielectric Fluids

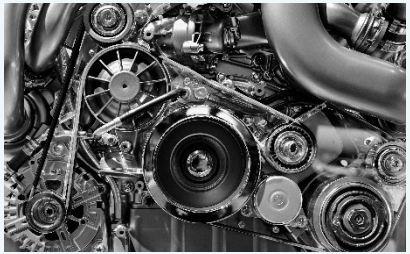
- High flash and fire point
- Good thermal stability for long life
- Low viscosity with low volatility
- Excellent dielectric properties
- Compliant with IEC 61099, FM 6933, UL EOUV
- Environmentally friendly
- Bio-based esters offer improvement over vegetable oils and mineral oils





Automotive Applications

- Synthetic Esters have a long history of high performance in racing oils and premium synthetics
- Full synthetic oils typically utilize a combination of PAO and synthetic ester. Low viscosity trend (0W-20 and lower)
- Diesters improve additive solubility and provide seal conditioning
- Low NOACK volatility
- Clean, reduces sludge formation
- Long drain intervals







Environmentally Acceptable Lubricants (EAL)

- Synthetic Esters are optimum for environmentally sensitive applications:
  - Marine
  - Mining
  - Forestry
  - Agriculture
  - Railroad
  - Wind turbines
- Performance is equal or better than petroleum oils

- Most esters meet USA EPA Marine (VGP) Vessel General Permit standards



- Many esters are renewable, sustainable, and have USDA BioPreferred status



- Wide variety of synthetic esters on LuSC list achieve EU Ecolabel status



PRODUCTS FOR METALWORKING FLUIDS

Esters in metalworking fluids

MONO and POLYOL ESTERS

- Excellent lubricity
- Non-toxic, Non-hazardous handling
- Low color and odor
- Biodegradable

COMPLEX ESTERS

- Boundary lubrication
- Improves AW/EP

ALKOXYLATE ESTERS (PEG/PPG)

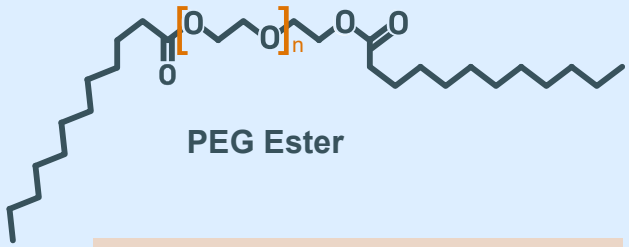
- Non-ionic emulsifiers
- Hard water stable
- Boundary lubrication

PHOSPHATE ESTERS

- Emulsifier/Co-emulsifier
- Corrosion inhibitor
- Non-staining

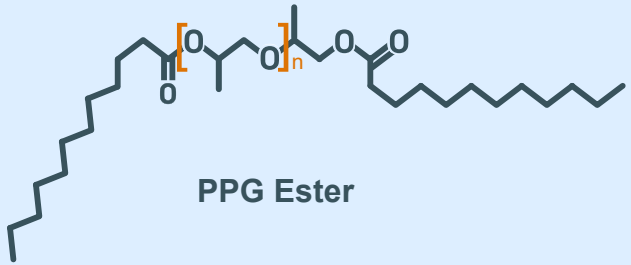
MULSIFAN® Series

- Esters of natural fatty acids and polyglycols
- Emulsifiers with HLB 6 to 14
  - Higher PEG increases HLB
  - Longer fatty acid decreases HLB
  - Diesters have lower HLB
- Couplers, dispersants, defoamers
- Good lubricity
- Non-toxic, Non-hazardous handling
- Low foam, hard water stable



PEG Ester

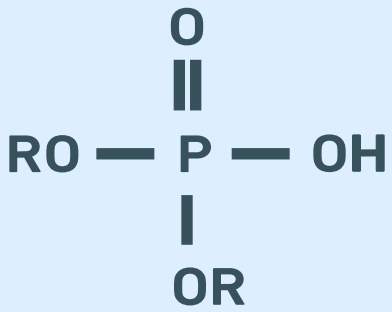
- FIELDS OF APPLICATION
  - Metalworking
  - Textile lubricants
  - Cosmetics
  - Oil field
  - Agricultural products



PPG Ester

PHOSPHETAL® Series

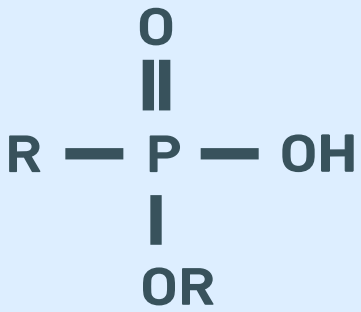
- Monophosphoric acid esters of linear alcohols and alcohol ethoxylates
- Available as acid form or neutralized
- Corrosion inhibitors
- EP Enhancement
- Co-Emulsifiers
- Dispersing agents



- FIELDS OF APPLICATION
  - Metalworking
  - Lubricants
  - Textile finishing
  - Oil field
  - Water treatment
  - Cleaning products

CUBLEN® Series

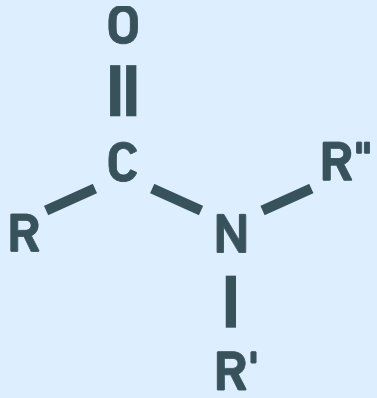
- Phosphonates
- Organic carbon directly bonded to phosphorus
- Wide range of phosphonates available
- High stability in aqueous systems
- Outstanding metal chelation
- Effective at low concentrations
- Dispersion stabilizers
- Scale and soap deposit inhibitor



- FIELDS OF APPLICATION
  - Metalworking
  - Lubricants
  - Textile finishing
  - Oil field
  - Water treatment
  - Cleaning products

PURTON® Series

- Amides made from fatty acid + secondary amine
- Non-ionic emulsifier
- Corrosion inhibitor
- Antistatic additive
- High stability in aqueous systems
- Effective at low concentrations
- Dispersion stabilizers



- FIELDS OF APPLICATION
  - Metalworking
  - Oil field
  - Lubricants
  - Personal Care
  - Cleaning and Degreasing
  - Metal treatment
  - Paints and Coatings

SYNTRAN® Metal forming Lubricants



A water-based emulsion polymer coating is applied over sheet metal, forming a solid film on the surface.

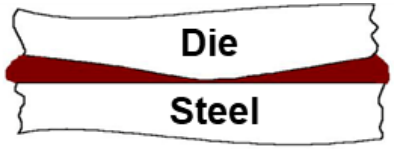
The polymer coating provides controlled and consistent lubrication when forming or stamping.

Product benefits include:

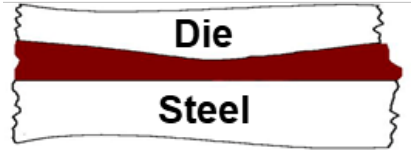
- Part Surface Finish Quality
- Production Cost Savings
- Improved Manufacturing Environment
- Worker Safety



Liquid Lubricant



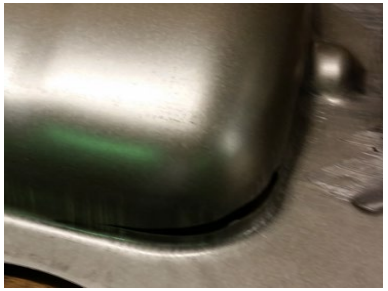
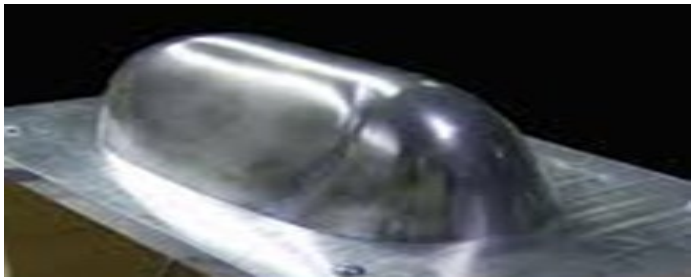
Solid Polymer Lubricant



SYNTRAN® Metal forming Lubricants

- Improved wear protection from polymer film technology will reduce costs by:



  - Reducing defects due to galling, flaking, and forming failures.
  - Extend the life of the molds and dies used for forming or stamping.

DIELECTRIC INSULATING FLUIDS

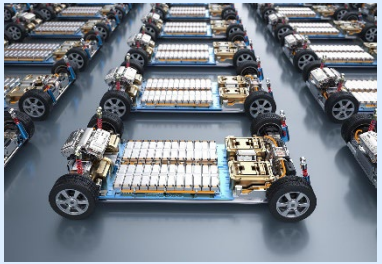
Synthetic Esters for Multipurpose EV Lubricant/Coolants/Dielectric Fluids

Ref #	Product Name	KV, cSt @20°C	KV, cSt @40°C	KV, cSt @100°C	Pour Point, °C	Flash Point, °C	DBV, kV IEC 60156 2.5mm
ULV-1	LUBRICIT EXP 23016A	2.6	1.8	0.8	<-80	115	>75
ULV-2	LUBRICIT EXP 23016B	3.8	2.6	1.1	<-80	140	>75
ULV-3	LUBRICIT EXP 23016D	4.0	2.7	1.0	-77	135	>75
ULV-4	LUBRICIT EXP 23016C	4.5	2.9	1.2	-80	150	>75
ULV-5	LUBRICIT 2-EH iC9	5.8	3.6	1.4	-75	150	>75
LV-8	LUBRICIT iC9-9	7.7	4.7	1.7	-75	145	>75
LV-11	LUBRICIT EXP 23018B	8.7	5.2	1.8	-20	190	>75
LV-12	LUBRICIT 2-EHL	8.7	5.2	1.8	-25	185	>75
LV-15	LEXOLUBE 2I-214	10.0	5.7	1.9	-70	190	>75
LV-17	LUBRICIT DOA	14.6	7.6	2.3	-50	215	>75
LV-18	LUBRICIT EXP 23018E	15	7.7	2.1	-50	195	>75
LV-19	LUBRICIT EXP 23018F	15	7.8	2.3	-80	200	>75
LV-22	LUBRICIT NG 710	15	8.3	2.5	-50	210	>75

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







EsterTec synthetic esters

A Novel Molecular Technology Platform. Exceptional Dielectric Fluid Potential.

Product Property	ESTERTEC 2N-1416	ESTERTEC 2LN-1418	ESTERTEC 2L-1425	ESTERTEC 2G-1432	Standard PE Ester
KV100, cSt	3.6	4.1	5	7	5
KV40, cSt	16	18	25	32	30
Viscosity Index	115	125	140	180	120
Pour Point, °C	-60	-40	-25	-50	-50
Density	0.895	0.893	0.890	0.890	0.970
Flash/Fire Point, °C	230 / 255	240 / 265	250 / 275	295 / 315	270 / 310
Biogenic Content, %	55	58	63	72	0
Specific Heat Capacity, J/g·°K	2.17	2.11	2.16	2.19	1.928
Thermal Conductivity, W/m·K	0.135	0.137	0.142	0.145	0.142
Dielectric Breakdown Voltage, 2mm, kV	> 50	> 50	> 50	> 50	> 50
Hydrolytic Stability	☑	☑	☑	☑	☑
Oxidative Stability	☑	☑	☑	☑	☑
Cost/Performance Advantage	☑	☑	☑	☑	

☑ = Equal or Better than standard synthetic esters



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THANK YOU

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