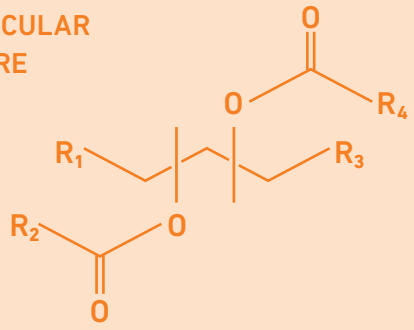
SYNTHETIC ESTER PERFORMANCE BUILT ON VSP TECHNOLOGY

EsterTec® VSP synthetic esters offer exceptional performance based on an innovative molecular design achieved via a unique production process. Utilizing standard raw materials that are globally accessible, these esters ensure high stability through vicinal ester molecular positioning. Steric hindrance enhances oxidative stability, while secondary alcohols on adjacent carbons significantly improve hydrolytic stability. Experience the next level of synthetic ester performance and reliability by formulating with EsterTec VSP esters for exceptional Value, Sustainability, and Performance (VSP).

VSP MOLECULAR STRUCTURE



ESTERTEC VSP: BEST-IN-CLASS SYNTHETIC LUBRICANT BASE STOCK DESIGNED FOR OUTSTANDING PERFORMANCE VALUE AND RELIABILITY

With a broad viscosity range and operating temperature window, EsterTec affords superior control of friction and reduces wear, ensuring the stability and long life of high-performance lubricants. This advanced component is miscible with PAO and petroleum-based stocks, as well as compatible with standard elastomers and seals. EsterTec excels in heat transfer, features excellent dielectric properties, and exhibits high flash and fire points for enhanced safety in both lubricant and electrical insulating fluid applications. Environmentally friendly, with a high biogenic content, most EsterTec grades are readily biodegradable and USDA BioPreferred, making it a top choice for those seeking efficiency and sustainability on their ESG scorecard.

BENEFIT FROM ALL THE PERFORMANCE ADVANTAGES OF A STANDARD DIESTER OR POLYOL ESTER, PLUS EXCEPTIONAL BENEFITS THAT SET THIS TECHNOLOGY APART:

- **Natural Energy Efficiency:** Leverage their low density, high viscosity index, and superior lubricity, for enhanced energy savings.
- **Best-in-Class Stability:** Enjoy an unparalleled combination of oxidative, thermal, and hydrolytic stability, optimized for extended product life and consistent performance in applications that experience high temperatures or water ingress.
- **Optimal Heat Transfer and Dielectric Properties:** Achieve excellent thermal management and dielectric insulation, which can be leveraged in EV cooling applications.
- **High Biogenic Content:** Choose an environmentally friendly option that has a higher biogenic content compared to many synthetic diester or polyol esters.
- **Cost-Effective:** Save more due to lower-cost-per-unit volume. Molecular design leads to significantly lower density compared to standard esters.
- **Wide Temperature Operating Range:** Reliable operation from -60°C to 240°C, improving low-temperature viscometrics and high-temperature stability.
- **Enhanced Friction and Wear Control:** Improved protection for components, reducing maintenance costs and downtime.
- **Energy Efficiency:** Lower energy consumption, translating to significant savings over time.
- **Environmentally Friendly:** A sustainable choice for next-generation lubricant formulations.

PERFORMANCE DATA

EsterTec synthetic esters

EsterTec VSP: State-of-the-art synthetic ester technology that expands your formulation toolbox.

ESTERTEC VSP PRODUCT 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
Biogenic Content, %	55	58	63	72	62	50	42	30
Oxidative Stability	✓	✓	✓	✓	✓	✓	✓	✓
Hydrolytic Stability	✓	✓	✓	✓	✓	✓	✓	✓
Friction/Wear Reduction	✓	✓	✓	✓	✓	✓	✓	✓
Energy-Efficiency Advantage	✓	✓	✓	✓	✓	✓	✓	✓
Cost/Performance Advantage	✓	✓	✓	✓	✓	✓	✓	✓



FIELDS OF APPLICATION

EsterTec excels in numerous fields of application, delivering exceptional performance, value, and reliability across various industries, including:


METALWORKING FLUIDS


HYDRAULIC FLUIDS


ENGINE OILS


COMPRESSOR FLUIDS


BEARING LUBRICANTS


GEAR OILS


H1 FOOD-GRADE LUBRICANTS


GREASES


TRANSMISSION FLUIDS


DRILLING MUD LUBRICANTS


EALS FOR ENVIRONMENTALLY SENSITIVE APPLICATIONS


TRANSFORMER OILS


MULTIFUNCTIONAL DIELECTRIC/ COOLANT/LUBRICANTS


OVEN CHAIN OILS


COMPUTER IMMERSION COOLING

SUPERIOR VALUE, SUSTAINABILITY, AND PERFORMANCE

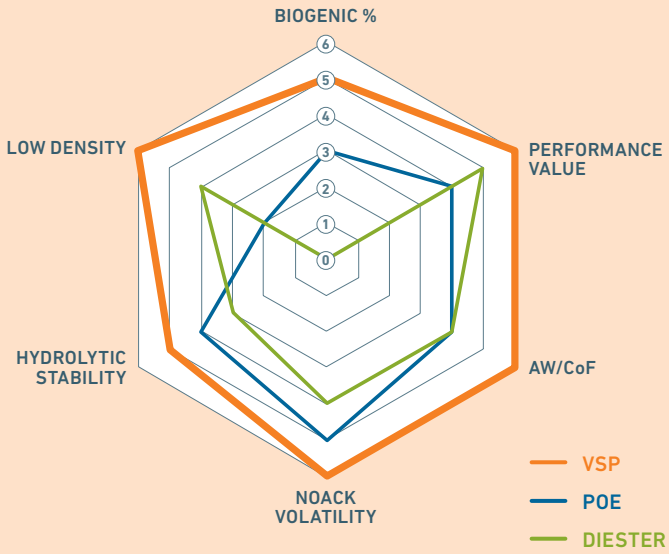
EsterTec VSP esters can be used to optimize premium synthetic lubricant formulations for use in high-performance applications. Technical and economic benefits include:

- **Oxidative Stability:** Resists degradation at high temperatures, minimizing deposits and sludge formulation; noncorrosive to iron, aluminum, or copper.
- **Hydrolytic Stability:** Remains stable and effective even in the presence of moisture from condensation or contamination; achieves effective long-life performance in aqueous metalworking fluids.
- **Friction/Wear Reduction:** Minimizes energy losses due to friction, improving energy efficiency.
- **Energy Efficiency:** Low density that leads to decreased pumping energy requirements and reduced weight in mobile applications; helps conserve energy usage compared to standard lubricants.
- **Cost-Effectiveness:** Affords favorable total cost of ownership through its efficiency and performance results; lower density = lower shipping costs.
- **Eco-Friendliness:** High biogenic content, readily or inherently biodegradable, and low aquatic toxicity, making EsterTec VSP esters the preferred choice for EAL formulations.

ESTERTEC DELIVERS PERFORMANCE THAT IS EQUAL TO OR BETTER THAN STANDARD POLYOL ESTERS IN THE FOLLOWING AREAS:

- Pour Point
- Flash Point
- Foam Tendency
- Demulsibility
- Copper Corrosion
- Oxidative Stability
- Thermal Stability
- Specific Heat
- Thermal Conductivity
- Odor
- Color
- Clarity
- Miscibility with PAO
- Compatibility with Elastomers

ESTERTEC COMPARISON RADAR CHART





EsterTec VSP: Cutting-Edge Synthetic Ester Lubricant Technology

EsterTec VSP esters are the latest advancement in synthetic ester molecular design, meticulously created to deliver versatile and reliable functionality. Through its innovative molecular structure and production process, this synthetic lubricant component offers:

Superior Stability: Exceptional resistance to oxidation, thermal breakdown, and hydrolysis, for extended service life

Excellent Control of Friction and Wear: A unique molecular design that enables a balance of polar attraction to metal interfaces and surface packing under EHL conditions that reduce the coefficient of friction

Broad Operating Temperature Range: Lubricants formulated with VSP esters for cold temperature applications exhibit low dynamic viscosity and an excellent pour point, ensuring reliable performance in extreme conditions. For high-temperature applications, VSP esters offer low volatility and a high flash point, enhancing product durability and safety. The excellent viscometric properties of EsterTec VSP contribute to improved energy efficiency, making them the ideal solution for demanding industrial, automotive, and dielectric applications.

ZSCHIMMER & SCHWARZ

Chemistry tailor-made

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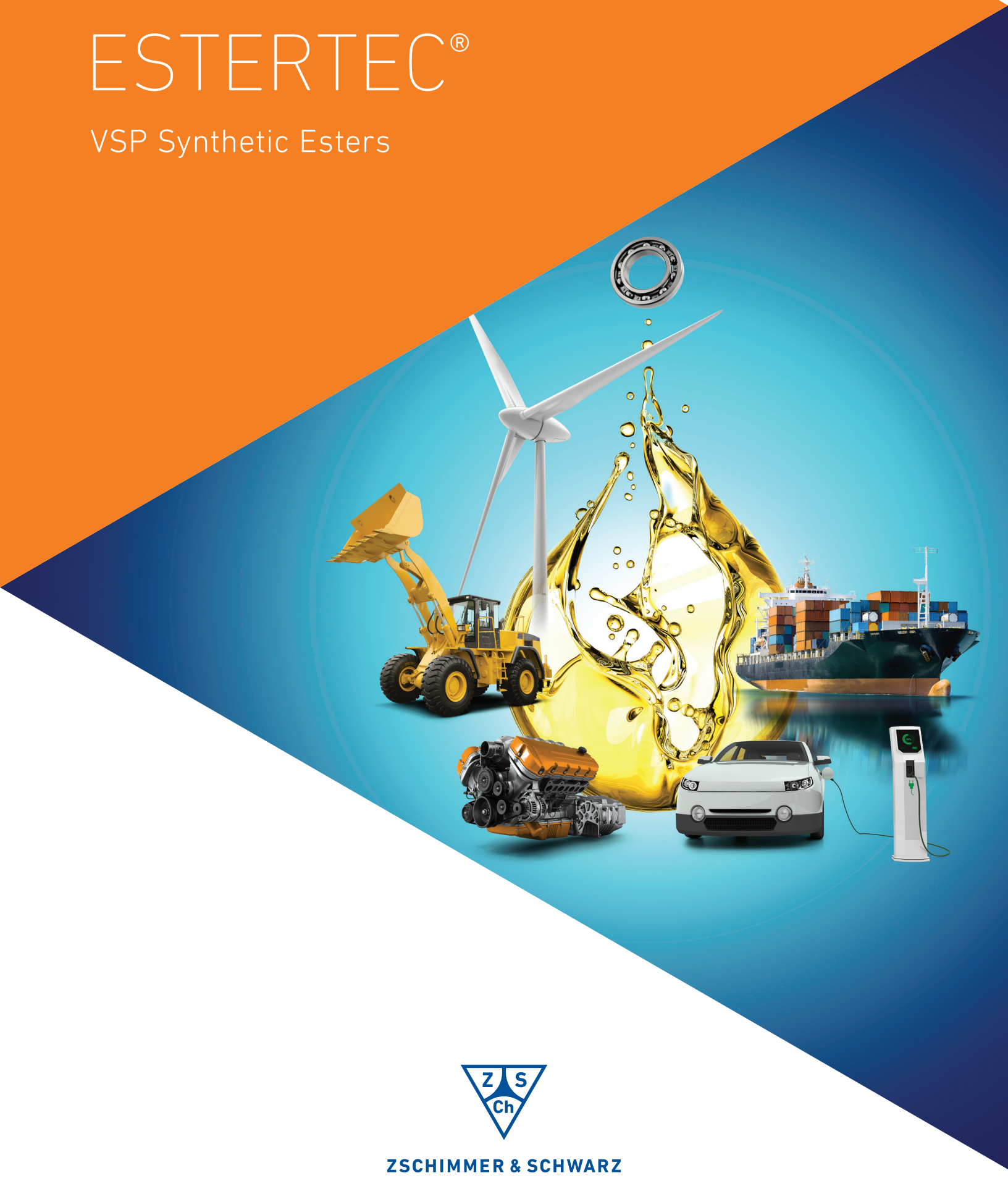
ESTERTEC®

VSP Synthetic Esters



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