Esterex™ esters portfolio

Current industrial and automotive design trends are increasing the demand for long-lasting, clean lubricants with higher temperature stability and longevity. In turn, this has required the industry to innovate and create higher performing lubricants and greases that provide extended durability and improved energy efficiency. Using Esterex™ esters as a key part of those solutions enables formulators to address the needs of modern, high performance applications.

Ester chemistry	Grade	SG at 15.6/ 15.6°C (ASTM D4052)	KV at 100°C cSt (ASTM D445)	KV at 40°C cSt (ASTM D445)	VI (ASTM D2270)	Pour point °C (ASTM D97 / D5950)	Flash point (COC) °C (ASTM D92)	Biodegradability[a] (OECD 301F/ 301B)	Passenger car motor oil	Heavy duty motor oil	Automatic transmission fluid	Automotive gear oil/ Heavy duty transmission fluid	2 & 4 stroke engine oil	Electric vehicle driveline fluid	Industrial gear oil	Turbine oil	Chain oil	Hydraulic fluid	Compressor oil	Grease	Textile oil
Octyl Adipate	Esterex™ A32	0.928	2.8	9.5	149	-65	207	Readily	○	○	○	○	◎	○	○		◎	○	◎	◎	◎
Nonyl Adipate	Esterex™ A34	0.922	3.2	12	137	-60	199	Readily	○	○	○	○	◎	○	○		◎	○	◎	◎	◎
Decyl Adipate	Esterex™ A41[b]	0.921	3.6	14	144	-57	231	Readily	○	○	○	○	◎	○	○		◎	○	◎	◎	◎
Tridecyl Adipate	Esterex™ A51	0.915	5.4	27	136	-57	247	Readily	○	○	○	○	◎	○	○		◎	○	◎	◎	◎
Fatty Acid TMP Polyol Ester[c]	Esterex™ NP343	0.945	4.3	19	136	-48	257	Readily	○		○	○	◎	○	○	○	◎	○	◎	◎	◎
Fatty Acid PE Polyol Ester[d]	Esterex™ NP451	0.993	5	25	130	-60	255	Readily	○				◎			○		○	◎		
Decyl Phthalate	Esterex™ P61	0.967	5.4	38	62	-42	224	Readily	○				◎		○				◎		
Decyl Phthalate	Esterex™ P62	0.967	5.4	39	58	-51	243	Readily	○				◎		○				◎		
Tridecyl Phthalate	Esterex™ P81	0.955	8.3	84	52	-33	265	Inherently					◎		○		◎		◎		
Tridecyl Phthalate	Esterex™ P101	0.965	10.1	100	76	-33	250	Inherently					◎		○		◎		◎	◎	◎
Nonyl Trimellitate	Esterex™ TM111[b]	0.978	11.9	124	81	-33	274	Not readily or inherently					◎		○		◎		◎	◎	◎

The data shown are typicals that may vary with time. The colored circles represent the treat rates of each Esterex grade in various applications. In a number of cases, different treat rates can be chosen to achieve specific formulation goals.

○ >80% ◎ 40-60% ○ <=20%

[a] Biodegradability using OECD 301F/301B testing guidelines. (OECD, 1992)
Readily biodegradable: A substance is considered "readily biodegradable" when the test material achieves greater than 60% biodegradation in 28 days. Single substances with one isomer (a monomer, e.g. ethanol) must pass the 10-day window criterion, which means that once the 10% biodegradation mark has been attained, test material must then reach the 60% biodegradation mark within 10 days and before day 28 of the test. The 10-day window criterion does not apply to complex mixtures (isomeric mixtures).
Inherently biodegradable: A substance is considered "inherently biodegradable" when the test material achieves greater than 20% biodegradation in 28 days, or greater than 60% biodegradation within 60 days.
Source: ExxonMobil data.

[b] Available in selected regions. Please contact your sales representative for complete country availability.

[c] TMP = Trimethylolpropane

[d] PE = Pentaerythritol

Please refer to your regional / country product documentation (Safety data sheet) for detailed information.

Performance benefits

- Long-lasting, clean and varnish-free performance in formulations
- High performance in wide temperature range
- Readily or inherently biodegradable options
- Excellent hydrolytic and thermal stability
- Improved energy efficiency from excellent lubricity properties
- Low volatility, non-VOC and high temperature resistance

Application flexibility

Esterex™ esters can be used in a broad range of automotive and industrial applications, including:

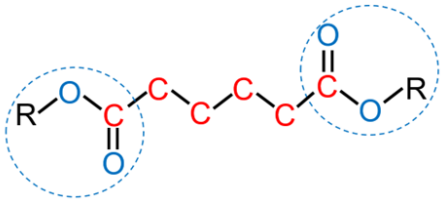
- Compressor
- Refrigeration compressor
- Hydraulic
- Turbine
- Industrial gear
- Paper machine
- Food process machinery
- Heat transfer
- Chain
- Greases

Diesters:

Diesters are derived from synthetic dibasic acids and monofunctional alcohols. Diesters provide a wide operating temperature range and have low volatility. These synthetic esters are often used as co-base stocks with hydrocarbon oils to improve additive solubility and seal compatibility.

Diester

- A hydrocarbon center
- Two ester functional groups



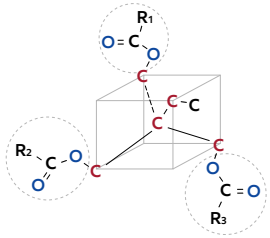
Adipate Diester

Polyol esters:

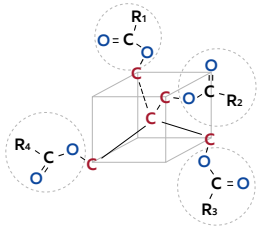
Polyol esters are derived from organic carboxylic esters and neo-polyols. Polyol esters are available in a wide viscosity range and offer long-lasting, clean and varnish-free performance, and are the preferred choice for high-temperature applications.

Polyol ester

- Tetrahedron center
- Spherical molecule



Trimethylolpropane (TMP) Polyol Ester



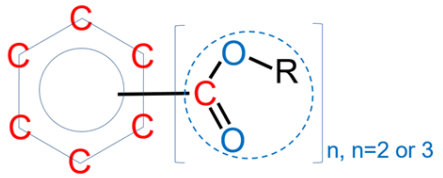
Pentaerythritol (PE) Polyol Ester

Aromatic esters:

Aromatic esters have unique structures that resist oxidation and prevent the formation of deposits and varnish. Aromatic esters are high viscosity base stocks that offer superb hydrolytic and thermal stability.

Aromatic ester

- An aromatic center
- Two and three ester linked side chains



Phthalate Ester (n=2) & Trimellitate Ester (n=3)

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