



Base Stocks & Additives SELECTION GUIDE



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Manufacturing & Technical Center
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Synthetic esters, with their polarity and uniform structure, provide multiple high performance functions in lubricants:

- ◆ As a base stock or as an additive, esters improve lubricity, improve the solubility of additives, have an affinity for metal surfaces and improve cleanliness and sludge control.
- ◆ Versus mineral oils, the ester structure offers lower volatility at lower molecular weight and lower viscosity.
- ◆ Esters can be selected to provide extreme high temperature performance, extreme low temperature performance or both.
- ◆ Esters provide or enhance seal and gasket compatibility.
- ◆ Esters generally offer high thermal-oxidative stability.

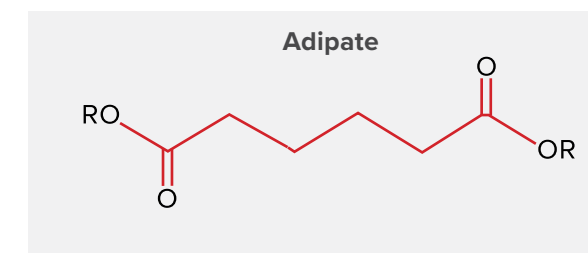
Esters can be combined with PAO's or mineral oils to improve seal swell, solubilize additives, reduce volatility and improve energy efficiency.

Many esters are used in environmentally acceptable lubricant applications due to their biodegradability and low toxicity.

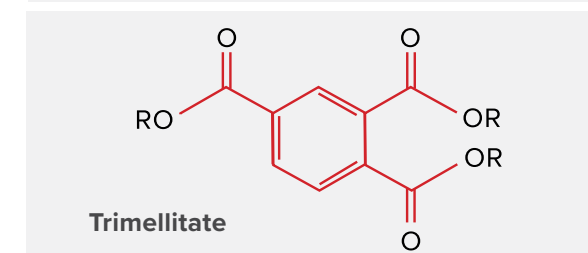
Synthetic Ester Types:

Diesters

Adipates make a great base stock or blend component when biodegradability or high-temperature cleanliness is important. Diesters may also be used in combination with PAO's or Group III's for engine, compressor, gear, transmission, hydraulic and other oils.



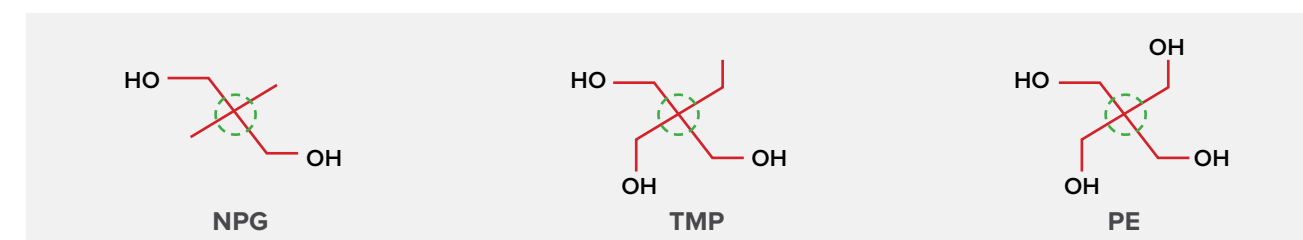
Trimellitate esters are often a cost effective alternative to high viscosity polyol esters. They are used where low volatility, thermal stability and high lubricity are needed. Applications include compressor lubes, gear oils, chain lubes and greases.



R = Alkyl group

Polyol Esters

Esters of Polyols, such as NeoPentyl Glycol (NPG), Trimethylol Propane (TMP) and PentaErythritol (PE), get their high performance and stability from their core Quaternary Carbon structure. That, along with their high polarity, further attracts the esters to metal surfaces which enhances lubricity. From refrigeration lubes to oven chain lubes, polyols can be customized for almost any application.



Performance Advantages:

Gears, including Industrial, Automotive & Wind

- High or low viscosity performance
- High viscosity at elevated temperatures
- Improved thermal & oxidative stability
- Great solubilizing characteristics

Chain Oils

- High temperature performance
- Low coking, low residue

Hydraulic Fluids

- Biodegradability
- Fire resistance, low volatility

Compressor

- High or low viscosity performance
- High thermal and oxidative stability
- Natural detergency, low varnish
- Polyol esters are primary base stock for HFC refrigerants

Engine Oils

- Meet increasing demand for low viscosity, high VI
- Low pour point, low cold crank viscosity
- Lower volatility
- Solvency, seal swell, and lubricity

Greases

- Great for high and low-temperature application

Product Name		Description	ISO VG	Industrial						Transportation					Metalworking Fluid				Additives	
				Gear	Hydraulic	Compressor	Turbine	Chain	Grease	Engine	Gear	Axle	2-Stroke	4-Stroke	Water Miscible	Neat Oil	Steel Rolling	Aluminum Processing	Lubricity Additive	Friction Modifier
Mono Esters																				
OLEO	TruVis DOS	Di-octyl sebacate (DOS)	12						●	●						●				
	TruVis EHO/M1008	2-Ethylhexyl oleate <i>Environmentally friendly</i>	8		●				●				●		●	●				●
	TruVis TDS	Isotridecyl stearate <i>Environmentally friendly</i>	17												Emulsifiable					●
Diesters																				
ADIPATE	TruVis A80	Di-octyl adipate (DOA)	8	●	● EAL-HEES				●		●	●	●	●		●			●	
	TruVis A85	Di-isooctyl adipate (DIOA)	9	●	●	●			●	●	●	●	●	●		●				
	TruVis A90	Di-isononyl adipate (DINA)	11	●	●				●	●	●	●	●	●						
	TruVis A100	Di-isodecyl adipate (DIDA)	13	●	●	●			●	●	●	●	●	●						
	TruVis A130	Di-isotridecyl adipate (DITA/DTDA)	27	●	● EAL-HEES	●		▲ 300 °C	●	●	●	●	●	●		●				
SPECIAL	TruVis D2020	2-Ethylhexyl dodecanedioate	14						●											
TRIMELLITATE	TruVis TM350	Hexyl trimellitate	34	●		●		▲	●		●									
	TruVis TM500 / TM1055	810 Trimellitate	50 / 52	●		●		▲	●		●									
	TruVis TM850	Trioctyl trimellitate (TOTM)	85	●				▲	●		●									
	TruVis TM900	Trinonyl trimellitate (TNTM)	86	●		●		▲	●		●									
	TruVis TM1300	Triisodecyl trimellitate (TIDTM)	132	●		●		▲	●		●									
	TruVis TM2200	Trisodecyltridecyl trimellitate (TIDTDTM)	220	●		●		▲	●		●									
	TruVis TM2250	Trimellitate Ester Blend (TIDTDTM/TTDTM)	220	●		●		▲	●		●									
	TruVis TM3200	Tritridecyl trimellitate (TTDTM)	320	●		●		▲ 300 °C	● High Temp		●				●	●				
Polyol Esters																				
NEOPENTYL GLYCOL	TruVis P2207	Neopentyl glycol ester	8			■														
TRIMETHYLOLPROPANE	TruVis P3020	Trimethylolpropane C8C10 (TMP C8C10) <i>NSF HX1 Food Grade</i>	19	□	● EAL-HEES	●	●	▲ 300 °C	● EAL	●	●	●	●	●		●	●	●	●	
	TruVis P3050	Trimethylolpropane trioleate <i>Environmentally friendly</i>	46	●	● HFD-U				●				●		●	●	●		●	
	TruVis P3058	Trimethylolpropane complex ester	48			●							●	●						
	TruVis P3121	Trimethylolpropane C9 (TMP C9) <i>NSF HX1 Food Grade</i>	21	●		●		▲ 300 °C	●	●	●		●	●			●	●	●	
PENTAERYTHRITOL	TruVis P4032	Pentaerythritol	32			■		▲	●											
	TruVis P4068	Pentaerythritol	68			■														
	TruVis P4246	Pentaerythritol	46			■														
	TruVis P4268	Pentaerythritol	68			■														
	TruVis P60175	Dipentaerythritol	171					▲												
BLEND	TruVis P4232	Neopentyl glycol/pentaerythritol blend	32		●	■	●							●						



Markets for Esters

✓ Automotive

✓ Industrial

✓ Metalworking

✓ Power Generation

✓ Construction

✓ Marine

**TOGETHER BRINGING
DYNAMIC STABILITY™
TO THE LUBRICANT INDUSTRY**



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