



CalEster™

SYNTHETIC BASE STOCKS

Calumet Specialty Products Partners, L.P. offers a complete line of high-purity synthetic polyol esters for use in high-performance lubricant applications. With more than 50 years of experience in manufacturing synthetic polyol esters, Calumet's lubricant-grade esters are engineered to deliver the highest performance under the most demanding conditions.

In addition to the products shown below, Calumet's lubricant chemists are capable of developing custom esters or blends designed to optimize performance in your specific applications.

CalEster POEs may be used alone in high-temperature applications for optimum performance, or blended with PAOs or other synthetic base stocks to improve the balance of the finished lubricant. At Calumet, we have the talent, flexibility, reliability, and capacity to meet your lubricant needs. Bring us your challenges and let us work for you.

PRODUCT FEATURES

- Excellent High-Temperature Stability
- Excellent Low-Temperature Fluidity
- Extremely Low Volatility
- High Viscosity Index
- High Lubricity
- Excellent Additive Solubility
- Enhanced Cleanliness
- Readily Biodegradable
- All Calumet Synthetic Polyol Esters are Phthalate Free

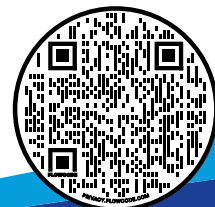
PRODUCT BENEFITS

- Extended Operating Temperature Range
- Longer Lubricant Life with Less Waste Disposal
- Reduced Maintenance and Downtime
- Improved Energy Efficiency
- Environmentally Friendly

INDUSTRY APPLICATIONS

- Aviation Lubricants
- Refrigeration Lubricants
- Industrial Lubricants
- Automotive Lubricants

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CalEster™ TYPICAL PROPERTIES

PROPERTIES	METHOD	N	TS	MW	T	J	LV	600	DB2	F	HT68	HT125	HT175	22 Pro	32 Pro	68S	68 Pro	100 Pro	170 Pro	220 Pro	HV
Viscosity @ 100°C (cSt)	ASTM D445	2.5	4.0	4.1	4.3	4.9	4.9	5.0	5.0	8.9	8.9	14.5	17.6	4.1	5.7	8.4	9.7	12.8	16.9	19.4	25.3
Viscosity @ 40°C (cSt)	ASTM D445	8.2	17.5	18.7	19.4	23.9	23.7	23.0	24.5	54.5	66.0	127	182	18.6	30.4	71.0	67.0	104	171	222	378
Viscosity @ -40°C (cSt)	ASTM D2532	633	3,340	4,366	3,950	6,870	7,874	6,200	8,000	38,000	-	-	-	4,366	19,400	-	-	-	-	-	-
Viscosity Index	ASTM D2270	140	129	121	131	132	133	150	133	142	108	114	105	122	130	84	126	117	105	99	88
Pour Point (°C)	ASTM D97	-51	-69	-66	-57	-63	-65	-80	-65	-65	-41	-40	-34	-66	-60	-42	-50	-45	-38	-29	-18
Flash Point (°C)	ASTM D92	210	252	250	259	258	255	262	255	286	271	297	296	250	258	264	276	286	290	296	301
Color, ASTM	ASTM D1500	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5	L0.5
Total Acid Number (mg KOH/g)	ASTM D664	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04	≤0.04
Water Content (wt %)	ASTM D1533	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	≤0.005	≤0.005	≤0.005	≤0.005	≤0.005	≤0.005	≤0.005	<0.03
Density @ 15.6°C (lb/gal)	ASTM D4052	7.68	7.94	8.31	7.89	8.26	8.32	8.25	8.18	8.41	8.05	8.11	8.11	8.28	8.23	7.98	8.25	8.25	8.19	8.14	8.07
Noack Volatility (mass %)	ASTM D5800	42	5	4	4	3	5	6	6	3	2	2	2	4	4	3	3	3	2	2	2
Food Grade	NSF				HX-1																
Biodegradability	OECD 301 B	>60%	>60%	>60%	86%	91%		90%		67%											
Phthalate Free		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Application Guide																					
Aviation		√	√	√	√	√				√											
Automotive			√		√	√				√											
Industrial		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Refrigeration*														√	√	√	√	√	√	√	√

*Refrigeration grades dried to meet low moisture specification.

TECHNICAL ASSISTANCE

If you have questions regarding these products or their technical specifications, please contact your sales representative or Calumet Technical Services at (800) 437-3188 or technical@calumet.com.

Calumet's sampling and testing procedures in effect at the time of production will be used for certification testing. Results may be based on tank certification, manufacturing data, periodic testing and/or most recent product restock. Typical values only represent the values one would expect if the property were tested in our laboratories with our test methods on the specified date. Some product properties are not frequently measured, and accordingly typical values are not based on a statistically relevant number of tests. The information in this document relates only to the named product. The user is solely responsible for all determination regarding any use and any process.