

# Base oils and additives for lubricants



Product and application guide



# Contents

<b>Introduction</b>	<b>5</b>
Base oils and additives for lubricants	5
Technology & innovation	5
Power products	5
<b>Product list</b>	<b>6</b>
<b>Base fluids &amp; lubricity additives</b>	<b>6</b>
Ester base fluids & lubricity additives	6
Polyalkylene glycol base fluids	12
• <i>Water insoluble base fluids</i>	12
• <i>Water soluble base fluids</i>	14
• <i>High viscosity water soluble base fluids</i>	14
<b>Performance additives</b>	<b>16</b>
Friction modifiers	16
Corrosion inhibitors	18
Emulsifiers	20
• <i>Non-ionic emulsifiers</i>	20
• <i>Polymeric emulsifiers</i>	20
Fatty acids (emulsifiers/lubricity additives/CI)	22
Grease thickeners	22
Diesel lubricity additives	24
Demulsifiers/dehazers	24
Asphaltene dispersants	26



# Base oils and additives for lubricants

**A unique range of functional ingredients - delivering superior performance and tailored solutions to our customers in the automotive, industrial and marine lubricant sectors.**

With a strong reputation for quality and innovation, coupled with a corporate commitment to renewability and sustainability, our speciality products add value, impart demonstrable effects and reduce environmental impact.

By combining application expertise, a dedicated market team and technical resources, we strive to deliver an efficient and reliable service around the globe. Working closely with our customers, we continuously seek opportunities to develop innovative products and services which contribute to sustainable development, improve quality of life and create value.

Designed to tackle the lubrication needs of today and the performance and legislative targets of the future, our products will continue to help:

- Improve fuel economy
- Reduce emissions
- Extend oil drain intervals
- Improve equipment durability
- Increase production efficiency



## Technology & innovation

We responsibly manufacture high quality products using unique multiple technology platforms. Proven strengths include:

- Ester technology (**Priolube™**)
- Self-emulsifying esters combining lubrication and emulsification in a single molecule (**Priolube™**)
- Polyalkylene glycols (**Emkarox™**)
- Polymeric surfactants (**Celevida™**)
- Speciality effect additives (**Perfad™**, **Kemelix™** and **Pluvia™**)
- Fatty acids (**Pripol™**, **Prisorine™** and **Priolene™**)

## Power products

Look out for the gold circles (●) to the left of the product names. These are 'power products' - so-called because of their outstanding performance in recommended applications. The gold circle is designed to help you make more informed choices when selecting products for your formulations. Make sure you request a sample for your own evaluations.

# Base fluids & lubricity additives

## Ester base fluids & lubricity additives

Power product	Product	Chemical description	Automotive applications				Industrial marine applications										Additional features					Typical data									
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	EU Ecolabel (on LuSC list)	Kinematic viscosity at 40°C (mm <sup>2</sup> /s)	Kinematic viscosity at 100°C (mm <sup>2</sup> /s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Iodine value (g/100g)	Acid value (mgKOH/g)
●	Pefad 3950F	Proprietary					●																	392	40	152	-20	214	0.97	24	20
●	Perfad 8100	Complex ester					●														73			1100	64	119	-29	292	0.97	95	<1.40
●	Perfad 8400	Complex ester					●																	3510*	151**	134	-6	280	0.97	7	2
	Priolube 1407	Unsaturated polyol ester	●		●		●					●	●								100			84	10	97	0	215	0.96	79	0.50
●	Priolube 1415	Mono ester					●												●		67			8.7	2.8	187	-27	220	0.87	68	0.20
●	Priolube 1426	Unsaturated polyol ester						●											●		85			65	13	208	-27	310	0.92	84	1.80
●	Priolube 1427	Unsaturated polyol ester					●					●							●		90	●		48	9.5	187	-39	300	0.90	84	1
	Priolube 1428	Unsaturated polyol ester					●												●		86			22	5	160	-15	250	0.90	88	2
	Priolube 1435	Unsaturated polyol alcohol ester					●												●		100			41	9	195	-15	290	0.92	89	1.50
	Priolube 1442	Unsaturated polyol ester													●	●					93			64	12.5	190	-21	290	0.92	90	0.50
●	Priolube 1445	Unsaturated polyol ester													●	●			●		93	●		67	12.5	188	-30	290	0.92	88	0.50
	Priolube 1446	Unsaturated polyol ester													●	●			●		90	●		30	7	207	-30	295	0.90	81	0.60
●	Priolube 1847	Complex ester		●			●	●	●	●				●					●		81	●		1040	90	167	-24	300	0.95	4	0.10
●	Priolube 1851	Complex ester					●	●	●	●				●					●		95	●		495	49	153	-36	300	0.95	3	0.10
	Priolube 1856	Petrochemical di-ester						●	●	●							●	●	●					12.5	3.3	140	-78	230	0.91	0.4	0.05
	Priolube 1859	Petrochemical di-ester								●								●	●					9	2.6	140	-78	210	0.91	0.6	0.05
●	Priolube 1875	Oleochemical di-ester								●								●			69			95	14	144	-40	280	0.91	2	0.07
●	Priolube 1889	Saturated polyol ester						●	●							●								170	17	107	-29	302	0.97	0.5	0.40
	Priolube 1921	Saturated polyol ester											●						●					17	4	159	0	220	0.90	10	3.00
●	Priolube 1929	Complex ester		●		●	●	●	●	●		●									80			1700	125	175	-21	310	0.92	32	0.10
	Priolube 1935	Petrochemical di-ester		●			●							●				●	●					14.5	3.7	149	-72	226	0.92	0.6	0.05
	Priolube 1936	Petrochemical di-ester		●	●		●		●	●				●			●	●						26	5.3	139	-54	244	0.91	0.3	0.05
	Priolube 1937	Saturated polyol ester					●									●		●						19	4.1	120	-40	240	0.99	0	0.05
	Priolube 1938	Trimellitate ester						●		●						●		●						143	13.1	83	-30	280	0.97	0.2	0.05
●	Priolube 1939	Trimellitate ester					●	●		●						●		●						306	20.2	73	-9	276	0.96	0.5	0.05

\*Dynamic viscosity at 40°C (mPa.s), \*\*Dynamic viscosity at 100°C (mPa.s)

Power product	Product	Chemical description	Automotive applications				Industrial marine applications										Additional features					Typical data								
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	EU Ecolabel (on LuSC list)	Kinematic viscosity at 40°C (mm <sup>2</sup> /s)	Kinematic viscosity at 100°C (mm <sup>2</sup> /s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Iodine value (g/100g)
	Priolube 1940	Trimellitate ester						●		●							●						91	9.6	78	-36	261	0.99	0.6	0.05
●	Priolube 1941	Trimellitate ester						●		●							●						52	8	124	-45	282	0.97	0.5	0.05
	Priolube 1942	Trimellitate ester						●		●								●					71	9.6	116	-48	273	0.97	0.7	0.05
	Priolube 1943	Trimellitate ester						●										●					97	11	100	-39	275	0.97	0.6	0.05
	Priolube 1968	Unsaturated polyol ester					●					●	●						●	86			100	13	127	5	300	0.92	45	2.00
●	Priolube 1973	Saturated polyol ester			●	●		●	●			●	●				●		●	87	●		46	8	148	-44	280	0.90	2	0.05
●	Priolube 1976	Mono ester			●													●					26	5.4	157	-33	260	0.86	2	0.03
	Priolube 2014	Unsaturated polyol ester					●					●							●	84			48	9	187	-21	322	0.92	103	1
	Priolube 2016	Unsaturated polyol ester					●					●							●	82			24	6	211	-12	290	0.90	102	2
	Priolube 2017	Saturated polyol ester					●													65			10	2.9	186	5	200	0.86	1	0.1
	Priolube 2018	Mono ester					●									●							8.5	2.7	159	-27	220	0.9	68	0.2
	Priolube 2040	Saturated polyol ester	●		●														●	100			255	16	46	-6	220		1	1.00
	Priolube 2044	Unsaturated polyol ester										●	●						●				85	12.4	142	-3	250	0.92	44	9
●	Priolube 2046	Complex ester		●		●		●	●	●										85			400	40	163	-36	310	0.92	20	0.10
●	Priolube 2065	Unsaturated polyol ester						●						●	●			●	90	●			48	9.8	196	-39	300	0.92	84	1.00
●	Priolube 2087	Complex ester				●	●	●	●		●	●	●						●	88	●		320	35	150	-40	260	0.92	30	0.50
●	Priolube 2088	Complex ester						●	●	●				●				●	94	●			320	35	150	-40	260	0.92	30	0.15
●	Priolube 2089	Unsaturated polyol ester						●						●				●	92	●			44	8.7	181	-54	315	0.92	72	0.05
	Priolube 2101	Unsaturated polyol ester					●					●			●					90			46	9.5	187	-47	325	0.91	86	0.48
	Priolube 2104	Saturated mono ester					●					●											5.6	2	177	-26	178	0.9	4	0.5
	Priolube 2127	Unsaturated polyol ester					●					●			●				●	90			48	9.5	187	-39	300	0.9	84	1
	Priolube 2215	Unsaturated polyol ester					●					●			●				●	67			8.1	2.7	208	-34	242	0.9	63	0.1
	Priolube 2220	Trimellitate ester						●		●						●							126	12	84	-33	260	0.97	0.1	0.05
	Priolube 2223	Trimellitate ester					●	●		●						●							324	22	78	-24	268	0.95	0.1	0.02
●	Priolube 2500	Saturated polyol ester						●	●	●			●			●		●	●	80	●		90	13	143	-24	280	0.92	3	0.50
●	Priolube 2510	Complex ester								●								●	●	●	89		100	15	157	-34	260	0.94	18	<0.50
●	Priolube 2520	Complex ester								●								●	●	●	92		220	28	164	-27	270	0.94	27	<0.50
●	Priolube 2568	Complex ester								●								●	●	●	88		68	12	175	-45	269	0.94	14	<0.50
	Priolube 2720	Polyol ester		●	●	●		●	●	●	●	●				●							20.4	4.6	143	-51	268			0.05

\*Dynamic viscosity at 40°C (mPa.s), \*\*Dynamic viscosity at 100°C (mPa.s)

Power product	Product	Chemical description	Automotive applications				Industrial marine applications									Additional features						Typical data										
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	EU Ecolabel (on LuSC list)	Kinematic viscosity at 40°C (mm²/s)	Kinematic viscosity at 100°C (mm²/s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Iodine value (g/100g)	Acid value (mgKOH/g)	
	Priolube 2722	Unsaturated polyol ester																					63	10	141	-22	331	0.92	98	0.58		
	Priolube 3905	Oleochemical di-ester				●																	70		135	18	145	-48	290	0.91	73	2
●	Priolube 3952	Emulsifiable ester					●																61		380	34	142	-36	330	0.94	1	33
●	Priolube 3953	Emulsifiable ester					●																70		360	33	131	-39	330	0.93	1	18
●	Priolube 3955	Emulsifiable ester					●																68		420	41	147	-21	320	0.97	1	50
	Priolube 3958	Petrochemical di-ester		●															●	●					10.5	3	146	-78	215	0.92	0.4	0.05
	Priolube 3959	Petrochemical di-ester									●								●	●					7.7	2.4	135	-81	203	0.93	0.1	0.05
	Priolube 3960	Petrochemical di-ester		●															●						19	4.5	163	-72	230	0.91	0.6	0.05
	Priolube 3963	Petrochemical di-ester		●	●														●	●					11.5	3.2	149	-78	230	0.91	0.4	0.05
	Priolube 3967	Oleochemical di-ester			●	●														●		70		94	13	145	-45	290	0.91	60	0.07	
●	Priolube 3970	Saturated polyol ester		●	●	●		●	●	●	●	●	●			●		●	●	●	●	81	●	20	4.4	140	-51	250	0.94	0.5	0.05	
	Priolube 3971	Saturated polyol ester						●	●	●	●	●							●	●					30	5.9	144	-3	285	0.96	0.5	0.05
	Priolube 3973	Petrochemical di-ester					●													●					12.2	3.3	147	-60	219	0.92	1	0.05
	Priolube 3985	Oleochemical di-ester						●														70		84	13	144	-45	290	0.91	80	0.07	
●	Priolube 3986	Complex ester		●		●	●	●	●	●	●												85	●	47000	2000	278	6	325	0.92	120	0.10
●	Priolube 3987	Saturated polyol ester				●		●	●	●									●	●					145	18.2	140	-33	320	0.92	3.5	0.10
●	Priolube 3988	Saturated polyol ester				●		●	●														86	●	100	13.8	140	-34	280	0.92	3	0.1
	Priolube 3997	Complex ester		●					●														82		40000	2000	290	6	325	0.92	7	0.04
●	Priolube 3999	Unsaturated polyol ester			●	●		●	●									●	●		●				90	14	144	-27	290	0.92	58	0.05
	Priolube LL 564	Mono ester					●	●		●											●				7	2.5	228	-46	189	0.87	30	1

Ester base fluids for electric vehicles

Product	Chemical description	Automotive applications				Electric vehicle fluids	Industrial marine applications									Additional features					Typical data								
		Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils		Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Kinematic viscosity at 40°C (mm <sup>2</sup> /s)	Kinematic viscosity at 100°C (mm <sup>2</sup> /s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Iodine value (g/100g)
Priolube EF 3221	Ester-based					●													●	●	141	7.7	2.4		-81	203	0.92		
Priolube EF 3446	Ester-based					●													●	●	135	6.1	2.0	141	< -40	204	0.92		< 0.1

Polyalkylene glycol - water insoluble base fluids

Power product	Product	Chemical description	Automotive applications				Industrial marine applications									Additional features					Typical data										
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	EU Ecolabel (on LuSC list)	Kinematic viscosity at 40°C (mm <sup>2</sup> /s)	Kinematic viscosity at 100°C (mm <sup>2</sup> /s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Hydroxyl value (mgKOH/g)	Refractive index at 20°C	4-ball mean wear scar (mm)
	Emkarox VG 146	Water-insoluble PAG					●		●														145	25	207	-45	224	0.99	29	1.451	0.54
●	Emkarox VG 222	Water-insoluble PAG						●	●	●							●						221	38	215	-36	225	0.99	27	1.450	0.51
●	Emkarox VG 380	Water-insoluble PAG						●	●	●							●						380	61	234	-33	230	0.99	21	1.451	0.54
	Emkarox VG 100 NS	Water-insoluble PAG							●	●				●			●				●		107	18	181	-42	280	1.03			
	Emkarox VG 150 NS	Water-insoluble PAG							●	●				●			●				●		152	25	198	-42	280	1.03			

Polyalkylene glycol - water soluble base fluids

Power product	Product	Chemical description	Automotive applications				Industrial/marine applications										Additional features					Typical data											
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Kinematic viscosity at 40°C (mm <sup>2</sup> /s)	Kinematic viscosity at 100°C (mm <sup>2</sup> /s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Cloud point (°C) (1% aqueous solution)	Hydroxyl value (mgKOH/g)	Refractive index at 20°C	4-ball mean wear scar (mm)	
●	Emkarox VG 130W	Water-soluble PAG					●	●	●	●														152	25	197	-32	232	1.07	81	98	1.460	0.46
	Emkarox VG 132W	Water-soluble PAG					●	●	●	●													●	131	25	225	-42	230	1.06	59	34	1.459	0.58
	Emkarox VG 330W	Water-soluble PAG					●	●	●	●														328	56	239	-30	228	1.07	65	44	1.460	0.51
●	Emkarox VG 681W	Water-soluble PAG					●	●	●	●													●	680	116	274	-30	230	1.06	54	14	1.461	0.54
●	Emkarox VG 1055W	Water-soluble PAG					●	●	●	●													●	1052	171	284	-24	240	1.06	61	22	1.460	0.46

Polyalkylene glycol - high viscosity water soluble base fluids

Power product	Product	Chemical description	Automotive applications				Industrial/marine applications										Additional features					Typical data									
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial Gear Oils	Chain Oils	Ferrous Metal Rolling Oils	Non-ferrous Metal Rolling Oils	Hydraulic Fluids - EAL	Hydraulic Fluids - Fire Resistant	Quenching Fluids	Air Compressor	Gas Turbine Engine Lubricants	Incidental Food Contact Approved	Oxidative Stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Kinematic viscosity at 40°C (mm <sup>2</sup> /s)	Kinematic viscosity at 100°C (mm <sup>2</sup> /s)	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Cloud point (°C) (1% aqueous solution)	Hydroxyl value (mgKOH/g)	Refractive index at 20°C	Water diluted form H <sub>2</sub> O content (%)	
	Emkarox HV 20	Water-soluble PAG					●															●	19500	2400	4	240	1.09	78	9	1.467	
	Emkarox HV 20 SOL 70%	Water-soluble PAG					●															●	2164	323	-33		1.09	78		1.424	30
	Emkarox HV 20 SOL 60%	Water-soluble PAG					●															●	1264	461	-25		1.09	78		1.436	40
	Emkarox HV 26	Water-soluble PAG					●																26000	3000	5	240	1.09	77	7	1.467	
●	Emkarox HV 45	Water-soluble PAG					●															●	45000	6500	7	240	1.09	76	6	1.467	
	Emkarox HV 45 SOL 56%	Water-soluble PAG					●															●	1895	566	-33		1.08	76		1.425	44
●	Emkarox HV 165 SOL 50%	Water-soluble PAG																					165000	14600	15		1.08	73	5	1.410	50



# Performance additives

## Friction modifiers

Power product	Product	Chemical description	Automotive applications				Industrial marine applications										Additional features					Typical data				
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greasas	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	EU Ecolabel (on LuSC list)	Iodine value (g/100g)	Melting point (°C)	Phosphorus (%)	Sulphur (%)
	Optislip O	Oleamide	●		●													●	95		90	69	0	0	0	
●	Perfad 3000	Polymer			●																25		0	0	0	
●	Perfad 3057	Polymer			●																4.7		0	0	0	
●	Perfad 3006	Polymer			●	●															2		0	0	0	
	Perfad 3570	Polymer			●															84	124		0	0	0	
	Perfad 3571	Saturated fatty alcohol			●															100	30		0	0	0	
	Perfad 3575	Polymer			●																<1		0	0	0	
	Perfad 3576	Polymer			●																<2		0	0	0	
	Perfad 4000	Fatty amide			●															80	10		0	0	0	
●	Perfad FM 3336	Ester	●		●															100	●	5	15	0	0	0
	Perfad NG 2500	Polymer			●																4		0	0	0	
	Priolube 594	Proprietary blend	●		●		●														100		0	0	0	
	Priolube 1407	Unsaturated polyol partial ester	●		●															100	79	>20	0	0	0	
	Priolube 2040	Saturated polyol ester	●		●															●	100	1		0	0	0

Corrosion inhibitors rust preventatives

Power product	Product	Chemical description	Automotive applications				Industrial marine applications								Additional features					Typical data								
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	EU Ecolabel (on LUSC list)	Solubility	Physical form	Density at 20°C (g/ml)	pH (10% m/m aqueous solution)	Acid value (mgKOH/g)
	Priacid A95	Azelaic acid					●	●														●	Water	Waxy solid			575	108
●	Perfad 9013	Ashless organo-nitrogen compound						●															Oil	Semi-solid	1.01	7	217	
●	Pripol 1017	Dimer acid	●																	100			Oil/Fuel	Liquid	0.95		193	
	Pripol 1025	Dimer acid (hydrogenated)	●																			●	Oil/Fuel	Liquid	0.95		194	
	Pripol 1040	Trimer acid	●																	100			Oil/Fuel	Liquid	1.00		189	
●	Pluvia T 20	Polyoxyethylene (20) sorbitan monolaurate					●																Water	Liquid	1.11	3	0.6	
●	Pluvia T 40	Polyoxyethylene (20) sorbitan monopalmitate					●																Water	Liquid			1	
●	Pluvia T 60	Polyoxyethylene (20) sorbitan monostearate					●																Water	Semi-solid			0.6	33
●	Pluvia T 80 NV	POE(20) sorbitan mono-oleate					●							●									Water	Yellow brown	1.07	5	>149	
●	Pluvia T 85	POE(20) sorbitan tri-oleate	●				●																Oil	Yellow brown	1.00	5.5	>149	

Non-ionic emulsifiers

Power product	Product	Chemical description	Automotive applications				Industrial marine applications								Additional features				Typical data								
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Physical form	Colour	HLB	Cloud point - 10% aqueous solution (°C)	Flash point COC (°C)
	Priolube 594	Unsaturated polyol ester					●														99	Liquid	Colourless	2.8		300	0.96
●	Pluvia S 80 NV	Sorbitan monooleate					●					●	●							●	100	Liquid	Amber	4.3		>149	1
	Pluvia S 85	Sorbitan trioleate	●															●		●	100	Liquid	Amber	1.8		>149	0.95

Polymeric emulsifiers

Power product	Product	Chemical description	Automotive applications				Industrial/marine applications								Additional features				Typical data								
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Physical form	Colour	HLB	Flash point COC (°C)	Density at 25°C (g/ml)	Melting point (°C)
●	Celevida 4500	Proprietary	●				●															Liquid	Dark brown	6.0	268	0.97	
●	Celevida 6300	Proprietary	●																	60	Waxy solid	Red brown	6.0	66*	0.94	40	
●	Celevida 6400	Proprietary	●				●															Waxy solid	Red brown	8.0	76*	0.90	45
●	Celevida P1	Proprietary					●													100	Waxy solid	Amber	1.0	230*	0.90	26	
●	Celevida P9	Proprietary					●													100	Liquid	Amber	1.0		0.93		

\* Flash point PMCC (°C)

Fatty acids (emulsifiers/lubricity additives/C1)

Power product	Product	Chemical description	Automotive applications				Industrial marine applications								Additional features					Typical data																								
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative Stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Acid value (mgKOH/g)	Saponification value (mgKOH/g)	Iodine value (g/100g)	Cloud point (°C)	Colour gardner	Flash point COC (°C)	Dynamic viscosity at 25°C (mPa.s)	Dynamic viscosity at 80°C (mPa.s)	Density at 25°C (g/ml)	Monomer	Intermediate	Dimer	Trimer	Unsap. (%)	C12	C14	C16	C18	C18:1	C18:2		
●	Pripol 1017	Dimer acid				●				●										100	193	198	95		5	275	8000	225	0.95	2.0	5	77	20	0.2										
	Pripol 1022	Dimer acid							●											100	193	199		<60	5	275	5800	190	0.94	2.0	5	74	21	0.2										
●	Priolene 6907	Oleic acid	●				●	●		●							●	●	●	100	200	202	95	7	10-1.5*	223	25	0.90										0.5	3	5	2	72	9	
●	Prisorine 3501	Isostearic acid					●			●								●	●	100	187	195	5	5	90**	175.0	45	0.89																ca. 83% branched chains, saturated

\* Colour Iovibond (5¼" cell y/r) \*\* Colour APHA

Grease thickeners

Power product	Product	Chemical description	Automotive applications				Industrial marine applications								Additional features						Typical data																					
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	EU Ecolabel (on LuSC list)	Acid value (mgKOH/g)	Saponification value (mgKOH/g)	Iodine value (g/100g)	Cloud point (°C)	Colour APHA														
●	Prisorine 3501	Isostearic acid																		●	●	100					187	195	5	5	90.00											
●	Priacid A95	Azelaic acid					●	●															●	575																		

Diesel lubricity additives

Power product	Product	Chemical description	Automotive applications				Industrial marine applications								Additional features				Typical data				
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	HFR wear scar* (µm)	Cloud point (°C)	Sulphur content (ppm)
●	Perfad FA 3340	Complex ester	●															84	280	<-55	<10	<1	Good
●	Priolene 6907	Oleic acid	●				●										●	100	387	7	<15	<203	Good
	Priolube 1407	Unsaturated polyol partial ester	●		●													100	329	8	<15	<1	Acceptable

\*Diesel + 150ppm additive

Demulsifiers/dehazers

Power product	Product	Chemical description	Automotive applications				Industrial marine applications								Additional features				Typical data								
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metaworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Active content (%)	Dynamic viscosity at 25°C (mPa.s)	pH (1% in 85/15 m/m IPA/water)	Cloud point (°C)	Flash point PMCC (°C)	RSN
●	Kemelix 3422X	Polyimine alkoxyate	●																	100	7440	8.0	13	>100	7	2	1.01
●	Kemelix D310	Resin alkoxyate	●																	88	790	7.0	53	63	16	-10	1.03
	Kemelix D311	Resin alkoxyate	●																	80	423	6.5	58	63	17	-14	1
	Kemelix D317	Modified polyol alkoxyate	●																	80	2000	8.5	33	63	10	-2	1
●	Kemelix D400	Modified polyol alkoxyate	●																	80	700	8.0	<20	30	6	-1	0.98
●	Kemelix D510	Polyimine alkoxyate	●																	100	1900	7.5	50	>100	11	3	1.02
	Kemelix D511	Polyol alkoxyate	●																	100	1170	10.0	87	>100	17	-4	1.02
	Kemelix D513	Polyimine alkoxyate	●																	100	2680	7.5	34	>100	6	-13	0.99

Asphaltene dispersants

Power product	Product	Chemical description	Automotive applications				Industrial marine applications										Additional features				Typical data							
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL	Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Biobased carbon content (ASTM D6866)	Appearance at 25°C	Active content (%)	Dynamic viscosity at 25°C (mPa.s)	Pour point (°C)	Flash point PMCC (°C)	Density at 25°C (g/ml)	pH (10% m/m aqueous solution)
●	Celevida 2500	Proprietary	●																			Brown Liquid	90	1360	-24	>100	0.98	8.5



## About us

The Energy Technologies business in Cargill Bioindustrial creates, makes and sells specialty chemicals and additives for the global energy market. Working in close collaboration with our customers, we apply sustainable concepts and deep scientific expertise so that together we can efficiently power the world of tomorrow.

At our core, we are experts in synthetic ester and polyalkylene glycol chemistries, taking products from lab scale through to full manufacturing. Investing in the development of new chemistries allows us to support our customers in meeting new industry challenges.

For those who dare to imagine a brighter future, we establish long lasting relationships and create bespoke industry solutions through our integrated research & development and global manufacturing capabilities. Being both global and local, you have direct access to our network of technical experts. We look forward to talking to you.

## Further information

Cargill Bioindustrial sales and distribution are coordinated through an extensive worldwide network of technical and commercial experts. For further information or guidance please contact us: [energy\\_technologies@cargill.com](mailto:energy_technologies@cargill.com)

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