Base oils and additives for lubricants

Product and application guide

Cargill®

Contents

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							
			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	
●	Perfad 3950	Proprietary					●							
●	Perfad 8100	Complex ester					●							
●	Perfad 8400	Complex ester					●							
	Priolube 1407	Unsaturated polyol ester	●		●		●				●	●		
●	Priolube 1415	Mono ester					●							
●	Priolube 1426	Unsaturated polyol ester						●						
●	Priolube 1427	Unsaturated polyol ester					●				●			
	Priolube 1428	Unsaturated polyol ester					●							
	Priolube 1435	Unsaturated polyol alcohol ester					●							
	Priolube 1442	Unsaturated polyol ester											●	
●	Priolube 1445	Unsaturated polyol ester											●	
	Priolube 1446	Unsaturated polyol ester											●	
	Priolube 1800	Saturated polyol ester					●							
	Priolube 1802	Unsaturated polyol ester									●			
●	Priolube 1847	Complex ester		●			●	●	●	●			●	
●	Priolube 1851	Complex ester					●	●	●	●			●	
	Priolube 1856	Petrochemical di-ester						●	●	●				
	Priolube 1857	Petrochemical di-ester												
	Priolube 1859	Petrochemical di-ester								●				
●	Priolube 1875	Oleochemical di-ester								●				
●	Priolube 1889	Saturated polyol ester						●		●				
	Priolube 1921	Saturated polyol ester										●		
●	Priolube 1929	Complex ester		●		●	●	●	●	●		●		
	Priolube 1935	Petrochemical di-ester		●				●					●	
	Priolube 1936	Petrochemical di-ester		●	●			●		●			●	
	Priolube 1937	Saturated polyol ester						●						

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

				Additional features						Typical data							
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%)	Renewable (%)	EU Ecolabel (on LuSC list)	Kinematic viscosity at 40°C (mm^2/s)	Kinematic viscosity at 100°C (mm^2/s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Iodine value (gI/100g)	Acid value (mgKOH/g)
										292	40	191	-29	214	0.97	24	19
								73		1100	64	119	-29	292	0.97	95	<1.40
										3510*	151**	134	-6	280	0.97	7	2
								100		84	10	97	0	215	0.96	79	0.50
●							●	67		8.7	2.8	187	-27	220	0.87	68	0.20
●							●	85		65	13	208	-27	310	0.92	84	1.80
●							●	90	●	48	9.5	187	-39	300	0.90	84	1
							●	86		22	5	160	-15	250	0.90	88	2
							●	100		41	9	195	-15	290	0.92	89	1.50
●								93		64	12.5	190	-21	290	0.92	90	0.50
●							●	93	●	67	12.5	188	-30	290	0.92	88	0.50
●							●	89	●	30	7	207	-30	295	0.90	81	0.60
						●	●	82		28	5.9	163	-6	280	0.93	5	0.10
								88		39	7.5	163	-3	300	0.92	16	0.50
						●	●	85	●	1040	90	167	-24	300	0.95	4	0.10
						●	●	88	●	495	49	153	-36	300	0.95	3	0.10
			●	●	●	●	●			12.5	3.3	140	-78	230	0.91	0.4	0.05
			●			●	●			11.7	3.4	143	-78	230	0.91	0.4	0.05
						●	●			9	2.6	140	-78	210	0.91	0.6	0.05
						●		69		95	14	144	-40	280	0.91	2	0.07
		●								170	17	107	-29	302	0.97	0.5	0.40
							●			17	4	159	0	220	0.90	10	3.00
								80		1700	125	175	-21	310	0.92	32	0.10
						●	●			14.5	3.7	149	-72	226	0.92	0.6	0.05
		●				●	●			26	5.3	139	-54	244	0.91	0.3	0.05
		●				●				19	4.1	120	-40	240	0.99	0	0.05

Power product	Product	Chemical description	Automotive applications				Industrial marine applications							
			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	
	Priolube 1938	Trimellitate ester						●		●				
●	Priolube 1939	Trimellitate ester					●	●		●				
	Priolube 1940	Trimellitate ester						●		●				
●	Priolube 1941	Trimellitate ester						●		●				
	Priolube 1942	Trimellitate ester						●		●				
	Priolube 1943	Trimellitate ester						●						
	Priolube 1968	Unsaturated polyol ester					●				●	●		
●	Priolube 1973	Saturated polyol ester			●	●		●	●			●	●	
●	Priolube 1976	Mono ester			●									
	Priolube 2014	Unsaturated polyol ester					●				●			
	Priolube 2016	Unsaturated polyol ester					●				●			
	Priolube 2017	Saturated polyol ester					●							
	Priolube 2018	Mono ester					●							
	Priolube 2040	Saturated polyol ester	●		●									
	Priolube 2044	Unsaturated polyol ester									●	●		
●	Priolube 2046	Complex ester		●		●		●	●	●				
●	Priolube 2065	Unsaturated polyol ester						●					●	
●	Priolube 2087	Complex ester				●	●	●	●		●	●	●	
●	Priolube 2088	Complex ester						●	●	●			●	
●	Priolube 2089	Unsaturated polyol ester						●					●	
	Priolube 2091	Emulsifiable ester					●							
	Priolube 2101	Unsaturated polyol ester					●				●			
	Priolube 2104	Saturated mono ester					●				●			
	Priolube 2127	Unsaturated polyol ester					●				●			
	Priolube 2215	Unsaturated polyol ester					●				●			
	Priolube 2220	Trimellitate ester						●		●				
	Priolube 2223	Trimellitate ester					●	●		●				
●	Priolube 2500	Saturated polyol ester						●	●	●			●	
●	Priolube 2510	Complex ester								●				

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

				Additional features						Typical data							
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%)	Renewable (%)	EU Ecolabel (on LuSC list)	Kinematic viscosity at 40°C (mm^2/s)	Kinematic viscosity at 100°C (mm^2/s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Iodine value (gI/100g)	Acid value (mgKOH/g)
		●				●				143	13.1	83	-30	280	0.97	0.2	0.05
		●				●				306	20.2	73	-9	276	0.96	0.5	0.05
		●				●				91	9.6	78	-36	261	0.99	0.6	0.05
		●				●				52	8	124	-45	282	0.97	0.5	0.05
						●				71	9.6	116	-48	273	0.97	0.7	0.05
						●				97	11	100	-39	275	0.97	0.6	0.05
							●	86		100	13	127	5	300	0.92	45	2.00
		●				●	●	88	●	46	8	148	-44	280	0.90	2	0.05
						●				26	5.4	157	-33	260	0.86	2	0.03
							●	84		48	9	187	-21	322	0.92	103	1
							●	82		24	6	211	-12	290	0.90	102	2
								65		10	2.9	186	5	200	0.86	1	0.1
●										8.5	2.7	159	-27	220	0.9	68	0.2
							●	100		255	16	46	-6	220		1	1.00
							●			85	12.4	142	-3	250	0.92	44	9
								85		400	40	163	-36	310	0.92	20	0.10
●				●	●		●	90	●	48	9.8	196	-39	300	0.92	84	1.00
							●	94	●	320	35	150	-40	260	0.92	30	0.50
				●	●		●	94	●	320	35	150	-40	260	0.92	30	0.15
							●	88	●	44	8.7	181	-54	315	0.92	72	0.05
							●			110	19	194	6	290	1.05	42	1
●								90		46	9.5	187	-47	325	0.91	86	0.48
										5.6	2	177	-26	178	0.9	4	0.5
●							●	90		48	9.5	187	-39	300	0.9	84	1
●							●	67		8.1	2.7	208	-34	242	0.9	63	0.1
		●				●				126	12	84	-33	260	0.97	0.1	0.05
		●				●				324	22	78	-24	268	0.95	0.1	0.02
		●		●	●	●	●	80	●	90	13	143	-24	280	0.92	3	0.50
					●	●	●	89		100	15	157	-34	260	0.94	18	<0.50

Power product	Product	Chemical description	Automotive applications				Industrial marine applications							
			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	
●	Priolube 2520	Complex ester								●				
●	Priolube 2568	Complex ester								●				
	Priolube 2720	Polyol ester		●	●	●		●	●	●	●	●		
	Priolube 2722	Unsaturated polyol ester											●	
	Priolube 3905	Oleochemical di-ester				●								
	Priolube 3949	Petrochemical di-ester			●									
●	Priolube 3952	Emulsifiable ester					●					●		
●	Priolube 3953	Emulsifiable ester					●					●		
●	Priolube 3955	Emulsifiable ester					●					●		
	Priolube 3958	Petrochemical di-ester		●										
	Priolube 3959	Petrochemical di-ester											●	
	Priolube 3960	Petrochemical di-ester		●										
	Priolube 3963	Petrochemical di-ester		●	●									
	Priolube 3966	Petrochemical di-ester		●	●			●	●	●				
	Priolube 3967	Oleochemical di-ester			●	●								
●	Priolube 3970	Saturated polyol ester		●	●	●		●	●	●	●	●	●	
	Priolube 3971	Saturated polyol ester						●	●	●	●	●		
	Priolube 3973	Petrochemical di-ester					●			●			●	
	Priolube 3985	Oleochemical di-ester							●					
●	Priolube 3986	Complex ester		●		●	●	●	●	●	●	●		
●	Priolube 3987	Saturated polyol ester				●		●	●	●			●	
●	Priolube 3988	Saturated polyol ester				●		●	●	●			●	
	Priolube 3997	Complex ester		●					●					
●	Priolube 3999	Unsaturated polyol ester			●	●		●	●				●	
	Priolube LL 564	Mono ester					●	●		●				

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

				Additional features						Typical data							
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%)	Renewable (%)	EU Ecolabel (on LuSC list)	Kinematic viscosity at 40°C (mm^2/s)	Kinematic viscosity at 100°C (mm^2/s)	Viscosity index	Pour point (°C)	Flash point (°C)	Density at 20°C (g/ml)	Iodine value (gI/100g)	Acid value (mgKOH/g)
					●	●	●	92		220	28	164	-27	270	0.94	27	<0.50
					●	●	●	88		68	12	175	-45	269	0.94	14	<0.50
		●								20.4	4.6	143	-51	268			0.05
●								93		63	10	141	-22	331	0.92	98	0.58
								70		135	18	145	-48	290	0.91	73	2
						●				16	4.5	186	-30	250	0.92	0.1	0.05
●								61		380	34	142	-36	330	0.94	1	33
								70		360	33	131	-39	330	0.93	1	18
●								68		420	41	147	-21	320	0.97	1	50
						●	●			10.5	3	146	-78	215	0.92	0.4	0.05
						●	●			7.7	2.4	135	-81	203	0.93	0.1	0.05
						●				19	4.5	163	-72	230	0.91	0.6	0.05
						●	●			11.5	3.2	149	-78	230	0.91	0.4	0.05
●		●		●	●	●	●			12.2	3.3	148	-78	235	0.91	0.5	0.05
							●	70		94	13	145	-45	290	0.91	60	0.07
		●		●	●	●	●	82	●	20	4.4	140	-51	250	0.94	0.5	0.05
						●	●	85	●	30	5.9	144	-3	285	0.96	0.5	0.05
●							●			12.2	3.3	147	-60	219	0.92	1	0.05
								70		84	13	144	-45	290	0.91	80	0.07
								82	●	47000	2000	278	6	325	0.92	120	0.10
						●	●	97	●	145	18.2	140	-33	320	0.92	3.5	0.10
								86	●	100	13.8	140	-34	280	0.92	3	0.1
								82		40000	2000	290	6	325	0.92	7	0.04
●				●	●		●	87		90	14	144	-27	290	0.92	58	0.05
							●	70		7	2.5	228	-46	189	0.87	30	1

Ester base fluids for electric vehicles

Product	Chemical description	Automotive applications					Industrial marine applications						
		Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Electric vehicle fluids	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL
Priolube EF 3221	Ester-based					●							

Polyalkylene glycol - water insoluble base fluids

Power product	Product	Chemical description	Automotive applications				Industrial marine applications							
			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
●	Emkarox VG 126	Water-insoluble PAG					●	●	●	●				
	Emkarox VG 146	Water-insoluble PAG					●		●					
	Emkarox VG 180	Water-insoluble PAG						●	●	●				
●	Emkarox VG 222	Water-insoluble PAG						●	●	●				
●	Emkarox VG 380	Water-insoluble PAG						●	●	●				
●	Emkarox VG 444	Water-insoluble PAG						●	●	●				
	Emkarox VG 462	Water-insoluble PAG						●	●	●				
	Emkarox VG 100 NS	Water-insoluble PAG							●	●			●	
	Emkarox VG 150 NS	Water-insoluble PAG							●	●			●	

				Additional features					Typical data							
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%)	Renewable (%)	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 (gI/100g)	Acid value (mgKOH/g)
							●		7.7	2.4		-81	203	0.92		

			Additional features					Typical data								
Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Renewable (%)	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)	Hydroxyl value (mgKOH/g)	Refractive index at 20°C	4-ball mean wear scar (mm)
			●					125	23	204	-36	225	0.99	30	1.460	0.51
								145	25	207	-45	224	0.99	29	1.451	0.54
			●					180	30	211	-36	225	0.99	28	1.450	0.48
			●					221	38	215	-36	225	0.99	27	1.450	0.51
			●					380	61	234	-33	230	0.99	21	1.451	0.54
			●					447	72	242	-36	228	0.99	23	1.453	0.46
								460	75	244	-27	230	0.99	18	1.451	0.54
	●						●	107	18	181	-42	280	1.03			
	●						●	152	25	198	-42	280	1.03			

Polyalkylene glycol - water soluble base fluids

Power product	Product	Chemical description	Automotive applications				Industrial/marine applications							
			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
●	Emkarox VG 130W	Water-soluble PAG					●	●	●	●				
	Emkarox VG 132W	Water-soluble PAG					●	●	●	●				
	Emkarox VG 330W	Water-soluble PAG					●	●	●	●				
●	Emkarox VG 681W	Water-soluble PAG					●	●	●	●				
●	Emkarox VG 1055W	Water-soluble PAG					●	●	●	●				

Polyalkylene glycol - high viscosity water soluble base fluids

Power product	Product	Chemical description	Automotive applications				Industrial/marine applications						
			Fuel additives	Gear & transmission tils	Four-stroke engine tils	Two-stroke engine tils	Metalworking	Greases	Industrial Gear Oils	Chain Oils	Ferrous Metal Rolling Oils	Non-ferrous Metal Rolling Oils	Hydraulic Fluids - EAL
	Emkarox HV 20	Water-soluble PAG					●			●			
	Emkarox HV 20 SOL 70%	Water-soluble PAG					●			●			
	Emkarox HV 20 SOL 60%	Water-soluble PAG					●			●			
	Emkarox HV 26	Water-soluble PAG					●						
●	Emkarox HV 45	Water-soluble PAG					●			●			
	Emkarox HV 45 SOL 56%	Water-soluble PAG					●			●			
	Emkarox HV 105 SOL 60%	Water-soluble PAG											
●	Emkarox HV 165 SOL 50%	Water-soluble PAG											

* Kinematic Viscosity of neat polymer at 40°C 105000, **Kinematic viscosity of neat polymer at 40°C 165000

			Additional features					Typical data									
Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Renewable (%)	Kinematic viscosity at 40°C (mm^2/s)	Kinematic viscosity at 100°C (mm^2/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)
								152	25	197	-32	232	1.07	81	98	1.460	0.46
			●					131	25	225	-42	230	1.06	59	34	1.459	0.58
								328	56	239	-30	228	1.07	65	44	1.460	0.51
			●					680	116	274	-30	230	1.06	54	14	1.461	0.54
			●	●				1052	171	284	-24	240	1.06	61	22	1.460	0.46

				Additional features				Typical data									
Hydraulic Fluids - Fire Resistant	Quenching Fluids	Air Compressor	Gas Turbine Engine Lubricants	Incidental Food Contact Approved	Oxidative Stability	Biodegradability OECD 301B (>60%)	Renewable (%)	Kinematic viscosity at 40°C (mm^2/s)	Kinematic viscosity at 100°C (mm^2/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^2O content (%)
●	●			●				19500	2400	4	240	1.09	78	9	1.467	
●	●			●				2164	323	-33		1.09	78		1.424	30
●	●			●				1264	461	-25		1.09	78		1.436	40
	●							26000	3000	5	240	1.09	77	7	1.467	
●	●			●				45000	6500	7	240	1.09	76	6	1.467	
●	●			●				1895	566	-33		1.08	76		1.425	44
	●							105000	11400	11		1.09	74	5	1.410	40
	●							165000	14600	15		1.08	73	5	1.410	50

Performance additives

Friction modifiers

Power product	Product	Chemical description	Automotive applications				Industrial marine applications					
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	
	Optislip O	Oleamide	●		●							
●	Perfad 3000	Polymer			●							
●	Perfad 3057	Polymer			●							
●	Perfad 3006	Polymer			●	●						
●	Perfad 3100	Polyol partial ester		●					●			
	Perfad 3570	Polymer			●							
	Perfad 3571	Saturated fatty alcohol			●							
	Perfad 3575	Polymer			●							
	Perfad 3576	Polymer			●							
	Perfad 4000	Fatty amide			●							
●	Perfad FM 3336	Ester	●		●							
●	Perfad FM 3339	Alkanolamine			●							
	Perfad FM 3345	Fatty amide		●								
	Perfad NG 2500	Polymer			●							
	Priolube 594	Proprietary blend	●		●		●					
	Priolube 1407	Unsaturated polyol partial ester	●		●							
	Priolube 2040	Saturated polyol ester	●		●							

						Additional features					Typical data				
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%)	Renewable (%)	EU Ecolabel (on LuSC list)	Iodine value (gI/100g)	Melting point (°C)	Phosphorus (%)	Sulphur (%)	Ash (%)
								●	95		90	69	0	0	0
											25		0	0	0
											4.7		0	0	0
											2		0	0	0
								●	100	●	1		0	0	0
									84		124		0	0	0
									100		30		0	0	0
											<1		0	0	0
											<2		0	0	0
									80		10		0	0	0
									100	●	5	15	0	0	0
									90		5	-12	0	0	0
											55		0	0	0
											4		0	0	0
											100		0	0	0
									100		79	>20	0	0	0
								●	100		1		0	0	0

Corrosion inhibitors rust preventatives

Power product	Product	Chemical description	Automotive applications				Industrial marine applications							
			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
	Priacid A95	Azelaic acid					●	●						
	Perfad 9000	Proprietary blend					●							
●	Perfad 9013	Ashless organo-nitrogen compound						●						
●	Pripol 1017	Dimer acid	●											
	Pripol 1025	Dimer acid (hydrogenated)	●											
	Pripol 1040	Trimer acid	●											
	Pripol 1252	Dimer acid	●											
●	Pluvia T 20	Polyoxyethylene (20) sorbitan monolaurate					●							●
●	Pluvia T 40	Polyoxyethylene (20) sorbitan monopalmitate					●							●
●	Pluvia T 60	Polyoxyethylene (20) sorbitan monostearate					●							●
●	Pluvia T 80 NV	POE(20) sorbitan mono-oleate					●					●		●
●	Pluvia T 85	POE(20) sorbitan tri-oleate	●				●							●

			Additional features						Typical data					
Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	NSF HX-1	Oxidative stability	Biodegradability OECD 301B (>60%)	Renewable (%)	EU Ecolabel (on LuSC list)	Solubility	Physical form	Density at 20°C (g/ml)	pH (10% m/m aqueous solution)	Acid value (mgKOH/g)	Melting point (°C)
								●	Water	Waxy solid			575	108
									Oil	Viscous liquid	0.97		60	
									Oil	Semi-solid	1.01	7	217	
							100		Oil/Fuel	Liquid	0.95		193	
					●		100		Oil/Fuel	Liquid	0.95		194	
							100		Oil/Fuel	Liquid	1.00		189	
							100		Oil	Liquid	0.94		188	
			●	●					Water	Liquid	1.11	3	0.6	
			●	●					Water	Liquid			1	
			●	●					Water	Semi-solid			0.6	33
			●	●					Water	Yellow brown	1.07	5	>149	
			●	●					Oil	Yellow brown	1.00	5.5	>149	

Non-ionic emulsifiers

Power product	Product	Chemical description	Automotive applications				Industrial marine applications						
			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	
	Priolube 594	Unsaturated polyol ester					●						
●	Pluvia S 80 NV	Sorbitan monooleate					●					●	
	Pluvia S 85	Sorbitan trioleate	●										

Polymeric emulsifiers

Power product	Product	Chemical description	Automotive applications				Industrial/marine applications					
			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
●	Celevida 4500	Proprietary	●				●				●	
●	Celevida 6300	Proprietary	●									
●	Celevida 6400	Proprietary	●				●				●	
●	Celevida P1	Proprietary					●					
●	Celevida P9	Proprietary					●					

* Flash point PMCC (°C)

					Additional features					Typical data					
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%)	Renewable (%)	Physical form	Colour	HLB	Cloud point - 10% aqueous solution (°C)	Flash point COC (°C)	Density at 25°C (g/ml)
									99	Liquid	Colourless	2.8		300	0.96
	●							●	100	Liquid	Amber	4.3		>149	1
						●		●	100	Liquid	Amber	1.8		>149	0.95

					Additional features				Typical data					
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%)	Renewable (%)	Physical form	Colour	HLB	Flash point COC (°C)	Density at 25°C (g/ml)	Melting point (°C)
	●								Liquid	Dark brown	6.0	268	0.97	
								60	Waxy solid	Red brown	6.0	66*	0.94	40
	●								Waxy solid	Red brown	8.0	76*	0.90	45
								100	Waxy solid	Amber	1.0	230*	0.90	26
								100	Liquid	Amber	1.0		0.93	

Fatty acids (emulsifiers/lubricity additives/CI)

Power product	Product	Chemical description	Automotive applications				Industrial marine applications											Additiona		
			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	
●	Pripol 1017	Dimer acid					●				●									
	Pripol 1022	Dimer acid									●									
●	Priolene 6907	Oleic acid	●				●	●				●						●	●	
●	Prisorine 3501	Isostearic acid						●				●								

* Colour lovibond (5¼" cell y/r) ** Colour APHA

Grease thickeners

Power product	Product	Chemical description	Automotive applications				Industrial marine applications						
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Metalworking	Greases	Inndustrial gear oils	Chain oils	Ferrous metal rolling oils	Non-ferrous metal rolling oils	Hydraulic fluids - EAL
●	Prisorine 3501	Isostearic acid						●				●	
●	Priacid A95	Azelaic acid					●	●					

l features			Typical data																			
Oxidative Stability	Biodegradability OECD 301B (>60%)	Renewable (%)	Acid value (mgKOH/g)	Saponification value (mgKOH/g)	Iodine value (gI/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
		100	193	198	95		5	275	8000	225	0.95	2.0	5	77	20	0.2						
		100	193	199		<60	5	275	5800	190	0.94	2.0	5	74	21	0.2						
	●	100	200	202	95	7	10-1.5*	223	25		0.90						0.5	3	5	2	72	9
●	●	100	187	195	5	5	90**	175.0	45		0.89						ca. 83% branched chains, saturated					

				Additional features						Typical data				
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%)	Renewable (%)	EU Ecolabel (on LuSC list)	Acid value (mgKOH/g)	Saponification value (mgKOH/g)	Iodine value (gI/100g)	Cloud point (°C)	Colour APHA
						●	●	100		187	195	5	5	90.00
									●	575				

Diesel lubricity additives

Power product	Product	Chemical description	Automotive applications				Industrial marine applications				
			Fuel additives	Gear & transmission oils	Four-stroke engine oils	Two-stroke engine oils	Greases	Industrial gear oils	Chain oils	Ferrous metal rolling oils	
●	Perfad FA 3340	Complex ester	●								
●	Priolene 6907	Oleic acid	●				●				
	Priolube 1407	Unsaturated polyol partial ester	●		●						

*Diesel + 150ppm additive

Demulsifiers/dehazers

Power product	Product	Chemical description	Automotive applications				Industrial marine applications					
			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
●	Kemelix 3422X	Polyimine alkoxylate	●									
●	Kemelix D310	Resin alkoxylate	●									
	Kemelix D311	Resin alkoxylate	●									
	Kemelix D317	Modified polyol alkoxylate	●									
●	Kemelix D400	Modified polyol alkoxylate	●									
●	Kemelix D510	Polyimine alkoxylate	●									
	Kemelix D511	Polyol alkoxylate	●									
	Kemelix D513	Polyimine alkoxylate	●									

* Cloud point determined on 10% aqueous solution, ** Cloud point determined on 1% aqueous solution

						Additional features				Typical data				
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%)	Renewable (%)	HFRR wear scar* (µm)	Cloud point (°C)	Sulphur content (ppm)	Total acid number (mgKOH/g)	Demulsibility*
									84	280	<-55	<10	<1	Good
						●		●	100	387	7	<15	<203	Good
									100	329	8	<15	<1	Acceptable

					Additional features				Typical data							
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%)	Renewable (%)	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	Pour point (°C)	Density at 25°C (g/ml)
									100	7440	8.0	13	>100	7	2	1.01
									88	790	7.0	53	63	16	-10	1.03
									80	423	6.5	58	63	17	-14	1
									80	2000	8.5	33	63	10	-2	1
									80	700	8.0	<20	30	6	-1	0.98
									100	1900	7.5	50	>100	11	3	1.02
									100	1170	10.0	87	>100	17	-4	1.02
									100	2680	7.5	34	>100	6	-13	0.99

Asphaltene dispersants

Power product	Product	Chemical description	Automotive applications				Industrial marine applications							
			Fuels 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	
●	Celevida 2500	Proprietary	●											

Seal swell additives

Power product	Product	Chemical description	Automotive applications				Industrial marine applications						
			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
●	Perfad 5000	Polyol ester		●	●	●			●				●

				Additional features				Typical data						
Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Renewable (%)	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)
								Brown Liquid	90	1360	-24	>100	0.98	8.5

				Additional features				Typical data						
Hydraulic fluids - fire resistant	Quenching fluids	Air compressor	Gas turbine engine lubricants	Incidental food contact approved	Oxidative stability	Biodegradability OECD 301B (>60%)	Renewable (%)	Kinematic viscosity at 40°C (mm^2/s)	Kinematic viscosity at 100°C (mm^2/s)	Viscosity index	Pour point (°C)	Flash point (°C)	Iodine value (gI/100g)	Acid value (mgKOH/g)
●						●	100	26	6	173	-8	245	<0.1	0.5

Who are we?

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:

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