Industrial metalworking

Performance components for use in metalworking and forming applications

Cargill®

Advanced performance components for metalworking processes

The metalworking industry is constantly undergoing change driven by the demand for superior performance products to provide improved productivity at lower cost. As a global supplier of metalworking fluid components and with our broad experience in this field we have an understanding of the issues faced and are committed to offering our customers innovative and creative solutions.

As technologies and working practices develop, metalworking fluid formulators, as well as base fluid and additive suppliers, must adapt quickly to support the advances taking place. We recognize these changes and the diverse demands placed on the metalworking fluid formulation and have developed a broad range of advanced performance products with the following functionalities:

- Base oils for neat, semi-synthetic and synthetic metalworking fluids
- Lubricity boosters
- Emulsifiers
- Fatty acids
- Corrosion inhibitors
- Temporary corrosion protection additives

Base oils

Our range of Priolube™ and Emkarox™ base fluids provide outstanding lubricity and cooling and our emulsification portfolio offers the formulator emulsion stability, tramp oil rejection and extended fluid lifetime.

Product name	Chemical description	Kinematic viscosity at 40°C (mm²/s)	Kinematic viscosity at 100°C (mm²/s)	Viscosity index	Pour point (°C)	Cloud point (°C)	Flash point COC (°C)	Density at 20°C (g/ml)	Color	
									Descriptor	Value
Emkarox HV26	Polyalkylene glycol	26,000	3,000	-	5	77	240	1.09	-	-
Emkarox HV45[3]	Polyalkylene glycol	45,000	6,500	-	7	78	240	1.09	-	-
Emkarox VG 1055W	Polyalkylene glycol	1,052	171	284	-24	61	240	1.06	-	-
Emkarox VG 126	Polyalkylene glycol	125	23	204	-36	-	225	0.99	APHA	50
Emkarox VG 130W	Polyalkylene glycol	152	25	197	-32	81	232	1.07	-	-
Emkarox VG 132W	Polyalkylene glycol	131	25	225	-42	59	230	1.06	-	-
Emkarox VG 146	Polyalkylene glycol	145	25	207	-45	-	224	0.99	APHA	50
Emkarox VG 330W	Polyalkylene glycol	328	56	239	-30	65	228	1.07	-	-
Emkarox VG 681W	Polyalkylene glycol	680	116	274	-30	54	230	1.06	-	-
Perfad 3950	Ester	292	40	191	-29	-	214	0.97	lovibond (1"cell y/r)	>70-9.1
Priolube 1407	Ester	84	10	98	0	-	-	-	-	-
Priolube 1415	Ester	9	2.8	159	-27	-24	220	0.87	lovibond (5¼" cell y/r)	4.0-0.7
Priolube 1427	Ester	48	9.5	187	-39	-15	300	0.90	lovibond (1" cell y/r)	5.0-1.0
Priolube 1428	Ester	22	5	160	-15	<0	250	0.90	lovibond (1" cell y/r)	1.0-2.0
Priolube 1435	Ester	41	9	195	-15	-3	290	0.92	lovibond (1" cell y/r)	5.0-1.5
Priolube 1800	Ester	28	5.9	163	-6	-13	280	0.93	Gardner	1
Priolube 1802	Ester	39	7.5	163	-3	-	300	0.92	Gardner	3
Priolube 1808	Ester	35	7	166	-1	0	295	0.92	Gardner	3
Priolube 1939	Ester	335	20.2	62	-9	-	276	0.96	APHA	50
Priolube 1968	Ester	100	13	127	5	12	300	0.92	Gardner	4
Priolube 2044	Ester	85	12.4	142	-3	-	250	0.92	Gardner	6
Priolube 2101	Ester	46	9.5	187	-47	-	325	-	lovibond (1" cell y/r)	5.0-1.0
Priolube 2104	Ester	6	2	177	-26	-	178	-	-	-
Priolube 2215	Ester	8	2.7	208	-	-	-	0.90	-	-
Priolube 2720	Ester	20	5	143	-51	-	268	-	APHA	300
Priolube 3952	Self-emulsifying ester	380	34	142	-36	-60	330	0.94	-	-
Priolube 3953	Self-emulsifying ester	360	33	131	-39	-60	330	0.93	-	-
Priolube 3955	Self-emulsifying ester	420	41	147	-21	-60	320	0.97	-	-
Priolube 3970	Ester	20	4.4	140	-51	-	250	0.94	ASTM D1500	0.5
Priolube 3971	Ester	30	5.9	144	-3	-	285	0.96	APHA	150
Priolube LL-564	Ester	7	2.5	228	-46	-	189	0.87	-	-
Priolube WSE 3961	Ester	474	55	183	12	-	279	1.06	Gardner	5
Priolube 1973	Ester	46	8.0	148	-44	-	280	0.90	Gardner	4
Priolube 2087	Ester	320	35	150	-40	-	260	0.92	Gardner	7
Priolube 1929	Ester	1,700	125	175	-21	-	310	0.92	Gardner	5
Priolube 3986	Ester	47,000	2000	278	6	-	325	0.92	Gardner	5

[1] Inflection Point is the temperature where the rate of weight loss is at its maximum
[2] Midpoint is the temperature where the weight loss of the product is 50%
[3] Available in neat and water diluted form
[4] Information given is based on data obtained from similar substances

Iodine value (g I_2/100g)	SAP value (mgKOH/g)	Acid value (mgKOH/g)	TGA			Falex coefficient of friction	Falex Fail to load (lbs)	Application				
			Inflection point[1] (°C)	Midpoint[2] (°C)	Deposits			Metalworking			Metal rolling	
								Neat oils	Semi-synthetic	Synthetic	Ferrous	Non-ferrous
-	-	-	-	-	-	-	-	-	-	•	-	-
-	-	-	-	-	-	-	-	-	-	•	-	-
-	-	-	-	-	-	-	-	-	-	•	-	-
3	-	-	-	-	-	-	-	•	-	-	-	-
-	-	-	-	-	-	-	-	-	-	•	-	-
-	-	-	-	-	-	-	-	-	-	•	-	-
3	-	0.3	-	-	-	-	-	•	-	-	-	-
-	-	-	-	-	-	-	-	-	-	•	-	-
-	-	-	-	-	-	-	-	-	-	•	-	-
24	102	19	-	-	-	-	-	-	•	•	-	-
-	-		413	388	Trace	0.048	1,825	-	-	-	-	•
68	143	0.2	-	-	-	-	-	•	•	-	-	-
84	182	1	441	431	Slight trace	0.057	1,200	•	-	-	•	-
88	188	2	-	-	-	-	-	•	•	-	-	-
89	193	1.5	-	-	-	-	-	•	•	-	-	-
5	268	0.1	-	-	-	-	-	•	•	-	-	-
16	226	0.5	288	295	None[4]	0.050[4]	1,230[4]	-	-	-	•	-
7	242	1	-	-	-	-	-	•	•	-	-	-
0.5	214	0.05	-	-	-	-	-	-	•	-	-	-
45	180	2	443	433	Trace	0.065	1210	•	•	-	•	•
44	180	9	447	429	Slight trace	0.052	1,050	-	-	-	-	•
86	182	0.5	323	361	Slight trace	0.057	1,200	-	-	-	-	-
4	173	0.5	433	430	None	-	-	-	-	-	-	-
-	-	0.1	-	-	-	-	-	-	•	-	-	-
-	-	0.05	364	346	None[4]	0.059[4]	1,240	-	-	-	-	-
1	134	33	-	-	-	-	-	-	•	-	-	-
1	148	18	-	-	-	-	-	-	•	-	-	-
1	142	50	-	-	-	-	-	-	-	•	-	-
0.5	310	0.05	364	346	None	0.059	1,240	-	-	-	-	•
0.5	330	0.05	399	382	None	0.046	1,330	-	-	-	-	•
30	-	1	-	-	-	-	-	•	•	-	-	-
31	92	5	-	-	-	-	-	-	-	•	-	-
2	174	0.05	-	-	-	-	-	-	-	-	-	•
30	260	0.5	-	-	-	-	-	-	-	-	-	•
32	310	0.1	-	-	-	-	-	-	-	-	-	•
12.5	181	0.01	-	-	-	-	-	-	-	-	-	•

Lubricity boosters

In a world where chlorinated paraffins have become less acceptable through legislation or self-regulation, high molecular weight complex esters offer a viable alternative. We have developed a range of complex esters under the Priolube brand designed to help you, the formulator, create products which meet the challenging demands of the metalworking industry.

Product name	Chemical description	Kinematic viscosity at 40°C (mm^2/s)	Kinematic viscosity at 100°C (mm^2/s)	Viscosity index	Pour point (°C)	Cloud point (°C)	Flash point COC (°C)	Color		Density at 20°C (g/ml)
								Descriptor	Value	
Perfad 8100	Ester	1,100	64	-	-29	<-55	292	APHA	5	0.97
Perfad 8400	Ester	3,510[3]	151[3]	-	-6	-	280	-	-	0.97
Priolube 1847	Ester	1,040	85	167	-24	-50	300	Gardner	4	0.95
Priolube 1851	Ester	495	49	153	-36	-34	300	Gardner	4	0.95
Priolube 1929	Ester	1,700	125	175	-21	-60	310	Gardner	5	0.92
Priolube 2087	Ester	320	35	150	-40	<-60	260	Gardner	7	0.92
Priolube 3986	Ester	47,000	2000	278	6	-	325	Gardner	5	0.92
Pripol 1017	Dimer acid	2,400	-	-	-15	-	-	Gardner	5	-
Pripol 1022	Dimer acid	1,834	-	-	-15	-	-	-	-	-

[1]Inflection Point is the temperature where the rate of weight loss is at its maximum
[2]Midpoint is the temperature where the weight loss of the product is 50%
[3]Dynamic viscosity (mPa.s)

Emulsifiers

Our emulsifier technologies can be used to create a stable and predictable formulation, and offer high emulsion stability in use.

Product name	Chemical description	Color	Flash point COC (°C)	Density at 20°C (g/ml)	Cloud point (°C)	HLB value	Application	
							Metalworking	Metal rolling
Priolube 1407	Ester	Yellow	215	0.96	8	-	•	•
Priolube 594	Ester	Colorless	300	0.96	-	2.8	•	-
Pluvia T 85	Ethoxylated ester	Yellow brown	149	1.00	-	11	•	•
Pluvia T 80	Ethoxylated ester	Yellow brown	100	1.07[1]	-	15	•	•
Pluvia S 80	Ester	Amber	148	1.00[1]	-	4.3	•	•

[1]Density at 25°C

Iodine value (g I_2/100g)	SAP value (mgKOH/g)	Acid value (mgKOH/g)	TGA			Falex coefficient of friction	Falex Fail to load (lbs)	Application	
			Inflection point[1] (°C)	Midpoint[2] (°C)	Deposits			Metalworking	Ferrous metal rolling
95	-	<1.4	-	-	-	-	-	●	-
7	-	2	-	-	-	-	-	●	-
4	234	0.1	-	-	-	-	-	●	-
3	225	0.1	-	-	-	-	-	●	-
32	160	0.01	-	-	-	-	-	●	-
30	260	0.5	436	417	Slight trace	0.032	1400	●	●
12.5	181	0.01	446	445	Trace	0.062	1130	●	●
95	198	193	455	411	Trace	0.06	1480	-	●
-	199	193	452	407	Trace	0.06	1300	-	●

Fatty acids and corrosion inhibitors

Our fatty acid products are widely used in industrial applications and have multiple functions. When neutralised with an alkanolamine, they can be used as an effective corrosion inhibitor.

Product name	Physical form	Acid value (mgKOH/g)
Priacid A95	Waxy solid	60
Pripol 1017	Liquid	193

Temporary corrosion protection additives

Temporary corrosion protection may be required in many areas within the metalworking industry and identifying the right product, or combination of products to use will be determined by the application area in which it will be applied. Perfad™ 9000 is an ashless rust inhibitor which provides outstanding corrosion protection at low treat rates, and leaves no residue on the metal surface.

Product name	Physical form	Density at 20°C (g/ml)	Acid value (mgKOH/g)	Solubility
Perfad 9000	Viscous liquid	0.97	575	Oil

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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Cargill®