CALUMET

METALWORKING FLUIDS

Metalworking fluids are widely used in transportation equipment, machinery and metal fabrication. They are fluids designed specifically for metal-cutting and metal-forming processes and serve the main functions of cooling, lubricating and removing chips. Calumet offers a wide variety of paraffinic, naphthenic, solvents, white oils and petrolatums that are used in formulations for metalworking fluids applications.

COMMON METAL PROCESSES

- Cutting
- Cleaning
- Drawing
- Grinding
- Sawing
- Taping
- Honing
- Stamping
- Electric Discharge Machining/Dielectric

BASE OILS

We offer an extensive product line of naphthenic and paraffinic base oils that have the desirable characteristics for metalworking formulations. Base oils are used as base stocks in metalworking fluids because they control heat, reduce friction, increase tool life, protect against corrosion and rust, and improve surface integrity.

HYDROCAL™ NAPHTHENIC BASE OILS

PROPERTIES	METHOD	38	45	60	100	750	2400
Viscosity @ 100 °F (SUS)	D2161	37.5	44.9	62.9	109.3	765.1	2411.1
Viscosity @ 210 °F (SUS)	D2161	30.3	31.9	34.6	38.7	64.6	99.6
Viscosity @ 40 °C (cSt)	D445	3.3	5.5	10.3	20.6	143.2	440.4
Viscosity @ 100 °C (cSt)	D445	1.3	1.7	2.5	3.7	11.1	21.8
Viscosity Index	D2270	85	65	39	20	43	43
API Gravity @ 60 °F	D4052	29.8	28.0	27.1	25.7	23.7	22.2
Flash Point, COC (°F)	D92	219	265	317	329	438	481
Pour Point (°F)	D97	-81	-81	-78	-64	-15	10
Color, ASTM	D1500	L0.5	L0.5	L0.5	L0.5	1.0	L2.0
Aniline Point (°F)	D611	138.6	149.0	162.8	175.3	207.6	217.7
Aniline Point (°C)	D611	59.2	65.0	72.7	80.3	97.5	103.2
Neut. No (mg KOH/g)	D974	0.01	0.01	0.01	0.01	0.01	0.01
Sulfur (Wt.%)	D4294	0.0024	0.0054	0.0078	0.0210	0.0228	0.0715
Refractive Index @ 20 °C	D1218	1.4768	1.4837	1.4899	1.4910	1.4999	1.5041
Clay Gel (Wt.%)	D2007						
Asphaltenes		0	0	0	0	0	0
Polar Compounds		0	0	0	0	0	2
Aromatics		25	31	32	24	26	32
Saturates		75	69	68	76	74	66
Carbon Type Analysis (%)	D2140						
Ca			9	13	8	10	9
Cn			51	40	47	36	36
Cp			40	47	45	54	55
FDA 21 CFR 178.3620 (c)			PASS	PASS	PASS	PASS	PASS

CALPAR™ PARAFFINIC BASE OILS

PROPERTIES	METHOD	60	75	100	325	600	2500
Viscosity @ 100 °F (SUS)	D2161	51.3	74.3	111.4	330.3	640.5	2641.2
Viscosity @ 210 °F (SUS)	D2161	33.4	36.8	40.3	53.9	69.4	155.3
Viscosity @ 40 °C (cSt)	D445	7.3	13.2	21.3	63.7	122.1	484.5
Viscosity @ 100 °C (cSt)	D445	2.1	3.1	4.2	8.2	12.4	31.7
Viscosity Index	D2270	71	93	95	97	92	96
API Gravity @ 60 °F	D4052	36.2	34.6	32.7	30.4	28.4	27.0
Flash Point (°C)	D92	159	194	207	250	261	316
Flash Point (°F)	D92	318	382	406	481	502	600
Pour Point (°C)	D97	-49	-18	-19	-12	-13	-7
Pour Point (°F)	D97	-57	0	-2	10	9	20
Color, ASTM	D1500	L0.5	L0.5	L0.5	L1.0	L2.0	L3.5
Aniline Point (°C)	D611	91.6	99.5	102.4	114.0	117.0	133.1
Aniline Point (°F)	D611	196.9	211.2	216.4	237.0	243.0	271.5
Saturates (Mass %)	D2007	94.0	94.9	92.1	92.3	86.7	87.0
Sulfur (Mass %)	D4294	0.0007	0.0007	0.0021	0.0050	0.0075	0.0087

CALSOL™ NAPHTHENIC BASE OILS

PROPERTIES	METHOD	806	810	8240
Viscosity @ 40 °C (cSt)	D445	9.5	20.6	448.3
Viscosity @ 100 °C (cSt)	D445	2.4	3.6	16.6
Viscosity @ 100 °F (SUS)	D2161	59.8	108.9	2515.9
Viscosity @ 210 °F (SUS)	D2161	34.2	38.3	87.1
API Gravity @ 60 °F	D4052	26.8	24.1	18.8
Specific Gravity @ 60 °F	D1250	0.8938	0.9091	0.9414
Viscosity-Gravity Constant	D2501	0.861	0.871	0.871
Density (Pounds per Gallon)	D1250	7.452	7.582	7.849
Molecular Weight	D2502	270	305	405
Pour Point (°F)	D97	-82	-58	12
Color, ASTM	D1500	L0.5	L0.5	1.0
UV Absorptivity @ 260 nm	D2008	0.90	2.1	2.3
Volatility @ 225°F (Wt.%)	D972	60.4	13.5	0.1
Flash Point, COC (°F)	D92	302	335	446
Refractive Index @ 20 °C	D1218	1.4871	1.4956	1.5107
Aniline Point (°F)	D611	159.5	162.1	184.6
Clay-Gel (Wt.%)	D2007			
Asphaltenes		0	0	0
Polar Compounds		0	0	0
Aromatics		28	34	26
Saturates		72	66	74
Carbon Type Analysis (%)	D2140			
Ca		8	10	9
Cn		50	49	52
Cp		42	41	39
FDA 21 CFR 178.3620 (c)	FDA	PASS	PASS	PASS

SOLVENTS

We offer low viscosity solvents that have the desirable characteristics for metalworking formulations. These solvents can be used as base stocks to control heat, reduce friction, increase tool life, protect against corrosion and rust, and improve surface integrity.

ALIPHATIC SOLVENTS

ALIPHATIC SOLVENTS — LOW VAPOR PRESSURE SOLVENTS

PROPERTIES	METHOD	142 Flash <1%	195-208 <1%	300-360 <1%	600 Solvent	Mineral Spirits <1%	VM&P <1%	LVP 100	LVP 200	LVP 300
API Gravity @ 60 °F	ASTM D4052	49.3	67.9	54.7	40.2	52.2	59.4	45.9	42.9	41.5
Density @ 60 °F (Pounds Per Gallon)	ASTM D1250	6.524	5.916	6.337	6.869	6.422	6.180	6.649	6.766	6.792
Flash Point TCC (T), COC (C), PMCC (P) (°F)	ASTM D56, D92, D93	152 (T)	18 (T)	102 (T)	272 (C)	115 (T)	62 (T)	201 (P)	242 (P)	256 (C)
Color, Saybolt	ASTM D156	30	30	30	25	30	30	30	30	30
Refractive Index @ 25 °C	ASTM D1218	1.4297		1.4786	1.4538	1.4245	1.4087	1.4380	1.4460	1.4495
Aromatics (Vol. %)	ASTM D1319	<1.0	<1.0	<1.0	5.8	<1.0	<1.0	<1.0	<1.0	<1.0
Distillation, IBP (°F)	ASTM D86	371	196	307	516	324	249	431	485	512
Distillation, 50% (°F)	ASTM D86	385	200	327	542	360	266	444	502	542
Distillation, Dry Point (°F)	ASTM D86	412	208	361	583	405	295	474	538	590
Specific Gravity @ 60/60 °F	ASTM D1250	0.7826	0.7095	0.7601	0.8239	0.7702	0.7412	0.7975	0.8115	0.8183
Aniline Point (°F)	ASTM D611	171.2	146.2	131.2	182	163.5	152.8	172.8	179.5	191.5
Kauri-Butanol Value	ASTM D1133	32.8	31.9	32.7	24.3	30.8	32.4	26.7	25.0	23.1
Pour Point (°F)	ASTM D97	-60	<-85	<-60	14	<-60	<-70	-27	-9	-1
Viscosity @ 40 °C (cSt)	ASTM D445	-	-	-	3.56	-	-	1.91	2.80	3.67
Meets CARB Requirements	Method 310	-	-	-	Yes	-	-	Yes	Yes	Yes
Vapor Pressure @ 20 °C (mm Hg)	ASTM D2879	-	-	-	0.03	-	-	0.11	0.03	0.02
Flammable			√	√		√	√			
Combustible		√			√					
Non-Hazardous					√			√	√	√

ISAPARAFINNIC SOLVENTS

PROPERTIES	METHOD	CONOSOL® C-170	CONOSOL C-200	CONOSOL 260	CONOSOL 340
API Gravity @ 60 °F	ASTM D4052	42.5	42.5	39.9	34.6
Density @ 60 °F (Pounds Per Gallon)	ASTM D1250	6.770	6.770	6.873	7.092
Flash Point TCC (T), COC (C), PMCC (P) (°F)	ASTM D56, D92, D93	148 (T)	212 (P)	285 (P)	341 (C)
Color, Saybolt	ASTM D156	30	30	30	30
Refractive Index @ 25 °C	ASTM D1218	1.4347	1.4437	1.4536	1.4658
Aromatics (Vol. %)	ASTM D1319	<0.50	0.26	0.30	0.28
Distillation, IBP (°F)	ASTM D86	400	434	519	599
Distillation, 50% (°F)	ASTM D86	433	460	550	611
Distillation, Dry Point (°F)	ASTM D86	508	519	596	642
Specific Gravity @ 60/60 °F	ASTM D1250	0.7883	0.8131	0.8237	0.8518
Aniline Point (°F)	ASTM D611	162.3	168.2	191.0	189.8
Kauri-Butanol Value	ASTM D1133	28.4	28.8	23.8	21.7
Pour Point (°F)	ASTM D97	<-80	-40	-30	-30
Viscosity @ 40 °C (cSt)	ASTM D445	2.08	2.30	3.74	7.86
Meets CARB Requirements	Method 310	-	Yes	Yes	Yes
Vapor Pressure @ 20 °C (mm Hg)	ASTM D2879	-	0.10	0.01	<0.01
Combustible		√	-		
Non-Hazardous		-	√	√	√

WHITE OILS & PETROLATUMS

If the metal working process requires any credentials or purity, we offer white oils to accommodate. Petrolatums are typically used to produce metalworking fluid additives.

WHITE OILS

PROPERTIES	METHOD	DRAKEOL 7®	DRAKEOL 9	DRAKEOL 21
API Gravity @ 60 °F	D4052	37.2	34.0	32.2
Specific Gravity @ 25/25 °C	D4052	0.8330/ 0.8610	0.8330/ 0.8610	0.8530/ 0.8760
Color, (Saybolt)	D156	30	30	30
Viscosity @ 40 °C (cSt)	D7042	10.8/13.6	14.2/17.0	38.4/41.5
Viscosity @ 100 °F (SUS)	D2161	65/75	80/90	200/215
Flash Point °F (COC)	D92	369	391	439
Odor	USP/NF	PASS	PASS	PASS
Acidity	USP	PASS	PASS	PASS
Infrared Absorption	USP	PASS	PASS	PASS
Limit of PAH	USP	PASS	PASS	PASS
Limit of Sulfur Compounds	USP	PASS	PASS	PASS
Readily Carbonizable Substances	USP	PASS	PASS	PASS
Solid Paraffins	USP	PASS	PASS	PASS
FDA 21 CFR 172.878	FDA	PASS	PASS	PASS

WHITE PETROLATUM USP

PROPERTIES	METHOD	SNOW
Melting Point, °F (°C)	USP/ASTM D127	125/15 (52/57)
Viscosity SUS @ 210 °F	ASTM D2161	64/75
Maximum Lovibond	Color 2" Cell IP17	2.0Y
Consistency @ 77 °F	USP/ASTM D937	170/205

TECHNICAL ASSISTANCE

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