



ELASTOMERS

Elastomers are polymers that are highly elastic and viscous, which are used in a wide variety of products and applications from tires for cars, to lid containers for food, to the tools and seals used in industrial equipment. Calumet offers naphthenic, paraffinic, blended process oils and white mineral oils that are used in all types of elastomer compounds, improving the workability of the elastomer without altering their physical properties.

APPLICATIONS

- **Automotive:** tires, windshield wipers, seals and gaskets
- **Oil and Gas Industry:** seals, hoses, packer cups and pipe wipers
- **Industrial:** tools, sealing rings, conveyor belts, insulation, hoses and tubes
- **Wire and cables:** wires, energy and telecommunications cables
- **Agricultural:** animal tags and agricultural equipment
- **Medical:** gloves, implants and prosthetics, tubing and catheters
- **Consumer Products:** sponges, footwear, sporting goods, baby bottles and soft spoon coatings

NAPHTHENIC BASE OILS

Calumet produces the CALSOL™ 8 and 5 series of naphthenic base oils that are refined from a select blend of crude oil using a multi-stage hydrotreating process. These products help balance hardness and color stability in elastomers due to their lower polar content, a result of additional processing. They also provide excellent cross-linking and high solvency, making them an excellent candidate for softer and flexible elastomer compounds.

CALSOL 8 series is optimal for maximizing solvency and pour point. Solvency is important in elastomer applications because solvency helps minimize the cost in the compound by higher oil loading when formulating compounds. The lower pour point helps the compounds remain pliable and flexible in cold applications. Calsol 8 series also has low polar compound levels and excellent color stability.

CALSOL 5 series is a premium light-colored, non-staining naphthenic oil with excellent color stability. Additional properties of Calsol 5 series include high oxidation stability, low aromatic levels, low polar compounds levels and low UV absorptivity values.

Calumet also offers RAVEN™ products that are high quality naphthenic-based black oils that can be used as process oils in the elastomer compounds.

CALSOL SPECIALTY PROCESS OILS

CALSOL 5 SERIES

PROPERTIES	METHOD	510	550	5550	5160S	5200
Viscosity @ 40 °C (cSt)	D445	20.7	96.0	97.1	283.4	381.2
Viscosity @ 100 °C (cSt)	D445	3.7	9.2	9.0	17.0	20.3
Viscosity @ 100 °F (SUS)	D2161	109.7	509.2	514.4	1539.3	2078.1
Viscosity @ 210 °F (SUS)	D2161	38.7	55.3	56.8	88.3	102.9
API Gravity @ 60 °F	D4052	25.6	23.6	25.2	23.2	22.6
Specific Gravity @ 60 °F	D1250	0.9007	0.9123	0.9029	0.9146	0.9182
Viscosity-Gravity Constant	D2501	0.863	0.841	0.840	0.838	-
Density (Pounds per Gallon)	D1250	7.500	7.597	7.529	7.626	7.646
Molecular Weight	D2502	320	400	420	495	520
Pour Point (°F)	D97	-48	-30	-36	-16	13
Color, ASTM	D1500	L0.5	L0.5	L0.5	L1.0	L2.0
UV Absorptivity @ 260 nm	D2008	0.9	1.4	0.5	1.7	2.2
Volatility @ 225 °F (Wt.%)	D972	6.0	-	0.3	0.1	-
Flash Point, COC (°F)	D92	338	412	438	499	473
Refractive Index @ 20 °C	D1218	1.4901	1.4917	1.4918	1.4999	-
Aniline Point (°F)	D611	176.1	195.8	209.5	217.8	218.5
Clay-Gel (Wt.%)	D2007					
Asphaltenes		0	0	0	0	-
Polar Compounds		0	0	0	0	-
Aromatics		24	18	18	21	-
Saturates		76	82	82	79	-
Carbon Type Analysis (%)	D2140					
Ca		6	0	4	7	
Cn		50	62	44	38	
Cp		44	38	52	55	
FDA 21 CFR 178.3620 (c)	FDA	PASS	PASS	PASS	PASS	PASS

CALSOL SPECIALTY PROCESS OILS

CALSOL 8 SERIES

PROPERTIES	METHOD	806	810	Calight RPO	815	850	875	8120	8240
Viscosity @ 40 °C (cSt)	D445	9.5	20.6	29.6	30.6	95.9	146.3	233.1	448.3
Viscosity @ 100 °C (cSt)	D445	2.4	3.6	4.3	4.6	8.0	9.4	12.2	16.6
Viscosity @ 100 °F (SUS)	D2161	59.8	108.9	154.3	158.8	512.5	794.5	1283.0	2515.9
Viscosity @ 210 °F (SUS)	D2161	34.2	38.3	40.6	41.9	53.2	58.4	68.7	87.1
API Gravity @ 60 °F	D4052	26.8	24.1	23.4	24.5	21.4	20.5	20.3	18.8
Specific Gravity @ 60 °F	D1250	0.8938	0.9091	0.9134	0.907	0.9254	0.9309	0.9321	0.9414
Viscosity-Gravity Constant	D2501	0.861	0.871	0.871	0.862	0.871	0.878	0.869	0.871
Density (Pounds per Gallon)	D1250	7.452	7.582	7.616	7.562	7.716	7.761	7.771	7.849
Molecular Weight	D2502	270	305	315	345	370	365	390	405
Pour Point (°F)	D97	-82	-58	-43	-55	-22	-11	0	12
Color, ASTM	D1500	L0.5	L0.5	L0.5	L0.5	1.0	1.0	L1.0	1
UV Absorptivity @ 260 nm	D2008	0.9	2.1	0.9	1.7	3.2	3.3	3.2	2.3
Volatility @ 225 °F (Wt.%)	D972	60.4	13.5	5.4	12.1	3.3	1.7	1.0	0.1
Flash Point, COC (°F)	D92	302	335	345	325	377	399	423	446
Refractive Index @ 20 °C	D1218	1.4871	1.4956	1.4973	1.4941	1.5024	1.5118	1.5065	1.5107
Aniline Point (°F)	D611	159.5	162.1	165.7	179.0	180.0	180.0	185.8	184.6
Clay-Gel (Wt.%)	D2007								
Asphaltenes		0	0	0	0	0	0	0	0
Polar Compounds		0	0	0	0	1	1	2	0
Aromatics		28	34	34	35	39	36	41	26
Saturates		72	66	66	65	60	64	57	74
Carbon Type Analysis (%)	D2140								
Ca		8	10	10	8	8	17	9	9
Cn		50	49	50	48	52	38	50	52
Cp		42	41	40	44	40	45	41	39
FDA 21 CFR 178.3620 (c)	FDA	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

RAVEN™

PROPERTIES	METHOD	RAVEN 1500	RAVEN 140	RAVEN 5000
Viscosity at 100 °F (SUS)	ASTM D2161	1636	3291	-
Viscosity at 210 °F (SUS)	ASTM D2161	107	144	5627
Viscosity at 40 °C (cSt)	ASTM D445	305	602	-
Viscosity at 100 °C (cSt)	ASTM D445	21	29	-
Viscosity Index	ASTM D2270	82	66	-
API Gravity @ 60 °F	ASTM D4052	18.5	20.5	10.3
Specific Gravity, 60/60 °F	ASTM D4052	0.9433	0.9309	0.9978
Viscosity-Gravity Constant	ASTM D2501	0.882	0.854	0.867
Flash Point, COC (°F)	ASTM D92	333	445	595
Color, ASTM	ASTM D1500	D8.0	D8.0	D8.0
Pour Point (°F)	ASTM D97	-	1	-
Glass Transition Temperature (°C)	ASTM E1356	-39	-61	-39
Aniline Point (°F)	ASTM D611	187	209	-
Clay-Gel (Wt. %)	ASTM D2007			
-Asphaltenes		3.5	1.6	18.6
-Polars		20.5	14	31.5
-Aromatics		34.6	30.3	31.1
-Saturates		44.9	55.7	37.4
Benzo(a)pyrene (ppm)	EN 16143	< 1	< 1	< 1
Σ 8 PAH (ppm)	EN 16143	< 10	< 10	< 10

PARAFFINIC BASE OILS

Paraffinic oils provide excellent UV resistance and oxidative stability, increased tensile and tear strength, and they are good candidates for harder and less flexible compounds.

Calumet produces the CALSOL P9 series of highly refined paraffinic process oils. These oils provide excellent color stability without sacrificing elastomer compatibility and process characteristics. These products are available in a wide range of viscosities. Additional properties include light color, high stability, low volatility and a high-viscosity index.

CALSOL P9 SERIES

PROPERTIES	METHOD	P904	P910	P915	P930	P960	P9250
Viscosity @ 40 °C (cSt)	D445	4.0	20.1	30.4	63.9	122.6	492.0
Viscosity @ 100 °C (cSt)	D445	1.5	4.1	5.3	8.3	12.6	31.7
Viscosity @ 100 °F (SUS)	D2161	39.9	105.7	156.6	331.1	642.5	2641.2
Viscosity @ 210 °F (SUS)	D2161	31.0	39.9	43.7	54.1	70.0	155.4
API Gravity @ 60 °F	D4052	36.8	33.5	32.3	30.3	29.0	27.0
Specific Gravity @ 60 °F	D1250	0.8408	0.8575	0.8638	0.8745	0.8816	0.8927
Viscosity-Gravity Constant	D2501	0.833	0.809	0.810	0.809	0.809	0.799
Density (Pounds per Gallon)	D1250	7.014	7.150	7.202	7.282	7.341	7.443
Molecular Weight	D2502	210	365	400	470	535	695
Pour Point (°F)	D97	-85	5	5	10	13	20
Color, ASTM	D1500	L0.5	1	L1.0	L1.5	2.0	L3.5
UV Absorptivity @ 260 nm	D2008	0.1	0.1	0.4	0.3	0.6	0.8
Volatility @ 225 °F (Wt.%)	D972	50.6	2.1	0.4	0.3	0.1	0.1
Flash Point, COC (°F)	D92	280	402	436	465	503	598
Refractive Index @ 20 °C	D1218	1.4609	1.4698	1.4747	1.4786	1.4834	1.4892
Aniline Point (°F)	D611	176.0	220.7	223.9	240.6	248.2	269.6
Clay-Gel (Wt.%)	D2007						
Asphaltenes		0	0	0	0	0	0
Polar Compounds		-	0	0	0	0	2
Aromatics		-	9	8	7	11	28
Saturates		93	91	92	93	88	70
Carbon Type Analysis (%)	D2140						
Ca		2	0	3	0	2	1
Cn		43	36	31	35	31	29
Cp		55	64	66	65	63	70
FDA 21 CFR 178.3620 (c)	FDA	-	PASS	PASS	-	-	-

BLENDING NAPHTHENIC AND PARAFFINIC BASE OILS

Calumet offers the CALPRO™ series of hybrid process oils that are a custom combination formulated and optimized to achieve unique properties for customer specific requirements. The purpose of blended naphthenic and paraffinic oils is to meet specific customer specifications and applications. These oils are designed to achieve specific chemical or physical properties.

CALPRO™ HYBRID PROCESS OILS

PROPERTIES	METHOD	CALPRO 36	CALPRO 60	CALPRO 100	CALPRO 150	CALPRO 200	CALPRO 500
Viscosity @ 40 °C (cSt)	D445	2.81	10.12	20.16	29.16	41.92	97
Viscosity @ 100 °C (cSt)	D445	N/A	2.50	3.85	4.94	6.13	9.67
Viscosity @ 100 °F (SUS)	D2161	35.8	62.0	106.6	150.9	216.6	508.9
Viscosity @ 210 °F (SUS)	D2161	29.9	34.7	39.2	42.8	46.8	59.1
Viscosity Index	D2270	N/A	56	65	88	88	70
API Gravity @ 60 °F	D4052	31.4	29.7	29.5	30.2	30.5	26.4
Flash Point, COC (°F)	D92	226	317	353	393	434	233
Flash Point, COC (°C)	D92	108	158	178	201	223	452
Pour Point (°F)	D97	-90	-71	-13	0	0	3
Pour Point (°C)	D97	-68	-58	-25	-18	-18	-16
Color, ASTM	D1500	L0.5	L0.5	L0.5	L0.5	L0.5	L1.0
Aniline Point (°F)	D611	102	176.5	198.9	214.2	223.6	220.3
Aniline Point (°C)	D611	101.3	80.3	92.8	101.2	106.4	104.6
Refractive Index @ 20 °C	D1218	-	1.4812	-	-	1.478	1.4897

WHITE OILS

White oils are among the most versatile products in the world, making them a standard preference across diverse industries due to their high purity. Calumet white oils of specific viscosities are refined to meet the purity requirements of certain USP/NF monographs and various FDA regulations, making them ideal for various applications.

- Heavily credentialed to meet global standards
- Our manufacturing process delivers a high purity product

Please contact Calumet's Product Support Team at technical@calumet.com for specific application requirements.

WHITE OILS

PROPERTIES	METHOD	DRAKEOL® 34	DRAKEOL® 34S	PAROL® 350 HP	PAROL® 500 HP
Viscosity @ 100 °F (SUS)	D2161	370/410	370/410	350/370	515/615
Viscosity @ 40 °C (cSt)	D7042	72.0/79.5	72.0/79.5	66.7/71.2	99.0/120.0
Specific Gravity @ 25/25 °C	D4052	0.8580/0.8720	0.8580/0.8720	0.8637	0.8732
Flash Point, COC (°F)	D92	478	478	461	508
Flash Point, COC (°C)	D92	248	248	238	264
Pour Point (°F)	D97	5	5	10	10
Pour Point (°C)	D97	-15	-15	-12	-12

Drakeol® products meet the following FDA regulations:
21 C.F.R. 172.878 regarding direct food additives,
21 C.F.R. 178.3620 (a) regarding indirect food additives.

Parol® technical mineral oils meet 21 C.F.R. 178.3620 (b) regarding indirect food additives.

TECHNICAL ASSISTANCE

For product or technical questions, contact your Sales Representative or Calumet Product Support at (800) 437-3188 or email technical@calumet.com.

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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.

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Rev. 8/24



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