CALUMET

OILFIELD

Calumet offers a wide array of fluids developed specifically and used extensively in the exploration of oil and gas. Areas of application include every aspect of upstream energy production, midstream transportation, and downstream refining operations. Our highly refined products offer consistent quality, low environmental impact, high worker safety and in some cases, circular carbon options.

OILFIELD INDUSTRY APPLICATIONS

- Drilling Fluids
- Fracturing Fluids
- Production Fluids
- Equipment Lubricants, Greases and Fluids

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DRILLING APPLICATION

Drilling for oil and gas involves chemistry, whether the system is Oil or Water based.

Calumet fluids are specially developed for drilling applications, delivering improved performance and efficiency. With consistent viscosities, densities and chemical compositions, these fluids can be used interchangeably in all climate conditions.

Calumet CALSIA™ Drilling Fluids are normal/isoalkane, that begin with a severe hydrocracking and hydroisomerization process. They have several unique properties for use in invert mud systems but are primarily identified by their pour points for use in extreme weather conditions. Calsia Drilling Fluids meet OGP Group III non-aqueous fluids.

All Calumet products are produced to the highest technical standards. These products are also compliant with the EPA Maximum Contaminant Levels (MCLs) for BTEX (benzene, toluene, ethylbenzene, and xylenes) compounds in drinking water.

Our products offer many advantages:

- Low toxicity to humans and aquatic life
- Provides superior low-temperature fluidity in ultra-deepwater drilling applications
- No long-term environmental impact
- Effectively used as:
  Viscosity Modifier • Heat String Fluid • Diluent for Liquid Mud Additives (LMA)
  Base Gel Fluid • Differential Fluid • Rate of Penetration (ROP) Enhancer

PRODUCT RECOMMENDATIONS

- CALSIA 62
- CALSIA 70
- CALSIA 80
- CALSIA 96
- CALSIA 100
- LVT 200
- CONOSOL C-170
- LVP-100

FRACTURING APPLICATION

Fracturing involves the use of non-compressible liquids to hydraulically crack the formation open to improve porosity and increase the flow of hydrocarbons to the wellbore. These liquids are typically water-based due to the large volumes required in current multi-stage fracturing operations. To achieve instant dispersion of the polymer when added to water and avoid fisheyes, an oil-based dispersion or emulsion of the polymer is created.

Calumet supplies fluids to slurry the friction reducing polymer, and provides a perfect mix of normal and iso-paraffinic hydrocarbons used to emulsify water-based polymers. These fluids are hydrotreated, BTEX non-detectable, and safe for water-based systems.

PRODUCT RECOMMENDATIONS

- CALSIA 62
- CALSIA 70
- CONOSOL C-170

PRODUCTION APPLICATION

Wax and asphaltene deposits are the top issues facing producers. CALWAXSOL™ is a blend of alcohols, polyesters and light hydrocarbons designed to specifically break up wax deposits and turn them into small discrete particles that flow in crude oil. Formulated to work under static conditions, CALWAXSOL will also tackle hard-to-access wax deposits from oil batteries and refining equipment.

Production chemistry typically involves the use of formulated ingredients to achieve the correct concentration for the specific application. Calumet can provide fluids used as a base in these chemical applications.

Our Hydrocal™ naphthenic oils are produced using a multi-stage hydrotreating process and offer high-quality, stable base stocks for production applications.

PRODUCT RECOMMENDATIONS

- CALWAXSOL
- CALSIA 62
- HYDROCAL 38
- HYDROCAL 40
- MINERAL SPIRITS <1%

CALUMET SOLVENTS TYPICAL PROPERTIES

PROPERTIES	METHOD	CALSIA 62	CALSIA 70	CALSIA 80	CALSIA 96	CALSIA 100	LVT 200	CONOSOL C-170	LVP 100	MINERAL SPIRITS <1%
Viscosity @ 40 °C (cSt)	ASTM D445	2	2	2.26	2.18	2.31	2.34	2.08	1.91	-
Density @ 60 °F (15°C), kg/L	ASTM D4052	0.7935	0.823	0.8101	0.8090	0.8109	0.8108	0.8132	0.7975	0.7702
Flash Point (°C), PMCC (P) TCC (T)	ASTM D93/ D56	70 (P)	80 (P)	96 (P)	98 (P)	102 (P)	97 (P)	81 (P)	94 (P)	46 (T)
Pour Point (°F)	ASTM D97	-60	-38	-46	-28	-50	<-90	<-80	-27	<-60
Aromatics (wt.%)	ASTM D5186	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%	<0.5	<0.5	<1.0	<1.0
BTEX (Detection Limits per EPA Drinking Water MCLs)										
Benzene (5 ppb)	EPA 8260B	ND	ND	ND	ND	ND	ND	ND	ND	
Toluene (700 ppb)	EPA 8260B	ND	ND	ND	ND	ND	ND	ND	ND	
Ethylbenzene (1 ppm)	EPA 8260B	ND	ND	ND	ND	ND	ND	ND	ND	
Xylene (10 ppm)	EPA 8260B	ND	ND	ND	ND	ND	ND	ND	ND	
PROCESSES										
Drilling		√	√	√	√	√	√	√	√	
Fracking		√	√					√		
Production Chemistry		√								√

PROPERTIES	METHOD	CALWAXSOL
Density @ 60 °F (Pounds per gallon)	ASTM D1250	6.3
Flash Point TCC	ASTM D56	37 °F
Aromatics (Vol. %)	ASTM D1319	10-15%
Distillation, IBP (°F)	ASTM D86	145
Distillation, Dry Point (°F)	ASTM D86	310
Specific Gravity @ 60/60 °F	ASTM D1250	0.753
Pour Point (°F)	ASTM D97	<-70
PROCESSES		
Drilling		
Fracking		
Production Chemistry		√

CALUMET BASE OILS TYPICAL PROPERTIES

PROPERTIES	METHOD	HYDROCAL 38	HYDROCAL 40
Viscosity@ 100 °F (SUS)	D2161	37.50	41.30
Viscosity @ 210 °F (SUS)	D2161	30.30	31.20
Viscosity @ 40 °C (cSt)	D445	3.30	3.97
Viscosity @ 100 °C (cSt)	D445	1.30	1.51
Viscosity Index	D2270	85	74
API Gravity @ 60 °F	D4052	29.80	28.70
Flash Point, COC (°F)	D92	219	243
Pour Point (°F)	D97	-81	-80
PROCESSES			
Drilling			
Fracking			
Production Chemistry		√	√

PERFORMANCE BRANDS - Oil Field Surface Equipment Lubrication, Oils and Greases

Bel-Ray® Specialty Lubricants

For more than 75 years, Calumet Branded Products have proven their value, setting the highest standard of quality and performance. A leader in lubrication technology, our company has engineered products to protect, while delivering superior business value for applications in the oil and gas industry. We've been helping customers realize an optimized total cost of ownership through:

- **Reduced maintenance and down time**
  Extremely high film strength and consistent film thickness that minimize metal to metal contact between moving surfaces resulting less contact, wear and damage.
- **Increased production**
  Maximized drain intervals and usable lubricant life provide optimal operational availability and readiness.
- **Extended equipment life**
  Lubricant formulations focused on proactively managing moisture, heat and contaminants.
- **Improved asset reliability**
  Maximized component mean time between failures and planned maintenance interval.
- **Sustainable product options**
  Maintaining environmental stewardship utilizing the latest in environmentally responsible lubricant technology while providing equal or greater asset protection.
- **Training, lubrication and reliability support programs available**
  Value added training and services offered, supporting lubrication and reliability program development, implementation and sustainability for all departments: operations, maintenance, reliability and management.

Visit www.belray.com to learn more about our solutions or to contact us for additional information.

ONE CALUMET - INVESTING IN EVERYONE'S FUTURE

Calumet is investing in research and product technology with an enhanced focus on environmental sustainability for the Oil & Gas Industry.

CALUMET SPECIALTY PRODUCTS & SOLUTIONS

Calumet manufactures, formulates, and markets a diversified slate of specialty branded products to customers in various consumer-facing and industrial markets. We are headquartered in Indianapolis, Indiana, with approximately 1,400 employees and 12 facilities across North America, and we serve over 2,700 global customers in 90 countries.

BASE OILS

SPECIALTY OILS

SOLVENTS

ESTERS

WAXES

FUELS

ASPHALT

PERFORMANCE BRANDS

TECHNICAL ASSISTANCE

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

CALUMET

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Rev. 4/25