CALUMET



FLOTATION PROCESS SOLUTIONS

CALUMET MINING OVERVIEW

Calumet delivers high-performance solvents and base oils for a wide range of mining applications, from ore extraction and solvent extraction to flotation and material handling. Our highly refined products provide exceptional consistency, process reliability, and environmental stewardship, helping operators improve efficiency, optimize recovery, and maintain tighter control over critical mining processes.

▶ MINING SOLUTIONS

- **Gold Recovery Solutions:** Preg-Robbing Mitigation and Carbon Blinding
- **Copper Solvent Extraction:** SX-EW Diluents for Copper Recovery
- **Critical Minerals and Metal Extraction:** Extraction Diluents for Precious and Base Metals
- **Flotation Process Solutions:** Diesel Alternatives
- **Ore Handling and Dust Control:** Railcar Dust Suppression and Product Preservation

▶ ABOUT CALUMET

Calumet manufactures, formulates, and markets a diversified slate of specialty branded products and renewable fuels. Founded in 1919, Calumet proudly produces more than 1,900 unique specialty products including: base oils, solvents, waxes, high-purity specialty oils, asphalts, fuels, and esters used in the development of the world's most trusted brands and products. Calumet is vertically integrated and holds a comprehensive portfolio of branded products for use in commercial, industrial and consumer applications.

Headquartered in Indianapolis, Indiana, more than 1,500 team members operate at 12 specialty product manufacturing and production facilities across North America. Calumet products are available in more than 80 countries across the world, serving 2,400+ customers globally.

CALUMET

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FLOTATION PROCESS SOLUTIONS

Flotation is a critical mineral recovery process used to separate valuable minerals from ore. Traditionally, diesel fuel has been used as a flotation aid to enhance mineral hydrophobicity, enabling target particles to attach to air bubbles and be recovered in the froth phase. In these applications, hydrocarbon-based collectors and frothing agents either adsorb directly onto the mineral surface or form a hydrophobic film that promotes efficient separation.

Calumet highly refined solvents and base oils provide a premium alternative to conventional diesel flotation oils. Engineered for consistent performance, our products deliver effective film strength, excellent low-temperature properties, and reliable flotation characteristics that support process efficiency and recovery.

By replacing traditional fuel-grade products with specialty hydrocarbon fluids, mining operators can benefit from improved product consistency, enhanced process control, reduced odor, and a more environmentally responsible solution. The result is dependable flotation performance that helps maximize recovery while supporting operational and sustainability objectives.

KEY BENEFITS

- **Consistent Flotation Performance** through highly refined, tightly controlled formulations.
- **Effective Film Strength** to support mineral collection and recovery.
- **Excellent Low-Temperature Properties** for reliable operation in challenging environments.
- **Improved Process Control** compared to commodity diesel fuels.
- **Reduced Environmental Impact** through cleaner, highly refined hydrocarbon alternatives.

APPLICATIONS

- Molybdenum Flotation
- Potash Flotation
- Diesel Flotation Replacement Programs
- Specialty Mineral Processing Operations
- Copper Flotation

▶ PRODUCT RECOMMENDATION

- CALXTRA™ 170
- CALXTRA™ 400-500 <1% Solvent
- HYDROCAL™ 38
- HYDROCAL™ 60
- CALSOL™ 806
- CALPAR™ 60

▶ 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 BASE OILS TYPICAL PROPERTIES

PROPERTIES	METHOD	CALSOL 806	HYDROCAL 38	HYDROCAL 60	CALPAR 60
Viscosity @ 40 °C (cSt)	ASTM D445	9.5	3.3	10.3	7.3
Viscosity @ 100 °C (cSt)	ASTM D445	2.4	1.3	2.5	2.1
Viscosity @ 100 °F (SUS)	ASTM D2161	59.8	37.5	62.9	51.3
Viscosity @ 210 °F (SUS)	ASTM D2161	34.2	30.3	34.6	33.4
Specific Gravity @ 60 °F	ASTM D1250	0.8938	0.8783	0.8921	0.8437
Density (Pounds per Gallon)	ASTM D1250	7.452	7.313	7.428	7.025
Flash Point (°C)	ASTM D92	150	104	158	159
Flash Point (°F)	ASTM D92	302	219	317	318
Pour Point (°F)	ASTM D97	-82	-81	-78	-57
Aniline Point (°C)	ASTM D611	70.8	138.6	72.7	91.6
Aniline Point (°F)	ASTM D611	159.5	59.2	162.8	196.9
Carbon Type Analysis (%)	ASTM D2140				
Ca		8	-	13	1
Cn		50	-	40	36
Cp		42	-	47	63
APPLICATIONS					
Gold Recovery Solutions					✓
Copper Solvent Extraction			✓	✓	
Critical Minerals & Metal Extraction					
Flotation Process Solutions		✓	✓	✓	✓
Ore Handling & Dust Control					

CALUMET SOLVENTS TYPICAL PROPERTIES

PROPERTIES	METHOD	CALXTRA 400-500 <1%	CALXTRA 170
Viscosity @ 40 °C (cSt)	ASTM D445	1.87	2.08
Specific Gravity @ 60/60 °F	ASTM D1250	0.7980	0.8132
Density @ 60 °F (Pounds Per Gallon)	ASTM D1250	6.654	6.77
Flash Point (°F)	ASTM D93	202	178
Pour Point (°F)	ASTM D97	-38	<-80
Aniline Point (°F)	ASTM D611	170.7	165.2
Aromatics (Vol. %)	ASTM D1319	<1.0	<0.5
Vapor Pressure @ 20 °C (mm Hg)	ASTM D2879	0.11	-
Distillation IBP (°F)	ASTM D86	432	400
Distillation EP (°F)	ASTM D86	473	508
BTEX (Detection Limits per EPA Drinking Water MCLs)	EPA 8260B	ND	ND
Transportation: Not Regulated		✓	✓
APPLICATIONS			
Gold Recovery Solutions			
Copper Solvent Extraction		✓	
Critical Minerals & Metal Extraction		✓	✓
Flotation Process Solutions		✓	✓
Ore Handling & Dust Control			

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