

CYCLOGEN[®] Product Data Sheet



Description and Physical Properties

Cyclogen[®] recycling oils are engineered for use in hot and cold recycling to restore the chemical composition of oxidized asphalt binders. The Cyclogen naphthenic base oils are wax-free and low pour point, with excellent natural solvency to penetrate, flux and co-mingle with the reclaimed asphalt pavement (RAP) without solvents or cutter stock. Cyclogen decreases binder viscosity, rebalancing the asphalt components to rejuvenate RAP. Two grades of base oil are available for hot processes, Cyclogen L (lower viscosity) and Cyclogen M (higher viscosity). Cationic, water-based emulsion formulations (Cyclogen LE and ME) are available for cold recycling. Cyclogen oils are stable with long shelf lives.

Recommended Use

Cyclogen recycling oils are engineered for use in hot processes such as hot in-place recycling (HIR). Cyclogen emulsions are designed for cold recycling processes such as cold in-place recycling (CIR), pugmill mix or lay, and spray recycling applications. The grade and amount of Cyclogen is determined by test results on the asphalt material to be recycled, with typical application of 0.5 to 1.5% emulsion concentrate by weight of RAP.

Specifications

Base Oil Properties	Test Procedure	Cyclogen [®] L (pump @ 140°F)	Cyclogen [®] M (pump @ 190°F)
Viscosity @ 60°C (140°F), cSt	D-2170	200-500	1,000-4,000
Flash Point, COC, °C (°F)	D-92	204 (400) min.	232 (450) min.
Volatility	D-1160		
IBP, °C (°F)	10 mm	149 (300) min.	163 (325) min.
2%v, °C (°F)		191 (375) min.	204 (400) min.
5%v, °C (°F)		210 (410) min.	221 (430) min.
RTF-C Weight Change, %	D-2872	4.0 max.	2.0 max.
Compatibility, PC/S ⁽¹⁾	D-2006-70	0.5 min.	0.5 min.
Saturates, % by weight	D-2007	28 max.	28 max.
Asphaltenes, % w	D-2006-70	1.5 max.	7.0 max.
Chemical Composition (PC + A ₁)/(S + A ₂) ⁽¹⁾	D-2006-70	0.4-0.8	0.6-1.0
RTF-C Ratio (ratio of 60°C viscosity after: before aging)	D-2872	2.5 max.	2.5 max.
Specific Gravity	D-70	0.98-1.02	0.98-1.02

⁽¹⁾ Chemical composition by ASTM Method D-2006-70:

PC = Polar Compounds,
A₂ = Second Acidaffins,

A₁ = First Acidaffins.
S = Saturated Hydrocarbons.

Emulsion Properties	Test Procedure	Cyclogen [®] LE	Cyclogen [®] ME
Viscosity, 25°C (77°F), ssf	D-244	15 – 85	15 - 85
Sieve, w%	D-244 ⁽²⁾	0.1 max	0.1 max
Residue, w%	D-244 (mod) ⁽³⁾	60 min	60 min
Viscosity, 60°C (140°F), cSt		200 - 500	
Particle Charge Test	D-244	positive	positive
pH of Emulsion	D-244		
Pumping Stability	GP ⁽⁴⁾	Pass	Pass
Cement Mixing Test, %	D-244	2.0 max	2.0 max
Emulsion base oil meets requirements for:		Cyclogen L (above)	Cyclogen M (above)

⁽²⁾ Test procedure identical with ASTM D-244 except that distilled water shall be used in place of two percent sodium oleate solution.

⁽³⁾ Evaporation Test for residue % by heating 50-gram sample to 149°C (300°F) until foaming ceases, then immediate cooling, reweighing & calculation.

⁽⁴⁾ Pumping stability is determined by charging - 450 ml of emulsion into a one-liter beaker and circulating the emulsion through a gear pump (Roper 29.B22621) having a ¼" inlet and outlet. The emulsion passes if there is no significant separation after circulating ten minutes.

Storage and Handling

Before being filled, tanks and trucks should be examined for possible contaminants. The Cyclogen water-based emulsions should not be exposed to overheating. The cationic emulsions are chemically stabilized, so care should be taken not to upset the chemical balance with contamination by chemicals, over-exposure to air, or adverse mechanical or thermal conditions.

Martin Asphalt Quality

Through Martin Asphalt, you get **Everything Asphalt**—a full range of products. In addition, you receive technical assistance in selecting the right materials and application. The company's AASHTO Certified Laboratory makes sure the products meet your specifications. And your products are delivered both on spec and on time via Martin's Gulf Coast network of production plants, storage facilities and transportation fleet including ocean-going and inland barges, rail cars and tanker trucks. For more information on the Cyclogen product for use in your processes, contact us.

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