



Eco Flow® System



PRODUCT DESCRIPTION

Eco Flow is a two component, single dosing system specifically designed for pipelines carrying water or a mixture of hydrocarbon and water. The Eco Flow system is a combination of chemicals formulated for optimal benefit of prime additives for water treatment, blended in well determined concentrations to obtain maximum performance.

The formulation of Eco Flow is a combination of vapor phase, neutralizing, and film-forming corrosion inhibitors to combat the broadest range of corrosive attack from moisture and condensation, oxygen, carbon dioxide, hydrogen sulfide, and other corrosive contaminants. These formulations offer the benefits of filming inhibitors that form a tenacious protective film on metal surfaces, neutralizing inhibitors that combat corrosive fluid formation, and vapor phase inhibitors that reach areas inaccessible by direct contact to protect areas subject to varying flow ratios. In addition, Eco Flow contains an antisclant agent.

Eco Flow has been designed specifically to be effective in pipelines carrying either fresh water, seawater, produced water, or multiphase systems with a water continuous phase. Eco Flow offers an effective solution to pipeline bottleneck problems, without mechanical expansion. In many aging oil fields the basic sediment and water (BS&W) increases over time to the point where a water soluble drag reducer is needed instead of an oil soluble drag reducer. It is an effective way to cope with pressure and/or capacity limitations due to increased water production in existing fields. It can increase throughput while reducing internal corrosion rates. Eco Flow is also a highly effective polymer for use in water flooding applications. Eco Flow increases movement of the residual oil to a producing well by reducing the tendency of water to "finger" or form channels, which bypass much of the residual oil. The high molecular weight makes Eco Flow more effective at lower concentrations than other water-soluble polymers. The lower concentration results in much less formation damage than other polymers.

Additionally, the small amount of damage that is inevitable with polymer flooding is completely reversible with Eco Flow.

FEATURES

Eco Flow Inhibitor

- Effective for a wide range of systems and corrosive conditions
- Provides maximum control over long distances for highly corrosive systems having a high ratio of water-to-hydrocarbons, including low areas in systems where water collects and extreme corrosive attack occurs
- Form an adsorbed, protective layer that protects ferrous and non-ferrous metals
- Effective against water, corrosive gases, and halogens
- Vapor phase action provides protection from atmospheric conditions and moisture condensation to areas not accessible by filming inhibitors
- Combines anti-corrosion and antisclant properties
- Resists biological attacks
- Environmentally friendly
- Does not contain heavy metals, chlorinated hydrocarbons, or volatile amines

Eco Flow Enhancer

- More than 60% drag reduction depending on conditions and systems
- Increased flow rates while maintaining current operating pressures
- Maintains flow while reducing operating pressures
- Less polymer is required to achieve a given performance
- Lower injections rates than traditional drag reducers
- Faster dissolution rates than traditional drag reducers
- Reduces potential internal corrosion through erosion
- Can be used in two-or-three-phase systems
- Drag reduction achieved in water-oil systems with over 50 % oil

PERFORMANCE of ECO FLOW Inhibitor

	Z**, Protec- tion
Wheel Test	
Film Persistency, 500-1000 ppm	90+
Continuous Treatment, 15-25 ppm	90+
Rotating Cylinder Electrode***	
20-50 ppm	95+

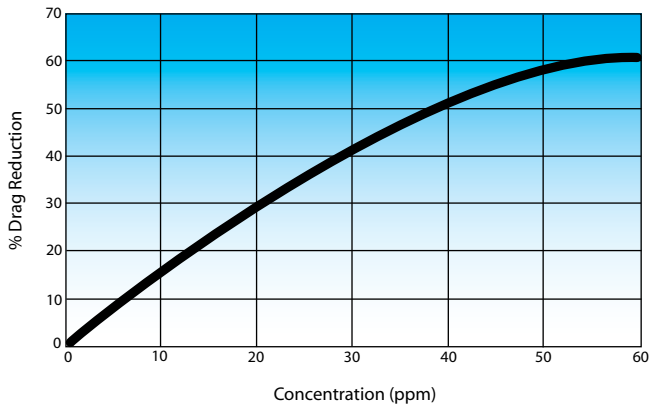


* Test performed by Dixie Testing and Products, Inc. Corrosion Wheel test in 90% NACE recommended electrolyte (-NaCl - 73,300 ppm, CaCl₂ - 7,534 ppm, MgCl₂ - 1,000 ppm) + 10% Depolarized Kerosen containing 500 ppm H₂S saturated with CO₂ at 150°F (65°C).

** $Z = 100\% (CR_c - CR_i) / CR_c$, where CR_c - corrosion rate in electrolyte without inhibitor, CR_i - corrosion rate in electrolyte with inhibitor

*** Data for Eco Flow. Test was performed in accordance to ASTM G 170-01, a Standard Guide for Evaluating and Qualifying Oilfield and Refinery Corrosion Inhibitors in the Laboratory.

Performance Graph of EcoFlow



APPLICATION

This 2 part system will be applied separately by 2 pumps through the same line as continuous treatment. Contact technical services for exact dosage.

SYSTEM PROPERTIES

Application	Water and Water-Hydrocarbon Blends	
TYPICAL PROPERTIES		
	Eco Flow Inhibitor	Eco Flow Enhancer
Color	Amber to dark green/brown liquid	Milky white viscous liquid
Flashpoint	N.A.	Does not flash
Viscosity	N.A.	2500 cP
Freezing point	N.A.	14°F (-10°C)
Boiling point	N.A.	212°F (100°C)
pH	8-9 (1% in water)	N.A.
Vapor pressure	N.A.	0.000387 lb/in ² 0.002 mm Hg@ 25°C
NVC	50-55%	N.A.

STORAGE/PACKAGING

Eco Flow system will be supplied as a 2 component system, both components are available in 5 gallon (19 liter) pails, 55 gallon (208 liter) metal drums, liquid totes 275 gal (1040 liter), and bulk. Products should be stored in tightly closed containers in heated warehouse to avoid freezing.

FOR INDUSTRIAL USE ONLY
KEEP OUT OF REACH OF CHILDREN
KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
CONSULT SAFETY DATA SHEET FOR MORE INFORMATION

LIMITED WARRANTY

All statements, technical information and recommendations contained herein are based on tests Cortec Corporation believes to be reliable, but the accuracy or completeness thereof is not guaranteed.

Cortec Corporation warrants Cortec® products will be free from defects when shipped to customer. Cortec Corporation's obligation under this warranty shall be limited to replacement of product that proves to be defective. To obtain replacement product under this warranty, the customer must notify Cortec Corporation of the claimed defect within six months after shipment of product to customer. All freight charges for replacement products shall be paid by customer.

Cortec Corporation shall have no liability for any injury, loss or damage arising out of the use of or the inability to use the products.

BEFORE USING, USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE, AND USER ASSUMES ALL RISK AND LIABILITY WHATSOEVER IN CONNECTION THEREWITH. No representation or recommendation not contained herein shall have any force or effect unless in a written document signed by an officer of Cortec Corporation.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO CASE SHALL CORTEC CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.



Distributed by:

4119 White Bear Parkway, St. Paul, MN 55110 USA
 Phone (651) 429-1100, Fax (651) 429-1122
 Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com
 Internet http://www.cortecvci.com