



VpCI® FORMULATED PRODUCTS FOR PROCESS INDUSTRIES



# VpCI®-BioFlow and EcoFlow System



## PRODUCT DESCRIPTION

VpCI-BioFlow and EcoFlow system is a combination of a flow improver and corrosion inhibitor to improve water flow and corrosion protection of pipelines carrying water or a mixture of hydrocarbon and water. The VpCI-Ecoflow - Bioflow combination of chemicals has been designed in such a way that the end user obtains optimal benefit of 5 prime additives for water treatment, blended in well determined concentrations to obtain maximum performance and this with a single dosing system. The formulation of the VpCI-BioFlow 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, VpCI-BioFlow contains biodispersant and antisalant agent.

EcoFlow has been designed specifically to be effective in pipelines carrying either fresh water, seawater, produced water, or multiphase systems with a water continuous phase.

EcoFlow 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. EcoFlow is also a highly effective polymer for use in water flooding applications. EcoFlow 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 EcoFlow 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 EcoFlow.

## FEATURES

### VpCI-BioFlow

- Effective for a wide range of systems and corrosive conditions
- Provide 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 biodispersion and antisalant properties
- Environmentally friendly
- Does not contain heavy metals, chlorinated hydrocarbons, or volatile amines

### EcoFlow

- 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 VpCI-BIOFLOW

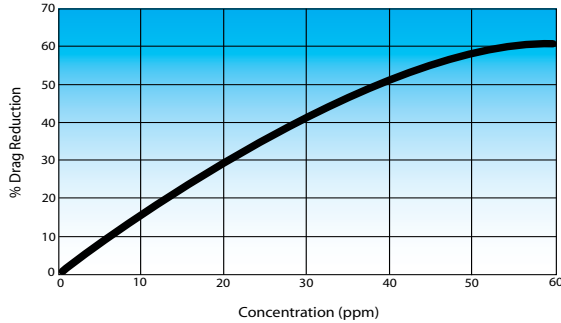
	Z**, Protection
Wheel Test Film Persistency, 500-1000 ppm Continuous Treatment, 15-25 ppm	90+ 90+
Rotating Cylinder Electrode*** 20-50 ppm	95+

\* Test performed by Dixie Testing and Products, Inc. Corrosion Wheel test in 90% NACE recommended electrolyte (-NaCl - 73,300 ppm, CaCl<sub>2</sub> - 7,534 ppm, MgCl<sub>2</sub> - 1,000 ppm) + 10% Depolarized Kerosen containing 500 ppm H<sub>2</sub>S saturated with CO<sub>2</sub> at 150°F (65°C).

\*\* Z = 100% (CR<sub>c</sub>-CR<sub>i</sub>)/CR<sub>c</sub>, where CR<sub>c</sub> - corrosion rate in electrolyte without inhibitor, CR<sub>i</sub> - corrosion rate in electrolyte with inhibitor

\*\*\* Data for VpCI-BioFlow. 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



### FOR INDUSTRIAL USE ONLY

**KEEP OUT OF REACH OF CHILDREN**

**KEEP CONTAINER TIGHTLY CLOSED**

**NOT FOR INTERNAL CONSUMPTION**

**CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION**

## APPLICATION

This 2 part system will be applied separately by 2 pumps through the same line as continuous treatment @ 50-200ppm in the ratio of VpCI-BioFlow to EcoFlow is 2:1.

## SYSTEM PROPERTIES

Application	Water and Water-Hydrocarbon Blends	
TYPICAL PROPERTIES		
	VpCI-BioFlow	EcoFlow
Color	Brown liquid	Milky white liquid
Density	7.8-7.9 lb/gal (0.93-0.94 kg/L)	8.2 lb/gal (0.96 kf/L)
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	9.5-10.5 (neat)	N.A.
Vapor pressure	N.A.	0.000387 lb/in <sup>2</sup> 0.002 mm Hg@ 25°C
NVC	31-35%	N.A.

## STORAGE/PACKAGING

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

## 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.

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