

# Erifon EcoMac Arctic

## BOP Control Fluid

### General Description

Erifon EcoMac Arctic has been specifically formulated to provide the high performance required for the newest generation of deepwater BOP control systems. This high performance BOP control fluid exhibits excellent stability, anti-wear, anti-corrosion properties, and also possesses a high resistance to microbiological attack. Erifon EcoMac Arctic concentrate can withstand temperatures of -50 degrees Centigrade (-58 degrees Fahrenheit) for transport and storage in extremely cold environments where products cannot easily be insulated from the elements.



The high performance characteristics and environmental features, coupled with it being extremely economical in use, make Erifon EcoMac Arctic an ideal hydraulic operating medium for sub-sea BOP equipment in Arctic environments.

### Salient Features

#### High dilution ratio

As Erifon EcoMac Arctic is economical, requiring a low dilution with water. Storage space and transportation costs are also minimized. Erifon EcoMac Arctic contains a sophisticated additive package to ensure that safety and reliability of the hydraulic system are maintained.

Erifon EcoMac Arctic is formulated for use in BOP systems at concentrations as low as 2% in fresh water; this will be acceptable for most applications. In cases where poor water will be used, higher dilutions may be required. Glycol may be added as required to provide anti-freeze protection during operations. Subsea temperature and topsides temperature should be considered to prevent freezing in the diluted state. The MacDermid Technical Staff will be happy to recommend the optimum dilution to be used for a specific application.

#### Tolerance to Hard Water

Erifon EcoMac Arctic can tolerate extremely hard natural water. Erifon EcoMac does not produce precipitates up to five hundred parts per million of water hardness.



## Low Toxicity

Erifon EcoMac meets worldwide environmental requirements. Erifon EcoMac Arctic is registered as a Class E, compliant to UK OCNS 2007 regulations, for Scandinavian and EU waters. Third Party testing has shown that all of the chemicals utilized in the fluid comfortably meet the EU legislative requirements.

Erifon EcoMac Arctic falls in the “yellow” classification for use in Norway and has no substitution warnings for use in the UK sector.

Erifon EcoMac Arctic meets U.S. EPA regulations for Region 4, Region 6 and Alaska. It does not contain oils or produce sheen upon inadvertent losses or discharge to the ocean. Erifon EcoMac Arctic meets the stringent Alaskan DEC requirements, notably the most stringent in the world.

## Material Compatibility

Erifon EcoMac Arctic is inhibited to prevent corrosion of ferrous metal alloys, even when electrolytic effects prevail where multi-metal couples are encountered. The fluid will also have no adverse affect on the seal packing compounds generally used in the construction of the hydraulic systems, including Nitrile and Viton. Paints of the cured epoxy nylon or phenolic type may be used without being significantly effected by the fluid. Painting of internal surfaces of hydraulic systems is not advised.

## Stability

Erifon EcoMac Arctic contains a broad spectrum biocide to minimize the effects of bacteria and fungal activity. This aspect alone can greatly reduce hydraulic system maintenance and repair costs. In addition, the high product stability, achieved by using soluble rather than emulsifiable products as a basis for the formulation, ensures that separation does not take place. This makes Erifon EcoMac Arctic an ideal product for use in systems, which use high pressure air accumulators.

## Physical Properties Table:

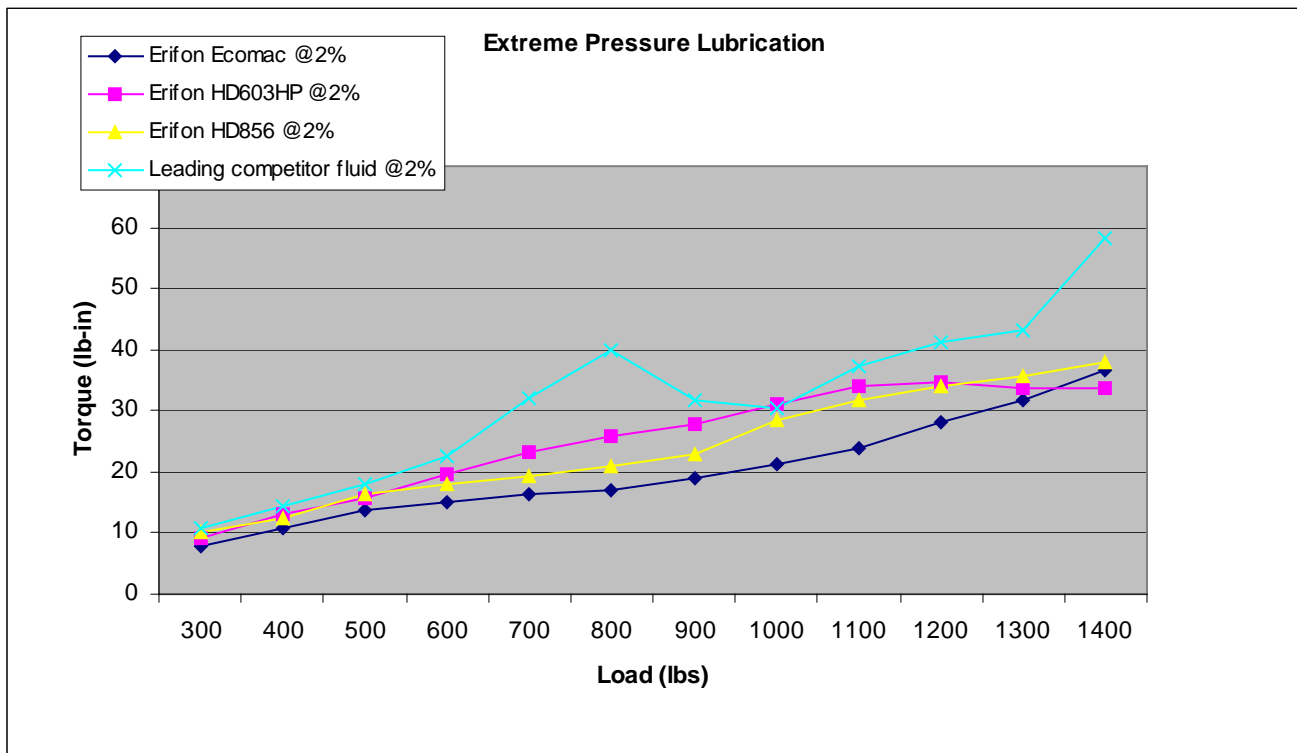
Physical Properties	
Appearance	Pale yellow clear liquid
Pour Point (C) (°F)	-50 (-58)
pH of Concentrate	10.2
pH at 2% Dilution	9.5
Specific Gravity	1.096
Viscosity (cSt) at 40 deg. C (104F)	6.8
Viscosity (cSt) at 20 deg. C (68F)	13.8
Viscosity (cSt) at 0 deg. C (32F)	36.0
IP135 (ASTM D665B) corrosion at 2% with 10% seawater	No corrosion



## Anti-Wear Properties

Considerable care has been taken to give Erifon EcoMac Arctic excellent anti-wear properties, particularly where metal - metal rubbing contacts occur. This is of particular importance in modern control systems using shear seal valves with metal – metal sealing faces, and where hydraulic system pressures are high.

The graph below shows the torque (friction) produced during standard Falex lubrication test. Four solutions of 98% tap water and 2% dilutions of Erifon EcoMac Arctic, Erifon HD 603HP, Erifon HD 856 and the leading competitor fluid. The straightness of the gradient in the Falex extreme pressure (EP) graph also shows the controlled lubrication properties, this translates to reliable and constant friction reduction.



Information given in this publication is based upon technical data gained in our own and other Laboratories and is believed to be true. However the material is used in conditions beyond our control thus we can assume no liability for results obtained or damages incurred through the application of the data presented herein.



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