HFA01

BOP Control Fluid Concentrate

General Description

HFA01 is a fully synthetic BOP control fluid concentrate, formulated for use at a dilution of 100:1 in fresh water, thus is extremely economical. It has excellent stability, anti-wear and anti-corrosion properties, and is fully inhibited to resist microbiological attack. HFA01 has been developed by the same technical team who developed Stack Magic 200 and HD603HP; this team should be regarded worldwide as the leading BOP control fluid developers and there chemistry is in use in systems on a large number of installations.

High Dilution Ratio

As HFA01 can be used at a dilution ratio of 100:1 with fresh water, although performance is better at 50:1, it is very economical to use, even when BOP functions are operated frequently. Storage space and supply costs are also minimized. The high operating dilution does not, however, mean that performance has been compromised in any way. HFA01 contains a sophisticated additive package to ensure that the safety and reliability of the BOP system are maintained.

Physical Properties

Viscosity (cS) @

-20°C	~750
0°C	~85
20°C	~20
40°C	~8

Pour Point (°C) -29°C (this can be tailored to the application and MEG free product can be supplied for areas where freezing is not expected.
pH Value (Concentrate) 9.60
pH Value (@ 100:1 dilution) 9.3
Specific Gravity (15.6°C) (60°) 1.10
Max. Recommended Temp. (°C) (°F) 60°C (140°F)

Material Compatibility HFA01 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 effect on the seal and packing compounds generally used in the construction of BOP systems. Paints of the cured epoxy, nylon or phenolic type may be used without being significantly affected by the fluid. The painting of internal surfaces of hydraulic systems is not advised.

Anti-Wear Properties Considerable care has been taken to give HFA01 excellent anti-wear properties, particularly where metal-to-metal rubbing contacts occur. This is of particular importance in modern control systems using shear-seal valves with metal-to-metal sealing faces.

Stability HFA01 represents a major breakthrough in BOP fluid stability. Earlier products were liable to become unstable and degrade in a very short period of time if contaminated with seawater and/or microorganisms such as bacteria or fungi. HFA01 will tolerate contamination with moderate amounts of seawater without suffering from precipitation, flocculation or phasing. It also contains a broad-spectrum anti-microbiological package to minimize the effects of bacterial and fungal activity. This aspect alone can greatly reduce BOP system maintenance and repair costs by preventing degradation in the system which would otherwise lead to acid corrosion, abrasive wear and sludging.

Discharge into marine environments HFA01 is not included in the U.K. Notification Scheme for the Selection of Chemicals For Use Offshore.

Installation of HFA01

Whether the fluid is installed in a new system, or one that is already in operation on another type of BOP fluid, it is important to carry out an effective flushing operation to ensure freedom from microbiological and other contaminants. Even new systems, particularly if they have been in storage for some time, can contain contaminants that can severely inhibit the proper operation of even a high quality fluid like HFA01.
It should be stressed that carrying out a proper flushing and cleaning operation prior to installation will greatly increase the life of the fluid, and may well result in substantial savings in equipment reconditioning at a later date. The operator is urged to examine the condition of the equipment prior to fluid installation, however, as no fluid, regardless of quality, can rectify system damage that has already taken place.

The most effective method of flushing a system, especially where microbiological attack has already occurred, is to use Systems Cleaner. Systems Cleaner is a highly effective treatment for use in systems suffering from microbiological and other forms of contamination. Supplied as a concentrate, it attacks a wide variety of microorganisms, breaks down sludge deposits and neutralizes acid degradation products. It is also widely used to flush new control systems prior to fluid installation, improving fluid and system service life.
New systems may be flushed using a 2% solution of Systems Cleaner in a 100:1 mix of HFA01 in fresh water. The solution should remain in the system for a period of between twenty-four and forty-eight hours before being discarded and the system being recharged with fresh HFA01.
Operational systems should be treated by adding the Systems Cleaner to the existing BOP fluid at a level of 2%, and then cycling the system to ensure complete distribution of the Systems Cleaner solution. After a period of between twenty-four and forty-eight hours, the system should be drained and HFA01 installed.
When flushing new or operational systems, particular attention must be given to accumulators and pilot lines, as if these are not treated adequately they could re-contaminate the entire system, and waste the entire flushing operation.
The specific procedures necessary will vary from system to system. John Neale Ltd staff can offer detailed advice on the correct approach to be used in particular circumstances.
Once HFA01 has been successfully installed in a system, it is recommended that advantage is taken of the John Neale Ltd Fluid Monitoring Service, as part of a planned maintenance program.

Fluid Maintenance

HFA01 is designed for use at an operating dilution of 100:1 with fresh water. In general, it will work satisfactorily at ratios of between 50:1 and 100:1. Outside these limits there will be penalties to be paid either because of higher than necessary fluid costs, or a reduction in performance and system reliability. The quality of water used is of great importance. Only fresh water should be used, preferably from the installation's potable water system. It should not be assumed that potable water is automatically free of potentially damaging microorganisms, as tests by Health Authorities are testing specifically for pathogens (organisms which can cause illness), while others, which could cause fluid deterioration, could still be present. The anti-microbiological package in HFA01 is perfectly adequate to deal with fluid contamination that enters the system by normal means (airborne, water splash, etc.) and will ensure long fluid life, but no fluid or additive pack can cope with continuous ingression of micro-organisms via the make-up water. It is preferable not to use drill water for make up, and seawater must never be used. If any doubt exists as to the suitability of water supplies, samples may be submitted to John Neale Ltd, and these will be analyzed and a report and recommendations issued. At its normal dilution ratio of 100:1, HFA01 may be used at temperatures down to 0 °C(32°F). For lower temperature operation, it is necessary to add a pour point depressant to the system. John Neale Ltd provides a product, Stack Glycol, specifically for this purpose, and the chart on page 4 shows the mix ratios of HFA01, Stack Glycol and water to be used for various operating temperatures. Pure glycols may be used as alternative pour point depressants, but commercially available antifreeze formulations must be avoided due to the likely interaction between additives that could detrimentally affect fluid performance.

The most important aspects of maintaining HFA01 are to ensure the correct dilution and, where applicable, Stack Glycol level, and to keep the water supply free from microorganisms. HFA01 is extremely tolerant of all types of contamination, and this means that it will not deteriorate immediately such contamination occurs. A planned program of maintenance can therefore provide advance warning of system problems, allowing them to be dealt with before they have a significant effect on system safety and reliability.

Surveys of service samples submitted to John Neale Ltd for analysis under their Fluid Monitoring Service show incorrect dilution to be the most frequent cause of fluid failure, closely followed by bacterial contamination of the make-up water supply. Studying the rate of deterioration of these fluids suggests that a program of sample checking every two to three months is generally adequate to provide sufficient warning of impending problems. In certain circumstances, such as in particularly warm climates, or where sub-standard supplies of water cannot be avoided, monthly checks are advantageous.

The taking of samples may be made easier by the installation of suitable sample ports at strategic points about the system. It should be remembered that the sample taken would only be of use when analyzed if it is representative of fluid within the system as a whole.