

Oceanic BTC491 (UK)

Subsea Production Control Fluid

General Description

Oceanic BTC491 is a fully synthetic hydraulic medium specifically designed for control of sub surface safety valves set in oil and gas wells with flowing temperatures of up to 180 °C (356°F).

This includes a safety margin as testing shows that Oceanic BTC491 control fluid has extremely high stability at temperatures of 190 °C (374°F), with no solids formation. The product also exhibits minimal increase in acidity over extended periods. In both these aspects, Oceanic BTC491 demonstrates superior performance when compared with other types of subsea production control fluid.

The technology incorporated into Oceanic BTC491 also gives the fluid extremely good boundary lubricant properties; this is particularly important when dealing with very low viscosity fluids of this type.



Oceanic BTC491 is designed to be compatible with and to have similar viscosity/ temperature characteristics to, synthetic hydrocarbon fluids already used in subsea production control systems. There is, however, also available a lower viscosity version, which offers considerable advantages particularly when pressure drops through systems might be critical such as where direct hydraulic actuation is employed. The lower viscosity fluid retains all the benefits of the standard product. Oceanic BTC491, while developed specifically for operation of high temperature sub surface safety valves, can also be used as the hydraulic medium in control systems designed for operation with existing synthetic hydrocarbon based fluids.

For systems requiring a "total loss" configuration, Oceanic BTC491 can be used solely in the sub surface safety valve control system, retaining the use of water based fluids such as Oceanic HW540 for all other valve actuation. Relatively minor modifications are required to separate the SSSV control system, this generally being already partially implemented with high pressure, high temperature wells as the SSSV control system normally operates at a higher pressure than the remainder of the control system.

Oceanic BTC491 control fluid is believed to be fully compatible with materials currently used in the construction of subsea production control systems.

For further details, please contact your MacDermid Offshore Solutions Sales Engineer or the MacDermid Technical Services Department at the address given on this leaflet.



Typical Physical Properties

Appearance	Clear Pale Yellow Fluid	
Specific Gravity @ 15.6 °C (60°F)	0.840	IP160/ASTM D1298
Flash Point	182 °C (360°F)	IP36/ASTM D92
Acidity (mgm KOH.g ⁻¹)	1.60	IP1B
Pour Point	-62 °C (-80°F)	IP15/ASTM D97
Copper Corrosion (2hrs -100 °C)	Class 1A	IP154/ASTM D130
Viscosity - 20 °C -4°F 0 °C 32°F 20 °C 68°F 40 °C 104°F	170.00 Centistokes 52.00 Centistokes 20.80 Centistokes 10.90 Centistokes	IP71/ASTM D445
Viscosity Index	155	IP226/ASTM D2270
Foam Characteristics	Sequence I 60 - 0 Sequence II 60 - 0 Sequence III 40 - 0	IP 146/ASTM D892
Corrosion Test	Distilled Water 10% - Nil Synthetic Sea Water 10%- Nil	IP135A/ASTM D665 IP135B/ASTM D665

Compatibility with Seal Materials

Oceanic BTC 491 can be considered to be compatible with most seal materials used in subsea hydraulic systems e.g. Nitrile, common Fluoroelastomers, Teflon, Buna and P.T.F.E.

To be absolutely certain it is best to carry out checks.

Seal Swell Results (NCB 463:1981 Appendix C)

Common Fluoroelastomers

Swell = 0.002%

Shore A Hardness before immersion 78 Shore A

Shore A Hardness after immersion 77 Shore A

Compatibility with Hose Lining Materials

MacDermid Offshore Solutions have carried out tests with Hytrel 6356, Hytrel 7248 and Rilsan BESNO P40 TLO. Work carried out to date indicates that Oceanic BTC 491 has no adverse effects on any of these materials.

Compatibility with Paint Coatings

The use of Epoxy or resin based coatings is advised. Normal coatings may be softened and/or lifted. The painting of the interior of hydraulic reservoirs is not recommended.

Compatibility with Filter Elements

Filter elements should be suitable for use with synthetic hydrocarbons. Porous filter media should be avoided.

Hydrolytic and Oxidative Stability

Tests carried out to date indicate that Oceanic BTC 491 has extremely good resistance to oxidation and hydrolytic attack. Oceanic BTC 491 has been formulated to absorb water as it ingresses into the hydraulic system in much the same way as an HLP-D type oil.

Test Results

Hydrolytic Stability Test (ASTM d 2619)

48 Hours at 93.3 Deg.C.

Copper Rating to ASTM D130	Class 1a
Copper Weight Loss (mg sq.cm)	2
Acidity of Water Layer	Water Absorbed into Product

Thermal Stability Test (Cincinnati Milacron Procedure "A")

168 Hours at 135 Deg.C.

Copper Bar - Visual Rating	Clean - no change
Deposit (mg)	1.6
Loss (mg)	1.8
Steel Bar - Visual Rating	Slight Discolour
Deposit (mg)	0
Loss (mg)	0.1
Sludge - mg per 100 ml	24.1



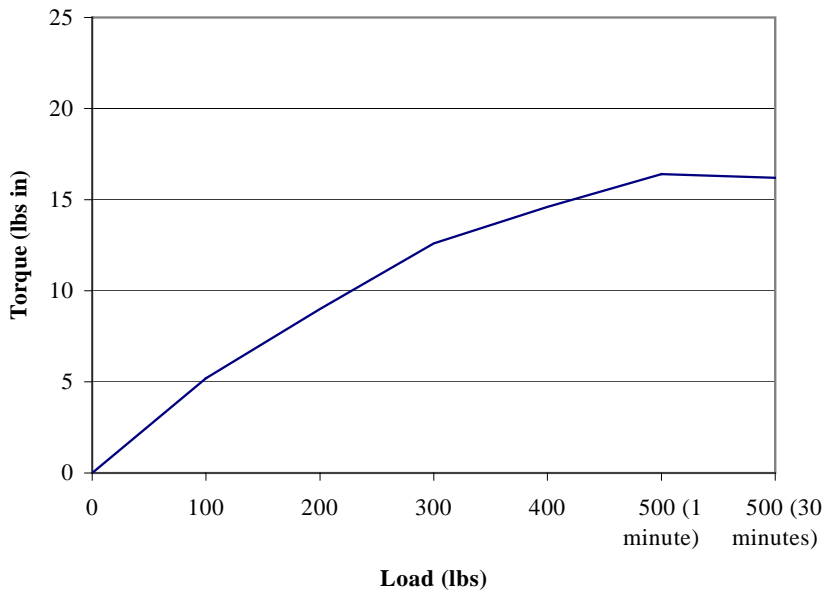
Wear Testing

Oceanic BTC 491 has been formulated to have extremely good lubricating properties. The following data was obtained on an ARMCO FALEX pin and vee-block wear tester in our Fluid Test Laboratory. The test procedure was to increase the applied load in 100lb increments at 1 minute intervals up to a load of 500lb. The load was then maintained at 500lb for 30 minutes. The torque and wear teeth were recorded at each increment and at the end of the test period.

Results

<i>Load (lb)</i>	<i>Torque (lb in)</i>	<i>Wear Teeth</i>
<i>100</i>	5.3	0
<i>200</i>	8.9	0
<i>300</i>	12.6	0
<i>400</i>	14.8	0
<i>500 (1 minute)</i>	16.8	0
<i>500 (30 minutes)</i>	16.4	14

Falex Lubrication Test



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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