Anvol CF 22

Environmentally responsible Motion compensator and surface BOP control fluid

Description

Castrol Anvol CF 22 is water based hydraulic fluid specifically formulated for use in all elements of floating Drilling and Production unit Motion Compensation systems, including heave compensators and riser, guide
line and pod line tensioners. Castrol Anvol CF 22 is also suitable for use as the operating fluid in closed loop Blow-out Preventer (BOP) cont systems.

Because of their excellent fire and explosion resistance, water-glycol fluids are the preferred hydraulic medium for motion compensation systems. To provide the maximum assurance of safety, Castrol Anvol CF 22 also meets strict requirements with respect to compression ignit The fluid passes the 50:1 compression ratio requirement as specified in MIL-H-22072.

Castrol Anvol CF22 has viscosity-temperature characteristics which enable it to be used in motion compensation and BOP systems across th full range of ambient conditions encountered without adverse effect on system response, even when operating at low temperatures.

Because of the risks associated with the location of Motion compensation and BOP systems, the use of lubricants in these systems is subjec the requirements of the OSPAR Harmonised Mandatory Control Scheme.All components have been tested to meet OSPAR requirements. Being based upon water and glycol, Castrol Anvol CF 22 disperses in sea water which makes its components available for biodegradation.

Castrol Anvol CF 22 is not miscible with mineral oil and when changing from mineral oil based products to Castrol Anvol CF 22, the system should be drained thoroughly and all accumulators should be fully discharged to eliminate mineral oil residues. Flushing with potable water before refilling with Castrol Anvol CF 22 is recommended. More detailed advice on changeover procedures is available upon request.

Application

Motion compensation and Riser Tensioner systems of mobile offshore drilling installations..
Accumulator driven hydraulic systems controlling surface mounted blow-out preventers.

Features and Benefits

Castrol Anvol CF 22 provides the following key benefits:

- Tested according to OSPAR requirements.
- UK OCNS Group B.
- Exceeds US EPA toxicity requirements.*
- Passes US EPA static sheen test.
- Fire and explosion resistant.
- Good viscosity characteristics over a wide temperature range, ensuring consistent response times.
- Excellent corrosion protection to BOP components preventing expensive rectification of corrosion damage.
- Compatible with all common seal materials (KBR, Viton, Nitrile) allowing simple replacement of mineral oil in hydraulic systems.

* As specified in NPDES permit GMG29000 for subsea production control fluids with reference to *M. bahia*.

Castrol Anvol CF 22 is biodegradable in the marine environment. The biodegradability of the product ensures the natural degradation of product should it enter the aquatic enviroment.

Castrol Anvol CF 22 has excellent oxidation stability, good thermal stability and is extremely resistant to hydrolysis. Superior oxidative and thermal stability extends product life, therefore minimising product consumption and waste.

The physical properties of Castrol Anvol CF 22 and hence system operating characteristics are comparable with those of mineral oil-based hydraulic fluids. This ensures that existing surface BOP control systems can be readily converted to Castrol Anvol CF 22 with minimal risk an few, if any, systems changes. Hydraulic systems will operate without noticeable changes in response times or operating characteristics.

Castrol Anvol CF 22 provides a high level of corrosion protection when used in surface BOP control systems, minimising the risk of corrosion which can be present when dilutable BOP control fluids are used, cause by variations in water quality and variations in fluid concentration during mixing.

Additional Information

Compatibility with System Components:

Seals, Packing's etc.
The following elastomeric and plastic materials are fully compatible:
• Nitrile (Buna N)
• Viton
• EPR (Ethylene Propylene)
• Butyl
• Silicone
• PTFE
• Nylon

Polyurethane components are not recommended for use with water-based fluids. Polyurethanes can be subject to hydrolysis. Some grades of Polyurethane have been developed with improved hydrolytic stability, but it is recommended that compatibility tests are carried out before using these.

Asbestos, leather, fabric and cork impregnated materials should be avoided in rotary seals since hese materials tend to swell and distort due absorption of water.

Paints
Vinyl or epoxy resin based paints are compatible. Most other paint types will be softened or lifted.

Metals
The fluid is compatible with all metals commonly used in the construction of motion compensation equipment, and is inhibited against corrosion in both the liquid and vapour phases.

Magnesium and its alloys are not compatible with any water-based fluids and the use of zinc and cadmium plating should be avoided. If Aluminium components are in contact with the fluid, they should be hard anodised, and aluminium rubbing contacts should be avoided.

Bearing Types
It should be noted that heavily loaded rolling bearings cannot be adequately lubricated with water based fluids and to achieve satisfactory lif when switching from non-aqueous types it may be necessary to change to a different type of bearing. Guidelines for system designers are lai down in the BSI (British Standards Institute) Document PD 6487:1979 "Guide for Calculating the Life of Ball Bearings When Used with Fire Resistant Hydraulic Fluids".

Compatibility with Other Compensator Fluids:
Castrol Anvol CF 22 is believed to be fully miscible and compatible with other water-glycol based compensation fluids currently in service. Al other fluid types (phosphate ester, oleate ester, silicone and mineral oil) are incompatible. When changing over from any of these the system must be fully drained, flushed and cleaned before installing the new fluid. Care should also be taken to ensure that all system materials are fully compatible with the new fluid (see preceding sections).

Technical Data

Name	Method	Units	Anvol CF 22
Viscosity, Kinematic @ 0°C @ 40°C @ 100°	ASTM D445	mm^2/s	118.8 22 13.5
Viscosity Index	ASTM D2270		180
Relative Density @ 15°C	ASTM D4052		1.070
Pour Point	ASTM D97	°C	<-30
Flash Point (Open)	ASTM D92	°C	None
pH Value @ 20°C	ASTM D974		9.1
Foaming Tendancy / Stability	ASTM D892	cm^3/cm^3	100/nil
Compression Ignition Ratio	Mil-H 22072 Waukesha VC Engine		>50:1
Bulk Modulus		N/m^3	2.3×10^3
Specific Heat Capacity		kJ/kg°C	3.257
Coefficient of Thermal Expansion		$°C^{-1}$	0.0003
Thermal Conductivity		W/m°C	0.0042

The above figures are typical of those obtained with normal production tolerance and do not constitute a specification.

Care and Handling

Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

Packaging and Storage

All packages should be stored under cover. Where outside storage is unavoidable drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 600C, exposed to hot sun or freezing conditions.

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