

BioStat Range

Environmentally responsible thruster/stern tube lubricant

Description

Castrol BioStat environmentally acceptable lubricants are specifically designed to replace conventional lubricants in the stern tube bearings and thruster gearboxes of ships. Small quantities of lubricant can be discharged into the marine environment in the course of normal operation of vessels, but the cumulative amount for all vessels is very large. Larger quantities of oil may be released under fault conditions.

Castrol BioStat lubricants are formulated from synthetic ester base oils which are selected to give a wide operating temperature range and long service life.

Castrol BioStat lubricants have been tested and registered according to OSPAR (Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic) requirements and therefore meet the definition of an Environmentally Acceptable Lubricant (EAL) under the US Vessel General Permit for Discharges Incidental to the Normal Operation of Vessels (VGP) 2013.

Application

The Castrol BioStat range of lubricants has been developed to replace conventional mineral oil based lubricants in the stern tube bearings and thruster gearboxes of all vessels operating in the marine environment. Castrol BioStat can also replace conventional gear oils in the gearboxes of deck machinery, where there is a risk of spills or leaks during operation or maintenance activities.

Castrol BioStat has been approved by all the major stern tube seal manufacturers for use in their equipment. In many cases, it is necessary to specify a particular type of sealing ring whenever an environmentally acceptable lubricant is used. Conversion to an EAL is therefore most easily carried out during a dry-docking. The inspection interval for the stern tube seal may also be reduced for some lubricant/sealing ring combinations.

Castrol BioStat provides extremely high gear and bearing protection and can replace conventional gear oils in thruster gearboxes. Propeller shaft seals for thrusters are similar to those of stern tubes and the same reservations about sealing ring types apply.

Advantages

Reduced environmental impact when compared to conventional lubricants – demonstrable benefits in the following key environmental performance criteria:

- Superior biodegradation
- Significantly reduced bioaccumulation* and toxicity
- Enhanced renewability

*Using OSPAR criteria for assessing bioaccumulation potential.

High levels of protection given to bearing and gear components, particularly at high loads and low speeds, which can contribute to extended component life and increased reliability:

- Load carrying performance to failure load stage 13 (or better) in the FZG gear test.
- Minimal wear in FZG low speed gear wear test.
- Minimal wear in FAG FE8 bearing test, at both standard (80 kN) and increased (100kN) radial load.

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Typical Characteristics

Name	Method	Units	BioStat 68	BioStat 100	BioStat 150	BioStat 220
Viscosity, Kinematic 40°C	ASTM D445	mm ² /s	68	100	150	220
Viscosity, Kinematic 100°C	ASTM D445	mm ² /s	13.3	16.9	21.7	28.4
Viscosity Index	ASTM D2270		178	178	178	178
Density @ 15°C, Relative	ASTM D4052	g/ml	0.93	0.93	0.93	0.93
Pour Point	ASTM D97		-39	-27	-27	-27
Flash Point Closed	ASTM D93	°C	>220	>220	>220	>220
Steel Corrosion - Seawater Water	ASTM D665	Rating	Pass	Pass	Pass	Pass
Corrosion protection, 0.5% NaCl (SKF Emcor)	ISO 11007	Rating	2-2	2-2	2-2	2-2
Copper Corrosion (100°C / 3 hrs)	ASTM D130	Rating	1A	1A	1A	1A
Demulsification time @ 54C	ASTM D1401	ml/ml/ml	0/23/57(30)			
Demulsification time @ 82C	ASTM D1401	ml/ml/ml		0/23/57(30)	0/23/57(30)	0/23/57(30)
FZG Gear Test	DIN 51354 Pt 2		13	>13	>13	>13
FZG Micro-pitting Test	FVA No 54		> 10	> 10	> 10	> 10

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

User Advice

Castrol BioStat lubricants are fully miscible with conventional mineral oils and compatibility has been confirmed by testing with several standard lubricant grades. However, Castrol strongly recommends that the residual mineral oil in the system is reduced to 5% when changing to BioStat. This is to ensure that the intended environmental performance is achieved, as well as to ensure reliable operation.

There are many different types of lubricant which are marketed as biodegradable or environmentally friendly, which are based upon a variety of different base oil types. As a general rule Castrol does not recommend mixing different types of environmentally acceptable lubricants due to the number of different base oils and additive system combinations which are possible. There are exceptions but compatibility testing is required before confirmation can be given.

Castrol BioStat does not require any additional maintenance in service over and above that which is considered good practice for gearboxes in general service. The lubricant – whatever type is in use – is a key component without which the system will not operate, but it is frequently ignored or abused which can have long term effects upon the reliability of the system. Water removal equipment and additional filtration will prolong the life of system components and of the lubricant and is recommended, particularly when BioStat is used by dynamically positioned vessels. Some Class Societies may insist on the installation of water removal equipment whenever EALs are used.

Care and Handling

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

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 60°C, exposed to hot sun or freezing conditions.

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