

PRODUCT & TECHNICAL DATA

CASTROL BIOBAR SERIES Environmentally friendly hydraulic oil

DESCRIPTION

The Castrol BioBar range of high specification hydraulic oils are intended as drop-in replacements for conventional mineral oils in equipment where there is a risk of accidental spillage or leakage and consequent environmental damage.

Hydraulic systems are found throughout marine installations – on cranes, winches, life boat davits and deck hydraulic remote control systems, often located where leakage or spillage can escape into the marine environment. High flow rates, high operating pressures and extensive use of flexible hoses combine to make these systems vulnerable to a rapid loss of fluid caused by chafe or mechanical damage.

BioBar contains selected additives ensuring good oxidation stability, good anti-corrosion and anti-wear properties and low aquatic toxicity. The combination of base oils used in BioBar endows it with a very high viscosity index and an extremely low pour point as well as giving excellent compatibility with elastomeric seal materials. The careful choice of the saturated synthetic ester enables the product to operate up to +120°C system temperature.

The biodegradability of BioBar was measured in an OECD 306 (seawater) biodegradation test with a result greater than 60%, making it 100% more biodegradable than conventional mineral oils. BioBar is therefore classified as readily biodegradable in the marine environment. The toxicity of BioBar was measured on 6 marine species and was found to be up to 100% less toxic than conventional mineral oils. It also has less potential for bioaccumulation and >30% of BioBar is derived from renewable resources.

BioBar is miscible with conventional mineral oil based hydraulic fluids. When changing from mineral oil based products to BioBar, the system should be drained to ensure that the mineral oil content of the refilled system is less than 5%. This is necessary to ensure that the overall biodegradability is not adversely affected. BioBar fulfils the requirements of the German VDMA paper 24568/ 24569 for HEES fluids.

Recommended for the following Applications

Hydraulic systems and hydrostatic transmissions incorporating gear pumps, vane pumps, radial piston or axial piston pumps and motors where there is a perceived risk of egress into the environment in the event of spillage or leakage.

Key Benefits

Castrol BioBar hydraulic fluids combine excellent protection, extended drain performance and versatility in Offshore operations to provide the following key benefits:-

- High biodegradability, low toxicity and reduced potential for bioaccumulation minimise environmental impact in the event of spillage or leakage
- Good oxidation and hydrolytic stability
- High shear stability
- Compatible with all common seal materials (KBR, Viton, Nitrile) allowing simple replacement of mineral oil in hydraulic systems.

Performance Levels & OEM Approvals

- ISO Grade HEES

FEATURES AND BENEFITS

- Readily biodegradable in marine and freshwater environments.
- Significantly lower aquatic toxicity compared to conventional mineral hydraulic oils - exceeds US EPA environmental requirements.
- The majority of the base oil is derived from renewable resources and does not bioaccumulate.
- Excellent oxidation stability
- Good thermal stability
- Extremely resistant to hydrolysis
- Product is supplied in 208 litre steel drums.
- Physical properties and hence system operating characteristics are comparable with those of mineral oil-based hydraulic fluids
- Synergistic blend of base oils results in similar elastomer (seal) compatibility to standard hydraulic oils
- BioBar is compatible with conventional mineral oil-based products
- Low measured Friction Coefficient
- Good filterability - measured using ISO 13357-2 test procedure
- Exceeds the requirements of the Eaton-Vickers 35VQ25 pump test.
- Long service history in offshore, off-road and forestry applications
- Environmentally responsible. The ready biodegradability of the product ensures the rapid natural degradation of product should it enter the aquatic environment.
- Minimises harm to the environment in the event of an accidental spillage.
- Superior oxidative and thermal stability provides extended product life, therefore minimising product consumption and waste.
- Packaging can be re-used or recycled at the end of life.
- Existing equipment can be readily converted to BioBar with minimal risk and few, if any, system changes. Hydraulic systems will operate without noticeable changes in response times or operating characteristics.
- Resistance to "judder" under high load / slow speed operating conditions on deck equipment.
- No filter blocking.
- Assured hydraulic pump wear protection.
- Assurance of product performance.



Marine

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TECHNICAL DATA

	TEST METHOD	BIOBAR 32	BIOBAR 46	BIOBAR 68	BIOBAR 100
PHYSICAL TESTS					
Kinematic Viscosity, cSt @ 40°C	ASTM D445	32	47.8	68	110
Kinematic Viscosity, cSt @ 100°C	ASTM D445	6.4	8.2	11.0	15.6
Viscosity Index	ASTM D2270	145	146	150	150
Relative Density	ASTM D4052	0.900	0.910	0.950	0.950
Pour Point, °C	ASTM D97	-45	-45	-30	-30
Flash Point, °C	ASTM D92	232	232	230	230
Steel Corrosion Distilled water	ASTM D665	No rusting	No rusting	No rusting	No rusting
Sea Water		No rusting	No rusting	No rusting	No rusting
Copper Corrosion (100°C/3 hrs)	ASTM D130	1A slight tarnish	1A slight tarnish	1A slight tarnish	1A slight tarnish
Air Release Value, mins	ASTM D3427	4	4.5	5	5
Foaming tendency/stability cm ³ /cm ³	ASTM D892	20/0	20/0	50/0	50/0
Demulsification time, mins	ASTM D1401	43/37/0 (15)	43/37/0 (15)	43/37/0(20)	43/37/0(20)
PERFORMANCE TESTS					
Thermal stability after 168 hrs @ 135°C % change in kinematic viscosity Change in Acidity, mgKOH/g Sludge, mg/100ml Copper weight loss, mg	ASTM D2070	Not tested	3.23 1.6 7.9 6.1	Not tested	Not tested
Hydraulic stability % change in kinematic viscosity Copper weight loss mg/cm ² Water layer acidity, mgKOH/g	ASTM D2619	Not tested	2.4 0.1 4.4	Not tested	Not tested
Oxidation stability (RPVOT)	ASTM D2272	300	320	315	315
FZG Gear Test	DIN 51354 Part 2	Not tested	>12	Not tested	Not tested
Filterability, dry	ISO 13357-2		Pass		
Eaton-Vickers 35VQ25A Pump Test Ring weight loss Vane weight loss		Not tested	Pass Pass	Not tested	Not tested