



## BioBar Range

Environmentally responsible hydraulic fluids

### 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 pollution.

Hydraulic systems are found throughout an offshore installation - on cranes, drill floor power units and hydraulic ring mains and are 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 rapid loss of fluid caused by chafe or mechanical damage.

Castrol 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 Castrol 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 product level biodegradability of Castrol BioBar was measured in an extended OECD 306 (seawater) biodegradation test with a result greater than 60%, making it 100% more biodegradable than conventional mineral oils. This ensures its biodegradation should it enter the marine environment. The toxicity of Castrol BioBar was measured on 6 marine species and was found to be 100 times less toxic than conventional mineral oils. It also has > 50% less potential for bioaccumulation and > 30% of Castrol BioBar is derived from renewable sources.

Castrol BioBar is miscible with conventional mineral oil based hydraulic fluids. When changing from mineral oil based products to Castrol 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 maximum environmental benefit can be achieved.

### Application

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 ingress into the environment in the event of spillage or leakage.

### Features and Benefits

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

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

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

## Technical Data

| Name   | Method         | Units              | BioBar 22    | BioBar 32    | BioBar 46    | BioBar 68    | BioBar 100   |
|--|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|
| Viscosity, Kinematic 40°C                          | IP 71          | mm <sup>2</sup> /s | 22           | 32           | 46           | 68           | 104          |
| Viscosity, Kinematic 100°C                         | IP 71          | mm <sup>2</sup> /s | 4.87         | 6.44         | 8.14         | 11.0         | 15.6         |
| Viscosity Index                                    | IP 226         |                    | 139          | 145          | 147          | 150          | 150          |
| Density @ 15°C, Relative                           | IP 365         | g/ml               | 0.90         | 0.90         | 0.92         | 0.95         | 0.95         |
| Pour Point   | IP 15          | °C                 | -45          | -45          | -33          | -30          | -30          |
| Flash Point, COC                                   | ASTM D92       | °C                 | 226          | 232          | 218          | 230          | 230          |
| Steel Corrosion - Distilled Water                  | ASTM D665      |                    | No rusting   | No rusting   | No rusting   | No rusting   | No rusting   |
| Steel Corrosion - Seawater Water                   | ASTM D665      |                    | No rusting   | No rusting   | No rusting   | No rusting   | No rusting   |
| Copper Corrosion (100°C / 3 hrs)                   | ASTM D130      |                    | 1A           | 1A           | 1A           | 1A           | 1A           |
| Air Release Value                                  | ASTM D3427     | mins               | 4            | 4            | 4.5          | 5            | 5            |
| Foaming Tendancy / Stability                       | ASTM D892      | ml/ml              | 20/0         | 20/0         | 20/0         | 50/0         | 50/0         |
| Demulsification Time                               | ASTM D1401     | mins               | 43/37/0 (15) | 43/37/0 (15) | 43/37/0 (15) | 43/37/0 (20) | 43/37/0 (20) |
| Hydrolytic Stability - Copper Weight Loss          | ASTM D2619     | mg/cm <sup>2</sup> | 0            | -            | 0.1          | -            | 0.1          |
| Hydrolytic Stability - Water Layer Acidity         | ASTM D2619     | mgKOH/g            | 1.1          | -            | 1.1          | -            | 1.1          |
| Hydrolytic Stability - Change in Acidity           | ASTM D2619     | mgKOPH/g           | -1.5         | -            | -1.3         | -            | -0.9         |
| Oxidation Stability (RPVOT)                        | ASTM D2272     |                    | 300          | 300          | 300          | 300          | 300          |
| FZG Gear Test                                      | DIN 51354 Pt 2 |                    | -            | > 12         | -            | -            | -            |
| Filterability, Dry                                 | ISO 13357-2    |                    | -            | Pass         | -            | -            | -            |
| Eaton-Vickers 35VQ25A Pump Test - Ring Weight Loss |                |                    | -            | -            | Pass         | -            | -            |
| Eaton-Vickers 35VQ25A Pump Test - Vane Weight Loss |                |                    | -            | -            | Pass         | -            | -            |

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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