Dilmar Oil Company

Green Biodegradable AW 46

Zinc Free Hydraulic Oil

Product Description

Dilmar Green Biodegradable AW Oils are 'top-tier', anti-wear hydraulic oils formulated to be the ultimate 'high reference oil' in the hydraulics industry. Based on advanced 'zinc and chlorine free' technology, Dilmar Green Biodegradable AW Oils are formulated to ensure exceptional performance in hydraulic fluid power transmission systems subjected to severe duty.

- **Applications**

Primary application in industrial, marine and mobile hydraulic and fluid power transmission systems.

- **Performance features**

Outstanding oil life Typically two to four times that of many anti-wear hydraulic oils.
Peace of mind Through longer component life and trouble free operation.
Lower ecological impact Zinc and chlorine free formulations

- **Long life**

The length of hydraulic oil's life depends mainly on its ability to resist oxidation due to heat in the presence of air, water and metal catalysts such as copper. Oxidation results in the formation of sludge and acidic products.
A standard test of oxidation properties is the Turbine Oil Stability Test (TOST), in which the oil is heated at 95°C in the presence of water and oxygen with copper and iron as catalysts. The test results are expressed as time taken (hours) for the acid value to reach 2 mg KOH/g. In this test, these oils have an oxidation life of two to four times that of many other anti-wear hydraulic oils.

- **Vane pump wear performance**

Dilmar Green Biodegradable AW Oils have been subjected to a number of vane pump tests which are some of the most severe for evaluating steel-on-steelanti-wear properties. Excellent performance has been achieved in the standard industry tests using Vickers (V104C and 35VQ25M) and Denison (T6-C) hydraulic vane pumps. In addition, outstanding performance is also observed when applying in-house test conditions. These test the fluids over the complete range of pump operating conditions. The results have proven that these oils are capable of providing the ultimate protection under the extremes of operation found in real service.

- **Thermal stability**

Oil’s thermal stability is the measure of its ability to resist degradation and attack of metals at high temperature. An accelerated test for this is to maintain the oil at a temperature of 135°C for one week in the presence of steel and copper. Tests with Dilmar Green Biodegradable AW Oil show negligible weight changes of the metals, whilst the steel remains bright and there is only slight discoloration of the copper; many anti-wear hydraulic oils cause the copper to become black.

- **Piston pump performance**

Many piston pumps utilize brass components and in particular brass slippers which fit onto the heads of steel pistons and slide on a steel surface. These bronze slippers are usually the items of wear and an oil's performance is normally evaluated by the weight loss of bronze and the loosening of the fit on the pistons, referred to as "slipper fit". Many anti-wear hydraulic oils permit either considerable wear, if the pumps are highly loaded, or in extreme cases result in pump failure by the slippers detaching themselves from the pistons.
Dilmar Green Biodegradable AW Oils give extremely low wear rates of the brass components in the Denison P-46 pump; the most severe standard industry test for this performance aspect.

- **Hydrolytic Stability**

Hydrolytic stability indicates the extent to which an oil tends to develop acidity in the presence of copper and water at high temperatures. The test for hydrolytic stability not only evaluates the acidity developed by the oil, but also any acidity developed in the water present, and is also regarded as giving an indication of an oil's suitability for use with copper alloy parts. It is a stringent test in which many good anti-wear hydraulic oils perform poorly, but in which these oils give outstanding results. In the hydrolytic stability test, oil, water and copper are sealed in a bottle and rotated for 48 hours in an oven at 93°C. At the end of the test, the oil and water layers are separated and the insoluble’s weighed. The change in

weight of the copper is also measured and the oil viscosity and acid numbers of both the oil and the water are determined. Results of the tests with these oils are excellent. They show negligible copper weight loss and very small changes in acid values of oil and water.

- **Water separation**

The small quantities of water that can enter a hydraulic system through condensation (caused by breathing) can form highly viscous water-in-oil emulsions which may damage valves and pumps. As the temperature of many industrial hydraulic systems is too low to evaporate this water, it is essential that the hydraulic oils should have good water separation properties (demulsibility). A standard test for demulsibility is the ASTM D- 1401. In this test, an equal mixture of oil and water is stirred for five minutes and the time required for the separation of the emulsion is recorded. These oils separate completely from water extremely rapidly in this test.

- **Corrosion resistance**

The corrosion resistance of Dilmar Green Biodegradable AW Oils have been tested using in-house as well as in the widely used rust test IP 135 and copper corrosion test IP 154. Excellent performance has been proven involving such metals as silver, copper, phosphor bronze, aluminum bronze, brass, magnesium, aluminum, zinc, cadmium-plated steel and steel. These oils show a marked improvement with regard to phosphor bronze and silver over conventional anti-wear hydraulic oils in general.

- **Air release and anti-foam properties**

These oils are free from excessive foaming tendencies and are capable of releasing air readily in order to avoid cavitation effects and increased compressibility. The performance of these oils in these tests is outstanding - even under the most severe conditions.

- **Oil seal and paint compatibility**

The compatibility of an oil with seals used in hydraulic systems can be evaluated by numerous tests usually relating to the 'swell' characteristics. The properties of the base oil mainly influence oil seal and paint compatibility, whilst additives have little effect. These oils are compatible with all seal materials and paints normally specified for use with mineral oils.

- **Filterability**

Hydraulic oil can cause filter blocking by deposits formed through contamination including water etc. Tests show that these oils have excellent filterability, even when contaminated with water and other system degradation materials.

- **Specification and Approvals**

Dilmar Green Biodegradable AW Oils have been tested and approved to exceed the following industry requirements: Denison HF-0 Rexroth Vickers M-2950-S (Mobile systems)

Typical Physical Characteristics
Dilmar Green Biodegradable 46
Viscosity Grade (ISO 3448) 46
ISO Oil Type HM
Kinematic Viscosity
@ 0°C cSt = 576
20°C cSt = 135
40°C cSt = 46
100°C cSt = 6.8
(IP 71)
Viscosity Index (IP226) = 98
Density @ 15°C (IP 365) kg/l = 0.876
Flash Point (IP 34) (PMCC) °C = 218
Pour Point (IP 15) °C = -30