CALTEX

PRODUCT BULLETIN

Delo® 1000 Marine

Marine & Stationary Diesel Engine Oil

Lower alkaline reserve (12 Base Number) trunk piston engine oil (TPEO) designed for use in high specific output medium-speed trunk piston engines burning distillate fuels with sulfur content up to 1.0% under severe conditions in marine or stationary service. Based on Phenalate™ technology.

APPLICATIONS

- Medium-speed trunk piston engines including latest designs in stationary power generation
- Medium-speed trunk piston engines (marine service)
- Certain crosshead type engines (where recommended by the manufacturer). Particularly suitable as a system oil where a higher than normal alkalinity reserve is required.
- Cylinder lubrication in certain trunk piston engines (with separate lubricators which supplement splash lubrication from the crankcase)

PERFORMANCE STANDARDS

- API CF
- Approved by major manufacturers for use in their medium-speed engines

ENVIRONMENT, HEALTH and SAFETY

Information is available on this product in the Caltex Material Safety Data Sheet (MSDS) and Caltex Customer Safety Guide. Customers are encouraged to review this information, follow precautions and comply with laws and regulations concerning product use and disposal. To obtain a MSDS for this product, visit www.caltexoils.com.

BENEFITS

Reduces maintenance costs
The Phenalate™ detergent/dispersant additive system provides exceptional engine cleanliness by controlling "black sludge", which can adversely affect both operation and maintenance in newer design engines.

Maintains power output
Outstanding thermal and oxidation stability assist the Phenalate™ detergent/dispersant additive system in providing excellent control of high temperature deposits in areas such as the undercrown of the piston and the piston ring belt area, enabling piston rings to function efficiently.

Prolongs oil change-out periods
Base Number (BN) level and superior alkalinity retention characteristics maintain sufficiently high BN under all service conditions to ensure corrosive acids formed by the combustion of fuel sulfur are effectively neutralized, thereby minimizing liner wear.

Efficient purifying system performance
The Phenalate™ detergent/dispersant additive system effectively controls insolubles. Excellent water separation characteristics enable water to be centrifuged out with essentially no loss of additive.

KEY PROPERTIES

SAE Grade	30	40	50
Base No.,			
D2896, mg KOH/g	12	12	12
D4739, mg KOH/g	12	12	12
FZG Fail Load Stage	11	11	11
Sulfated Ash, m %	1.6	1.6	1.6
Viscosity,			
mm^2/s @ 40°C	96.0	137	219
mm^2/s @ 100°C	11.0	14.0	19.0
Viscosity Index	99	98	97
Zinc, m %	0.06	0.06	0.06

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A **ChevronTexaco** Product

This bulletin was prepared in good faith from the best information available at the time of issue. While the values and characteristics are considered representative, some variation, not affecting performance, can be expected. It is the responsibility of the user to ensure that the products are used in the applications for which they are intended.

Produced by ChevronTexaco Global Lubricants Solutions.

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SERVICE CONSIDERATIONS

BASE NUMBER (BN) SELECTION

Manufacturer's lubricant recommendations must be matched to the properties of the fuel and to the severity of the application. Use of an oil with a BN lower than required can result in rapid corrosive wear. Excessively high BN lubricants, relative to fuel sulfur content, can result in ash deposit accumulation on exhaust valves and result in possible valve distress.

PURIFICATION SYSTEMS

Active purification systems continuously remove combustion contaminants from the oil, by use of centrifugal type separators and automatic back flushing type filtration systems. As a consequence, TPEOs are formulated to hold contaminants in suspension while in the engine and reserve tank, but release them in the purification system. At the same time, they must resist the loss of detergent/ dispersant additives with the contaminants whilst undergoing purification. Because of this, they are formulated differently from automotive and railroad diesel engine oils that are designed for systems without active purification. Consequently, one type should never be substituted for the other.

As a result of the need for TPEOs to release their contaminants in purification systems, the additive system must be extremely well balanced. This "detergency balance" can be easily disturbed if large amounts of top-up oil are added to a system oil containing a higher than normal loading of contaminants, such as can occur with faulty purifier operation. For this reason, it is recommended that oil levels be maintained daily and not fall below 95% of nominal capacity.

In addition, top-ups with an oil of different detergent/dispersant characteristics will very likely cause a disturbance in dispersancy balance and will, therefore, require careful management of oil changeover procedures.

Water can be centrifuged out with essentially no loss of additive. However, water washing of the oil is not recommended.

Some medium-speed trunk piston engines burning distillate fuels are not fitted with active purification systems, but rather with oil cleaning centrifugal filters such as those manufactured by Glacier. In applications where such oil cleaning centrifugal filters are fitted, the engine oil must carry contaminants in suspension and is drained and replaced based on factors such as Base Number depletion and the level of insolubles.

TPEOs do not generally offer a level of dispersancy sufficient for such applications. Accordingly, in most cases, an alternative engine oil type should be selected for medium-speed trunk piston engines burning distillate fuels and fitted with "centrifugal filters". As it is not feasible to provide a generalized recommendation, the engine manufacturer’s recommendations should be followed in each case.

IN-SERVICE OIL ANALYSIS

Wherever possible, oil analysis should be carried out on a regular basis to determine when change-out of the oil should occur, in accordance with the manufacturer's guidelines.