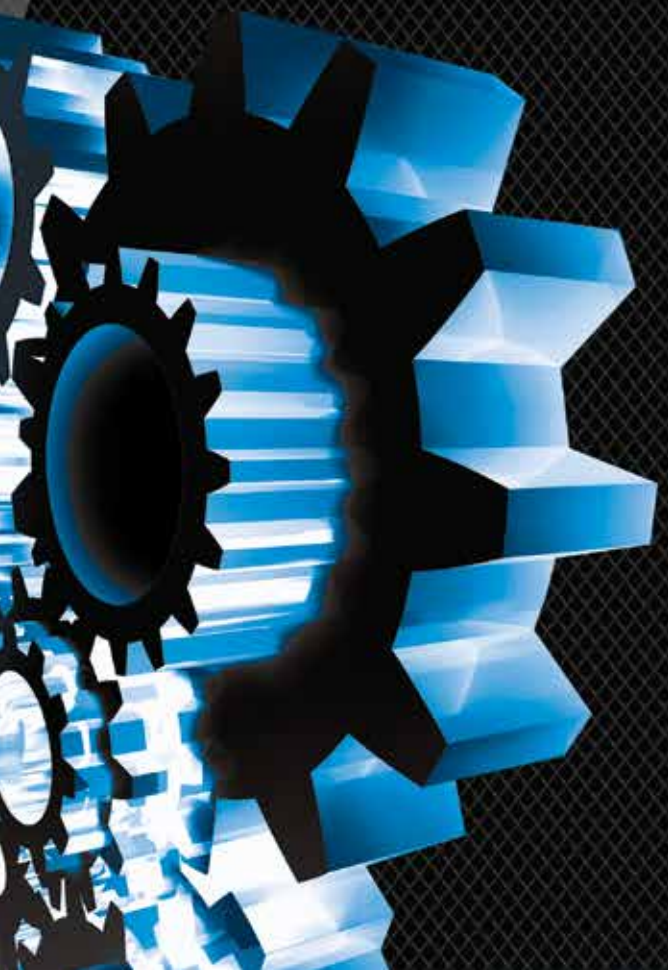
ECO DTM

OIL STABILIZER

ENGINE TREATMENT



FLEX-O™

www.flexoeco.com

ECO DTM

OIL STABILIZER

ECO DTM is classified as s 100% petroleum lubricant because it is purely oil itself and contains no metal, graphite, wax or detergent additives.

ECO DTM increases oil stability and improves the adhesion and cohesion characteristics providing better gas sealing, improved cold starts and improved lubricating qualities of your base oil.

ECO DTM exhibits these properties: adhesion, high viscosity index, visco elasticity, other oil properties, cohesion; and **when added** to your oil **improves** in turn: gas sealing ability, cold starting, oil seailng functions, high temperature oil stability, overall lubricant.

These properties result in:

INCREASED:

- Oil life
- Fuel economy
- Engine or machine life
- Engine power
- Lubricity

DECREASED:

- Maintenance requirements
- Equipment downtime
- Makeup oil usage
- Smoke and emissions
- Vibration and noise

ECO DTM is a petroleum product designed for blending with any petroleum base lubricant or fluid, to improve lubricity during use and after shutdown in the following components:

Gasoline engine crankcases, Torque Converters, Diesel engine crankcases, Power steering units, Natural gas / propane crankcases, Transmission manual / automatic, Transfer cases, Compressors, Hydraulic systems, Differentials, Gear boxes, Angle drivers

INCREASED FUEL ECONOMY

Proper use of ECO DTM decreases friction and engine deposits, with corresponding increases in compression and thermal efficiency. Engine then operates more efficiency and use the energy available from the fuels. These improvements result in fuel savings. (Up to 15%)

INCREASED ENGINE LIFE

ECO DTM provides continuous lubrication to the upper and lower engine. The reduction of friction, especially during the first few moments of engine warm up, when the most engine wear occurs, extends useful life of the engine components. The reduction of friction and blow-by, coupled with increased protection of metal surfaces from engine acids can extend engine life. Capital investments is deferred.

INCREASED ENGINE POWER

The power delivered by an internal combustion engine is directly related to compression and combustion efficiency. ECO DTMs ability to improve and equalize cylinder compression while simplifying a more complete burn, results in added usage power from the engine. (Up to 10%)

INCREASED OIL LIFE

Histories of engine oil analysis before and after the use of ECO DTM on a consistent base generally results in a reduction of wear metal present in the sump oil. Some operators have increased their oil life substantially.

DECREASED MAINTENANCE

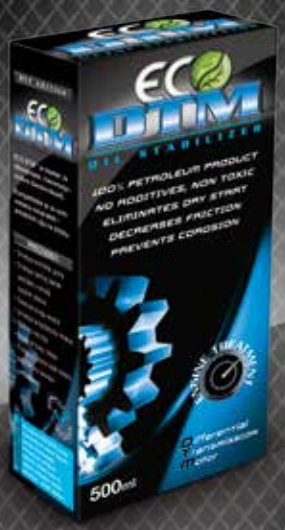
Through its to sustain effective operating levels in many maintenance components for extended periods of time, it allows extensions of many scheduled replacements. More time is then available pre preventive maintenance.

DECREASED DOWNTIME

Downtime, one of the management's constant obstacles to efficient operation, is decreased by using ECO DTM. Premature engine component failures, usually caused by inadequate lubrication and increased stresses, are lessened by the incorporation of ECO DTM Oil Stabilizer.

DECREASED HARMFUL EMISSIONS

Deposits in from the upper and lower engine areas, reducing efficiency and causing an incomplete burn. Harmful exhaust emissions are products of incomplete combustion. ECO DTM reduces deposits and increases thermal efficiency, easing a cleaner burn with fewer harmful emissions. (Up to 25%)



DECREASED OIL USAGE

Better sealing properties inherent in base oil with ECO DTM added means less oil lost or burned. Oil seals are found to function better with ECO DTM added to the system; and, especially so in dynamic hydraulic systems.

DECREASED VIBRATION AND NOISE

Many operators notice this immediate result when ECO DTM is incorporated in the oil system. Vibration and noise are reduced because ECO DTM IMPROVES the lubricating qualities of the system oil.

A FEW REASONS WHY YOU SHOULD USE ECO DTM

1. Many people use ECO DTM to curb oil consumption. This works two ways; (a) ECO DTM seals the cylinder to stop oil from entering into the combustion chamber to be burned and (b) it keeps the heat and contaminants of the combustion chamber from going into the oil, thus keeping the oil clean, and as everyone knows a clean engine is a long lasting engine.

2. Many people will say that their engine doesn't burn any oil and that don't need ECO DTM. ECO DTM serves two purposes for them also. (a) ECO DTM eliminates dry starts, this is the number one because of cylinder wear in an otherwise well-maintained engine. Because of ECO DTMs clinging action it will not run off of cylinders and gears after the engine has been shut down. (b) most important of all, ECO DTM is insurance against an engine being ruined by overheating. Oil treated with ECO DTM maintains its viscosity, and thermal breakdown to protect the engine in high- heat working conditions.

3. The winter season is a particularly important reason to use ECO DTM because of the devastating effect of piston wash that occurs during long periods of idling during cold weather the fuel temperature drops considerably and often fails to have the spray pattern necessary to complete combustion. This causes the piston to fill with raw fuel. On the compression stroke some of the fuel is used past the rings into the oil, especially when the engine has some wear. ECO DTM does not wash off or break down with contact of gasoline or diesel fuel as does plain oil.

4. ECO DTM does not make an engine harder to run over in the winter, this is a misconception because of ECO DTMES thickness. It has been proven that ECO DTM reduces friction of all components thus making it easier to turn the engine over. The engine turns over easier at any temperature being all parts are well lubricated at all times.

5. ECO DTM reduces blow-by and helps keep exhaust clean especially in older worn diesel gasoline or propane engines.

6. 25% of ECO DTM to each gear box will not only quiet a noisy standard transmission but ECO DTM will guarantee lubrication to the front gears during long upgrades.

7. Temperatures in transmission and differentials drop because ECO DTM reduces friction. Power dividers are especially needful of ECO DTMs climbing and clinging action.

8. The combination of ECO DTMs climbing and clinging actions are insurance against total loss of lubrication in a case of blown gasket, seal or loss of bolt in on oil pans.
9. ECO DTM will improve gas mileage because of improved combustion and reduced friction in the combustion chamber.

PRACTICAL DEFINITIONS

ADHESION

When the oil added with ECO DTM, it will stick to metal parts of machinery continually. This characteristic helps the oil, instead of falling down by gravity, sticks to chains, boring machines or conveyors, etc. It means when you start the machine you'll get the lubrication right away.
Remark: An oil with low viscosity will has a small adhesion due to the thin film, not strong enough to resist the loading then you will have the metal - to - metal contact.

COHESION

ECO DTM helps oil to cling metal surfaces, it means the contact between metal and oil at the molecular level can be explained by cohesions between oil molecules and metal surfaces.

VISCOSITY INDEX

The Viscosity Index is an empirical number indicating the rate of change in viscosity of an oil within a given temperature range. A low viscosity index signifies a relatively large change in viscosity with temperature, while a high viscosity index shows a relatively small change in viscosity with temperature. In other words, the higher the Viscosity Index, the more stable the viscosity will be through the temperature changes, so less oil tend to thin out when heated.
ECO DTM has a high Viscosity Index!

OIL SEALING FUNCTION

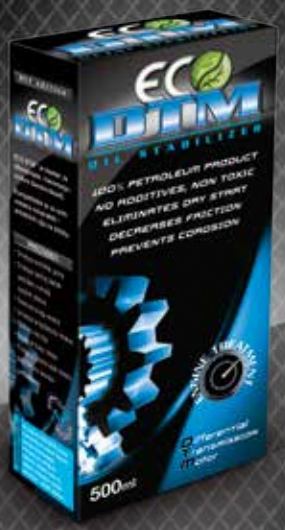
ECO DTM puts oil back into seals, that have shrunk and pulled away from the sealing surface, in returning the seal back to normal size it again stops oil from leaking from the seal.Remark: If your rings are finished, don't expect ECO DTM to put them back to normal. You should change them before starting using ECO DTM in order to get a better result.

VISCOELASTICITY

In order to visualize well this property, we can compare to a system composed with a spring and shock absorber, mounted in parallel and connected to another spring in a row. If the material is unloaded, the viscous – elastic system reacts first instantly by an elastic (immediate) contraction caused by spring followed by the time - dependent (viscous) one and then the total deformation decreased with time, it means that the ECO DTM comes back to its normal state after a certain time of relaxation. Because of this special characteristic, when you add the ECO DTM to the oil, the vibration will be reduced and there is less chattering in the machinery then your motor will be more quiet.

GAS SEALING FUNCTION

ECO DTM helps reduce combustion gas from being blown past the top piston ring during the combustion cycle.
Here is the case that usually happens during the compression process: Hydrocarbon gases when compressed tend to dissolve in the lubricant, reducing viscosity. Certain of them condense on the cylinder walls, condensation being greatest when cylinder walls are cooled by low - temperature water. Condensed hydrocarbon gases may wash the lubricant from the cylinder wall, giving rise cylinder wall and piston – ring wear.
ECO DTM could be added to oil to minimize this bad effect !



DIESEL FUEL (SUMMARY)

Low sulphur diesel fuel was introduced to the Canadian market in October 1994.

THE CONTEXT

Hyposulphurous fuel is a diesel fuel which contains less than 0. 05% sulphur (in weight). Presently, in Canada, fuel must not contain more than 0.5% sulphur (in general), Canadian petroleum companies suggest a fuel with an average of about 0.25% sulphur (S).[1]

There are, then, two qualities of diesel fuel:**
1) High- level sulphur: < 0.25% (in weight) S content
2) Low - level sulphur: <0.05% (in weight) S content

High – level fuel will, however, always be available for heating and for construction equipment

A Memorandum of Understanding (MOU) was signed by all distributors including: Imperial Oil, Petro Canada, Shell Canada, Ultramar, Sunoco, Musky, Federated Co – op, Chevron, Mowak, Canadian Tire, Gaslands, Olco, Co- op Atlantic and Parkland. Irving Oil and Hughes Petroleum have indicated their intention to conform to the MOU recommendations.

In Canada, British Columbia is concerned with the quality of the air, particulary in Lower Mainland. A regulation has been introduced allowing the province to check motor vehicle emissions and the quality of the fuel for these vehicles. British Columbia intends to apply the MOU recommendations to companies which have fleets of transport trucks equipped with diesel fuel devices.[2]

At present, the rate of sulphur in conventional diesel can vary from 0.15% up to 0.4%. As for low sulphur diesel fuel, the rate of S can vary from 0.03% to 0.05%. Heating can contain levels up to 0.04% (the allowable limit according to Montreal Urban Community norms).[3]

We add anti – wear agents to the fuel to combat against moderate forms of lubricant limits. These additives are often composed of a sulphur of phosphorus base – or both. We believe that the phosphorus or sulphur contained in the additives combines with the metal in the surface of the bearings to form a thin film which acts – as an anti – soldering agent, and which prevents the minuscule metal protrusions from becoming welded together.

With high temperatures caused by pressure and elevated friction speeds, thin surface tends to soften and to produce an elastic flow. As a result the protrusions are smoothed out and the friction is reduced.

Also, the sulphur itself is a natural anti – oxidation agent. The quantity of sulphur to be removed depends on the percentage of sulphur in the crude oil. This can vary from one refinery to another.

[1] source: L'Echo du Transport magazine

[2] source: MOU Memorandum of Understanding at Environment of Canada

[3] source: Ultramar Canada Inc. – Quality Control

[4] source: Information Service – Deere Power System Group

There probably exist two major types of oxidation reactions.
Without going into detail, the benefits of adding sulphur to these reactions are:
a) To obtain more stable products
b) To slow down the rate of oxidation

It should be noted that “premature“ breaking of the injection system caused by poor quality diesel fuel is not covered by guarantee according to the injection pump manufacturers and the John Deere company.[4]

If the motor of your vehicle is a 1995 model (United States 1994), it was designed to use a diesel fuel that is low in sulphur. To feed it with an ordinary diesel fuel, then, could affect your guarantee. As we have noted in the preceding response, the consequences of improper feeding vary to according to the vehicle’s exhaust system. It would be to your advantage is consult the manufacturer of your vehicle or motor to determine its policy regarding the guarantee.[2]

In the light of foregoing, the shrinkage or reduction in the percentage of sulphur in diesel fuel will affect the properties of the lubricant. A hydro treating process is usually employed to remove or reduce the quantity of sulphur in the fuel. It involves the extraction of aromatic and impurities through a chemical reaction between the feedstock and hydrogen; this occurs in the presence of a catalyst which acts to slow down or decelerate the reaction at high temperature under high pressure. Through this process, acids are formed which can increase the rate of oxidation in the lubricants. These oxidation effects in the lubricants are undesirable. It is important to keep the oxidation rate of a lubricating oil as low as possible in order to ensure both constant output and maximal length service. It must be noted that all additives which retard oxidation will alos retard the corrosion of the bearings.

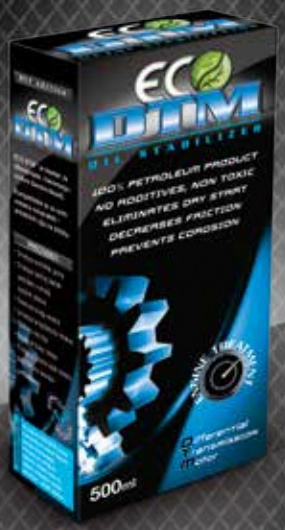
At the temperatures below 70°C, oxidation is usually fairly low in normal atmospheres, but studies indicate that above this temperature rate of oxidation doubles each time rises by 9 to 10 °C.

For an oxidation – resistant oil, the base oils must be refined with meticulous care and the type and concentration of lubricating agent selected must be the most appropriate one for his particular oil.

ALTERNATIVE SOLUTION

The addition of ECO DTM to low- sulphur diesel fuel will compensate for the beneficial properties that were lost when the sulphur was extracted from the fuel.

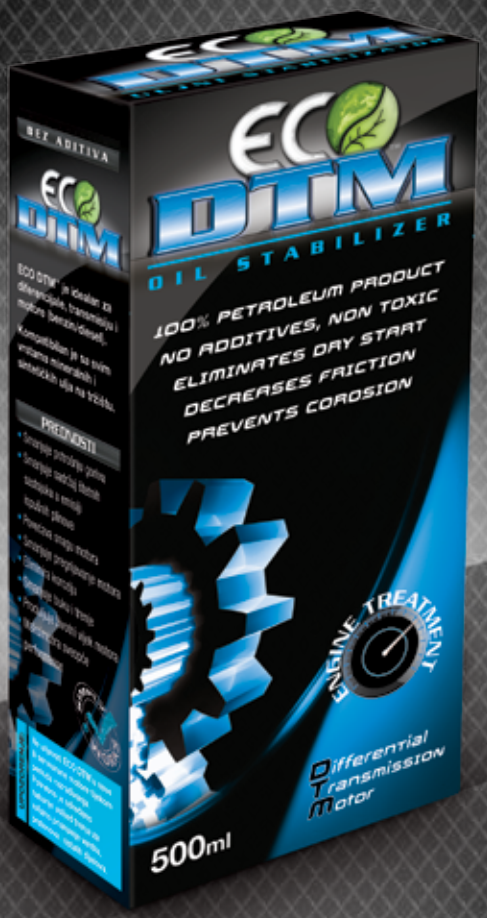
When the ECO DTM Oil Stabilizer is mixed with diesel fuel it helps to dissolve the resins and adhesive which keeps the deposits in place. These deposits form on the rings and valves, reducing the capacity to use the fuel in an efficient manner. This leads to sticking rings and increases wear on the motor.
Utilisation: 500 ml in 380 litres of diesel fuel



eco dtm is universal lubricant and can be used in the following applications by percentage of oil capacity:

25%	10%
Gasoline engine crankcases	Torque converter
Diesel engine crankcases	Hydrostatic drives
Propane engine	Vacuum pump
Transmission standard	Motorcycle transmission
Differentials	Two Cycle Oil*
Motorcycle 4 stroke	Automatic
Lawn mower engine 4 stoke	Hydraulics*
Power generator engine	Mixed with grease
Oil bath axels	Marine premix
Angle drives	Air Compressor
Gear boxes	Synthetic oil
	All other applications

* According to application



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