



Available from  
**EnviroProducts (Vic) Pty Ltd**  
ELTHAM, VIC  
**Tel: 9431 2998 Fax: 9431 1973**  
**[enviroproducts@optusnet.com.au](mailto:enviroproducts@optusnet.com.au)**

*See the website...*

**[www.4planetearth.com/enviroprods](http://www.4planetearth.com/enviroprods)**

*for more technical info?*

**[www.ethosfr.com](http://www.ethosfr.com)**

## **PRODUCTS - 4-E Corporation Exclusive!**

### **4-E Corporation, Ethos Fuel Re-formulator 3-in-1 Product**

1. Save up to 20% on fuel
2. Reduce engine wear
3. Reduce emissions by up to 30%

With Ethos Fuel Re-formulator you will Save fuel! Save Oil! Save on Wear and Tear to your engine! Make it run smoother, cleaner and with more power with our custom ester blend that is completely non-toxic.

Hundreds of millions of miles of road tests has proven that commercial fleets on average increase fuel mileage and reduce emissions. 4-E's, Ethos FR offers a cost effective solution to help industry meet environmental regulations and relieve skyrocketing fuel prices.

Commercial fleets in the United States, Canada, Mexico, Latin America, Asia and Europe use this re-formulator. It significantly reduces emissions, fuel consumption, and engine maintenance costs. EPA laboratory tests confirm that Fuel Re-formulator is clean upon ignition and ashless upon combustion. 4-E's, Ethos FR now offers this exclusive product for general consumer use.



### **Why Lubricate Fuel?**

The closer the piston is to Top Dead Centre (on the combustion stroke) the higher the pressure & temperature, and the greater the resulting detrimental forces on upper cylinder components. Eventually the Compression Ring wears an indentation into the cylinder wall, at TDC. This spot receives the least lubrication. This is the "Lubrication Gap" in all internal combustion engines.

Ethos FR contains Synthetic Esters adapted from Supercritical Jet Engine Lubricants. It "Bridges the Lubrication Gap". Some of these Synthetic Esters survive combustion and attach themselves to all metal surfaces within the area of the Upper Cylinders. Long term effects of Ethos FR start appearing after several weeks of continuous use, and the engine begins to run noticeably smoother. These Synthetic Esters continue to deposit themselves on the metal surfaces, in the boundary layer on the upper cylinders. Engine performance & engine efficiency continues to improve measurably, over a period of months. As long as the use of Ethos FR continues as specified on the bottle label, Superior Engine Performance will result. If you have a new engine it will run better than new. If you have an old engine, it's performance will return closer to the manufacturer's specifications. The Synthetic Esters in Ethos FR are extremely stable. They do not deteriorate into potentially harmful materials, so there is no way that they can void the warranty on a brand new engine. That is why they have been used Continuously, in Supercritical Jet Engine Lubrication for more than 50 YEARS. This is reflected in the fact, that when maintenance is performed on a jet aircraft engine, they never drain the lubricant. Never! They just "top it off" or add lubricant until it's up to the maximum recommended level.

Ethos FR is unique and contains 288 distinct cleaning and lubricating esters. These esters are polarized and, they contain oxygen. Some of these esters attach themselves to fuel molecules and enhance combustion. Still other esters continuously clean carbon and dissolve varnish. A cleaner engine increases performance. Higher performance means less fuel is used, resulting in lower exhaust emissions.

### **What Does This Mean For The Environment?**

Hundreds of millions of miles of road tests has proven that commercial fleets on average increase fuel mileage and reduce. Commercial fleets in the United States, Canada, Mexico, Latin America, Asia and Europe use the 4-E's, Ethos Fuel Reformulator.

Ethos FR is non-toxic, non-hazardous and works with any fuel used in trucks, buses, recreational vehicles, ships. Railroads, automobiles, generators and more. This product reduces fuel costs by producing a net gain in mileage above it's cost. Ethos FR comes from two distinct families of esters, those being a group of cleaning esters and a group of lubricating esters in a mineral oil base. It cleans and lubricates the internal parts of the engine without the use of petroleum-derived solvents commonly found in fuel additives. The main objective is to make fuels self-cleaning and self-lubricating without increasing toxic emissions. Moving parts function more smoothly with reduced heat and friction, requiring less maintenance. Horsepower returns closer to the manufacturer specifications. Ethos FR removes carbon deposits, one of the culprits that cause fuel to combust incompletely, resulting in wasted fuel that creates toxic emissions. The combination of cleaning and lubricating esters in Ethos FR stabilize the fuel without changing it's specifications.

Cont ...

The overall result is that Ethos FR makes engines combust fuel more completely. When an engine uses each measure of fuel to the maximum degree possible, it has two very important benefits. It reduces fuel consumption and reduces non-combusted residues that an engine expels in the form of exhaust emissions, such as hydrocarbons, nitrogen oxides, carbon monoxide, particulate matter and other harmful products of combustion. Unused fuel is saved in the fuel tank, waiting to be used efficiently by the engine, instead of exhausted in the form of toxic emissions. Ethos FR reduces emissions without adding any of its own components to the exhaust and is ashless upon combustion and it is not derived from petroleum.

While the debate on emissions reduction solutions for the future continues, 4-E is making a difference in cleaning the air today. Improved and accessible technology to measure diesel engine emissions is still in development. The change from diesel to alternative fuels has become more controversial as research shows that natural gas may be more hazardous since it caused particulate matter to reduce to a micro size, making it easier to assimilate by humans. And, acquisition and operating costs associated with alternative fuels has slowed down widespread implementation. Ethos FR's unique blend of esters reduces emissions and its implementation is economical, therefore its continuing use is sustainable as well as safe. Its remarkable results makes it a preferred choice to reduce emissions in standard diesel and in any alternative fuel program.

## What Are Esters?

In the simplest terms, esters can be defined as the reaction products of acids and alcohols. Thousands of different kinds of esters are commercially produced for a broad range of applications. Within the realm of synthetic lubrication, a relatively small but still substantial family of esters have been found to be very useful in severe environment applications.

Esters have been used successfully in lubrication for more than 50 years and are the preferred stock in many severe applications where their benefits solve problems or bring value. For example, esters have been used exclusively in jet engine lubricants worldwide for over 40 years due to their unique combination of low temperature flow-ability with clean high temperature operation.

Esters are also the preferred stock in the new synthetic refrigeration lubricants used with CFC replacement refrigerants. Here the combination of branching and polarity make the esters miscible with the HFC refrigerants and improves both low and high temperature performance characteristics. In automotive applications, the first qualified synthetic crankcase motor oils were based entirely on esters and these products were quite successful when properly formulated. Esters have given way to \*PAO's (Polyalphaolefins) in this application due to PAO's lower cost and their formulating similarities to mineral oil. Nevertheless, esters are nearly always used in combination with PAO's in full synthetic motor oils in order to balance the effect on seals, solubilize additives, reduce volatility, and improve energy efficiency through higher lubricity. The percentage of ester used in motor oils can vary anywhere from 5 to 25% depending upon the desired properties and the type of ester employed.

Ester lubricants have already captured certain niches in the industrial market such as reciprocating air compressors and high temperature industrial oven chain lubricants. When one focuses on high temperature extremes and their telltale signs such as smoking, wear, and deposits, the potential applications for the problem solving ester lubricants are virtually endless.

In many ways esters are very similar to the more commonly known and used synthetic hydrocarbons or PAO's. Like PAO's, esters are synthesized from relatively pure and simple starting materials to produce predetermined molecular structures designed specifically for high performance lubrication. Both types of synthetic base-stocks are primarily branched hydrocarbons, which are thermally and oxidatively stable, have high viscosity indices, and lack the undesirable and unstable impurities found in conventional petroleum based oils. The primary structural difference between esters and PAO's is the presence of multiple ester linkages \*(COOR) in esters which impart polarity to the molecules. This polarity affects the way esters behave as lubricants in the following ways:

- **Volatility:**

The polarity of the ester molecules causes them to be attracted to one another and this intermolecular attraction requires more energy (heat) for the esters to transfer from a liquid to a gaseous state. Therefore, at a given molecular weight or viscosity, the esters will exhibit a lower vapour pressure which translates into a higher flash point and a lower rate of evaporation for the lubricant. Generally speaking, the more ester linkages in a specific ester, the higher its flash point and the lower its volatility.

- **Lubricity:**

Polarity also causes the ester molecules to be attracted to positively charged metal surfaces. As a result, the molecules tend to line up on the metal surface creating a film, which requires additional energy (load) to penetrate. The result is a stronger film, which translates into higher lubricity and lower energy consumption in lubricant applications.

- **Detergency/Dispersency:**

The polar nature of esters also makes them good solvents and dispersants. This allows the esters to solubilize or disperse oil degradation by-products, which might otherwise be deposited as varnish or sludge, and translates into cleaner operation and improved additive solubility in the final lubricant.

### **Biodegradability:**

While stable against oxidative and thermal breakdown, the ester linkage provides a vulnerable site for microbes to begin their work of biodegrading the ester molecule. This translates into very high biodegradability rates for ester lubricants and allows more environmentally friendly products to be formulated.