

The future for fuel



When we formed OXYOL in 2005, it was in a rapidly changing political and economic climate. The world was 'going green' and governments were looking more seriously than ever at legislation to enforce reductions in fossil fuel emissions, while stimulating migration to renewable energy sources.

From our collective experience in the area and our extensive research into the evolving science of fuel catalysts, we knew that any solution would have to do much more than comply with current emissions legislation. For any product to have long-term commercial viability, it would also have to offer substantial cost benefits to the user.

Our research took us to the US, where we found the very best products which we now bring to Europe and other markets. Our O-ACES range now offers outstanding performance and cost savings in many industrial and commercial arenas.

At OXYOL, we would welcome the chance to show you how our products could benefit you, because we are passionate about making cleaner energy pay.



Charles Sanders, CEO

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fuel savings
of up to **20%**

a brighter future

There are uncertain times ahead for fuel users. Costs are rising, governments are imposing ever more stringent emission regulations, and many of the proposed mechanical solutions for the reduction of emissions actually increase fuel consumption and running costs.

Against this backdrop, commercial consumers of fossil fuels will inevitably struggle to keep costs down, but there is one beacon of light amid all the doom and gloom.

The brighter future comes in the form of a product which has already proved itself time and time again in the very toughest conditions. The O-ACES range of fuel catalysts was declassified by the US Military in 2001 and is now producing measurable benefits in other industrial sectors.

In application after application, the O-ACES range reduces fuel and oil consumption, lowers maintenance costs, extends engine life and assists achieving emissions targets. **Significantly.**

Cost savings

Fuel savings of up to 20%

Engine wear reduction can exceed 50%

Engine life extension can exceed 50%

Reduces oil burn by up to 80%

Extends plant maintenance intervals up to 30%

Environmental

Reduces CO₂ by up to 20%

Reduces soot by up to 20%

Increased performance

Increases lubrication, reduces friction

Increases power by up to 10%

Increases starting ability in all conditions

The complete fuel management solution

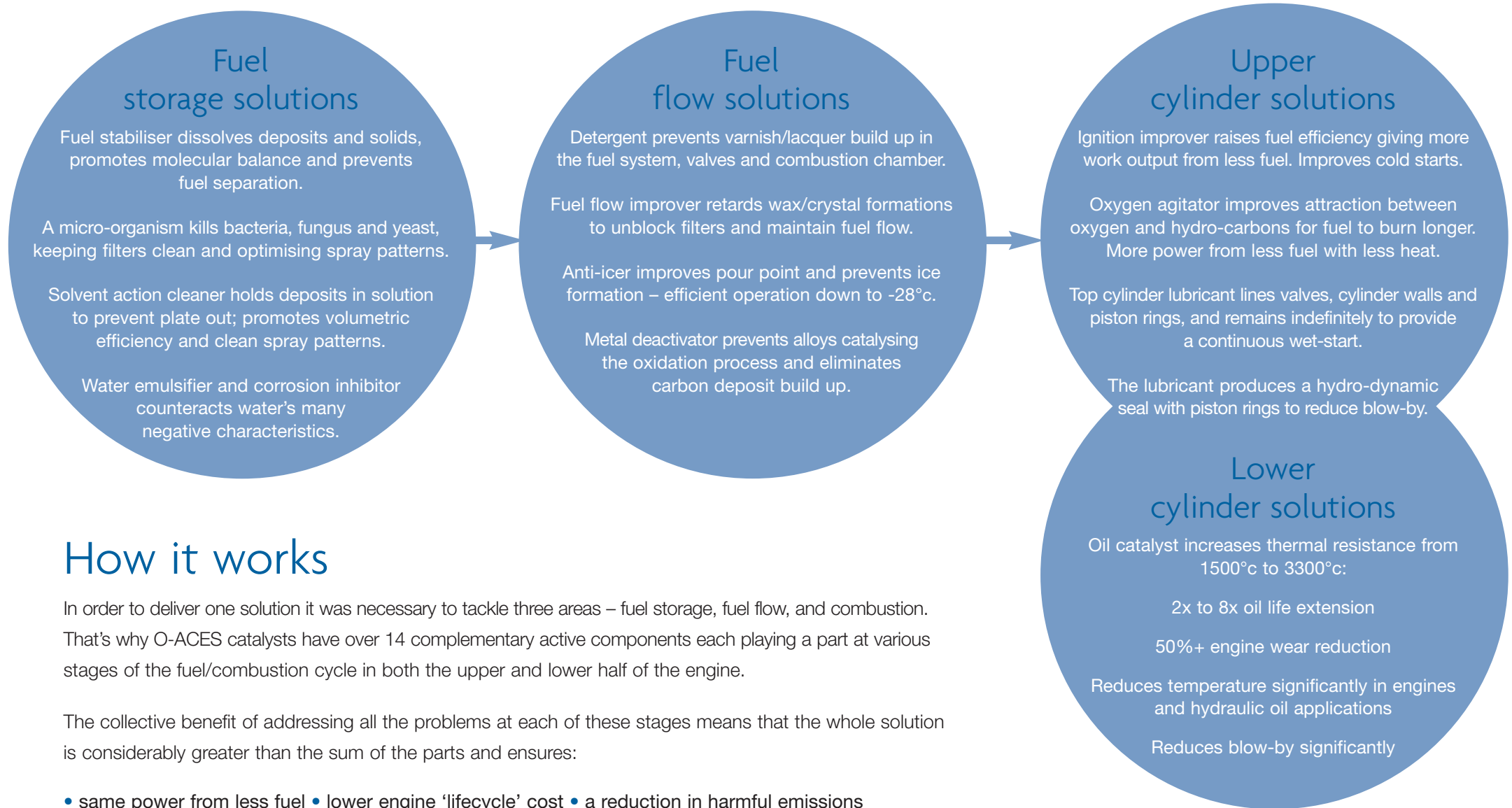
The O-ACES range of fuel catalysts was born from the fuel and engine efficiency problems identified by a very demanding customer – the US Military.

As vast consumers of fossil fuels in tough environments, they needed to address a number of specific issues including improvements in fuel consumption and engine life as well as reductions in emissions. The collective scale of these challenges meant the research team had to find a way to cure all the problems at source with one efficient fuel management solution.

O-ACES is simplicity itself to use.

- It is a liquid solution
- It self-mixes immediately
- It requires no engine modifications





How it works

In order to deliver one solution it was necessary to tackle three areas – fuel storage, fuel flow, and combustion. That's why O-ACES catalysts have over 14 complementary active components each playing a part at various stages of the fuel/combustion cycle in both the upper and lower half of the engine.

The collective benefit of addressing all the problems at each of these stages means that the whole solution is considerably greater than the sum of the parts and ensures:

- same power from less fuel
- lower engine 'lifecycle' cost
- a reduction in harmful emissions

The bottom line? O-ACES catalysts deliver benefits in fuel usage, in engine uptime/life extension, in the environment and in the P&L account.

Proven results

The O-ACES approach truly excels – a fact borne out in the US by customers ranging from the Military to the Marine, Construction, Mining, Power Generation, Trucking, Waste Management, Rail and Public Transportation industries.

In the four years since declassification, sales have continued to grow exponentially in the US, with more than 50 billion litres of fuel treated to date. Customer experience has shown that the O-ACES range of self-mixing liquid solutions require no engine modifications and are consistently achieving:

- 10% to 20% fuel savings (dependent upon application)
- CO₂ emissions reduced in direct proportion to fuel saved
- 50%+ extension to engine life
- Incremental productivity from maintenance interval extension



fuel savings
of up to **20%**

Tried. Tested. Trusted.

The O-ACES products were developed on behalf of the US Military to enable engines to operate more efficiently in increasingly demanding environments. There is no better corroboration of the success of that programme than the US Military's own testing procedure.

In 1995, the products were extensively tested by Southwest Research Institute, San Antonio, Texas – arguably the largest and most reputable fuel testing laboratory in the world, and where the US Military tests and approves products for military use.

Not only did O-ACES products surpass all of the objectives set by the test centre, but they also achieved the highest performance rating seen under the Caterpillar 1-K Test – a 252 hour continuous full-throttle run. It has been used by the US Military ever since, treating more than 10 billion litres of their fuel in the process.

Independent validation

Penn State University

Between July 2004 and February 2005, the US Department of Energy commissioned Penn State University to carry out laboratory trials on a brand new (2004) engine. The report confirmed that O-ACES 2 reduced NO_x by 11% and particulate emissions by 47%; and that O-ACES 3 reduced engine wear by 25% in their four-ball wear test.

Tianjin University

2006 saw the launch of O-ACES in China and, as part of the fight against city pollution, trials were undertaken by Tianjin University using vehicles from the Tianjin Bus Company. Field test results corroborated a fuel saving range of 11% to 23% and a NO_x reduction of 28%.

Whether customers test the products at top research establishments or 'out in the field' the weight of evidence proves that O-ACES catalysts deliver exactly what they promise.

Engine wear reduction
can exceed **50%**

Goddard Space Flight Center

In 1998, the Goddard Space Flight Centre, Maryland undertook an engine wear and life test on O-ACES 3 (oil catalyst), in which their report concluded '...oil changes will be extended to 2,000 hours [from 250 hours] without a significant increase in wear rates. This represents a breakthrough in wear reduction on average of 62.5%.'



O-ACES. A range for a brighter future

You'll find in the following section a detailed rundown of the extensive range of O-ACES products for both fossil and renewable fuels. Before taking a look it is worth noting that the continued growth of the global economy means that the demands for fossil fuels – and consequently their prices – are likely to rise.



For any major fossil fuel user, a renewable energy supply becomes a very appealing prospect, and bio-diesel and ethanol will become more and more important in the fuel mix.

At OXYOL, our ethanol and bio-diesel catalysts and continuing dedication to research and development are starting to solve the problems encountered with renewable fuels. We are helping the new fuels go further with fewer engine modifications, so customers will find the choice for renewable energy easier to make.

In summary, fossil fuels will continue to be required for the foreseeable future so the search must continue for efficiencies and emission reductions. At the same time, fossil fuel users will want to migrate to renewable energy where possible, and we can play a leading role in helping them achieve this.

Significant NO_x
and PM reduction



Our fossil fuel catalysts:

O-ACES 2

For use with all grades of diesel and kerosene from grades 1 to 6. It is self-mixing, either at the point the vehicle is refuelled or at source in the fuel storage tank/bunker. It is self-mixing at a ratio of 1:2000.

O-ACES 4

A petrol catalyst with a similar application and equivalent benefits as O-ACES 2. It is self-mixing at a ratio of 1:800.

O-ACES 3

Synthetic and mineral oil catalyst. Suitable for all metal-to-metal applications including engine, hydraulic and gear oils to reduce wear, friction and extend the oil life by more than double. It is self-mixing at a ratio of 1:20.

Reduces soot
by up to **20%**

Renewable fuel catalysts:

O-ACES 4(E)

For use with ethanol blended fuels. It successfully addresses the significantly lower performance of ethanol to bring it in-line with fossil fuels from a consumption and engine wear/management perspective. Equally importantly, with O-ACES 4(E) no engine alterations are necessary for even a 50:50 ethanol and petrol blend.

Bio-diesel catalyst

OXYOL is actively involved in solutions for bio-fuels including a 10:90 ethanol and bio-diesel solution (i.e. 100% renewable energy), overcoming the biggest bio-diesel challenge of variable composition and the resulting gelling problems.

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The image shows an oil field at sunset. The sky is a deep orange, and the sun is a bright white circle in the upper left. Silhouetted against the sky are several pumpjacks and a large industrial structure. A large white circle highlights the sun. A semi-transparent blue circle is on the left side of the image. The text "Corporate advance. Environmental advantage." is centered in white.

Corporate advance. Environmental advantage.

Rapid commercial payback

The operational benefits

- Immediate payback on fuel savings alone
- Over time, the benefits of extended engine life and reduced maintenance begin to build

The strategic benefits

- Hit and exceed emissions targets faster
- Environmental achievement helps win business and retain customers
- Boost your brand image by dealing with fossil fuel issues and adopting a renewable energy migration strategy

Reduces CO₂
by up to 20%



fuel savings
of up to 20%

For the environment

- Less fuel is used to deliver more power
- Evidence has shown that O-ACES catalysts can reduce Particulate Matter by 47% and NO_x by between 11% and 62%, whilst CO₂ falls in direct proportion to fuel saved
- Oil life extension, reduced maintenance costs and extended engine life; all contribute to a reduction in an engine's 'whole life' environmental cost

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Working together

OXYOL is committed to working in partnership with our clients. Making cleaner energy pay for our customers means working with them to achieve emissions targets and cost savings (whilst offering a commercially viable transition to renewable energy alternatives).

In practice, this means the inclusion of core elements including:

- A full understanding of the customer's commercial model
- The joint establishment of a field trial, against which a Proof of Benefits programme is run
- Close support for company-wide adoption supported with continuous monitoring to ensure capture of all the (deferred) benefits e.g. reduced maintenance costs and extended engine life
- Working with customers to maximise the environmental message

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Engine life extension
exceeding 50%

Increases lubrication.
Reduces friction.



The future starts here

Reduced fuel and maintenance costs... longer engine life... reductions in emissions... a successful migration to renewable fuel sources. These goals are all available to you now.

OXYOL's fuel management solutions can change the way your business meets the demands for fuel efficiency now and into the future.

We would welcome the opportunity to work in partnership with you to achieve your goals.

For more information please visit oxyol.com
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