



Manufactured by BP Australia

Fact Sheet

Opal fuel - quality and performance tested

Petrol sniffing is a highly dangerous form of substance abuse and destroys lives. Opal fuel which is a direct substitute for regular unleaded 91, has been specially designed to help discourage petrol sniffing.

Manufactured by BP Australia, Opal fuel was introduced to the Australian market in 2005. Designed with lower levels of aromatics; the properties associated with giving petrol sniffers a 'high,' Opal fuel meets all the specifications of the National Fuels Quality Standard Act 2000.

A combination of laboratory and field tests undertaken since 2005 indicate that Opal fuel is safe for use in cars and boats in which the manufacturer recommends regular unleaded 91. Details of the testing and results observed are outlined in this fact sheet.

Laboratory testing on vehicles - 2004

As with all BP fuel products, thorough testing and control processes were undertaken to ensure the quality and performance of Opal fuel prior to its launch in 2005. This included independent laboratory testing at the Toyota Vehicle and Engine Testing Laboratory in Melbourne in October 2004. Three tests were undertaken on a Toyota Avalon 3.0 litre Automatic, a Ford Falcon Futura 4.0 litre Automatic and a Holden Commodore 3.5 litre Automatic.

Driveability test

The driveability test measures the operation of a vehicle as perceived by a driver. It consists of assigning demerit points to vehicle performance characteristics that can be attributed to the fuel and that are not an acceptable part of vehicle operation.

The three cars were driven on Opal fuel by trained assessors and demerit points were assigned for noted performance issues. At the end of the test the points were tallied and compared to the points recorded by the same assessors driving the same cars on regular unleaded 91.

The report found that there was no significant difference between a vehicle running on Opal fuel and the same vehicle running on regular unleaded 91.

Tailpipe emissions

Using ADR 79/00; the standard testing design rule for measuring tailpipe emissions; Opal fuel was compared to regular unleaded 91. Emissions measured were unburnt hydrocarbons (HC), carbon monoxide (CO) and oxides of Nitrogen (NOx).

Using the average of three runs, the tailpipe exhaust emissions for a vehicle running on Opal fuel were equal to or less than the tailpipe emissions of the same vehicle running on regular unleaded 91. The only exception was the Avalon which showed an increase in NOx.

There are exhaust emission benefits from using Opal fuel. Overall, the cars that were run on Opal fuel tested lower for regulated exhaust emissions.

Impact on air quality

When vehicle exhaust air toxics were calculated using the USA EPA air toxics indicator model, air toxics were reduced by 45% when using Opal fuel when compared with using regular unleaded 91. Because of its formulation with less than 5% total of benzene, toluene, xylene and olefins, Opal burns very cleanly when compared to regular unleaded 91, helping to reduce air toxics.

Typical vehicle exhaust air toxics indices for regular unleaded 91 are 19-22. Opal fuel showed 9-12, a reduction of 45% versus regular unleaded 91.

Fuel economy in cars

Opal was tested for fuel economy in line with the testing standard ADR 81/01, and compared to regular unleaded 91.

Testing showed a minor decrease in fuel economy between Opal fuel versus regular unleaded 91. However the reported variation of 0.3 litres per 100km is within the normal variability for petrol grades and can vary depending on car maintenance and driving styles.

See overleaf for new and improved Opal fuel testing information >

Additional testing on new and improved Opal fuel - 2010

BP has an ongoing commitment to helping reduce petrol sniffing and in line with our dedication to continuous improvement of BP fuels, new and improved Opal fuel - with an advanced fuel formulation - was developed and tested in 2010.

The new and improved formulation contains advanced fuel technology which has been designed to clean and protect vital parts of the engine. New and improved Opal fuel was tested on both motor vehicle and outboard engines.

Vehicle testing

The use of ordinary fuels can result in the formation of deposits on critical engine components which can reduce engine performance. New and improved Opal fuel is formulated with advanced cleaning properties. It not only has the ability to keep a new engine in a clean condition, but also has the ability to remove existing engine deposits that ordinary fuels can leave behind.

To investigate the cleaning power of new and improved Opal fuel, testing was conducted at the Orbital independent laboratory in WA on a split fuel Toyota Aurion V6 engine. One bank of cylinders operated on regular unleaded 91 and the other on the new and improved Opal fuel. This test is based on the ASTM test (5598) for injector deposits.

Testing showed that after 3200km, there were significantly less deposits on the inlet valves of the cylinders using the new and improved Opal fuel, while the inlet valves of the cylinders on regular unleaded 91 had accumulated a significant amount of deposits. When the sides were changed and the inlet valves that had been exposed to regular unleaded 91 were now exposed to new and improved Opal fuel, up to 20.8% (with an average of 10.6%) of the deposits on the inlet valves were removed within 3200 km. This demonstrates that new and improved Opal fuel can clean up existing inlet valve deposits.



Fuel inlet valve using regular unleaded 91 after 3200km*



Fuel inlet valve using new and improved Opal fuel after 3200km*

Outboard testing - laboratory

Testing on outboard engines was also conducted at Orbital's WA laboratory. A new Yamaha 80 horsepower, four stroke outboard was used to determine whether running new and improved Opal fuel had any detrimental effect on the engine. Specifically the test included looking for any noticeable fouling of the fuel injectors or spark plugs.

Prior to testing, the engine was run in as per the user manual which involved eight hours of continuous running. The test cycle then involved two hours of high load, high speed running followed by three hours of light load, low speed. This cycle was developed to replicate circumstances likely to create valve deposits and injector fouling.

After running new and improved Opal fuel for five hours per day over three continuous days there was no significant change seen in the condition of the inlet ports, valves, fuel injectors or spark plugs nor a significant reduction in flow rate which would indicate fouling.

Outboard testing - field

To ensure the laboratory results for new and improved Opal fuel were replicable in the field, Opal fuel was also tested outside the laboratory.

Field testing was undertaken on an Evinrude 115HP E-TEC outboard engine. This testing evaluated the engine's performance and smoke output when in idle, mid-power and with the throttle wide open.

Throughout the testing the engine did not experience hard-starting or rough running when using new and improved Opal fuel. The engine stability at the 2200rpm-2500rpm mode of operation appeared to improve whilst using new and improved Opal fuel.

To find out more about Opal fuel, call the BP Fuel and Lubricants Technical Helpline on **1300 139 700** or visit **www.opalfuel.com.au**

*under standard laboratory test conditions as per ASTM test (5598)