

OMNITERRA FIRE REPORT

Conducted at the Fire Service College

25th & 26th August 2016 Moreton in Marsh

GL56 0RH

United Kingdom



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Background

In 2015, a number of minor preliminary tests were undertaken on behalf of a South African Consortium by a UK Fire & Rescue Service to ascertain if a product new to the UK (OMNITERRA FIRE) fulfilled the claims by the manufacturer of its ability to extinguish fire more effectively than traditional products such as plain water, foam etc.

Following those original tests, it was agreed that more comprehensive and detailed tests should be undertaken through an independent source, designed to capture the full range of fire classes.

For this purpose, the South African Consortium, chaired by Sir Ken Knight, was commissioned to provide an independent overview and validation of Omniterra Fire for firefighting purposes.

Independent Test Information

The tests were carried out at an independent location, The Fire Service College, Moreton-in-Marsh, Gloucestershire on the 25th and 26th August 2016.

The College, is a renowned and acknowledged center of excellence for the UK and International Fire Service, providing world class incident ground training facilities supported by expert instructors. By using the Fire Service College, it enabled Omniterra Fire to be tested through the full range of fire behavior classes by trained fire professionals in a neutral test center environment.

The tests were carried out under the direction of the South African Consortium, supervised by former Chief Fire Officer Simon Routh-Jones QFSM. Neither The Fire College nor Simon Routh-Jones are in any way associated with the Clients or the manufacturers of Omniterra Fire.

Test Criteria

The tests were designed to compare both a water attack and a conventional firefighting medium against Omniterra Fire, developed to reduce the time taken to extinguish a fire and in some instances, the levels of smoke and pollutants.

The method of application for the tests was a Dosatron Unit independently supplied and calibrated by FSE Group and as used in previous tests by a UK Fire & Rescue Service.

The Unit comprised of a 285 litre Water tank with top ll and a 20 litre Foam/Solution tank with top ll. The Pump was operated through a Honda Engine driving an impeller pump delivering approximately 7 Bar (100 psi) through a 20mm/1” hose reel.

The testing process was delivered via the pump, which was used to attack, suppress and extinguish each fire scenario. For each of the scenarios the testing process was delivered using the traditional method of fire fighting with the same firefighting crew to ensure continuity of application.

In total, five test scenarios were undertaken to capture a wide range of re classes.

These constituted:

- Pallet Fires within a building
- Straw Fires within a building which also tested the penetration effectiveness of Omniterra Fire
- Vehicle Fires
- Tyre Fires
- Oils/ Fuel fire

A further test on magnesium was undertaken as a comparison against hand-held Dry Powder extinguishers.



Thermal Imaging

In order to ensure continuity of test conditions for each of the scenarios, a thermal imaging camera with heat recording facility was operated. This ensured that the conditions of the fire behaviour for each of the individual scenarios were as similar as possible.

Test Duplication

Each of the scenarios initially had two burns carried out using water or another medium to give a base line of measurement of conventional fire fighting. Two further tests were then undertaken using Marine 3005 at the specified dilution ratio and all data was recorded.

The purpose of undertaking two tests per scenario was to ensure that any variation within the tests would be moderated and to verify how Omniterra Fire consistently performed across the range of fire classes.

By using the thermal imaging camera with heat recording facility we were able to monitor the output temperature in a like for like environment. All tests were timed

and recorded from the initial lighting, heat buildup and applications of the extinguishing media through to the final extinction of the fire.

The scenarios were chosen to reflect the incidents that a fire fighter would regularly encounter and where Omniterra Fire could be adequately compared against other mediums as an alternative method of extinguishing a fire.

Scenarios:

1. A car fire is a regular occurrence that provides for a number of different types of fire behavior.



2. Burning Tyres were used to demonstrate the difficulties – physical and environmental – that can be encountered by re crews.



3. An Oil / fuel scenario was chosen to evaluate how Omniterra Fire would operate as a water based option as opposed to the conventional, environmentally unfriendly method of using foam.



4. Straw was tested to see how Omniterra Fire would perform in a simulated thatched roof re incident. This test was particularly looking to establish the penetration qualities of Omniterra Fire a quality lacking when water only is used in such incidents. Wood is a standard frequent fire occurrence and would allow for a straight forward comparison test.



Results of tests

In brief, the results from the scenario tests are as follows, however more detailed results are shown on the data sheets attached and the conclusions below.

SCENARIO	BEST TIME TO EXTINGUISH	BEST TIME TO EXTINGUISH WITH OMINTERRA FIRE	COMMENTS
CAR FIRE	31 seconds/ water	12 seconds	The smoke emitted from the re during Marine 3005 test was considerably less than during the water test.
BURNING TYRES	22 seconds/water	5 seconds	The black combustion cloud immediately changed to white vapour upon application of Marine 3005, thus reducing the effects of pollution.
OIL/FUEL	14 seconds/ Foam	13 seconds	Omniterra Fire prevented re-ignition even with the application of an ignition source by Fire fighters, whereas the foam test re-ignited.
STRAW	19 seconds/water	9 seconds	The smoke emitted from the re during Omniterra Fire test was considerably less than during the water test. Omniterra Fire prevented re-ignition, whereas the water test re-ignited.
TIMBER	32 seconds/water	24 seconds	The smoke emitted from the re during Omniterra Fire test was considerably less than during the water test.

Magnesium

Magnesium was selected as a hazardous material scenario to ascertain if Omniterra Fire could cope with such types of fire.

In view of the limitations of the pump to apply Dry Powder, it was decided that a quantity of 40 litres would be ignited and extinguished using two 9kg hand-held extinguishers.

Similarly, 40 litres of magnesium would be ignited and extinguished using a 3% solution of Omniterra Fire and water applied from the low pressure Dosatron pump.



Results

- The two hand-held extinguishers failed to extinguish the fire.
- Omniterra Fire solution extinguished the fire in 65 seconds and formed a chemical reaction with the magnesium that allowed it to melt more effectively allowing for a higher level of containment for the clean-up crew.
- The Magnesium test was only conducted once as an addendum test but the results were significantly impressive to warrant further investigation and testing.
- Research has proven that cold aqueous solutions of various salts, including those used in Omniterra Fire, react at a higher speed allowing the magnesium to dissolve in the marine salt properties.



Summary and Conclusion of Omniterra Fire

Testing

Omniterra Fire demonstrated that it could be used effectively across a wide fire-fighting spectrum.

It is easy to use, environmentally friendly and minimises waste. It is understood from previous tests and discussion where the Environmental Agency were present, that they have concluded that Omniterra Fire is not detrimental to the environment.

The only difficulties encountered were with the third party supplied pump as it was not always easy to determine the exact induction rates and volumes of water.

Omniterra Fire was observed to mix well with water and was easy to use through a fire fighting branch at a relatively low water pressure rate.

The scenarios undertaken demonstrated the effectiveness of how Omniterra Fire compared against the various types of incident and showed how it would react with different types of materials etc.

It should be noted however that the tests were not designed or intended to evaluate Omniterra Fire in large or in constructed building fires. Likewise, the test on straw is not of the scale of a thatched property incident. However, the tests demonstrated how Omniterra Fire was able to penetrate the straw and most importantly, prevent fire-ignition.

The opinion of all involved was that Omniterra Fire tackled the fires more effectively than conventional water or foam. Although the Oil/ Fuel test was marginal, Omniterra Fire had the distinct advantages in reducing the toxins caused by smoke, restricted fire-ignition and of course Omniterra Fire is bio-degradable unlike the chemical foams most normally used for this type of fire. In the other tests the primary benefits were rapid extinguishing and less water needing to be applied.

Within the scenarios set to test Omniterra Fire, it was evident that there was a reasonable temperature drop on application. More significantly however, it was recognised that on the application of Omniterra Fire that there was a notable increase

in visibility around the fire, thus enabling a greater ability to attack the fire at source. This was particularly evident with the tyre fire which, on application of Omniterra Fire, almost instantly reduced the large amount of particulate matter pollution. This would therefore provide a safer environment for fire fighting and ultimately expedite the extinguishing of the fire whilst reducing risk to fire fighting personnel.

It is our opinion that with the correct training and application, Omniterra Fire would alleviate the dilemma faced by fire fighters of which medium to use on a specific fire incident. It is apparent from the tests that Omniterra Fire works effectively when being delivered at low pressures which would be a distinct advantage when looking at a smaller response vehicle configuration. The wider benefit would be that it could be introduced into a greater variety of fire fighting vehicles reducing fire fighting time, whilst also being environmentally friendly.

Final Comment

The fire-fighting team was particularly impressed with the speed that Omniterra Fire tackled the tyre fire scenario as they can be hazardous and difficult to deal with.

Omniterra Fire appears to have a unique characteristic of being able to extract the toxic chemicals produced from the breakdown of synthetic rubber compound within the smoke.

The chemicals from a tyre fire usually remain within the fire area but when extinguished with Omniterra Fire, it appears that only the vapour from the fire is released into the atmosphere.

Although every effort was made to ensure the accuracy and reliability of every test, there is a possibility that some of the data recorded may be slightly inaccurate due to the measurement restrictions of the pump. However, the expert opinion is that Omniterra Fire is a safe, efficient and effective product and would benefit the Fire and Rescue Services through application as a 'one stop shop' or a 'stop the clock' product.

Tests observed and witnessed by:

Simon Routh-Jones QFSM

Stephen C. Neville OBE

Report validated by:

Sir Ken Knight CBE QFSM FIFireE

Handwritten signature in blue ink, appearing to read "Simon Routh-Jones".Handwritten signature in blue ink, appearing to read "Stephen C. Neville".Handwritten signature in blue ink, appearing to read "Sir Ken Knight".