

Sub 86



Barricade Fire Protection Pty Ltd
Submission to:

**The Australian
Parliament**

**House Select
Committee**

**Inquiry into the Recent
Australian Bushfires**

Suggestions to Mitigate Loss of Life and Property

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Barricade Fire Protection
Pty Ltd

*Suggestions to Mitigate Loss of Life and
Property From Bushfires*

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Executive Summary

Barricade Fire Blocking Gel (Barricade) is an integral part of a new technological approach to fire protection currently being used and investigated throughout the USA and parts of Europe, revolutionising fire protection practices.

Barricade is a benign, non-toxic super absorbent polymer that absorbs and encapsulates water during a one step preparation/application process for rapid and effective use in fire protection.

Preparation consists of attaching the Barricade container to an ordinary garden hose, which, when flowing automatically mixes the product for simple and effective application.

The preparation, consisting of encapsulated (or gelled) water, is armed with remarkable properties enabling its adhesion to practically any surface; including the underside of horizontal surfaces, synthetics and glass.

Barricade forms a layer of encapsulated water approximately 6mm thick, providing an extremely high degree of insulation against ignition from radiant heat, flame impingement and burning ember exposure.

Consequently, Barricade is used to assist businesses, capital works, public, individual and community assets, and most importantly people, from the devastating effects of fire. Fire fighters can increase their ability to protect multiple sites simultaneously, including buildings, vehicles, fences, as well as forming environmental barriers to block the path of a fire.

Barricade exceeds the protection requirements set down by the CSIRO test protocol for bushfire protection of fire fighting vehicles.

Specific uses of the product are discussed and recommendations for the community and fire services are provided that will minimise the incidence and cost of bushfires to the Australian Community.

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Introduction

The purpose of this submission is to introduce a revolutionary new fire protection product, Barricade Fire Blocking Gel (Barricade), to greatly increase the efficacy of metropolitan and regional fire services, utilities, and community practices to defend lives and property from fires.

Barricade has been proven to be extremely useful in the following applications:

- To insulate property, structures (houses etc) from the radiant heat of a bushfire.
- To protect structures from combustion during the flashover of a bushfire
- To extinguish burning embers that come into contact with structures during fires.
- To confine a fire to a defined area by forming a firebreak.
- To protect fire fighters trapped in a fire unit during burn back situation.
- To maximise the resources of the fire fighting service utilising less time and water to protect assets.
- To reduce environmental damage to waterways and water tables by reducing the volume of run off water used in traditional fire fighting methods

A Description of Barricade Fire Blocking Gel

Barricade is a super absorbent polymer, capable of absorbing up to 400 times its own weight in water. This absorbed water is held in gelled form and has remarkable adhesion properties. This means that the gelled water can then be applied to practically any surface (including underneath horizontal surfaces) and remain in place for up to 36 hours.

To protect a house, Barricade is applied by attaching the container to the user's garden hose, resulting in the gelled water forming a protective layers of approximately a thickness of 6 mm (1/4 inch) to all combustible surfaces of the house. These surfaces would include timber walls, windows, underside of eaves, window sills and doorways, timber decking, fences and any trees and shrubs close to the house. The time required to apply the product to an average house would be approximately 20 minutes.

Once the house is covered in Barricade, the solution immediately protects all combustible surfaces. The solution is capable of absorbing and withstanding extreme, prolonged heat, protecting the underlying combustible surface from fire until the layer of Barricade has completely evaporated.

The concept is to apply Barricade to a house and on strategic areas of a property prior to a fire impacting. In most cases, the movement of bushfires can be predicted and several hours warning is usually provided to residents in a threatened area. Barricade stays in place for up to 36 hours to protect the property from ignition due to radiant heat, actual contact with flames and burning ember attack. If the product begins to dry out due to extended high temperature, it can easily be re-hydrated by spraying a light mist of water, which is immediately absorbed into the gel.

After the fire front has passed, all surfaces covered with Barricade can be easily removed by spraying with a jet of water from an ordinary garden hose.

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How Effective is Barricade?

Testing carried out by the United States National Institute of Standards and Technology (NIST) have shown that Barricade is up to 30 times more effective than water alone in preventing ignition to timber surfaces.

These tests established that unprotected timber surfaces would ignite from radiated heat at a level of 25 kw/m^2 after a period of 30 seconds. It also established that a radiant heat level as low as 15 kw/m^2 can cause ignition in the presence of an ignition source (such as flame impingement). A copy of the NIST report and an independent evaluation is attached to this submission.

At these heat levels, Barricade was found to provide up to 15 minutes of protection against ignition. Water on the other hand was found to provide less than 60 seconds of protection prior to ignition.

It is important to note that although bushfires move at varying speeds depending on fuel availability, wind velocities, terrain etc, it is well established that the danger period for a fire front to pass over a particular structure (a house, for example) is two to three minutes.

Although there is no definitive model of a bushfire, the CSIRO has developed a simulation of a typical bushfire to find a method of protecting fire fighters that may be trapped in a vehicle caught in a bushfire. This simulation utilizes heat fluxes of 2 kw/m^2 for a 6 minute period.

Since Barricade was tested at heat flux levels in excess of 12 times that required by the CSIRO test method, this NIST report clearly proves that Barricade provides an effective barrier to the heat from bushfires.

Further proof of the effectiveness of Barricade was demonstrated in April of this year when the Currumbin Valley Bushfire Brigade conducted a test burn with two motor vehicles. This test burn, which was fully documented and is also available on film, set fire around and under two motor vehicles, one of which was coated with Barricade prior to the test.

The vehicle that was coated with Barricade was driven away from the test site with little or no damage (not even to the tyres), whereas the

vehicle without the Barricade coating suffered severe damage to the tyres, windscreen and bodywork, which was fully involved in fire.

Thermocouples placed in and around the vehicle indicated that temperatures within the vehicle did not exceed 38 degrees Celsius, despite temperature outside the vehicle reaching 750 degrees Celsius. A test report and video presentation is attached to this report.

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Previous Successes of Barricade

Being new technology and having been developed in the USA, the field experience with the application of Barricade to date is largely from the USA. A sample of where Barricade has been used to successfully protect life and property is as listed below:

- In South Dakota USA, the Black Hills fire department was issued with Barricade to protect the community. During a large bushfire that destroyed 13,200 acres, Barricade was applied to 6 homes before the fire fighters had to leave the area due to personal danger. These homes were the only structures saved, all other homes and outbuildings were destroyed. As a result, every fire department in South Dakota is now issued with Barricade.
- In the Summer of 2001, Barricade was used with great success by various fire departments in Jackson's Hole, Wyoming USA, when over 200 homes were saved through the application of Barricade
- Barricade Gel saved over 100 homes during the 2001 wildland fire in Montana USA
- Barricade Gel saved several dozen homes during the fierce wild fires in Florida during the 1998 summer
- Florida Light and Power (FLP) use Barricade exclusively during every Fire season to protect power poles from destruction during bushfires. FLP report savings up to US\$ 5.00million per year just in power pole replacement costs. Actual benefits to the community in terms of maintaining a continuous power supply during a bushfire emergency is immeasurable.
- Los Angeles County Fire Service uses barricade Gel. It is carried on every fire appliance
- Test results at Currumbin Valley Rural Fire Brigade in 2003 demonstrate that Barricade is an effective medium for Fire Truck Cabin Crew protection.
- The tests carried out by NSW National Parks and Wildlife at Lane Cove National Park in 2002 clearly demonstrated the benefits of Barricade when used to form containment lines during back burn operation.

Proposed Uses of Barricade in Australian Bushfires

Property (house) Insulation

Barricade has been proven to provide an excellent barrier to ignition when applied to houses and other structures. Individual homeowners can apply the product to their own properties using Barricade's one-step preparation/application procedure, to protect against ignition and destruction. The product is easy to use and is designed to work with a standard garden hose so that an average householder can successfully protect their assets.

Houses or other structures will be protected against:

- Ignition and destruction due to radiated heat from a bushfire within close proximity.
- Ignition and destruction during the flashover of a bushfire.
- Ignition and destruction from burning embers that come into contact with the structure when a bushfire occurs. Burning embers are readily extinguished immediately on contact with Barricade .

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Use by Fire Services

In addition to the Fire Services using Barricade in the examples cited throughout this document, enormous advantages over traditional fire fighting methods can be gained by using Barricade in the following situations:

- Exposure and Asset Protection

Fire brigades are often called upon to provide protection to a group of houses in the line of a fire front. Several fire fighters and units are usually mobilised to a designated area to continually wet down threatened home(s) to safeguard against ignition and possible destruction. This unnecessarily ties up the two most valuable weapons we have against a fire: manpower and water.

Using Barricade means that:

Fire-fighters would be free to continue the task of extinguishing fires in other areas

Significantly less water is required to protect each asset. Barricade is applied once, versus continual streams of water applications using traditional methods.

Additionally, fire services will be able to use Barricade in ordinary house fire situations. Barricade can be used to insulate and protect adjacent structures from ignition due to radiant heat and free up the fire hoses and associated water that would otherwise be used to protect these adjacent assets.

- Cabin Crew Protection

The test burn carried out at Currumbin Valley recently clearly demonstrated the ability of Barricade to protect vehicles and occupants during the flashover of a bushfire. Thermocouples placed in and around the vehicle indicated that temperatures within the vehicle did not exceed 38 degrees Celsius, despite temperature outside the vehicle reaching 750 degrees Celsius. A test report and video presentation is attached to this report.

- Helicopter Application

As an effective firebreak, Barricade can be rapidly applied to vast areas by helicopter. The application method would not vary from methods already employed to disperse water and foams to bushland areas for this purpose.

The use of Barricade, however, means that less water and fewer applications would be required to achieve a more effective result . This is because the water is held in gelled form and resists runoff and evaporation and remains in place for much longer periods, providing prolonged protection. Alternatively, ordinary water and foams quickly penetrate the soil or quickly evaporate resulting in only very transient periods of protection.

Barricade maximises resources such as manpower and helicopters in addition to minimising water usage.

Fire Breaks

Barricade is an effective barrier to ignition when applied to grass, trees, foliage etc. Barricade can be used as an artificial firebreak during back burning and fuel reduction operations to limit fire size and the possibility of the back burn getting out of control due to wind shifts etc. This capability was proven in tests carried out with the National Parks and Wildlife Service at Lane Cove National Park in 2002.

Use by Utility Organisations

Both water and electricity suppliers can benefit from using Barricade to prevent fire damage and maintain uninterrupted services. As demonstrated by the use of Barricade by Florida Light and Power organization; Australian electricity companies can use the product to assist in the maintenance of a reliable, continuous electricity supply during a fire, by coating power poles that are located in a fire threatened area.

In addition, other utility companies such as water authorities, can benefit from the use of Barricade as a firebreak. The demonstrated high risk of performing dangerous operations; such as welding pipelines in bushland areas, can be dramatically reduced by using Barricade as a firebreak around the work area. Welding sparks and/or fire ignitions would be readily extinguished well before developing into

Toxicology and Environmental Fate of Barricade

Barricade fire blocking gel is safe for the environment and safe for people. The Material Safety Data Sheet included as Attachment 1 demonstrates the overwhelming safety of the product.

All ingredients in Barricade are currently on the Australian Inventory of Chemicals and have been investigated for their safety and have not been found to be harmful to people or the environment.

Barricade is extremely low in toxicity and does not pose environmental risk as it is fully biodegradable and is non-bio accumulative.

Barricade can be used without fear of contamination of the environment.

It is also important to note that no special solutions are used in the clean up of Barricade following its application to a surface. Barricade is completely removable with a jet of plain water.

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a dangerous fire outbreak as occurred at Engadine, NSW in 2002 where many houses were subsequently destroyed and millions of dollars damage were done as a result of welding sparks igniting adjacent bushland and the fire spreading to neighbouring residential areas.

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Recommendations

In consideration of the information provided in this submission, the following recommendations are intended to provide methods to utilise Barricade to minimise losses to the community in terms of life and property.

1. That incentive be given to individual homeowners to be prepared for bushfires and be in a position to protect themselves and their property during a bushfire. This incentive should take the form of either:
 - a) A subsidy of the purchase price, or
 - b) An Insurance premium rebate, or
 - c) An overall price reduction by the removal import tariff for Barricade components and application equipment
2. That fire services charged with the responsibility of maintaining bushland areas (such as the National Parks and wildlife service) use the product as a fire break during back burning operations to protect against the fire spreading to unwanted locations and/or out of control.
3. Encourage utility organisations, electricity supply organisations in particular, to use Barricade to maintain continuous supply and prevent fires due to maintenance work.
4. Encourage the various Fire Services to utilise Barricade as means of maximising the use of manpower and minimising the use of water in asset and exposure protection operations.
5. Encourage the various Fire Services to utilise Barricade as a means of protecting trapped fire fighters in vehicles.
6. Encourage the various Fire Service to utilise Barricade as fire breaks from helicopter borne delivery systems.
7. That Government funding be made available to conduct further testing to further develop the above and other uses of this new technology.