
Challenging the Foams:

**Safer options with the world's first non-toxic fire
suppressant: BlazeTamer380™**

**A submission to the Senate Foreign Affairs, Defence and Trade Committee on Part (B) of its inquiry:
contamination of other sites using firefighting foams.**

Prepared by Keith Blyth for BioCentral Laboratories Ltd

Additional Test Results/Video Evidence available upon request

February 2016

Overview:

BlazeTamer380™ is a ~~water~~ polymeric water enhancer that increases the efficiency of water by 43% for Class A bushfire operations.

Developed and produced by Adelaide based BioCentral Laboratories Ltd¹, BlazeTamer380™:

- Delivers superior fire extinguishing performance characteristics;
- Offers a non-toxic, harmless to humans, animals and vegetation option in firefighting practices;
- Provides a healthy, environmentally friendly cost effective alternative to the use of foams in Australian firefighting.
- Reduces the cost of all direct attack aerial and ground unit firefighting activities

¹ See Appendix A: Introducing BioCentral Laboratories

Delivering Superior fire extinguishing performance characteristics:

What is BlazeTamer380™?

BlazeTamer380™² is a polymeric elastomer designed for use by aircraft (fixed wing or rotary) to suppress bushfires. It is a Polyacrylamide – a polymer of controllable molecular weight formed from the polymerisation of acrylamide.

Blazetamer380™ can also be used by any ground based vehicle with a dedicated water tank for firefighting efforts.

This elastomer is a, water soluble linear liquid, designed specifically to bind water molecules together instantly with moderate agitation.

BlazeTamer380™, an anionic Polyacrylamide, binds water molecules together in random linear chains. This in turn greatly reduces the water molecules susceptibility to evaporation (steaming off), on contact with any hot surface.

BlazeTamer380™ becomes viscous (thick) when activated.

BlazeTamer380™ is non-toxic and non-corrosive which, given time, will break down into CO₂, water and nitrogen. Increased UV activity accelerates the breakdown timeline.

BlazeTamer380™ is now being utilised in New South Wales – RFS and Tasmania – Tasmanian Aerial Fire-Fighting Authorities. It has also just successfully won the tender to supply the Victorian Country Fire Association and DELWP – Department for Environment, Land, Water & Planning. BlazeTamer380™ is currently being used in Texas, Minnesota, Michigan, Philadelphia USA.

How does BlazeTamer380™ work?

BlazeTamer380™ contains a mix of polymers, surfactants, water and other ingredients. It is provided as a concentrate from BioCentral Laboratories and is mixed with water in very small concentrations (from 0.1% to 0.65%). Highest rate of mixture to date is 6.5 litres per 1000 litres of water dropped from aircraft.

When placed on a fire an endothermic reaction occurs. This endothermic reaction absorbs heat and cools the fire, thus breaking the fire triangle – this causes rapid extinguishment of the fire, with little to no re-ignition, virtually no ash and reduced smoke.

² See Appendix B: Differences between BlazeTamer and other products currently in use.

**What types of fire will
BlazeTamer380™ extinguish?**

BlazeTamer380™ has been used to extinguish many types of fires – with the exception of electrical fires. To date the product has demonstrated its ability to control:

- Grease/Fat fires
- Coal Fires
- Diesel Fires
- Ethanol Fires
- Class A Wildland and Structural Fires
- Peat fires (speciality for this technology).
- Tire fires (speciality for this technology). Tests have demonstrated a 60% reduction in water required to extinguish equivalent fire sources.
- It has successfully complied with Australian Standards for both A & F class fire extinguishers.

Offering a non-toxic option in firefighting practices:

Is BlazeTamer380™ safe to use?

BlazeTamer380™ has undergone 11 years of rigorous and comprehensive testing, receiving full United States Department of Agriculture – Forestry Service Accreditation.³

BlazeTamer380™ is also one of the few products approved for use in and around water catchment areas by the Australian Water Quality Centre and is approved for use by the EPA⁴ and in the European Union. BlazeTamer380™ is also accredited for use by the Australasian Fire and Emergency Service Council (AFAC).

Is BlazeTamer380™ environmentally friendly?

BlazeTamer380™ applied dilution solution breaks down in approximately 100 days, eventually degraded by biological and Ultra Violet action. This degradation ensures no harmful residues remain in the environment.

Similar polymers have been used in soils prepared for food crop production in agriculture for water retention, erosion control, spray drift reduction and efficiency improvements in nutrients. The polymers have no effect on the plants themselves and residues have not been found to be harmful to humans or animals.

Part of the requirements for US Department of Agriculture approval for use included extensive independent testing on potential impacts on fish populations. BlazeTamer380™ has a slight level of toxicity to fish (in concentrated form). The mixed product presents very low risk: during the testing a Zero Mortality rate for baby Rainbow Trout was achieved.

Does BlazeTamer380™ damage housing?

BioCentral Laboratories encourages every home owner to inspect the dwelling if there has been a fire or ember damage – followed by a thorough cleaning of ash and residue from gutters. BlazeTamer380™ does not damage structural surfaces, timber or paintwork. Some smooth, non-porous surfaces may remain slippery if subject to aerial spraying (during a fire). This is easily washed off with water.

Any product which lands on gravel or gardens will quickly break down and degrade. It can also be watered into the soil as part of any clean-up process following a fire event.

³ See Appendix C: United States of America Department of Agriculture-Forest Service
USDA-FS 5100-306A accreditation.

⁴ See Appendix D: Letter from Environment Protection Authority

Providing a cost effective alternative to the use of foams in Australian firefighting:

Is BlazeTamer380™ cost effective?

BlazeTamer380™ is an extremely cost effective⁵ firefighting option for Australian bushfires in contrast to current foams being used:

- Assists pilots in hitting targeted drop zone/area consistently by reducing the mixed solution drifting in high wind conditions;
- Reduces pumping load dynamics;
- Reduces evaporation rate;
- Fast knockdown;
- Inhibits re-ignition;
- No residual clean up requirement.
- Is 43% more effective than water alone

Does BlazeTamer380™ need to be premixed?

BioCentral Laboratories has engineered a portable filling station that is both solar and battery powered. A fixed wing, single engine aerial bomber can be refilled within 3 minutes. BlazeTamer380™ is mixed as the aircraft is filled with water.

BlazeTamer380™ is also compatible with most on-board concentrate injection systems.

What aircraft are suitable for BlazeTamer380™?

BlazeTamer380™ has been successfully used by:

- Helicopters fitted with on-board Belly Tanks
- Helicopters using Bambi Buckets or similar bucket systems
- Ground filled Air tractors
- Water scooping Fire Boss
- The large Airtanker Program (LAT) C130 – recently used in NSW

⁵ See Appendix E: Cost Comparison

Can BlazeTamer380™ be used by fire engines?

Yes, in a pre-mixed form. At a maximum dilution rate of 1-2 litres per thousand litres, (dependent on fire fuel loads), it is simply poured into the tank and recirculated one full cycle through the pump, it is then ready to use.

This application method has been successfully tried and executed by the VIC CFA and the Texas AT&M Forest Service.

How does BlazeTamer380™ differ to existing products?

- It is easy to mix;
- It is the first and only Elastomer to be registered on the USDA-FS QPL. (Qualified Product List)
- It is the only product of its type in the world to be used exclusively to fight fires.
- It uses effectively a third to a quarter the amount of concentrate compared to other water enhancers;
- It is approved to use in all aircraft types and configurations;
- It is easy to clean up;
- It mixes easily in all water types including hard and saline water, and sea water;
- When dropped from aircraft the polymer chains make the water less prone to drift and wind shear evaporation – it has been designed to “FLY”;
- It will make a continuous footprint on the ground and has a more concentrated ground coverage level than gels or foams;
- It will remain effective on the ground for up to 2 hours (dependent on coverage level and mix rate) unlike foams which become virtually ineffective in less than 30 minutes.

Appendix A:

Introducing BioCentral Laboratories

BioCentral Laboratories Limited (BCL) is an Adelaide based, South Australian unlisted public company. BCL was formed as a research and development entity to explore commercial options for a range of linear polymers in firefighting, agriculture, road construction and engineering.

BCL has commercialised a number of innovative polymer products most notably:

- AquaBoost™ (for water retention in agriculture);
- PolyCom™ (for road base construction);
- DustChek™ (for dust control on heavy mining haul roads).

Recently, the company's flagship product BlazeTamer380™ achieved USDA-FS approval and BCL is now embarking on commercialisation and introduction to the Australian fire industry.

This product offers fire authorities around the world a cost effective and environmentally sensitive solution to bushfire issues.

Contact Details:

BIOCENTRAL LABORATORIES LIMITED

22 Phillips Street, Thebarton SA 5031

Managing Director:

John Stepancic

General Manager

Melissa Brooks

Appendix B:

Differences between BlazeTamer 380™ and other products currently in use in Australia

Differences between BlazeTamer380 and Foam, Super Absorbent Water Enhancers, Retardant

Application Properties	Foam	Water Enhancers	Retardant	BlazeTamer380
Mix Rate	0.1% - 1.0%	0.5% - 3.0%	15% – 20%	0.1% - 0.65%
Aerial Attack type Direct or Indirect	<ul style="list-style-type: none"> • Direct on fire 	<ul style="list-style-type: none"> • Direct on fire • Near Direct attack as short term wet break 	<ul style="list-style-type: none"> • Indirect attack as a chemical break only in advance of the fire 	<ul style="list-style-type: none"> • Direct on fire • Near Direct attack as short term wet break
Wind effects	<ul style="list-style-type: none"> • Prone to drift from aircraft 	<ul style="list-style-type: none"> • Prone to drift from aircraft 	<ul style="list-style-type: none"> • High viscosity less prone to drift • Low viscosity prone to drift from aircraft 	<ul style="list-style-type: none"> • Only minor drift in high wind conditions
Mixing Infrastructure	<ul style="list-style-type: none"> • Minimal 	<ul style="list-style-type: none"> • Complex systems requiring technical expertise and training 	<ul style="list-style-type: none"> • High cost infrastructure and technical expertise required 	<ul style="list-style-type: none"> • Minimal
Approvals in all aircraft types	<ul style="list-style-type: none"> • Only some products approved in all aircraft types 	<ul style="list-style-type: none"> • Only some products approved in all aircraft types 	<ul style="list-style-type: none"> • Specific products for specific aircraft types 	<ul style="list-style-type: none"> • Approved for use in all aircraft types and applications
Compatible with on board aircraft dosing systems	<ul style="list-style-type: none"> • Yes 	<ul style="list-style-type: none"> • Only some aircraft compatible 	<ul style="list-style-type: none"> • Not mixed on board aircraft 	<ul style="list-style-type: none"> • Yes
Humidity Effects	<ul style="list-style-type: none"> • Ineffective in very low humidity conditions 	<ul style="list-style-type: none"> • High dose rates required in low humidity conditions 	<ul style="list-style-type: none"> • Still works when water evaporated off 	<ul style="list-style-type: none"> • Works well in very low humidity conditions
High drop heights	<ul style="list-style-type: none"> • Prone to drift • Needs low wind conditions 	<ul style="list-style-type: none"> • Prone to drift • Needs low wind conditions 	<ul style="list-style-type: none"> • High viscosity retardant works • Low viscosity retardant prone to drift 	<ul style="list-style-type: none"> • Not subject to wind drift effects
Mixing with high salinity water	<ul style="list-style-type: none"> • Compatible 	<ul style="list-style-type: none"> • Product becomes unusable 	<ul style="list-style-type: none"> • Compatible 	<ul style="list-style-type: none"> • Compatible
Accuracy of mixing dose and its effectiveness on drop performance	<ul style="list-style-type: none"> • Very susceptible to variations in mixing rate on operational effectiveness 	<ul style="list-style-type: none"> • Can overdose mix to turn solution into thick gel • High viscosity curve 	<ul style="list-style-type: none"> • Can overload aircraft due to high specific gravity of retardant and high dose rates if mixing not accurate 	<ul style="list-style-type: none"> • Unaffected

Appendix C:

USA Accreditation 5100-306A



US Forest Service

Washington Office

Fire & Aviation Management

4/5/12

Water Enhancers (Gels) for Wildland Fire Management



Qualified By US Forest Service in Accordance with Forest Service Specification 5100-306A as Amended

These products are evaluated and qualified only at the specified mix ratio range and only for use with the indicated application.
Consult individual agencies for specific policies relating to water enhancer use. Please review the Notes for Selection and Use.

Chemical	Mix Ratio ¹	Qualified Applications ²				Ground Engine
		Fixed-Wing Airtanker		Helicopters		
		Multi Engine	SEATS	Fixed-Tank	Bucket	
Uncolored						
Chemdal Aqua Shield 100	0.4–1.2%	3	●	-	●	●
Sold as Phos-Chek AquaGel-K	0.4–1.2%	3	● 4	-	●	●
Sold as FireOut Ice	0.4–1.2%	3	●	-	●	●
Barricade II	1.0%	3	● 4	-	●	●
Barricade II	1.0%–3.0%	-	-	-	●	●
Thermo-Gel 200L	0.5%–3.0%	3	● 4	-	●	●
Thermo-Gel 500P	0.4%–0.5%	3	● 4	●	●	●
Thermo-Gel 500P	0.4%–1.2%	3	● 4	-	●	●
Wildfire AFG Firewall II	0.25%–3.0%	3	● 4	●	●	●
BioCentral Blazetamer 380	0.65%	3	●	●	●	●
GelTech FireIce	0.12 lb/gal–0.18 lb/gal	3	● 4	-	●	●
Phos-Chek Insul-8	0.37%	3	●	●	●	●
Phos-Chek Insul-8	0.37%–0.67%	3	●	-	●	●
Phos-Chek Insul-8	0.37%–3.0%	-	-	-	●	●
Colored – Specific colors are evaluated for use with specific products. Using a color qualified with one product in another product without further testing does not make a new qualified product.						
Thermo-Gel 200L AV-B1 (Blue)	0.5%–3.0%	3	●	-	●	●
1 – Each product is qualified for the specified mix ratio or range. Mixtures outside the mix ratio or mix ratio range shown are not qualified for use.						
2 – Qualification Notes:						
● Fully Qualified – Product complies with all requirements of a formal specification.						
○ Conditional Approval – Product complies with all requirements in the specification for laboratory evaluation; a field evaluation is required for full qualification. Evaluations from the field are requested with regard to effectiveness, ease of use and mixing. (Evaluation forms are available on the web at www.fs.fed.us/rm/fire/wfcs/tests/index.htm . Select “Water Enhancer Evaluation” under Section 12 – Operational Field Evaluation Test.)						
- Not qualified for this application.						
3 – Forest Service policy does not allow application of water enhancers from large airtankers. These products meet the requirements for application from multi-engine aircraft for those agencies whose policy permits this use.						
4 – Colored experimental products may be used within a controlled study to determine visibility as required by the specification.						

Appendix D:

Australian Environment Protection Authority

 <p>Environment Protection Authority www.epa.sa.gov.au</p>	 <p>GPO Box 2607 Adelaide SA 5001 250 Victoria Square Adelaide SA T (08) 8204 2000 F (08) 8204 2020 Country areas 1800 623 445</p>
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John Stepancic
Managing Director
BioCentral Laboratories Ltd

Dear John,

I have reviewed the MSDS for BLAZETAMER (attached). On the basis of this information it is my assessment that the BLAZETAMER product represents a low risk to the environment if it is used appropriately in a fire fighting scenario.

The EPA is not in a position to formally endorse the product (or any other fire fighting chemical agent). However the EPA would consider the appropriate use of this product to be consistent with the requirements of the *Environment Protection Act 1993* and the Environment Protection (Water Quality) Policy 2003.

Regards,


Clive Jenkins
Senior Scientific Officer
Science and Assessment Division
ENVIRONMENT PROTECTION AUTHORITY

Date: 5/4/2012

SAFETY DATA SHEET



Blazetamer380

Infosafe No.: MTB1X
Version No.: 1.0
ISSUED Date: 30/09/2011
ISSUED BY BIOCENTRAL
LABORATORIES LTD

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name

Blazetamer380

Company Name

BIOCENTRAL LABORATORIES LTD

Address

22 Phillips Street Thebarton
SA 5031 Australia

Emergency Tel.

+61 415 824 608 or +61 458 047 431

Telephone/Fax Number

Tel: +61 8 8234 8886

Fax: +61 8 8234 8889

Recommended Use

A Class fire suppression and retarding liquid. The use of the product involves significant dilution with water (1:150 to 1:1500).

2. HAZARD IDENTIFICATION

Hazard Classification

NON-HAZARDOUS SUBSTANCE.

NON-DANGEROUS GOODS.

Not Classified as Hazardous according to criteria of National Occupational Health & Safety Commission, Australia (NOHSC).

Not Classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Risk Phrase(s)

Not classified as hazardous according to criteria of NOHSC

Environmental Hazards

Based on component data the product is not expected to be harmful to the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition, information on ingredients

The product is a polyacrylamide copolymer emulsion, containing surfactants and performance additives.

Ingredients

Name	CAS	Proportion
Ingredients determined not to be hazardous, including water		100 %

4. FIRST-AID MEASURES

Inhalation

If inhaled, remove to fresh area. Keep at rest until recovered. If symptoms persist seek medical attention.

Ingestion

Do NOT induce vomiting. Wash out mouth and lips thoroughly with water. Seek medical attention.

Skin

If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If symptoms develop seek medical attention.

Eye

If in eyes, hold eyelids apart and flush the eyes continuously with running water. Continue flushing for several minutes until all contaminants are washed off completely. Seek medical attention.

First Aid Facilities

Eye wash fountains and normal wash room facilities.

Advice to Doctor

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use appropriate fire extinguisher for surrounding environment.

Hazards from Combustion Products

Under fire conditions this product has been tested using method NFX 70-100. The R value was determined at 0.72.

Special Protective Equipment for fire fighters

Fire fighters should wear appropriate protective clothing and breathing apparatus in accordance with prevailing fire conditions.

Specific Hazards

The product is a fire retardant and therefore non combustible.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures

Wear appropriate personal protective equipment and clothing to prevent exposure. Increase ventilation. Evacuate all unprotected personnel. If possible contain the spill. Place inert, non-combustible absorbent material onto spillage. Use clean non-sparking tools to collect the material and place into suitable labelled containers for subsequent recycling or disposal. Dispose of waste according to the applicable local and national regulations. If contamination of sewers or waterways occurs inform the local water authorities and EPA in accordance with local regulations.

Personal Precautions

Spills produce extremely slippery surfaces on non porous surfaces only.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Wear appropriate protective equipment to prevent inhalation and eye exposure. Use in designated areas with adequate ventilation. Prevent the creation of vapours and mist in the work atmosphere. Keep containers closed when not in use. Practice good personal hygiene, that is, always wash hands after handling, and before eating, drinking, smoking or using the toilet facilities.

Conditions for Safe Storage

Non combustible liquid. Store in a cool, dry well-ventilated area away from heat and out of direct sunlight. Keep containers closed when not in use and securely sealed and protected against physical damage. Inspect regularly for deficiencies such as damage or leaks.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards

No exposure standards have been established for this material.

Engineering Controls

Use with good general ventilation. If mist or vapour are produced local exhaust ventilation should be used.

Respiratory Protection

In case of insufficient ventilation, suitable respiratory equipment should be worn.

Eye Protection

Where eye contamination is likely the use of chemical goggles, safety glasses with side shield protection or face shield as appropriate should be worn.

Hand Protection

Suitable impervious gloves, e.g. neoprene, nitrile or laminated film are recommended.

Footwear

Safety boots as required.

Body Protection

Suitable impervious protective clothing should be worn when handling large quantities.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

White milky liquid.

Odour

Mild odour.

Melting Point

0°C (32°F) approx.

Boiling Point

>100°C (212°F)

Solubility in Water

Miscible with water.

Specific Gravity

0.998 (H₂O=1)

pH Value

6.4 (as supplied)

Vapour Pressure

Not available

Vapour Density (Air=1)

Not available

Flash Point

Not applicable, water-based emulsion.

Flammability

Non-combustible liquid.

Flammable Limits - Lower

Not applicable

Flammable Limits - Upper

Not applicable

10. STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions of storage and handling.

Hazardous Decomposition Products

Under the conditions set out in Section 5: Hazardous Combustion Products the release of gases including oxides of carbon and sulphur, are deemed to be within safe limits.

Hazardous Polymerization

Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information

Acute Oral Toxicity:

For the Concentrate: LD50 >5050 mg/kg

For the Mixed Fire Chemical: LD50 >5050 mg/kg

Acute Dermal Toxicity:

For the Concentrate: LD50 >2020 mg/kg

For the Mixed Fire Chemical: LD50 >2020 mg/kg

Primary Eye Irritation - Nonwashed Eyes:

For the Concentrate: Mildly irritating. Toxicity category IV. Irritation score: 5.3

For the Mixed Fire Chemical: Practically non-irritating. Toxicity category IV. Irritation score: 0.7

Primary Eye Irritation - Washed Eyes:

For the Concentrate: Minimally irritating. Toxicity category IV. Irritation score: 5.3

For the Mixed Fire Chemical: Practically non-irritating. Toxicity category IV. Irritation score: 1.3

Primary Dermal Irritation:

For the Concentrate: Slight irritant. Toxicity category III

For the Mixed Fire Chemical: Slight irritant. Toxicity category IV

Inhalation

Inhalation of vapours or mists may cause irritation to the mucous membranes and upper airways.

Ingestion

May cause irritation to the mouth, oesophagus and stomach. Symptoms may include nausea and vomiting.

Skin

May cause mild irritation in contact with the skin, which can result in redness, itchiness and possible dermatitis.

Eye

May cause transient eye irritation resulting in redness, swelling, stinging and lacrimation.

Chronic Effects

Prolonged or repeated exposure to this material may result in irritation to the skin, and aggravate existing respiratory disorders.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Anionic polyacrylamide has no systemic toxicity to aquatic organisms or micro-organisms.

Persistence / Degradability

Non-degraded anionic polyacrylamide has been shown to be recalcitrant to microbial degradation. This is probably related to the extremely high molecular weight which renders microbial attack very difficult. However, once the polymer has been degraded through photolysis (i.e., the action of UV light), and the macromolecule broken down into oligomers, it becomes bioavailable and is biomineralized.

Mobility

Not available

Bioaccumulative Potential

Anionic polyacrylamide has no potential to bioaccumulate, being completely soluble in water (only limited by viscosity) and insoluble in octanol.

Environmental Protection

This product is an A Class fire suppression and retarding liquid. The use of the product involves significant dilution with water (1:150 to 1:1500).

This product represents a low risk to the environment if it is used appropriately in a fire fighting scenario.

Acute Toxicity - Fish

LC50 (Brachydanio rerio) 96 hours: 178 - 357 mg/L

Test F242:OECD 203/GLP/report 21/12/1995

Acute Toxicity - Daphnia

EC50 (Daphnia magna) 48hr: 212 mg/L

Test F243:OECD 202/GLP/report 21/12/1995

Acute Toxicity - Algae

EC50A (I)/Chlorella vulgaris/ 96 hours: > 1,000 mg/L

EC50µ (I)/Chlorella vulgaris/ 96 hours: > 1,000 mg/L

No Observed Effect Concentration (NOEC): 708 mg/L

Test F244:OECD 201/GLP/report 21/12/1995

Acute Toxicity - Bacteria

EC10/Pseudomonas putida/18 hours: 127 mg/L

EC50/Pseudomonas putida/18 hours: 892 mg/L

Test F245:OECD 301F,DIN 38412-27,ISO 7027/GLP/report 21/12/1995

13. DISPOSAL CONSIDERATIONS

Disposal considerations

Dispose of waste, according to federal, EPA and state regulations. Assure conformity with all applicable regulations.

14. TRANSPORT INFORMATION

Transport Information

Not classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

U.N. Number

None Allocated

Proper Shipping Name

None Allocated

DG Class

None Allocated

Packing Group

None Allocated

DOT Proper Shipping Name

This product is not regulated for transportation.

DOT Packing Group

None allocated

DOT Class

None allocated

15. REGULATORY INFORMATION

Regulatory information

Not classified as Hazardous according to criteria of National Occupational Health & Safety Commission (NOHSC), Australia.

Not classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

This product is considered to be a non-hazardous chemical under the Hazard Communication Standard.

Poisons Schedule

Not Scheduled

16. OTHER INFORMATION

Date of preparation or last revision of MSDS

SDS SDS amendment: February 2015 Section 14

SDS amendment: August 2013

1. Identification of the substance/mixture and of the company/undertaking

2. Hazards identification

3. Composition/information on ingredients

6. Accidental release measures

9. Physical and chemical properties
12. Ecological information
16. Other information

MSDS Reviewed: March 2011
Supersedes: December 2008

References

Hazard Communication Standard.
ACGIH Threshold Limit Values.
NIOSH: Pocket Guide to Chemical Hazards.

Technical Contact Point

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END OF SDS

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Appendix E:

Cost Comparison of Aerial Fire Suppressants/Retardants

Cost Comparison for BlazeTamer380 against other Aerial Fire Suppressants/Retardants.

Product	Cost per litre concentrate or cost per Kg for powder concentrate	Recommended application rates	Cost per litre delivered typical helicopter application or light fuels by SEAT	Cost per litre delivered typical for SEAT application in moderate to heavy fuels	Cost per litre delivered heavy fuels or short term breaks (1-2 hours)	Cost per 1000 litres delivered typical helicopter application	Cost per 3000 litres delivered typical SEAT application	Comments
BlazeTamer380	1000L Tote \$19/L 20L Pail \$22/L	0.2% - 0.65%	Mix at 0.2% Tote price \$0.038 Pail price \$0.044	Mix at 0.4% Tote price \$0.076 Pail price \$0.088	Mix at 0.65% Tote price \$0.124 Pail price \$0.143	Tote Cost \$38 Pail Cost \$44	Tote Cost \$114 Pail Cost \$132	Price difference between totes and pails is due to packaging costs
Bushfire fighting foams	\$5.35/L Angas Forexpan-S	0.1% - 1.0%	Mix at 0.3% Cost \$0.015	Mix at 0.3% Cost \$0.0161	Not appropriate for short term breaks Mix at 0.3% Cost \$0.0161	\$16.10	\$48.30	Not appropriate for short term breaks for times greater than 15-30 minutes
Superabsorbent polymers Liquid Concentrate	Estimated cost only \$19/L	0.7% - 2.0%	Mix at 0.7% Cost \$0.133	Mix at 1.5% Cost \$0.285	Mix at 2.0% Cost \$0.38	Cost \$133	Cost \$855	Mix rate determined from D. Cant's CFS experience comparing product application rates
Retardant Powder "A"	Estimated cost only \$5.25 kg	Standard mix rate as specified 1 Kg yields 8.972 litres	Cost \$0.585	Cost \$0.585	Cost \$0.585	Not approved for helicopter tank use Cost \$585	Cost \$1755	Costs are estimates only. Note: Fixed mix rate indirect attack application
Retardant Liquid Concentrate "B"	Estimated cost only \$5.00/L	Standard mix rate as specified 1 litre yields 4.398 litres	Cost \$1.137	Cost \$1.137	Cost \$1.137	Not approved for helicopter tank use Cost \$1137	Cost \$3411	Costs are estimates only. Note: Fixed mix rate indirect Attack application