Environmental Protection Authority
Te Mana Rauhī Taiao

STAFF ADVICE

APP203594 – Foamstream V4

Substance database ID - 49336

August 2018

[redacted]

1. Executive Summary

1.1 Foamstream V4 is a foam concentrate enhancing the herbicidal properties of hot water. It is intended to be used in purpose-built machines to be delivered on target plants.

1.2 The applicant intends to import Foamstream V4 and supply it to professional users.

1.3 Foamstream V4 has the following hazard classifications: 6.3B, 8.3A and 9.1D.

1.4 With controls in place, the risks to human health and the environment are negligible.

2. Application Context

Background

2.1 Foamstream V4 is a soluble concentrate containing sugars of decyloctylglycosides [redacted] and C_{10} to C_{16} chain length even-numbered alkyl glycosides [redacted] as the surfactant foaming agents, plus other components. It is intended for use as a herbicide for the control of weeds, moss, and algae in publicly accessible areas such as cobble and streets, pavements, monuments, street furniture, parks, schools, waterways (waste water site filter-beds, clean water sites), and artificial surfaces (astro-turf and rubber playgrounds/ pitches).

2.2 The sugars of decyloctylglycosides and C_{10} to C_{16} chain length even-numbered alkyl glycosides are the “active components” in Foamstream V4 because of their properties as surfactant foaming agents. They generate a foam during the application process (delivered by a purpose-built machine, the foam itself contains 0.5% of Foamstream V4), which in combination with a jet of hot water, blankets the weeds thus exposing them to heat for a longer period than without the foam.

2.3 Foamstream V4 has herbicidal properties through a non-toxic mode of action. The herbicidal effect comes from the prolonged heat of the foam.

2.4 The composition of Foamstream V4 is considered confidential by the applicant.

2.5 A category A assessment of Foamstream V4 is appropriate because there are no reference substances to process this application as a rapid. A category A is proposed because a qualitative risk assessment is deemed sufficient given the use pattern, the non-toxic mode of action, the non-dispersive way Foamstream V4 will be applied and the high dilution factor of the applied substance.

Surfactant foaming agents

2.6 To allow evaluation of Foamstream V4, key aspects of decyloctylglycosides and C_{10} to C_{16} chain length even-numbered alkyl glycosides regulation have been summarised below.

Regulatory status

Table 1 Surfactant foaming agents' regulatory status

Name	Regulatory status and history in New Zealand	International regulatory status and history (Australia, Canada, Europe, Japan, USA)
Decyloctylglycosides (CAS 68515-73-1)	Approved HSR003148	Approved in Europe, Canada, Australia, Japan and the USA
C_{10} to C_{16} chain length even-numbered alkyl glycosides (CAS 110615-47-9)	Not classified as hazardous in New Zealand	Approved in Europe, Canada, Australia, Japan and the USA

2.7 The surfactant "decyloctylglycosides" has previously been approved in New Zealand for use in the formulation of a pesticide or veterinary medicine. It has also been approved internationally. In Europe it can be found in the following products: washing & cleaning products, fertilisers, and plant protection products (information from European Chemicals Agency, ECHA).

2.8 The surfactant "C_{10} to C_{16} chain length even-numbered alkyl glycosides" has no hazardous classification in New Zealand. In Europe it can be found in the following products: washing & cleaning products and plant protection products (information from ECHA).

2.9 The Pesticide Management Regulatory Agency (Canada), European authorities (Denmark, Finland, Poland, Switzerland and United Kingdom), the Washington EPA and the California EPA have exempted Foamstream V4 from registration.

Physical form and use pattern

2.10 Foamstream V4 is formulated as a soluble concentrate.

2.11 Foamstream V4 is delivered by a purpose-built machine. This machine delivers foam on the target plants by means of specialised applicator heads and heats up the foam at 95-110 °C.

2.12 Foamstream V4 concentrate is loaded in the machine and is diluted to deliver a 0.5% foam spray. The Foamstream V4 contributes to generating a stable foam onto the target, thus acting as a foam blanket to entrap the hot water around the weed for much longer than plain hot water. This results in a higher kill rate for the target weeds. The heat in the hot water is responsible for killing the weeds, whilst Foamstream V4 merely acts as an insulator to retain the heat.

2.13 The intended use of Foamstream V4 is as a herbicide on a variety of public spaces. The use pattern is summarised in Table 2.

Table 2 Summary of use pattern for Foamstream V4

Substance category	Wide dispersive use?	Home use?	Concentration	Application rate(s)	Remarks
Biocide	Yes ☐ No ☒	Yes ☐ No ☒	The foam is diluted to 0.5%	NA	

3. Hazard Assessment

Hazard classification of Foamstream V4

3.1 The hazard classifications of Foamstream V4 determined by the EPA staff are: 6.3B, 8.3A and 9.1D. Table 3 shows the method used for classification and indicates the main component that contributes to each hazard classification.

3.2 The EPA staff classification of Foamstream V4 differed from that of the applicant in that it has an additional 9.1D classification. This is because the intended use of Foamstream V4 is as a biocide.

Table 3 Hazard classification of Foamstream V4

Hazard Class/Subclass	Mixture classification		Method of classification			Remarks
	Applicant's classification	EPA classification	Mixture data	Read across	Mixture rules[1]	
Class 1 Explosiveness	NA	No	☐	☐	☒	
Class 2, 3 & 4 Flammability	NA	No	☐	☐	☒	
Class 5 Oxidisers/Organic Peroxides	NA	ND	☐	☐	☒	
8.1 Metallic corrosiveness	NA	ND	☐	☐	☒	
6.1 Acute toxicity (oral)	NA	No	☐	☐	☒	
6.1 Acute toxicity (dermal)	NA	No	☐	☐	☒	
6.1 Acute toxicity (inhalation)	NA	ND	☐	☐	☒	
6.1 Aspiration hazard	NA	ND	☐	☐	☒	
6.3 Skin irritancy	6.3B	6.3B	☐	☐	☒	Citric acid
8.3 Eye corrosion	8.3A	8.3A	☐	☐	☒	Decyloctylglycosides, C_{10} to C_{16} chain length even-numbered alkyl glycosides and citric

Hazard Class/Subclass	Mixture classification		Method of classification			Remarks
	Applicant's classification	EPA classification	Mixture data	Read across	Mixture rules[1]	
						acid, see comment in section 3.3
6.5A Respiratory sensitisation	NA	ND	☐	☐	☒	
6.5B Contact sensitisation	NA	ND	☐	☐	☒	
6.6 Mutagenicity	NA	ND	☐	☐	☒	
6.7 Carcinogenicity	NA	ND	☐	☐	☒	
6.8 Reproductive/ developmental toxicity	NA	ND	☐	☐	☒	
6.8 Reproductive/ developmental toxicity (via lactation)	NA	ND	☐	☐	☒	
6.9 Target organ systemic toxicity	NA	ND	☐	☐	☒	
9.1 Aquatic ecotoxicity	NA	9.1D	☐	☐	☐	Classification is based on the biocidal action of the substance
9.2 Soil ecotoxicity	NA	ND	☐	☐	☒	
9.3 Terrestrial vertebrate ecotoxicity	NA	ND	☐	☐	☒	
9.4 Terrestrial invertebrate ecotoxicity	NA	ND	☐	☐	☒	

-: No information provided by the applicant

NA: Not Applicable. For instance, testing for a specific endpoint may be omitted if it is technically not possible to conduct the study as a consequence of the properties of the substance e.g. highly volatile, highly reactive or unstable substances cannot be tested; mixing of the substance with water may cause danger of fire or explosion; or the radio-labelling of the substance required in certain studies may not be possible.

ND: Not Determined. Data were unavailable for one or more components.

No: Data are available for the formulation or for all components and classification is not triggered.

[1] Use of mixture rules may not adequately take into account interactions between different components in some circumstances and must be considered of lower reliability than data on the mixture itself.

[2] Klimisch, H-J., Andrear, M., & U. Tillmann, 1997. A systematic approach for evaluating the quality of experimental toxicological and ecotoxicological data. Reg. Toxicol. Pharmacol. 25, 1–5 (1997)

3.3 The EPA database contains very little information on the two surfactant foaming agents in Foamstream V4, therefore the classification is based on the Safety Data Sheets of the surfactants which have been cross-referenced to data available on ECHA.

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4. Risk Assessment

Human health risk assessment

4.1 Foamstream V4 is intended to be supplied to the professional markets. Users are expected to load the substance in the machine (the machine dilutes the substance in hot water) and apply the diluted substance (the foam) using specialised spray equipment. It is likely that users will be exposed to the substance during loading of Foamstream V4 in the machine and to the diluted foam when applying the substance. The public could also be exposed to the foam.

Skin irritancy (6.3B)

4.2 It is **likely** that skin exposure may occur during the loading of this substance by the users, but any effect is expected to be minor and reversible. The prescribed HSW (HS) requirements include requirements for Personal Protective Equipment (PPE) and as such the risk from the skin irritancy hazard for users is assessed to be **negligible**.

4.3 It is **likely** that skin exposure may occur if members of the public are in contact with the foam, but any effect is expected to be **negligible** because the foam is diluted so that it is no longer irritant.

Eye corrosivity (8.3A)

4.4 It is **unlikely** that eye exposure may occur during the loading of this substance by the users, and any effect is expected to be **major and irreversible**. The prescribed HSW (HS) requirements include requirements for PPE and as such the residual risk from the eye corrosivity hazard has been assessed as being **negligible**.

Environmental risk assessment

4.5 Foamstream V4 is intended for use as a herbicide for the control of weeds, moss, and algae in publicly accessible areas such as cobble and streets, pavements, monuments, street furniture, parks, schools, waterways (waste water site filter-beds, clean water sites), and artificial surfaces (astro-turf and rubber playgrounds/ pitches).

Biocidal effect

4.6 It is **unlikely** that non-target organisms will be exposed to Foamstream V4, because the application by means of specialised applicator heads will minimize spray drift, run off and exposure of non-target sensitive areas.

4.7 Once applied, Foamstream V4 quickly loses its biocidal properties with the cooling down of the foam. Furthermore, the surfactant foaming agents and other components of Foamstream V4 are all rapidly degradable, therefore, should the diluted substance enter waterways or other environmental compartments, no significant effect on aquatic organisms, soil-dwelling organisms, and terrestrial vertebrates and invertebrates is expected.

4.8 It is unlikely that the foam, once applied to weeds, will be attractive to bees, other pollinators or other non-target organisms because the sugars in the foam are diluted to 0.5%.

4.9 The prescribed controls include requirements to avoid adverse effects to the environment beyond the application area (Clause 46 of the HPC Notice) and to not apply the substance to water (Clause 52 of the HPC Notice).

4.10 The application of Foamstream V4 by a purpose-built machine is key in reducing the exposure to the environment. It is therefore necessary to apply an additional control to restrict the use of Foamstream V4 to the appropriate equipment (Clause 47 of the HPC Notice): the Foamstream Municipal machine.

Risk assessment conclusion

4.11 Risks during other phases of the lifecycle are also mitigated by the prescribed controls.

4.12 With the proposed controls in place, the residual risks of the use of Foamstream V4 are negligible.

5. Controls

Prescribed controls

5.1 The hazard classifications of Foamstream V4 determine a set of prescribed controls specified by the EPA Notices. There are also requirements in the Health and Safety at Work (Hazardous Substance, HSW (HS)) Regulations under the HSW Act.

5.2 The prescribed controls set the baseline for how the substance should be managed and include specifications on how the substance is to be packaged, labelled, stored, disposed of, transported, handled and used. The prescribed controls also set information requirements (eg Safety Data Sheets), signage and emergency management.

Labelling and identification

5.3 The name and concentration of the following components need to be specified on the label and SDS:

Table 4 List of components requiring identification

Label	SDS
Citric acid (8.3A)	Citric acid (8.3A)
D-Glucopyranose, oligomeric, decyl octyl glycosides (8.3A)	D-Glucopyranose, oligomeric, decyl octyl glycosides (8.3A)
D-Glucopyranose, oligomeric, C10-16-alkyl glycosides (8.3A)	D-Glucopyranose, oligomeric, C10-16-alkyl glycosides (8.3A)

Exposure limits

5.4 No TEL (Tolerable Exposure Limit) has been set because it is considered that exposure to this substance is not likely to result in an appreciable toxic effect to people, provided conditions of use are followed.

5.5 No Environmental Exposure Limit (EEL) values have been set previously for the surfactant foaming agents in Foamstream V4. Exposure to the environment is not expected, provident conditions of use are followed.

Maximum application rate

5.6 No maximum application rate is required because this substance is not used in a wide dispersive way.

Additional controls

Equipment

5.7 This substance must only be applied with the Foamstream Municipal machine.

6. Conclusion

6.1 After taking into account the prescribed controls and any variations to these controls, it was concluded that the residual level of risk of any potentially significant adverse effects is negligible.