

# Tag® G2

Lonza NZ Limited

Chemwatch: 5377-59

Version No: 3.1.1.1

Safety Data Sheet according to HSNO Regulations

Chemwatch Hazard Alert Code: 3

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L.GHS.NZLEN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

Product name	Tag® G2
Synonyms	Not Available
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains 3-amino-1,2,4-triazole, oxyfluorfen, terbuthylazine and glyphosate acid)
Other means of identification	Not Available

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Herbicide. Use according to manufacturer's directions.
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### Details of the supplier of the safety data sheet

Registered company name	Lonza NZ Limited
Address	13-15 Hudson Road Bell Block New Plymouth 4312 New Zealand
Telephone	+64 6 755 9234
Fax	+64 6 755 1174
Website	www.lonza.co.nz
Email	office-newplymouth@lonza.com

### Emergency telephone number

Association / Organisation	Lonza NZ Limited
Emergency telephone numbers	0800 243 622
Other emergency telephone numbers	+64 4 917 9888 (International)

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

Classification [1]	Acute Toxicity (Oral) Category 5, Acute Toxicity (Dermal) Category 5, Acute Toxicity (Inhalation) Category 5, Eye Irritation Category 2, Reproductive Toxicity Category 2, Specific target organ toxicity - single exposure Category 2, Specific target organ toxicity - repeated exposure Category 2, Chronic Aquatic Hazard Category 1, Acute Terrestrial Hazard Category 1, Acute Vertebrate Hazard Category 3
Legend:	1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI
Determined by Chemwatch using GHS/HSNO criteria	6.1E (dermal), 6.1E (inhalation), 6.1E (oral), 6.4A, 6.8B, 6.9B, 9.1A, 9.2A, 9.3C

### Label elements

Hazard pictogram(s)	
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SIGNAL WORD	<b>WARNING</b>
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### Hazard statement(s)

H303	May be harmful if swallowed.
H313	May be harmful in contact with skin.
H333	May be harmful if inhaled.
H319	Causes serious eye irritation.
H361	Suspected of damaging fertility or the unborn child.
H371	May cause damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.
H421	Very toxic to the soil environment

Continued...

H433	Harmful to terrestrial vertebrates.
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**Precautionary statement(s) Prevention**

P201	Obtain special instructions before use.
P260	Do not breathe mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P270	Do not eat, drink or smoke when using this product.

**Precautionary statement(s) Response**

P391	Collect spillage.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P312	IF INHALED: Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
P308+P311	IF exposed or concerned: Call a POISON CENTER/doctor/physician/first aider.
P337+P313	If eye irritation persists: Get medical advice/attention.

**Precautionary statement(s) Storage**

P405	Store locked up.
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**Precautionary statement(s) Disposal**

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS****Substances**

See section below for composition of Mixtures

**Mixtures**

CAS No	%[weight]	Name
5915-41-3	25-35	<u>terbutylazine</u>
61-82-5	1-10	<u>3-amino-1,2,4-triazole</u>
1071-83-6	1-<3	<u>glyphosate acid</u>
42874-03-3	1-3	<u>oxyfluorfen</u>
Not Available	balance	Ingredients determined not to be hazardous

**SECTION 4 FIRST AID MEASURES****Description of first aid measures**

<b>Eye Contact</b>	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with fresh running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Seek medical attention without delay; if pain persists or recurs seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<b>Skin Contact</b>	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately remove all contaminated clothing, including footwear.</li> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▶ <b>IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.</b></li> <li>▶ For advice, contact a Poisons Information Centre or a doctor.</li> <li>▶ Urgent hospital treatment is likely to be needed.</li> <li>▶ In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.</li> <li>▶ If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist.</li> <li>▶ If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.</li> </ul> <p><b>Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:</b></p> <ul style="list-style-type: none"> <li>▶ <b>INDUCE</b> vomiting with fingers down the back of the throat, <b>ONLY IF CONSCIOUS</b>. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> </ul> <p><b>NOTE:</b> Wear a protective glove when inducing vomiting by mechanical means.</p>

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

For triazines:

Clinical effects:

Nausea, vomiting, diarrhoea, abdominal pain and a burning sensation in the mouth. However, due to the lack of clinical data serious effects cannot be excluded from large dose deliberate ingestions.

In the case of products with organic solvents, aspiration can develop. Ataxia, anorexia, dyspnoea and muscle spasms have all been reported in animal studies but have not been seen in humans.

Management principles:

Ingestion:

- ▶ In most cases there is probably no need for anything other than oral fluids and reassurance. If a very large amount has been ingested then consider: adult: gastric lavage (with a cuffed endotracheal tube if an organic solvent is involved) followed by 50 g activated charcoal, child: 1 g/kg activated charcoal.
- ▶ Do not induce vomiting if product contains an organic solvent.
- ▶ Observe the patient if a large dose has been ingested.
- ▶ Symptomatic and supportive care.

Inhalation:

- ▶ Remove to fresh air. Give oxygen if necessary.
- ▶ Bronchodilators may be given if indicated. Otherwise treat for the particular solvent involved.

Skin:

- ▶ Wash with copious amounts of water and prevent drying/cracking (due to solvent) with an emollient

Eye:

- ▶ Irrigate for 15 to 20 minutes with running water or saline.
- ▶ Refer to an ophthalmologist.

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## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

The product contains a substantial proportion of water, therefore there are no restrictions on the type of extinguishing media which may be used. Choice of extinguishing media should take into account surrounding areas.

Though the material is non-combustible, evaporation of water from the mixture, caused by the heat of nearby fire, may produce floating layers of combustible substances.

In such an event consider:

- ▶ foam.
- ▶ dry chemical powder.
- ▶ carbon dioxide.

### Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	None known.
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### Advice for firefighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Use water delivered as a fine spray to control fire and cool adjacent area.</li> <li>▶ Avoid spraying water onto liquid pools.</li> <li>▶ <b>DO NOT</b> approach containers suspected to be hot.</li> <li>▶ Cool fire exposed containers with water spray from a protected location.</li> <li>▶ If safe to do so, remove containers from path of fire.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Combustible.</li> <li>▶ Slight fire hazard when exposed to heat or flame.</li> <li>▶ Heating may cause expansion or decomposition leading to violent rupture of containers.</li> <li>▶ On combustion, may emit toxic fumes of carbon monoxide (CO).</li> <li>▶ May emit acrid smoke.</li> <li>▶ Mists containing combustible materials may be explosive.</li> </ul> <p>Combustion products include: carbon dioxide (CO<sub>2</sub>) hydrogen chloride phosgene nitrogen oxides (NO<sub>x</sub>) other pyrolysis products typical of burning organic material.</p>

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<p>Environmental hazard - contain spillage.</p> <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> <li>▶ Control personal contact with the substance, by using protective equipment.</li> <li>▶ Contain and absorb spill with sand, earth, inert material or vermiculite.</li> <li>▶ Wipe up.</li> <li>▶ Place in a suitable, labelled container for waste disposal.</li> </ul>
<b>Major Spills</b>	<p>Environmental hazard - contain spillage.</p> <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by all means available, spillage from entering drains or water courses.</li> <li>▶ Consider evacuation (or protect in place).</li> <li>▶ No smoking, naked lights or ignition sources.</li> </ul>

- ▶ Increase ventilation.
- ▶ Stop leak if safe to do so.
- ▶ Water spray or fog may be used to disperse / absorb vapour.
- ▶ Contain or absorb spill with sand, earth or vermiculite.
- ▶ Collect recoverable product into labelled containers for recycling.
- ▶ Collect solid residues and seal in labelled drums for disposal.
- ▶ Wash area and prevent runoff into drains.
- ▶ After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- ▶ If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ <b>DO NOT allow clothing wet with material to stay in contact with skin</b></li> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> <li>▶ <b>DO NOT enter confined spaces until atmosphere has been checked.</b></li> <li>▶ Avoid smoking, naked lights or ignition sources.</li> <li>▶ Avoid contact with incompatible materials.</li> <li>▶ When handling, <b>DO NOT eat, drink or smoke.</b></li> <li>▶ Keep containers securely sealed when not in use.</li> <li>▶ Avoid physical damage to containers.</li> <li>▶ Always wash hands with soap and water after handling.</li> <li>▶ Work clothes should be laundered separately.</li> <li>▶ Use good occupational work practice.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> <li>▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.</li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ No smoking, naked lights or ignition sources.</li> <li>▶ Store in a cool, dry, well-ventilated area.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ Protect containers against physical damage and check regularly for leaks.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this SDS.</li> </ul>

### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ Polyethylene or polypropylene container.</li> <li>▶ Packing as recommended by manufacturer.</li> <li>▶ Check all containers are clearly labelled and free from leaks.</li> </ul>
<b>Storage incompatibility</b>	<ul style="list-style-type: none"> <li>▶ Avoid reaction with oxidising agents</li> </ul>

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
New Zealand Workplace Exposure Standards (WES)	3-amino-1,2,4-triazole	Amitrole (3-Amino-1,2,4-triazole)	0.2 mg/m <sup>3</sup>	Not Available	Not Available	Not Available

#### EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
3-amino-1,2,4-triazole	Amitrole	0.6 mg/m <sup>3</sup>	23 mg/m <sup>3</sup>	220 mg/m <sup>3</sup>

Ingredient	Original IDLH	Revised IDLH
terbuthylazine	Not Available	Not Available
3-amino-1,2,4-triazole	Not Available	Not Available
glyphosate acid	Not Available	Not Available
oxyfluorfen	Not Available	Not Available

#### OCCUPATIONAL EXPOSURE BANDING

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
terbuthylazine	E	≤ 0.01 mg/m <sup>3</sup>
glyphosate acid	E	≤ 0.01 mg/m <sup>3</sup>
oxyfluorfen	E	≤ 0.01 mg/m <sup>3</sup>

#### Notes:

Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

#### MATERIAL DATA

## Exposure controls

<p><b>Appropriate engineering controls</b></p>	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <ul style="list-style-type: none"> <li>▶ Employees exposed to confirmed human carcinogens should be authorized to do so by the employer, and work in a regulated area.</li> <li>▶ Work should be undertaken in an isolated system such as a "glove-box". Employees should wash their hands and arms upon completion of the assigned task and before engaging in other activities not associated with the isolated system.</li> <li>▶ Within regulated areas, the carcinogen should be stored in sealed containers, or enclosed in a closed system, including piping systems, with any sample ports or openings closed while the carcinogens are contained within.</li> <li>▶ Open-vessel systems are prohibited.</li> <li>▶ Each operation should be provided with continuous local exhaust ventilation so that air movement is always from ordinary work areas to the operation.</li> <li>▶ Exhaust air should not be discharged to regulated areas, non-regulated areas or the external environment unless decontaminated. Clean make-up air should be introduced in sufficient volume to maintain correct operation of the local exhaust system.</li> <li>▶ For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood. Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.</li> <li>▶ Except for outdoor systems, regulated areas should be maintained under negative pressure (with respect to non-regulated areas).</li> <li>▶ Local exhaust ventilation requires make-up air be supplied in equal volumes to replaced air.</li> <li>▶ Laboratory hoods must be designed and maintained so as to draw air inward at an average linear face velocity of 0.76 m/sec with a minimum of 0.64 m/sec. Design and construction of the fume hood requires that insertion of any portion of the employees body, other than hands and arms, be disallowed.</li> </ul>
<p><b>Personal protection</b></p>	
<p><b>Eye and face protection</b></p>	<ul style="list-style-type: none"> <li>▶ Safety glasses with side shields.</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]</li> </ul>
<p><b>Skin protection</b></p>	<p>See Hand protection below</p>
<p><b>Hands/feet protection</b></p>	<ul style="list-style-type: none"> <li>▶ Wear chemical protective gloves, e.g. PVC.</li> <li>▶ Wear safety footwear or safety gumboots, e.g. Rubber</li> </ul> <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p> <p>Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:</p> <ul style="list-style-type: none"> <li>· frequency and duration of contact,</li> <li>· chemical resistance of glove material,</li> <li>· glove thickness and</li> <li>· dexterity</li> </ul> <p>Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).</p> <ul style="list-style-type: none"> <li>· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.</li> <li>· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.</li> <li>· Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.</li> <li>· Contaminated gloves should be replaced.</li> </ul> <p>As defined in ASTM F-739-96 in any application, gloves are rated as:</p> <ul style="list-style-type: none"> <li>· Excellent when breakthrough time &gt; 480 min</li> <li>· Good when breakthrough time &gt; 20 min</li> <li>· Fair when breakthrough time &lt; 20 min</li> <li>· Poor when glove material degrades</li> </ul> <p>For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.</p> <p>It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.</p> <p>Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.</p> <p>Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:</p> <ul style="list-style-type: none"> <li>· Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.</li> <li>· Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential</li> </ul> <p>Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p>
<p><b>Body protection</b></p>	<p>See Other protection below</p>

**Other protection**

- ▶ Overalls.
- ▶ P.V.C. apron.
- ▶ Barrier cream.
- ▶ Skin cleansing cream.
- ▶ Eye wash unit.

**Recommended material(s)****GLOVE SELECTION INDEX**

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

Tag® G2

Material	CPI
PE/EVAL/PE	A

\* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

**NOTE:** As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

\* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

**Respiratory protection**

Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A-AUS	-	A-PAPR-AUS / Class 1
up to 50 x ES	-	A-AUS / Class 1	-
up to 100 x ES	-	A-2	A-PAPR-2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES****Information on basic physical and chemical properties**

<b>Appearance</b>	Light brown liquid with a faint odour; mixes with water.		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	1.03-1.06
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	Not Available
<b>pH (as supplied)</b>	3.5-4.5	<b>Decomposition temperature</b>	Not Available
<b>Melting point / freezing point (°C)</b>	Not Available	<b>Viscosity (cSt)</b>	Not Available
<b>Initial boiling point and boiling range (°C)</b>	100	<b>Molecular weight (g/mol)</b>	Not Applicable
<b>Flash point (°C)</b>	>100	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Available	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	Not Available	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	Not Available	<b>Volatile Component (%vol)</b>	Not Applicable
<b>Vapour pressure (kPa)</b>	Not Available	<b>Gas group</b>	Not Available
<b>Solubility in water</b>	Miscible	<b>pH as a solution (1%)</b>	Not Available
<b>Vapour density (Air = 1)</b>	Not Available	<b>VOC g/L</b>	Not Applicable

**SECTION 10 STABILITY AND REACTIVITY**

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> </ul>
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7

<b>Incompatible materials</b>	See section 7
<b>Hazardous decomposition products</b>	See section 5

## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

<b>Inhaled</b>	Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.
<b>Ingestion</b>	Accidental ingestion of the material may be damaging to the health of the individual.
<b>Skin Contact</b>	<p>Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.</p> <p>Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis. Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
<b>Eye</b>	Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.
<b>Chronic</b>	<p>Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>Exposure to the material may cause concerns for humans owing to possible developmental toxic effects, generally on the basis that results in appropriate animal studies provide strong suspicion of developmental toxicity in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of other toxic effects. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p>

<b>Tag® G2</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Not Available	Not Available
<b>terbuthylazine</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (rat) LD50: >3000 mg/kg <sup>[2]</sup>	Skin (rabbit): non-irritating *
	Inhalation (rat) LC50: >3.51 mg/l/4h <sup>[2]</sup>	
	Oral (rat) LD50: 1590-2000 mg/kg <sup>[2]</sup>	
<b>3-amino-1,2,4-triazole</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
	Oral (rat) LD50: 1100 mg/kg <sup>[2]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
<b>glyphosate acid</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: 2000 mg/kg <sup>[2]</sup>	Not Available
	Inhalation (rat) LC50: >12.2 mg/l/4h <sup>[2]</sup>	
	Oral (rat) LD50: 3860 mg/kg <sup>[2]</sup>	
<b>oxyfluorfen</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50: >10000 mg/kg <sup>[2]</sup>	Eye (rabbit): mild to moderate *
	Oral (rat) LD50: 5000 mg/kg <sup>[2]</sup>	Skin (rabbit): mild *
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

<b>TERBUTHYLAZINE</b>	Oral (rat) LD50: 1590->2000 mg/kg * Eye (rabbit): non-irritant * NOEL (12 months) for dogs 0.4 mg/kg daily; (lifetime) rats 0.35 mg/kg daily (2 years) for mice 16.8 mg/kg Toxicity Class WHO II; EPA III ADI: 0.002 mg/kg/day NOEL: 5 mg/kg/day
<b>3-AMINO-1,2,4-TRIAZOLE</b>	<p>The substance is classified by IARC as Group 3:  <b>NOT</b> classifiable as to its carcinogenicity to humans.  Evidence of carcinogenicity may be inadequate or limited in animal testing.  Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen  [National Toxicology Program: U.S. Dep. of Health &amp; Human Services 2002]  Foetotoxicity, foetolethality, specific developmental abnormalities (endocrine system) recorded. ADI: 0.003 mg/kg/day NOEL: 0.025 mg/kg/day</p>
<b>GLYPHOSATE ACID</b>	Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an

irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

For ATMP (aminotris(methylenephosphonic acid) and its salts:

ATMP acid, Na salt and 6Na salts cause serious eye irritation whereas ATMP.2Na to 5Na salts are not classified for eye irritation.

Low pH (<2) would predict that ATMP acid should be severely irritant or corrosive to skin as well as eyes, however available existing animal data indicating non-classification take precedence in accordance with EU regulation (EC) 1272/2008 criteria

ATMP acid and some of its sodium salts may cause corrosion to metals to varying degrees dependent upon the pH/degree of neutralization.

Acute Toxicity: Oral/ inhalation/ dermal

Not classified for acute toxicity, based on available studies results on oral and dermal routes of exposure.

In the rat, ATMP is poorly absorbed from the gut and rapidly eliminated after oral and i.v. administration. Elimination is primarily via the faeces following oral dosing with urine predominating after i.v. dosing. These differences demonstrate clear differences in systemic disposition of ATMP after enteral or parenteral administration. Bone is the only tissue that exhibits deposition of test substance-derived radioactivity, however this is unlikely to occur to any biologically significant extent in view of the low level of uptake reported.

ATMP is of low acute toxicity in mammals. The acute oral LD50 is 2910 mg/kg while the dermal LD50 is >6310 mg/kg. The tetrasodium salt of ATMP was of lower toxicity with an oral LD50 of ~8610 mg/kg and a dermal LD50 of >5740 mg/kg. The pentasodium salt (20592-85-2) was of lower oral toxicity (7120 mg/kg) and dermal toxicity (>6320 mg/kg).

Irritation / corrosion: Skin/Eye

Based on available data, ATMP.4Na salt may be a mild irritant and 5Na may be slightly irritating to the skin, not resulting in classification.

ATMP acid, Na and 6Na salts cause serious eye irritation.

ATMP.2Na to 5Na salts are not classified for eye irritation. The tetra- and pentasodium salts of ATMP are mildly irritating.

ATMP can be considered to be non-irritating to the skin. The tetra- and pentasodium salts of ATMP induced very slight skin irritation responses.

Sensitisation Not classified for skin sensitization, based on animal data and human exposure reports (ATMP salts are not classified by analogy with ATMP acid).

Toxicity after repeated exposure: Oral/ inhalation/ dermal

Not classified for toxicity after repeated exposure, based on ATMP acid studies results.

Repeated exposure in the diet to 500 mg/kg bw/day of the acid for 2 years resulted in no toxicological effects of concern. The systemic NOAEL for this good quality study conducted to OECD guideline 453 is therefore considered to be >500 mg/kg bw/day. Information available on the tetrasodium salt is less robust but similarly indicates that it is of low oral toxicity following repeat exposure with a NOAEL of >600 mg active acid/kg bw/day derived from a 28 day study or >175 mg/kg bw/d derived from a 90 day study.

Genotoxicity / Mutagenicity Not classified either for mutagenicity or genotoxicity.

Neither the acid nor the salt induced gene mutations in bacteria. ATMP.6Na salt did not induce chromosome damage

either *in vitro* or *in vivo* and ATMP and its salts do not have any structural alerts for genotoxic activity.

Neither the acid nor a sodium salt induced gene mutations in bacteria. ATMP induced gene mutations in mouse lymphoma cells but this effect was not seen when a neutralized test solution was tested up to the solubility limit and is therefore considered to be an artefact of pH. The pentasodium salt of ATMP did not induce chromosome damage either *in vitro* or *in vivo*. Both the acid and the salts are therefore considered to lack genotoxic potential. This is confirmed by a carcinogenicity study.

Carcinogenicity Not classified for carcinogenicity.

ATMP was not carcinogenic to rats treated with dose levels up to 500 mg/kg in the diet for 24 months

ATMP sodium salts are not expected to be carcinogenic; by analogy with ATMP acid studies results.

Toxicity for reproduction ATMP acid is not toxic for reproduction, based on rats three-generation study. By analogy, ATMP salts are not expected to have a toxic effect neither on fertility nor on development.

ATMP is not selectively toxic to the male or female reproductive system, with a NOAEL of 275 mg/kg bw/day for males and 310 mg/kg bw/day for females. While no reproductive toxicity data were located for the salts, physico-chemical considerations suggest these will resemble those of the parent acid. ATMP and its salts are not fetotoxic or teratogenic in the rat or mouse with a consistent NOAEL of 1000 mg/kg body weight/day in both species.

Overall the NOAEL for ATMP is > 500 mg/kg bw/day, based on a chronic toxicity study

For phosphonic acid and its salts:

Phosphonic acids and their salts have not been shown to induce skin sensitisation in guinea pigs. None of the studies however follow OECD guidelines or were GLP compliant. However, only the investigation on the disodium salt of HEDP was recorded to a standard sufficient to support the robustness and reliability of the study design and conduct. Most studies were not reported in great detail, but they stated the adherence to well established protocol such as Buehler or Magnusson and Kligman. The information available provided, however, a coherent picture in that these compounds should not be considered skin sensitizers.

The acids or salts of ATMP, HEDP and DTPMP did not show any carcinogenic activity when tested in rodents.

The effects of ATMP acid and its salts on the reproductive system can be evaluated on the basis of a well conducted 3-generation reproductive toxicity study. Although the study predated current guidelines (*e.g.*, no evaluation of the oestrus cycle, sperm parameters and developmental milestones), the overall evidence suggests that ATMP acid and its salts are not selectively toxic to the male or female reproductive system. The absence of effects on the reproductive organs in well conducted subchronic and chronic toxicity studies with ATMP provides further support to this assessment. On the basis of a 3-generation reproductive toxicity study and also a well conducted FDA segment II study, there is further no evidence for foetotoxic or teratogenic effects of ATMP. In the absence of any guideline compliant reproductive toxicity studies, the reproductive toxicity of HEDP acid can be evaluated on the basis of subchronic oral feeding studies in rats and dogs which did not reveal any effects on the reproductive system at exposures up to 1500-1800 mg/kg bw/d. There were also no effects on fertility (*i.e.*, indicated by the pregnancy rate) of the disodium salt of HEDP when fed at doses up to 447 mg/kg bw/d to rats in a 2-generation study. The reproductive toxicity of DTPMP acid and its salts can be evaluated on the basis of a well conducted 2-generation study in which Long Evan rats fed with DTPMP containing diet at levels up to 312 mg acid/kg bw/d. Although in this study, some alterations were observed with regard to a lower pregnancy rate in F2 (*i.e.*, not statistically significant) and reduced pup body weight in F2a (*i.e.*, statistically significant), these effects were not considered to be of biological significance as they were either not observed in F1 or could not be replicated in F2b. The absence of effects on the reproductive system could further be confirmed in an OECD guideline compliant subchronic toxicity study.

Generally, from a structure activity standpoint, none of the phosphonates possess structural elements that indicate the potential for genotoxicity.

Neither ATMP acid nor the salt induced gene mutations in bacterial systems. When testing ATMP acid in the acid form, it induced dose-dependent gene mutations in mouse lymphoma cells. However, this positive result was demonstrated to be an artefact of pH which was not observed when neutralized ATMP acid was tested in the *in vitro* mouse lymphoma assay up to the solubility limit. The pentasodium salt of ATMP did not induce chromosome damage either *in vitro* or *in vivo*.

The available data on *in vivo* and *in vitro* genotoxicity of HEDP and its salts indicate no potential of HEDP and its salts to cause mutagenicity in bacterial mutagenicity assays. Conflicting results were obtained in an *in vitro* mouse lymphoma assay. In this assay, a dose-dependent positive response was seen in the presence of metabolic activation which was, however, discounted because of high control values.

Both, DTPMP acid and the salt were negative in well performed and guideline compliant bacterial mutagenicity assays. DTPMP acid was further negative for gene mutations at the HPRT locus in CHO cells. Similarly to HEDP acid, the evidence for mutagenic potential is conflicting. While the salt of DTPMP was negative for mammalian gene mutations, DTPMP acid, even when neutralised, induced mutations at the thymidine kinase locus in mouse lymphoma L5178Y cells. Since pH effect has been excluded and increased osmolality is an unlikely cause (positive response was only seen in presence of S9 mix), it is possible that chelation of essential ions may have caused the positive response in the presence of S9. Iron chelation appears to play a role in contributing to positive responses in the mouse lymphoma assay.

HERA (Human and Environmental Risk Assessment on ingredients of European household cleaning products) - Phosphonates

Oral bisphosphonates (given in certain medical treatments) can give stomach upset and inflammation and erosions of the esophagus, which is the main problem of oral N-containing preparations. This can be prevented by remaining seated upright for 30 to 60 minutes after taking the medication. Intravenous bisphosphonates can give fever and flu-like symptoms after the first infusion, which is thought to occur because of their



	<p>potential to activate human T cells. Notably, these symptoms do not recur with subsequent infusions. There is a slightly increased risk for electrolyte disturbances, but not enough to warrant regular monitoring. In chronic renal failure, the drugs are excreted much slower, and dose adjustment is required. Bisphosphonates have been associated with osteonecrosis of the jaw; with the mandible twice as frequently affected as the maxilla and most cases occurring following high-dose intravenous administration used for some cancer patients. Some 60% of cases are preceded by a dental surgical procedure and it has been suggested that bisphosphonate treatment should be postponed until after any dental work to eliminate potential sites of infection. A number of cases of severe bone, joint, or musculoskeletal pain have been reported, prompting labeling changes.</p> <p>Bisphosphonates are incorporated into the bone matrix, from where they are gradually released over periods of weeks to years. The extent of bisphosphonate incorporation into adult bone, and hence, the amount available for release back into the systemic circulation, is directly related to the total dose and duration of bisphosphonate use. Although there are no data on foetal risk in humans, bisphosphonates do cause foetal harm in animals, and animal data suggest that uptake of bisphosphonates into foetal bone is greater than into maternal bone. Therefore, there is a theoretical risk of foetal harm (e.g., skeletal and other abnormalities) if a woman becomes pregnant after completing a course of bisphosphonate therapy. The impact of variables such as time between cessation of bisphosphonate therapy to conception, the particular bisphosphonate used, and the route of administration (intravenous versus oral) on this risk has not been established.</p> <p>The non-nitrogenous bisphosphonates (disphosphonates) are metabolised in the cell to compounds that compete with adenosine triphosphate (ATP) in the cellular energy metabolism. The osteoclast initiates apoptosis and dies, leading to an overall decrease in the breakdown of bone. Nitrogenous bisphosphonates act on bone metabolism by binding and blocking the enzyme farnesyl diphosphate synthase (FPPS) in the HMG-CoA reductase pathway (also known as the mevalonate pathway). Disruption of the HMG CoA-reductase pathway at the level of FPPS prevents the formation of two metabolites (farnesol and geranylgeraniol) that are essential for connecting some small proteins to the cell membrane. This phenomenon is known as prenylation, and is important for proper sub-cellular protein trafficking</p>
OXYFLUORFEN	<p>The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>For oxyfluorfen:</p> <ul style="list-style-type: none"> <li>▶ <b>Acute toxicity:</b> Oxyfluorfen is practically nontoxic by ingestion, with reported oral LD50 values of 5000 mg/kg in both rats and dogs, and 2700 to 5000 mg/kg in mice. The dermal LD50 is greater than 5000 mg/kg in both rats and rabbits, also indicating slight toxicity by this route. It causes no skin irritation in rabbits, no skin sensitization in guinea pigs, and moderate eye irritation in rabbits. However, Goal and other formulations may show severe skin and eye irritant properties, and may be skin sensitizers. The 4-hour inhalation LC50 for the technical product is not available, but that for Goal 1.6E is greater than 22.64 mg/L, indicating practically no toxicity via this route.</li> <li>▶ <b>Chronic toxicity:</b> Effects on the liver have been observed in long-term feeding studies with rats, mice, and dogs.</li> <li>▶ <b>Reproductive effects:</b> In a developmental study with rats given doses of 10, 100, or 1000 mg/kg/day by gavage, decreased implantation, increased resorption, and lower foetal survival was seen at the 1000 mg/kg level. Toxic effects on the mothers were also seen at this dose. At 5 mg/kg/day, there was decreased survival of foetuses and decreased maternal and foetal weights. It does not appear likely that oxyfluorfen will cause reproductive effects in humans at likely levels of exposure.</li> <li>▶ <b>Teratogenic effects:</b> In a developmental study with rabbits, 30 mg/kg/day, the highest dose tested, produced an increase in fused sternal bones in the fetuses as well as toxic effects on the mothers. These data suggest oxyfluorfen may have teratogenic effects, but only at very high doses.</li> <li>▶ <b>Mutagenic effects:</b> Mutagenicity tests on rats, mice and on bacterial cell cultures have produced mixed results. However, unscheduled DNA synthesis assays have been negative. Due to the conflicting results, it is not possible to determine the mutagenic potential of oxyfluorfen.</li> <li>▶ <b>Carcinogenic effects:</b> In a 20-month study with mice fed 0.3, 3, or 30 mg/kg/day, doses at and above 3 mg/kg/day produced non-significant increases in both benign and malignant liver tumors in male mice. No increased tumor formation was seen in female mice at any dose. No carcinogenic effects were observed in a 23-year study with rats fed doses 2 mg/kg/day, nor in dogs at doses of 3 mg/kg/day. These data suggest that oxyfluorfen is not carcinogenic.</li> <li>▶ <b>Organ toxicity:</b> The liver appears to be the main target organ, based on long-term feeding studies.</li> <li>▶ <b>Fate in humans and animals:</b> Because oxyfluorfen is highly hydrophobic, it may have the potential to bioconcentrate in animal fatty tissues ADI 0.003 mg/kg * Toxicity class WHO Table 5, EPA IV * NOEL In chronic dietary trials, NOEL for rats 40, dogs 100, mice 2 mg/kg diet *</li> </ul>
TERBUTHYLAZINE & OXYFLUORFEN	[ * <i>The Pesticides Manual, Incorporating The Agrochemicals Handbook, 10th Edition, Editor Clive Tomlin, 1994, British Crop Protection Council</i> ]

Acute Toxicity	✓	Carcinogenicity	✗
Skin Irritation/Corrosion	✗	Reproductivity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✓
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification  
 ✓ – Data available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

Tag® G2	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
terbuthylazine	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	1.6mg/L	4
	EC50	48	Crustacea	>5mg/L	4
	EC50	72	Algae or other aquatic plants	0.009mg/L	4
	NOEC	72	Algae or other aquatic plants	0.002mg/L	4
3-amino-1,2,4-triazole	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	>1-mg/L	2
	EC50	48	Crustacea	18mg/L	4
	EC50	96	Algae or other aquatic plants	<2.3mg/L	1
	EC10	94	Algae or other aquatic plants	0.16mg/L	1

Continued...

	NOEC	1392	Fish	0.009mg/L	2
glyphosate acid	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	1.3mg/L	4
	EC50	48	Crustacea	2.95mg/L	4
	EC50	96	Algae or other aquatic plants	=1.3mg/L	1
	BCFD	96	Crustacea	10mg/L	4
	NOEC	840	Algae or other aquatic plants	0.0069mg/L	4
oxyfluorfen	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	0.041mg/L	3
	EC50	48	Crustacea	>0.032mg/L	4
	EC50	72	Algae or other aquatic plants	0.00008mg/L	4
	NOEC	72	Algae or other aquatic plants	0.00002mg/L	4
<b>Legend:</b>	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Toxic to soil organisms.

Toxic to flora.

On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and/or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and/or delayed, to the structure and/or functioning of natural ecosystems.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

The triazine pesticides behave as weak bases in aqueous solution. Triazines are more soluble at low pHs. Adsorption of triazines through an exchange process to organic matter and clay minerals is dependent on the pH of the solution and the acidity of the adsorbent surface. Hydrogen bonding and hydrophobic bonding also occur with soil organic matter at higher pHs. Hydrolysis and oxidation are general routes of soil metabolism whilst photodecomposition appears to be minimal. Vapour transport losses are dependent on vapour pressure and the pH of the evaporating surface as ionised compounds are less volatile. Transport from soil to water occurs in solution and in sediments. Herbicide concentrations in excess of 5 ppb may play a part in the decline in submerged aquatic vegetation (SAV). However, recovery from exposure to these concentrations does occur as these herbicides degrade rapidly under estuarine conditions. Residues do not appear to build up in sediments.

**DO NOT discharge into sewer or waterways.**

#### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
terbuthylazine	HIGH	HIGH
3-amino-1,2,4-triazole	HIGH (Half-life = 360 days)	LOW (Half-life = 1.33 days)
glyphosate acid	LOW	LOW
oxyfluorfen	HIGH	HIGH

#### Bioaccumulative potential

Ingredient	Bioaccumulation
terbuthylazine	LOW (LogKOW = 2.8694)
3-amino-1,2,4-triazole	LOW (BCF = 2.46)
glyphosate acid	LOW (BCF = 10)
oxyfluorfen	HIGH (LogKOW = 6.0465)

#### Mobility in soil

Ingredient	Mobility
terbuthylazine	LOW (KOC = 1858)
3-amino-1,2,4-triazole	LOW (KOC = 82.01)
glyphosate acid	LOW (KOC = 18.79)
oxyfluorfen	LOW (KOC = 46840)

## SECTION 13 DISPOSAL CONSIDERATIONS

#### Waste treatment methods

<b>Product / Packaging disposal</b>	<ul style="list-style-type: none"> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> </ul> <p>Otherwise:</p> <ul style="list-style-type: none"> <li>▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li> <li>▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li> <li>▶ Due to their environmental persistence and potential health hazards, PCBs, PBBs, dioxins and their derivatives or congeners (including chlorinated diphenyl ethers), cannot be disposed of in landfills or dumped at sea.</li> <li>▶ Environmentally acceptable method of disposal include high temperature incineration. However this option is costly and uncertain.</li> <li>▶ Other acceptable disposal technologies include base-catalysed dechlorination in the BCD (Base-Catalyzed Decomposition) Process.</li> </ul>
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- ▶ Currently, most wastes must be stored in an approved manner until satisfactory arrangements can be made for their disposal. All wastes and residues containing these substances (e.g. wiping clothes, absorbent materials, used disposable protective gloves, contaminated clothing, etc.) should be collected, placed in proper containers, labelled and disposed of in the manner prescribed by government regulations.
  - ▶ Regulations may require the compulsory reporting of all spills.
- Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
- A Hierarchy of Controls seems to be common - the user should investigate:
- ▶ Reduction
  - ▶ Reuse
  - ▶ Recycling
  - ▶ Disposal (if all else fails)
- This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
- ▶ **DO NOT allow wash water from cleaning or process equipment to enter drains.**
  - ▶ It may be necessary to collect all wash water for treatment before disposal.
  - ▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
  - ▶ Where in doubt contact the responsible authority.
  - ▶ Recycle wherever possible or consult manufacturer for recycling options.
  - ▶ Consult State Land Waste Authority for disposal.
  - ▶ Bury or incinerate residue at an approved site.
  - ▶ Recycle containers if possible, or dispose of in an authorised landfill.

Ensure that the hazardous substance is disposed in accordance with the Hazardous Substances (Disposal) Notice 2017

### Disposal Requirements

Packages that have been in direct contact with the hazardous substance must be only disposed if the hazardous substance was appropriately removed and cleaned out from the package. The package must be disposed according to the manufacturer's directions taking into account the material it is made of. Packages which hazardous content have been appropriately treated and removed may be recycled.



The hazardous substance must only be disposed if it has been treated by a method that changed the characteristics or composition of the substance and it is no longer hazardous.

Only dispose to the environment if a tolerable exposure limit has been set for the substance.

Only deposit the hazardous substance into or onto a landfill or sewage facility or incinerator, where the hazardous substance can be handled and treated appropriately.

## SECTION 14 TRANSPORT INFORMATION

### Labels Required

	
Marine Pollutant	
HAZCHEM	*3Z

### Land transport (UN)

UN number	3082
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains 3-amino-1,2,4-triazole, oxyfluorfen, terbuthylazine and glyphosate acid)
Transport hazard class(es)	Class : 9 Subrisk : Not Applicable
Packing group	III
Environmental hazard	Environmentally hazardous
Special precautions for user	Special provisions : 274; 331; 335; 375 Limited quantity : 5 L

### Air transport (ICAO-IATA / DGR)

UN number	3082
UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s. * (contains 3-amino-1,2,4-triazole, oxyfluorfen, terbuthylazine and glyphosate acid)
Transport hazard class(es)	ICAO/IATA Class : 9 ICAO / IATA Subrisk : Not Applicable ERG Code : 9L
Packing group	III
Environmental hazard	Environmentally hazardous

<b>Special precautions for user</b>	Special provisions	A97 A158 A197
	Cargo Only Packing Instructions	964
	Cargo Only Maximum Qty / Pack	450 L
	Passenger and Cargo Packing Instructions	964
	Passenger and Cargo Maximum Qty / Pack	450 L
	Passenger and Cargo Limited Quantity Packing Instructions	Y964
	Passenger and Cargo Limited Maximum Qty / Pack	30 kg G

**Sea transport (IMDG-Code / GGVSee)**

<b>UN number</b>	3082	
<b>UN proper shipping name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains 3-amino-1,2,4-triazole, oxyfluorfen, terbuthylazine and glyphosate acid)	
<b>Transport hazard class(es)</b>	IMDG Class	9
	IMDG Subrisk	Not Applicable
<b>Packing group</b>	III	
<b>Environmental hazard</b>	Marine Pollutant	
<b>Special precautions for user</b>	EMS Number	F-A , S-F
	Special provisions	274 335 969
	Limited Quantities	5 L

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 REGULATORY INFORMATION****Safety, health and environmental regulations / legislation specific for the substance or mixture**

This substance is to be managed using the conditions specified in an applicable Group Standard

HSR Number	Group Standard
HSR007866	Not Available

**TERBUTHYLAZINE IS FOUND ON THE FOLLOWING REGULATORY LISTS**

International Air Transport Association (IATA) Dangerous Goods Regulations  
 International Maritime Dangerous Goods Requirements (IMDG Code)  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data

New Zealand Inventory of Chemicals (NZIoC)  
 New Zealand Land Transport Rule: Dangerous Goods 2005 - Schedule 1 Quantity limits  
 United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

**3-AMINO-1,2,4-TRIAZOLE IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Chemical Footprint Project - Chemicals of High Concern List  
 International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs  
 International Air Transport Association (IATA) Dangerous Goods Regulations  
 International Maritime Dangerous Goods Requirements (IMDG Code)  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals

New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data  
 New Zealand Inventory of Chemicals (NZIoC)  
 New Zealand Land Transport Rule: Dangerous Goods 2005 - Schedule 1 Quantity limits  
 New Zealand Workplace Exposure Standards (WES)  
 United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

**GLYPHOSATE ACID IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Chemical Footprint Project - Chemicals of High Concern List  
 GESAMP/EHS Composite List - GESAMP Hazard Profiles  
 IMO IBC Code Chapter 17: Summary of minimum requirements  
 IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk  
 International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs  
 International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans  
 International Air Transport Association (IATA) Dangerous Goods Regulations

International Maritime Dangerous Goods Requirements (IMDG Code)  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data  
 New Zealand Inventory of Chemicals (NZIoC)  
 New Zealand Land Transport Rule: Dangerous Goods 2005 - Schedule 1 Quantity limits  
 United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

**OXYFLUORFEN IS FOUND ON THE FOLLOWING REGULATORY LISTS**

International Air Transport Association (IATA) Dangerous Goods Regulations  
 International Maritime Dangerous Goods Requirements (IMDG Code)  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data

New Zealand Inventory of Chemicals (NZIoC)  
 New Zealand Land Transport Rule: Dangerous Goods 2005 - Schedule 1 Quantity limits  
 United Nations Recommendations on the Transport of Dangerous Goods Model Regulations

**Hazardous Substance Location**

Continued...

Subject to the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Hazard Class	Quantity beyond which controls apply for closed containers	Quantity beyond which controls apply when use occurring in open containers
Not Applicable	Not Applicable	Not Applicable

#### Certified Handler

Subject to Part 4 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Class of substance	Quantities
9.1A, 9.2A, 9.3A, and 9.4A	Any quantity

Refer Group Standards for further information

#### Tracking Requirements

Not Applicable

#### National Inventory Status

National Inventory	Status
Australia - AICS	Yes
Canada - DSL	No (oxyfluorfen; terbuthylazine)
Canada - NDSL	No (3-amino-1,2,4-triazole; glyphosate acid; oxyfluorfen)
China - IECSC	No (oxyfluorfen)
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (oxyfluorfen; terbuthylazine)
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	No (oxyfluorfen)
USA - TSCA	No (glyphosate acid; oxyfluorfen)
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - ARIPS	No (oxyfluorfen; terbuthylazine)
<b>Legend:</b>	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

#### SECTION 16 OTHER INFORMATION

<b>Revision Date</b>	21/01/2020
<b>Initial Date</b>	20/01/2020

#### SDS Version Summary

Version	Issue Date	Sections Updated
2.1.1.1	20/01/2020	Classification
3.1.1.1	21/01/2020	Ingredients

#### Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

#### Definitions and abbreviations

PC – TWA: Permissible Concentration-Time Weighted Average  
 PC – STEL: Permissible Concentration-Short Term Exposure Limit  
 IARC: International Agency for Research on Cancer  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 STEL: Short Term Exposure Limit  
 TEEL: Temporary Emergency Exposure Limit.  
 IDLH: Immediately Dangerous to Life or Health Concentrations  
 OSF: Odour Safety Factor  
 NOAEL :No Observed Adverse Effect Level  
 LOAEL: Lowest Observed Adverse Effect Level  
 TLV: Threshold Limit Value  
 LOD: Limit Of Detection  
 OTV: Odour Threshold Value  
 BCF: BioConcentration Factors  
 BEI: Biological Exposure Index

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