

# AC HOWL 360

## AXICHEM Pty Ltd

Chemwatch: 24-9539

Version No: 6.1.1.1

Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: 2

Issue Date: 01/11/2019

Print Date: 14/08/2020

L.GHS.AUS.EN

### SECTION 1 Identification of the substance / mixture and of the company / undertaking

#### Product Identifier

Product name	AC HOWL 360
Synonyms	Not Available
Other means of identification	Not Available

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

Relevant identified uses	Water soluble herbicide, non-selective.
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#### Details of the supplier of the safety data sheet

Registered company name	AXICHEM Pty Ltd
Address	18 Conquest Way Wangara WA 6065 Australia
Telephone	+61 8 9302 4666
Fax	Not Available
Website	<a href="http://www.axichem.com.au">www.axichem.com.au</a>
Email	<a href="mailto:msds@axichem.com.au">msds@axichem.com.au</a>

#### Emergency telephone number

Association / Organisation	CHEMWATCH EMERGENCY RESPONSE
Emergency telephone numbers	+61 2 9186 1132
Other emergency telephone numbers	+61 1800 951 288

Once connected and if the message is not in your preferred language then please dial 01

### SECTION 2 Hazards identification

#### Classification of the substance or mixture

Poisons Schedule	S5
Classification <sup>[1]</sup>	Skin Corrosion/Irritation Category 2, Eye Irritation Category 2A, Chronic Aquatic Hazard Category 2
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

#### Label elements

Hazard pictogram(s)	
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Signal word	Warning
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#### Hazard statement(s)

H315	Causes skin irritation.
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H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long lasting effects.

### Precautionary statement(s) Prevention

P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

### Precautionary statement(s) Response

P321	Specific treatment (see advice on this label).
P362	Take off contaminated clothing and wash before reuse.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P391	Collect spillage.
P302+P352	IF ON SKIN: Wash with plenty of water.
P332+P313	If skin irritation occurs: Get medical advice/attention.

### Precautionary statement(s) Storage

Not Applicable

### 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
38641-94-0	30-40	<u>glyphosate isopropylamine salt</u>
Not Available		(360 g/L)
Not Available	10-<30	surfactant
Not Available	balance	Ingredients determined not to be hazardous
Not Available		including
7732-18-5		<u>water</u>

## 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 or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>▶ Transport to hospital, or doctor.</li> </ul>

**Ingestion**

- ▶ If swallowed do **NOT** induce vomiting.
- ▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- ▶ Observe the patient carefully.
- ▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- ▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- ▶ Seek medical advice.

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

Treat symptomatically.

**Treatment for significant glyphosate exposures**

The presence of a phosphono-group in the structure has been incorrectly interpreted as an organophosphate which suggests cholinesterase inhibition in poisoning cases. Retrospective studies on glyphosate poisoning have shown atropine and pralidoxime been mistakenly administered to counteract such poisoning cases.

There is no available antidote for glyphosate poisoning and treatment is largely symptomatic in nature.

In any significant ingestion exposure, the acute syndrome of glyphosate/ surfactant toxicity may occur within the first 24 hours of ingestion and may progress rapidly. These cases of significant ingestion, in particular those greater than a mouthful (> 0.5 ml/kg) of larger than 41% glyphosate concentrations SHOULD BE EVALUATED BY A PHYSICIAN AND CONSIDERED FOR HOSPITAL ADMISSION.

**Prevention of absorption**

On admission to a hospital, normally, further absorption of the ingested herbicide would be prevented by performing gastric lavage. It is usually considered if no significant spontaneous vomiting has occurred. Gastric lavage may be very effective if performed within one to two hours post ingestion.

However, if a co-ingestant has pharmacologic properties that slows gastrointestinal movement, lavage may be indicated even after a prolonged post-ingestion time.

Activated charcoal is also given to absorb remaining glyphosate. Cathartics speed gastrointestinal transit time and decrease the time that the drug or chemical is available for absorption. Cathartics also hasten the elimination of the charcoal/drug complex in the GI tract.

**Enhanced elimination**

Glyphosate is excreted very well by the kidneys. Thus to increase the elimination of the glyphosate, adequate urine flow will ensure the rapid elimination of the glyphosate. This elimination can be enhanced by a technique known as forced diuresis.

**Monitoring of the blood pressure**

A poisoned patient would normally be monitored for signs of haemodynamic or blood pressure instability. If the patient has a reduced blood pressure, intravenous fluids administration would be instituted to ensure adequate blood volume. If the blood pressure reduction is severe, then blood vessel vasoconstrictors (otherwise known as vasopressors) would be given to maintain the blood pressure. This would include the administration of drugs such as dopamine, noradrenaline, adrenaline or phenylephrine, which would raise the blood pressure rapidly.

<http://www.prn2.usm.my/mainsite/bulletin/sun/1997/sun14.html>

*Dr. Mohd. Isa Abd. Majid*

*Toxicology Laboratory at the National Poison Centre, Universiti Sains Malaysia, 11800 Minden, Penang.*

A 1991 survey of 93 attempted suicides by drinking undiluted Roundup type preparations noted 7 deaths within hours of intakes of 85 to 200 ml. Severe effects shown were pulmonary dysfunction, kidney failure, coma, hypotension requiring pressor amines, repeated seizures, cardiac arrest. 13 of 93 showed only mild effects, nausea, vomiting and recovered within 24 hours.

**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 breathing apparatus plus protective gloves in the event of a fire.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</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> <li>▶ Equipment should be thoroughly decontaminated after use.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Non combustible.</li> <li>▶ Not considered to be a significant fire risk.</li> <li>▶ Expansion or decomposition on heating may lead to violent rupture of containers.</li> <li>▶ Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).</li> <li>▶ May emit acrid smoke.</li> </ul> <p>Other decomposition products include: carbon dioxide (CO<sub>2</sub>) nitrogen oxides (NO<sub>x</sub>) phosphorus oxides (PO<sub>x</sub>) other pyrolysis products typical of burning organic material.</p>
<b>HAZCHEM</b>	Not Applicable

## 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 breathing apparatus plus protective gloves.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Stop leak if safe to do so.</li> <li>▶ Contain spill with sand, earth or vermiculite.</li> <li>▶ Collect recoverable product into labelled containers for recycling.</li> <li>▶ Neutralise/decontaminate residue (see Section 13 for specific agent).</li> <li>▶ Collect solid residues and seal in labelled drums for disposal.</li> <li>▶ Wash area and prevent runoff into drains.</li> <li>▶ After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.</li> <li>▶ If contamination of drains or waterways occurs, advise emergency services.</li> </ul>

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> </ul> <p>Do NOT mix, store or apply the material/ formulations of the glyphosate, its salts or compounds in galvanised steel or unlined steel (except stainless steel), containers or spray tanks. The material/ formulations of the material/ spray solutions react with such containers and tanks to produce hydrogen gas which forms gas mixtures which may flash or explode when exposed to open flame, spark, welder torch, lighted cigarette or other sources.</p> <p>Glyphosate preparations are considered to be relatively "safe to use" as weedkiller herbicide. However any weedkiller, by its</p>
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	<p>action of killing plant life cannot be completely safe and must be used with care and not be sprayed about indiscriminately. Glyphosate is poisonous in large doses, but if used with care and with responsible application is non harmful.</p> <ul style="list-style-type: none"> <li>▶ Limit all unnecessary personal contact.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</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 are maintained.</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>▶ 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>▶ <b>DO NOT use mild steel or galvanised containers</b></li> <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>▶ Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.</li> </ul>

**SECTION 8 Exposure controls / personal protection**

**Control parameters**

**Occupational Exposure Limits (OEL)**

**INGREDIENT DATA**

Not Available

**Emergency Limits**

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
AC HOWL 360	Not Available	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
glyphosate isopropylamine salt	Not Available	Not Available
water	Not Available	Not Available

**Occupational Exposure Banding**

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
glyphosate isopropylamine salt	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**

None assigned. Refer to individual constituents.

**Exposure controls**

<b>Appropriate engineering controls</b>	<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.</p> <p>The basic types of engineering controls are:</p> <ul style="list-style-type: none"> <li>Process controls which involve changing the way a job activity or process is done to reduce the risk.</li> <li>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation</li> </ul>
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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. Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

#### Personal protection



#### Eye and face protection

- ▶ Safety glasses with side shields.
- ▶ Chemical goggles.
- ▶ 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]

#### Skin protection

See Hand protection below

#### Hands/feet protection

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.

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.

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.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- 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.

- 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.

- Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.

	<ul style="list-style-type: none"> <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> <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>
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<ul style="list-style-type: none"> <li>Overalls.</li> <li>P.V.C apron.</li> <li>Barrier cream.</li> <li>Skin cleansing cream.</li> <li>Eye wash unit.</li> </ul>

## 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:

AC HOWL 360

Material	CPI
BUTYL	A
NEOPRENE	A
VITON	A
NATURAL RUBBER	C
PVA	C

\* 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.

## SECTION 9 Physical and chemical properties

### Information on basic physical and chemical properties

<b>Appearance</b>	Viscous straw coloured/yellowish liquid with faint amine odour; mixes with water.		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	1.1
<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 Applicable
<b>pH (as supplied)</b>	4.6-5.4	<b>Decomposition temperature</b>	Not Available

Melting point / freezing point (°C)	~0	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	~100	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Applicable	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Applicable	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

## SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<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>
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

## SECTION 11 Toxicological information

### Information on toxicological effects

Inhaled	<p>Not normally a hazard due to non-volatile nature of product</p> <p>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.</p>
Ingestion	<p>Accidental ingestion of the material may be damaging to the health of the individual.</p> <p>Glyphosate is classified by IARC as "Probably Carcinogenic to Humans"(Group 2A, 2016)</p> <p>In making this overall evaluation, the IARC Working Group noted that the mechanistic and other relevant data support the classification of glyphosate in Group 2A. In addition to limited evidence for the carcinogenicity of glyphosate in humans and sufficient evidence for the carcinogenicity of glyphosate in experimental animals, there is strong evidence that glyphosate can operate through two key characteristics of known human carcinogens, and that these can be operative in humans. Specifically:</p> <ul style="list-style-type: none"> <li>· There is strong evidence that exposure to glyphosate or glyphosate-based formulations is genotoxic based on studies in humans in vitro and studies in experimental animals. One study in several communities in individuals exposed to glyphosate-based formulations also found chromosomal damage in blood cells; in this study, markers of chromosomal damage (micronucleus formation) were significantly greater after exposure than before exposure in the same individuals.</li> <li>· There is strong evidence that glyphosate, glyphosate-based formulations, and aminomethylphosphonic acid can act to induce oxidative stress based on studies in experimental animals, and in studies in humans in vitro. This mechanism has been challenged experimentally by administering antioxidants, which abrogated the effects of glyphosate on oxidative stress. Studies in aquatic species provide additional evidence for glyphosate-induced oxidative stress.</li> </ul> <p>This classification remains controversial and has been challenged by manufacturers at government level.</p> <p>While glyphosate can be described as an organophosphorus compound, glyphosate is not a member of the family of organophosphate esters which are widely used as pesticides. Thus glyphosate and its salts and compounds do not inhibit cholinesterase activity as do the esters.</p> <p>While glyphosate itself may be relatively harmless, some of the products with which it is formulated have a rather less benign reputation. Marketed formulations of glyphosate generally contain a surfactant. The purpose of this is to prevent the chemical from forming into droplets and rolling off leaves which are sprayed. Some of these surfactants are serious irritants, toxic to fish, and can themselves contain contaminants which are carcinogenic to humans.</p> <p>The most widely used type of surfactants in glyphosate formulations are known as ethylated amines. POEA (polyoxy-ethyleneamine) has been frequently mentioned as a surfactant, but in fact it refers to a group of ethylated amine products used in glyphosate formulations. Members of this group of surfactants are significantly more toxic than glyphosate. They are serious irritants of eyes, the respiratory tract and skin, and have been found to contain dioxane (not dioxin) contaminants which are suspected of being carcinogenic. Accordingly, the UN FAO has set standards of 1ppm for levels of the contaminant 1,4 dioxane which may be present in POEA surfactants.</p> <p>A 1991 survey of 93 attempted suicides by drinking undiluted Roundup type preparations noted 7 deaths within hours of intakes</p>

	<p>of 85 to 200 ml. Severe effects shown were pulmonary dysfunction, kidney failure, coma, hypotension requiring pressor amines, repeated seizures, cardiac arrest. 13 of 93 showed only mild effects, nausea, vomiting and recovered within 24 hours. 73 of 93 recovered but suffered sore throat, difficulty in swallowing, mouth ulcers, gastrointestinal haemorrhage, hypotension responsive to intravenous fluids, transient liver or kidney damage, blood in urine. A wide variation in dose response was seen and may be due to a major presence of surfactants. [IPCS Environmental Health Criteria No. 159]</p>
<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>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.</p> <p>The material may accentuate any pre-existing dermatitis condition</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>	<p>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.</p> <p>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.</p>
<b>Chronic</b>	<p>For glyphosates:</p> <p>Exposure of male farmers to glyphosate-based herbicides was associated with an increase in miscarriage and premature birth in farm families. Glyphosate killed cultured human placental cells at concentrations far below those used in agriculture practice. Moreover this study found that a commercial preparation containing glyphosate, Roundup, was at least twice as toxic as glyphosate alone. Roundup's main adjuvant is the surfactant tallow ethoxylated which helps penetration of plant cell walls. This surfactant may enhance the bioavailability and/ or bioaccumulation of glyphosate. The viability of cells exposed to glyphosate was considerably reduced when even minute concentrations of Roundup were added.</p> <p>Environmental Health Perspectives 113, 76, pp A403-404, June 2005</p> <p>Repeated exposure over 90 days to dietary glyphosate, by mice, produced decreased weight gain at high levels. This did not occur in rats. Repeated skin exposure over 3 weeks produced only slight primary skin irritation in rabbits. Repeated challenges to guinea pig skin elicited no allergic reaction. There was no evidence of neurological damage, including delayed effects in chickens following repeated oral doses, or cholinesterase inhibition in rats following single oral doses.</p> <p>A 2-year feeding study in mice at high doses produced reduced body-weight gain and changes in the liver. Reduced weight gain and eye changes were seen in rats in one 2-year study. These studies did not produce evidence of tumour formation and the US EPA has classified glyphosate as category E (evidence of non-carcinogenicity in humans). Maternally toxic doses did not produce birth defects in rats. When glyphosate was fed continuously at high dose rates to rats for two successive generations, toxicity was recorded in the off-spring. Glyphosate has not produced genetic change in a variety of standard tests using animal or bacterial cells.</p> <p>Long-term administration of glyphosate to several animal species produced cytoplasmic alteration and hypertrophy of salivary glands and adverse effects on the hepatobiliary system. Prolonged or repeated administration of technical grades of glyphosate produced diarrhoea, nasal discharge, inactivity, reduced body weight gain, stomach haemorrhages, thymic hyperplasia, and microscopic changes in liver and kidneys, effects on the uterus and adverse effects on reproduction.</p> <p><b>Chronic toxicity:</b> Studies of glyphosate lasting up to 2 years, have been conducted with rats, dogs, mice, and rabbits, and with few exceptions no effects were observed. For example, in a chronic feeding study with rats, no toxic effects were observed in rats given doses as high as 400 mg/kg/day. Also, no toxic effects were observed in a chronic feeding study with dogs fed up to 500 mg/kg/day, the highest dose tested.</p> <p><b>Reproductive effects:</b> Laboratory studies show that glyphosate produces reproductive changes in test animals very rarely and then only at very high doses (over 150 mg/kg/day). It is unlikely that the compound would produce reproductive effects in humans.</p> <p><b>Teratogenic effects:</b> In a teratology study with rabbits, no developmental toxicity was observed in the fetuses at the highest dose tested (350 mg/kg/day). Rats given doses up to 175 mg/kg/day on days 6 to 19 of pregnancy had offspring with no teratogenic effects, but other toxic effects were observed in both the mothers and the fetuses. No toxic effects to the fetuses occurred at 50 mg/kg. Glyphosate does not appear to be teratogenic.</p> <p><b>Mutagenic effects:</b> Glyphosate mutagenicity and genotoxicity assays have been negative. These included the Ames test, other bacterial assays, and the Chinese Hamster Ovary (CHO) cell culture, rat bone marrow cell culture, and mouse dominant lethal assays. It appears that glyphosate is not mutagenic.</p> <p><b>Carcinogenic effects:</b> Rats given oral doses of up to 400 mg/kg/day did not show any signs of cancer, nor did dogs given oral doses of up to 500 mg/kg/day or mice fed glyphosate at doses of up to 4500 mg/kg/day. It appears that glyphosate is not carcinogenic.</p> <p><b>Organ toxicity:</b> Some microscopic liver and kidney changes, but no observable differences in function or toxic effects, have been seen after lifetime administration of glyphosate to test animals.</p> <p>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p>

<b>AC HOWL 360</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (Rabbit) LD50: >5000 mg/kg <sup>[2]</sup>	Not Available
	Oral (Rat) LD50: >5000 mg/kg <sup>[2]</sup>	

glyphosate isopropylamine salt	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (rat) LD50: 7500 mg/kg <sup>[2]</sup> Oral (rat) LD50: 4320 mg/kg <sup>[2]</sup>	Not Available
water	<b>TOXICITY</b>	<b>IRRITATION</b>
	Oral (rat) LD50: >90000 mg/kg <sup>[2]</sup>	Not Available
<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>GLYPHOSATE ISOPROPYLAMINE SALT</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.
<b>WATER</b>	No significant acute toxicological data identified in literature search.

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

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

## SECTION 12 Ecological information

### Toxicity

AC HOWL 360	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available

  

glyphosate isopropylamine salt	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96	Fish	1.3mg/L	4
	EC50	48	Crustacea	3mg/L	4
	EC50	96	Algae or other aquatic plants	1.05mg/L	4
	NOEC	168	Algae or other aquatic plants	0.05mg/L	4

  

water	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96	Fish	897.520mg/L	3
	EC50	96	Algae or other aquatic plants	8768.874mg/L	3

**Legend:** 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

for glyphosate:

The Australian Acceptable Intake (ADI) of glyphosate for a human is 0.3 mg/kg/day, set for the public for daily, lifetime exposure. This is based on the NOEL of 30 mg/kg/day, the level determined to show no effects during long term exposure for the most sensitive indicators and the most sensitive species. (Ref: Comm. Dept. of Human Services and Health, "ADI List", Australian Government Printing Services, May 1994) [NUFARM]

**Environmental fate:**

Continued...

Glyphosate is strongly absorbed by some types of soil and becomes immobile; it is very mobile in water and is readily translocated in plants, even downwards. Even at low temperatures glyphosate is degraded in soil and would not be expected to persist from one growing season to the next. Microbial degradation is major cause of loss from soil with liberation of carbon dioxide. The principal metabolite is aminomethylphosphonic acid.

**Breakdown in soil and groundwater:** Glyphosate is moderately persistent in soil, with an estimated average half-life of 47 days. Reported field half-lives range from 1 to 174 days. It is strongly adsorbed to most soils, even those with lower organic and clay content. Thus, even though it is highly soluble in water, field and laboratory studies show it does not leach appreciably, and has low potential for runoff (except as adsorbed to colloidal matter). One estimate indicated that less than 2% of the applied chemical is lost to runoff. Microbes are primarily responsible for the breakdown of the product, and volatilization or photodegradation losses will be negligible

**In soil:** DT 50: 3 day for trimesium salt, < 60 d for the acid.

**Breakdown in water:** In water, glyphosate is strongly adsorbed to suspended organic and mineral matter and is broken down primarily by microorganisms. Its half-life in pond water ranges from 12 days to 10 weeks

#### Ecotoxicity:

Fish and aquatic invertebrates are more sensitive to glyphosate and its formulations. Its toxicity is increased with higher water temperatures and pH. Some soil invertebrates including springtails, mites and isopods are also adversely affected by glyphosate. Of nine herbicides tested for their toxicity to soil microorganisms, glyphosate was found to be the second most toxic to a range of bacteria, fungi, actinomycetes and yeasts.

**Breakdown in vegetation:** Glyphosate may be translocated throughout the plant, including to the roots. It is extensively metabolized by some plants, while remaining intact in others.

Bird: Acute Oral LD50 (Bobwhite quail): > 3850 mg/kg (for glyphosate)

Formulae containing glyphosate may include surfactants which modify environmental behaviour.

for "Roundup" (a glyphosate containing formulation)

Fish LC50 (96 h): bluegill sunfish 5.8-14 mg/l (moderately toxic); rainbow trout 8.2-26 mg/l (moderately toxic); channel catfish 16 mg/l (slightly toxic); coho salmon (22 mg/l (slightly toxic); chinook salmon 20 mg/l (slightly toxic)

Carp TL50 (96 h) 19.7 mg/l (slightly toxic)

Oral LD50 Dog: > 5 ml/kg, Practically non-toxic

Oral LD50 Goat: 4860 mg/kg, Slightly toxic

Honeybee LD50 (48 h) > 100 micrograms/bee, Practically non-toxic

Daphnia magna EC50 (48 h): 24-37 mg/L, Slightly toxic

Gammarus pseudolimnaeus EC50 (48-hr): 42 mg/L, Slightly toxic

Crayfish LC50 (96 h): > 1000 ppm, Practically non-toxic

Toxicity to birds: Not toxic

Carp contained in a static pond were unaffected at any time during a 90 day observation period following exposure by aerial application of Roundup herbicide at the normal use concentration. Tissue residue analyses indicated that glyphosate will not bioaccumulate.

Exposure to Roundup in freshwater concentrations of 0, 10, 103 and 990 microgram/L for 10 days did not impair the ability of salmon smolts to adapt to seawater.

Immersion of chicken eggs at 4 different embryo ages (0, 6, 12 and 18 days) for about five seconds in 1 or 5% Roundup in water solutions was reported to have no adverse effect on the hatchability or time of hatch of eggs.

Brahman-cross heifers were given Roundup by gavage, at daily doses of 0,400, 500, 630, 790 and 1000 mg/kg for 7 consecutive days. Clinical signs of toxicity, including loss of appetite, diarrhoea and death (790 and 1000 mg/kg) were observed at 500 mg/kg and above. The no-effect level was considered to be 400 mg/kg/day.

[MONSANTO]

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

## Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
water	LOW	LOW

## Bioaccumulative potential

Ingredient	Bioaccumulation
water	LOW (LogKOW = -1.38)

## Mobility in soil

Ingredient	Mobility
water	LOW (KOC = 14.3)

## SECTION 13 Disposal considerations

### Waste treatment methods

Product / Packaging disposal	
	Triple or preferably pressure rinse containers before disposal. Add rinsings to spray tank. <ul style="list-style-type: none"> <li>▶ Recycle wherever possible or consult manufacturer for recycling options.</li> <li>▶ Consult State Land Waste Authority for disposal.</li> <li>▶ Bury or incinerate residue at an approved site.</li> <li>▶ Recycle containers if possible, or dispose of in an authorised landfill.</li> </ul>

## SECTION 14 Transport information

### Labels Required

<b>Marine Pollutant</b>	
<b>HAZCHEM</b>	Not Applicable

**Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**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

#### glyphosate isopropylamine salt is found on the following regulatory lists

Australia Chemicals with non-industrial uses removed from the Australian Inventory of Chemical Substances (old Inventory)

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Chemical Footprint Project - Chemicals of High Concern List

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

#### water is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

### National Inventory Status

National Inventory	Status
Australia - AIIC	No (glyphosate isopropylamine salt)
Australia Non-Industrial Use	No (water)
Canada - DSL	Yes
Canada - NDSL	No (glyphosate isopropylamine salt; water)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (glyphosate isopropylamine salt)
Korea - KECI	No (glyphosate isopropylamine salt)
New Zealand - NZIoC	Yes
Philippines - PICCS	No (glyphosate isopropylamine salt)
USA - TSCA	No (glyphosate isopropylamine salt)
Taiwan - TCSI	Yes
Mexico - INSQ	No (glyphosate isopropylamine salt)
Vietnam - NCI	Yes
Russia - ARIPS	Yes
<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>	01/11/2019
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<b>Initial Date</b>	01/11/2009
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## SDS Version Summary

Version	Issue Date	Sections Updated
5.1.1.1	17/08/2016	Acute Health (eye), Chronic Health, Classification, First Aid (swallowed)
6.1.1.1	01/11/2019	One-off system update. NOTE: This may or may not change the GHS classification

## 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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