

SAFETY DATA SHEET

Ardent 50 SC

Revision Date 17-Aug-2023

Version 2.0

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Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Ardent 50 SC

Synonyms	Kresoxim-methyl 500 SC
Pure substance/mixture	Mixture
Formula	SC

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

Recommended use	Fungicide
Uses advised against	Do not use for any other purpose than described on the label

Details of the supplier of the substance or mixture and of the safety data sheet

Supplier's name and address	ADAMA SOUTH AFRICA (PTY) LTD Ground Floor, Simeka House The Vineyards Office Estate 99 Jip De Jager Drive Bellville 7530, South Africa + 27 21 982 1460
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For further information please contact

Email address	SDS@ADAMA.COM
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Emergency telephone numbers

+ 27 82 446 8946 (Griffon Poison Information Centre)
+ 27 86 155 5777 (Tygerberg Poison Information Centre)
+27(0)86 100 0366; (SPILL TECH®)
+27 (0)83 253 6618

Section 2: HAZARDS IDENTIFICATION

Classification of the liquid mixture

Carcinogenicity	Category 2 (H351)
Acute aquatic hazard	Category 1 (H400)
Chronic aquatic hazard	Category 1 (H410)

Signal word	DANGER
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Hazard statement	H351 – Suspected of causing cancer. H410 – Very toxic to aquatic life with long-lasting effects.
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Other hazards

Precautionary statements

- P203 – Obtain, read and follow all safety instructions before use.
- P405 – Store locked up.
- P102 – Keep out of reach of children.
- P270 – Do not eat, drink, or smoke when using this product.
- P280 – Wear protective gloves/face protection/eye protection/protective clothing.
- P264 – Wash hands and face thoroughly after handling.
- P318 – If exposed or concerned, get medical advice.
- P273 – Avoid release to the environment apart from the intended use.
- P391 – Collect spillage.
- P501 – Dispose of contents and/or container to an approved waste disposal plant.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture (liquid)

Chemical name	Weight%	CAS Number	EC Number	GHS classification	M-Factor
Kresoxim-methyl	43 – 46	143390-89-0	604-351-6	Carcinogenicity 2 (H351) Aquatic acute 1 (H400) Aquatic chronic 1 (H410)	10
Water	41 – 48	7732-18-5	231-791-2	Not classified	
Other ingredients	9 – 13	–	–	Not relevant for classification	

Section 4: FIRST AID MEASURES

General advice	If exposed or concerned, get medical advice. If possible, show the label (directions for use) or this SDS.
Ingestion	Most important acute symptoms/effects: none known. IF SWALLOWED: Rinse mouth well with clean water.
Inhalation	Most important acute symptoms/effects: irritation, coughing may occur. IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Skin contact	Most important acute symptoms/effects: none known. IF ON SKIN: Wash with soapy water. Take off contaminated clothing and wash it before reuse.
Eye contact	Most important acute symptoms/effects: eye irritation may occur. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical help.
Most important delayed symptoms/effects after exposure	Prolonged or repeated exposure may cause damage to organs such as the liver, including liver cancer.
Indication of immediate medical attention	If skin irritation occurs, or if eye irritation persists, or if a burning sensation in the upper airways persists, get medical help. Get medical help if you feel unwell. Treat symptomatically. Pre-existing conditions may be aggravated, such as eye, skin, or respiratory disorders.

Protection of first responders

Avoid contact with the mixture.
Wear gloves and a mask to prevent transmission of pathogens.

Section 5: FIREFIGHTING MEASURES

Appropriate/suitable extinguishing media

Water spray, foam, carbon dioxide (CO₂) or dry powder may be used but select extinguishing media that is appropriate for local circumstances and the surroundings.

Inappropriate extinguishing media

Water jet. Do not scatter spilled material with high pressure water streams.

Nature of hazardous combustion products

Suffocating, irritating and toxic fumes of carbon oxides (CO and CO₂), oxides of nitrogen, and other unknown hazardous substances may form.

Other hazards arising from the mixture

None known. There is no sensitivity to mechanical impact or to static discharge for this mixture, and no direct explosion hazard.

Special protective equipment

Avoid breathing vapours and combustion by-products. Use self-contained breathing apparatus and complete protective clothing. Do not attempt to act without suitable protective equipment.

Precautions and/or protective actions

Move containers from the fire area if it can be done without risk.
Avoid contact with oxidising agents.
Use water spray to cool down closed containers, but only after considering other material in the vicinity that may pose a hazard.
Stay upwind and keep out of low areas.
Take precautions to prevent extinguishing media contaminating surface water or ground water.

Section 6: ACCIDENTAL RELEASE MEASURES

Distinguish between large or small spills or releases.

Personal precautions

Avoid skin and eye contact with spilled material. Do not inhale spray or mist.
Wash hands thoroughly after handling. Do not touch eyes.
Do not eat, drink, or smoke during clean-up operations.

Protective equipment

Wear protective gloves/protective clothing/face protection/eye protection.

Emergency actions and procedures

Stop leaks if it can be done without risk. Remove all non-essential persons from the spill area. No other special emergency actions or procedures are required.

Environmental precautions

The product is for terrestrial use only and not intended for aquatic applications. Do not apply directly to areas where surface water is present, or to aquatic habitats, estuaries, or marine habitats. Do not mix and load within 15 m of boreholes, streams, rivers or dams. Prevent spray drift onto other crops, grazing, rivers, dams or areas not under treatment.
Avoid contamination of food, feedstuffs, drinking water and eating utensils.
Do not contaminate surface or ground water when disposing of rinsate or water used to wash equipment.
Report a large release to the appropriate authorities.

Methods and materials for containment/cleaning up

Move intact containers from the spill area. The product is a water dispersible liquid. The spill area may be slippery when wet.

Small spills: Dilute with water, if necessary, then mop up and place in an appropriate waste disposal container. Rinse the spill area with soapy water and mop up.

Large spills: Prevent entry into sewers, water courses, basements, or confined areas by diking, if possible. Contain the spillage, collect and transfer it to suitable containers for salvage or disposal. Alternatively, avoid spreading by using a suitable sorbent (dry sand, sawdust, diatomaceous earth, vermiculite, or universal sorbent) and scoop into containers for disposal. Flush the area with water if appropriate.

Dispose of via a licensed waste disposal contractor.

Section 7: HANDLING AND STORAGE

Precautions for safe handling	<p>Wear protective gloves, protective clothing, face and eye protection, such as nitrile rubber gloves, face shield, a face mask and long-sleeved clothing. Do not eat, drink, or smoke when using this product. Do not breath mist or spray. Wash hands and face thoroughly after handling. Do not touch eyes. Wash contaminated clothing before reuse.</p>
Conditions for safe storage	<p>Store locked up. Store in the original container in a cool, dry and well-ventilated area. Keep containers tightly closed and out of direct sunlight. Protect them from sources of heat and open flames. Store separately from any food, feed, or drinks. Keep out of reach of children and uninformed persons.</p>
Any incompatibilities	<p>Avoid excessive heat. Avoid contact with strong bases, acids, or oxidising agents.</p>
Risk Management Methods (RMM)	<p>The information required is contained in this Safety Data Sheet.</p>



Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

National occupational exposure limits	<p>Studies indicate that agricultural operators are at low risk of exposure to kresoxim-methyl during mixing and loading. Actual exposures are much less than the Acceptable Operator Exposure Level (AOEL) of 0.9 mg/kg bodyweight per day.</p>
Biological limit values	<p>The acceptable daily intake (ADI) of kresoxim-methyl is 0 to 0.4 mg/kg bodyweight per day. It is considered unnecessary to set an acute reference dose (RfD).</p>
Engineering controls	<p>Ensure adequate ventilation, especially in confined areas. Safety showers and eye wash stations should be provided.</p>
Respiratory protection	<p>Wear a face mask.</p>
Eye protection	<p>Wear a face shield or safety glasses. When chemical dust is present, protect the eyes with tight sealing safety goggles (EN 166).</p>
Hand protection	<p>Wear suitable chemical resistant gloves (EN 374) made from nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm) or butyl rubber (0.7 mm).</p>
Body protection	<p>Wear a water repellent woven overall (65% polyester and 35% cotton) with long sleeves. Wear protective boots (EB13832).</p>
General hygiene	<p>Do not eat, drink, or smoke when using this product. Wash hands and face after handling. Wash clothes before reuse.</p>

Environmental protection

Do not contaminate surface or ground water when disposing of rinsate or water used to wash equipment.



Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Property	Value	Method	Remark
Physical state	liquid suspension		
Clarity	not applicable		a suspension
Colour	off-white		
Odour	odourless		
Odour threshold	not determined		
Melting point/freezing point			
Boiling point (or initial point and range)			
Flammability (gases, liquids, solids)	not flammable		aqueous suspension
Lower and upper explosion limits			
Lower and upper flammability limits			
Flash point			
Autoignition temperature			
Decomposition temperature			
pH, neat			
pH, aqueous dilution	6 to 9		
Dissociation in water, pKa	kresoxim-methyl does not dissociate		
Kinematic viscosity (of liquids) in mm²/s			
Solubility in water	disperses in water		
Solubility in a specified non-polar solvent	not miscible with non-polar solvents		
Partition coefficient (n-octanol/water)	log P _{ow} = 3.40 at 25 °C (a.i.)		
Vapour pressure	2.3 x 10 ⁻⁶ Pa at 20 °C (a.i.)		
Density and/or relative density	approximately 1.1 to 1.3		
Bulk density, g/ml	not applicable		not a solid
Relative vapour density			
Particle characteristics			
Evaporation rate			
Surface tension			

Note: blank cells indicate that no information is available or was provided.

Section 10: STABILITY AND REACTIVITY

Chemical stability	Stable when handled and stored under normal conditions.
Reactivity	Non-corrosive to metals. No other data available.
Safety significance of any change in physical appearance	The mixture is not expected to change in physical appearance over time, except for non-hazardous and reversible settling.
Possibility of hazardous reactions	No known hazardous reactions and no polymerisation under normal handling conditions.
Conditions to avoid	Keep out of direct sunlight, away from excessive heat and flames. Pressure, shock, static discharge, and vibrations have no known effect.
Incompatible materials	Avoid strong bases, acids, and oxidising agents.
Hazardous decomposition products	The mixture is not expected to produce hazardous decomposition products when used and stored properly.

Section 11: TOXICOLOGICAL INFORMATION

Toxicological effect	Ardent 50 SC (mixture)	Kresoxim-methyl (active ingredient)
Acute oral toxicity	LD ₅₀ (rat) > 5 000 mg/kg	LD ₅₀ (rat) > 5 000 mg/kg
Acute dermal toxicity	LD ₅₀ (rat) > 2 000 mg/kg	LD ₅₀ (rat) > 2 000 mg/kg
Acute inhalation toxicity		LC ₅₀ (rat, 4 hours) > 5.6 mg/l
Skin corrosion/irritation		not a skin irritant
Serious eye damage/eye irritation		not an eye irritant
Respiratory or skin sensitisation		not a skin sensitiser (guinea pig)
Germ cell mutagenicity		not mutagenic or genotoxic
Carcinogenicity		suspected of causing cancer
Reproductive toxicity		not a reproductive toxicant
STOT, single exposure		
STOT, repeated exposure		
Aspiration hazard		not classified

Note: blank cells indicate that no information is available or was provided

Section 12: ECOLOGICAL INFORMATION

Ecotoxicological effect	Ardent 50 SC (mixture)	Kresoxim-methyl (active ingredient)
Acute aquatic toxicity: fish		<i>Oncorhynchus mykiss</i> (rainbow trout) 96-hour LC ₅₀ 0.199 mg/l
crustacea		<i>Daphnia magna</i> (water flea) 96-hour EC ₅₀ 0.186 mg/l
algae		<i>Ankistrodesmus bibrianus</i> 72-hour E _b C ₅₀ 0.063 mg/l
Chronic aquatic toxicity: fish		<i>Oncorhynchus mykiss</i> (rainbow trout) 28-day NOEC 0.013 mg/l
crustacea		<i>Daphnia magna</i> (water flea) 28-day NOEC 0.032 mg/l
algae		
Acute terrestrial toxicity: birds		mallard duck oral LD ₅₀ > 5 000 mg/kg bobwhite quail oral LD ₅₀ > 2 000 mg/kg
honeybees		acute oral LD ₅₀ > 100 µg/bee acute contact LD ₅₀ > 100 µg/bee
earthworm		<i>Eisenia foetida</i> LC ₅₀ > 937 mg/kg dry soil
soil		DT ₅₀ < 5 days
water		rapidly hydrolysed
biodegradation		not readily
Bioaccumulative potential: Partition coefficient		log P _{ow} = 3.40 at 25 °C
Bioconcentration factor, BCF		220 (whole fish), 430 (viscera), 52 (fillet)
Mobility in soil		medium mobility (K _{ioc} = 219 – 372 ml/g)
Other adverse effects		
PBT and vPvB assessment	The components of this mixture do not meet the criteria for classification	
	<i>Note: blank cells indicate that no information is available or was provided</i>	

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste residues responsibly as hazardous chemical waste through a licensed waste removal company.

Waste from unused product or residues must be classified, labelled, handled, and treated in accordance with the regional, national, and local laws and regulations. Refer to the manufacturer or supplier for information on recovery or recycling, for options on reclamation, and on disposal of unused material.

During incineration, hazardous gases (oxides of carbon and nitrogen) may be produced.

Avoid release of waste into the environment.

Dispose of the container by rinsing it properly. Do not re-use. Destroy it mechanically and dispose of to an approved recycling facility.

Section 14: TRANSPORT INFORMATION

IMDG/IMO	UN number (see Note below)	3082
	UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (kresoxim-methyl)
	Transport hazard class	9
	UN packing group number	III
	Marine pollutant	Yes
	Special precautions for users	EmS F-A S-F
RID/ADR	UN number (see Note below)	3082
	UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (kresoxim-methyl)
	Transport hazard class	9
	UN packing group number	III
	Environmental hazard	Yes
	Special precautions for users	EmS F-A S-F
ICAO/IATA	UN number (see Note below)	3082
	UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (kresoxim-methyl)
	Transport hazard class	9
	UN packing group number	III
	Environmental hazard	Yes
	Special precautions for users	EmS F-A S-F
	MARPOL 73/758 Annex II, and the IBC Code: Transport in bulk	Not applicable



Note: UN 3077 and UN 3082 – These products may be transported as non-dangerous goods under the special provisions of IMDG Code 2.10.2.7, ADR SP375 and ICAO/IATA A197 when packed in single or inner packaging of up to 5 litres for liquids, or 5 kg and less for solids

Section 15: REGULATORY INFORMATION

Relevant safety regulations	Regulations for Hazardous Chemical Agents 2021, Department of Employment and Labour (March 2021).
Relevant health regulations	Occupational Health and Safety Act, Act 85 of 1993, Department of Employment and Labour.
Relevant environmental regulations	Guidelines on the administration of incidents, as described in section 30 of the National Environmental Management Act, Act 107 of 1998 (NEMA), Department of Environmental Affairs (2019).

Waste Classification and Management Regulations 2013, National Environmental Management Waste Act, Act 59 of 2008, Department of Water and Environmental Affairs.

Relevant transport regulations

The National Road Traffic Act 93 of 1996, Department of Transport.

SANS 10228: The identification and classification of dangerous goods for transport by road and rail modes (2012).

Other relevant regulations

Regulations to Domesticated the Requirements of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 2023, Department of Forestry, Fisheries and the Environment (February 2023).

Subject to the Montreal Protocol No

Subject to the Stockholm Convention No

Subject to the Rotterdam Convention No

Subject to any prohibitions No

Subject to any restrictions No

Section 16: OTHER INFORMATION

Revision notes

This is a complete revision of Version 1 of the SDS dated 27 November 2019 to reflect the altered composition of Ardent 50 SC (other formulants).

Full text of hazard statements referred to in Sections 2 and 3

- H351 – Suspected of causing cancer
- H400 – Very toxic to aquatic life
- H410 – Very toxic to aquatic life with long-lasting effects

Abbreviations used

- ADI means acceptable daily intake.
- ADR means Agreement Concerning the International Carriage of Dangerous Goods by Road.
- a.i. means active ingredient
- AOEL means Acceptable Operator Exposure Level.
- CAS Number means Chemical Abstract Service number.
- EC Number means European Inventory of Existing Commercial Substances (EINECS) or European List of Notified Chemical Substances (ELINCS) number.
- EC₅₀ means the concentration at which 50% of the test organisms are affected.
- GHS means Globally Harmonised System of Classification and Labelling of Chemicals.
- ICAO means International Civil Aviation Organisation
- IATA means International Air Transport Association.
- IMDG means International Maritime Dangerous Goods.
- IMO means International Maritime Organisation.
- LC₅₀ means the lethal concentration to 50% of a test population (the median lethal concentration).
- LD₅₀ means the lethal dose to 50% of a test population (the median lethal dose).
- NEMA means National Environmental Management Act.
- NOEC means no observed effect concentration.
- PBT means persistent, bioaccumulative and toxic
- PEL means permissible exposure limit.
- RE means repeated exposure.
- RID means Regulations Concerning the International Carriage of Dangerous Goods by Rail.
- SE means single exposure.
- SDS means safety data sheet.
- STOT means specific target organ toxicity.



TWA means time-weighted average.

UN means United Nations.

vPvB means very persistent and very bioaccumulative

WG means water dispersible granules.

Reviser's code: KQ-kn-1147

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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