1. Identification

Product identifier:	Delfin® WG
Synonyms:	LarvaePro
Company product code or Supplier code:	N/A
Insecticide Group Code:	11A
RSA Reg. No. (Act No. 36 of 1947):	L9761
Supplier:	Andermatt Madumbi (Pty) Ltd Suite 105, 24 Hilton Ave, Hilton KZN 3245, South Africa Telephone: +27 (0) 33 342 3984 (09:00 to 16:00) Email address (technical): support@andermatt.co.za
Recommended use:	Biological insecticide for suppression of various *Lepidoptera* larvae
Restrictions on use:	Do not use for any other purpose than described on the product label
Emergency numbers:	+27 (0) 33 342 3984 (09:00 to 16:00) +27 (0) 82 446 8946 (24 H)

2. Hazards identification

Delfin® is a solid (granular) mixture.

Classification: Serious eye damage/eye irritation: Category 2B

Signal word: **WARNING**

Hazard statements: CAUSES EYE IRRITATION H320

Additional hazard information: Caution: Contains *Bacillus thuringiensis* subspecies kurstaki strain SA-11. Microorganisms may have the potential to provoke sensitising reactions.

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No hazard symbol required

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Precautionary statements:

Wear protective gloves/protective clothing/eye protection.	P280
In case of inadequate ventilation, wear respiratory protection.	P284
Do not eat, drink, or smoke when using this product.	P270
Wash hands and face thoroughly after handling. Do not touch eyes.	P264+P265
Avoid breathing dust, mist or spray.	P261
IF IN THE EYES: Rinse cautiously with water for several minutes.	P305+P351
Remove contact lenses, if present and easy to do. Continue rinsing.	P338
If eye irritation persists: Get medical help.	P337+P317
IF ON SKIN: Wash with plenty of water.	P302+P352
If skin irritation or rash occurs: Get medical help.	P332+P317
Take off contaminated clothing and wash it before reuse.	P362+P364
IF INHALED: Remove person to fresh air and keep comfortable for breathing.	P304+P340
If experiencing respiratory symptoms: Get emergency medical help immediately	P342+P316
Contaminated work clothing should not be allowed out of the workplace.	P272
Dispose of contents and/or container in accordance with regulations.	P501

3. Composition/information on ingredients

Ingredient	CAS number	%
Bacillus thuringiensis subspecies kurstaki strain SA-11 (Btk SA-11)	680338-71-1	85 (> 1 x 10^{10} units/kg)
Solid formulants	Confidential	15

4. First aid measures

Eye contact:

Most important acute symptoms/effects: eye irritation, redness, and/or excessive tears.
IF IN THE 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.

Skin contact:

Most important acute symptoms/effects: skin irritation, redness may occur.
IF ON SKIN: Wash with plenty of water.
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs, get medical help.

Inhalation:

Most important acute symptoms/effects: irritation of the upper airway, coughing and shortness of breath may occur.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Get medical help if the person feels unwell.

Ingestion:	Most important acute symptoms/effects: no symptoms or effects are known. IF SWALLOWED: Rinse mouth with water for several minutes. Get medical help if you feel unwell.
Most important delayed symptoms/effects after exposure:	Microorganisms may have the potential to provoke sensitising reactions, especially if there is prolonged or frequently repeated skin contact.
Indication of immediate medical attention:	If skin irritation or rash occurs, or if eye irritation persists, or if a burning sensation in the upper airways persists, get medical help. Treat symptomatically. Pre-existing conditions may be aggravated, such as eye, skin or respiratory disorders.
Protection of first responders:	Avoid undue contact with the mixture. Wear gloves and a mask to prevent transmission of pathogens.

5. Firefighting measures

Appropriate/suitable extinguishing media:	Water spray, foam, carbon dioxide (CO_2) or dry powder may be used but select extinguishing media that is appropriate for local circumstances and the surroundings.
Inappropriate extinguishing media:	None known.
Nature of hazardous combustion products:	None expected.
Other hazards arising from the mixture:	None known when properly stored and handled. There is no direct explosion hazard, no sensitivity to mechanical impact or to static discharge for this mixture.
Special protective equipment:	Avoid breathing vapours and combustion by-products that may be emitted from other sources. 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.

6. Accidental release measures

Distinguish between large or small spills or releases.

Personal precautions:	Avoid contact with skin and eyes. Avoid creation and inhalation of dust. 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/eye protection.
Emergency actions and procedures:	No special emergency actions or procedures are required.
Environmental precautions:	Do not apply manually within 100 meters or aerially within 400 meters of any habitats of endangered or threatened *Lepidoptera*. The product is for terrestrial use only. Do not apply directly to areas where surface water is present, or to intertidal areas below the high-water mark. Do not contaminate surface or ground water when disposing of rinsate or water used to wash equipment. Avoid release of spills to the environment. Prevent spills from entering storm sewers or drains. Report a large release to the appropriate authorities.
Methods and materials for containment and cleaning up:	Move intact containers from the spill area. The product is a water dispersible solid. The spill area may be slippery when wet. Small spills: Sweep up without creating dust clouds and place in an appropriate waste disposal container. Large spills: Ensure adequate ventilation. Sweep up without creating dust clouds and transfer to containers for disposal (reclaim if possible). Wash the spill area with water and strong detergent (the area may become slippery), then flush with water if appropriate. Dispose of via a licensed waste disposal contractor.

7. Handling and storage

Precautions for safe handling:	Wear protective gloves/protective clothing/eye protection, such as nitrile rubber gloves, safety glasses, and long-sleeved clothing. Do not eat, drink, or smoke when using this product. Do not touch eyes. Wash hands and face thoroughly after handling.
Conditions for safe storage:	Store in the original container in a cool, dry area out of direct sunlight. Keep containers closed. Protect from freezing. Temperatures above 32 °C may impair effectiveness. Store separately from any food, feed, or drinks. Keep out of reach of children and uninformed persons.
Any incompatibilities:	Avoid exposure to moisture or contact with strong oxidising agents.

8. Exposure controls/personal protection

No occupational exposure limit values have been established for this mixture.

No biological limit values are available for this mixture.

Appropriate engineering controls include good general ventilation. No other control parameters are considered necessary. Safety showers and eye wash stations should be provided.

Microorganisms may have the potential to provoke sensitising reactions. The product should not be used by subjects affected by immunodeficiency or in treatment with immunosuppressive agents.

Microbial pest control products may cause irritation if inhaled and may cause skin and eye irritation Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. These reactions can be avoided if exposure is minimized or limited by following label recommendation and precautions.

Users must wear a long-sleeved shirt, long pants, shoes plus socks, water-proof gloves and eye goggles or face mask when handling these mixtures. If dust or mist is present, a dust/mist filtering respirator should be used.

9. Physical and chemical properties

Physical state	Solid (granules)
Clarity:	Not applicable
Colour:	Brown
Odour:	Fish-like
Odour threshold:	Not determined
Melting point/freezing point:	Not applicable
Boiling point (or initial point and range):	Not applicable
Flammability (gases, liquids, solids):	Not determined
Lower and upper explosion limits:	No data available
Lower and upper flammability limits:	Not determined
Flash point:	Not determined
Autoignition temperature:	No data available
Decomposition temperature:	Not determined
pH, neat:	Not applicable
pH, aqueous dilution	5.5 to 6.5 (1% dilution)
Dissociation in water, pKa:	No data available
Kinematic viscosity (of liquids) in mm^2/s:	Not applicable
Solubility in water:	Disperses in water

Solubility in a specified non-polar solvent:	Not miscible with non-polar solvents
Partition coefficient (n-octanol/water):	Not determined
Vapour pressure (at 25 °C):	Not applicable
Density and/or relative density:	0.428 to 0.473 g/ml
Relative vapour density:	Not applicable
Particle characteristics:	No data available
Evaporation rate:	Not applicable

10. Stability and reactivity

Chemical stability:	The mixture is chemically stable and not reactive when handled or stored at ambient temperatures and below.
Safety significance of any change in physical appearance:	The mixture is not expected to change in physical appearance over time.
Possibility of hazardous reactions:	No known hazardous reactions and no polymerisation.
Conditions to avoid:	Avoid exposure to moisture and excessive heat. Pressure, shock, static discharge, and vibrations have no known effect.
Incompatible materials:	No known incompatibilities,
Hazardous decomposition products:	The mixture is not expected to produce hazardous decomposition products when used and stored properly.

11. Toxicological information

The following information is available for the end-use product:

Acute toxicity – oral	LD_{50} (rat) > 5 000 mg/kg body weight
– dermal	LD_{50} (rat) > 2 000 mg/kg body weight
– inhalation	No reliable data available
Skin corrosion/irritation	Not a skin irritant
Serious eye damage/irritation	Causes eye irritation
Respiratory/skin sensitization	No reliable data available. Microorganisms may have the potential to provoke sensitising reactions
Germ cell mutagenicity	No data available
Carcinogenicity	Not carcinogenic
Reproductive toxicity	Not a reproductive toxicant
STOT-single exposure	No data available
STOT-repeated exposure	No data available
Aspiration hazard	Not expected to have severe acute effects after aspiration.

Symptoms related to the physical, chemical, and toxicological characteristics of the mixture include possible irritation and redness upon skin contact. Eye contact causes irritation, redness, and excessive tears.

Effects of exposure: Apart from irritation, no data on immediate, delayed, or chronic effects from short- or long-term exposure is available. Prolonged or frequently repeated skin contact may cause allergic reactions.

12. Ecological information

No test data is available for the end-use product, The following information is available for the active ingredient:

Chronic aquatic hazard, fish	Rainbow trout, 96-hour LC_{50}	2.9 x 10^9 CFU/ℓ (low risk)
Chronic aquatic hazard, invertebrates	*Daphnia magna*, 48-hour LC_{50}	> 1.5 x 10^8 CFU/ℓ (low risk)
Acute aquatic hazard, aquatic plants	Algae, 72-hour EC_{50} (growth)	> 1 x 10^9 CFU/ℓ (low risk)
Chronic aquatic hazard, fish	Rainbow trout, 30-day LC_{50}	> 41.5 mg/ℓ
Toxicity for birds	Bobwhite quail 5-day gavage LC_{50}	> 3.86 x 10^9 CFU/kg
Toxicity for honeybees	48-hour oral/contact LD_{50}	> 320 µg/bee

The active ingredient *Bacillus thuringiensis* subspecies kurstaki strain SA-11 occurs naturally. No ecological hazard is expected.

Acute (short-term) aquatic toxicity:	Not classified	Based on available data
Chronic (long-term) aquatic toxicity:	Not classified	Based on available data
Toxicity for birds:	No hazard expected	Based on available data
Toxicity for earthworms:		No information available
Toxicity for terrestrial plants:	No unacceptable risk	Based on available data
Toxicity for honeybees:	No unacceptable risk	Based on available data
Toxicity for soil micro-organisms:		No information available
Possible impact on sewage treatment:		No information available
Degradability:	Active ingredient rapidly declines to natural background levels.	Based on available data
Persistence and mobility in soil:	Limited mobility (active ingredient)	Based on available data
Environmental fate	Active ingredient rapidly declines to natural background levels.	Based on available data
Bio-accumulative potential:		No information available
Ozone depletion potential:	None	Does not contain halocarbon molecules
Photochemical ozone creation potential:	Not expected	Based on type of ingredients.
Endocrine disrupting potential:	Not expected	Based on type of ingredients.
Climate change potential:	Not expected	Based on type of ingredients.
Other adverse effects:	None expected.	

13. Disposal considerations

Avoid release to the aquatic environment. Dispose of waste residues responsibly as low-hazard chemical waste through a licensed waste removal company.

Dispose of the container by rinsing it properly. Do not re-use. Destroy mechanically and dispose of as ordinary waste through a licensed waste removal company.

Refer to the manufacturer or supplier for information on recovery or recycling, for options on reclamation, and on disposal of unused material.

The physical/chemical properties of the product should have no significant effect on disposal procedures.

No special precautions for incineration are required.

There are no special precautions for landfill. The active ingredient occurs naturally and is of no environmental concern.

There is no other relevant information.

14. Transport information

UN number:	Not classified as dangerous in the context of transport regulations.
UN proper shipping name:	Not applicable.
UN packing group number:	Not applicable.
UN transport hazard class(es):	Not applicable.
A known marine pollutant (IMDG Code)?	Not a marine pollutant.
A known severe marine pollutant?	Not a marine pollutant.
Environmentally hazardous, ADR?	Not classified as dangerous in the context of transport regulations.
Environmentally hazardous, RID?	Not classified as dangerous in the context of transport regulations.
Environmentally hazardous, ADN?	Not classified as dangerous in the context of transport regulations.
Transport in bulk by sea, IMO?	Not classified as dangerous in the context of transport regulations.

There are no special precautions which a user needs to be aware of or needs to comply with.

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, 1993 (Act No. 85 of 1993).
Relevant environmental regulations:	The National Environmental Management Act, 107 of 1998 (NEMA). Guidelines on the administration of incidents, as described in section 30 of the NEMA, Department of Environmental Affairs (2019).

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.

16. Other information

SDS identification or reference number: 020

Date of the previous revision of this SDS: Not dated. Previous revision number: Not numbered.

There is no additional information relevant to the material's nature or use, or any other relevant information.

Abbreviations that may have been used in this document:

AND means European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.
ADR means Agreement Concerning the International Carriage of Dangerous Goods by Road.
bw means body weight.
CAS means Chemical Abstract Service.
Cat. means Category.
CFU means colony forming units.
GHS means Globally Harmonised System of Classification and Labelling of Chemicals.
IMDG Code means International Maritime Dangerous Goods Code.
IMO means International Maritime Organisation.
IRAC MoA means Insecticide Resistance Action Committee Mode of Action (Classification Scheme).
NEMA means National Environmental Management Act.
NOEC means no observed effect concentration.
OB means occlusion body.
RID means Regulations Concerning the International Carriage of Dangerous Goods by Rail.
SDS means safety data sheet.
STOT means specific target organ toxicity.
UN means United Nations.

This safety data sheet was compiled in compliance with the following regulations and guidelines:

a. Regulations for hazardous chemical agents 2021, Department of Employment and Labour (March 2021).
b. The globally harmonised system of classification and labelling of chemicals (GHS), 9th Revised Edition, United Nations (2021).
c. Globally harmonised system of classification and labelling of chemicals (GHS), SANS 10234:2019, Ed. 2.00 (2019).