SAFETY DATA SHEET

AWAKEN® ST

Section 1. Identification

Product identifier : AWAKEN® ST
Product code : 10033860
SDS # : 311
Product type : Liquid.

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

Identified uses
Seed treatment.

Uses advised against
Not available.

Supplier's details : Loveland Products Canada, Inc.
789 Donnybrook Drive
Dorchester, Ontario N0L 1G5
Telephone no. : 1-800-328-4678 (Customer Service)
Email : retail-SDS2@nutrien.com

Emergency telephone number (with hours of operation) : CHEMTREC: 1-800-424-9300
Medical: 1-800-561-8273
(24 h)

Section 2. Hazard identification

Classification of the substance or mixture : SERIOUS EYE DAMAGE - Category 1
TOXIC TO REPRODUCTION - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger
Hazard statements : Causes serious eye damage.
May damage fertility or the unborn child.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.
Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, protective clothing and eye or face protection.
Response : IF exposed or concerned: Get medical advice or attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
Storage : Store locked up.
Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
zinc di(acetate)	5 - 15	557-34-6
potassium acetate	1 - 5	127-08-2
ammonium nitrate	1 - 5	6484-52-2
urea	1 - 5	57-13-6
citric acid	0.1 - 1	77-92-9
disodium octaborate	0.1 - 1	12008-41-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact : CORROSIVE. Begin eye irrigation immediately. All eye exposures require medical evaluation following decontamination. Immediately rinse eyes with large quantities of water or saline for a minimum 30 minutes, longer irrigation time is preferred if possible. If possible, remove contact lenses being careful not to cause additional eye damage. If the initial water supply is insufficient, keep the affected area wet with a moist cloth and transfer the person to the nearest place where rinsing can be continued for the recommended length of time. Call an ambulance for transport to hospital. Continue eye irrigation during transport. For additional advice call the medical emergency number on this safety data sheet or your poison center or doctor.

Inhalation : Remove person to fresh air. No known significant effects. Seek medical attention for any signs of wheezing and/or breathing difficulties. For additional advice call the medical emergency number on this SDS or your poison center or medical provider.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Never give anything by mouth to an unconscious person. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Corrosive to eyes. Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause slight transient irritation.

Ingestion : May be harmful if swallowed. Over-exposure by ingestion is unlikely under normal working conditions.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Section 4. First-aid measures

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : Improved outcome requires prolonged rinsing or soaking with water in order to extract corrosive ions that have penetrated through the stratum corneum. Expert opinion indicates an extended duration of rinsing is required to remove corrosive chemicals - 60 minutes for strong alkalis, and 30 minutes for other corrosive substances. Water should be maintained at a comfortable temperature. It may be necessary to delay transport to emergency care facilities in order to to ensure 30 or 60 minutes of rinsing time. However, transporting the patient may be necessary depending on the condition of the patient or the availability of a water supply. If transport is necessary, rinsing the affected area should continue, if possible, during transport.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Decontamination measures may be necessary. Personnel and equipment must be checked and decontaminated prior to leaving the area.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Non-flammable. Material will not burn. Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
Ammonia

Special protective actions for fire-fighters : No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Contain and collect the water used to fight the fire for later treatment and disposal.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused adverse impacts (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Approach release from upwind. Put on appropriate personal protective equipment (see Section 8). Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Use appropriate equipment to put the spilled substance in a container for reuse or disposal. Recycle to process, if possible.
or
Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Read label before use. Apply this product only as specified on the label. Do not handle until all safety precautions have been read and understood. Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Do not breathe vapor or mist. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Do not store below the following temperature: 4.4°C (40°F). Protect from freezing. Contact your sales representative or a metallurgical specialist to ensure compatibility with your equipment.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Contact your personal protective equipment supplier to verify the compatibility of the equipment for the intended purpose.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

Physical state : Liquid.

Color : Green. [Dark]

Section 9. Physical and chemical properties and safety characteristics

Odor : Characteristic. [Slight]

Odor threshold : Not available.

pH : 6 to 7 [Conc. (% w/w): 100%]

Melting point/freezing point : Not available.

Boiling point, initial boiling point, and boiling range : Not available.

Flash point : [Product does not sustain combustion.]

Flammability : Non-flammable.

Lower and upper explosion limit/flammability limit : Not applicable.

Vapor pressure :

Ingredient name	Vapor Pressure at 20˚C			Vapor pressure at 50˚C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Water	23.8	3.2				

Relative vapor density : Not available.

Relative density : 1.175

Bulk density : 9.81 lb/gal

Solubility(ies) :

Media	Result
cold water	Easily soluble
hot water	Easily soluble

Solubility in water : Not available.

Miscible with water : Yes.

Partition coefficient: n-octanol/water : Not applicable.

Auto-ignition temperature : Not applicable.

Decomposition temperature : Not available.

Viscosity : Not available.

Particle characteristics

Median particle size : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Extremes of temperature and direct sunlight. Keep away from incompatible materials.

Incompatible materials : Strong oxidizers, strong reducing agents, strong acids, strong alkalis, brass, copper and galvanized metal. Contact your sales representative or a metallurgical specialist to ensure compatibility with your equipment.

Section 10. Stability and reactivity

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
zinc di(acetate)	LD50 Oral	Rat	2510 mg/kg	-
potassium acetate	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.6 mg/l	4 hours
	LD50 Dermal	Rabbit	>20000 mg/kg	-
	LD50 Oral	Rat	3250 mg/kg	-
ammonium nitrate	LD50 Oral	Rat	2217 mg/kg	-
urea	LD50 Oral	Rat	8471 mg/kg	-
citric acid	LD50 Oral	Rat	3 g/kg	-
disodium octaborate	LD50 Oral	Rat	2 g/kg	-

Conclusion/Summary : May be harmful if swallowed.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
ammonium nitrate	Eyes - Edema of the conjunctivae	Rabbit	3	-	3 days
	Skin - Edema	Rabbit	0	-	72 hours
citric acid	Eyes - Severe irritant	Rabbit	-	24 hours 750 ug	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Moderate irritant	Rabbit	-	0.5 Ml	-

Conclusion/Summary

Skin : May cause slight transient irritation.

Eyes : Causes serious eye damage.

Respiratory : No known significant effects or critical hazards.

Sensitization

Product/ingredient name	Route of exposure	Species	Result
ammonium nitrate	skin	Mouse	Not sensitizing

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
ammonium nitrate	OECD 471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Not available.

Conclusion/Summary : Potential for nitrosamine formation if ingested. Do not ingest.

Classification

Section 11. Toxicological information

Product/ingredient name	IARC	NTP	ACGIH
ammonium nitrate	2A	-	-

Reproductive toxicity

Not available.

Conclusion/Summary : Contains material which may damage fertility or the unborn child if swallowed. (Boron compounds <1.0%)

Teratogenicity

Not available.

Conclusion/Summary : Contains material which may cause developmental abnormalities, based on animal data. (Boron compounds <1.0%)

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
citric acid	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Ingestion.

Potential acute health effects

Eye contact : Corrosive to eyes. Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : May cause slight transient irritation.

Ingestion : May be harmful if swallowed. Over-exposure by ingestion is unlikely under normal working conditions.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : See above.

Potential delayed effects : See below.

Long term exposure

Potential immediate effects : See above.

Potential delayed effects : See below.

Potential chronic health effects

Section 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
ammonium nitrate	Chronic NOAEL Oral	Rat - Male, Female	256 mg/kg	12 months Continuous

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : Contains material which may damage fertility or the unborn child if swallowed. (Boron compounds <1.0%)

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
AWAKEN® ST	4940.2	N/A	N/A	N/A	N/A
zinc di(acetate)	500	N/A	N/A	N/A	N/A
potassium acetate	3250	N/A	N/A	N/A	N/A
ammonium nitrate	2217	N/A	N/A	N/A	N/A
urea	8471	N/A	N/A	N/A	N/A
citric acid	3000	N/A	N/A	N/A	N/A

Other information : Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
zinc di(acetate)	Acute EC50 800 µg/l Fresh water	Algae - Algae	72 hours
	Acute LC50 0.55 mg/l Fresh water	Fish - Oncorhynchus mykiss - Young of the year	96 hours
potassium acetate	Acute EC50 1.05 g/L Fresh water	Daphnia - Daphnia similis - Neonate	48 hours
	Acute LC50 313 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia	48 hours
	Acute LC50 298 mg/l Fresh water	Fish - Pimephales promelas	96 hours
ammonium nitrate	NOEC >1700 mg/l	Algae	10 days
	Acute EC50 490 mg/l	Daphnia	48 hours
	Chronic NOEC 6 to 12 mg/l Fresh water	Crustaceans - Cladocera	21 days
urea	Acute EC50 6573.1 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Neonate	48 hours
	Acute EC50 3910000 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 22.5 ppt Fresh water	Fish - Oreochromis mossambicus - Young	96 hours
	Chronic NOEC 2 g/L Fresh water	Fish - Heteropneustes fossilis	30 days
citric acid	Acute LC50 160000 µg/l Marine water	Crustaceans - Carcinus maenas - Adult	48 hours

Conclusion/Summary : Toxic to aquatic life with long lasting effects. May be harmful to the environment if released in large quantities. Apply this product only as specified on the label.

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
potassium acetate	-	100 % - 28 days	-	-

Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
potassium acetate	-	-	Readily
ammonium nitrate	-	-	Readily
urea	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
potassium acetate	-3.72	3.162	low
urea	<-1.73	-	low
citric acid	-1.8	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : Read label before use. Follow disposal instructions on label. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Triple rinse containers with water and add the rinse water to the spray tank. Do not reuse containers for any purpose. Disposal should be in accordance with applicable regional, national and local laws and regulations. Recycling decontaminated containers is the best option of container disposal. Do not contaminate water, food, or feed by storage or disposal.

Section 14. Transport information

	TDG Classification	DOT Classification	IMDG	IATA
UN number	Not regulated.	UN3082	Not regulated.	Not regulated.
UN proper shipping name	-	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (copper sulfate, zinc di(acetate))	-	-
Transport hazard class(es)	-	9 	-	-
Packing group	-	III	-	-
Environmental hazards	No.	No.	No.	No.

Additional information

DOT Classification : **Reportable quantity** 1589.8 lbs / 721.78 kg [162.28 gal / 614.28 L]. The classification of the product is due solely to the presence of one or more US DOT-listed 'Hazardous substances' that are subject to reportable quantity requirements and only applies to shipments of packages greater than, or equal to, the product reportable quantity. **Package sizes less than the product reportable quantity are not regulated as hazardous materials.**
Remarks This product does not contain any DOT listed marine pollutants (49 CFR Appendix B to 172.101).

Section 14. Transport information

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : The following components are listed: ammonium acetate; zinc di(acetate); ammonium nitrate

CEPA Toxic substances : None of the components are listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : All components are listed or exempted.

Canada : All components are listed or exempted.

China : All components are listed or exempted.

Eurasian Economic Union : **Russian Federation inventory**: All components are listed or exempted.

Japan : **Japan inventory (CSCL)**: Not determined.
Japan inventory (ISHL): Not determined.

New Zealand : All components are listed or exempted.

Philippines : All components are listed or exempted.

Republic of Korea : All components are listed or exempted.

Taiwan : All components are listed or exempted.

Thailand : Not determined.

Turkey : Not determined.

United States : All components are active or exempted.

Viet Nam : All components are listed or exempted.

Section 16. Other information

History

Date of issue/Date of revision : 4/11/2023

Date of previous issue : No previous validation

Version : 1

Section 16. Other information

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
HPR = Hazardous Products Regulations
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SGG = Segregation Group
UN = United Nations

Procedure used to derive the classification

Classification	Justification
SERIOUS EYE DAMAGE - Category 1 TOXIC TO REPRODUCTION - Category 1	Calculation method Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

Supply chain partners must ensure they pass this SDS, and all other relevant safety information to their customers.

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