

Material Safety Data Sheet

1. Product and company identification

Product name : 14169 2-0-0 Ultra Yield Corn Mix with 20Zn-10S-4Mn-1B-1Cu
Synonym : Micronutrient mix
Material uses : Agricultural industry: Fertilizer.
Manufacturer : Agrium Advanced Technologies (U.S.), Inc.
 2405 West Vassar Road (M-15)
 Reese, MI 48757
Supplier : Agrium Advanced Technologies (U.S.), Inc.
 100 Technology Loop
 Sylacauga, AL 35150
Validation date : Validated by Company on 4/21/2009.

In case of emergency : Transportation: 1-800-792-8311
 Medical: 1-888-670-8123

2. Hazards identification

Physical state : Solid.
OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : WARNING!
 HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
 Harmful if swallowed. Avoid exposure - obtain special instructions before use. Do not ingest. Avoid contact with eyes, skin and clothing. Contains material that may cause target organ damage, based on animal data. Wash thoroughly after handling.

Potential acute health effects

Inhalation : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Ingestion : Will cause irritation of the digestive tract if swallowed.
Skin : May cause skin irritation.
Eyes : May cause severe eye irritation.

Potential chronic health effects

Chronic effects : Inhalation of large quantities of manganese containing dusts over many years may result in damage to the central nervous system with symptoms of sleepiness, tremors and weakness in the legs, slurred speech, emotional disturbances and loss of balance in more advanced cases.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.
Target organs : Contains material which may cause damage to the following organs: blood, kidneys, lungs, upper respiratory tract, skin, eyes, central nervous system (CNS), nose/sinuses, throat.

Over-exposure signs/symptoms

Inhalation : No specific data.
Ingestion : No specific data.
Skin : No specific data.

2 . Hazards identification

- Eyes** : No specific data.
- Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.
- See toxicological information (section 11)

3 . Composition/information on ingredients

United States

<u>Name</u>	<u>CAS number</u>	<u>%</u>
zinc oxide	1314-13-2	7 - 13
zinc sulphate (anhydrous)	7733-02-0	7 - 13
manganese dioxide	1313-13-9	1 - 5
copper oxide	1317-38-0	1 - 5
urea	57-13-6	0.99 - 4.98
diiron trioxide	1309-37-1	1 - 3
boric acid	10043-35-3	1 - 3

Canada

<u>Name</u>	<u>CAS number</u>	<u>%</u>
zinc oxide	1314-13-2	7 - 13
zinc sulphate (anhydrous)	7733-02-0	7 - 13
manganese dioxide	1313-13-9	1 - 5
copper oxide	1317-38-0	1 - 5
urea	57-13-6	0.99 - 4.98
diiron trioxide	1309-37-1	1 - 3
boric acid	10043-35-3	1 - 3

Mexico

<u>Name</u>	<u>CAS number</u>	<u>UN number</u>	<u>%</u>	<u>IDLH</u>	<u>Classification</u>			
					<u>H</u>	<u>F</u>	<u>R</u>	<u>Special</u>
copper oxide	1317-38-0	Not available.	1 - 5	100 mg/m ³	2	0	0	
zinc oxide	1314-13-2	Not available.	7 - 13	500 mg/m ³	0	0	0	
manganese dioxide	1313-13-9	Not available.	1 - 5	500 mg/m ³	0	0	0	
diiron trioxide	1309-37-1	Not available.	1 - 3	2500 mg/m ³	0	0	0	
boric acid	10043-35-3	Not available.	1 - 3	-	0	0	0	

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

4 . First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

4 . First aid measures

- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- 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. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- 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.

5 . Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides
metal oxide/oxides
- 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.

6 . Accidental release measures

- Personal precautions** : 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. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- 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 environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). 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. Do not get in eyes or on skin or clothing. Do not ingest. 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.
- Storage** : 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. 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.

8 . Exposure controls/personal protection

United States

Ingredient	Exposure limits
zinc oxide	<p>NIOSH REL (United States, 6/2008). CEIL: 15 mg/m³ Form: Dust TWA: 5 mg/m³ 10 hour(s). Form: Dust and fumes STEL: 10 mg/m³ 15 minute(s). Form: Fume</p> <p>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hour(s). Form: Fume STEL: 10 mg/m³ 15 minute(s). Form: Fume TWA: 10 mg/m³ 8 hour(s). Form: Total dust TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction</p> <p>OSHA PEL (United States, 11/2006). TWA: 5 mg/m³ 8 hour(s). Form: Fume TWA: 15 mg/m³ 8 hour(s). Form: Total dust TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction</p> <p>ACGIH TLV (United States, 1/2008). STEL: 10 mg/m³ 15 minute(s). TWA: 2 mg/m³ 8 hour(s).</p>
manganese dioxide	<p>ACGIH TLV (United States, 1/2008). TWA: 0.2 mg/m³, (as Mn) 8 hour(s).</p> <p>OSHA PEL 1989 (United States, 3/1989). CEIL: 5 mg/m³, (as Mn)</p> <p>NIOSH REL (United States, 6/2008). TWA: 1 mg/m³, (as Mn) 10 hour(s). Form: Fume STEL: 3 mg/m³, (as Mn) 15 minute(s). Form: Fume</p> <p>OSHA PEL (United States, 11/2006). CEIL: 5 mg/m³, (as Mn)</p>
copper oxide	<p>NIOSH REL (United States, 6/2008). TWA: 0.1 mg/m³, (as Cu) 10 hour(s). Form: Fume</p>
urea	<p>AIHA WEEL (United States, 1/2008). TWA: 10 mg/m³ 8 hour(s).</p>
diiron trioxide	<p>ACGIH TLV (United States, 1/2008). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction</p> <p>NIOSH REL (United States, 6/2008). TWA: 5 mg/m³, (as Fe) 10 hour(s). Form: Dust and fumes</p> <p>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 10 mg/m³ 8 hour(s). Form: Total dust STEL: 10 ppm, (as Fe) 15 minute(s). Form: Total particulates</p> <p>OSHA PEL (United States, 11/2006).</p>

8 . Exposure controls/personal protection

boric acid	TWA: 10 mg/m ³ 8 hour(s). ACGIH TLV (United States, 1/2008). TWA: 2 mg/m ³ 8 hour(s). STEL: 6 mg/m ³ 15 minute(s).
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Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			Notations
Ingredient	List name	ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other	
zinc oxide	US ACGIH 1/2008	-	2	-	-	10	-	-	-	-	
	AB 6/2008	-	10	-	-	-	-	-	-	-	[a]
	BC 6/2008	-	5	-	-	10	-	-	-	-	[b]
	ON 6/2008	-	2	-	-	10	-	-	-	-	[c]
	QC 6/2008	-	2	-	-	10	-	-	-	-	[d]
manganese dioxide, as Mn	US ACGIH 1/2008	-	0.2	-	-	-	-	-	-	-	
	AB 6/2008	-	1	-	-	-	-	-	-	-	
	BC 6/2008	-	0.2	-	-	-	-	-	-	-	
	ON 6/2008	-	0.2	-	-	-	-	-	-	-	
	QC 6/2008	-	5	-	-	10	-	-	-	-	[e]
manganese dioxide, as manganese	US ACGIH 1/2008	-	0.2	-	-	-	-	-	-	-	
	AB 6/2008	-	1	-	-	-	-	-	-	-	
manganese dioxide, as Mn	ON 6/2008	-	0.2	-	-	-	-	-	-	-	
	QC 6/2008	-	5	-	-	-	-	-	-	-	[f]
boric acid	US ACGIH 1/2008	-	2	-	-	6	-	-	-	-	
	BC 6/2008	-	2	-	-	6	-	-	-	-	[g]
	ON 6/2008	-	2	-	-	6	-	-	-	-	[h]
diiron trioxide	US ACGIH 1/2008	-	5	-	-	-	-	-	-	-	[i]
	AB 6/2008	-	5	-	-	-	-	-	-	-	[j]
diiron trioxide, as Fe	BC 6/2008	-	10	-	-	-	-	-	-	-	
		-	5	-	-	-	-	-	-	-	[a]
		-	5	-	-	10	-	-	-	-	[b]
		-	3	-	-	-	-	-	-	-	[k]
diiron trioxide	ON 6/2008	-	10	-	-	-	-	-	-	-	[l]
		-	5	-	-	-	-	-	-	-	[d]
		-	10	-	-	-	-	-	-	-	[m]
diiron trioxide, as Fe	QC 6/2008	-	5	-	-	-	-	-	-	-	[n]
	US AIHA 1/2008	-	10	-	-	-	-	-	-	-	

Form: [a]Dust [b]Fume [c]Respirable [d]The notation "respirable" following the name of an agent in this Schedule means that size fraction of the airborne particulate deposited in the gas-exchange region of the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the American Conference of Governmental Industrial Hygienists (ACGIH) particle size-selective criteria; and (b) has the cut point of 4 microns at 50 per cent collective efficiency. [e]fume [f]Total dust. [g]Inhalable [h]The notation "inhalable" following the name of an agent in this Schedule means that size fraction of the airborne particulate deposited anywhere in the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the American Conference of Governmental Industrial Hygienists (ACGIH) particle size-selective criteria; and (b) has the cut point of 100 microns at 50 per cent collective efficiency. [i]Respirable fraction [j]Dust and fumes [k]Respirable dust [l]Total dust [m]total dust [n]dust and fume

Mexico

Ingredient	Exposure limits
zinc oxide	NOM-010-STPS (Mexico, 9/2000). LMPE-PPT: 10 mg/m ³ 8 hour(s). Form: powder LMPE-CT: 10 mg/m ³ 15 minute(s). Form: smoke LMPE-PPT: 5 mg/m ³ 8 hour(s). Form: smoke
manganese dioxide	NOM-010-STPS (Mexico, 9/2000). LMPE-PPT: 0.2 mg/m ³ , (as Mn) 8 hour(s).
diiron trioxide	NOM-010-STPS (Mexico, 9/2000). LMPE-CT: 10 mg/m ³ , (as Fe) 15 minute(s). LMPE-PPT: 5 mg/m ³ , (as Fe) 8 hour(s).
boric acid	ACGIH TLV (United States, 1/2008). TWA: 2 mg/m ³ 8 hour(s). STEL: 6 mg/m ³ 15 minute(s).

Consult local authorities for acceptable exposure limits.

8 . Exposure controls/personal protection

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : 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.
- 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.
- Personal protection**
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : 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.
- Eyes** : 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 or dusts.
- Skin** : 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.
- 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.

9 . Physical and chemical properties

Physical state : Solid.

10 . Stability and reactivity

- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.
- Conditions to avoid** : No specific data.
- Materials to avoid** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
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11 . Toxicological information

copper oxide	LD50 Oral	Rat	470 mg/kg	-
	LDLo	Rat	278 mg/kg	-
manganese dioxide	Intratracheal			
	LD50 Oral	Rat	3478 mg/kg	-
	LDLo	Rat	50 mg/kg	-
urea	Intratracheal			
	LD50	Rat	567 mg/kg	-
	Intratracheal LD50 Oral	Rat	8471 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
zinc oxide	A4	-	-	-	-	-
diiiron trioxide	A4	3	-	-	-	-
boric acid	A4	-	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
copper oxide	LD50 Oral	Rat	470 mg/kg	-
	LDLo	Rat	278 mg/kg	-
manganese dioxide	Intratracheal			
	LD50 Oral	Rat	3478 mg/kg	-
	LDLo	Rat	50 mg/kg	-
urea	Intratracheal			
	LD50	Rat	567 mg/kg	-
	Intratracheal LD50 Oral	Rat	8471 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

11 . Toxicological information

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
zinc oxide	A4	-	-	-	-	-
diiron trioxide	A4	3	-	-	-	-
boric acid	A4	-	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Mexico

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
copper oxide	LD50 Oral	Rat	470 mg/kg	-
	LDLo Intratracheal	Rat	278 mg/kg	-
manganese dioxide	LD50 Oral	Rat	3478 mg/kg	-
	LDLo Intratracheal	Rat	50 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
zinc oxide	A4	-	-	-	-	-
diiron trioxide	A4	3	-	-	-	-
boric acid	A4	-	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
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12 . Ecological information

zinc sulphate (anhydrous)	-	Acute LC50 240 to 500 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours
	-	Acute LC50 40 to 50 ug/L Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss - Fingerling	96 hours
zinc oxide	-	Acute LC50 2246000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas - Neonate - <24 hours	96 hours
	-	Acute LC50 24600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <24 hours	48 hours
copper oxide	-	Acute EC50 11 to 39 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours
	-	Acute LC50 25.4 to 29.5 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
boric acid	-	Acute LC50 50 to 100 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
urea	-	Acute LC50 66800 to 70500 ug/L Fresh water	Fish - Rohu - Labeo rohita - Egg	96 hours
	-	Acute LC50 22500 ug/L	Fish - Mozambique tilapia - Tilapia mossambica	96 hours
	-	Acute LC50 5000 ug/L Fresh water	Fish - Giant gourami - Colisa fasciata - Fingerling	96 hours

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
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12 . Ecological information

zinc sulphate (anhydrous)	-	Acute LC50 240 to 500 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours
	-	Acute LC50 40 to 50 ug/L Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss - Fingerling	96 hours
zinc oxide	-	Acute LC50 2246000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas - Neonate - <24 hours	96 hours
	-	Acute LC50 24600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <24 hours	48 hours
copper oxide	-	Acute EC50 11 to 39 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours
	-	Acute LC50 25.4 to 29.5 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
boric acid	-	Acute LC50 50 to 100 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
urea	-	Acute LC50 66800 to 70500 ug/L Fresh water	Fish - Rohu - Labeo rohita - Egg	96 hours
	-	Acute LC50 22500 ug/L	Fish - Mozambique tilapia - Tilapia mossambica	96 hours
	-	Acute LC50 5000 ug/L Fresh water	Fish - Giant gourami - Colisa fasciata - Fingerling	96 hours

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Mexico

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
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12 . Ecological information

copper oxide	-	Acute EC50 11 to 39 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours
	-	Acute LC50 25.4 to 29.5 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
zinc oxide	-	Acute LC50 2246000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas - Neonate - <24 hours	96 hours
	-	Acute LC50 24600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <24 hours	48 hours
boric acid	-	Acute LC50 50 to 100 ppm Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not available.	Not available.	Not available.	-		-
TDG Classification	Not available.	Not available.	Not available.	-		-
Mexico Classification	Not available.	Not available.	Not available.	-		-

PG* : Packing group

15 . Regulatory information

United States

- HCS Classification** : Toxic material
Target organ effects
- U.S. Federal regulations** : TSCA 4(a) final test rules: biuret; Urea, reaction products with formaldehyde
United States inventory (TSCA 8b): Not determined.
TSCA 12(b) one-time export: biuret; Urea, reaction products with formaldehyde
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: urea; zinc oxide; zinc sulphate (anhydrous); diiron trioxide; boric acid; manganese dioxide
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: urea: Immediate (acute) health hazard, Delayed (chronic) health hazard; zinc oxide: Immediate (acute) health hazard, Delayed (chronic) health hazard; zinc sulphate (anhydrous): Immediate (acute) health hazard, Delayed (chronic) health hazard; diiron trioxide: Delayed (chronic) health hazard; boric acid: Immediate (acute) health hazard, Delayed (chronic) health hazard; manganese dioxide: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 307: zinc oxide; zinc sulphate (anhydrous); copper sulphate; copper oxide
Clean Water Act (CWA) 311: zinc sulphate (anhydrous); iron(ii) sulfate heptahydrate; copper sulphate
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.
- Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** : Listed
- Clean Air Act Section 602 Class I Substances** : Listed
- Clean Air Act Section 602 Class II Substances** : Not listed
- DEA List I Chemicals (Precursor Chemicals)** : Not listed
- DEA List II Chemicals (Essential Chemicals)** : Not listed

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	zinc oxide	1314-13-2	7 - 13
	zinc sulphate (anhydrous)	7733-02-0	7 - 13
	manganese dioxide	1313-13-9	1 - 5
	copper oxide	1317-38-0	1 - 5
Supplier notification	zinc oxide	1314-13-2	7 - 13
	zinc sulphate (anhydrous)	7733-02-0	7 - 13
	manganese dioxide	1313-13-9	1 - 5
	copper oxide	1317-38-0	1 - 5

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

15 . Regulatory information

State regulations :

- Connecticut Carcinogen Reporting:** None of the components are listed.
- Connecticut Hazardous Material Survey:** None of the components are listed.
- Florida substances:** None of the components are listed.
- Illinois Chemical Safety Act:** None of the components are listed.
- Illinois Toxic Substances Disclosure to Employee Act:** None of the components are listed.
- Louisiana Reporting:** None of the components are listed.
- Louisiana Spill:** None of the components are listed.
- Massachusetts Spill:** None of the components are listed.
- Massachusetts Substances:** The following components are listed: ZINC SULFATE; ZINC OXIDE FUME; IRON OXIDE DUST
- Michigan Critical Material:** None of the components are listed.
- Minnesota Hazardous Substances:** None of the components are listed.
- New Jersey Hazardous Substances:** The following components are listed: ZINC SULFATE; ZINC OXIDE; COPPER compounds; MANGANESE DIOXIDE; IRON OXIDE FUME
- New Jersey Spill:** None of the components are listed.
- New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.
- New York Acutely Hazardous Substances:** The following components are listed: Zinc sulfate
- New York Toxic Chemical Release Reporting:** None of the components are listed.
- Pennsylvania RTK Hazardous Substances:** The following components are listed: SULFURIC ACID, ZINC SALT (1:1); ZINC OXIDE (ZNO); COPPER COMPOUNDS; MANGANESE COMPOUNDS; IRON OXIDE (FE2O3)
- Rhode Island Hazardous Substances:** None of the components are listed.

United States inventory (TSCA 8b) : Not determined.

Canada

WHMIS (Canada) :

- Class D-2A: Material causing other toxic effects (Very toxic).
- Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists :

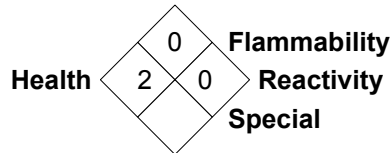
- CEPA Toxic substances:** None of the components are listed.
- Canadian ARET:** None of the components are listed.
- Canadian NPRI:** The following components are listed: Zinc; Zinc; Copper; Manganese
- Alberta Designated Substances:** None of the components are listed.
- Ontario Designated Substances:** None of the components are listed.
- Quebec Designated Substances:** None of the components are listed.

Canada inventory : Not determined.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Mexico

Classification :



EU regulations

Hazard symbol or symbols :



15 . Regulatory information

- Risk phrases** : R41- Risk of serious damage to eyes.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- Safety phrases** : S2- Keep out of the reach of children.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S29- Do not empty into drains.
S39- Wear eye/face protection.
S46- If swallowed, seek medical advice immediately and show this container or label.
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

International regulations

- International lists** : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): Not determined.
Japan inventory (ENCS): Not determined.
Japan inventory (ISHL): Not determined.
Korea inventory (KECI): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): Not determined.
- Chemical Weapons Convention List Schedule I Chemicals** : Not listed
- Chemical Weapons Convention List Schedule II Chemicals** : Not listed
- Chemical Weapons Convention List Schedule III Chemicals** : Not listed

16 . Other information

Label requirements : HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

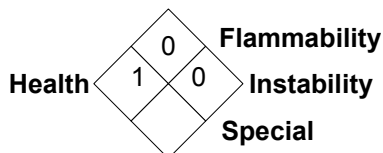
Hazardous Material Information System (U.S.A.) :

Health	1
Flammability	0
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

National Fire Protection Association (U.S.A.) :



16 . Other information

Date of issue : 4/21/2009.

Version : 4

☑ Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.