SAFETY DATA SHEET

1. Identification

Product identifier Zerophos

Other means of identification

Product code 30065

Recommended use Agricultural/ Horticultural Use- Micronutrient Fertilizer- Refer to product label.

Recommended restrictions Refer to product label.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Grigg Bros.
Address P.O. Box 125
Albion, ID 83311

United States

Telephone Office 208-673-6340

Fax 208-673-6342

Website www.griggbros.com
E-mail Not available.
Emergency phone number 1-888-246-8873

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Acute toxicity, oral Category 4

Skin corrosion/irritation Category 2
Serious eye damage/eye irritation Category 2A

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements



Signal word Warning

Hazard statement Harmful if swallowed. Causes serious eye irritation.

Precautionary statement

Prevention Wear eye/face protection. Wash thoroughly after handling. Do not eat, drink or smoke when using

this product.

Response If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. 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 advice/attention.

Storage Store away from incompatible materials.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise

classified (HNOC)

None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Urea		57-13-6	10 - < 20*

Material name: Zerophos SDS US

Chemical name	Common name and synonyms	CAS number	%
Calcium Carbonate		471-34-1	5 - < 10*
FERROUS SULFATE		7782-63-0	5 - < 10*
Humic Acid Ore / Leonardite		129521-66-0	5 - < 10*
Manganese Sulfate, monohydrate		10034-96-5	1 - < 3*
Manganese(II) Oxide		1344-43-0	1 - < 3*
Calcium Sulfate, dihydrate (Gypsum)		7778-18-9	< 1
Sulfuric acid, zinc salt (1:1)		7733-02-0	0.24
Calcium Oxide		1305-78-8	< 0.3*
Quartz, Dust, Respirable Fraction		14808-60-7	< 0.3
Other components below reportable	levels		60 - < 70

^{*}Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation If dust from the material is inhaled, remove the affected person immediately to fresh air. Call a

physician if symptoms develop or persist.

Wash off with soap and water. Get medical attention if irritation develops and persists. Skin contact

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if Eye contact present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

During fire, gases hazardous to health may be formed.

Do not use water jet as an extinguisher, as this will spread the fire.

Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Get medical advice/attention if you feel unwell. Get medical attention if symptoms occur. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Severe eye

Most important symptoms/effects, acute and delayed

Ingestion

irritation.

Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

Indication of immediate medical attention and special treatment needed **General information**

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing media

Specific hazards arising from the chemical

Special protective equipment

and precautions for firefighters

Fire fighting equipment/instructions

Specific methods

Use water spray to cool unopened containers.

Use standard firefighting procedures and consider the hazards of other involved materials.

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

General fire hazards No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of dust from the spilled material. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Stop the flow of material, if this is without risk. Dike far ahead of spill for later disposal. If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Collect dust using a vacuum cleaner equipped with HEPA filter. Following product recovery, flush area with water. Sweep up or vacuum up spillage and collect in suitable container for disposal. Minimize dust generation and accumulation. Prevent entry into waterways, sewer, basements or confined areas. For waste disposal, see section 13 of the SDS.

Material name: Zerophos SDS US 2/9

Environmental precautions

Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not taste or swallow. Avoid breathing dust. Avoid contact with eyes. Avoid prolonged exposure. Wear appropriate personal protective equipment. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Observe good industrial hygiene practices. Practice good housekeeping.

Conditions for safe storage, including any incompatibilities

Store in original tightly closed container. Keep container tightly closed. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

upational exposure limits US. OSHA Table Z-1 Limits for Air	Contaminants (29 CFR 1910.1	000)	
Components	Туре	Value	Form
Calcium Carbonate (CAS 471-34-1)	PEL	5 mg/m3	Respirable fraction.
Calcium Oxide (CAS	PEL	15 mg/m3 5 mg/m3	Total dust.
1305-78-8) Calcium Sulfate, dihydrate	PEL	5 mg/m3	Respirable fraction.
Gypsum) (CAS 7778-18-9)		15 mg/m3	Total dust.
Manganese Sulfate, nonohydrate (CAS I 0034-96-5)	Ceiling	5 mg/m3	
Manganese(II) Oxide (CAS I344-43-0)	Ceiling	5 mg/m3	
JS. OSHA Table Z-3 (29 CFR 1910.			_
Components	Туре	Value	Form
Quartz, Dust, Respirable Fraction (CAS 14808-60-7)	TWA	0.3 mg/m3	Total dust.
		0.1 mg/m3	Respirable.
		2.4 mppcf	Respirable.
JS. ACGIH Threshold Limit Values			
Components	Туре	Value	Form
Calcium Oxide (CAS 1305-78-8)	TWA	2 mg/m3	
Calcium Sulfate, dihydrate Gypsum) (CAS 7778-18-9)	TWA	10 mg/m3	Inhalable fraction.
Manganese Sulfate, nonohydrate (CAS I 0034-96-5)	TWA	0.1 mg/m3	Inhalable fraction.
Manganese(II) Oxide (CAS	TWA	0.02 mg/m3 0.1 mg/m3	Respirable fraction. Inhalable fraction.
1344-43-0)		-	
Quartz, Dust, Respirable Fraction (CAS 14808-60-7)	TWA	0.02 mg/m3 0.025 mg/m3	Respirable fraction. Respirable fraction.
JS. NIOSH: Pocket Guide to Chem	ical Hazards		
Components	Туре	Value	Form
Calcium Carbonate (CAS	TWA	5 mg/m3	Respirable.
,		10 mg/m3	Total
Calcium Oxide (CAS 305-78-8)	TWA	2 mg/m3	
Calcium Sulfate, dihydrate Gypsum) (CAS 7778-18-9)	TWA	5 mg/m3	Respirable.
		10 mg/m3	Total
Manganese Sulfate, monohydrate (CAS I 0034-96-5)	STEL	3 mg/m3	Fume.

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US. NIOSH: Pocket Guide to Chen	nical Hazards		
Components	Туре	Value	Form
	TWA	1 mg/m3	Fume.
Manganese(II) Oxide (CAS 1344-43-0)	STEL	3 mg/m3	Fume.
•	TWA	1 mg/m3	Fume.
Quartz, Dust, Respirable Fraction (CAS 14808-60-7)	TWA	0.05 mg/m3	Respirable dust.
US. AIHA Workplace Environment	al Exposure Level (WEEL) Gu	ides	
Components	Туре	Value	Form
Urea (CAS 57-13-6)	TWA	10 mg/m3	Total particulate.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit

(OEL), suitable respiratory protection must be worn. Provide eyewash station.

Individual protection measures, such as personal protective equipment

Eye/face protection Face shield is recommended. Wear safety glasses with side shields (or goggles). Use tight fitting

goggles if dust is generated.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.

Other Wear suitable protective clothing.

Respiratory protection Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels

exceeding the exposure limits. Respiratory protection not required.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash

work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Solid.
Form Powder.
Color Not available.
Odor Not available.
Odor threshold Not available.
pH Not available.

Melting point/freezing point 149 °F (65 °C) estimated Initial boiling point and boiling 572 °F (300 °C) estimated

range

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower

Not available.

(%)

Flammability limit - upper

(%)

Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure 0.00002 hPa estimated

Vapor density Not available.

Relative density 1.702 g/cm3 estimated

Material name: Zerophos sps us

Solubility(ies)

Solubility (water) Not available.

Partition coefficient Not available.

(n-octanol/water)

Auto-ignition temperatureNot available.Decomposition temperatureNot available.ViscosityNot available.

Other information

Density 2.09 g/cm3 estimated
Specific gravity 2.09 estimated

10. Stability and reactivity

ReactivityThe product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability Material is stable under normal conditions.

Possibility of hazardous Hazardous polymerization does not occur.

reactions

Conditions to avoid Contact with incompatible materials. Avoid dispersal of dust in the air (i.e., clearing dust surfaces

with compressed air).

Incompatible materials Acids. Fluorine.

Hazardous decomposition

products

No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation Prolonged inhalation may be harmful. Inhalation of dusts may cause respiratory irritation.

Skin contact No adverse effects due to skin contact are expected.

Eye contact Causes serious eye irritation. Dust in the eyes will cause irritation.

Ingestion Harmful if swallowed.

Symptoms related to the physical, chemical and

toxicological characteristics

Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Severe eye

irritation.

Information on toxicological effects

Acute toxicity Harmful if swallowed. Not known.

Product	Species	Test Results	
Zerophos			
<u>Acute</u>			
Dermal			
LD50	Rat	5789 mg/kg estimated	
Inhalation			
LC50	Rat	12750 mg/m³ estimated	
		4.5 mg/l, 192 hours estimated	
Oral			
LD100	Mouse	25924 mg/kg estimated	
LD50	Mouse	19260 mg/kg estimated	
	Rat	5656 mg/kg estimated	
Components	Species	Test Results	
Calcium Carbonate (CAS 47	71-34-1)		

Acute Oral

LD50 Mouse 6450 mg/kg
Rat 6450 mg/kg

Material name: Zerophos SDS US

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Components **Test Results Species**

Manganese Sulfate, monohydrate (CAS 10034-96-5)

Acute

Oral

LD100 Mouse 305 mg/kg

Sulfuric acid, zinc salt (1:1) (CAS 7733-02-0)

Acute Dermal

LD50 Rat > 2000 mg/kg

Oral

LD50 Mouse 57 mg/kg Rat 623 mg/kg

Urea (CAS 57-13-6)

Acute Oral

LD50 Rat 8471 mg/kg

Sheep 28500 mg/kg

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye

Causes serious eye irritation. Dust in the eyes will cause irritation.

irritation

Respiratory or skin sensitization

Not available. Respiratory sensitization

Skin sensitization This product is not expected to cause skin sensitization.

No data available to indicate product or any components present at greater than 0.1% are Germ cell mutagenicity

mutagenic or genotoxic.

This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Quartz, Dust, Respirable Fraction (CAS 14808-60-7) 1 Carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Quartz, Dust, Respirable Fraction (CAS 14808-60-7) Known To Be Human Carcinogen.

This product is not expected to cause reproductive or developmental effects. Reproductive toxicity

Specific target organ

toxicity - single exposure

Not classified.

Specific target organ toxicity - repeated

exposure

Not classified.

Not available. **Aspiration hazard**

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the

possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
Zerophos			
Aquatic			
Crustacea	EC50	Daphnia	2045.9525 mg/l, 48 hours estimated
Fish	LC50	Fish	2773.821 mg/l, 96 hours estimated

Material name: Zerophos SDS US

^{*} Estimates for product may be based on additional component data not shown.

Components Species Test Results

Calcium Carbonate (CAS 471-34-1)

Aquatic

Fish LC50 Western mosquitofish (Gambusia affinis) > 56000 mg/l, 96 hours

Calcium Sulfate, dihydrate (Gypsum) (CAS 7778-18-9)

Aquatic

Fish LC50 Fathead minnow (Pimephales promelas) > 1970 mg/l, 96 hours

Manganese Sulfate, monohydrate (CAS 10034-96-5)

Aquatic

Crustacea EC50 Water flea (Daphnia obtusa) 30.8 - 44.1 mg/l, 48 hours

Fish LC50 Fathead minnow (Pimephales promelas) 36.9 mg/l, 96 hours

29.7 - 52.7 mg/l, 192 hours

Sulfuric acid, zinc salt (1:1) (CAS 7733-02-0)

Aquatic

Crustacea EC50 Rotifer (Philodina acuticornis) 0.3 mg/l, 48 hours
Fish LC50 Rainbow trout,donaldson trout 0.162 mg/l, 96 hours

(Oncorhynchus mykiss)

Urea (CAS 57-13-6)

Aquatic

Crustacea EC50 Water flea (Daphnia magna) 3910 mg/l, 48 hours
Fish LC50 Carp (Leuciscus idus melanotus) > 10000 mg/l, 48 hours

Guppy (Poecilia reticulata) 16200 - 18300 mg/l, 96 hours

Harlequinfish, red rasbora (Rasbora

heteromorpha)

12000 mg/l, 96 hours 590 - 730 mg/l, 96 hours

Mozambique tilapia (Tilapia mossambica)

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential Not available.

Partition coefficient n-octanol / water (log Kow)

Jrea -2.11

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation

potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of

contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste

disposal company.

Waste from residues / unused

products

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see:

Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

Since emptied containers may retain product residue, follow label warnings even after container is

emptied.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

Material name: Zerophos sps us

^{*} Estimates for product may be based on additional component data not shown.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication

Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

FERROUS SULFATE (CAS 7782-63-0)

Manganese Sulfate, monohydrate (CAS 10034-96-5)

Manganese(II) Oxide (CAS 1344-43-0)

Sulfuric acid, zinc salt (1:1) (CAS 7733-02-0)

Listed.

Listed.

Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous No

chemical

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.	
Manganese Sulfate, monohydrate	10034-96-5	1 - < 3	
Manganese(II) Oxide	1344-43-0	1 - < 3	

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Manganese Sulfate, monohydrate (CAS 10034-96-5)

Manganese(II) Oxide (CAS 1344-43-0)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act

Not regulated.

(SDWA)

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd.

(a))

Quartz, Dust, Respirable Fraction (CAS 14808-60-7)

US. Massachusetts RTK - Substance List

Calcium Carbonate (CAS 471-34-1)

Calcium Oxide (CAS 1305-78-8)

Calcium Sulfate, dihydrate (Gypsum) (CAS 7778-18-9)

FERROUS SULFATE (CAS 7782-63-0)

Quartz, Dust, Respirable Fraction (CAS 14808-60-7)

Sulfuric acid, zinc salt (1:1) (CAS 7733-02-0)

US. New Jersey Worker and Community Right-to-Know Act

Calcium Carbonate (CAS 471-34-1)

Calcium Oxide (CAS 1305-78-8)

Calcium Sulfate, dihydrate (Gypsum) (CAS 7778-18-9)

Manganese Sulfate, monohydrate (CAS 10034-96-5)

Material name: Zerophos sps us

Manganese(II) Oxide (CAS 1344-43-0)

Quartz, Dust, Respirable Fraction (CAS 14808-60-7)

Sulfuric acid, zinc salt (1:1) (CAS 7733-02-0)

US. Pennsylvania Worker and Community Right-to-Know Law

Calcium Carbonate (CAS 471-34-1) Calcium Oxide (CAS 1305-78-8)

Calcium Sulfate, dihydrate (Gypsum) (CAS 7778-18-9)

FERROUS SULFATE (CAS 7782-63-0)

Quartz, Dust, Respirable Fraction (CAS 14808-60-7)

Sulfuric acid, zinc salt (1:1) (CAS 7733-02-0)

US. Rhode Island RTK

FERROUS SULFATE (CAS 7782-63-0)

Manganese Sulfate, monohydrate (CAS 10034-96-5)

Manganese(II) Oxide (CAS 1344-43-0) Sulfuric acid, zinc salt (1:1) (CAS 7733-02-0)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Quartz, Dust, Respirable Fraction (CAS 14808-60-7) Listed: October 1, 1988

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No

^{*}A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 12-27-2016

Version # 01

United States & Puerto Rico

Disclaimer The information provided in this Safety Data Sheet is correct to the best of Manufacturer's

Toxic Substances Control Act (TSCA) Inventory

knowledge, information and belief at the date of its publication; however, it is provided only as a guidance for safe handling, use, processing, storage, transportation, disposal and release of the Product. No warranties of any kind, either expressed or implied, including warranties of merchantability or fitness for a particular purpose, are made with respect to the Product or the information provided herein, or that the Product or information herein may be used without infringing the intellectual property rights of others. The information provided in this Safety Data Sheet relates only to the specific Product designated and may not be valid if the Product is used in combination with other materials or in any other process, unless specified herein. The user assumes all risk and liability for loss, injury, damage or expense due to any use, handling, storage or disposal of the Product, and Manufacturer recommends that the user conducts its owns tests of the Product to determine suitability of the Product for user's particular use.

Revision information Product and Company Identification: Product and Company Identification

Material name: Zerophos SDS US

No