



Revision date: 02.1.2023
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Product name: MicroFuse™ Corn

SECTION 1: Identification

Product identifier used on the label:

Product Name: MicroFuse™ Corn

Other means of identification:

EPA Registration Number: EXEMPT

SDS number:

Recommended use of the chemical and restrictions on use:

Recommended use: Fertilizer Micronutrient Additive.

Recommended restrictions: Not intended for human consumption.

Name, address, and telephone number of the distributor, or other responsible party:

Company Name: Company Winfield Solutions, LLC
Address: P.O. Box 64589
St. Paul, MN 55164-0589
Company Telephone: 1-855-494-6343 (M-F 8AM-5PM CST)

Medical Emergency Number: 1-877-424-7452 (24 hrs)

**For Emergency, Spill, Leak,
Fire, Exposure, or Accident,
Call:** Chemtrec USA: 800-424-9300 (24hrs)

SECTION 2: Hazard(s) identification

Classification of the chemical in accordance with paragraph (d) of §1910.1200:

Physical hazards

No physical hazards under GHS.

Health hazards

Skin irritation, Category 2.

Serious eye damage, Category 1.

Toxic to reproduction. Category 1A.

Specific target organ toxicity - Single exposure, Category 3, Respiratory system.

Specific target organ toxicity - Repeated exposure, Category 2.

Environmental hazards

Not adopted under OSHA GHS

GHS Signal word: **DANGER.**

GHS Hazard statement(s):

- H315 - Causes skin irritation
- H318 - Causes serious eye damage
- H335 - May cause respiratory irritation
- H360 - May damage fertility and the unborn child.
- H373 - May cause damage to organs <Central Nervous System> through prolonged or repeated exposure <<by inhalation>>

GHS Hazard symbol(s):



GHS Precautionary statement(s):

Prevention:

- Do not breathe dust/fume/gas/mist/ vapors/spray.
- Wash skin thoroughly after handling.
- Use only outdoors or in a well-ventilated area.
- Wear protective gloves/protective clothing/eye protection/face protection.

Response:

- If on skin: Wash with plenty of water.
- If inhaled: Remove person to fresh air and keep comfortable for breathing.
- 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/doctor.
- Specific treatment (see sections 4 to 8 on this SDS and any additional information on this label).
- If skin irritation occurs: Get medical advice/attention.
- Take off contaminated clothing and wash it before reuse.

Storage:

- Store in a well-ventilated place. Keep container tightly closed.
- Store locked up.

Disposal:

- Dispose of contents/container to a suitable treatment site in accordance with local/regional/international regulations.

Hazard(s) not otherwise**Classified (HNOC):** None known.**Percentage of ingredient(s) of unknown acute toxicity:**

75% of the mixture consists of ingredients of unknown acute toxicity (oral).

85% of the mixture consists of ingredients of unknown acute toxicity (dermal/inhalation).

SECTION 3: Composition/information on ingredients**Mixture:** Mixture of Borates, Oxides and Sulfates of Copper, Manganese and Zinc.

Chemical name	CAS#	Concentration (weight %)
Zinc Oxide	1314-13-2	20 - 40%
Zinc Sulfate	7733-02-0	10 - 30%
Ulexite	1319-33-1	10 - 15%
Manganese Oxide	1344-43-0	10 - 15%
Manganese Sulfate	7785-87-7	3 - 5%
Copper Oxide	1317-38-0	1 - 3%
Copper Sulfate	7758-98-7	1 - 3%

Note: The balance of the ingredients are not classified as hazardous or are below the concentration limit to be classified as hazardous, under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

SECTION 4: First-aid Measures**Description of necessary measures:**

Inhalation: Remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain medical attention.

Skin contact: Wash with plenty of water. Seek medical attention if irritation persists.

Eye contact: Wash the eyes with running water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

Ingestion: Rinse mouth and then drink plenty of water. Induce vomiting (lean victim forward to reduce risk of aspiration). Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Obtain medical attention.

Most important symptoms/effects, acute and delayed:

Eye and skin irritation may occur. Prolonged dermal exposure may cause skin irritation. Ingestion may cause stomach upset. Occasional mild irritation effects to the nose and throat may occur from inhalation. The pulmonary effects consisting of dyspnea, shallow respiration and fever which mimic metal fume fever. This product contains Manganese. Chronic exposure to heavy concentrations of manganese containing dust can cause central nervous system disorders.

Central Nervous System: Symptoms may appear after 1-2 years of elevated exposure. Stage 1 - subclinical, reversible. Indifference irritability, headache, anorexia, sleep disturbances, decreased libido, arthralgia, muscular spasm, diminished fine motor coordination, emotional and behavioral disorders called “manganic psychosis” are more frequently seen among miners at this stage. Higher incidence of respiratory infection and pneumonia is seen persons with a history of alcoholism, psychiatric, neurologic, or pulmonary diseases, liver dysfunction, or anemia.

Indication of immediate medical attention and special treatment needed, if necessary: If any symptoms are observed, contact a physician and give them this SDS sheet. Treat symptomatically.

SECTION 5: Fire-fighting measures

Suitable extinguishing media: Product is not combustible. Use dry chemical, carbon dioxide, or water extinguishers.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical:

Reacts with oxidizers such as H_2O_2 , F_2 , $Ca(OCL)_2$ and organic peroxides.

Special protective equipment and precautions for fire-fighters: Wear self-contained breathing apparatus and protective clothing. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: Ensure adequate ventilation. Evacuate personnel to safe areas. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Methods and materials for containment and cleaning up:

Small Spills: Sweep up and try to keep dust to a minimum.

Large Spills: Sweep up and try to keep dust to a minimum.

Containment: Do not release into sewers or waterways.

See Section 13 for information on appropriate disposal.

SECTION 7: Handling and Storage

Precautions for safe handling: Use proper safety equipment at all times. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Wash hands before breaks and at the end of work. Clothing being used around chemicals should be cleaned daily.

Conditions for safe storage, including any incompatibles:

Store materials in a cool dry place away from strong oxidizers. Store only in the original container. Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available:

Substance	PEL-TWA (8 hour)	PEL-STEL (15 min)
Zinc Oxide	5 mg/m ³	None known
Zinc Sulfate (Zinc compounds)	5 mg/m ³	None known
Ulexite	15 mg/m ³ - total dust 5 mg/m ³ - respirable dust	None known
Manganese Oxide	5 mg/m ³ (ceiling)	None known
Manganese Sulfate	5 mg/m ³ (ceiling)	None known
Copper Oxide	1 mg/m ³	None known
Copper Sulfate	1 mg/m ³	None known

US ACGIH Threshold Limit Values			
Substance	TLV-TWA	TLV-STEL	REMARKS
Zinc Oxide	2 mg/m ³	10 mg/m ³	Metal fume fever
Zinc Sulfate (Zinc compounds)	10 mg/m ³	None known	n/a
Ulexite	2 mg/m ³	6 mg/m ³	n/a
Manganese Oxide	0.2 mg/m ³	None known	Central Nervous System impairment

Manganese Sulfate	0.2 mg/m ³	None known	Central Nervous System impairment
Copper Oxide (as Cu dusts)	1 mg/m ³	None known	n/a
Copper Sulfate (as Cu dusts)	1 mg/m ³	None known	n/a

US NIOSH NIOSH Recommended Exposure Limits		
Substance	TLV-TWA	TLV-STEL
Zinc Oxide	5 mg/m ³	10 mg/m ³
Zinc Sulfate	None known	None known
Ulexite	10 mg/m ³	None known
Manganese Oxide	1 mg/m ³	3 mg/m ³
Manganese Sulfate	1 mg/m ³	3 mg/m ³
Copper Oxide	0.1 mg/m ³	None known
Copper Sulfate	1 mg/m ³	None known

Appropriate engineering controls: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Individual protection measures, such as personal protective equipment:

Eye/face protection: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Skin and Hand protection: Wear protective gloves, boots, and aprons to prevent prolonged or repeated skin contact.

Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Respiratory protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Other:

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics. Consider periodic medical exams of exposed workers with emphasis on skin, respiratory, and blood screening.

Thermal hazards: None established.

SECTION 9: Physical and chemical properties

Appearance (physical state, color, etc.):	Granular solid
Color:	Black / Gray
Odor:	No odor.
Odor threshold:	Not established
pH:	5 - 6 (1/100 dilution)
Melting point/freezing point:	No data available
Initial Boiling Point and boiling range:	No data available
Flash point:	No data available
Evaporation rate:	No data available
Flammability (solid, gas):	Not flammable
Upper/lower flammability or explosive limits	
Flammability limit – lower (%):	No data available
Flammability limit – upper (%):	No data available
Explosive limit – lower (%):	No data available
Explosive limit – upper (%):	No data available
Vapor pressure:	No data available
Vapor density (air=1):	No data available
Relative density (water = 1):	1.1 – 1.5
Solubility(ies):	Partially Soluble
Partition coefficient	
n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	Not established
Viscosity:	No data available
Density:	88lbs Cubic Foot

SECTION 10: Stability and Reactivity

Reactivity: Stable.

Chemical stability:	This product is stable at room temperature in closed containers under normal storage and handling conditions.
Possibility of hazardous reactions:	Hazardous polymerization cannot occur.
Conditions to avoid:	Avoid moisture.
Incompatible materials:	Reacts with oxidizers such as H ₂ O ₂ , F ₂ , Ca(OCL) ₂ and organic peroxides.
Hazardous decomposition products:	None expected.

SECTION 11: Toxicological information

Information on likely routes of exposure:

Inhalation:	Inhalation is the most significant route of exposure in occupational and other settings.
Ingestion:	An expected route of entry. Ingestion may cause stomach upset.
Skin:	An expected route of entry. May cause skin irritation.
Eyes:	Not a primary route of entry but may cause irritation.
Target Organ(s):	Eyes, Skin, Respiratory system, Central nervous system.

Symptoms related to the physical, chemical, and toxicological characteristics:

Occasional mild irritation effects to the nose and throat may occur from inhalation. The pulmonary effects consisting of dyspnea, shallow respiration and fever which mimic metal fume fever. Skin and eye irritation may occur. Stomach upset may occur.

Delayed and immediate effects and chronic effects from short or long-term exposure:

Central Nervous System: Symptoms may appear after 1-2 years of elevated exposure. Stage 1 – subclinical reversible. Indifference irritability, headache, anorexia, sleep disturbances, decreased libido, arthralgia, muscular spasm, diminished fine motor coordination, emotional and behavioral disorders called “manganic psychosis” are more frequently seen among miners at this stage. Higher incidence of respiratory infection and pneumonia is seen in persons with a history of alcoholism, psychiatric, neurologic, or pulmonary diseases, liver dysfunction, or anemia.

Numerical measures of toxicity:

Acute toxicity estimates:

Ingredient Information:

Substance	Test Type (species)	Value
Zinc Oxide	LD ₅₀ Oral (Mouse)	7950 mg/kg
	LD ₅₀ Dermal (Rat)	No known data
	LC ₅₀ Inhalation (Mouse)	2500 mg/m ³
Zinc Sulfate	LD ₅₀ Oral (Rat)	No known data
	LD ₅₀ Dermal (Rat)	No known data
	LC ₅₀ Inhalation (Rat)	No known data

Ulexite	LD ₅₀ Oral (Rat)	2660 mg/kg
	LD ₅₀ Dermal (Rat)	No data available
	LC ₅₀ Inhalation (Rat)	No data available
Manganese Oxide	LD ₅₀ Oral (Rat)	> 2000 mg/kg
	LD ₅₀ Dermal	No known data
	LC ₅₀ Inhalation (Rat)	> 5.35 mg/l
Manganese Sulfate	LD ₅₀ Oral	No known data
	LD ₅₀ Dermal	No known data
	LC ₅₀ Inhalation	No known data
Copper Oxide	LD ₅₀ Oral (Rat)	> 2500 mg/kg
	LD ₅₀ Dermal (Rat)	> 2000 mg/kg
	LC ₅₀ Inhalation (Rat)	No known data
Copper Sulfate	LD ₅₀ Oral (Rat)	482 mg/kg
	LD ₅₀ Intraperitoneal (Rat)	20 mg/kg
	LD ₅₀ Subcutaneous (Rat)	43 mg/kg
	LD ₅₀ Intravenous (Rat)	48.9 mg/kg

Skin corrosion/irritation: May cause skin irritation.

Serious eye damage/eye irritation: May cause eye irritation.

Respiratory sensitization: No information available on the mixture, however none of the components have been classified as a respiratory sensitizer (or are below the concentration threshold for classification).

Skin sensitization: No information available on the mixture, however none of the components have been classified as a skin sensitizer (or are below the concentration threshold for classification).

Germ cell mutagenicity: No information available on the mixture, however none of the components have been classified as causing germ cell mutagenicity (or are below the concentration threshold for classification).

Carcinogenicity: No information available on the mixture, however none of the components are listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA.

Reproductive toxicity: Toxic to reproduction. Category 1A. May damage fertility and the unborn child.

**Specific target organ toxicity-
Single exposure:**

No information available on the mixture.

**Specific target organ toxicity-
Repeat exposure:**

No information available on the mixture, however Manganese Sulfate is known to cause Central nervous system effects after repeated exposure.

Aspiration hazard:

No information available on the mixture, however none of the components have been classified as causing an aspiration hazard (or are below the concentration threshold for classification).

SECTION 12: Ecological information**Ecotoxicity (aquatic and terrestrial, where available):****Ingredient Information:**

Substance	Test Type	Species	Value
Zinc Oxide	LC ₅₀	Fish - Oncorhynchus mykiss (rainbow trout)	> 1.2 mg/l – 96h
	EC ₅₀	Invertebrate - Daphnia magna (Water flea)	> 4 mg/l – 48h
	EC ₅₀	Algae - Desmodesmus subspicatus (green algae)	> 1.3 mg/l - 72h
Zinc Sulfate	LC ₅₀	Fish	No data available
	EC ₅₀	Invertebrate	No data available
	EC ₅₀	Algae	No data available
Ulexite	LC ₅₀	Fish – S.gairdneri (Rainbow Trout)	150 mg/B/L-24d
	NOEC- LOEC	Fish – S.gairdneri (Rainbow Trout)	0.75-1 mg/B/L-36d
	LC ₅₀	Fish – Carassius auratus (Goldfish)	178 mg/B/L-3d
	NOEC- LOEC	Fish – Carassius auratus (Goldfish)	26.50 mg/B/L-7d
	LC ₅₀	Invertebrate - Daphnia magna (Water flea)	133 mg/B/L-48h
	NOEC- LOEC	Invertebrate - Daphnia magna (Water flea)	6-13 mg/B/L-21d
Manganese Oxide	LC ₅₀	Fish - Oncorhynchus mykiss (rainbow trout)	> 1.2 mg/l – 96h

	EC ₅₀	Invertebrate - Daphnia magna (Water flea)	> 4 mg/l – 48h
	EC ₅₀	Algae - Desmodesmus subspicatus (green algae)	> 1.3 mg/l - 72h
Manganese Sulfate	LC ₅₀	Fish	No data available
	EC ₅₀	Invertebrate	No data available
	EC ₅₀	Algae	No data available
	EC ₅₀	Algae	No data available
Copper Oxide	LC ₅₀	Fish - Oncorhynchus mykiss (rainbow trout)	0.19 - 0.21 mg/l - 96h
	EC ₅₀	Invertebrate - Daphnia magna (Water flea)	0.011 - 0.039 mg/l - 48h
	NOEC	Algae - - Phaeodactylum tricornutum	0.0057 mg/l - 72h
Copper Sulfate	LC ₅₀	Fish – Other fish	1 - 2.5 mg/l - 96h
	EC ₅₀	Invertebrate - Daphnia magna (Water flea)	0.024 mg/l - 48h
	EC ₅₀	Algae	No data available

Persistence and Degradability:

Not determined

Bioaccumulative Potential:

This material is not expected to bioaccumulate.

Mobility in Soil:

Because it is insoluble, no soil absorption is expected.

Other adverse effects (such as hazardous to the ozone layer):

No additional information available.

SECTION 13: Disposal considerations**Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:**

Product - Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations. This product has been evaluated for RCRA characteristics and should not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous.

Contaminated packaging - Contaminated packaging may contain residues of product. Dispose of in the same manner as product. Comply with applicable local, state or international regulations concerning solid or hazardous waste disposal and/or container disposal.

SECTION 14: Transport Information**Land transport DOT**

UN number

Not regulated under DOT

UN proper shipping name

Not applicable

Transport hazard class(es)	Not applicable
Packing group, if necessary	Not applicable

Maritime transport IMDG

UN number	Not regulated under IMDG
UN proper shipping name	Not applicable
Transport hazard class(es)	Not applicable
Packing group, if necessary	Not applicable

Air transport ICAO-TI and IATA-DGR

UN number	Not regulated under IATA
UN proper shipping name	Not applicable
Transport hazard class(es)	Not applicable
Packing group, if necessary	Not applicable

Environmental hazards

Marine pollutant: No.

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)

No further relevant information available.

Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.

None.

SECTION 15: Regulatory Information**Safety, health and environmental regulations specific for the product in question.****USA:**

United States Federal Regulations: This SDS complies with the OSHA, 29 CFR 1910.1200. This product is hazardous under OSHA.

Toxic Substances Control Act (TSCA) – This substance is listed, as required, on the TSCA inventory.

SARA Title III

Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A): None

Section 311/312 (40 CFR 370):

Acute Health Hazard: Yes

Chronic Health Hazard: Yes

Fire Hazard: No

Pressure Hazard: No

Reactivity Hazard: No

Section 313 Toxic Release Inventory (40 CFR 372): Manganese oxide, Manganese sulfate, Copper sulfate, Copper oxide, Zinc oxide and Zinc Sulfate are listed.

STATE REGULATIONS:

This SD'S contains specific health and safety data is applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

California Proposition 65 (California Safe Drinking Water and Toxic Enforcement Act of 1986:

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Massachusetts Right to Know: Zinc oxide, Zinc Sulfate, and Copper sulfate are listed on the Massachusetts Right to Know List.

New Jersey Right to Know: Manganese oxide, Manganese sulfate, Zinc oxide, Zinc Sulfate, Copper sulfate, and Copper oxide are listed on the New Jersey Right to Know list.

Pennsylvania Right to Know: Manganese oxide, Manganese sulfate, Zinc oxide, Zinc Sulfate, Copper sulfate, and Copper oxide are listed on the Pennsylvania Right to Know List.

SECTION 16: Other information, including date of preparation or last revision

Revision Date: 02.01.2023

NFPA Rating

Health hazard: 1

Fire Hazard: 0

Reactivity Hazard: 0

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