

# Material Safety Data Sheet (MSDS)

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## Agriculture Grade Manganese Sulfate Monohydrate

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According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

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### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1 Product Identifier

- **Product Name:** Agriculture Grade Manganese Sulfate Monohydrate (Powder/Granular)
- **Chemical Name:** Manganese(II) sulfate monohydrate
- **CAS No:** 10034-96-5
- **EC No:** 232-089-9
- **Molecular Formula:**  $\text{MnSO}_4 \cdot \text{H}_2\text{O}$

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

- **Identified Uses:** Micronutrient fertilizer blends, soil correction programs, foliar spray solutions, crop nutrition programs, controlled release granules, hydroponic and greenhouse feed.
- **Uses Advised Against:** No specific uses advised against are identified.

#### 1.3 Details of the supplier of the safety data sheet

- **Company Name:** BTLnewmaterial
- **Address:** Room 706, No. 154, Wuyi East Road, Niezhou Residential Committee, Caizichi Sub-district Office, Leiyang City, Hengyang City, Hunan Province, China
- **Email:** lixifirm@outlook.com

- **Phone/WhatsApp:** +8618273793022
- **Website:** manganesesupply.com

#### 1.4 Emergency telephone number

- **Emergency Phone:** +8618273793022
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## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

- **Specific target organ toxicity - repeated exposure (Category 2):** H373
- **Chronic aquatic toxicity (Category 2):** H411
- **Serious eye damage/eye irritation (Category 1):** H318

### 2.2 GHS Label elements, including precautionary statements

- **Pictograms:**
  - Health Hazard (GHS08)
  - Environment (GHS09)
  - Corrosion (GHS05)
- **Signal Word:** Danger
- **Hazard Statements:**
  - H318: Causes serious eye damage.
  - H373: May cause damage to organs (brain) through prolonged or repeated exposure (inhalation).
  - H411: Toxic to aquatic life with long lasting effects.
- **Precautionary Statements:**
  - P260: Do not breathe dust/fume/gas/mist/vapors/spray.
  - P273: Avoid release to the environment.
  - P280: Wear protective gloves/protective clothing/eye protection/face protection.
  - P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue

rinsing.

- P310: Immediately call a POISON CENTER or doctor/physician.
- P314: Get medical advice/attention if you feel unwell.
- P391: Collect spillage.
- P501: Dispose of contents/container to an approved waste disposal plant.

## 2.3 Other hazards

- None known.
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## SECTION 3: Composition/information on ingredients

### 3.1 Substances

- **Chemical Name:** Manganese(II) sulfate monohydrate
- **Synonyms:** Manganous sulfate monohydrate
- **CAS No:** 10034-96-5
- **EC No:** 232-089-9
- **Molecular Weight:** 169.02 g/mol

### 3.2 Composition / Impurities

Component	Concentration
Manganese Sulfate Monohydrate (MnSO <sub>4</sub> ·H <sub>2</sub> O)	≥ 98.5%
Manganese (Mn)	30–32%
Iron (Fe)	≤ 0.05%
Calcium (Ca)	≤ 0.2%
Magnesium (Mg)	≤ 0.2%
Lead (Pb)	≤ 10 ppm
Copper (Cu)	≤ 10 ppm
Zinc (Zn)	≤ 10 ppm

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## SECTION 4: First aid measures

### 4.1 Description of first aid measures

- **General Advice:** Consult a physician. Show this safety data sheet to the doctor in attendance.
- **If Inhaled:** If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
- **In Case of Skin Contact:** Wash off with soap and plenty of water. Consult a physician.
- **In Case of Eye Contact:** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
- **If Swallowed:** Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

### 4.2 Most important symptoms and effects, both acute and delayed

- The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11. Prolonged exposure may cause central nervous system effects (manganism).

### 4.3 Indication of any immediate medical attention and special treatment needed

- No data available.
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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

- **Suitable Extinguishing Media:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### 5.2 Special hazards arising from the substance or mixture

- Sulphur oxides, Manganese/manganese oxides.

### 5.3 Advice for firefighters

- Wear self-contained breathing apparatus for firefighting if necessary.

#### **5.4 Further information**

- No data available.
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### **SECTION 6: Accidental release measures**

#### **6.1 Personal precautions, protective equipment and emergency procedures**

- Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

#### **6.2 Environmental precautions**

- Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

#### **6.3 Methods and materials for containment and cleaning up**

- Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

#### **6.4 Reference to other sections**

- For disposal see section 13.
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### **SECTION 7: Handling and storage**

#### **7.1 Precautions for safe handling**

- Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

#### **7.2 Conditions for safe storage, including any incompatibilities**

- Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Keep away from moisture and incompatible chemicals to preserve efficacy. Hygroscopic.

### 7.3 Specific end use(s)

- Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.
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## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

- **Components with workplace control parameters:**
  - Manganese and inorganic compounds (as Mn): TWA 0.2 mg/m<sup>3</sup> (inhalable fraction), 0.02 mg/m<sup>3</sup> (respirable fraction) (ACGIH).

### 8.2 Exposure controls

- **Appropriate Engineering Controls:** Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
- **Personal Protective Equipment:**
  - **Eye/Face Protection:** Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
  - **Skin Protection:** Handle with gloves. 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.
  - **Body Protection:** Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
  - **Respiratory Protection:** Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

- **Control of Environmental Exposure:** Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
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## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

- **Appearance:** Form: Powder or Granular; Color: Pale pink
- **Odor:** Odorless
- **Odor Threshold:** No data available
- **pH:** 3.0 - 6.0 (at 50 g/L at 20 °C)
- **Melting Point/Freezing Point:** 700 °C (anhydrous)
- **Initial Boiling Point and Boiling Range:** No data available
- **Flash Point:** Not applicable
- **Evaporation Rate:** No data available
- **Flammability (solid, gas):** The product is not flammable.
- **Upper/Lower Flammability or Explosive Limits:** No data available
- **Vapor Pressure:** No data available
- **Vapor Density:** No data available
- **Relative Density (Bulk Density):** 0.9–1.2 g/cm<sup>3</sup>
- **Water Solubility:** Soluble in water (approx. 762 g/L at 20 °C)
- **Partition Coefficient: n-octanol/water:** No data available
- **Auto-ignition Temperature:** No data available
- **Decomposition Temperature:** > 850 °C
- **Viscosity:** No data available
- **Explosive Properties:** No data available
- **Oxidizing Properties:** No data available

### 9.2 Other safety information

- **Moisture (Powder):** ≤ 1.0%

- **Moisture (Granular):**  $\leq 0.5\%$
  - **Particle Size (Powder):** 95% pass 100 mesh
  - **Particle Size (Granular):** 2–4 mm
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## **SECTION 10: Stability and reactivity**

### **10.1 Reactivity**

- No data available.

### **10.2 Chemical stability**

- Stable under recommended storage conditions.

### **10.3 Possibility of hazardous reactions**

- No data available.

### **10.4 Conditions to avoid**

- Avoid moisture.

### **10.5 Incompatible materials**

- Strong oxidizing agents.

### **10.6 Hazardous decomposition products**

- Hazardous decomposition products formed under fire conditions: Sulphur oxides, Manganese/manganese oxides.
  - Other decomposition products: No data available.
  - In the event of fire: see section 5.
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## **SECTION 11: Toxicological information**

### **11.1 Information on toxicological effects**

- **Acute Toxicity:**
  - LD50 Oral - Rat - 2,150 mg/kg (anhydrous basis)

- Inhalation: No data available.
  - Dermal: No data available.
  - **Skin Corrosion/Irritation:** No data available.
  - **Serious Eye Damage/Eye Irritation:** Causes serious eye damage.
  - **Respiratory or Skin Sensitization:** No data available.
  - **Germ Cell Mutagenicity:** No data available.
  - **Carcinogenicity:**
    - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
  - **Reproductive Toxicity:** No data available.
  - **Specific Target Organ Toxicity - Single Exposure:** No data available.
  - **Specific Target Organ Toxicity - Repeated Exposure:** May cause damage to organs through prolonged or repeated exposure. Inhalation of manganese dusts or fumes can cause central nervous system effects (manganism), characterized by neurological symptoms similar to Parkinson's disease.
  - **Aspiration Hazard:** No data available.
  - **Additional Information:** RTECS: OP1050000. Men exposed to manganese dusts showed a decrease in fertility. Chronic manganese poisoning primarily involves the central nervous system. Early symptoms include languor, sleepiness and weakness in the legs. A stolid mask-like appearance of the face, emotional disturbances such as profound weeping and laughing, and a spastic gait with tendency to fall in walking are findings in more advanced cases. High incidence of pneumonia has been found in workers exposed to the dust or fume of some manganese compounds.
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## SECTION 12: Ecological information

### 12.1 Toxicity

- **Toxicity to Fish:** LC50 - Pimephales promelas (fathead minnow) - 30.6 mg/l - 96 h
- **Toxicity to Daphnia and Other Aquatic Invertebrates:** EC50 - Daphnia magna (Water flea) - 8.3 mg/l - 48 h

## 12.2 Persistence and degradability

- The methods for determining the biological degradability are not applicable to inorganic substances.

## 12.3 Bioaccumulative potential

- No data available.

## 12.4 Mobility in soil

- No data available.

## 12.5 Results of PBT and vPvB assessment

- PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

## 12.6 Other adverse effects

- Toxic to aquatic life with long lasting effects.
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# SECTION 13: Disposal considerations

## 13.1 Waste treatment methods

- **Product:** Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
  - **Contaminated Packaging:** Dispose of as unused product.
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# SECTION 14: Transport information

## 14.1 UN number

- ADR/RID: 3077
- IMDG: 3077
- IATA: 3077

## 14.2 UN proper shipping name

- ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese(II) sulfate monohydrate)
- IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese(II) sulfate monohydrate)
- IATA: Environmentally hazardous substance, solid, n.o.s. (Manganese(II) sulfate monohydrate)

### 14.3 Transport hazard class(es)

- ADR/RID: 9
- IMDG: 9
- IATA: 9

### 14.4 Packaging group

- ADR/RID: III
- IMDG: III
- IATA: III

### 14.5 Environmental hazards

- ADR/RID: yes
- IMDG Marine pollutant: yes
- IATA: yes

### 14.6 Special precautions for user

- **Further Information:** EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.
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## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006 (REACH) and the Globally Harmonized System of Classification and

Labelling of Chemicals (GHS).

## 15.2 Chemical safety assessment

- For this product a chemical safety assessment was not carried out.
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## SECTION 16: Other information

### Full text of H-Statements referred to under sections 2 and 3.

- H318: Causes serious eye damage.
- H373: May cause damage to organs through prolonged or repeated exposure.
- H411: Toxic to aquatic life with long lasting effects.

**Disclaimer:** The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. BTLnewmaterial and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.