

## 1. Identification

**Product identifier** **Manganese 27**

**Other means of identification**

**SDS number** 110500

**Product code** 110300, 110301, 110302, 110303, 110304, 110500, 110501, 110503

**Recommended use** Soil additive, micronutrient.

**Recommended restrictions** None known.

### Manufacturer/Importer/Supplier/Distributor information

**Manufacturer/Supplier** Advanced Micronutrient Products, Inc.

**Address** 2405 W. Vassar Road (M-15) Reese, MI. 48757

**Contact person** Product Stewardship

**Emergency** Chemtrec Ph # 800-424-9300 CCN 724829

**Email** info@ampmicros.com

## 2. Hazard(s) identification

**Physical hazards** Not classified.

**Health hazards**

Serious eye damage/eye irritation	Category 1
Specific target organ toxicity, repeated exposure (inhalation)	Category 2 (central nervous system, lung)

**Environmental hazards**

Hazardous to the aquatic environment, acute hazard	Category 1
Hazardous to the aquatic environment, long-term hazard	Category 1

**OSHA defined hazards** Not classified.

### Label elements



**Signal word** Danger

**Hazard statement** Causes serious eye damage. May cause damage to organs (central nervous system, lung) through prolonged or repeated exposure by inhalation. Very toxic to aquatic life with long lasting effects.

### Precautionary statement

**Prevention** Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe dust/fume. Avoid release to the environment.

**Response** 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. Collect spillage.

**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.

## 3. Composition/information on ingredients

### Mixtures

Chemical name	CAS number	%
Manganese sulfate	7785-87-7	30-60

Trimanganese tetraoxide	1317-35-7	15-30
Manganese oxide	1344-43-0	10-15
Diiron trioxide (ferric oxide)	1309-37-1	7-13
Urea	57-13-6	3-5
Calcium sulfate	7778-18-9	1-3
Iron sulfate	7720-78-7	1-3
Zinc oxide	1314-13-2	1-3
Zinc sulfate	7733-02-0	1-3

#### 4. First-aid measures

<b>Inhalation</b>	If symptomatic, move to fresh air. Get medical attention if symptoms persist.
<b>Skin contact</b>	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse.
<b>Eye contact</b>	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention immediately.
<b>Ingestion</b>	Seek medical advice.
<b>Most important symptoms/effects, acute and delayed</b>	Causes serious eye damage. May cause skin irritation.
<b>Indication of immediate medical attention and special treatment needed</b>	Symptoms may be delayed.
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

#### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Extinguish with foam, carbon dioxide, dry powder or water fog.
<b>Unsuitable extinguishing media</b>	None known.
<b>Specific hazards arising from the chemical</b>	During fire, gases hazardous to health may be formed.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Fire fighting equipment/instructions</b>	Cool containers exposed to heat with water spray and remove container, if no risk is involved.
<b>Specific methods</b>	Keep unnecessary personnel away.
<b>General fire hazards</b>	No unusual fire or explosion hazards noted.

#### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Wear appropriate personal protective equipment (See Section 8).
<b>Methods and materials for containment and cleaning up</b>	Sweep up or vacuum up spillage and collect in suitable container for disposal.
<b>Environmental precautions</b>	Prevent further leakage or spillage if safe to do so. Avoid release to the environment.

#### 7. Handling and storage

<b>Precautions for safe handling</b>	Do not get in eyes, on skin, on clothing. Wear appropriate personal protective equipment. 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.
<b>Conditions for safe storage, including any incompatibilities</b>	Store in tightly closed original container in a dry, cool and well-ventilated place. Store away from incompatible materials (See Section 10). Use appropriate container to avoid environmental contamination. Keep out of reach of children.

## 8. Exposure controls/personal protection

### Occupational exposure limits

#### US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Calcium sulfate (CAS 7778-18-9)	PEL	5 mg/m <sup>3</sup>	Respirable fraction.
		15 mg/m <sup>3</sup>	Total dust.
Diiron trioxide (ferric oxide) (CAS 1309-37-1)	PEL	10 mg/m <sup>3</sup>	Fume.
Manganese oxide (CAS 1344-43-0)	Ceiling	5 mg/m <sup>3</sup>	
Manganese sulfate (CAS 7785-87-7)	Ceiling	5 mg/m <sup>3</sup>	
Trimanganese tetraoxide (CAS 1317-35-7)	Ceiling	5 mg/m <sup>3</sup>	
Zinc oxide (CAS 1314-13-2)	PEL	5 mg/m <sup>3</sup>	Fume.
		5 mg/m <sup>3</sup>	Respirable fraction.
		15 mg/m <sup>3</sup>	Total dust.

#### US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Calcium sulfate (CAS 7778-18-9)	TWA	10 mg/m <sup>3</sup>	Inhalable fraction.
Diiron trioxide (ferric oxide) (CAS 1309-37-1)	TWA	5 mg/m <sup>3</sup>	Respirable fraction.
Iron sulfate (CAS 7720-78-7)	TWA	1 mg/m <sup>3</sup>	
Manganese oxide (CAS 1344-43-0)	TWA	0.1 mg/m <sup>3</sup>	Inhalable fraction.
		0.02 mg/m <sup>3</sup>	Respirable fraction.
Manganese sulfate (CAS 7785-87-7)	TWA	0.1 mg/m <sup>3</sup>	Inhalable fraction.
		0.02 mg/m <sup>3</sup>	Respirable fraction.
Trimanganese tetraoxide (CAS 1317-35-7)	TWA	0.1 mg/m <sup>3</sup>	Inhalable fraction.
		0.02 mg/m <sup>3</sup>	Respirable fraction.
Zinc oxide (CAS 1314-13-2)	STEL	10 mg/m <sup>3</sup>	Respirable fraction.
	TWA	2 mg/m <sup>3</sup>	Respirable fraction.

#### US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Calcium sulfate (CAS 7778-18-9)	TWA	5 mg/m <sup>3</sup>	Respirable.
		10 mg/m <sup>3</sup>	Total
Diiron trioxide (ferric oxide) (CAS 1309-37-1)	TWA	5 mg/m <sup>3</sup>	Dust and fume.
Iron sulfate (CAS 7720-78-7)	TWA	1 mg/m <sup>3</sup>	
Manganese oxide (CAS 1344-43-0)	STEL	3 mg/m <sup>3</sup>	Fume.
	TWA	1 mg/m <sup>3</sup>	Fume.
Manganese sulfate (CAS 7785-87-7)	STEL	3 mg/m <sup>3</sup>	Fume.
	TWA	1 mg/m <sup>3</sup>	Fume.
Trimanganese tetraoxide (CAS 1317-35-7)	STEL	3 mg/m <sup>3</sup>	Fume.
	TWA	1 mg/m <sup>3</sup>	Fume.
Zinc oxide (CAS 1314-13-2)	Ceiling	15 mg/m <sup>3</sup>	Dust.
	STEL	10 mg/m <sup>3</sup>	Fume.
	TWA	5 mg/m <sup>3</sup>	Fume.
	TWA	5 mg/m <sup>3</sup>	Dust.

## US. Workplace Environmental Exposure Level (WEEL) Guides

Components	Type	Value	Form
Urea (CAS 57-13-6)	TWA	10 mg/m <sup>3</sup>	Total particulate.
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).		
<b>Appropriate engineering controls</b>	Provide adequate ventilation.		
<b>Individual protection measures, such as personal protective equipment</b>			
<b>Eye/face protection</b>	Wear safety glasses with side shields (or goggles).		
<b>Skin protection</b>			
<b>Hand protection</b>	Chemical resistant gloves are recommended.		
<b>Other</b>	Wear chemical-resistant gloves, footwear and protective clothing appropriate for risk of exposure. Contact chemical protective clothing manufacturer for specific information.		
<b>Respiratory protection</b>	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister.		
<b>Thermal hazards</b>	Not applicable.		
<b>General hygiene considerations</b>	Handle in accordance with good industrial hygiene and safety practice.		

## 9. Physical and chemical properties

### Appearance

<b>Physical state</b>	Solid.
<b>Form</b>	Granular.
<b>Color</b>	Brown.
<b>Odor</b>	Odorless.
<b>Odor threshold</b>	Not available.
<b>pH</b>	Not available.
<b>Melting point/freezing point</b>	Not available.
<b>Initial boiling point and boiling range</b>	Not available.
<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	Not available.
<b>Flammability (solid, gas)</b>	Non flammable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Explosive limit - lower (%)</b>	Not available.
<b>Explosive limit - upper (%)</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Vapor density</b>	Not available.
<b>Relative density</b>	Not available.
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Other information</b>	
<b>Explosive properties</b>	Not explosive.
<b>Oxidizing properties</b>	Not oxidizing.
<b>Particle size</b>	2 - 3 mm

## 10. Stability and reactivity

<b>Reactivity</b>	The product is non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Stable at normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Humidity. Contact with incompatible materials.
<b>Incompatible materials</b>	Strong oxidizing substances.
<b>Hazardous decomposition products</b>	No hazardous decomposition products are known.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	Under normal conditions of intended use, this material is not expected to be an inhalation hazard.
<b>Skin contact</b>	May cause skin irritation.
<b>Eye contact</b>	Causes serious eye damage.
<b>Ingestion</b>	May cause discomfort if swallowed.

**Symptoms related to the physical, chemical and toxicological characteristics** Causes serious eye damage. May cause skin irritation.

### Information on toxicological effects

**Acute toxicity** Causes serious eye damage.

Components	Species	Test Results
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Manganese sulfate (CAS 7785-87-7)

**Acute**

*Oral*

LD50

Rat

1470 mg/kg

Zinc sulfate (CAS 7733-02-0)

**Acute**

*Oral*

LD50

Rat

920 mg/kg

623 mg/kg

**Skin corrosion/irritation** May cause skin irritation.

**Serious eye damage/eye irritation** Causes serious eye damage.

### Respiratory or skin sensitization

**Respiratory sensitization** Not a respiratory sensitizer.

**Skin sensitization** Not a skin sensitizer.

**Germ cell mutagenicity** Not classified.

**Carcinogenicity** Not classified.

### IARC Monographs. Overall Evaluation of Carcinogenicity

Diiron trioxide (ferric oxide) (CAS 1309-37-1) 3 Not classifiable as to carcinogenicity to humans.

### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

**Reproductive toxicity** Not classified.

**Specific target organ toxicity - single exposure** Not classified.

**Specific target organ toxicity - repeated exposure** May cause damage to organs (central nervous system, lung) through prolonged or repeated exposure by inhalation.

**Aspiration hazard** Not classified.

## 12. Ecological information

**Ecotoxicity** Very toxic to aquatic life with long lasting effects.

Components	Species	Test Results
Zinc oxide (CAS 1314-13-2)		
<b>Aquatic</b>		
Crustacea	LC50 Water flea (Daphnia magna)	0.098 mg/l, 48 Hours
Zinc sulfate (CAS 7733-02-0)		
<b>Aquatic</b>		
Fish	LC50 Carp (Cyprinus carpio)	0.15 mg/l, 96 hours
<b>Persistence and degradability</b>	None known.	
<b>Bioaccumulative potential</b>		
<b>Partition coefficient n-octanol / water (log Kow)</b>		
Urea (CAS 57-13-6)	-2.11	
<b>Mobility in soil</b>	No data available.	
<b>Mobility in general</b>	No data available.	
<b>Other adverse effects</b>	Not available.	

### 13. Disposal considerations

<b>Disposal instructions</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied. The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.
<b>Hazardous waste code</b>	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
<b>Waste from residues / unused products</b>	Recover and recycle, if practical. Dispose in accordance with all applicable regulations.
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

#### DOT

<b>UN number</b>	UN3077
<b>UN proper shipping name</b>	Environmentally hazardous substances, solid, n.o.s. (Zinc oxide, Zinc sulfate)
<b>Transport hazard class(es)</b>	
<b>Class</b>	9
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	9
<b>Packing group</b>	III
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	Yes
<b>Special precautions for user</b>	Not available.
<b>Special provisions</b>	8, 146, 335, A112, B54, IB8, IP3, N20, T1, TP33
<b>Packaging exceptions</b>	155
<b>Packaging non bulk</b>	213
<b>Packaging bulk</b>	240

#### IATA

<b>UN number</b>	UN3077
<b>UN proper shipping name</b>	Environmentally hazardous substance, solid, n.o.s. (Zinc oxide, Zinc sulfate)
<b>Transport hazard class(es)</b>	
<b>Class</b>	9
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	9
<b>Packing group</b>	III
<b>Environmental hazards</b>	Yes
<b>ERG Code</b>	9L
<b>Special precautions for user</b>	Not available.

#### IMDG

<b>UN number</b>	UN3077
<b>UN proper shipping name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc oxide, Zinc sulfate)

**Transport hazard class(es)****Class** 9**Subsidiary risk** -**Label(s)** 9**Packing group** III**Environmental hazards****Marine pollutant** Yes**EmS** F-A, S-F**Special precautions for user** Read safety instructions, SDS and emergency procedures before handling.**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not available.**15. Regulatory information****US federal regulations** This product is hazardous according to OSHA 29 CFR 1910.1200.**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**CERCLA Hazardous Substance List (40 CFR 302.4)**

Iron sulfate (CAS 7720-78-7)	LISTED
Manganese oxide (CAS 1344-43-0)	LISTED
Manganese sulfate (CAS 7785-87-7)	LISTED
Trimanganese tetraoxide (CAS 1317-35-7)	LISTED
Zinc oxide (CAS 1314-13-2)	LISTED
Zinc sulfate (CAS 7733-02-0)	LISTED

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

<b>Hazard categories</b>	Immediate Hazard - Yes
	Delayed Hazard - Yes
	Fire Hazard - No
	Pressure Hazard - No
	Reactivity Hazard - No

**SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical** Yes**SARA 313 (TRI reporting)**

Chemical name	CAS number	% by wt.
Manganese sulfate	7785-87-7	30-60
Trimanganese tetraoxide	1317-35-7	15-30
Manganese oxide	1344-43-0	10-15
Zinc oxide	1314-13-2	1-3
Zinc sulfate	7733-02-0	1-3

**Other federal regulations****Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Manganese oxide (CAS 1344-43-0)  
Manganese sulfate (CAS 7785-87-7)  
Trimanganese tetraoxide (CAS 1317-35-7)

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

Not regulated.

**Safe Drinking Water Act (SDWA)** Not regulated.**US state regulations****US. Massachusetts RTK - Substance List**

Calcium sulfate (CAS 7778-18-9)  
Diiron trioxide (ferric oxide) (CAS 1309-37-1)  
Iron sulfate (CAS 7720-78-7)

Trimanganese tetraoxide (CAS 1317-35-7)  
Zinc oxide (CAS 1314-13-2)  
Zinc sulfate (CAS 7733-02-0)

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

Calcium sulfate (CAS 7778-18-9)  
Diiron trioxide (ferric oxide) (CAS 1309-37-1)  
Iron sulfate (CAS 7720-78-7)  
Manganese oxide (CAS 1344-43-0)  
Manganese sulfate (CAS 7785-87-7)  
Trimanganese tetraoxide (CAS 1317-35-7)  
Zinc oxide (CAS 1314-13-2)  
Zinc sulfate (CAS 7733-02-0)

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

Calcium sulfate (CAS 7778-18-9)  
Diiron trioxide (ferric oxide) (CAS 1309-37-1)  
Iron sulfate (CAS 7720-78-7)  
Trimanganese tetraoxide (CAS 1317-35-7)  
Zinc oxide (CAS 1314-13-2)  
Zinc sulfate (CAS 7733-02-0)

#### US. Rhode Island RTK

Manganese oxide (CAS 1344-43-0)  
Manganese sulfate (CAS 7785-87-7)  
Trimanganese tetraoxide (CAS 1317-35-7)  
Zinc oxide (CAS 1314-13-2)  
Zinc sulfate (CAS 7733-02-0)

#### US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

#### International Inventories

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

\*A "Yes" indicates this product complies 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** 19-May-2015  
**Revision date** -  
**Version #** 01  
**HMIS® ratings** Health: 3\*  
Flammability: 1  
Physical hazard: 0

#### NFPA ratings





**References**

Registry of Toxic Effects of Chemical Substances (RTECS)  
HSDB® - Hazardous Substances Data Bank  
IARC: International Agency for Research on Cancer.  
National Toxicology Program (NTP) Report on Carcinogens

**Disclaimer**

The information and recommendations contained in this Safety Data Sheet relate only to the specific material referred to herein (the "Material") and does not relate to the use of such Material in combination with any other material or process. The information and recommendations contained herein are believed to be current and correct as of the date prepared. However, the information and recommendations are presented without warranty, representation or license of any kind, express or implied, with respect to its accuracy, correctness or completeness, and the seller, supplier and manufacturer of the Material and their respective affiliates disclaim all liability for reliance on such information and recommendations. This Data Sheet is not a guarantee of safety. A buyer or user of the Material (a "Recipient") is responsible for ensuring that it has all current information necessary to safely use the Material for its specific purpose. Furthermore, the Recipient assumes all risk in connection with the use of the Material. The Recipient assumes all responsibility for ensuring the Material is used in a safe manner in compliance with applicable environmental, health, safety and security laws, policies and guidelines. The Supplier does not warrant the merchantability of the Material or the fitness of the Material for any particular use and assumes no responsibility for injury or damage caused directly or indirectly by or related to the use of the Material.