




## SAFETY DATA SHEET

SECTION 1	PRODUCT AND COMPANY IDENTIFICATION
Trade Name:	MicroEssentials® SZ
Chemical Name:	Monoammonium Phosphate with Ammonium Sulfate and Sulfur and Zinc
CAS Number:	7722-76-1
Chemical Family:	Ammonium Phosphates—Inorganic Salts
Synonyms:	Monoammonium Phosphate + Sulfur and Zinc Monobasic Ammonium Phosphate + Sulfur and Zinc Ammonium Dihydrogen Phosphate + Sulfur and Zinc MAP + S + Z Ammonium Dihydrogen Orthophosphate
Primary Use:	Crop nutrient
Company Information:	THE MOSAIC COMPANY 3033 Campus Drive Plymouth, MN 55441 www.mosaicco.com 800-918-8270 or 763-577-2700 8 AM to 5 PM Central Time US
Emergency Telephone:	<b>EMERGENCY OVERVIEW</b> <b>24 Hour Emergency Telephone Number:</b> <b>For Chemical Emergencies:</b> <b>Spill, Leak, Fire or Accident</b> <b>Call CHEMTREC</b> <b>North America: (800) 424-9300 (reference CCN201871)</b> <b>Others: (703) 527-3887 (collect)</b>

SECTION 2	HAZARD IDENTIFICATION	
GHS Classification:	Acute Toxicity Oral Category 5 Skin Irritant Category 2 Eye Irritant Category 2B STOT SE Category 3	Hazard Statement H303 Hazard Statement H315 Hazard Statement H320 Hazard Statement H335
	<b>Signal Word: WARNING</b> <b>Hazard Statement(s)</b> H303: May be harmful if swallowed H315: Causes skin irritation H320: Causes eye irritation H335: May cause respiratory irritation	
Label Elements:		
Prevention:	P264: Wash thoroughly after handling. P280: Wear protective gloves P261: Avoid breathing dust P271: Use only outdoors or in a well-ventilated area.	
Response:	P302+ P352	IF ON SKIN: Wash with plenty of water.
	P321	Specific Treatment, see supplemental first aid information.
	P332+ P313	If skin irritation occurs: Get medical advice/attention.
	P362+ P364	Take off contaminated clothing and wash it before reused.
	P305+P351+ P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.



	P337+ P313	If eye irritation persists: Get medical advice/attention.
	P304+ P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P312	Call a POISON CENTER.
Storage:	Not applicable	Not applicable
Disposal:	P501	Disposal of content/containers to be in accordance with local/regional/national regulations.

<b>SECTION 3</b>	<b>COMPOSITION INFORMATION ON INGREDIENTS</b>			
Formula:	Proprietary			
Composition:	Monobasic Ammonium Phosphate Ammonium Sulfate Sulfur Zinc Compounds (Proprietary)	CAS 7722-76-1 CAS 7783-20-2 CAS 7704-34-9 Proprietary	75-78% 12-15% 4-6% 1.2-2.0%	Acute Toxicity Oral Category 5 Skin Irritant Category 2 Eye Irritant Category 2B STOT SE 3 (Lungs, Inhalation)

<b>SECTION 4</b>	<b>FIRST AID MEASURES</b>	
First Aid Procedures:	Eyes:	Move victim away from exposure and into fresh air. Flush eyes with plenty of clean water for at least 15 minutes. If symptoms persist, seek medical attention.
	Skin:	Wash contaminated area thoroughly with mild soap and water. If chemical or solution soaks through clothing, remove clothing and wash contaminated skin. If irritation develops and persists after washing, seek medical attention.
	Inhaled:	If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.
	Ingestion:	If large amounts are swallowed, seek emergency medical attention. If possible, do not leave victim unattended and observe closely for adequacy of breathing.
Note to Physician:	If person has been exposed to concentrated decomposition products, treat symptomatically and watch for delayed symptoms of pulmonary edema.	

<b>SECTION 5</b>	<b>FIRE FIGHTING MEASURES</b>
Extinguishing Media:	Use extinguishing agent suitable for type of surrounding fire. Avoid excessive water to minimize runoff. Prevent firefighter water from entering the environment. Small fires: Water spray, foam, dry chemical or CO <sub>2</sub> Large fires: Water spray, fog or foam
Protection of Firefighters:	Positive pressure, self-contained breathing apparatus is required for all firefighting activities involving hazardous materials.

<b>SECTION 6</b>	<b>ACCIDENTAL RELEASE MEASURES</b>
Response Techniques:	Stay upwind and away from spill (dust hazard). Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Notify appropriate federal, state, and local agencies as may be required (see Section 15). Minimize dust generation. Sweep up and package appropriately for disposal.



SECTION 7	HANDLING AND STORAGE
Handling:	<p>The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8). Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Wash contaminated clothing or shoes. Use good personal hygiene practices.</p> <p>Avoid systems that would tend to segregate dust or any components of this product. Avoid accumulation of fugitive dust, as high concentrations of sulfur dust may present an explosion hazard. Follow standard safe-work practices, including hot-work procedures when working around this product.</p>
Storage:	<p>Use and store this material in dry, well-ventilated areas. Store only in approved containers. Keep container(s) tightly closed. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Material may absorb moisture from the air.</p>

SECTION 8	EXPOSURE CONTROLS / PERSONAL PROTECTION	
Engineering Controls:	<p>Use process enclosure, general dilution ventilation or local exhaust systems where necessary to maintain airborne dust concentration below the OSHA standards or in accordance with applicable regulations.</p>	
Personal Protective Equipment (PPE):	Eye/Face:	<p>Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended.</p>
	Skin:	<p>The use of cloth or leather work gloves is advised to prevent skin contact, possible irritation and absorption.</p>
	Respiratory:	<p>A NIOSH approved air purifying respirator with a type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed if workplace conditions warrant a respirator.</p>
	Other:	<p>A source of clean water should be available in the work area for flushing eyes and skin.</p>
General Hygiene Considerations:	<p>Wash thoroughly after handling Use adequate ventilation</p>	
Exposure Guidelines:	OSHA Permissible Exposure Limits (PEL):	<p>Particulates Not Otherwise Regulated: 5 mg/m<sup>3</sup> TWA (respirable); 15 mg/m<sup>3</sup> TWA (total) Ammonia: 50 ppm (35 mg/m<sup>3</sup>) TWA Sulfur: No Occupational Limits</p>
	ACGIH Threshold Limit Value (TLV):	<p>Particulates Not Otherwise Specified: 3 mg/m<sup>3</sup> TWA (respirable); 10 mg/m<sup>3</sup> TWA (inhalable) Ammonia: 25 ppm (18 mg/m<sup>3</sup>) TWA; 35 ppm (27 mg/m<sup>3</sup>) STEL Sulfur: No Occupational Limits</p>



<b>SECTION 9</b>		<b>PHYSICAL AND CHEMICAL PROPERTIES</b>	
Note: Unless otherwise stated, values in this section are determined at 20°C (68°F) and 760 mm Hg (1 atm).			
Appearance:	Gray, tan, or brown granules	Vapor Pressure (mm Hg):	Not applicable
Odor:	Rotten egg-like or Slight ammonia odor	Vapor Density (air=1):	Not applicable
Odor Threshold:	No data available	Specific Gravity or Relative Density:	Not applicable
Physical state:	Solid	Bulk Density:	Loose 57 - 66 lbs/ft <sup>3</sup> (915 - 1060 kg/m <sup>3</sup> ); Packed 54 - 62 lbs/ft <sup>3</sup> (865 - 995 kg/m <sup>3</sup> )
pH:	4.2 – 5.5 in a 1 w/v %	Solubility in Water:	75% - 85% 300 g/L at 20°C
Melting Point/ Freezing Point:	Partial at 235°F (113°C)	Partition coefficient:	No data available
Boiling Point:	Not applicable	Auto-Ignition Temperature:	Not applicable
Flash Point:	Not applicable	Decomposition Temperature:	374°F (190°C)
Evaporation Rate:	No data available	Viscosity:	No data available
Flammability:	Not applicable	Volatility:	Not applicable
Upper/Lower Flammability or explosive limits	Not applicable		

<b>SECTION 10</b>		<b>STABILITY AND REACTIVITY</b>	
Chemical Stability:	Stable under normal conditions of storage and handling. Decomposes at 374°F (190°C).		
Conditions to Avoid:	Extreme temperatures, accumulation of dust.		
Incompatible Materials:	Avoid contact with alkaline materials		
Hazardous Decomposition Products:	If heated to the point of decomposition, oxides of phosphorus, nitrogen and/or sulfur (e.g., SO <sub>2</sub> ) may be released, as well as ammonia vapor.		
Corrosiveness:	May be corrosive to iron and mild steels, aluminum, zinc and copper		
Hazardous Polymerization:	Will not occur		

<b>SECTION 11</b>		<b>TOXICOLOGICAL INFORMATION</b>	
Substance:	Monoammonium Phosphate		
Acute Oral Toxicity:	LD <sub>50</sub> (rat, oral) > 2000 mg/kg		
Acute Inhalation Toxicity:	No data available		
Acute Dermal Toxicity:	LD <sub>50</sub> (rat, dermal) > 5000 mg/kg		
Substance:	Ammonium Sulfate		
Acute Oral Toxicity:	LD <sub>50</sub> (rat, oral) > 2000 to 4250 mg/kg LD <sub>50</sub> (mouse, oral) > 640 to 4250 mg/kg		
Acute Inhalation Toxicity:	No data available		
Acute Dermal Toxicity:	LD <sub>50</sub> (rat, mouse, dermal) > 2000 mg/kg		




Substance:	Sulfur		
Acute Oral Toxicity:	LD <sub>50</sub> (rat, oral) > 5000 mg/kg		
Acute Inhalation Toxicity:	No data available		
Acute Dermal Toxicity:	LD <sub>50</sub> (rat, dermal) > 2000 mg/kg		
Substance:	Zinc Compounds		
Acute Oral Toxicity:	LD <sub>50</sub> (mouse/rat, oral) 186 - 623 mg/kg		
Acute Inhalation Toxicity:	No data available		
Acute Dermal Toxicity:	No data available		
Mutagenesis:	No data available	Target Organ	STOT SE Cat 3; may cause respiratory irritation.
Developmental Toxicity:	No data available	Carcinogenicity	The ingredients of this product are not classified as carcinogenic by NTP (National Toxicology Program), IARC, or OSHA

SECTION 12	ECOLOGICAL INFORMATION
Ecotoxicology:	<p>Ammonium sulphate (CAS 7783-20-2)  <b>Aquatic</b>            Algae EC<sub>50</sub> Chlorella vulgaris 2700 mg/l, 18 days            Crustacea EC<sub>50</sub> Water flea (Daphnia magna) &gt; 100 mg/l, 96 hours            Fish LC<sub>50</sub> Salmo gairdneri 173 mg/l, 96 hours</p> <p>Sulfur (CAS 7704-34-9)  <b>Aquatic</b>            Fish LC<sub>50</sub> Western mosquitofish (Gambusia affinis) &gt; 10000 mg/l, 96 hours            Crustacea LC<sub>50</sub> Water flea (Daphnia magna) 0.098 mg/l, 48 Hours</p> <p>Zinc Compounds  <b>Aquatic</b> (very toxic to aquatic organisms)            Ceriodaphnia dubia EC<sub>50</sub> 0.413 mg/l, 48 hours            Selenastrum capricornutum LC<sub>50</sub> 0.136 mg/l, 72 hours</p> <p>May release ammonium ions that are toxic to fish. Un-ionized ammonia concentrations above 0.02 mg/l are considered toxic in fresh water. May release phosphates which will result in algae growth, increased turbidity, and depleted oxygen. At high concentrations, this may be hazardous to fish or other marine organisms. Release to watercourses may cause effects downstream. Fish 96 hour LC<sub>50</sub>, OECD Guidelines 203 (rainbow trout): &gt; 86 mg/l.</p>




SECTION 13	DISPOSAL CONSIDERATIONS
	Recover or recycle if possible. Properly characterize all waste materials. Consult federal, state/provincial and local regulations regarding the proper disposal of this material. Prevent material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways.



SECTION 14	TRANSPORT INFO
Regulatory Status:	Not regulated
Identification Number:	HTS 3105.59.00
Hazard Class:	Not applicable
Proper Shipping Name	Not applicable
Packing Group	Not applicable
DOT Emergency Response Guide Number:	Not applicable
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	Not applicable
MARPOL Annex V:	Non-HME
IMO/IMDG:	Not applicable

SECTION 15	REGULATORY INFORMATION				
CERCLA:	Listed (Zinc compounds) 1000 lbs RQ; 454 kg RQ				
RCRA 261.33:	Not listed				
SARA Title III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or for quantities of less than 10,000 pounds on-site.)	Section 302/304: Listed (Zinc compounds)	RQ: 1000 lbs (Zinc compounds)	TPQ: No		
	Section 311/312:				
	Acute: Yes	Chronic: No	Fire: No	Pressure: No	Reactivity: No
	Section 313: Listed (Zinc compounds)				
NTP, IARC, OSHA:	This material has not been identified as a carcinogen by NTP, IARC, or OSHA.				
Canada DSL and NDSL:	DSL: Yes NDSL: Not listed				
TSCA:	Listed on the TSCA Inventory				
CA Proposition 65: (Health & Safety Code Section 25249.5)	 WARNING: Cancer and Reproductive Harm – <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>				
WHMIS:	<p><b>WHMIS 2015</b> This SDS has been prepared according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all of the information required by the HPR.</p> <p><b>WHMIS 1988 (Repealed)</b> Classifications and/or symbols from the Controlled Products Regulations (CPR) are included in the Other Hazardous Classifications in Section 16 for reference.</p>				



SECTION 16	OTHER INFORMATION																																										
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Revision Date:	April 30, 2018																																										
Sections Revised:	Section 15																																										
SDS Number:	MOS 100038																																										
References:	Globally Harmonized System of Classification and Labelling of Chemicals (GHS) – 4 <sup>th</sup> Edition 2011 OSHA Hazard Communication Standard, 2012 MARPOL Annex V; The Fertilizer Institute (TFI), 2003; TOXNET																																										
Other Hazard Classifications:	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="511 1003 800 1050">NFPA HAZARD CLASS</th> <th colspan="2" data-bbox="829 1003 1118 1050">HMIS HAZARD CLASS</th> <th colspan="2" data-bbox="1154 1003 1487 1050">WHMIS 1988 (CPR) HAZARD CLASS</th> </tr> </thead> <tbody> <tr> <td data-bbox="511 1050 686 1115">Health:</td> <td data-bbox="686 1050 800 1115">2</td> <td data-bbox="829 1050 992 1115">Health:</td> <td data-bbox="992 1050 1118 1115">2</td> <td data-bbox="1154 1050 1339 1115">Symbol</td> <td data-bbox="1339 1050 1487 1115">N/A</td> </tr> <tr> <td data-bbox="511 1115 686 1157">Flammability:</td> <td data-bbox="686 1115 800 1157">0</td> <td data-bbox="829 1115 992 1157">Flammability:</td> <td data-bbox="992 1115 1118 1157">0</td> <td data-bbox="1154 1115 1339 1157">Classification</td> <td data-bbox="1339 1115 1487 1157">Not WHMIS Controlled</td> </tr> <tr> <td data-bbox="511 1157 686 1199">Instability:</td> <td data-bbox="686 1157 800 1199">0</td> <td data-bbox="829 1157 992 1199">Physical Hazard:</td> <td data-bbox="992 1157 1118 1199">0</td> <td data-bbox="1154 1157 1339 1199">Sub Class</td> <td data-bbox="1339 1157 1487 1199">N/A</td> </tr> <tr> <td data-bbox="511 1199 686 1255">Special Hazard:</td> <td data-bbox="686 1199 800 1255">None</td> <td data-bbox="829 1199 992 1255">PPE:</td> <td data-bbox="992 1199 1118 1255">Section 8</td> <td colspan="2"></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2" data-bbox="511 1287 1118 1354">WHMIS 2015 (HPR) HAZARD CLASS</th> </tr> </thead> <tbody> <tr> <td data-bbox="511 1354 686 1396">Signal Word</td> <td data-bbox="686 1354 1118 1396">Warning</td> </tr> <tr> <td data-bbox="511 1396 686 1507">Symbol</td> <td data-bbox="686 1396 1118 1507">  </td> </tr> <tr> <td data-bbox="511 1507 686 1619">Classification</td> <td data-bbox="686 1507 1118 1619">           Acute Toxicity Oral Category 5            Skin Irritant Category 2            Eye Irritant Category 2B            STOT SE Category 3         </td> </tr> <tr> <td data-bbox="511 1619 686 1759">Hazard Statements</td> <td data-bbox="686 1619 1118 1759">           H303: May be harmful if swallowed            H315: Causes skin irritation            H320: Causes eye irritation            H335: May cause respiratory irritation         </td> </tr> </tbody> </table>			NFPA HAZARD CLASS		HMIS HAZARD CLASS		WHMIS 1988 (CPR) HAZARD CLASS		Health:	2	Health:	2	Symbol	N/A	Flammability:	0	Flammability:	0	Classification	Not WHMIS Controlled	Instability:	0	Physical Hazard:	0	Sub Class	N/A	Special Hazard:	None	PPE:	Section 8			WHMIS 2015 (HPR) HAZARD CLASS		Signal Word	Warning	Symbol		Classification	Acute Toxicity Oral Category 5 Skin Irritant Category 2 Eye Irritant Category 2B STOT SE Category 3	Hazard Statements	H303: May be harmful if swallowed H315: Causes skin irritation H320: Causes eye irritation H335: May cause respiratory irritation
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