



MATERIAL SAFETY DATA SHEET

DYNAMATE®

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I. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	DYNAMATE®
Chemical Name:	Potassium Magnesium Sulfate
Chemical Family:	Inorganic Salt
Synonyms:	Potassium Magnesium Sulfate, SPM, Langbeinite Sulfate of Potash Magnesia Sul-Po-Mag®
Chemical Formula:	$K_2SO_4 \cdot 2MgSO_4$
Primary Use:	Feed Ingredient
Responsible Party:	Mosaic USA LLC 3033 Campus Drive Plymouth, MN 55441
Non-Emergency Technical Contact:	8:00 am - 4:00 pm Central Time, Mon - Fri: 800-323-5523

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Number:

For Chemical Emergencies:

Spill, Leak, Fire or Accident

Call CHEMTREC

North America: (800) 424-9300

Others: (703) 527-3887 (collect)

Health Hazards:	Irritant. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.		
Physical Hazards:	None known		
Physical Form:	Solid		
Appearance:	White and pink to gray, crystalline or granular		
Odor:	None		
<u>NFPA HAZARD CLASS</u>		<u>HMIS HAZARD CLASS</u>	
Health:	1 (Slight)	Health:	1 (Slight)
Flammability:	0 (Least)	Flammability:	0 (Least)
Instability:	0 (Least)	Reactivity:	0 (Least)
Special Hazard:	None	PPE:	Section VIII

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Revised Section: All

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II. COMPOSITION/INFORMATION ON INGREDIENTS

Component	% Weight	Exposure Guideline		
Potassium Magnesium Sulfate (Langbeinite) CAS No. 14977-37-8	88 - 99.5	NE	OSHA ACGIH	All
Sodium Chloride CAS No. 7647-14-5	0.5 - 12	NE	OSHA ACGIH	All

NE = Not established, but the following particulate limits apply to all inert inorganic dusts.

Particulates Not Otherwise Classified (PNOC)	10 mg/m ³ 3 mg/m ³	ACGIH ACGIH	TWA - Inhalable TWA - Respirable
Particulates Not Otherwise Regulated (PNOR)	15 mg/m ³ 5 mg/m ³	OSHA OSHA	TWA - Total Dust TWA - Respirable

Notes: State, local or other agencies or advisory groups may have published more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

III. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS	
Eye:	Contact may cause mild eye irritation including stinging, watering and redness.
Skin:	Contact may cause mild irritation including redness and a burning sensation. No harmful effects from skin absorption have been reported.
Inhalation (Breathing):	No information available. Studies by other exposure routes suggest a low degree of hazard by inhalation.
Ingestion (Swallowing):	Low to moderate degree of toxicity by ingestion.
Signs and Symptoms:	Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, abdominal cramping, irregular heartbeats (arrhythmias), dehydration, and hypertension.
Cancer:	Inadequate data available to evaluate the cancer hazard of this material.
Target Organs:	No data available.
Developmental:	Inadequate data available for this material.
Other Comments:	To the best of our knowledge, the chemical and toxicological properties of potassium magnesium sulfate have not been thoroughly investigated.
Pre-Existing Medical Conditions:	Respiratory diseases (asthma-like disorders) and high blood pressure (hypertension).

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IV. FIRST AID MEASURES

Eye:	If irrigation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water for at least 15 minutes. If symptoms persist, seek medical attention.
Skin:	Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.
Inhalation (Breathing):	If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
Ingestion (Swallowing):	If swallowed, seek emergency medical attention. If victim is drowsy or unconscious and vomiting, place on left side with the head down and do not give anything by mouth. If victim is conscious and alert and ingestion occurred within the last hour, vomiting should be induced for ingestion of large amounts (more than 5 ounces or a little more than 1/2 cup in an adult) preferably under direction from a physician or poison center. If possible, do not leave victim unattended and observe closely for adequacy of breathing.
Note to Physicians:	None known

V. FIRE FIGHTING MEASURES

Flammable Properties:	DYNAMATE[®] is non-flammable. Flash Point - Not applicable OSHA Flammability Class - Not applicable LEL/UEL - Not applicable Auto-ignition Temperature - Not applicable
Unusual Fire & Explosion Hazards:	None known
Extinguishing Media:	Use extinguishing agent suitable for type of surrounding fire.
Fire Fighting Instructions:	Positive pressure, self-contained breathing apparatus is required for all fire fighting activities involving hazardous materials. Full structural fire fighting (bunker) gear is the minimum acceptable attire. The need for proximity, entry, flashover and/or special chemical protective clothing (see Section VIII) needs to be determined for each incident by a competent fire fighting safety professional. Water used for fire suppression and cooling may become contaminated. Discharge to sewer system(s) or the environment may be restricted, requiring containment and proper disposal of water.

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VI. ACCIDENTAL RELEASE MEASURES

DYNAMATE® is a naturally-occurring feed nutrient. Potassium magnesium sulfate is also a crop nutrient and plant food however; large spills can harm or kill vegetation.

- Stay upwind and away from spill (To avoid potential dust exposure).
- Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section VIII).
- 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
- Minimize dust generation.
- Sweep up and package appropriately for disposal.

VII. HANDLING AND STORAGE

Handling:	The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections II and VIII). Wash thoroughly after handling. Wash contaminated clothing or shoes. Use good personal hygiene practices.
Storage:	Stable under normal storage conditions.

VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section II), additional ventilation or exhaust systems may be required.
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Respiratory:	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 (see Section II). 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.
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Personal Protective Equipment (PPE)

Skin:	The use of cloth or leather work gloves is advised to prevent skin contact; possible irritation and absorption (see glove manufacturer literature for information on permeability).
Eye/Face:	Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended.
Other PPE:	A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.



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IX. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm)

Flash Point:	Not applicable
Flammable/ Explosive Limits (%)	LEL/UEL - Not applicable
Auto-ignition Temperature:	Not applicable
Appearance:	White and pink to gray, crystalline or granular
Physical State:	Crystalline to granular solid
Odor/Taste:	None
Molecular Weight of Pure Material:	415 (for potassium magnesium sulfate)
pH:	Approximately 7 in a 5% solution
Vapor Pressure (mm Hg):	Not applicable
Vapor Density (air = 1):	Not applicable
Boiling Point:	Not available
Freezing/Melting Point:	972°C (1700°F)
Solubility in Water:	Approximately 24.4% @ 77°F (25°C)
Specific Gravity:	2.81 – 2.85
Volatility:	No data available
Bulk Density:	Loose - 83 to 94 lbs/ft ³ (1300 - 1505 kg/m ³)

X. STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions of storage and handling.
Conditions to Avoid:	Mildly corrosive to metals in the presence of moisture.
Incompatible Materials:	Avoid contact with hot nitric acid, may cause evolution of toxic nitrosyl chloride. Contact with other strong acids may produce irritating hydrogen chloride gas. NaCl reacts with most noble metals, such as iron or steel, building materials (such as cement) bromine, or trifluoride. A potentially explosive reaction may occur if NaCl is mixed with dichloromaleic anhydride and urea. Electrolysis of mixtures containing NaCl and nitrogen compounds may form explosive nitrogen trichloride.
Hazardous Decomposition Products:	Combustion can yield oxides of sulfur when heated above 1000°F (537°C).
Hazardous Polymerization:	Will not occur

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XI. TOXICOLOGICAL INFORMATION

Potassium Magnesium Sulfate:	No LD50 or LC50 data located for potassium magnesium sulfate. No eye or skin irritation data located for potassium magnesium sulfate.
Sodium Chloride:	Rat, oral LD50 = 3 g/kg; Mouse, oral LD50 = 4 g/kg Rat LC50 >42 g/m ³ / 1 hour Rabbit, Eye: 100 mg/24 hour, moderate irritant Rabbit, Eye: 500 mg/24 hour, mild irritant No skin irritation data located for sodium chloride.

No definitive information available for this product on skin irritation, carcinogenicity, mutagenicity, target organs or developmental toxicity.

XII. ECOLOGICAL INFORMATION

Ecotoxicity:	When dissolved in water, sodium chloride creates an elevated level of salinity that may be harmful to fresh water aquatic species and to plants that are not salt-tolerant.
BOD AND COD:	No data found

XIII. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not an RCRA "listed" or "characteristic" hazardous waste. Contamination may subject it to hazardous waste regulations. Properly characterize all waste materials. Consult state and local regulations regarding the proper disposal of this material.

XIV. TRANSPORT INFORMATION

Hazard Class or Division:	Not listed in the hazardous materials shipping regulation (49 CFR, Table 172.101) by the U.S. Department of Transportation, or in the Transport of Dangerous Goods (TDG) regulations in Canada.
HTS (Harmonized Tariff Schedule) Code	3104.90.01

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XV. REGULATORY INFORMATION

CERCLA:	Not listed
RCRA 261.33:	Not listed
SARA Title III: Exemptions at 40 CFR, Part 370 may apply for agricultural use, or quantities of less than 10,000 pounds on site.	SARA 313: No
	SARA 311/312: Acute: Yes; Chronic: No; Fire: No; Pressure: No; Reactivity: No
	SARA 302/304: No
TSCA:	Sodium chloride is listed in the TSCA Inventory. Potassium magnesium sulfate (langbeinite) is a naturally occurring chemical substance processed only by mechanical means that is exempted from TSCA listing per 40 CFR, Part 710.26(d).
Proposition 65: (CA Health and Safety Code Section 25249.5)	Warning: This product contains substances that are known to the State of California to cause cancer and/or reproductive harm.
NTP, IARC, OSHA:	None of the ingredients in this product has been identified as a carcinogen by NTP, IARC, or OSHA.
Canada DSL:	Sodium chloride is listed on the Domestic Substances List (DSL). As potassium magnesium sulfate (langbeinite) is a naturally occurring substance processed only by mechanical means, it is considered to be on the DSL per the Canadian Environmental Protection Act (CEPA), New Substances Notification Regulations, Section III.
Canada NDSL:	No
WHMIS:	This MSDS has been prepared accordingly to the hazard criteria of the controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR.

XVI. OTHER INFORMATION

The information in this document is believed to be correct as of the date issued. Nothing herein contained shall be deemed to be a representation or warranty with respect to the product described herein. **NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE, AND ALL SUCH REPRESENTATIONS AND WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED BY MOSAIC.** This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof. The conditions and use of this product are beyond the control of Mosaic, and Mosaic disclaims any liability for loss or damage incurred in connection with the use or misuse of this substance.

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