Material Safety Data Sheet  
Material Name: MAGNESIUM NITRATE HEXAHYDRATE 66.7% SOLUTION  
ID: MRD-022

**Section 1 - Chemical Product and Company Identification**

Chemical Name: Inorganic Nitrate Solution  
Product Use: Various Industrial Applications

**Manufacturer Information**
MINERAL RESEARCH AND DEVELOPMENT  
5910 Pharr Mill Road  
PO Box 1330  
Harrisburg, NC 28075

Phone: 704-454-4811  
Fax: 704-454-7390  
Emergency # CHEMTREC: (800) 424-9300

**General Comments**
NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

**Section 2 - Composition / Information on Ingredients**

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>13446-18-9</td>
<td>Magnesium nitrate, hexahydrate</td>
<td>66.7</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>33.3</td>
</tr>
</tbody>
</table>

**Component Related Regulatory Information**
This product may be regulated, have exposure limits or other information identified as the following: Water Dissociable Nitrate Compounds.

**Component Information/Information on Non-Hazardous Components**
This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). This product is considered hazardous under the criteria specified in the Canadian Workplace Hazardous Materials Information System (WHMIS).

**Section 3 - Hazards Identification**

**Emergency Overview**
WARNING! This product may be harmful or fatal if swallowed. This product is irritating to the eyes, respiratory system and skin. This product is a aqueous solution, which will not burn. However, if evaporated to dryness this product is an oxidizer and can sustain combustion. Irritating and toxic fumes and gases may be released upon thermal processing or during combustion.

**Potential Health Effects: Eyes**
Contact with the eyes can cause moderate irritation. Symptoms may include discomfort or pain and redness. Severe over exposure can result in swelling of the conjunctiva along with tissue damage, which may lead to blindness.

**Potential Health Effects: Skin**
This product is irritating to the skin. Depending on the duration of contact, symptoms will include reddening, discomfort, irritation, and possible tissue damage. Repeated contact with this material may produce dermatitis.

**Potential Health Effects: Ingestion**
This product may be harmful or fatal if swallowed. If ingested, this product will immediately cause burns to the mouth, throat, esophagus and possibly the digestive tract. Ingestion can cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product may cause methemoglobinemia upon ingestion characterized by cyanosis, headache, dizziness, fatigue, nausea, vomiting, drowsiness, stupor, coma and rarely death.

**Potential Health Effects: Inhalation**
This product is irritating to the respiratory system. Inhalation of vapors or mists of the product can cause sneezing, coughing and difficulty breathing.
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Medical Conditions Aggravated by Exposure
Pre-existing skin and eye conditions.

HMIS Ratings: Health: 2 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe  * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes
Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

First Aid: Skin
For skin contact, wash immediately with soap and water. If irritation persists get medical attention.

First Aid: Ingestion
If material is ingested, immediately contact a physician or poison control center. Give one to two glasses of water or milk. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to a victim who is unconscious or is having convulsions.

First Aid: Inhalation
If inhaled, immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. If irritation persists get medical attention.

First Aid: Notes to Physician
Provide general supportive measures and treat symptomatically.

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not flammable
Method Used: Not applicable
Upper Flammable Limit (UFL): Not applicable
Lower Flammable Limit (LFL): Not applicable
Auto Ignition: Not flammable
Flammability Classification: Non-flammable
Rate of Burning: Not applicable

General Fire Hazards
This product is an aqueous solution, which will not burn. However, if evaporated to dryness this product is an oxidizer and can sustain combustion.

Hazardous Combustion Products
Decomposition may yield magnesium compounds and oxides of nitrogen.

Extinguishing Media
Dry chemical, foam, carbon dioxide, water fog.

Fire Fighting Equipment/Instructions
Firefighters should wear full protective clothing including self-contained breathing apparatus.

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0 Other:
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures
Stop the flow of material, if this is without risk. Wear appropriate protective equipment and clothing during clean-up. Contain the discharged material and dike the spilled material where possible. Prevent entry into sewers, drains, underground or confined spaces, water intakes and waterways.

Clean-Up Procedures
Absorb spill with inert material such as: lime, polypads, or other suitable absorbent material. Shovel the absorbed material into appropriate container for disposal.

Evacuation Procedures
Isolate area. Keep unnecessary personnel away.

Special Procedures
Isolate exposure. Wear appropriate personal protective equipment. Follow all Local, State, Federal and Provincial regulations for disposal.
*** Section 7 - Handling and Storage ***

Handling Procedures
Open container carefully, as needed to relieve any build up of pressure. Do not get this material in your eyes, on your skin, or on your clothing. Do not inhale vapors or mists of this product. Use this product with adequate ventilation. Wash thoroughly after handling.

Storage Procedures
Store in a cool, dry area. Do not freeze. Store away from direct sunlight and any sources of heat. Empty product containers may contain product residue. Do not reuse empty containers. Do not store this material in open or unlabeled containers.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines
A: General Product Information
Keep formation of airborne mists to a minimum.

B: Component Exposure Limits
ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

Engineering Controls
Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/face
Wear chemical goggles and face shield.

Personal Protective Equipment: Skin
Wear impervious (neoprene) gloves, impervious apron.

Personal Protective Equipment: Respiratory
If ventilation is not sufficient to effectively prevent buildup of vapors or mists, appropriate approved NIOSH respiratory protection must be provided. Respirators should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134) and ANSI's standard for respiratory protection (Z88.2-1992). A written respiratory protection program, including provisions for medical certification, training, fit testing, exposure assessments, maintenance, inspection, cleaning, and convenient, sanitary storage must be implemented.

Personal Protective Equipment: General
Eye wash fountain and emergency showers are recommended. An emergency spill response will necessitate the use of more stringent personal protective equipment.

*** Section 9 - Physical & Chemical Properties ***

Appearance: Colorless to slightly yellow
Physical State: Liquid
Vapor Pressure: Not Applicable
Boiling Point: >212°F (>100°C)
Solubility (H2O): Completely
Freezing Point: 19.4°F (-7°C)
Octanol/H2O Coeff.: Not Available

Odor: None
pH: Not Determined
Vapor Density: Not Applicable
Melting Point: Not Determined
Specific Gravity: @ 59°F (15°C): 1.35 - 1.36
Evaporation Rate: Similar to water

Physical Properties: Additional Information
No additional information available.

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability
This is a stable material.
Chemical Stability: Conditions to Avoid
 Avoid contact with extreme heat and incompatible materials.

Incompatibility
 This product is incompatible with flammable and combustible materials, strong reducing agents and finely powdered metals.

Hazardous Decomposition
 Decomposition may yield magnesium compounds and oxides of nitrogen.

Hazardous Polymerization
 Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity
A: General Product Information
 No information available for the product.
 The nitrate component of this product may cause methemoglobinemia upon ingestion characterized by cyanosis, headache, dizziness, fatigue, nausea, vomiting, drowsiness, stupor, coma and rarely death.

B: Component Analysis - LD50/LC50
 Magnesium nitrate, hexahydrate (13446-18-9)
 Oral LD50 Rat: 5440 mg/kg

Carcinogenicity
A: General Product Information
 No carcinogenicity data available for this product.

B: Component Carcinogenicity
 None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Chronic Toxicity
 No information available for the product.

Epidemiology
 No epidemiological data is available for this product.

Neurotoxicity
 No data available for this product.

Mutagenicity
 No data available for this product.

Teratogenicity
 No data available for this product.

Other Toxicological Information
 No additional information available.

*** Section 12 - Ecological Information ***

Ecotoxicity
A: General Product Information
 In high concentrations, this product may be harmful to both terrestrial and aquatic plant or animal life.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity
 No ecotoxicity data are available for this product's components.

Environmental Fate
 No data available for this product.

*** Section 13 - Disposal Considerations ***

A: General Product Information
 You must test your waste using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.
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B: Component Waste Numbers
No EPA Waste Numbers are applicable for this product’s components.

Disposal Instructions
Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

*** Section 14 - Transportation Information ***

US DOT Information
This material is not hazardous as defined by 49CFR 172.101, the US Department of Transportation.

Canada Transportation of Dangerous Goods Information
This material is not considered as dangerous goods, per regulations of Transport Canada.

International Transportation Regulations
No additional information available.

*** Section 15 - Regulatory Information ***

US Federal Regulations
A: General Product Information
No additional information available.

B: Component Analysis
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).
Magnesium nitrate, hexahydrate (13446-18-9)

SARA 313: form R reporting required for 1.0% de minimis concentration; Chemical Category N511 (related to Water Dissociable Nitrate Compounds)

SARA 311/312: Acute Health Yes Chronic Health No Fire No Pressure No Reactive No

State Regulations
A: General Product Information
Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State
None of this product’s components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Canadian WHMIS Information
A: General Product Information
All components are on the Canadian Domestic Substances or Non-Domestic Substances Inventory Lists.

B: Component Analysis - WHMIS IDL
No components are listed in the WHMIS IDL.

WHMIS Classification: Class D2B: Material Causing Other Toxic Effects

Additional Regulatory Information
A: General Product Information
All components are on the U.S. EPA TSCA Inventory List.

Magnesium Nitrate Tetrahydrate is a hydrate of an anhydrous form that is on the US TSCA and Canadian DSL inventories, and can be referenced under the parent compound name (CAS #10377-60-3).
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#### B: Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>AUST</th>
<th>MITI</th>
<th>PHIL</th>
<th>KOREA</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium nitrate, hexahydrate</td>
<td>13446-18-9</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

#### *** Section 16 - Other Information ***

**Disclaimer:** Supplier gives no warranty of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser will make his own tests to determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental and/or consequential property damage arising out of the use of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. Read the Material Safety Data Sheet before handling product.

**Key/Legend**


This is the end of MSDS # MRD-022