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

**Chemical Name:** Inorganic Nitrate Solution  
**Product Use:** Variety of Industrial Applications  
**Manufacturer Information**  
MINERAL RESEARCH AND DEVELOPMENT  
5910 Pharr Mill Road  
P. O. 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>13477-34-4</td>
<td>Calcium Nitrate Tetrahydrate</td>
<td>60-72</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>28-40</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 an 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.

**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

**Upper Flammable Limit (UFL):** Not applicable

**Auto Ignition:** Not flammable

**Rate of Burning:** Not applicable

**Method Used:** Not applicable

**Lower Flammable Limit (LFL):** Not applicable

**Flammability Classification:** Non-flammable

**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 calcium 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:** none

**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 cleanup. 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
Physical State: Liquid
Vapor Pressure: Not Applicable
Boiling Point: >212°F (>100°C)
Solubility (H2O): Completely
Freezing Point: -31°F (-35°C)
Octanol/H2O Coeff.: Not Available
Odor: None
pH: @ 59°F (15°C): 3.0 - 8.0
Vapor Density: Not Applicable
Melting Point: Not Determined
Specific Gravity: @ 59°F (15°C): 1.38 - 1.50
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 calcium compounds and oxides of nitrogen.
**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**
- Calcium Nitrate Tetrahydrate (13477-34-4)
  - Oral LD50 Rat: 3900 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**

**US EPA Waste Number & Descriptions**

**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.

**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 by the US Department of Transportation.

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

IMDG Information
This material is not considered a hazardous material.

*** 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).

Calcium Nitrate Tetrahydrate (13477-34-4)
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.

Calcium 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.

B: Component Analysis - Inventory Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
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<tr>
<td>Calcium Nitrate Tetrahydrate</td>
<td>13477-34-4</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>Water</td>
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<td>Yes</td>
<td>DSL</td>
</tr>
</tbody>
</table>
Material Name: CALCIUM NITRATE TETRAHYDRATE SOLUTION

** Section 16 - Other Information **

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-016