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MATERIAL SAFETY DATA SHEET KEG 9-0-0-60S

A. GENERAL INFORMATION

April 2015

Trade Name: Keg 9-0-0-60S

Formula of Blend: 44% by weight of Granular Ammonium Sulfate
56% by weight of NutraSul 90

Formula of Ammonium Sulfate: $(\text{NH}_4)_2\text{SO}_4 / \text{S}$ Chemical Family: Ammonium Salt /Sulfur

B. TRANSPORTATION REQUIREMENTS: Ammonium sulfate

TDG Classification: Not controlled under TDG (Canada)

PIN: Not applicable (PIN and PG)

Special Provisions for Transport: Not applicable

OTHER REGULATIONS:

- CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL) and is acceptable for use under the provisions of CEPA.

OTHER CLASSIFICATIONS:

- HCS (U.S.A) Not controlled under the HCS (United States).
- DSCL (EEC) Not controlled under DSCL (Europe).

C. TRANSPORTATION REQUIREMENTS: NutraSul 90 (Non Regulated as per following exemptions/provisions, and observations):

US and Canadian Shipments: non regulated as per T.D.G.A.R.'s exemption part 2.3 (a) (xxxviii) and 49 CFR (Canadian Shipments and Packaging 171.12 (a) and CFR 49 (Special Provisions 172.102 pt 30.)

International Shipments:

AIR (IATA): Exempted under Special Provision A 105 SEA (IMDG): Exempted as per Sulfur Observations Part 1 & 2
Appearance: Specifically formed product in the shape of pastilles.

TRANSPORTATION EMERGENCIES: call collect CANUTEX 613-996-6666 (24 hours).

WHIMIS: non-controlled product in accordance with sub-paragraph 13(a)(i-iv) or paragraph 14 (a) of the Hazardous Products Act.

D. FIRST AID MEASURES: Ammonium Sulfate and NutraSul 90

Eye Contact: Causes eye irritation. Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention if irritation persists.

Minor Skin Contact: If the chemical touches exposed skin, such as the hands, gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Cover irritated skin with an emollient. If irritation persists, obtain medical attention. Wash contaminated clothing before reusing.

Extensive Skin Contact: No additional information.

Minor Inhalation: Repeated or prolonged inhalation of dust may lead to respiratory irritation. Loosen tight clothing around the individual's neck and waist. Allow the person to rest in a well-ventilated area. Obtain medical attention if irritation persists.

Severe Inhalation: Over-exposure by inhalation may cause respiratory irritation. In emergency situations use proper respiratory protection to evacuate the victim to a safe area as soon as possible. Loosen tight clothing around the victim's neck and waist. Allow the victim to rest in a well-ventilated area. Oxygen may be administered if breathing is difficult. If the victim is not breathing, perform artificial respiration. Obtain immediate medical attention.

Slight Ingestion: If victim is unconscious, never induce vomiting or give anything by mouth. If conscious, have person drink several glasses of water or milk and INDUCE VOMITING. Obtain medical attention.

Extensive Ingestion: No additional information.

E. HAZARDS INFORMATION: Ammonium sulfate (Alone)

Potential Acute Health Effects: This product may irritate eyes and skin upon prolonged or repeated contact. Over-exposure by inhalation may cause respiratory tract irritation. Ingestion of this substance may produce irritation of the gastro-intestinal tract, characterized by burning and diarrhea.

Potential Chronic Health Effects: There is no known effect from chronic exposure to this product.

- Carcinogenic Effects: NONE by ACGIH, EPA, IARC, NTP, OSHA.
- Mutagenic Effects: NONE by ACGIH, EPA, IARC, NTP, OSHA.

- Teratogenic Effects: NONE by ACGIH, EPA, IARC, NTP, OSHA.

F. TOXICOLOGICAL INFORMATION: Ammonium sulfate

Routes of Entry: Ingestion and inhalation.

Toxicological Data on Ingredients: Granular Ammonium Sulfate, 20.5-0-0-24S:

- ORAL (LD50): Acute: 3000 mg/kg (Rat)

Special Remarks on Toxicity to Animals: Very low toxicity for humans or animals. The product itself and its products of degradation are not toxic under normal conditions of use. Will release ammonium ions. Ammonia is a toxic hazard to fish.

Other Effects on Humans: No additional remarks.

Special Remarks on Chronic Effects on Humans: No additional remarks.

Special Remarks on Other Effects on Humans: ACGIH TLV is based on "Particulates Not Otherwise Classified".

G. TOXICOLOGICAL INFORMATION: NutraSul 90

Ingestion: Solid Sulfur is virtually non-toxic. It can be taken internally in fairly large doses without injury. However, ingested sulfur is converted to sulfides in the gastrointestinal tract, and ingestion of 10 to 20 grams has caused irritation of the GI tract and renal injury. Individuals with known allergies to sulfide drugs may also have allergic reactions to elemental sulfur. Swallowing large amounts may cause nausea and vomiting. Do not eat sulfur.

H. FIRE AND EXPLOSION DATA: Ammonium sulfate

The product is: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Point: Not applicable.

Flammability Limits: Not applicable.

Products of Combustion: Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases: Ammonia, Nitrogen Oxides (NO, NO₂) Sulfur oxides (SO₂, SO₃)

Fire Hazard in Presence of Various Substances: Not applicable.

Explosion Hazard in Presence of Various Substances: This product is non-explosive. Sensitizer: increases explosion hazard of ammonium nitrate when mixed together.

Fire Fighting Media and Instructions: Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases. Use extinguishing media suitable for surrounding materials.

Special Remarks on Fire Hazards: Non-combustible. Flammable/toxic gases will form at elevated temperatures (>280 °C) by thermal decomposition (Ammonia, Sulfur Oxides, Nitrogen Oxides). A self-contained breathing apparatus should be used to avoid inhalation of toxic fumes.

Special Remarks on Explosion Hazards: No additional remarks.

I. FIRE AND EXPLOSION DATA: NutraSul 90 (Alone)

Flash Point °C	Auto Ignition °C	Flammable Limits in air
Pure Liquid S – 188 °C, (370°F)	Dust clouds 190 °C (374 °F)	Minimum explosion concentration is approximately 55 gm per cu. Meter (0.0549 oz per cu. ft). Maximum explosive concentration lies between 1000 and 2000 gm/m ³ probably about 1400 gm/m ³ .
Impure Liquid S - 168 °C, (335 °F)	Undispersed dust, 220 °C, (428 °F)	

Unusual Fire and Explosion Hazards: Dust suspended in air is readily ignited by flame, static electricity or friction spark. Every reasonable step must be taken to minimize dust formation. Dust tight casings should be equipped with explosion relief vents. Sparkless electric equipment is recommended. Handling equipment must be grounded or bonded to avoid static electricity. Keep away from sources of flame or sparks. Detailed recommendations in Manufacturing Chemists Association SD-74 and National Safety Council 612 Bulletins covering “Sulfur” should be followed when handling sulfur fertilizers.

Explosive Limits: LEL 55 gm/m³
UEL 1400 gm/m³

J. PRECAUTIONS/PROCEDURES: Ammonium sulfate & NutraSul 90

Accidental Release Measures:

- **Small Spill:** Use appropriate tools to put the spilled solid in a suitable container for intended use or disposal.
- **Large Spill:** Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses, wells, etc. Product will promote algae growth and may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 500mg/L. Will dissolve and disperse in water. Reclaiming material may not be viable. Recover and place material in suitable containers for recycle, reuse, or disposal. Ensure disposal is in compliance with government requirements and local regulations.

Handling and Storage

- **Normal Handling:**
 - Avoid contact with skin and eyes.
 - Avoid repeated or prolonged inhalation of dust.
 - Wear personal protective equipment when handling this product.
 - Avoid contamination of food, feed, domestic or irrigation water supplies, lakes, streams and ponds.
 - Dispose product according to federal, provincial and municipal regulations.
 - Keep out of reach of children.
 - Incompatible with oxidizing agents.
- **Storage:** Store in a dry, cool and well-ventilated area. Sulfur/Bentonite fertilizer will physically break down when exposed to moisture or water.

Exposure Controls/Personal Protection

- **Engineering Controls:** Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- **Personal Protection:** The selection of personal protective equipment varies, depending upon conditions of use. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, leather gloves, and safety glasses with side shields.
- **Personal Protection in case of Large Release:** Wear a NIOSH approved dust respirator if engineering, work practice or other control measures are not adequate to prevent overexposure. Where skin and eye contact may occur as a result of prolonged or repeated exposures, wear long sleeved clothing, coveralls, leather gloves, and safety glasses with side shields.

Exposure Limits: TLV-TWA 10 mg/m³ as inhaled dust Ref: ACGIH 1994 Particulates Not Otherwise Classified (nuisance dust). Consult authorities for local acceptable exposure limits.

Fire Extinguishing Agents Recommended:

- A fine water spray or fog is recommended.
- CO₂ or dry chemical.
- Small fires may be smothered with sand or solid Sulfur.

Fire Extinguishing Agents to Avoid:

Hoses and extinguishers with pressure streams should be avoided where solid Sulfur is dusty or where it may create a further hazard by raising more dust clouds.

Special Fire Fighting Precautions:

Because burning Sulfur evolves Sulfur dioxide, breathing apparatus or gas masks approved for use in acid-gas atmosphere should be used. Fumes from unprotected Sulfur fires shall be avoided, if possible, by approaching for the upwind side.

K. PERSONAL PROTECTIVE EQUIPMENT: Ammonium sulfate and NutraSul 90

Respiratory Protection: Dust-type respirators shall be provided for dusty conditions. Breathing apparatus must be available for emergency use in case of fire.

Eyes and Face: Dust-tight goggles with plastic or rubber frames may be helpful in dusty conditions. Eye Wash equipment near the work area.

Hands, Arms and Body: Workers whose skin may be sensitive to Sulfur dust should button collars, roll sleeves down, and gather trousers at the ankle. Gloves may be helpful.

Other Clothing and Equipment: Hardhat and safety shoes. Fire-retardant fabric is recommended. Sulfur impregnated clothing should not be worn.

L. PHYSICAL AND CHEMICAL PROPERTIES: Ammonium sulfate

Physical State and Appearance: Solid (Crystalline granules)

Molecular Weight: 132.14

Color: Off-white

pH (10% Soln./water): 4

Odor: Odorless

Boiling Point: Decomposes

Odor Threshold: 17 PPM (Ammonia)

Melting Point: 235 °C (455 °F)

Taste: Acrid (Slight)

Critical Temperature: Not available.

Ionicity in water: Not available

Specific Gravity g/cc: 0.89 (Water = 1)

Solubility: Easily soluble in hot water. Soluble in cold water.

Vapor Pressure: Not applicable.

Water/Oil Distribution Coefficient: Not available.

Vapor Density: Not applicable.

M. PHYSICAL AND CHEMICAL PROPERTIES: NutraSul 90

Physical State and Appearance: Solid (pastille)

Color: Green

pH: Neutral when dry

Odor: May have slight Sulfur odor

Boiling Point: 444 °C (832 °F)

Melting Point: 119 °C (246 °F)

Specific Gravity: Solid, 2.07/gm/ml

Solubility: Disintegrates readily in water, but Sulfur is insoluble.

Vapor Pressure: Solid: Less than 0.0001 mm. Hg at 20 °C (68 °F)

Water/Oil Distribution Coefficient: Not available.

Vapor Density: > 1

N. STABILITY AND REACTIVITY DATA: Ammonium sulfate

Stability: The product is stable.

Instability Temperature: Not available.

Condition of Instability: No additional remark.

Incompatibility with Various Substances: Slightly reactive to reactive with oxidizing agents. Very slightly to slightly reactive with metals, alkalis, moisture. Non-reactive with reducing agents, combustible materials, organic materials, acids.

Corrosivity: Highly corrosive in presence of aluminum, zinc, and copper. Slightly corrosive to steel and 304 stainless steel. Non-corrosive to 316 stainless steel.

Special Remarks on Reactivity: Avoid contact with moisture. Slow hydrolysis will produce corrosive acids.

Special Remarks on Corrosiveness: Incompatible with copper alloys. Corrosive to brass. Corrosive to ferrous metals and alloys.

O. STABILITY AND REACTIVITY DATA: NutraSul 90

Stability: The product is stable.

Incompatibility with Various Substances: Mixtures with chlorates, nitrates or other oxidizing agents may be explosive. Sulfur will react with alkalis or alkaline earths.

Conditions to Avoid: The main hazards are fire and dust explosions. Hazardous polymerization will not occur.

Special Remarks on Reactivity: Avoid contact with moisture. Slow hydrolysis will produce corrosive acids.

P. ECOLOGICAL INFORMATION: Ammonium sulfate

Ecotoxicity: Very low toxicity for humans or animals. This product itself and its products of degradation are not toxic under normal conditions of use. Will release ammonium ions. Ammonia is a toxic hazard to fish.

BOD and COD: Not available.

Products of Biodegradation: Nitrogen oxides (NO, NO₂). Sulfur oxides (SO₂, SO₃).

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not harmful under normal conditions of use. Avoid spills or releases to watercourses.

Special Remarks on the Products of Biodegradation: Product will promote algae growth and may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 500mg/L. Will dissolve and disperse in water. Reclaiming material may not be viable.

NOTICE:

The data and information presented herein are based upon tests, research and reports, which are considered by us to be reliable, and believed to be accurate. The data and information are presented without warranty, guarantee or liability on our part, and are presented to the customer for his own consideration, investigation and verification.