

AMMONIUM SULFATE, GRANULAR GRADE 20-0-0-24S MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Ammonium Sulfate, Granular Grade 20-0-0-24S

Manufacturer:

Teck Metals Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8
Emergency Telephone: 250-364-4214

Supplier:

International Raw Materials Ltd.
Public Ledger Building
150 South Independence Mall West
Philadelphia, PA 19106-3407

MSDS Preparer:

Teck Metals Ltd.
3300 – 550 Burrard Street
Vancouver, British Columbia
V6C 0B3

Date of Last Review/Edit: July 10, 2009.

Product Use: Agricultural industry: fertilizer. Industrial applications: manufacture of specialty fertilizers.

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Approximate Percent by Weight	CAS Number	Occupational Exposure Limits (OELs)	LD ₅₀ /LC ₅₀ Species and Route
Ammonium Sulfate	97%	7783-20-2	OSHA PEL (see note below) ACGIH TLV (see note below) NIOSH REL None established	Rat, oral LD ₅₀ – 4,540 mg/kg Rat, dermal LD ₅₀ – >2,000 mg/kg
Zinc Sulfate Monohydrate	3%	7446-19-7	OSHA PEL (see note below) ACGIH TLV (see note below) NIOSH REL None established	Rat, oral LD ₅₀ – 1,538 mg/kg (Anhydrous)

NOTE: OELs for individual jurisdictions may differ from OSHA PELs. Check with local authorities for the applicable OELs in your jurisdiction.

OSHA PEL – All inert or nuisance dusts, whether mineral, inorganic, or organic not listed specifically by substance name in Tables Z-1 or Z-3 of CFR 1910.1000 are covered by the Particulates Not Otherwise Regulated (PNOR) limit of 15 mg/m³ total dust and 5 mg/m³ respirable fraction.

ACGIH® TLV® - ACGIH® believes that even biologically inert, insoluble, or poorly soluble particles may have adverse effects and recommends that airborne concentrations should be kept below 3 mg/m³ respirable particles and 10 mg/m³ inhalable particles, until such time as a TLV® is set for a particular substance. While ammonium sulfate does not completely meet the ACGIH® definition of a Particle Not Otherwise Specified (PNOS) due to its solubility, this is still considered to be a valid guideline for ammonium sulfate fertilizer dust.

OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health. OEL – Occupational Exposure Limit, PEL – Permissible Exposure Limit, TLV – Threshold Limit Value, REL – Recommended Exposure Limit.

Trade Names and Synonyms: 20-0-0-24 Ammonium Sulfate Fertilizer, Ammonium Sulphate, (NH₄)₂SO₄

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview: Off-white granules that are stable under normal temperatures and pressures and will not burn. Relatively non-toxic in small doses, it undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases such as ammonia, nitrogen oxides and sulfur oxide.

Potential 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 large amounts of this substance may produce irritation of the gastro-intestinal tract, characterized by burning and diarrhea. Small amounts are unlikely to cause any toxic effects. Ingredients of this material are not listed as human carcinogens by ACGIH, IARC OSHA, NTP, or the EU (see Toxicological Information, Section 11).

Potential Environmental Effects: This product is highly soluble in water but has limited direct toxicity to organisms living in aquatic and terrestrial environments. The exception to this is in circumstances in which elevated zinc concentrations may develop. However, if dissolved in water, the product can release free ammonia, which has the potential to be toxic to fish and other aquatic organisms.

SECTION 4. FIRST AID MEASURES

Eye Contact: Quickly and gently blot or brush chemical off face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. Obtain medical advice.

Skin Contact: No health effects expected. If irritation does occur, flush with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Inhalation: If symptoms are experienced remove source of contamination or move victim to fresh air. Obtain medical advice.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 2 – 8 oz. (60 – 240 ml) of water. If vomiting occurs naturally, have victim rinse mouth with water again. Obtain medical advice and bring a copy of this MSDS.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Product is not considered a fire or explosion hazard. However, it can enhance the explosive properties of ammonium nitrate when they are mixed together.

Extinguishing Media: Use any means of extinction appropriate for surrounding fire conditions such as water spray, carbon dioxide, dry chemical or foam. Cool any containers that are exposed to heat or flames by the application of water streams until well after the fire has been extinguished.

Fire Fighting: This material will not burn. Material undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases such as ammonia, nitrogen oxides and sulfur oxides. Firefighters must wear full protective clothing and an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask. Do not allow water run-off to enter sewers or watercourses.

Flashpoint and Method: Not Applicable.

Upper and Lower Flammable Limit: Not Applicable.

Autoignition Temperature: Not Applicable.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Control source of release if possible to do so safely. Clean up spilled material immediately observing precautions in Section 8, Personal Protection. Granules and dust should be cleaned up using methods that will minimize dust generation (e.g., vacuum solids or dampen material and wet sweep/shovel, etc.). Return uncontaminated spilled material to the process if possible. Place contaminated material in suitable containers for recovery or disposal. Treat or dispose of waste material in accordance with all local, state/provincial, and national requirements.

Personal Precautions: Protective clothing, gloves, and a respirator are recommended for persons responding to an accidental release. (see also Section 8) Close-fitting safety goggles may also be necessary in some circumstances to prevent eye contact with fertilizer dust.

Environmental Precautions: This product can pose a threat to the environment. Do not allow spills or water run-off from storage area to enter sewers or watercourses.

SECTION 7. HANDLING AND STORAGE

Store in a dry, cool, well-ventilated area. Avoid unnecessary contact with skin and eyes. Avoid generating dust and the release of dust into the workplace. Good housekeeping is important to prevent accumulations of dust. Keep away from incompatible materials. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate designated areas. Keep out of the reach of children.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Protective Clothing: The hazard potential of this material is low. Where there is large scale use of this material with significant potential for worker contact, long-sleeved clothing or coveralls, chemical resistant gloves, and safety glasses with side shields may be necessary.

Ventilation: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure guidelines. If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure guidelines.

Respiratory Protection: Where dust is generated and cannot be controlled to within acceptable levels by engineering means, use appropriate NIOSH-approved respiratory protection equipment (a 42CFR84 Class N, R or P-95 particulate filter cartridge respirator or an N-95 disposable dust mask).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Solid off-white granules	Odor: Odorless	Physical State: Solid	pH: 7.4 (10% sol'n in water)
Vapor Pressure: Not Applicable	Vapor Density: Not Applicable	Boiling Point/Range: Decomposes above 280°C (536°F)	Melting Point/Range: 235°C (455°F)
Specific Gravity: 0.913 (Water = 1)	Evaporation Rate: Not Applicable	Coefficient of Water/Oil Distribution: No Data	Odor Threshold: Not Applicable
Solubility in Water: Highly soluble, 76g/100 mL at 20°C		Bulk Density Loose: 865 kg/m ³ ; Packed: 910 kg/m ³	

SECTION 10. STABILITY AND REACTIVITY

Stability & Reactivity: This material is stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur.

Incompatibilities: Reactive with oxidizing agents, metals and alkalis. Corrosive to copper alloys such as brass. Slightly corrosive to steel and 304 stainless steel. Non corrosive to 316 stainless steel.

Hazardous Decomposition Products: Upon heating to decomposition ammonia, nitrogen oxides and/or sulphur oxides may be generated.

SECTION 11. TOXICOLOGICAL INFORMATION

General: In the form in which this product is sold it is relatively non-toxic. The major route of exposure would be through the generation and inhalation of airborne dust.

Acute:

Skin/Eye: This product may irritate eyes and skin upon prolonged or repeated contact but would not cause tissue damage.

Inhalation: Over-exposure by inhalation may cause respiratory tract irritation.

Ingestion: Ingestion of small quantities of ammonium sulfate fertilizer is unlikely to cause a toxic effect. The ingestion of large amounts of this substance may produce irritation of the gastro-intestinal tract, characterized by burning and diarrhea.

Chronic: Neither Ammonium Sulfate nor Zinc Sulfate Monohydrate is considered a human carcinogen by the American Conference of Governmental Industrial Hygienists (ACGIH), the International Agency for Research on Cancer (IARC), the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), or the European Union (EU).

SECTION 12. ECOLOGICAL INFORMATION

This product is highly soluble in water, but has limited direct toxicity to organisms living in aquatic and terrestrial environments. The exception to this is in circumstances in which elevated zinc concentrations may develop. However, if dissolved in water, the product can release free ammonia, which has the potential to be toxic to fish and other aquatic organisms. Toxic thresholds are dependent on pH. In addition, when present in slow-moving watercourses, the product can promote algal growth, which may, in turn, degrade water quality. The product can also, if ingested, be harmful to livestock and wildlife.

The zinc content of this product is directly bioavailable and may be toxic to aquatic organisms, especially fish; water hardness, pH and dissolved organic carbon content are significant regulating factors. In terrestrial environments, chemical conditions of the soil can regulate the degree of zinc mobility and bioaccumulation in organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Do not wash down drain. Recover and place material in a suitable container for intended use or disposal. Ensure disposal complies with government requirements and local regulations.

SECTION 14. TRANSPORT INFORMATION

Proper Shipping Name under Transport Canada and U.S. DOT Not regulated.
Hazard Classification Transport Canada and U.S. DOT Not controlled under TDG (Canada) or DOT (USA)
Product Identification Number Not Applicable
Marine Pollutant No

SECTION 15. REGULATORY INFORMATION

U.S.:

Ingredients listed on TSCA Inventory Yes
Hazardous under OSHA Hazard Communication Standard No
CERCLA Section 103 Hazardous Substance Zinc Sulfate RQ: 1,000lbs.
EPCRA Section 302 Extremely Hazardous Substance No ingredients qualify
EPCRA Section 312 Hazard Categories None
EPCRA Section 313 Toxic Release Inventory (Supplier Notification) Ammonium Sulfate (Solution)
CAS No. 7783-20-2
Percent by Weight: 97%
Zinc Compounds (Zinc Sulfate)
CAS No. 7446-19-7
Percent by Weight: 3%

CANADIAN:

Ingredients listed on Domestic Substances List Yes
WHMIS Classification: Not a Controlled Product

SECTION 16. OTHER INFORMATION

The information in this Material Safety Data Sheet is based on the following references:

- American Conference of Governmental Industrial Hygienists, 2004, Documentation of the Threshold Limit Values and Biological Exposure Indices, Seventh Edition plus updates.
- American Conference of Governmental Industrial Hygienists, 2009, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
- American Conference of Governmental Industrial Hygienists, 2009, Guide to Occupational Exposure Values.
- Bretherick's Handbook of Reactive Chemical Hazards, 20th Anniversary Edition. (P. G. Urban, Ed.) 1995.
- Canadian Centre for Occupational Health and Safety (CCOHS) CHEMINFO Chemical Substance Data Base, On-Line.
- Commission de la santé et la sécurité du travail, Service du répertoire toxicologique, Sulfate d'ammonium, 2000-07.
- European Economic Community, Commission Directives 91/155/EEC and 67/548/EEC and 88/379/EEC.

- European Fertilizer Manufacturers Association, Guidance for the Compilation of Safety Data Sheets for Fertilizer Materials – Ammonium Sulphate (<http://www.efma.org/publications/guidance/section10.asp> - last accessed 2009-06-03).
- Industry Canada, SOR/88-66, Controlled Products Regulations, as amended.
- International Agency for Research on Cancer (IARC), Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, 1972 – 2009, (multi-volume work), World Health Organization, Geneva.
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Thirteenth Edition.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, National Toxicology Program (NTP), 11th Report on Carcinogens, January 2005.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, Registry of Toxic Effects of Chemical Substances (RTECS) last accessed 2009-02-05.
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.

Notice to Reader

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