





NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	PROTECTIVE CLOTHING
Health  Flammability Reactivity Specific Hazard			

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME Ammonium Sulfate , Fluid Grade 21-0-0-24S	
SYNONYM 21-0-0-24 Ammonium Sulfate Fertilizer	MSDS NUMBER: 14037
CHEMICAL NAME Ammonium sulfate	REVISION NUMBER 4.5
CHEMICAL FAMILY Ammonium salt.	MSDS prepared by the Environment, Health and Safety Department on: March 5, 2001
CHEMICAL FORMULA (NH ₄) ₂ SO ₄	24 HR EMERGENCY TELEPHONE NUMBER: Transportation: 1-800-792-8311 Medical: 1-888-670-8123
MATERIAL USES Agricultural industry: Fertilizer. Industrial applications: Manufacture of specialty fertilizers.	
MANUFACTURER Cominco Limited Trail Operations Trail, B.C., Canada V1R 4L8	SUPPLIER Agrium North American Wholesale 13131 Lake Fraser Drive, S.E. Calgary, Alberta, Canada, T2J 7E8 Agrium U.S. Inc. Suite 1700, 4582 South Ulster St. Denver, Colorado, U.S.A., 80237

Section II. Hazardous Ingredients

NAME	CAS #	Exposure Limits (ACGIH)						% by Weight
		TLV-TWA mg/m ³	TLV-TWA ppm	STEL mg/m ³	STEL ppm	CEIL mg/m ³	CEIL ppm	
Ammonium sulfate	7783-20-2	10						100
TOXICOLOGICAL DATA ON INGREDIENTS	Ammonium Sulfate TFI Product Testing Program Results: Acute oral LD ₅₀ : 640-4,250 mg/kg (rat, mouse) Acute dermal LD ₅₀ : >2,000 mg/kg (rat, mouse) Ecotoxicity: Acute toxicity to fish, various species, 96 hr LC ₅₀ : >13.6-159.8 mg total NH ₃ /L Acute toxicity to aquatic invertebrates, Daphnia, 96 hr LC ₅₀ : >27 mg total NH ₃ /L This product and its components are not considered hazardous according to WHMIS (Canada) HSC, (United States) and DSCL (Europe).							

Section III. Hazards Identification.

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	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. There is no known effect from chronic exposure to this product.

Section IV. First Aid Measures

EYE CONTACT	May cause eye irritation by mechanical abrasion. Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention.
MINOR SKIN CONTACT	May cause skin irritation. Wash contaminated skin with soap and water. Cover dry or irritated skin with a good quality skin lotion. If irritation persists, seek medical attention.
EXTENSIVE SKIN CONTACT	No additional information.
MINOR INHALATION	Repeated or prolonged inhalation of dust may lead to respiratory irritation. Loosen tight clothing around the person's neck and waist. Allow the person to rest in a well ventilated area. Obtain medical attention if irritation persists.
SEVERE INHALATION	In emergency situations use proper respiratory protection to evacuate affected individuals to a safe area as soon as possible. Loosen tight clothing around the person's neck and waist. Oxygen may be administered if breathing is difficult. If the person is not breathing, perform artificial respiration. Obtain immediate medical attention.
SLIGHT INGESTION	If conscious, have person drink several glasses of water or milk and induce vomiting. NEVER induce vomiting or give an unconscious person anything by mouth. Lower the head so that the vomit will not reenter the mouth and throat. Obtain medical attention.
EXTENSIVE INGESTION	No additional information.

Section V. Fire and Explosion Data

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 THE PRESENCE OF VARIOUS SUBSTANCES	Not applicable.
EXPLOSION HAZARD IN THE 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.

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SPECIAL REMARKS ON EXPLOSION HAZARDS

No additional remark.

Section VI. Accidental Release Measures

SMALL SPILL	Use appropriate tools to put 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 which may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250 mg/L (U.S.) or 500 mg/L (Canada). 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 complies with government requirements and local regulations.

Section VII. Handling and Storage

PRECAUTIONS	Avoid contact with skin and eyes. Do not breathe dust. Do not ingest. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Keep away from incompatible materials.
STORAGE	Keep away from food, drink and animal feed. Store in a dry, cool and well ventilated area. Keep out of reach of children.

Section VIII. 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. Wear appropriate respiratory protection for dust/mist when ventilation is inadequate. A filtering facepiece dust mask is recommended for most applications if respiratory protection is needed. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, chemical resistant gloves, and safety glasses with side shields.
PERSONAL PROTECTION IN CASE OF LARGE RELEASE	No additional information.
EXPOSURE LIMITS	ACGIH TLV-TWA: 10 mg/m ³ for Particulates Not Otherwise Classified (nuisance particulates). OSHA PEL: 15 mg/m ³ for Particulates Not Otherwise Classified (nuisance particulates). Federal, State or Provincial exposure limits may vary by jurisdiction. Consult local authorities for acceptable exposure limits in your area.

Section IX. Physical and Chemical Properties

PHYSICAL STATE AND APPEARANCE	Solid deliquescent crystals.		
MOLECULAR WEIGHT	132.14	COLOR	Off-white.
pH (10% SOLN/WATER)	5.5	ODOR	Odorless.
BOILING POINT	Decomposes.	ODOR THRESHOLD	17 PPM (ammonia)
MELTING POINT	235°C (455°F)	TASTE	Acrid.
CRITICAL TEMPERATURE	Not available.	VOLATILITY	Not applicable.
SPECIFIC GRAVITY g/cc	0.929 (Water = 1)	SOLUBILITY	Easily soluble in hot water. Soluble in cold water.
BULK DENSITY kg/m³ ; lbs/ft³	Loose: 990 kg/m ³ ; 61.80 lbs/ft ³ ; Packed: 1070 kg/m ³ ; 66.80 lbs/ft ³ ;	DISPERSION PROPERTIES	See solubility in water.

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VAPOR PRESSURE	Not applicable.	WATER/OIL DIST. COEFF.	Not available.
VAPOR DENSITY	Not applicable.		

Section X. Stability and Reactivity Data

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS 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	A mineral salt. Highly corrosive to 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. Hydrolysis will slowly produce acids corrosive to metals.
SPECIAL REMARKS ON CORROSIVITY	Incompatible with copper alloys. Corrosive to brass. Corrosive to ferrous metals and alloys. Contact your sales representative or a metallurgical specialist to ensure compatibility with system equipment.

Section XI. Toxicological Information

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion. Inhalation.
TOXICITY TO ANIMALS	See Section II.
SPECIAL REMARKS ON TOXICITY TO 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. May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs.
OTHER EFFECTS ON HUMANS	Our data base contains no additional remark on the toxicity of this product
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	No additional remark.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	ACGIH TLV is based on "Particulates Not Otherwise Classified".

Section XII. Ecological Information

ECOTOXICITY	<p>Non-persistent. Non-cumulative when applied using normal agricultural practices. The product itself and its products of degradation are not harmful under normal conditions of careful and responsible use.</p> <p>Aquatic/Marine Toxicity: Will disperse with current. Release to watercourses may cause effects down stream from the point of release. Will release ammonium ions. Ammonia is a toxic hazard to fish. Avoid spills or release to watercourses. U.S. D.O.T.: This material NOT listed as a Marine pollutant.</p>
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Nitrogen oxides (NO, NO ₂ ...). Sulfur oxides (SO ₂ , SO ₃ ...).

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TOXICITY OF THE PRODUCTS OF DEGRADATION

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 DEGRADATION

Product will promote algae growth which may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250mg/L (U.S.) and 500 mg/L (Canada). Will dissolve and disperse in water. Reclaiming material may not be viable.

Section XIII. Disposal Considerations

WASTE DISPOSAL OR RECYCLING

Recover and place material in a suitable container for intended use or disposal. Recycle to process, if possible. Ensure disposal complies with government requirements and local regulations.

Section XIV. Transport Information

DOT / TDG CLASSIFICATION

Not controlled under TDG (Canada) or D.O.T. (U.S.A.)

PIN

Not applicable (PIN and PG).

SPECIAL PROVISIONS FOR TRANSPORT

Not applicable.

DOT (U.S.A) (Pictograms)



Section XV. Other Regulatory Information and Pictograms

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.

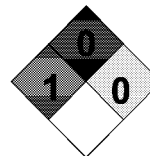
OTHER CLASSIFICATIONS

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

National Fire Protection Association (U.S.A.)

Hazards presented under acute emergency conditions only:

Health



Fire Hazard

Reactivity

Specific Hazard

TDG (Pictograms - Canada)



DSCL (Europe) (Pictograms)



ADR (Europe) (Pictograms)



Section XVI. Other Information

REFERENCES

- 29 CFR Part 1910
- 40 CFR Parts 1-799
- 49 CFR Parts 1-199
- Canadian Centre for Occupational Health and Safety CInfo Disk.
- American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2000
- Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers.
- TOMES Plus®, Vol 43, January 2000, Micromedex Inc.
- The Transportation of Dangerous Goods Act (1992) and Transportation of Dangerous Goods Regulations, Transport Canada.
- Manufacturer's Material Safety Data Sheet.
- The Fertilizer Institute Product Testing Plan Results, March 2001

OTHER SPECIAL CONSIDERATIONS Not applicable.

FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT **AGRIUM**
Environment, Health and Safety Department
Telephone (780) 998-6134 or Fax (780) 998-6143

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