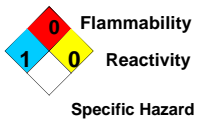





NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	HMIS		PROTECTIVE CLOTHING
			Health	1	
			Flammability	0	
			Reactivity	0	
			PPE	A	

## Section I. Chemical Product and Company Identification

**PRODUCT NAME/ TRADE NAME** Ammonium Sulfate, Crystalline Grades

**SYNONYM** This Material Safety Data Sheet applies to the following Agrium products:  
  
21-0-0-24 Ammonium Sulphate, Regular Grade  
21-0-0-24 Ammonium Sulphate, Fluid Grade

**MSDS NUMBER:** 16000

**CHEMICAL NAME** Ammonium sulfate

**REVISION NUMBER** 1.0

**CHEMICAL FAMILY** Ammonium salt.

**MSDS prepared by** September 18, 2006  
the Environment,  
Health and Safety  
Department on:

**CHEMICAL FORMULA** (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>

**MATERIAL USES** Agricultural industry: Fertilizer.  
Industrial applications: Manufacture of specialty fertilizers.

**24 HR EMERGENCY TELEPHONE NUMBER:**

Transportation: 1-800-792-8311  
Medical: 1-888-670-8123

**MANUFACTURER**

Various

**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 <sup>3</sup>	TLV-TWA ppm	STEL mg/m <sup>3</sup>	STEL ppm	CEIL mg/m <sup>3</sup>	CEIL ppm	
Ammonium sulfate	7783-20-2	---						100

**ACGIH TLV notations:**

--- No assigned TLV

(C) - Ceiling - the concentration not to be exceeded at any time

(I) - measured as the Inhalable fraction of the aerosol

(R) - measured as the Respirable fraction of the aerosol

(T) - measured as the Thoracic fraction of the aerosol

**TOXICOLOGICAL DATA ON INGREDIENTS**

**Ammonium Sulfate TFI Product Testing Program Results:**

Acute oral LD<sub>50</sub>, rat: >2,000-4,250 mg/kg

Acute oral LD<sub>50</sub>, mouse: 640 mg/kg

Acute dermal LD<sub>50</sub>: >2,000 mg/kg (rat, mouse)

**Ecotoxicity:**

Acute toxicity to fish, Coho salmon, rainbow trout, largemouth bass, bluegill, fathead minnow, 24-96

hr LC<sub>50</sub>: >90->1500 mg/L

Acute toxicity to aquatic invertebrates, Daphnia magna, 50-96 hr LC<sub>50</sub>: >433 mg/L

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Amphipod, 96 hrs, LC<sub>50</sub>=40-62 mg/L  
 Snails, 48-96 hrs, LC<sub>50</sub>>=100-700 mg/L  
 Toxicity to aquatic plants, Chlorella vulgaris, 21 days, NOEC=250 mg N/L  
 Chronic toxicity to fish, Rainbow trout, 12 & 35 days, LC<sub>50</sub>: 0.26-0.68 mg unionized NH<sub>3</sub>/L  
 Pink salmon, 21, 40, & 61 days, NOEC=1.2mg unionized NH<sub>3</sub>/L  
 Channel catfish, 6 months, LOEC=100-500 mg/L

**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. 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**

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 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**

Have conscious person drink several glasses of water or milk. Induce vomiting. Lower the head so that the vomit will not reenter the mouth and throat. NEVER give an unconscious person anything to drink. 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, sulfur oxides, and nitrogen oxides.

**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.

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<b>FIRE FIGHTING MEDIA AND INSTRUCTIONS</b>	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases. Use extinguishing media suitable for surrounding materials.
<b>SPECIAL REMARKS ON FIRE HAZARDS</b>	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.
<b>SPECIAL REMARKS ON EXPLOSION HAZARDS</b>	No additional remark.

<b>Section VI. Accidental Release Measures</b>	
<b>SMALL SPILL</b>	Use appropriate tools to put spilled solid in a suitable container for intended use or disposal.
<b>LARGE SPILL</b>	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.

<b>Section VII. Handling and Storage</b>	
<b>PRECAUTIONS</b>	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.
<b>STORAGE</b>	Keep away from food, drink and animal feed. Store in a dry, cool and well ventilated area. Keep out of reach of children.

<b>Section VIII. Exposure Controls/Personal Protection</b>	
<b>ENGINEERING CONTROLS</b>	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.
<b>PERSONAL PROTECTION</b>	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.
<b>PERSONAL PROTECTION IN CASE OF LARGE RELEASE</b>	No additional information.
<b>EXPOSURE LIMITS</b>	OSHA PEL: 15 mg/m <sup>3</sup> , total dust, 5 mg/m <sup>3</sup> respirable, for Particulates Not Otherwise Regulated (nuisance particulates).  Federal, State or Provincial exposure limits may vary by jurisdiction. Consult local authorities for acceptable exposure limits in your area.

<b>Section IX. Physical and Chemical Properties</b>			
<b>PHYSICAL STATE AND APPEARANCE</b>	Solid. (Deliquescent crystals.)		
<b>MOLECULAR WEIGHT</b>	132.14	<b>COLOR</b>	Off-white.
<b>pH (10% SOLN/WATER)</b>	5.5	<b>ODOR</b>	Odorless.
<b>BOILING POINT</b>	Decomposes.	<b>ODOR THRESHOLD</b>	~17 PPM (recognition) as ammonia.
<b>MELTING POINT</b>	235°C (455°F)	<b>TASTE</b>	Acrid.
<b>CRITICAL TEMPERATURE</b>	Not applicable.	<b>VOLATILITY</b>	Not applicable.

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<b>SPECIFIC GRAVITY g/cc</b>	0.961 (Water = 1)	<b>SOLUBILITY</b>	Easily soluble in hot water. Soluble in cold water.
<b>BULK DENSITY kg/m<sup>3</sup> ; lbs/ft<sup>3</sup></b>	Loose: ~ 960 kg/m <sup>3</sup> ; 60 lbs/ft <sup>3</sup> ; Packed: ~1040 kg/m <sup>3</sup> ; 65 lbs/ft <sup>3</sup> ;	<b>DISPERSION PROPERTIES</b>	See solubility in water.
<b>VAPOR PRESSURE</b>	Not applicable.	<b>WATER/OIL DIST. COEFF.</b>	Not available.
<b>VAPOR DENSITY</b>	Not applicable.		

**Section X. Stability and Reactivity Data**

<b>STABILITY</b>	The product is stable.
<b>INSTABILITY TEMPERATURE</b>	Not applicable.
<b>CONDITIONS OF INSTABILITY</b>	No additional remark.
<b>INCOMPATIBILITY WITH VARIOUS SUBSTANCES</b>	Slightly reactive with oxidizing agents, with metals, alkalis, or moisture. Non-reactive with reducing agents, combustible materials, organic materials, acids.
<b>CORROSIVITY</b>	A mineral salt. Highly corrosive to aluminum, zinc, and copper. Slightly corrosive to steel and 304 stainless steel. Non-corrosive to 316 stainless steel.
<b>SPECIAL REMARKS ON REACTIVITY</b>	Avoid contact with moisture. Hydrolysis will slowly produce acids corrosive to metals.
<b>SPECIAL REMARKS ON CORROSIVITY</b>	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 your equipment.

**Section XI. Toxicological Information**

<b>SIGNIFICANT ROUTES OF EXPOSURE</b>	Ingestion. Inhalation.
<b>TOXICITY TO ANIMALS</b>	See Section II.
<b>SPECIAL REMARKS ON TOXICITY TO ANIMALS</b>	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.
<b>OTHER EFFECTS ON HUMANS</b>	Our data base contains no additional remark on the toxicity of this product
<b>SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS</b>	No additional remark.
<b>SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS</b>	No additional remark.

**Section XII. Ecological Information**

<b>ECOTOXICITY</b>	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.  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 is NOT listed as a Marine pollutant.
<b>BOD and COD</b>	Not available.


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<b>PRODUCTS OF DEGRADATION</b>	nitrogen oxides (NO, NO <sub>2</sub> ...) sulfur oxides (SO <sub>2</sub> , SO <sub>3</sub> ...)
<b>TOXICITY OF THE PRODUCTS OF DEGRADATION</b>	The product itself and its products of degradation are not harmful under normal conditions of use. Avoid spills or releases to watercourses.
<b>SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION</b>	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.

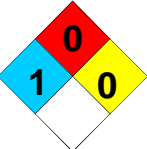

**Section XIII. Disposal Considerations**

<b>WASTE DISPOSAL OR RECYCLING</b>	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. Consult your local or regional authorities.
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**Section XIV. Transport Information**

<b>DOT / TDG CLASSIFICATION</b>	Not controlled under TDG (Canada) or D.O.T. (U.S.A.)
<b>PIN and Shipping Name</b>	Not applicable.
<b>SPECIAL PROVISIONS FOR TRANSPORT</b>	Not applicable.
<b>DOT (U.S.A) (Pictograms)</b>	

**Section XV. Other Regulatory Information and Pictograms**

<b>OTHER REGULATIONS</b>	<p>CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA.</p> <p>TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.</p> <p>CERCLA/SUPERFUND, 40 CFR 117,302: This product contains no Reportable Quantity (RQ) Substances.</p> <p>This product is not considered as a priority pollutant as regulated under the Clean Water Act.</p> <p>This product contains the following chemical subject to the reporting requirements of SARA Section 313 and 40 CFR 372:</p> <p>Aqueous ammonia from water dissociable ammonium ions; 10% of total aqueous ammonia is reportable under this listing), CAS# 7783-20-2: 25.78 wt% , see EPA doc 745-R-95-012.</p> <p>This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and is not subject to control under WHMIS (Canada), or the Hazcom Standard (US).</p>		
<b>OTHER CLASSIFICATIONS</b>	<b>HCS (U.S.A.)</b>	Not controlled under the HCS (United States).	
	<b>DSCL (EEC)</b>	Not controlled under DSCL (Europe).	
<b>National Fire Protection Association (U.S.A.)</b>	Hazards presented under acute emergency conditions only:		<p><b>Fire Hazard</b></p> <p><b>Reactivity</b></p> <p><b>Specific Hazard</b></p>
<b>TDG (Pictograms - Canada)</b>			

DSCL (Europe)  
(Pictograms)



ADR (Europe)  
(Pictograms)



### Section XVI. Other Information

#### REFERENCES

- Transportation of Dangerous Goods Act and Clear Language Regulations, current revision.
- Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
- Domestic Substances List, Canadian Environmental Protection Act.
- 29 CFR Part 1910
- 33 CFR Parts 151, 153, 154, 156
- 40 CFR Parts 1-799
- 46 CFR Part 153
- 49 CFR Parts 1-199
- American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2006.
- NFPA 704, National Fire Codes Online, National Fire Protection Association, current edition at time of MSDS preparation.
- Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
- TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: <http://csi.micromedex.com> (2006). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2006); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2006); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2006); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2006); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2006); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2006); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2006); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2006).
- The Fertilizer Institute Product Testing Program Results, March 2003
- Michigan Office of Regulatory Reform R325.51101et seq

#### OTHER SPECIAL CONSIDERATIONS

Rev data: All crystalline ammonium sulfate grades represented on this one sheet. HMIS ratings included.

FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT

AGRIUM  
Wholesale Environment, Health and Safety  
Telephone (780) 998-6906 or Fax (780) 998-6677

#### NOTICE TO READER

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