

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

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME Sulfate Plus, Granular

SYNONYM This Material Safety Data Sheet applies to the following Agrium product:
20.5-0-0-24 Granular Ammonium Sulfate - Redwater

MSDS NUMBER: 16039

CHEMICAL NAME Ammonium sulfate

REVISION NUMBER 2.0

CHEMICAL FAMILY Ammonium salt.

MSDS prepared by September 12, 2008
the Environment,
Health and Safety
Department on:

CHEMICAL FORMULA (NH₄)₂SO₄

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

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

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. Composition / Information on 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	-----						>98

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 LD₅₀, rat: >2,000-4,250 mg/kg

Acute oral LD₅₀, mouse: 640 mg/kg

Acute dermal LD₅₀: >2,000 mg/kg (rat, mouse)

Ecotoxicity:

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

hr LC₅₀: >90->1500 mg/L

Acute toxicity to aquatic invertebrates, Daphnia magna, 50-96 hr LC₅₀: >433 mg/L

Amphipod, 96 hrs, LC₅₀=40-62 mg/L
 Snails, 48-96 hrs, LC₅₀>=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, LC₅₀: 0.26-0.68 mg unionized NH₃/L
 Pink salmon, 21, 40, & 61 days, NOEC=1.2mg unionized NH₃/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 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 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 individual'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

Do not induce vomiting. May cause digestive tract irritation, with accompanying nausea, vomiting and diarrhea. If spontaneous vomiting does occur, lower the head so that the vomit will not reenter the mouth and throat.

If tolerated, give no more than 1 cup of milk or water for adults or 1/2 cup for children to rinse the mouth and throat, dilute the stomach contents, and minimize irritation. 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...)

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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.
SPECIAL REMARKS ON EXPLOSION HAZARDS	No additional remark.

Section VI. 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 which may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 500mg/L (Canada) and 250 mg/L (U.S). 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	OSHA PEL: 15 mg/m ³ , total dust, 5 mg/m ³ 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.

Section IX. Physical and Chemical Properties

PHYSICAL STATE AND APPEARANCE	Solid white crystalline granules.		
MOLECULAR WEIGHT	132.14	COLOR	White.
pH (10% SOLN/WATER)	3-4	ODOR	Odorless.
BOILING POINT	Decomposes.	ODOR THRESHOLD	~17 PPM (recognition) as ammonia.
MELTING POINT	235°C (455°F)	TASTE	Acrid.
CRITICAL TEMPERATURE	Not available.	VOLATILITY	Not applicable.
SPECIFIC GRAVITY g/cc	0.913 (Water = 1)	SOLUBILITY	Easily soluble in hot water. Soluble in cold water.
BULK DENSITY kg/m³ ; lbs/ft³	Loose: ~913 kg/m ³ ; 57 lbs/ft ³ ; Tapped: ~945 kg/m ³ ; 59 lbs/ft ³	DISPERSION PROPERTIES	See solubility in water.
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.
INCOMPATABILITY WITH VARIOUS SUBSTANCES	Slightly reactive with oxidizing agents, metals, alkalis, or 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 your 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	No additional remark.

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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 is 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 ...).
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.
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Section XIV. Transport Information

DOT / TDG CLASSIFICATION	Not controlled under TDG (Canada) or D.O.T. (U.S.A.)
PIN and Shipping Name	Not applicable.
SPECIAL PROVISIONS FOR TRANSPORT	No additional remark.
DOT (U.S.A) (Pictograms)	

Section XV. Other Regulatory Information and Pictograms

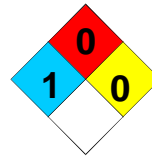
OTHER REGULATIONS	<p>CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA.</p> <p>TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.</p> <p>CERCLA/SUPERFUND, 40 CFR 117,302: 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. This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:</p> <p>Aqueous ammonia from water dissociable ammonium ions, 10% of which is reportable under this listing, as AS CAS# 7783-20-2. Refer to EPA doc 745-R-00-005 and the specific product analysis for your product to determine your reporting requirements under this regulation.</p> <p>Not controlled under WHMIS (Canada). 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>	
OTHER CLASSIFICATIONS	HCS (U.S.A.)	Not controlled under the HCS (United States).
	DSCL (EEC)	Not controlled under DSCL (Europe).

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

Hazards presented under acute emergency conditions only:

Health

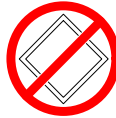


Fire Hazard

Reactivity

Specific Hazard

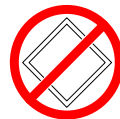
TDG (Pictograms - Canada)



DSCL (Europe) (Pictograms)



ADR (Europe) (Pictograms)

**Section XVI. Other Information****REFERENCES**

- 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, 2007.
- 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
- Expert Publishing, LLC (ExPub on-line version): Denver, Colorado, USA. Available at: <http://www.expub.com/index.aspx>. The EXPUB System includes a collection of over seventy National and International Databases from but not limited the ATSDR; California and U.S.EPA; CDC; U.S. Department of Transportation; U.S. Coast Guard; European Chemicals Bureau; National Library of Medicine; National Institute for Occupational Safety and Health; Georgetown University Medical Center and Reproductive Toxicology Center; United Nations Environmental Program; World Health Organization; and U.S. OSHA.
- The Fertilizer Institute Product Testing Program Results, March 2003

OTHER SPECIAL CONSIDERATIONS

Rev data: All granular 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

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