





| NFPA Classification | DOT / TDG Pictograms | WHMIS Classification | HMIS | | PROTECTIVE CLOTHING |
|--|---|---|---|------------------|---|
|  Health: 1, Flammability: 0, Reactivity: 0, Specific Hazard: 0 |  |  | Health Flammability Reactivity PPE | 1 0 0 A |  |

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME Sulfate Plus, Granular 20.5-0-0-24

SYNONYM This Material Safety Data Sheet applies to the following Agrium product:

20.5-0-0-24 Granular Ammonium Sulfate - Redwater

MSDS NUMBER: 00135

CHEMICAL NAME Ammonium sulfate

REVISION NUMBER 2.G

CHEMICAL FAMILY Ammonium salt.

MSDS prepared by August 31, 2013
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: 0-303-389-1653 Collect

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.
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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

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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.

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| 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 | <p>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.</p> |

Section IV. First Aid Measures

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| 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

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| 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, NO ₂ ...), sulfur oxides (SO ₂ , SO ₃ ...) |

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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

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| 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

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| 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

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| 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

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| 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

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| 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

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| 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

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| 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

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| 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

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|---|---|
| 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

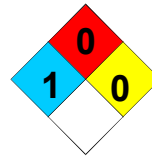
| | | |
|------------------------------|---|---|
| OTHER REGULATIONS | <p>CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA.</p> <p>TSCA (Toxic Substance Control Act): This product is listed on the 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.</p> <p>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, 20FG
- 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 (ExpPub 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

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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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