

SAFETY DATA SHEET

Section 1: Identification

1.1 Product identifier:

Ammonium Sulphate 21-0-0-24

CAS RN: 7783-20-2; EINECS: 231-984-1

1.2 Recommended use and restrictions on use:

Agriculture industry, fertilizer, Manufacture of specialty fertilizers.

Restrictions on use: Not available

1.3 Supplier identifier:

Ambatovy – Dynatec Madagascar S.A.

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For technical and commercial enquires: salesprocessing@ambatovy.mg

1.4 24-Hour Emergency telephone number:

(In Madagascar) +261 (0) 33 15 800 32 (24-hours)

(Global/International) +44 (0) 1235 239 670 (24-hours)

See Section 16 for more Emergency Response numbers supporting additional regions and languages.

Section 2: Hazards Identification

Classified according to Canada Hazardous Products Regulations (WHMIS 2015) and US Hazard Communication Standard (HCS 2012).

2.1 Classification:

Not classified in any hazard class.

2.2 Label elements:

Not applicable – not classified

2.3 Other hazards:

Aqueous solution is acidic.

Reacts with bases forming ammonia gas.

Hot product can react with nitrates, nitrites and chlorates.

Section 3: Composition/Information on Ingredients

Chemical Name	CAS No.	Wt.%	GHS Classifications
Ammonium sulphate	7783-20-2	99.3 - 100	Not classified

Section 4: First-aid Measures

4.1 Description of first-aid measures:

Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If exposed or concerned: Get medical advice.

Eye Contact: Rinse cautiously with lukewarm, gently flowing water or neutral saline solution for 5 minutes, while holding the eyelid(s) open. If exposed or concerned: Get medical advice.

Skin Contact: If on skin, wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice.

Ingestion: If exposed or concerned, call a POISON CENTER or doctor.

SAFETY DATA SHEET

4.2 Most important symptoms and effects, both acute and delayed:

Inhalation: Over-exposure to airborne dusts may cause irritation of the upper respiratory system. Symptoms may include coughing and shortness of breath. Decomposition at extreme high temperatures (>100°C) releases fumes that are severely irritating to the respiratory system.

Eye Contact: Direct contact with the eyes may cause mild, reversible irritation.

Skin Contact: Contact with the skin may cause moderate irritation when exposure is prolonged or repeated.

Ingestion: Ammonium sulphate has relatively low acute toxicity. Swallowing may cause gastro-intestinal irritation. Symptoms may include abdominal pain, nausea and diarrhea.

4.3 Immediate medical attention and special treatment needed:

Get medical advice if irritation or discomfort occurs.

Section 5: Fire-fighting Measures

5.1 Extinguishing media:

Use extinguishing agents suitable for the surrounding fire.

Unsuitable extinguishing media: Not available

5.2 Specific hazards arising from the product:

This substance is not combustible.

Under fire conditions or when heated to decomposition this substance can release very toxic and corrosive fumes of sulphur dioxide, sulphur trioxide, nitrogen oxides and ammonia.

Under fire conditions, thermal decomposition may also result in the generation of nitrogen (an asphyxiant), sulphur dioxide and ammonia (corrosives). Thermal decomposition temperature is reported to be between 150 -280°C (302-536°F).

5.3 Special protective equipment and precautions for firefighters:

As for any fire, evacuate the area and fight the fire from a safe distance. Ammonia gas and sulphur oxides are corrosive. Do not enter without wearing specialized protective equipment suitable for the situation. Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. A full-body encapsulating chemical resistant suit with positive pressure self-contained breathing apparatus (SCBA; NIOSH approved or equivalent) may be necessary.

Use water spray to knock down gases such as sulphur dioxide, sulphur trioxide or ammonia.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Isolate the area; keep all unprotected people away from the spill area.

Ventilate the area.

Wear personal protective equipment as indicated in Section 8.

Prevent the generation of airborne dusts; do not inhale dusts of this material.

Ensure clean-up is conducted by trained personnel only.

Do not touch the spilled material.

Spilled material may pose a slipping hazard.

6.2 Environmental precautions:

Avoid releases to the environment and prevent material from entering domestic sewers, natural waterways, or storm water management systems.

6.3 Methods and material for containment and cleaning up:

Restrict access to the spill area. Stop the spill if it is safe to do so.

Clean up spills immediately.

Scoop up spilled material into appropriate, labeled containers for reclamation or disposal.

Wet clean or vacuum up solids; do not use methods such as dry sweeping or blowers, which will raise dust into the air.

6.4 Additional Information:

See Section 8 for information on selection of personal protective equipment.

See Section 13 for information on disposal of spilled product and contaminated absorbents.

SAFETY DATA SHEET

Section 7: Handling and Storage

7.1 Precautions for safe handling:

- Do not get on skin or in eyes.
- Avoid generation of airborne dusts from this product.
- Handle this product with adequate ventilation.
- Wear personal protective equipment as described in Section 8.
- Keep away from extreme heat.
- Do not use with incompatible materials such as strong oxidizing agents (see Section 10).
- Wash hands and exposed skin thoroughly with soap and plenty of water after handling, before eating, drinking, smoking or using the toilet.
- Remove contaminated clothing and wash before reuse.

7.2 Conditions for safe storage:

- Store in a dry area.
- Keep containers closed when not in use.
- Store product in an appropriate labeled, container and provide adequate protection from weather.
- Have suitable emergency equipment for fires, spills and leaks readily available.
- Store away from incompatible materials such as strong oxidizing agents and strong bases.
- Do not contaminate water, food, or animal feed, streams and ponds by storage or disposal.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters:

Occupational Exposure Limits: Consult local authorities for acceptable exposure limits.

<u>Ingredient</u>	<u>ACGIH® TLV®</u>	<u>OSHA PEL TWA</u>
Ammonium sulphate	Not established	Not established
Particles (Insoluble or poorly soluble) not otherwise specified (PNOS / PNOR)	3 mg/m ³ (respirable) 10 mg/m ³ (inhalable)	5 mg/m ³ (respirable) 15 mg/m ³ (total dust)

<u>Other Exposure Limits, Country of origin</u>	<u>Occupational exposure limit value</u>
Belarus MAC	10 mg/m ³ TWA (aerosol)
Bulgaria	10 mg/m ³ TWA
Korea ISHA	10 mg/m ³ TWA 20 mg/m ³ STEL
Russia MAC	10 mg/m ³ TWA (aerosol)

8.2 Exposure controls:

Engineering Controls: Provide adequate ventilation, to prevent over-exposure to dust, fumes and/or aerosols from this product.

8.3 Individual Protection Measures:

Eye/Face Protection: Wear safety glasses with side shields or chemical safety goggles.

Skin Protection: Wear protective gloves when handling this product. Wear clean body-covering work clothing as needed to prevent skin irritation.

Respiratory Protection: If ventilation and other engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protective equipment. Where occupational exposure limits are exceeded, workers must wear an approved respirator. In workplaces where respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations.

A respiratory protection program that meets the regulatory standard, such as Canadian Standards Association (CSA) Standard Z94.4, or OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements, must be followed whenever workplace conditions warrant a respirator's use.

Other Protection: Workplaces should have a safety shower, hand-wash station and eye-wash fountain readily available in the immediate work area. Provide employee training in how to wear and use respirators and in good personal hygiene practices. Perform regular workplace exposure monitoring.

SAFETY DATA SHEET

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties:

Appearance:	Solid, Opaque white crystalline granules
Odour:	Odourless. Strong odour may indicate presence of toxic gases from thermal decomposition.
Odour threshold:	5 ppm for ammonia gas
pH:	4.5 – 5.5 (10% aqueous solution)
Melting point/freezing point:	235°C (decomposes)
Initial boiling point and boiling range:	Not applicable
Flash point:	Not flammable
Evaporation rate:	Not available
Flammability (solid/gas):	Non-flammable.
Explosive properties:	Non-explosive
Upper/lower flammability or explosive limits:	Not applicable
Vapour pressure:	Approximately 0
Vapour density:	Not available
Relative density:	1.7 – 1.8 (water = 1)
Solubility (ies):	Very soluble 76.4 g/100 mL in water
Partition coefficient (n-octanol/water):	Log K _{ow} = -5.1 OECD TG 107
Auto-ignition temperature:	Not applicable
Decomposition temperature:	Decomposition starts at 150 - 280°C. Decomposition is complete at 336-357°C.
Viscosity:	Not applicable

Section 10: Stability and Reactivity

10.1 Reactivity:

Not classified as dangerous for reactivity hazards.

10.2 Chemical Stability:

Stable at normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of Hazardous Reactions:

Hazardous polymerization does not occur.

10.4 Conditions to Avoid:

Avoid heating to decomposition.

Avoid moisture and high humidity; Ammonium sulphate absorbs moisture from the air and can form a wet solid or solution in conditions of high humidity.

10.5 Incompatible Materials:

Oxygen, oxidizers such as peroxides, ammonium nitrate, potassium chlorate, potassium nitrate, sodium nitrate, metal chlorates and strong bases.

Reacts with bases forming ammonia.

10.6 Hazardous Decomposition Products:

Extreme heat (280°C) or under fire conditions, may generate toxic and corrosive gases such as sulphur dioxide, sulphur trioxide, ammonia, and nitrogen.

Section 11: Toxicological Information

11.1 Likely routes of exposure: Inhalation of dust; Skin contact; Eye contact.

11.2 Acute Health Effects:

Inhalation: Over-exposure to airborne dusts may cause irritation to the upper respiratory system.

Ingestion: Ammonium sulphate is of relatively low acute toxicity (LD₅₀, oral, rat: 2000 - 4250 mg/kg bw). Clinical signs after oral exposure included staggering, prostration, apathy, and laboured and irregular breathing immediately after dosing at doses near to or exceeding the LD₅₀ value. [OECD SIDS 2004]

Skin: Low acute toxicity by the dermal route. Not a skin irritant based on evidence from animal tests and human occupational exposures.

SAFETY DATA SHEET

11.2 Acute Toxicity Data:

<u>Ingredient</u>	<u>LD₅₀ Oral</u>	<u>LD₅₀ Dermal</u>	<u>LC₅₀ Inhalation (4 hrs.)</u>
Ammonium sulphate	2 840 – 4 540 (rat)	>2 000 (rat)	> 1 800 mg/m ³ (guinea pig)

11.3 Skin corrosion / irritation:

Tests with rabbits Draize score for erythema: 0/4, observed for 8 days with no scaling or edema.

11.4 Serious eye damage / irritation:

Tests with rabbits demonstrated slight irritation and no edema, which was reversed in 8 days.

11.5 STOT (Specific Target Organ Toxicity) – Single Exposure:

In humans, inhalation exposure to 0.1 – 0.5 mg ammonium sulphate/m³ aerosol for two to four hours produced no pulmonary effects. At 1 mg ammonium sulphate/m³ very slight pulmonary effects in the form of a decrease in expiratory flow, in pulmonary flow resistance and dynamic lung compliance were found in healthy volunteers after acute exposure. [OECD SIDS 2004]

11.6 STOT (Specific Target Organ Toxicity) – Repeated Exposure:

A 14-day inhalation study on rats exposed to 300 mg/m³, the only tested dose, did not report histopathological changes in the lower respiratory tract. As the respiratory tract is the target organ for inhalation exposure, the NOEL for toxicity to the lower respiratory tract is 300 mg/m³.

The NOAEL after feeding diets containing ammonium sulphate for 13 weeks to rats was 886 mg/kg bw/day. The only toxicity sign found was diarrhea in male animals of the high-dose group (LOAEL: 1792 mg/kg bw/day). [OECD SIDS 2004]

11.7 Aspiration hazard:

Not known to be an aspiration hazard.

11.8 Respiratory and / or skin sensitization:

Not known to be a respiratory or skin sensitizer.

11.9 Carcinogenicity:

Ammonium sulphate is not known to be a carcinogen. This product does not contain any component that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH® (American Conference of Governmental Industrial Hygienists, OSHA or NTP (National Toxicology Program).

11.10 Reproductive toxicity:

In a screening study according to OECD TG 422 with up to 1500 mg/kg of Ammonium sulphate, no effects on development have been detected in rats.

11.11 Germ cell mutagenicity:

Ammonium sulphate was not mutagenic in bacteria (Ames test) and yeasts with and without metabolic activation systems. It did not induce chromosomal aberrations in mammalian or human cell cultures.

11.12 Interactive effects:

Data not available

Section 12: Ecological Information

12.1 Toxicity:

96-hour LC₅₀ *Leuciscus idus* – 460-1 000 mg/L

96-hour LC₅₀ *Brachydanio rerio* – 250 mg/L

96-hour LC₅₀ *Cyprinus carpio* – 18 mg/L

96-hour LC₅₀ *Pimphales promelas* - >100 mg/L

48-hour EC₅₀ *Daphnia magna* – 14 mg/L

This substance will promote algae growth in aquatic systems and may degrade water quality and taste. Deaths in cattle have been reported following contamination of feed and water with ammonium sulphate.

12.2 Persistence and degradability:

Readily biodegradable.

Products of biodegradation include oxides of nitrogen and sulphur. In water the substance releases ammonium ions, a toxicity hazard for aquatic organisms.

SAFETY DATA SHEET

12.3 Bioaccumulative potential:

Does not bioaccumulate.

12.4 Mobility in soil:

Completely soluble, this substance will readily disperse in water.

Section 13: Disposal Considerations**13.1 Disposal methods:**

Store material for disposal as indicated in Section 7 Handling and Storage.

Do not discharge directly to municipal sewers, drains or surface water streams.

Dispose of waste in accordance with relevant national, regional and local environmental control provisions.

Section 14: Transport Information**14.1 UN Number:**

Not regulated as a dangerous good for transport.

14.2 UN proper shipping name:

Not applicable

14.3 Transport hazard class(es):

Not applicable

14.4 Packing group:

Not applicable

14.5 Environmental hazards:

Not available

14.6 Special precautions for user:

Not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Liquid ammonium sulphate solution: Category Z

14.8 Transport Regulations:

IMO Classification: Not regulated as a dangerous good for transport.

ICAO/IATA Classification: Not regulated as a dangerous good for transport.

Section 15: Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:****Canada**

DSL Status: All component substances listed on the DSL (Domestic Substances List) or are not required to be listed.

NPRI Substances: Source of aqueous ammonia.

Ammonia (total): both ammonia (NH₃ - CAS No. 7664-41-7) and the ammonium ion (NH₄⁺) in solution is NPRI reportable.

USA**TSCA Inventory:**

All ingredients are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.

SARA Title III:

Sec. 313: Ammonia 1% *de minimis*

CERCLA: Ammonia 1000 lb (454 kg) RQ

EPA: Designated Generic Categories, Ammonium sulphate – NH₃ Equivalent Wt. % = 25.78

European Classification:

Classification according to Regulation (EC) No 1272/2008: No hazard classifications

Ammonium sulphate is listed in EINECS: 231-984-1

SAFETY DATA SHEET

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture (continued):

International Chemical Inventories:

Australia-Listed on Inventory of Chemical Substances (AICS). Sulphuric acid, diammonium salt
Canada-Listed on Domestic Substances List.
China-Listed on Inventory of Existing Chemical Substances (IECSC). Sulphuric acid, diammonium salt
EU- EINECS: 231-984-1
Japan-ENCS (Existing and New Chemical Substances), Ammonium sulphate is present, 1-400.
Korea-Listed on Existing Chemicals Inventory (KECI/KECL) Ammonium sulphate is present, KE-01743.
Mexico-Listed on the National Inventory of Chemical Substances (INSQ).
New Zealand-Listed on Inventory of Chemicals (NZIoC) HSNO Approval: HSR002770, HSC000321
Philippines-Listed on Inventory of Chemicals and Chemical Substances (PICCS).
Taiwan- Listed on the Taiwan Chemical Substance Inventory (TCSI).
Turkey-Listed on the chemical inventory EC No. 231-984-1.
U.S.A.- Listed on TSCA Inventory 8(b).

Section 16: Other Information

Revision date:

January 15, 2018

Revision summary:

Previous version May 2012. Revised to SDS template, includes WHMIS 2015 classification and label elements. Revised in all sections.

References and sources for data:

CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS).
HSDB® database. US National Library of Medicine.
National Toxicology Program (NTP) –Report on Carcinogens. 13th Edition, 2014.
OECD SIDS Initial Assessment Report for Ammonium Sulphate, 2004
Registry of Toxic Effects of Chemical Substances (RTECS®) database.

Legend to abbreviations:

ACGIH®– American Conference of Governmental Industrial Hygienists
GHS- Globally Harmonized System for Classification and Labeling
IARC – International Agency for Research on Cancer
LD₅₀- Median lethal dose; the dose causing 50 % lethality
NISOH – National Institute for Occupational Safety and Health (USA)
NTP – National Toxicology Program
OSHA – United States, Occupational Safety and Health Administration
SARA – Superfund Amendments and Reauthorization Act (US EPA)
SCBA – Self-Contained Breathing Apparatus
TLV - Threshold Limit Value
TSCA – Toxic Substances Control Act (US EPA)
TWA – Time weighted average
VEMP – Valeur d'exposition moyenne pondérée
WHMIS – Canada, Workplace Hazardous Materials Information System

Supplier Note:

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SAFETY DATA SHEET

Additional 24-hour Emergency Response Telephone Numbers:

Region/country	Languages provided	Emergency telephone number
East/South East Asia	English, Bengali, Cantonese, Indonesian, Hindi, Japanese, Korean, Malay, Mandarin, Sinhalese, Urdu, Tagalog, Thai, Vietnamese	+65 3158 1074
Sri Lanka	English, Sinhalese	+65 3158 1195
China and Taiwan	English, Mandarin	+86 10 5100 3039
Japan	English, Japanese	+81 345 789 341
Indonesia	English, Indonesian	00780 3011 0293 (toll-free, access from Indonesia only)
Malaysia	English, Malaysian	+60 3 6207 4347
Thailand	English, Thai	001800 1 2066 6751 (toll-free, access from Thailand only)
India	English, Hindi	+65 3158 1198
Pakistan	English, Urdu	+65 3158 1329
Bangladesh	English, Bengali	+65 3158 1200
Philippines	English, Tagalog	+65 3158 1203
Vietnam	English, Vietnamese	+65 3158 1255
Korea	English, Korean	+65 3158 1285
South Korea	English, Korean	+82 (0)234 798 401 (South Korea in country number)
Australia	English	+61 2801 44558
New Zealand	English	+64 9929 1483
EU Languages	English, Albanian, Bulgarian, Czech, Danish, Dutch, Finnish, French, German, Greek, Hungarian, Italian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serb-Croat, Slovak, Spanish, Swedish, Turkish, Ukrainian	+44 (0) 1235 239 670
	English, French	+33 1 7211 0003
	English, German	+49 69 2222 5285
	English, Spanish	+34 9 1114 2520
	English, Italian	+39 0236 042 884
	English, Dutch	+31 107 138 195