

**AMMONIUM SULFATE**

REVISION DATE: 9/19/2022

**1. - PRODUCT AND COMPANY IDENTIFICATION****Product name:** Ammonium sulfate.**Internal Code of product identification:** 130.60.0**Company name:** USIQUÍMICA DO BRASIL LTDA.**Address:** Rua da Lagoa, 431 - Cumbica - Guarulhos - SP.**Company Phone:** + 5511 3821-7000 (PBX system) - + 5511 2481-3355.**Emergency phone:** SUATRANS - COTEC - Environmental Emergency.

DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.

193 – Firefighters.

**Main recommended uses for the substance:** Used in agriculture as a fertilizer agent.**2. - HAZARDS IDENTIFICATION****Classification of Substance:**

Corrosive/Irritating to skin, category 3,

Serious eye damage/eye irritation, category 2B,

Systemic target organ toxicity after single exposure, category 3,

Acute toxicity - Oral - category 5,

Hazardous to the aquatic environment - Acute - category 3.

**Most important hazards:** Harmful if swallowed. Avoid direct contact with the product.**Product Effects:** The product has low toxicity, however the following points must be observed:

- **Inhalation:** High concentrations of suspended material can cause irritation of the nose and respiratory tract, with symptoms such as sore throat and cough.

- **Skin contact:** Prolonged contact may cause some irritation.

- **Eye contact:** May cause irritation to eyes.

- **Ingestion:** Small quantities can rarely cause toxic effects. Large amounts can cause disorders in the gastrointestinal tract.

- **Environmental effects:** It can contaminate watercourses, making them unfit for any purpose.

- **Specific hazards:** Combustion of ammonium can result in the emission of toxic gases of nitrogen oxides.


- **Main symptoms:** Ingestion may cause nausea, vomiting, diarrhea, hemorrhagic gastritis, convulsions and nephritis.

**Emergency overview:** During recovery of any reusable product, care should be taken not to generate excess dust. Be careful with the product as it can be slippery when wet. Keep the product away from drainage systems and bodies of water, as it may be toxic to aquatic organisms.

Try to contain the spilled product, removing it as soon as possible.

Isolate and evacuate area in case of spill. Keep the wind blowing your back during emergency care. Access for people in contaminated areas should only be allowed if they are wearing specific clothing and adequate protection.

**GHS labeling elements, including precautionary statements:**

LABEL ELEMENTS	DATA
Product identification and supplier emergency telephone number.	Commercial Name: Ammonium sulfate (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> Synonym: Diammonium sulfate. Emergency phone: SUATRANS - COTEC - Environmental Emergency. DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.
Chemical composition:	Total Nitrogen: 20.5- 21.0 (Minimum, N. 20%). Water, max: 0.3%.
Hazard pictograms	
Warning words	<b>CAUTION</b>

**AMMONIUM SULFATE**

REVISION DATE: 9/19/2022

Danger phrases	H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled. H320 - Causes eye irritation. H316 - Causes mild skin irritation. H401 - toxic to aquatic organisms.
Caution Phrases	P234 - Keep only in the original container. P261 - Avoid breathing vapors and mists. P264 - Wash thoroughly after handling. P270 - Do not eat, drink or smoke when using this product. P272 - Contaminated work clothing must not leave the workplace. P273 - Avoid to release in the environment. P280- Use protective gloves/protective clothing/eye protection/face protection. P301 + P312- IN CASE OF INGESTION: If you feel unwell, contact a TOXICOLOGICAL INFORMATION CENTER/or a doctor. P301 + P310- IN CASE OF INGESTION: Contact a TOXICOLOGICAL INFORMATION CENTER or physician immediately. P302+P352 - IN CASE OF SKIN CONTACT: Apply wet compresses. P303 + P361 + P353- IN CASE OF SKIN CONTACT ( or with the hair): Remove immediately all contaminated clothing. Rinse the skin with water or take a shower. P304 + P340- IN CASE OF INHALATION: Remove the person to a ventilated area and keep the person in a rest position that does not make it difficult to breathe. P305 + P351 + P338 - IN CASE OF EYE CONTACT: Rinse thoroughly with water for several minutes. If contact lenses are used, remove them if it is easy. Continue rinsing. P311 - Call a TOXICOLOGY INFORMATION CENTER or physician. P312 - Call a TOXICOLOGICAL INFORMATION CENTER or doctor if you feel unwell. P342+P311 - If experiencing respiratory symptoms: Call a TOXICOLOGICAL INFORMATION CENTER or physician. P362+P364 - Take off all contaminated clothing and wash it before reuse.

Other hazards which do not result in classification: No other hazards occur.

**3.- COMPOSITION AND INFORMATION ON THE INGREDIENTS**

**Substance:** Ammonium sulfate (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>.

**Common chemical name or generic name:** Ammonium sulfate, (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>.

**Synonym:** Diammonium sulfate.

**Chemical Abstract Service (CAS No):** 7783-20-2.

**Impurities that contribute to the danger:** None.

**4 - FIRST AID MEASURES**

**First aid measures:**

**Inhalation:** Remove casualty to uncontaminated, ventilated area. If breathing is difficult, give oxygen. Apply resuscitation maneuvers in case of cardiorespiratory arrest. Immediately forward to the nearest hospital.

**Skin contact:** Remove clothing contaminated by the product. Wash contact areas with plenty of water. If irritation persists, seek medical attention.

**Eye contact:** Immediately wash eyes with running water for 15 minutes, lifting eyelids to allow maximum removal of product. seek medical attention.

**Ingestion:** If a large amount of this substance is ingested, refer immediately to a doctor.

**What actions must be avoided:** Do not induce vomiting. If vomiting occurs spontaneously, the victim must be laid on their side to prevent pulmonary aspiration. Never administer liquids to unconscious victims.

**Brief description of the main symptoms and effects:** High concentrations of suspended material can cause irritation of the nose and respiratory tract, with symptoms such as sore throat and cough. Prolonged contact can cause some

**AMMONIUM SULFATE**

REVISION DATE: 9/19/2022

skin irritation. May cause eye irritation upon contact. Ingestion of small amounts can rarely cause toxic effects. Large amounts can cause disorders in the gastrointestinal tract.

**Notes to the physician:** Avoid contact with the product to help the victim. Keep victim at rest and warm. Do not give anything by mouth to an unconscious person. The symptomatic treatment must include, above all, supportive measures such as correction of hydroelectrolytic, metabolic disorders, as well as respiratory assistance. In case of contact with the skin and/or eyes, do not rub the affected parts.

**5. - FIREFIGHTING MEASURES**

**Suitable extinguishing measures:** The product is not combustible. In case of fire, use water.

**Inappropriate extinguishing measures:** Waterjet.

**Substance-specific hazards:** Ammonia vapors, nitrogen and sulfur oxides may be produced in case of fire.

**Special methods to fire fighting:** None.

**Fire fighter Protection:** Special protective equipment for personnel assigned to fight fires. Do not stay in the danger zone without self-contained breathing apparatus suitable for breathing independently of the environment. To avoid skin contact, maintain a safe distance and wear suitable protective clothing.

Refresh closed containers exposed to fire with water spray. Suppress (shoot down) with water jets (fog) gases, vapors and mists. Avoiding contamination of surface water and groundwater with fire fighting water.

**Other relevant information:** Avoid breathing toxic fumes. Open warehouse doors and windows for maximum ventilation.

**6. - CONTROL MEASURES FOR SPILLING OR LEAKING**

**Personal precautions, protective equipment and emergency procedures.**

**Personnel who are not part of the emergency services:** Do not breathe vapors or aerosols. Avoiding contact with the substance. Ensuring adequate ventilation. Evacuating the danger area, observe emergency procedures. If necessary, consult an expert.

**For the staff of the emergency department:** Use complete PPE, with protective PVC gloves, safety glasses with side protection and suitable protective clothing. The material used must be waterproof. In case of large leaks, where exposure is large, the use of a protective mask with a filter against vapors or mists is recommended. Spilled product that gets wet or spills from aqueous solutions creates a hazardous condition due to its slippery nature. Avoid generation of dust.

**Removal of ignition sources:** Keep away from sources of heat and ignition.

**Prevention of inhalation and contact with skin, mucous membranes and eyes:** See Section 8, Field: "Appropriate Personal Protective Equipment".

**Precautions to the environment:** Prevent spilled product from entering water courses. Collect the spilled product, place the material in appropriate containers for proper final destination.

**Cleaning methods:** Any spillage of fertilizer must be cleaned up immediately and stored in a labeled container for proper final disposal. Depending on the degree and nature of contamination, reuse the product on the farm or give it an appropriate final destination.

**Differences in the action of large and small leaks:**

**Small spill:** Use appropriate tools to place spilled solid in appropriate container.

**Large spill:** Use wheel loader to put the material into an appropriate container. Finish with manual sweeping.

**7. - HANDLING AND STORAGE**

**Handling:**

**Technical measures** Using only in areas provided with adequate exhaust ventilation. Providing the product handling area with a set of emergency shower and eye wash. Handling must only be done with the indicated PPE and under safe conditions.

**Prevention of worker's exposure:** Avoiding the formation of vapors/aerosols. Working with exhaust / chimney. Do not inhale the substance/mixture. Using specific PPE's - splash goggles, face shield, PVC gloves and protective clothing. Avoid inhaling vapors.

Wash after handling and decontaminate PPE's after use. PPE's must be approved for use only with the

**AMMONIUM SULFATE**

REVISION DATE: 9/19/2022

respective CAs - Certificates of Approval.

**Precautions for safe handling:** Keep the product in closed packaging. Avoid excessive dust formation. Avoid exposure to the atmosphere to prevent moisture absorption. When handling the product for long periods, use gloves. Do not eat, drink or smoke when in contact with the product.

**Storage:**

**Appropriate technical measures:** Store in a cool, dry, ventilated area. Isolate from incompatible materials.

**Prevention of worker's exposure:** Submit the entire system to periodic maintenance control. Keep staff permanently trained.

**Prevention of fire and explosion:** Keep the product away from heat and flame.

**Precautions and guidelines for safe handling:** Adequately ventilate the area. Wash contaminated clothing before reuse. Avoid breathing dust. Wear protection for eyes, skin and respiratory tract.

**Appropriate hygiene measures:** Do not eat, drink or smoke at the workplace. Wash your hands after handling the product and change your clothes before entering a meal.

**Storage:** Store the product in a well-ventilated area, away from heat and flame. The storage area must be a dry and clean place.

**Packaging materials:** The product is sold in bulk or packaged in big bags with a liner or polyethylene valve bag.

**8. - EXPOSURE CONTROLS AND PERSONAL PROTECTION**

**Parameters of specific control.**

**Occupational exposure limits:**

For ammonium sulfate: LT=3 mg/m<sup>3</sup>.

**Biological indicators:** Not found.

**Other limits and values:** N.A.

**Measures of engineering control:** Handling the product in a place with good natural or mechanical ventilation, in order to keep the concentration of vapors/dust below the tolerance limit. Provide mechanical ventilation and direct exhaust system to the outside environment. These measures help to reduce exposure to the product. It is recommended to make emergency showers and eye washes available in the work area. Engineering control measures are most effective in reducing product exposure.

**Appropriate Personal Protective Equipment:**

**Protection for the eyes/face:** Use safety glasses

**Protection for the skin/body:** Wear waterproof clothing (boots and overalls).

**Respiratory protection:** Use dust/mist mask where ventilation is inadequate.

**Special precautions:** Expose only what is necessary.

**9. - PHYSICAL AND CHEMICAL PROPERTIES**

**Physical state:** Solid.

**Form:** Granules or crystals.

**Color:** White.

**Odor:** Odorless.

**pH:** 3.5 to 5.0 (10% in water).

**Melting / freezing point:** Not applicable.

**Boiling point:** Not applicable.

**Flash point:** Not applicable.

**Evaporation rate:** Not applicable.

**Flammability:** Not flammable.

**Upper/lower explosive or flammable limits:** Not applicable.

**Vapor pressure:** Not applicable.

**Vapor Density:** Not applicable.

**Free density:** - 945 to 1138 kg/m<sup>3</sup> (20 °C).

**Solubility in water:** 76.9 g/100 mL of water at 25°C.

**Solubility in other solvents:** 72 g/1000 mL (30 °C).

**Partition coefficient octanol / water:** Not applicable.

**AMMONIUM SULFATE**

REVISION DATE: 9/19/2022

**Auto-ignition temperature:** Not applicable.**Decomposition temperature:** > 235 °C. **Viscosity:** Not available.**Further information:** Molecular weight: 132.14

g/mol

**10. - STABILITY AND REACTIVITY****Specific conditions:****Chemical stability:** It is stable under normal storage and handling conditions.**Reactivity:** Does not react.**Possibility of hazardous reactions:** Does not react.**Conditions to avoid:** Avoid extreme temperatures.**Materials or incompatible substances:** Alkalis, strong acids, copper and mixtures thereof. **Hazardous decomposition products** May emit ammonia and sulfur oxides.**11. - TOXICOLOGICAL INFORMATION****Information according to the different routes of exposure:** Acute toxicity: DL<sub>50</sub> (oral for rats): 58 mg/kg.**Skin corrosion/irritation:** Causes irritation. Severe ocular lesions/eye irritation: Causes irritation.**Respiratory or skin sensitization:** Causes irritation to the respiratory tract, nose, throat, may cause coughing and sneezing.**Germ cell mutagenicity:** It has no mutagenic effect.**Carcinogenicity:** It has no carcinogenic effect.**Reproductive toxicity:** It has no toxic effect on reproduction.**Specific target organ toxicity- single exposure:** Not available.**Specific target organ toxicity- repetitive exposure:** Not available.**Aspiration hazard:** Not available.**12. - ECOLOGICAL INFORMATION****- Environmental effects, behaviors and impacts of the product:****Ecotoxicity:** LC<sub>50</sub> for fish (96 h): > 10 mg/L;EC<sub>50</sub> for Daphnia (48 h): >10 mg/L;EC<sub>50</sub> for seaweed: > 10 mg/L.**Persistence and degradability:** The product is substantially biodegradable in water.**Bioaccumulation:** No potential.**Mobility:** Soluble in water. Not absorbed by the soil.**Environmental impact:** It can contaminate watercourses, making them unfit for any purpose.**Other adverse effects:** None.**13. - CONSIDERATIONS ON FINAL DISPOSAL****Recommended methods for final disposal:**

The treatment and disposal of product residues must be done in a suitable environment, by people trained in the use of special equipment and the recommended PPE's to avoid contact with the product, its vapors or mists. Leaks must be contained and collected for later disposal after neutralization.

**Product:**

Ensure all Federal, State and local agencies receive proper notice of spills and disposal methods. CONAMA Resolution 005/1993, Law No. 12,305, as of August 2, 2010 (National Solid Waste Policy).

**Product waste:**

Consult environmental regulatory agencies for advice on acceptable regulatory practices. Come in contact with relevant local authorities. It can be incinerated when in compliance with local regulations. Or dispose of in an approved chemical waste landfill.

**Used Package:**

Empty containers must be drained and covered before handling and transport operations. If



**AMMONIUM SULFATE**

REVISION DATE: 9/19/2022

the package is not properly washed and decontaminated, it is considered to contain the product.

**14. - TRANSPORT INFORMATION****National and International Regulations****Land:**

Resolution No. 5947/21 of the Brazilian National Land Transport Agency (ANTT), Approves the Complementary Instructions to the Regulation of Land Transport of Dangerous Goods and its amendments.

**UN number:** Product not covered by current regulations on the transport of dangerous products.

**Appropriate name for shipment:** -

**Risk class:** -

**Risk subclass:** -

**Risk number:** -

**Packing group:** -

**Waterway:**

DPC – Directorate of Ports and Coasts (Transport in Brazilian waters) Maritime Authority Regulations (NORMAM) NORMAM 01/DPC: Vessels Used in Open-seas Navigation

**UN number:** Product not covered by current regulations on the transport of dangerous products.

**Appropriate name for shipment:** -

**Risk class:** -

**Risk subclass:** -

**Risk number:** -

**Packing group:** --

**- Air Transport:**

ANAC - National Civil Aviation Agency - Resolution No. 129 as of January 8, 2009

RBAC N°175 - (BRAZILIAN CIVIL AVIATION REGULATION) - TRANSPORTATION OF DANGEROUS ITEMS IN CIVIL AIRCRAFT IS No. 175-001 - SUPPLEMENTARY INSTRUCTION - IS

ICAO - "International Civil Aviation Organization" - Doc 9284-NA/905 IATA - "International Air Transport Association" Dangerous Goods Regulation (DGR)

**UN number:** Product not covered by current regulations on the transport of dangerous products.

**Appropriate name for shipment:** -

**Risk class:** -

**Risk subclass:** -

**Risk number:** -

**Packing group:** -

**15. - REGULATORY INFORMATION****Specific regulations for the chemical product:**

Federal Decree No. 2,657, as of July 3, 1998;

Standard ABNT-NBR 14725:2014;

Ordinance No. 229, as of May 24, 2011 – Changes Regulatory Standard No. 26.

**16. - OTHER INFORMATION**

The information on this sheet corresponds to the current state of our knowledge and experience of the product and is not exhaustive. It applies to the product under the conditions specified, unless otherwise stated. In case of combinations or mixtures, make sure that no new danger can appear. This information does not, in any case, exempt the user of the product from complying with all legislative, regulatory and administrative texts relating to the product, safety, hygiene and protection of human and environmental health.

**Bibliographical References:**

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on "Documentation" of Occupational Exposure Limits (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Index (BEIs®). Translation Brazilian Association of Occupational Hygienists. São Paulo, 2016.



**AMMONIUM SULFATE**

REVISION DATE: 9/19/2022

BRAZIL. MINISTRY OF LABOR AND EMPLOYMENT (MTE). Regulatory Standard (NR) No. 7: Occupational Health Medical Control Program. Brasília, DF. Jun. 1978.

BRAZIL. MINISTRY OF LABOR AND EMPLOYMENT (MTE). Regulatory Standard (NR) No. 15: Unhealthy activities and operations. Brasília, DF. Jun. 1978.

US EPA. 2011. EPI Suite™ for Microsoft® Windows, v 4.10. United States: Environmental Protection Agency, Washington. 2011. Available at:

< <http://www.epa.gov/oppt/exposure/pubs/episuite.htm>>. Access on: September, 2022

Globally Harmonized System of Classification and Labelling of Chemicals (GHS). 9. rev. United Nations, 2021.

HSDB - HAZARDOUS SUBSTANCES DATA BANK. Available at: <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>>. Access on: September, 2022

IARC- INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. Available at:

<<http://monographs.iarc.fr/ENG/Classification/index.php>>. Access on: September, 2022

IPCS - INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY - INCHEM. Available at: <<http://www.inchem.org/>>. Access on: September, 2022

IUCLID - INTERNATIONAL UNIFORM CHEMICAL INFORMATION DATABASE. [S.I.]: European chemical Bureau. Available at: <<http://ecb.irc.ec.europa.eu>>. Access on: September, 2022

NIOSH - NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards. Available at:

<<http://www.cdc.gov/niosh/>>. Access on: September, 2022

NITE-GHS JAPAN - NATIONAL INSTITUTE OF TECHNOLOGY AND EVALUATION. Available at:

<[http://www.safe.nite.go.jp/english/ghs\\_index.html](http://www.safe.nite.go.jp/english/ghs_index.html)>. Access on: September, 2022

U.S. ENVIRONMENTAL PROTECTION AGENCY. ECOSAR - Ecological Structure-Activity Relationships. Version 1.11 Available at: <<http://www.epa.gov/oppt/newchems/tools/21ecosar.htm>>. Access on: September, 2022