

**45% UREA SOLUTION**

REVISION DATE: 9/18/2022

**1. - PRODUCT AND COMPANY IDENTIFICATION****Product name:** 45% UREA SOLUTION**Internal Code of product identification:** 182.01.0.**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:** In chemical, textile, cosmetic, pharmaceutical industries, as a biological nutrient in effluents and in agriculture as a source of nitrogen.**2. - HAZARD IDENTIFICATION****Classification of Substance**

Corrosive/Irritating to the skin - Category 5

Serious eye damage / eye irritation - Category 5

**PRODUCT EFFECTS:****Adverse effects on human health:** Adverse health effects are considered unlikely.**Inhalation:** Inhalation of the solution causes irritation of the nose, throat and upper respiratory tract. It can trigger sneezing and coughing.**Eye contact:** Causes irritation with redness, tearing and pain.**Skin Contact:** It has an irritating effect, producing local itching and redness.**Ingestion:** Ingestion of the product may cause gastrointestinal irritation. Nausea, vomiting, abdominal pain and diarrhea may appear when ingesting larger amounts of the product.**Environmental effects:** The product is not expected to present a danger to the environment**GHS LABELING ELEMENTS, including precautionary statements:**

LABEL ELEMENTS	DATA
Product identification and supplier emergency telephone number.	Commercial Name: 45% urea solution Synonym: Carbamide, carbonyldiamide, carbonic acid diamide. Emergency phone: SUATRANS - COTEC - Environmental Emergency. DDG (0800) 0111-767 - (0800) 7071-767 - 24 hours.
Chemical composition.	High purity urea: 45%. High purity water: 55%.
Hazard pictograms.	
Warning words.	<b>ATTENTION</b>
Danger phrases.	H317 - May cause allergic skin reactions. H320 - Causes eye irritation.
Precautionary phrases.	P280 - Use protective gloves/protective clothing/eye protection/face protection. P303+P361+P353 IF ON SKIN (or hair) - Take off immediately all contaminated clothing. Wash the skin with water/take a shower. P304+P340+P310 IF INHALED - Remove person to fresh air and keep at rest in a position comfortable for breathing. Contact a TOXICOLOGICAL INFORMATION CENTER or physician immediately.

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	P305+P351+P338+P310 IN CASE OF CONTACT WITH EYES - Rinse carefully with water for several minutes. If contact lenses are used, remove them if it is easy. Continue rinsing. Contact a TOXICOLOGICAL INFORMATION CENTER or physician immediately. P308+P311 IF exposed or concerned - Contact a TOXICOLOGICAL INFORMATION CENTER/doctor.
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Other hazards which do not result in classification: Not known.

**3. - COMPOSITION AND INFORMATION ON INGREDIENTS****Substance:** 45% urea aqueous solution -  $(\text{NH}_2)_2\text{CO} + \text{H}_2\text{O}$ .**Chemical or common name:** Aqueous urea solution -  $(\text{NH}_2)_2\text{CO} + \text{H}_2\text{O}$ .**Synonym (for urea):** Carbamide, carbonyldiamide, carbonic acid diamide.**CAS No. (Chemical Abstract Service):** CAS: 57-13-6.**Impurities that contribute to the danger:** Unidentified.**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:** May cause respiratory system irritation if dust is inhaled. May cause eye irritation which should cease after product removal. In case of prolonged exposure to the product, skin irritations are possible.**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 solution is not a fire hazard. Use appropriate fire fighting measures in the surrounding area.**Unappropriated extinguishing measures:** water gun.**Other relevant information:** If water is used, restrict pedestrian and vehicle traffic in areas where there may be a danger of slipping.**Specific hazards:** When heated, the urea solution decomposes into carbon dioxide ( $\text{CO}_2$ ) and ammonia ( $\text{NH}_3$ ). When burned, it emits nitrogen oxides ( $\text{NO}_x$ ). In high blood concentrations, urea increases the risk of glaucoma. The reaction of urea with nitrates presents a risk of fire and explosion. Urea is not a fuel, but it decomposes at temperatures above  $133^\circ\text{C}$  to form toxic vapors.**Additional indications:** The hazard depends on the burning products and the fire conditions. Contaminated fire-fighting water must be disposed of in accordance with official local regulations.**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.

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

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

**For non-emergency personnel.**

**Removal of ignition sources:** Keep away from sources of heat and ignition. Urea presents a risk of decomposition when exposed to heat or flame.

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

**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.

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

**Methods and materials for containment and cleaning:** Use water mist or vapor suppressing foam to reduce vapor dispersion. Use natural or spill containment barriers. Collect spilled product and place in proper containers. Adsorb the remaining product with dry sand, earth, vermiculite, or any other inert material. Place adsorbed material in appropriate containers and remove to a safe place.

**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:** Avoid 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 respective CAs – Certificates of Approval.

**Precautions and guidelines for safe handling:** Use personal protective equipment (PPE) to avoid direct contact with the product. Handling the product in a well-ventilated place. Forms a slippery layer with water.

To avoid any change in the quality of the product during storage and transport, the following physical conditions must be met:

- A storage temperature below 30°C is recommended.
- We recommend a storage temperature above -11°C to avoid crystallization of the product, which occurs from -11.5°C.
- Protect from sunlight to prevent the appearance of algae.
- Use well-closed containers to protect both the container and the product from any contaminating agent. Prolonged storage at temperatures above 30°C will cause hydrolysis, which leads to the formation of ammonia and increased pressure, and will reduce the shelf life of the product.

Transport of the urea solution must be done in insulated tanks or plastic containers.

Special shipping information: split packages must be transported in a safe position, in a well-ventilated vehicle. Fractional packages transported in non-ventilated compartments of vehicles may present safety risks.

**Storage:**

**Appropriate:** Keep container tightly closed in a dry, cool and well-ventilated area. Keep in a cool, dry place in unopened original packaging. Avoid damp, wet and lightly wet conditions, temperature extremes and sources of ignition.

**To avoid:** Avoid extreme heat. Highly reactive or incompatible with oxidizing materials, acids and alkalis.

**Hygiene measures:**

**Appropriate:** Always sanitize your hands before handling any food, as there is a risk of food contamination. Contaminated clothing must be washed and sanitized before use. Keep gloves free of

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moisture and decontaminated.

**Inappropriate:** Direct contact with the product and/or its residues.

**Technical measures**

**Suitable conditions:** Keep containers closed and in a well-ventilated place. Keep containers away from heat and direct sunlight. Avoid extreme temperatures. Avoid moisture.

Safe materials for packaging: Recommendations: Original material.

**8. - EXPOSURE CONTROLS AND PERSONAL PROTECTION****Control parameters:****Occupational exposure limits:**

For urea: AIHA WEEL: 10 mg/m<sup>3</sup> (8h, TWA).

**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:****Appropriate respiratory safety equipment in case of low concentrations or short period:**

Medium efficiency filter for solid and liquid particles.

**Hand protection:** Chemical resistant gloves.

**Eye protection:** Safety glasses with side shields (framed glasses).

**Protection of the skin and body:** Lightweight clothing to protect.

**Hygiene measures:** Hands and face should be washed before breaks and at the end of the shift. Remove immediately all contaminated clothing. Wash contaminated clothing before reuse.

**9. - PHYSICAL AND CHEMICAL PROPERTIES**

**Physical state:** Liquid.

**Form:** Not applicable.

**Color:** Colorless.

**Odor:** Unscented or with a slight ammonia smell.

**pH:** close to 9.8 (45% in water).

**Point of crystallization:** -11.5°C approximately.

**Boiling point:** 132.7°C (literature data).

**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.

**Density:** 1117,0 -1126,0 kg/m<sup>3</sup>.

**Solubility (urea in water):** Unlimited.

**Solubility (urea in ethanol):** 72 g/1000 mL (30°C).

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

**Auto-ignition temperature:** Not applicable.

**Decomposition temperature (urea):** 142°C.

**Viscosity:** Unknown.

**Thermal Conductivity (at 25°C):** 0.570 W/m K approx.

**Specific heat (at 25°C):** 3.40 kJ/kg K approx.

**Superficial tension:** min. 65 mN/m.

**Further information:**

**Molecular weight:** 60.06 g/mol (urea).

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18 g/mol (water).  
31.5 g/mol (32% solution)

**10. - STABILITY AND REACTIVITY****Specific conditions:**

**Reactivity:** Urea reacts violently with gallium perchlorate. Reacts with chlorine to form chloramines. Urea also reacts with sodium hypochlorite, sodium nitrate, calcium hypochlorite, sodium nitrite, strong oxidizing agents (permanganate, nitrate, dichromate, chloride).

**Chemical stability:** The product is stable under normal conditions. In the presence of heat, urea becomes unstable and decomposes. Does not polymerize.

**Conditions to avoid:** Elevated temperatures and contact with incompatible products.

**Materials or incompatible substances:** Urea can be slightly corrosive to steel, aluminum, zinc and copper.

**Hazardous decomposition products** Urea decomposes under heat and can form products such as: ammonia, nitrogen oxides, cyanuric acid, cyanic acid, biuret and carbon dioxide.

**11. - TOXICOLOGICAL INFORMATION**

**Acute toxicity:** Contact with 45% urea solution may cause irritation to the respiratory tract and eyes.

**Skin corrosion/irritation:** It causes irritation with redness, pain and dryness.

**Severe ocular lesions/eye irritation:** May cause irritation with tearing and pain.

**Respiratory or skin sensitization:** Prolonged and repetitive contact can cause irritation.

**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:** Ingestion in large quantities can cause damage to the gastrointestinal tract and pain in the abdomen.

**Specific target organ toxicity- repetitive exposure:** Repeated exposure may cause respiratory tract irritation.

**Aspiration hazard:** May cause coughing or mild throat irritation.

**12. - ECOLOGICAL INFORMATION****- Environmental effects, behaviors and impacts of the product:**

**Ecotoxicity:** The product is not expected to present a hazard to aquatic organisms. CL<sub>50</sub> (fish, 96 h): > 9,100 mg/L. CE<sub>50</sub> (daphnia, 24 h): > 10,000 mg/L.

**Persistence and degradability:** Substantially biodegradable in soil and water. Values not found.

**Bioaccumulative potential:** Low potential for bioaccumulation. log pow <1.

**Mobility in soil:** Urea is soluble in water. Values not found.

Additional indications:

Other adverse effects: In case of spillage, the product must be collected. The fall of the product in streams and rivers must be avoided. In this case, report the fact immediately to the region's environmental control agency.

**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:**

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Empty containers must be drained and covered before handling and transport operations. If 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. 5947/2021 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, of May 24, 2011 - Amends 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:**

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