1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1 Product Identifier

Trade name/designation:	UREA
CAS No.:	57-13-6
Product type:	Solid
Molecular formula	NH2CONH2
Molecular weight	60.06 g/mol
Other means of identification:	no data available
Uses:	Fertilizer, intermediate, raw material for manufacture of adhesives.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: General chemical reagent

1.3 Details of the supplier of the safety data sheet

Brunei Fertilizer Industries Sdn Bhd

Company address	Level 2, SPARK Centre, Sungai Liang Industrial Park, Simpang 787, Kg Sungai Liang, Belait KC1135, Brunei Darussalam
Telephone	+673 32300 40/41/97
E-mail	bfimarketing@bfi.com.bn

Emergency telephone

Telephone	+673 32300 40/41/97 +673 7172420

2 HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 Classification according to Regulation (EC) No. 1272/2008 [CLP]

This substance is classified as not hazardous according to regulation (EC) No. 1272/2008 [CLP].

2.2 Label elements

2.2.1 Labelling according to Regulation (EC) No. 1272/2008 [CLP]

According to EC directives or the corresponding national regulations the product does not have to be labelled.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	Typical weight per-centage
Urea	57-13-6	≥ 97 % wt.
Biuret	108-19-0	≤ 1.0 % wt.
Moisture Content (water)	7732-18-5	≤ 0.50 % wt.
Urea reaction products with formaldehyde	68611-64-3	≤ 0.55 % wt.
Ammonium Sulphate	7783-20-2	≤ 0.41 % wt

4 FIRST AID MEASURES

4.1 General information

When in doubt or if symptoms are observed, get medical advice. If unconscious place in recovery position and seek medical advice. Never give anything by mouth to an unconscious person or a person with cramps. Change contaminated, saturated clothing. Do not leave affected person unattended.

4.1.1 After inhalation

Remove casualty to fresh air and keep warm and at rest. If breathing is irregular or stopped, administer artificial respiration. In case of respiratory tract irritation, consult a physician.

4.1.2 In case of skin contact

After contact with skin, wash immediately with plenty of water and soap. Remove contaminated, saturated clothing immediately. In case of skin reactions, consult a physician.

4.1.3 After eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consultan ophthalmologist. Protect uninjured eye. Remove contact lenses, if present and easy to do. Continue rinsing.

4.1.4 In case of ingestion

If accidentally swallowed rinse the mouth with plenty of water (only if the person is conscious) and obtain immediate medical attention. Do **NOT** induce vomiting. Give nothing to eat or drink.

4.1.5 Most important symptoms and effects, both acute and delayed

Contact with eyes and skin may cause mechanical irritation. Inhalation of dust may cause upper respiratory tract irritation. Swallowing large amounts may cause gastric upset.

4.1.6 Indication of any immediate medical attention and special treatment needed

no data available

4.1.7 Self-protection of the first aider

First aider: Pay attention to self-protection.

4.1.8 Information to physician

no data available

5 FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

The product itself does not burn.
Co-ordinate fire-fighting measures to the fire surroundings.
Use water spray, foam, carbon dioxide, dry chemical. A solid stream of water may spread the fire.

Extinguishing media which must not be used for safety reasons

no restriction

5.2 Special hazards arising from the substance or mixture

Fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard. Settled dust presents a fire hazard. Resuspension of the dust into the air by vibration, traffic, material handling, etc. in high concentrations in the presence of an ignition source could result in a dust explosion. Minimize the generation and accumulation of dust.
Combustion may produce oxides of carbon, nitrogen, and ammonia.

5.3 Advice for firefighters

DO NOT fight fire when fire reaches explosives.
Special protective equipment for firefighters
Wear a self-contained breathing apparatus (SCBA) and chemical protective clothing.

5.4 Additional information

Do not allow run-off from fire-fighting to enter drains or water courses.
Do not inhale explosion and combustion gases.
Use water spray jet to protect personnel and to cool endangered containers.
In case of fire: Evacuate area.

6 ACCIDENTAL RELEASE MEASURE

6.1 Personal precautions, protective equipment and emergency procedures

Avoid generation of dust.

6.2 Environmental precautions

Do not allow to enter into surface water or drains.

6.3 Methods and material for containment and cleaning up

Wet down powder and collect in a manner to minimize the generation of airborne dusts or vacuum with a high efficiency vacuum cleaner. If a vacuum is used, explosion proof equipment is required. Non-sparking tools should be used. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentrations. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air.)

Spilled product must never be returned to the original container for recycling. Clean contaminated objects and areas thoroughly observing environmental regulations. Collect in closed and suitable containers for disposal.

6.4 Additional information

Clear spills immediately.

7 HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with eyes, skin, and clothing. Avoid breathing dust. Use with adequate ventilation. Wash thoroughly after handling. Minimize dust generation and accumulation. Housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Do not use compressed air to clean surfaces. Keep away from heat, sparks, and all sources of ignition. Protect from moisture.

Do not smoke in areas where the product is used or stored. Provide grounding and bonding during transfer to reduce the possibility of fire or explosion.

7.2 Conditions for safe storage, including any incompatibilities

Recommended storage temperature: 15-25°C

Storage class: 10-13

Urea must be stored in covered and dry storage conditions. The shelf life is 2 years when stored in line with industry recommendation. Keep the container tightly closed. Store in a cool, dry and well-ventilated area. Store away from incompatible materials (see Section10.5)

7.3 Specific end use(s)

no data available

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Airborne Exposure Limits

AIHA Workplace Environmental Exposure Limit (WEEL): 10 mg/m3, 8-hour TWA for Urea as inhalable dust.

OSHA PermissPEL: 15 mg/m^3, 8-hour TWA

8.2 Exposure controls

8.2.1 **Appropriate engineering controls**

Technical measures and the application of suitable work processes have priority over personal protection equipment. If handled uncovered, arrangements with local exhaust ventilation have to be used.

8.2.2 **Personal protection equipment**

Wear suitable protective clothing. When handling with chemical substances, protective clothing with CE-labels including the four control digits must be worn.

Eye/face protection

Eye glasses with side protection DIN-/EN-Norms: DIN EN 166

Recommendation: VWR 111-0432

Skin protection

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits.Recommended glove articles DIN-/EN-Norms: DIN EN 374 In the case of wanting

to use the gloves again, clean them before taking off and air them well.

By short-term hand contact

Suitable material:	NBR (Nitrile rubber)
Thickness of the glove material:	0,12 mm
Breakthrough time (maximum wearing time):	> 480 min
Recommended glove articles:	VWR 112-0998

By long-term hand contact

Suitable material:	NBR (Nitrile rubber)
Thickness of the glove material:	0,38 mm
Breakthrough time (maximum wearing time):	> 480 min
Recommended glove articles:	VWR 112-3717 / 112-1381

Respiratory protection

If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (SCBA or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (SCBA type N100 filters) maybe worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerin, etc.) are present, use a SCBA type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air- supplied respirator.

WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. If heat is involved, an ammonia/methylamine, dust/mist cartridge may be necessary.

Additional information

Wash hands before breaks and after work. Avoid contact with skin and eyes. When using do not eat, drink or smoke. Provide eye shower and label its location conspicuously.

8.2.3 Environmental Exposure Controls

Do not let products enter drains.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

(a) Appearance

Physical state:	solid
Colour:	White
Odour:	Odorless. Slight, ammoniacal
Odour threshold:	no data available

9.2 Safety relevant basic data

(a) pH:	6.2 – 9.0 (100 g/l; H2O; 20 °C)
(b) Melting point/freezing point:	133 - 135 °C
(c) Initial boiling point and boiling range:	197 °C (1013 hPa)
(d) Flash point:	no data available
(e) Evaporation rate:	no data available
(f) Flammability (solid, gas):	Dust may be combustible or explosive.
(g) Flammability or explosive limits	
Lower explosion limit:	no data available
Upper explosion limit:	no data available
(h) Vapour pressure:	~ 1.6 mPa (275 °C)
(i) Vapour density:	no data available
(j) Relative density:	1.33 g/cm³ (20 °C)
(k) Solubility(ies)	
Water solubility (g/L):	100 gm/l, easily soluble in cold water
Soluble (g/L) in Ethanol:	no data available
(l) Partition coefficient: n-octanol/water:	no data available
(m) Auto-ignition temperature:	no data available
(n) Decomposition temperature:	no data available
(o) Viscosity	
Kinematic viscosity:	no data available
Dynamic viscosity	no data available
(p) Explosive properties:	not applicable
(q) Oxidising properties:	not applicable

9.3 Other information

Dissociation constant:	no data available
Surface tension:	no data available
Henry constant:	no data available

10 STABILITY AND REACTIVITY

10.1 Reactivity

Urea reacts with calcium hypochlorite or sodium hypochlorite to form the explosive nitrogen trichloride.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Incompatibles.

10.5 Incompatible materials

It is incompatible with sodium nitrite, gallium perchlorate, strong oxidizing agents (permanganate, di-chromate, nitrate,chlorine), phosphorus pentachloride, nitrosyl perchlorate, titanium tetrachloride and chromyl chloride.

10.6 Hazardous decomposition products

Urea decomposes upon heating and can form products including ammonia, oxides of nitrogen, cyanuric acid, cyanic acid, biuret,carbon dioxide.

10.7 Additional information

Absorbs moisture from the air. Hygroscopic; keep container tightly closed.

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

- **Acute effects**

Acute oral toxicity:
LD50: > 8471 mg/kg - Rat (RTECS)

Acute dermal toxicity:
LD50: > 8200 mg/kg - Rat - (IUCLID)

Acute inhalation toxicity:
no data available

- **Irritant and corrosive effects**

Primary irritation to the skin:
not applicable

Irritation to eyes:
not applicable

Irritation to respiratory tract:
not applicable

- **Respiratory or skin sensitization**

In case of skin contact: not sensitizing
After inhalation: not sensitizing

- **STOT-single exposure**

not applicable

- **STOT-repeated exposure**

not applicable

- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction) Carcinogenicity**
  No indication of human carcinogenicity.

- **Germ cell mutagenicity**
  No indications of human germ cell mutagenicity exist.

- **Reproductive toxicity**
  No indications of human reproductive toxicity exist.

- **Aspiration hazard**
  not applicable

- **Other adverse effects**
  no data available

- **Additional information**
  no data available

- **Chronic Exposure:**
  A study of 67 workers in an environment with high airborne concentrations of urea found a high incidence of protein metabolism disturbances, moderate emphysema, and chronic weight loss.

- **Aggravation of Pre-existing Conditions:**
  Supersensitive individuals with skin or eye problems, kidney impairment or asthmatic condition should have physician's approval before exposure to urea dust.

12 ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Product/ ingredient name	Result	Species	Exposure
Urea	Acute EC50 6573.1 mg/l Fresh water Acute EC50 3910 mg/l Fresh water Acute LC50 >1000 mg/l Marine water Acute LC50 5000 µg/l Fresh water Acute LC50 22500 mg/l Fresh water Chronic NOEC 2 g/L Fresh water	Crustaceans - Ceriodaphnia dubia – Neonate	48 hours
		Daphnia - Daphnia magna -Neonate	48 hours
		Crustaceans - Chaetogammarusmarinus - Young	48 hours
		Fish - Colisa fasciata – Fingerling Fish - Oreochromis mossambicus – Young	96 hours 96 hours
		Fish - Heteropneustes fossilis	30 days

- **Conclusion/Summary**
  No known significant effects or critical hazards.

12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Urea	-	-	Readily

- **Conclusion/Summary**

  Readily biodegradable

12.3 Bio accumulative potential

Partition coefficient: n-octanol/water: -2.11 (20 °C)

12.4 Mobility in soil:

NA. The product may move with surface ground water flows because its high-water solubility.

12.5 Results of PBT/vPvB assessment

no data available

12.6 Environmental Fate

When released to soil, this material will hydrolyze into ammonium in a matter of days to several weeks. When released into thesoil, this material may leach into groundwater. When released into water, this material may biodegrade to a moderate extent. When released into water, this material is not expected to evaporate significantly. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily be degraded by reaction with photochemically produced hydroxyl radicals.

13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

- **Appropriate disposal / Product**

  Dispose according to local legislation. Consult the appropriate local waste disposal expert about waste disposal. Do not disposeinto sewer.

  Waste code product: no data available

- **Appropriate disposal / Package**

  Dispose according to local legislation. Handle contaminated packages in the same way as the substance itself.

- **Additional information**

  no data available

14 TRANSPORT INFORMATION

14.1 Land transport (ADR/RID)

No dangerous good in sense of this transport regulation.

14.2 Sea transport (IMDG)

No dangerous good in sense of this transport regulation.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Codenot relevant

14.3 Air transport (ICAO-TI / IATA-DGR)

No dangerous good in sense of this transport regulation.

15 REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- **EU legislation**
  - Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency,amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (Text with EEA relevance)
  - Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labellingand packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance)
  - Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Text withEEA relevance)
  - Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliamentand of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- **German regulations**

  Water hazard class (WGK): slightly hazardous to water (WGK 1)
- **National regulations (Brunei Darussalam)**
  - Workplace Safety and Health (General Provisions) Regulations: PEL of Dust is 10 mg/m3, 8-hour TWA; Toxic Substance
  - Workplace Safety and Health Act, Chapter 277: Toxic Substances is listed as Hazardous Substances
  - Workplace Safety and Health (Facilities) (Control of Major Accident Hazards) Regulations: Hazardous substancespecified in Division 2 of Part II of the Fifth Schedule to the Order
  - Environmental Protection and Management Act, Chapter 240

15.2 Chemical Safety Assessment

not relevant

16 OTHER INFORMATION

- **Abbreviations and acronyms**

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road AGS - Committee on Hazardous Substances (Ausschuss für Gefahrstoffe)
AIHA - American Industrial Hygiene Association
CLP - Regulation on Classification, Labelling and Packaging of Substances and Mixtures DFG - German Research Foundation (Deutsche Forschungsgemeinschaft)
Gestis - Information system on hazardous substances of the German Social Accident Insurance (Gefahrstoffinformationssystem der Deutschen Gesetzlichen Unfallversicherung)
IATA-DGR - International Air Transport Association-Dangerous Goods Regulations ICAO-TI - International Civil Aviation Organization-Technical Instructions
IMDG - International Maritime Code for Dangerous Goods LTV - Long Term Value
NIOSH - National Institute for Occupational Safety and Health OSHA - Occupational Safety & Health Administration
PBT - Persistent, Bio accumulative and Toxic PEL - Permissible Exposure Level/Limit
RID - Regulation concerning the International Carriage of Dangerous Goods by Rail STV - Short Term Value
SVHC - Substances of Very High Concern vPvB - very Persistent, very Bio accumulative
WEEL - Workplace Environmental Exposure Limit

- **Additional information**

Indication of changes: general update

Disclaimer: The information that Brunei Fertilizer Industries Sdn Bhd, BFI (the "Company") has presented here was prepared based upon data the Company believes to be accurate as of the date of this version, applies solely to the specific product designated and may not be accurate if such product is used with any other product. The Company makes no representation or warranties of any kind whatsoever, expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose, or course of performance or usage of trade.

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