# Gulf Petrochemical Industries Co. (BSC)

## Safety Data Sheet

**According to REACH Regulation (1907/2006/EC)**
**Reissue Date 01/05/2021**

# UREA

| 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING | |
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| **1.1 Product identifier** | |
| Name: | **Urea** |
| Chemical designation: (IUPAC) | Carbonyldiamide |
| Synonyms: | Carbamide |
| Formula:<br>- Molecular | CH4N2O |
| - Structural | $NH_2$-CO-$NH_2$ |
| Molecular weight: | 60.05 |
| CAS number: | 57-13-6 |
| EC number: | 200-315-5 |
| Registration number under REACH Regulations: | 01-2119463277-33-0095 |
| **1.2 Relevant identified uses of the substance or mixture and uses advised against** | |
| 1.2.1 Identified uses | Urea is applied in agriculture as mineral fertilizer, in livestock industry as food supplement and as raw material it can be applied in resins and glues manufacture. |
| 1.2.2 Uses advised against | No uses specifically advised against. |
| **1.3 Details of the supplier of the safety data sheet** | |
| De facto manufacturer's address: | Gulf Petrochemical Industries Company,<br>51, Road 1404,<br>Um Al-Baydh 614,<br>Sitra,<br>Kingdom of Bahrain |
| Telephone: | 00973 17 731777 |
| Fax: | 00937 17 731047 |
| E-mail: | jkhalfan@gpic.net |
| Contact person: | Mr. Jehad Khalfan<br>Finance & Marketing Manager |
| **1.4 Emergency telephone number** | 00973 17 733353 |
| **2. HAZARDS IDENTIFICATION** | |
| **2.1 Classification of the substance or mixture** | |
| Classification according to REGULATION (EC) No 1272/2008 on classification, labeling and packaging (GHS) | Not Classified |
| Classification according to Directive 67/548/EEC | Not Classified |

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| Manufacture<br>Use descriptors | **Environmental release category (ERC):**<br>ERC 1: Manufacture of substances<br>**Process category (PROC)**<br>PROC1: Use in closed process, no likelihood of exposure<br>PROC2: Use in closed, continues process with occasional controlled exposure<br>PROC3: Use in closed batch process (Synthesis or formulation)<br>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities<br>PROC 9: Transfer of substance or preparation into small containers (dedicated filing line, including weighing)<br>PROC 15: Use as laboratory reagent |
| **2.2. Label Elements** | **Label Hazard Warning:**<br>WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.<br><br>**Label Precautions:**<br>• Avoid breathing dust.<br>• Keep container closed.<br>• Avoid contact with eyes, skin and clothing.<br>• Use only with adequate ventilation.<br>• Wash thoroughly after handling.<br><br>**Label First Aid:**<br>If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention. |
| **2.3 Other hazards** | PBT/vPvB: No |

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| | Constituent | Typical Concentration | Concentration Range |
|---|---|---|---|
| Constituent | Urea EC № 200-315-5 | 99% (w/w) | >= 98.0−< 100.0% (w/w) |
| Impurities | Biuret<br>EC no.: 203-559-0 | 0.5% (w/w) | Max 1% (w/w) |
| Additives | No | | |

## 4. FIRST AID MEASURES

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| **4.1 Description of first aid measures** | |
| 4.1.1. General Information | In case of accident or if you feel unwell, seek medical advice immediately (show safety data sheet if possible) |
| 4.1.2. Following inhalation | Move the exposed person to fresh air at once. Keep warm at rest. If |

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| | there is respiratory distress give oxygen. If respiration stops or shows signs of failing, apply artificial respiration.<br>Get medical attention |
| 4.1.3 After skin contact: | Remove Contaminated clothing and wash skin with plenty of running water, under a shower if affected area is large enough to warrant this.<br>Get medical attention |
| 4.1.4 Following eye-contact: | Rinse immediately eye with plenty of low pressure water for at least 15 minutes. Remove any contact lenses. Get medical attention. |
| 4.1.5 After ingestion | Wash out mouth with water and give plenty of water to drink, provided person in conscious. Get medical attention. |
| 4.1.6 Self-protection of the first aider | First aid assistant: Pay attention to self-protection |
| **4.2 Most important symptoms and effects, both acute and delayed** | **Inhalation:** May cause irritation of the respiratory tract.<br>**Ingestion:** Causes irritation of the gastrointestinal tract with nausea, vomiting and diarrhea. May cause cardiac disturbances.<br>**Skin Contact:** May cause skin irritation<br>**Eye Contact:** May cause eye irritation |
| **4.3 Indication of any immediate medical attention and special treatment needed** | Treat symptomatically |
| **5. FIRE FIGHTING MEASURES** | |
| **5.1. Extinguishing media** | The product is not flammable/combustible.<br>In case of fire: all extinguishing agents allowed. |
| **5.2. Special hazards arising from the substance or mixture:** | At thermal destruction urea forms nitrogen oxides, ammonia and carbon dioxide. Urea interaction with nitric acid results information of acidogen nitrate explosive substance. |
| **5.3. Advice for fire fighters:** | None |
| **5.4 Additional Information** | Wear full protective clothing and MSHA/NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. |
| **6. ACCIDENTAL RELEASE MEASURES** | |
| **6.1 Personal precautions, protective equipment and emergency procedures:** | See section 8. |
| **6.2 Environmental precautions:** | Take precautionary measures against discharges into the environment |
| **6.3 Methods and material for containment and cleaning up:** | Avoid contact with eyes and skin. Wear personal protection (see section 8). Sweep spilled substance into containers. Avoid generating dusty conditions and provide ventilation. |
| **6.4 Reference to other sections:** | See section 8, 13. |
| **7. HANDLING & STORAGE** | |
| **7.1 Precautions for safe handling** | • Use with adequate ventilation. Avoid ingestion and inhalation. Minimize dust generation and accumulation.<br>• Avoid contact with eyes or skin.<br>• Wash thoroughly after handling and before eating, drinking or |

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| | smoking.<br>• May explode when mixed with certain strong reducing substances (hypochlorites) - forms nitrogen trichloride which explodes spontaneously in air. |
| **7.2 Conditions for safe storage, including any incompatibilities** | • Store in tightly closed containers.<br>• Store in a cool, dry place.<br>• Incompatible products: Strong oxidizing agents (hypochlorite's, nitric acid, sodium nitrite, etc.) |
| **7.3 Specific end use(s)** | No data available |

## 8. EXPOSURE CONTROL/PERSONAL PROTECTION

### 8.1 Control Parameters

| **DNEL / DMEL: Workers** | | | |
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| Acute – Systemic effects | Dermal (mg/kg bw/day) | 580 | Developmental toxicity / teratogenicity |
| | Inhalation (mg/m$^3$) | 292 | Developmental toxicity / teratogenicity |
| Acute – local effects | Dermal (mg/cm$^2$) | -- | -- |
| | Inhalation (mg/m$^3$) | -- | -- |
| Long-term – systemic effects | Dermal (mg/kg bw/day) | 580 | Developmental toxicity / teratogenicity |
| | Inhalation (mg/m$^3$) | 292 | Developmental toxicity / teratogenicity |
| Long-term – local effects | Dermal (mg/cm$^2$) | -- | -- |
| | Inhalation (mg/m$^3$) | -- | -- |
| **DNEL / DMEL: General Population** | | | |
| Acute – Systemic effects | Dermal (mg/kg bw/day) | 580 | Developmental toxicity / teratogenicity |
| | Inhalation (mg/m$^3$) | 125 | Developmental toxicity / teratogenicity |
| | Oral (mg/kg bw/day) | 42 | Developmental toxicity / teratogenicity |
| Acute – local effects | Dermal (mg/cm$^2$) | -- | |
| | Inhalation (mg/m$^3$) | -- | |
| Long-term – systemic effects | Dermal (mg/kg bw/day) | 580 | Developmental toxicity / teratogenicity |
| | Inhalation (mg/m$^3$) | 125 | Developmental toxicity / teratogenicity |
| | Oral (mg/kg bw/day) | 42 | Developmental toxicity / teratogenicity |
| Long-term – local effects | Dermal (mg/cm$^2$) | -- | |
| | Inhalation (mg/m$^3$) | -- | |
| **PNEC** | | | |
| PNEC aqua – freshwater (mg/l) | | 0.47 | Extrapolation method: assessment factor |
| PNEC aqua – marine water (mg/l) | | -- | No exposure is predicted due to the |

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| | | incorporation of Urea into the Urea cycle |
| PNEC aqua – intermittent releases (mg/l) | -- | A separate PNEC for intermittent release is not proposed. |
| PNEC aqua – freshwater sediment (mg/l) | -- | No data are available: a waiver is proposed on exposure grounds and a PNEC is not derived. |
| PNEC aqua – marine sediment (mg/l) | -- | No data are available: a waiver is proposed on exposure grounds and a PNEC is not derived. |
| PNEC soil (mg/kg) | -- | Urea is of inherently low toxicity to microorganisms and is utilized as a nutrient and N-source. A PNEC is therefore not proposed. |
| PNEC STP (mg/l) | -- | No data are available: a waiver is proposed on exposure grounds and a PNEC is not derived. |

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| **8.2 Exposure Controls** | |
| **8.2.1 Appropriate Engineering Controls** | Provide a good standard of general ventilation. Provide extract ventilation to points where emissions occur (local exhaust ventilation). |
| **8.2.2 Individual protection measures, such as personal protective equipment** | **Personal Protection Equipment**<br>**Respiratory protection:**<br>Wear breathing apparatus if dusty conditions warrant this.<br>**Hand Protection:**<br>Wear approved protective gloves.<br>**Eye Protection:**<br>Wear approved safety goggles<br>**Skin protection:**<br>Wear protective clothing<br>**General protection and hygiene measures:**<br>Wash at the end of each work shift and before eating, drinking, smoking or using the toilet. |
| **8.2.3 Environmental exposure controls** | Establish monitoring systems |
| **9. PHYSICAL AND CHEMICAL PROPERTIES** | |
| **9.1 Information on basic physical and chemical properties** | |
| Appearance (physical state and colour) | Solid, crystalline granules. White/ slightly coloured |
| Odour: | Odourless |
| Odour threshold: | No data available |
| pH: | 7, 5-9, 5 (10% solution in water) |
| Melting point/ freezing point: | 132.7 ºC (1013 hPa) |

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| Initial boiling point and boiling range: | Decomposition before the boiling point (CRC Handbook, 2006) |
| Flash point: | Not applicable (solid) |
| Flammability (solid, gas): | Non-flammable (sax & Lewis, 1987) |
| Upper/lower flammability or explosive limits: | Not applicable (Non-flammable) |
| Explosive properties: | Not applicable (based on the structure) |
| Oxidising properties: | Not applicable (based on the structure) |
| Vapour pressure: | 0.0016 Pa (25 $^{o}$C) (Jones, 1960) |
| Relative density: | 1.330 (20 $^{o}$C) |
| Water solubility: | 624000 mg/l (20 $^{o}$C) |
| Partition coefficient: n-octanol/water: | -1.73 (20 $^{o}$C) |
| Viscosity: | Not applicable (solid) |
| Vapour density: | Not applicable |
| Evaporation rate: | Not applicable |
| Auto-ignition temperature: | Not applicable (melting point: 132.7 $^{o}$C) |
| Decomposition temperature: | No data available |
| **9.2 Other information** | **Organic peroxide:** Based on the available data, the classification criteria are not met.<br>**Self-heating:** Based on the available data, the classification criteria are not met.<br>**Pyrophoric liquid/solid:** Based on the available data, the classification criteria are not met.<br>**Corrosive to metals:** Based on the available data, the classification criteria are not met. |
| | **Substance which in contact with water emits flammable gasses**: Based on the available data, the classification criteria are not met. |
| **10. STABILITY AND REACTIVITY** | |
| **10.1. Reactivity** | The product reacts with acids and acid anhydrides. Oxidizes, Deaminizes, Hydrolyzes. |
| **10.2. Chemical stability** | Stable in normal storage and transportation conditions. |
| **10.3. Possibility of hazardous reactions** | • Polymerizes, hydrolyses, oxidates, deaminates, enters into reactions with acids and their anhydrides.<br>• Enters into reaction with nitric acid generating urea nitrate, which when healed decomposes with an explosion.<br>• Urea in water solution:<br>  ○ Reacting with acids and alkali in water solution urea in |

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| | subjected to hydrolysis and dissociation with ammonia and carbon dioxide generation.<br>○ Well soluble in water , at >80 °$C$ urea water solution is hydrolysed and dissociated with biuret, carbon dioxide and ammonia generation.<br>○ Urea thermodistruction product – ammonia – reacts with oxidants; in certain conditions with open flame ammonia can generate nitric oxides. | |
| **10.4. Conditions to avoid** | Over moistening is undesirable as to leads to caking.<br>Keep away from sources of ignition.<br>Avoid storage with incompatible materials. | |
| **10.5.Incompatible materials** | Sodium hypochlorite, calcium, hypochlorite, sodium nitrate, nitrosyl perchlorate, strong oxidizing agents, dichromates, liquid chlorine, nitrates, permanganates, chromyl chloride. | |
| **10.6. Hazardous decomposition products** | Under normal conditions of storage and use, hazardous decomposition products should not be produced.<br>In case of fire: ammonia, carbon oxides, nitrous oxides. | |
| **11. TOXICOLOGICAL INFORMATION** | | |
| **11.1. Estimation of hazard influence (toxicity) on human body:** | Moderately hazardous substance. | |
| **11.2. Acute toxicity indices:** | 11.2.1. LD50 oral | 14300 mg/kg bw (rat; male)<br>15000 mg/kg bw (rat; female)<br>OECD 401<br>Sato, N. AikawaK., Sugimoto, T., Kotera, K., Tauchi, K., Tanaka (1997) |
| | 11.2.2. LD50 dermal | No data available |
| | 11.2.3. LC50 inhalation | Inhalation: not relevant |
| | 11.2.4. Skin corrosion / irritation | Not irritating (rabbit)<br>OECD 404, EU B.4, EPA OPPTS 870.2500 |
| | 11.2.5. Serious eye damage / irritation | Not irritating (rabbit) OECD 405;<br>Not irritating (human) – medical surveillance data collected from 9 urea producing facilities over several decades. |
| | 11.2.6. Specified target organ toxicity – single exposure | Based on the available data, the classification criteria are not met. |
| **11.3. Sensitization** | **Respiratory sensitization**: Based on the available data, the classification criteria are not met.<br>(Based on experience of extensive and historical occupational use of urea)<br>**Skin sensitivity**: Based on the available data, the classification criteria are not met. (Urea: naturally present in human skin. Used in skin cream. No reports of sensitization reactions) (Suttgen, 1992). (Alchangian *et al.,* 1986) | |

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| **11.4. Repeated dose toxicity:** | **Specific target organ toxicity – repeated exposure:** Based on the available data, the classification criteria are not met<br>Oral (12 months)<br>NOAEL: 2250mg/kg bw/day (rat; male/female)<br>NCI screening study<br>Fleischman, R.W. Baker, J.R. Hagopian, M. Wade, G.G. Hayden, D.W.(1980) |
| **11.5 CMR effects ( carcinogenity, mutagenicity and toxicity for reproduction):** | **Carcinogenicity:** Based on the available data, the classification criteria are not met Oral (12 months)<br>NOAEL: 2250mg/kg bw/day (rat; male/female)<br>Fleischman, R.W. Baker, J.R. Hagopian, M. Wade, G.G. Hayden, D.W.(1980)<br>**Germ cell mutagenicity:** Based on the available data, the classification criteria are not met.<br>**Reproductive toxicity:** Based on the available data, the classification criteria are not met.<br>**Development toxicity:** Oral(14 days)<br>**NOAEL (teratogenicity):** 500mg/kg bw/day (rat)<br>**Reproductive toxicity, effects on or via lactation:** Based on the available data, the classification criteria are not met. |
| **11.6 Aspiration Hazard:** | Based on the available data, the classification criteria are not met. |
| **12. ECOLOGICAL INFORMATION** | |
| **12.1. Toxicity** | **Acute toxicity to fish:**<br>LC50 Species: Leuciscus idus > 6810 mg/L (96h)<br>Chronic toxicity to fish: NOEC no data available<br>**Chronic toxicity to crustaceans:**<br>Gambusia affinis, fresh water<br>NOEC (1 wk): 200 mg/L based on : mortality<br>LOEC (1 wk): > 200 mg/L based on: motality (Oster, et al. (2011)<br>Acute toxicity to algae and other aquatic plants:<br>EC50 Species: Microcystis aeruginosa (algae)<br>Toxicity threshold (192 h): 47 mg/L (based on biomass) (freshwater, static) Brigmann, G. & Kuhn, R. (1982)<br>Euglena gracilis (aquatic plants) freshwater – Automatic biotest ECOTOX.<br>EC50 (1 h): 17.182 g/L based on: Inhibition of motility (97%) CL)<br>EC50 (6h): 14.945 g/L based on: Inhibition of motility (99% CL)<br>EC50 (24 h): 16.949 g/L based on: Inhibition of motility (96%) CL)<br>NOEC (1h): 10.5 g/L based on: Inhibition of motility (97% CL)<br>NOEC (6h): 10.5 g/L based on: Inhibition of motility (99% CL)<br>NOEC (24h): 10.5 g/L based on: Inhibition of motility (97% CL)<br>Azizullah, A., et al. (2011)<br>**Toxicity data on soil micro- and macro-organisms and other environmentally relevant organisms, such as birds, bees and plants:** Species: Glycine max. (L.) Merr. (legume)<br>Short-term toxicity (Laboratory study)<br>NOEC (7 d): 9 mg/leaf/day dissolved in 0.6 ml water (based on leaf tip necrosis) Krogmeier, M.J., McCarty, G.W. & Bremner, J.M (1989) |

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| **12.2 Mobility in soil** | Adsorption coefficient: Koc: 0.037-0.064<br>Hongprayoon, C., Patrick, W.H., Lindau, C.W., Bouldin, D.R. & Reddy, K.R (1991) |
| **12.3 Persistence and degradability** | When released to soil, this material will hydrolyze into ammonium in a matter of days to several weeks. When released into the soil, 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 has an experimentally-determined bio-concentration factor (BCF) of less than 100. This material is not expected to significantly bio-accumulate. When released into the air, this material is expected to be readily degraded by reaction with photo-chemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day.<br><br>Hydrolysis: Not predicted based on theoretical assessment of the structure of the molecule.<br>Photo transformation/photolysis: No data are available: not required.<br>Biodegradation: Urea is considered to be readily biodegradable. OECD 302B |
| **12.4 bioaccumulative potential** | Experimental BCF. Not applicable (low bioaccumulation potential).<br>Log Pow 1.73(20 DegC) |
| **12.5 Results of PBT and vPvB assessment** | Urea is neither a PBT nor a vPvB substance |
| **12.6 Other adverse effects** | No data available |
| **13. DISPOSAL CONSIDERATION** | |
| **13.1 Waste treatment methods** | Collect in closed containers for disposal. Waste disposal according to official state regulations. |
| **14. TRANSPORT INFORMATION** | |

| | IMDG (sea) | ADR (road)/RID (rail) | ICAO/IATA (air) |
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| UN Number | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations |
| Class | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations |
| Proper shipping name | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations |
| Packing group | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations |
| Environmental Hazards | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations | Not regulated as dangerous under transport regulations |

14.2 Special precautions for user- Not relevant
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

14.3 Not a marine pollutant in accordance with Annex V of MARPOL 73/78

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| **15. REGULATORY INFORMATION** | |
| **15.1 Safety, health and environmental regulations/legislation** | • System of specific information relating to Dangerous preparations 2001/58/EC<br>• Dangerous Preparations Directive 1999/45/EC. |

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| **specific for the substance or mixture** | • Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances<br>• UK regulatory references:<br>o Chemicals (Hazard Information & Packaging) Regulations. The Control of Substances Hazardous to Health Regulations 1988. Health and Safety at Work Act 1974<br>• Annex II, V of MARPOL 73/78<br>Other Regulatory Classifications:<br>WHMIS (Canada): Not controlled under WHMIS (Canada).<br>DSCL (EEC): R36/38- Irritating to eyes and skin. R40- Possible risks of irreversible effects. S24/25- Avoid contact with skin and eyes.<br>HMIS (U.S.A.): Health Hazard: 2<br>Fire Hazard: 1<br>Reactivity: 0<br>Personal Protection: E<br>National Fire Protection Association (U.S.A.): Health: 2<br>Flammability: 1<br>Reactivity: 0 |
| **15.2 Chemical Safety assessment** | Not applicable (not classified as dangerous) |
| **16. OTHER INFORMATION** | |
| **Abbreviations:** | **DNEL:** Derived no effect level<br>**PNEC:** predicted no effect concentration |

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| **Disclaimer:** | The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use.<br>Users should make their own investigations to determine the suitability of the information for their particular purposes.<br>In no event shall GPIC be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, whatsoever arising, even if GPIC has been advised of the possibility of such damages. |