Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier:
Product name: Ammonia Gas
Product code (SDS NO): 2025_Ammonia_Gas_ML_E-2

1.2 Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses of the product: Production of semiconductor

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier: Asahi Graphic Corporation
Address: KOHGA Bldg. 3F, 4-23-8 Ebisu, Shibuya-ku, Tokyo, 150-0013 Japan
Telephone number: +81-3-6878-8985
FAX: +81-3-5424-3018

1.4 Emergency telephone number: +60-12-3456-7890

Section 2. Hazards identification

GHS classification and label elements of the product

2.1 Classification of the substance or mixture

PHYSICAL AND CHEMICAL HAZARDS
Flammable gases: Category 2
Gases under pressure: Liquefied gas

HEALTH HAZARDS
Acute toxicity (Inhalation): Category 3
Skin corrosion/irritation: Category 1B
Serious eye damage/eye irritation: Category 1

ENVIRONMENT HAZARDS
Hazardous to the aquatic environment, short-term (acute): Category 1

(Note) GHS classification without description: Not classified/Classification not possible

2.2 Label elements

Signal word: Danger

HAZARD STATEMENT
H221 Flammable gas
H280 Contains gas under pressure; may explode if heated
H331 Toxic if inhaled
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage
H400 Very toxic to aquatic life

PRECAUTIONARY STATEMENT
Prevention
P273 Avoid release to the environment.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P271 Use only outdoors or in a well-ventilated area.
P264 Wash contaminated parts thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response
P381 In case of leakage, eliminate all ignition sources.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P391 Collect spillage.
P321 Specific treatment is required.
P310 Immediately call a POISON CENTER/doctor/physician.
P311 Call a POISON CENTER/doctor/physician.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P363 Wash contaminated clothing before reuse.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
Storage
P403 Store in a well-ventilated place.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P410 + P403 Protect from sunlight. Store in a well-ventilated place.
Disposal
P501 Dispose of contents/container in accordance with local/national regulation.

Section 3. Composition/information on ingredients

Mixture/Substance selection:

3.1 Substance

Ingredient name	CAS No.	Content (%)
Classification code and H code	EC No.	
Ammonia	7664-41-7	>99.999
Flam. Gas 2, H221; Press. Gas; Acute Tox. 3 *, H331; Skin Corr. 1B, H314; Eye Dam.1, H318; Aquatic Acute 1, H400 [SCL's, M-Factors, ATE, Component notes] note:[U]	231-635-3	

Note : The figures shown above are not the specifications of the product.

Section 4. First-aid measures

4.1 Descriptions of first-aid measures

IF INHALED
Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor/physician.

IF ON SKIN (or hair)
Take off immediately all contaminated clothing. Rinse skin with water or shower.
Wash with plenty of soap and water.
Immediately call a POISON CENTER/doctor/physician.

IF IN EYES
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor/physician.

IF SWALLOWED
Rinse mouth. Do NOT induce vomiting.
Call a POISON CENTER/doctor/physician if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

(Symptoms when inhalation or ingestion)

Burning sensation, Cough, Sore throat, Breathlessness

(Symptoms when skin and/or eye contact)

Pain, Blisters, Skin burns, Redness, Severe burns

4.3 Indication of any immediate medical attention and special treatment needed

Specific treatment is required.

Section 5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

In case of fire, use water mist, foam, dry powder, CO2 to extinguish.

Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

5.2 Specific hazards arising from the substance or mixture

Will form toxic nitrogen oxides upon combustion.

Containers may explode when heated.

5.3 Advice for firefighters

Specific fire-fighting measures

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

Evacuate non-essential personnel to safe area.

In case of leakage, eliminate all ignition sources.

Cool container with water spray.

Apply water from a safe distance to cool and protect surrounding area.

Prevent extinguishing water from entering sewers.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

6.1 Personnel precautions, protective equipment and emergency procedures

Evacuate area.

Keep unauthorized personnel away.

Wear an air-supplied respirator for handling a spill at a poor ventilated workplace.

Wear proper protective equipment.

Eliminate all sources of ignition and ventilate the area.

6.2 Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

If flown out into rivers, contact competent authorities.

6.3 Methods and materials for containment and cleaning up

Use clean non-sparking tools to collect absorbed material.

All equipment used when handling the product must be grounded.

Preventive measures for secondary accident

Stop leak if safe to do so.

Section 7. Handling and storage

7.1 Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use non-sparking tools.
Take action to prevent static discharges.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.
Avoid contact with eyes.

Safety Measures

Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
Use personal protective equipment as required.

Any incompatibilities

Acids, Oxidizing agents, Alcohols, Metals should not be mixed with the chemicals.

Advice on general occupational hygiene

Do not get in eyes, on skin, or on clothing.
Wash contaminated parts thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wash contaminated clothing before reuse.
Wash hands thoroughly after handling.

7.2 Storage

Conditions for safe storage

Keep container tightly closed.
Keep cool.
Store locked up.
Protect from sunlight. Store in a well-ventilated place.

Container and packaging materials for safe handling data is not available.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limit

ACGIH

TWA: 25ppm; STEL: 35ppm (Eye dam; URT irr)

Malaysia OEL (Occupational Safety Health Act 1994 [Act 514] Part III)

TWA: 25ppm, 17mg/m3

8.2 Exposure controls

Appropriate engineering controls

Use in a location equipped with a general ventilation system or local exhaust ventilation system.
Eye wash station should be available.
Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Hand protection

Chemical protective gloves Recommended material(s): impermeable or chemical resistant rubber

Eye protection

Wear safety glasses with side-shields or chemical safety goggle.

Skin and body protection

Wear face protection (as specified by the manufacturer/supplier or the competent authority).

Wear protective clothing.

Wear impervious clothing and boots in case of repeated or prolonged treatment.

Section 9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state: Gas (Liquefied gas)

Color: Colorless

Odor: Irritant odor

Odor threshold data is not available.

Melting point/Freezing point: −77.7℃

Boiling point or initial boiling point: −33.3℃

Boiling range data is not available.

Flammability (gases, liquids and solids): Ignitable

Lower and upper explosion limit/flammability limit:

Lower explosion limit: 15.4vol %

Upper explosion limit: 33.6vol %

Flash point: Not applicable

Auto-ignition temperature: 630℃

Decomposition temperature data is not available.

pH data is not available.

Kinematic viscosity data is not available.

Solubility:

Solubility in water: 540g/liter(20℃)

Solubility in solvent data is not available.

n-Octanol/water partition coefficient: log Pow: −1.14

Vapor pressure: 1013kPa(26℃)

Density and/or relative density: 0.7g/cm3(−33℃)

Relative vapor density (Air=1): 0.6

Particle characteristics: Not applicable

Evaporation rate data is not available.

Section 10. Stability and Reactivity

10.1 Reactivity

Reactivity data is not available.

10.2 Chemical stability

Stable under normal storage/handling conditions.

10.3 Possibility of hazardous reactions

May form explosive gaseous mixture with air

10.4 Conditions to avoid

Conditions to avoid data is not available.

10.5 Incompatible materials

Acids, Oxidizing agents, Alcohols, Metals

10.6 Hazardous decomposition products

The following substances are produced by pyrolysis.

Nitrogen oxides

Section 11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Acute toxicity (Dermal)

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Acute toxicity (Inhalation)

[Product]

Category 3, Toxic if inhaled

[Data for components of the product]

[Table 3 of Annex VI to the CLP Regulations]

Category 3

Irritant properties

Skin corrosion/irritation

[Product]

Category 1B, Causes severe skin burns and eye damage

[Data for components of the product]

[Table 3 of Annex VI to the CLP Regulations]

Category 1B

Serious eye damage/irritation

[Product]

Category 1, Causes serious eye damage

[Data for components of the product]

[Table 3 of Annex VI to the CLP Regulations]

Category 1

Sensitization

Respiratory sensitization

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Skin sensitization

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Germ cell mutagenicity

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Carcinogenicity

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Reproductive toxicity

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Specific target organ toxicity (STOT)

STOT-single exposure

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

STOT-repeated exposure

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Aspiration hazard

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Section 12. Ecological Information

12.1 Toxicity

Aquatic toxicity

[Product]

Category 1, Very toxic to aquatic life

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[Table 3 of Annex VI to the CLP Regulations]

Category 1

Water solubility

54 g/100 mL (20℃) (source: ICSC, 2013)

12.2 Persistence and degradability

[Data for components of the product]

Rapidly degradable (rapidly nitrified in aquatic environment) (source: NITE)

12.3 Bioaccumulative potential

[Data for components of the product]

log Kow: −1.14 (source: NITE)

12.4 Mobility in soil

Mobility in soil data is not available.

12.7 Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

13.1 Waste treatment methods

Avoid release to the environment.

Dispose of contents/container in accordance with local/national regulation.

Contaminated packing

Data is not available.

Section 14. Transport Information

UN No., UN CLASS

14.1 UN Number or ID Number : 1005

14.2 UN Proper Shipping Name :

AMMONIA, ANHYDROUS

14.3 Class or division (Transport hazard class) : 2.3

Subsidiary hazard(s) : 8

14.4 Packing group : Not regulated

ERG GUIDE No.: 125

Special provisions No.: 23; 379

IMDG Code (International Maritime Dangerous Goods Regulations)

14.1 UN Number or ID Number : 1005

14.2 UN Proper Shipping Name :

AMMONIA, ANHYDROUS

14.3 Class or division (Transport hazard class) : 2.3

Subsidiary hazard(s) : 8

14.4 Packing group : Not regulated

Special provisions No.: 23; 379

IATA (Dangerous Goods Regulations)

14.1 UN Number or ID Number : 1005

14.2 UN Proper Shipping Name :

AMMONIA, ANHYDROUS

14.3 Class or division (Transport hazard class) : 2.3

Subsidiary hazard(s) : 8

14.4 Packing group : Not regulated

Special provisions No.: A2

14.5 Environmental hazards

Marine pollutants (yes/no) : yes

14.6 Special precautions for user

Special precautions for user is not applicable.

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

This product is not intended to be carried in bulk.

Section 15. Regulatory Information

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

Other information is not available.

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

15.2 Chemical safety assessment

Advice on safe handling for this product can be found in sections 7 and 8 of this SDS.

Section 16. Other information

GHS classification and labelling

Flammable gases, Category 2: H221 Flammable gas

Gases under pressure: Liquefied gas: H280 Contains gas under pressure; may explode if heated

Acute toxicity, Category 3: H331 Toxic if inhaled

Skin corrosion/irritation, Category 1B: H314 Causes severe skin burns and eye damage

Serious eye damage/eye irritation, Category 1: H318 Causes serious eye damage

Hazardous to the aquatic environment, short-term (acute), Category 1: H400 Very toxic to aquatic life

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 23rd edit., 2023 UN

ASAHI GRAPHIC Ammonia Gas, Asahi Graphic Corporation, 2025_Ammonia_Gas_ML_E-2, 02/05/2025
IMDG Code, 2024 Edition (Incorporating Amendment 42-24)
IATA Dangerous Goods Regulations (66th Edition) 2025
2024 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2025 TLVs and BEIs. (ACGIH)
Supplier's data/information
Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013
Industry Code of Practice on Chemicals Classification and Hazard Communication (Amendment) 2019 and the 2014 version
Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000
GESTIS-Stoffdatenbank
Pub Chem (OPEN CHEMISTRY DATABASE)

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety. The GHS classification data given here is based on current EU official data (Consolidated version of the CLP Regulation published in 01/12/2023 and Commission delegated regulation (EU) 2024/197 (ATP21)), Malaysia official data (ICOP CHC (AMENDMENT) 2019 PART 1).