Date of issue for the 1st edition : Feb/06/2025
Date of revision : Feb/12/2025

Safety Data Sheet

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

Product identifier:
Product name: Ammonia Gas
Product code (SDS NO): 2025_Ammonia_Gas_USFJ-2
Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses of the product: Production of semiconductor
Uses advised against: Use for purposes other than recommended uses is prohibited.
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
Emergency telephone number: +81-3-6878-8985

Section 2. Hazards identification

GHS classification and label elements of the product
Classification of the substance or mixture
PHYSICAL AND CHEMICAL HAZARDS
Flammable gases: Category 1
Gases under pressure: Liquefied gas
HEALTH HAZARDS
Acute toxicity (Inhalation): Category 4
Skin corrosion/irritation: Category 1
Serious eye damage/eye irritation: Category 1
Respiratory sensitization: Category 1
Specific target organ toxicity - single exposure: Category 1 (central nervous system, respiratory system)
Specific target organ toxicity - repeated exposure: Category 1 (respiratory system)
ENVIRONMENT HAZARDS
Hazardous to the aquatic environment, short-term (acute): Category 3
(Note) GHS classification without description: Not classified/Classification not possible
Label elements

Signal word: Danger
HAZARD STATEMENT
H220 Extremely flammable gas
H280 Contains gas under pressure; may explode if heated
H332 Harmful if inhaled
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
H370 Causes damage to organs (central nervous system, respiratory system)
H372 Causes damage to organs through prolonged or repeated exposure (respiratory system)
H402 Harmful 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 gas.
P284 In case of inadequate ventilation wear respiratory protection.
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.
P270 Do not eat, drink or smoke when using this product.

Response

P381 In case of leakage, eliminate all ignition sources.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P321 Specific treatment is required.
P314 Get medical advice/attention if you feel unwell.
P310 Immediately call a POISON CENTER/doctor/physician.
P312 Call a POISON CENTER/doctor/physician if you feel unwell.
P308 + P311 IF exposed or concerned: Call a POISON CENTER/doctor/physician.
P342 + P311 If experiencing respiratory symptoms: 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.
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:

Substance

Ingredient name	CAS No.	Content (%)	ENCS
Ammonia	7664-41-7	>99.999	1-391

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

Components contributing to the hazard

Component(s) come under Deleterious Substance(s) list of Poisonous and Deleterious Substances Control Law, Japan

Applicable

Component(s) come under Labeling, etc. article of Industrial Safety and Health Act, Japan

Applicable

Component(s) come under Deliver of Documents, etc. article of Industrial Safety and Health Act, Japan

Applicable

Section 4. First-aid measures

Descriptions of first-aid measures

IF INHALED

Remove person to fresh air and keep comfortable for breathing.
If experiencing respiratory symptoms: 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.

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

Indication of any immediate medical attention and special treatment needed

Specific treatment is required.

Section 5. Fire-fighting measures

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.

Specific hazards arising from the substance or mixture

Will form toxic nitrogen oxides upon combustion.
Containers may explode when heated.

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

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.

Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.
If flown out into rivers, contact competent authorities.

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

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe gas.

(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.

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

Control parameters

Control value and Concentration standard value

Not established

Adopted value

The Japan Society for Occupational Health

25ppm; 17mg/m3

ACGIH

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

OSHA-PEL

TWA: 50ppm, 35mg/m3

NIOSH-REL

TWA: 25ppm; STEL 35ppm

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

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): Combustible

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: 0.7(−33℃)
Relative vapor density (Air=1): 0.6
Particle characteristics: Not applicable

Section 10. Stability and Reactivity

Reactivity
Reactivity data is not available.
Chemical stability
Stable under normal storage/handling conditions.
Possibility of hazardous reactions
May form explosive vapor-air mixtures.
Conditions to avoid
Conditions to avoid data is not available.
Incompatible materials
Acids, Oxidizing agents, Alcohols, Metals
Hazardous decomposition products
The following substances are produced by pyrolysis.
Nitrogen oxides

Section 11. Toxicological Information

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 4, Harmful if inhaled
[Data for components of the product]
[NITE-CHRIP]
gas: rat LC50: 7679 ppm (4-hour)
Irritant properties
Skin corrosion/irritation
[Product]
Category 1, Causes severe skin burns and eye damage
[Data for components of the product]
[NITE-CHRIP]
Category 1
Serious eye damage/irritation
[Product]
Category 1, Causes serious eye damage
[Data for components of the product]
[NITE-CHRIP]
Category 1

Sensitization
Respiratory sensitization
[Product]
Category 1, May cause allergy or asthma symptoms or breathing difficulties if inhaled
[Data for components of the product]
[NITE-CHRIP]
Category 1
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]
Category 1, Causes damage to organs
[Data for components of the product]
[NITE-CHRIP]
Category 1 (central nervous system, respiratory system)
STOT-repeated exposure
[Product]
Category 1, Causes damage to organs through prolonged or repeated exposure
[Data for components of the product]
[NITE-CHRIP]
Category 1 (respiratory system)
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

Toxicity
Aquatic toxicity
[Product]
Category 3, Harmful to aquatic life

[Data for components of the product]
Hazardous to the aquatic environment, short-term (acute)
[NITE-CHRIP]
Fish (Oncorhynchus mykiss) 96-hour LC50: 13.0 mg/L (a converted value equivalent to total ammonia. test substance: NH4Cl, pH: 8.29)
Hazardous to the aquatic environment, long-term (chronic)
[NITE-CHRIP]
Crustacea (Mysidopsis bahia) 32-day NOEC: 3.47 mg/L (a converted value equivalent to total ammonia. test substance: NH4Cl, pH: 7.92-8.01)

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

Persistence and degradability
[Data for components of the product]
Rapidly degradable (rapidly nitrified in aquatic environment) (source: NITE)

Bioaccumulative potential
[Data for components of the product]
log Kow: -1.14 (source: NITE)

Mobility in soil
Mobility in soil data is not available.

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

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
UN Number or ID Number : 1005
UN Proper Shipping Name :
AMMONIA, ANHYDROUS
Class or division (Transport hazard class) : 2.3
Subsidiary hazard(s) : 8
Packing group : Not regulated
ERG GUIDE No.: 125
Special provisions No.: 23; 379

IMDG Code (International Maritime Dangerous Goods Regulations)
UN Number or ID Number : 1005
UN Proper Shipping Name :
AMMONIA, ANHYDROUS
Class or division (Transport hazard class) : 2.3
Subsidiary hazard(s) : 8
Packing group : Not regulated
Special provisions No.: 23; 379

ASAHI GRAPHIC Ammonia Gas,Asahi Graphic Corporation,2025_Ammonia_Gas_USFJ-2,Feb/12/2025

IATA (Dangerous Goods Regulations)
UN Number or ID Number : 1005
UN Proper Shipping Name :
AMMONIA, ANHYDROUS
Class or division (Transport hazard class) : 2.3
Subsidiary hazard(s) : 8
Packing group : Not regulated
Special provisions No.: A2

Environmental hazards
Marine pollutants (yes/no) : yes

Special precautions for user
Special precautions for user is not applicable.

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.

Rules and regulations on domestic transport
Ship Safety Act
Class 2 : Gases-Division 2.3 Toxic gases
Civil Aeronautics Act
Prohibited

Section 15. Regulatory Information

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

Poisonous and Deleterious Substances Control Law, Japan
Deleterious Substances (Attached Table 2)
Applicable100%

Industrial Safety and Health Act, Japan
Specified Substances Gr.3
Applicable
Chemical Substances requiring Labeling and Deliver of Documents, etc.
Labeling, etc.
Applicable
Report required substances
Applicable
Appended Table 1 Dangerous Substances (related to Article 1, 6, and 9-3)
Flammable gases

PRTR law, Japan
The product is not applicable to Pollutant Release and Transfer Register (PRTR) law, Japan

Labor Standards Act, Japan
Chemical substances or compounds (including alloys) causing disease (Regulation, Appended Table 1-2-4-1)
Applicable

Fire Service Act, Japan
Fire fighting inhibitor need a notification
Regulation on dangerous substance attached table-2: Deleterious Substances (quantity 200kg)
Ammonia

High Pressure Gas Safety Act, Japan
Liquefied gas : Pressure (at service temperature, or 35℃) =>0.2MPa
Specified High-pressure gases
Toxic gases

Not applicable to Specified Chemical Substances, Monitoring Chemical Substances or Priority Assessment Chemical Substances of Chemical Substances Control Law, Japan.

Offensive Odor Control Law, Japan
Applicable

ASAHI GRAPHIC Ammonia Gas,Asahi Graphic Corporation,2025_Ammonia_Gas_USFJ-2,Feb/12/2025

Air Pollution Control Law, Japan
Specific substances
Applicable
Water Pollution Control Law, Japan
Hazardous substance(s)
Applicable
U.S. Toxic Substances Control Act (TSCA) Inventory
Chemicals listed in TSCA Inventory
Applicable
Superfund Amendments and Reauthorizations Act (SARA), Title III
SARA 313 (TRI)
Applicable
California proposition 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16. Other information

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
IMDG Code, 2024 Edition (Incorporating Amendment 42-24)
IATA Dangerous Goods Regulations (66th Edition) 2025
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2025 TLVs and BEIs. (ACGIH)
JIS Z 7252 : 2019
JIS Z 7253 : 2019
2024 Recommendation on TLVs (JSOH)
Notification No. 0111-1 (January 11, 2022), Chemical Hazards Control Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare
Supplier's data/information
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 Data published in Japan (National Institute of Technology and Evaluation (NITE) Chemical Risk Information Platform (NITE-CHRIP), up to FY2023).