

SIG SOUTHERN INDUSTRIAL GAS SDN BHD


SAFETY DATA SHEET

AMMONIA

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name	Ammonia
Synonyms	Ammonia Anhydrous, Ammonia Gas
Chemical Formula	NH ₃
CAS No	7440-37-1
Use of Substance	Manufacture of fertilizers, Industrial application.
Manufacturer	SOUTHERN INDUSTRIAL GAS SDN. BHD. PLO 137, Kawasan Perindustrian Senai III, 81400 Senai, Johor.
Contact Number	07-598 3863
Emergency Phone Number (24 hr)	07-598 3863

2. HAZARDS IDENTIFICATION

Chemical Name	CAS No.	Classification Code	Labeling		
			H-code	Signal Word	Hazard Pictogram
Ammonia	7664-41-7	Flam. Gas 2 Press. Gas Acute Tox. 3 (inh) Skin Corr. 1B Eye Dam. 1 Aquatic Acute 1	H 221 H 280 H 331 H 314 H 318 H 400	Danger	

Classification of the substance	Flam. Gas 2	: Flammable gases category 2
	Press. Gas	: Gases under pressure (Compressed gas)
	Acute Tox. 3	: Acute toxicity category 3
	Skin Corr. 1B	: Skin corrosion or irritation category 1B

	Eye Dam. 1	: Serious eye damage or eye irritation category 1
	Aquatic	: Hazardous to the aquatic environment – acute hazard
	Acute 1	category 1
Hazard Statement	H 221	: Flammable gas.
	H 280	: Contains gas under pressure; may explode if heated.
	H 331	: Toxic if inhaled
	H 314	: Cause severe skin burns and eye damage
	H 318	: Cause serious eye damage
	H 400	: Very toxic to aquatic life
Precautionary Statement	P 210	: Keep away from heat/sparks/open flames/hot surfaces – No smoking.
	P 260	: Do not breathe gas / vapors
	P 264	: Wash skin & eye thoroughly after handling
	P 273	: Avoid release to the environment
	P 280	: Wear protective gloves/protective clothing/eye protection/face protection.
	P 310	: Immediately call a POISON CENTER or doctor / physician.
	P 321	: Specific treatment (see section 4 first aid measures on this label)
	P 363	: Wash contaminated clothing before reuse.
	P 377	: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
	P 381	: Eliminate all ignition sources if safe to do so.
	P 391	: Collect spillage
	P 301 + P 330 + P 331	: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
	P 303 + P 361 + P 353	: IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
	P 304 + P 340	: If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P 305 + P 351 + P 338	: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P 403	: Store in a well-ventilated place.
	P 501	: Dispose of contents/container in accordance with local/regional/national/international regulations.
Other Hazards	Asphyxiant in high concentration.	

3. COMPOSITION/INFORMATION ON INGREDIENTS

Common Name	Ingredient	CAS Number	Purity	OSHA-PEL
Ammonia	Ammonia	7664-41-7	100%	50 ppm

*Contains no other components or impurities which influence the classification of the product.

4. FIRST AID MEASURES

Eye Contact

Get medical attention immediately.
Persons with potential exposure to ammonia should not wear contact lenses. Call a physician or poison center.
Immediately flush eye with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for 20-30 minutes.
May cause severe chemical burns to cornea.

Inhalation

Remove contact lenses.
The conscious person who has inhaled a concentration of ammonia which causes irritation effects should go to an uncontaminated area and inhale fresh air or oxygen.
Remove victim to uncontaminated area wearing self-contained breathing apparatus.
Keep victim warm and rested.
Call a doctor.

Skin Contact

Apply artificial respiration if breathing stopped.
When breathing has been restored, 100% oxygen is administered, but not for more than 1 hour of continuous treatment at one time.
If skin contact is extensive and emergency showers available, the victim should get under the emergency shower immediately.
Contaminated clothing and shoes should be removed under the shower.
In other cases, the affected areas should be washed thoroughly with plenty of water for 20- 30 minutes.

Ingestion

Get medical attention
Ingestion is not considered as a potential route of exposure.

Most important symptoms and effects, both acute and delayed

May cause severe chemical burns to skin and cornea.
Suitable first aid treatment should be immediately available.
Seek medical advice before using the product. May result in pulmonary oedema.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media

All known extinguishants can be used.

Unsuitable extinguishing media

None known

Special hazards arising from the chemical

The minimum ignition energy for ammonia is very high; however low concentrations are required for ignition.
Release in a confined space may present an explosion hazard.

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Cylinders may vent rapidly or rupture violently from pressure when involved in a fire situation.

Special protective equipment and precautions for fire fighters

In case of fire: Stop leak if safe to do so.
Continue water spray from protected position until container stays cool.
Use extinguishants to contain the fire.
Isolate the source of the fire or let it burn out.
In confined space use self-contained breathing apparatus.
Since ammonia is soluble in water, it is the best extinguishing medium.
Water will extinguish the fire and also absorb the escaped ammonia gas.
Use water spray to cool surrounding containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Evacuate area.
Use self-contained breathing apparatus and chemically protective clothing.
Ensure adequate air ventilation.
Monitor concentration of released product.
Eliminate ignition sources.

Environmental precautions

Try to stop release.
Prevent from entering sewers, basements and work pits, or any place where its accumulation can be dangerous.

Clean up methods

Hose down area with water.
Wash contaminated equipment or sites of leaks with copious quantities of water.
Keep area evacuated and free from ignition sources until any spilled liquid has evaporated.
Provide adequate ventilation.
Return cylinder to authorized distributor.

7. HANDLING AND STORAGE

Precaution for safe handling

Only properly trained or experienced persons should handle the gases under pressure.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature.
Suck back of water into the container must be prevented.
Do not allow back feed into the container.
Contact your gas supplier if in doubt.
Never use direct flame or electrical heating devices to raise the pressure of cylinder.
Keep away from ignition sources (including static discharges).
Eliminate sources of ignition. Earth-ground and bond all lines and equipment associated with the ammonia system. Electrical equipment should be non-sparking or explosion proof.
Valve protection caps must remain in place unless container is

secured with valve outlet piped to use point.

Condition for safe storage

Keep container below 50°C in a well-ventilated place.
 Avoid asphalted locations for storage, transfer and use (ignition risk if split).
 Containers should not be stored in conditions likely to encourage corrosion.
 Container should be stored in the vertical position and properly secured to prevent falling over.
 Gaseous or liquid anhydrous ammonia corrodes certain metals at ambient temperatures. The presence of oxygen enhances the corrosion of ordinary or semi-alloy steels. The addition of water inhibits this enhancement. Keep anhydrous ammonia system scrupulously dry.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limit – OSHA-PEL
 TWA :50ppm 8 hours

Appropriate engineering controls

Ensure adequate air ventilation.
 Use process enclosures, local exhaust ventilation or other engineering controls to keep workers exposure to airborne contaminants below any recommended or statutory limits.
 The engineering controls also need to keep gas, vapor or dust concentration below any below any lower explosive limits.
 Use explosion-proof ventilation equipment.
 System under pressure should be regularly checked for leakage.
 Exhaust gas should be vented to a gas treatment system.

Personal protection equipment

Wash hands, forearms and face thoroughly after handling chemical products; before eating, smoking and using the lavatory and at the end of the working period.
 Wear goggles for eye protection.
 Gas tight chemical goggles or full-face piece respirator.
 Appropriate protective and chemical-resistant gloves, boots, clothing and splash protection, or fully encapsulating vapor protective clothing.
 Contact lens should not be worn when working.
 Wear suitable hand, body and head protection.
 Do not eat, drink or smoke when using the product.
 For emergency release use NIOSH approved air-supplying respirator systems (SCBA or airline/ escape bottle) using a full-face mask and at a minimum Grade D air.
 For normal condition below fifty times the exposure limit but where engineering can not control exposure below the applicable limits, then appropriately selected air-purifying respirators with full-face mask can be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless, gas
Odour	Ammoniacal
Odour threshold	Odour threshold is subjective and inadequate to warn for over exposure.
pH	If dissolved in water pH value will be affected.
Melting point / Freezing point	-77.7 °C
Boiling point	-33 °C
Flash point	Not applicable for gases and gas mixtures.
Evaporation rate	Not available
Flammability	Flammable
Upper/lower explosive limit	LEL : 15% UEL : 30%
Vapour pressure	8.6 bar (20°C)
Vapour density (Air =1)	0.6
Relative density	Not applicable
Solubility	Hydrolyses
Partition coefficient	Not available
Auto ignition temperature	630 °C
Decomposition temperature	Not available
Viscosity	Not applicable.

10. STABILITY AND REACTIVITY

Reactivity	No reactivity hazard other than the effects described in sub-section below
Chemical Stability	Stable under normal conditions of use and storage.
Possibility of hazardous reactions	Can form potential explosive atmosphere in air. May react violently with oxidants.
Condition to avoid	None.
Incompatible materials	Oxidizing agents. Air, Oxidizer. May react violently with acids. Reacts with water to form corrosive alkalis. Corrosive to galvanized metal. Corrosive to brass, Cu, Zn, Au, Ag, and Hg.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Nitrogen dioxide, Nitric oxide.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity

Oral: LD₅₀

Species :Rat

Value in standard unit mg/kg : 350 mg/kg

Dermal: LD₅₀ > No information available.

Inhalation: LC₅₀

Species : Rat

Exposure time : 1 h

Value in non-standard unit :9500ppm

Species : Rat

Exposure time : 4 h

Value in non-standard unit :2000ppm

Skin corrosion / irritation

Severe irritant

Serious eye damage/ irritation

Severe irritant

Respiratory or skin sensitisation

Not classified as a sensitizer

Germ cell mutagenicity

Not available

Carcinogenicity product

Not available

Reproductive toxicity product

Not available

Specific target organ toxicity – single exposure product.

Not available

Specific target organ toxicity – repeated exposure product

Not available

Aspiration hazard product

Not available

12. ECOLOGICAL INFORMATION

Ecotoxicity effect

Acute toxicity product

Toxic to aquatic organisms.

24hr LC50 (rainbow trout - fertilized egg) = >3.58 mg/L.

24hr LC50 (rainbow trout - alevins 0-50 days old) = >3.58 mg/L.

24hr LC50 (rainbow trout - fry 85 days old) = 0.068 mg/L.

24hr LC50 (rainbow trout - adult): 0.097 mg/L.

48hr LC50 (Daphnia magna): 24 - 189 mg/L.

96hr LC50 (rainbow trout): 0.53 mg/L

Additional ecological information	Ammonia is readily oxidized to nitrile which is also very toxic to fish.
Persistence and degradability	The substance is biodegradable. Unlikely to persist.
Bioaccumulative potential	The substance has no potential for bioaccumulation.
Mobility in soil	The substance has low mobility in soil. The substance is soluble in water.
Other adverse effects	Ammonia gas can cause damage to the ecology due to its high alkalinity and affinity for water. pH changes can occur in the immediate environs of a spill which could affect both flora and fauna.

13. DISPOSAL CONSIDERATIONS

Waste from residue / unused product	Do not discharge into any place where its accumulation could be dangerous. Avoid discharge to atmosphere. Gas may be scrubbed in water Gas may be scrubbed in sulphuric acid solution.
Contaminated packaging	Do not reuse empty containers. Empty remaining contents. Dispose of container and unused contents in accordance with local and national regulation. Return cylinder to supplier.

14. TRANSPORT INFORMATION

UN Number	UN 1005
UN proper shipping name	Ammonia, Anhydrous
Transport hazard class(es)	2.3
Packing group	Not applicable
Environmental hazards	Environmentally hazardous.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable
Information	Ensure the driver is understand well on the potential hazards of the load and knows what to do in the event of an accident or an emergency. Secured the product containers before transporting it. Ensure that the cylinder valve is closed and not leaking. Container valve guards or caps should be in place. Ensure adequate air ventilation.

15. REGULATORY INFORMATION

Contact local government authority.

16. OTHER INFORMATION

Date of Preparation / Revision of SDS

20-October-2014 / Rev. 01

Legend to the abbreviations and
acronyms used

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P 305 + P 351 + P 338	: IF IN EYES: Rinse cautiously with water for several minutes.

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Remove contact lenses, if present and easy to do. Continue rinsing.

P 403 : Store in a well-ventilated place.

P 501 : Dispose of contents/container in accordance with local/regional/national/international regulations.

Abbreviations

LC ₅₀	:	median lethal concentration
LD ₅₀	:	median lethal dose
PEL	:	Permissible exposure limits

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