SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier : Ammonia

CAS No. : 7664-41-7

Chemical formula : NH3

Synonyms : Ammonia, Anhydrous

REACH Registration Number: 01-2119488876-14

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

Use of the Substance/Mixture : Industrial and professional use. Perform risk assessment prior to use.

Restrictions on Use : Not for consumer use.

1.3. Details of the supplier of the safety data sheet : Air Products Ireland Ltd
Unit 950 Western Industrial Estate
Kileen Road
Dublin 12
Ireland

Email Address – Technical Information : GASTECH@airproducts.com

Telephone : 1-4659650

1.4. Emergency telephone number : (01) 463 4200 / +353 1 463 4200

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Flammable gases - Category 2 H221:Flammable gas.
Gases under pressure - Liquefied gas. H280:Contains gas under pressure; may explode if heated.
Acute toxicity - Inhalation Category 3 H331:Toxic if inhaled.
Skin corrosion - Category 1B H314:Causes severe skin burns and eye damage.
Serious Eye Damage - Category 1 H318:Causes serious eye damage.
Acute aquatic toxicity. - Category 1 H400:Very toxic to aquatic life
Chronic aquatic toxicity - Category 2 H411:Toxic to aquatic life with long lasting effects.

2.2. Label elements

Hazard pictograms/symbols

Signal Word: Danger

Hazard Statements:

H221:Flammable gas.
H280:Contains gas under pressure; may explode if heated.
H314:Causes severe skin burns and eye damage.
H331:Toxic if inhaled.
H410:Very toxic to aquatic life with long lasting effects.
EUH071:Corrosive to the respiratory tract.

Precautionary Statements:

Prevention	:	P210:Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. P260:Do not breathe dust/fume/gas/mist/vapours/spray. P273:Avoid release to the environment. P280:Wear protective gloves/protective clothing/eye protection/face protection.
Response	:	P303+P361+P353 :IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304+P340 :IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P315 :Get immediate medical advice/attention. P377 :Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381 :Eliminate all ignition sources if safe to do so.
Storage	:	P403:Store in a well-ventilated place. P405:Store locked up.

2.3. Other hazards

Flammable.
Vapors may form explosive mixture with air.
Immediate fire and explosion hazard exists when mixed with air at concentrations exceeding the lower flammability limit (LFL).
Wear self-contained breathing apparatus and protective suit.
Direct contact with liquid can cause frostbite.
May react violently with water.
Do not breathe gas.
Corrosive to eyes, respiratory system and skin.
Compressed liquefied gas.
Substance does not meet the criteria for PBT and vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

Environmental Effects

Dangerous for the environment.

SECTION 3: Composition/information on ingredients

3.1. Substances

Components	EINECS / ELINCS Number	CAS Number	Concentration (Volume)
Ammonia, anhydrous	231-635-3	7664-41-7	100 %

Components	Classification (CLP)	REACH Reg. #
Ammonia, anhydrous	Flam. gas 2 ;H221 Press. Gas (Liq.) ;H280 Acute Tox. Inha 3 ;H331 Eye Dam. 1 ;H318 Skin Corr. 1B ;H314 Aquatic Acute 1 ;H400 Aquatic Chronic 2 ;H411	01-2119488876-14

Refer to section 16 for full text of each relevant hazard statement (H).

Concentration is nominal. For the exact product composition, please refer to technical specifications.

3.2. Mixtures : Not applicable.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Use chemically protective clothing.

Eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Keep eye wide open while rinsing.

Skin contact : Flush with copious amounts of water until treatment is available. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and badly.

Ingestion : Ingestion is not considered a potential route of exposure.

Inhalation : Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Mouth to mouth resuscitation is not recommended. Use a barrier device. If unconscious place in recovery position and seek medical advice. In case of shortness of breath, give oxygen. Consult a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms : Aspiration may cause pulmonary edema and pneumonitis. Coughing, irritation in the throat and nasal tract. May cause severe chemical burns to skin and cornea.

Suitable first-aid treatment should be immediately available. Seek medical advice before using product. Cough. Headache. Nausea.

4.3. Indication of any immediate medical attention and special treatment needed

Treatment : Treat bronchospasm and laryngeal edema if present. Observe for delayed chemical pneumonitis, pulmonary hemorrhage or edema. Obtain medical attention. If exposed or concerned: Get medical attention/advice.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray or fog.
Foam.The product itself does not burn.
Use extinguishing media appropriate for surrounding fire.

Extinguishing media which must not be used for safety reasons. : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

: Extinguish fire only if gas flow can be stopped. If possible, shut-off source of gas and allow the fire to burn itself out. Downwind personnel must be evacuated. Ammonia can form explosive compounds when combine d with mercury. Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Product is nonflammable and does not support combustion. Use of water may result in the formation of very toxic aqueous solutions. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray. Do not allow run-off from firefighting to enter drains or water courses. If possible, stop flow of product.

5.3. Advice for firefighters

: In the event of fire, wear self-contained breathing apparatus. Use self-contained breathing apparatus and chemically protective clothing. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.

Further information : Use of water may result in the formation of very toxic aqueous solutions., Combustion by-products may be toxic., If flames are accidentally extinguished, explosive re-ignition may occur; therefore, appropriate measures should be taken (e.g. total evacuation to protect persons from cylinder fragments and toxic fumes) should a rupture occur., In the event of fire, cool tanks with water spray .

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

: Remove all sources of ignition. Evacuate personnel to safe areas. Ventilate the area. Approach suspected leak areas with caution. Use self-contained breathing apparatus or positive pressure air line with mask and escape pack in areas where concentration is unknown or above the exposure limits.

6.2. Environmental precautions

: Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3. Methods and material for containment and cleaning up	:	Ventilate the area. Wash contaminated equipment or sites of leaks wit h copious quantities of water. Reduce vapor with fog or fine water spray.
Additional advice	:	If possible, stop flow of product. Increase ventilation to the release area and monitor concentrations. If leak is from cylinder or cylinder valve, call the emergency telephone number. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs.
6.4. Reference to other sections	:	For more information refer to Sections 8 & 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Use equipment rated for cylinder pressure. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Use an adjustable strap wrench to remove over-tight or rusted caps. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Close valve after each use and when empty. Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment. Do not subject containers to abnormal mechanical shock. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Keep container valve outlets clean and free from contaminates particularly oil and water. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. Purge air from system before introducing gas. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Avoid suckback of water, acid and alkalis. Installation of a cross purge assembly between the cylinder and the regulator is recommended. When returning cylinder install valve outlet cap or plug leak tight. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C (122°F). Never attempt to increase liquid withdrawal rate by pressurizing the container without first checking with the supplier. Never permit liquefied gas to become trapped in parts of the system as this may result in hydraulic rupture.

7.2. Conditions for safe storage, including any incompatibilities

Flammable storage areas should be separated from oxygen and other oxidizers by a minimum distance of 20 ft. (6.1 m.) or by a barrier of non-combustible material at least 5 ft. (1.5 m.) high, having a fire resistance rating of at

least 1/2 hour. Post "No Smoking or Open Flames" signs in the storage areas. Full containers should be stored so that oldest stock is used first. Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Observe all regulations and local requirements regarding storage of containers. Stored containers should be periodically checked for general condition and leakage. Local codes may have special requirements for toxic gas storage. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Return empty containers in a timely manner.

Technical measures/Precautions

Containers containing flammable gases should be stored away from other combustible materials. Where necessary containers containing oxygen and oxidants should be separated from flammable gases by a fire resistant partition. Provide sufficient air exchange and/or exhaust in work rooms. Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance whit local regulations.

7.3. Specific end use(s)

Refer to section 1 or the extended SDS if applicable.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit(s)

Ammonia, anhydrous	Time Weighted Average (TWA)	20 ppm	14 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
Ammonia, anhydrous	Short Term Exposure Limit (STEL)	50 ppm	36 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
Ammonia, anhydrous	Time Weighted Average (TWA)	20 ppm	14 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended
Ammonia, anhydrous	Short Term Exposure Limit (STEL)	50 ppm	36 mg/m3	EU. Scientific Committee on Occupational Exposure Limit Values (SCOELs), European Commission - SCOEL, as amended

If applicable, refer to the extended section of the SDS for further information on CSA.

DNEL: Derived no effect level (Workers)

Acute - systemic effects, inhalation	47.6 mg/m3
Acute - local effects, inhalation	36 mg/m3

Acute - systemic effects, dermal	:	6.8 mg/kg
Long-term - local effects, inhalation	:	14 mg/m3
Long-term - systemic effects, dermal	:	6.8 mg/kg
Long-term - systemic effects, inhalation	:	47.6 mg/m3

PNEC: predicted no effect concentration

Aqua (freshwater)	:	0.0011 mg/l
Aqua (marine water)	:	0.0011 mg/l

8.2. Exposure controls

Engineering measures

Handle product only in closed system or provide appropriate exhaust ventilation at machinery.
Provide natural or mechanical ventilation to prevent accumulation above exposure limits.
Provide readily accessible eye wash stations and safety showers.

Personal protective equipment

Respiratory protection	:	Keep self-contained breathing apparatus readily available for emergency use. Users of breathing apparatus must be trained. Use gas filters and full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Gas filters do not protect against oxygen deficiency. Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136. Consult respiratory device supplier´s product information for the selection of the appropriate device. Self-contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
Hand protection	:	Wear work gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk. Wear chemically resistant protective gloves. Standard EN 374 - Protective gloves against chemicals. Consult glove manufacturer´s product information on material suitability and material thickness. The breakthrough time of the selected gloves must be greater than the intended use period.
Eye/face Protection	:	Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection.
Skin and body protection	:	Use chemically protective clothing. Safety shoes are recommended when handling cylinders. Standard EN ISO 20345 - Personal protective equipment - Safety footwear. Keep suitable chemically resistant protective clothing readily available for emergency use. Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.

Special instructions for protection and hygiene	:	Ensure adequate ventilation, especially in confined areas. Provide good ventilation and/or local exhaust to prevent accumulation of concentrations above exposure limits.
Environmental Exposure Controls	:	If applicable, refer to the extended section of the SDS for further information on CSA.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

(a/b) Physical state/Colour	:	Liquefied gas. Colorless gas
(c) Odour	:	Ammoniacal.
(d) Density	:	0.0007 g/cm3 (0.044 lb/ft3) at 21 °C (70 °F) Note: (as vapor)
(e) Relative Density	:	0.7 (water = 1)
(f) Melting point / freezing point	:	-108 °F (-77.7 °C)
(g) Boiling point/range	:	-27 °F (-33 °C)
(h) Vapor pressure	:	124.73 psia (8.60 bara) at 68 °F (20 °C)
(i) Water solubility	:	517 g/l Hydrolyses.
(j) Partition coefficient: n-octanol/water [log Kow]	:	Not applicable for inorganic gases.
(k) pH	:	Not applicable for gases and gas mixtures.
(l) Viscosity	:	No reliable data available.
(m) Particle characteristics	:	Not applicable for gases and gas mixtures.
(n) Upper and lower explosion / flammability limits	:	33.6 %(V) / 15.4 %(V)
(o) Flash point	:	Not applicable for gases and gas mixtures.
(p) Autoignition temperature	:	630 °C
(q) Decomposition temperature	:	Not applicable.

9.2. Other information

Explosive properties	:	Not applicable.
Oxidizing properties	:	Not applicable.

Molecular Weight	:	17.03 g/mol
Odor threshold	:	Odour threshold is subjective and inadequate to warn of overexposure.
Evaporation rate	:	Not applicable for gases and gas mixtures.
Flammability (solid, gas)	:	Refer to product classification in Section 2
Specific Volume	:	1.4040 m3/kg (22.49 ft3/lb) at 21 °C (70 °F)
Upper flammability limit	:	33.6 %(V)
Lower flammability limit	:	15.4 %(V)
Relative vapor density	:	0.588 (air = 1)

SECTION 10: Stability and reactivity

10.1. Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.
10.2. Chemical stability	:	Stable under normal conditions.
10.3. Possibility of hazardous reactions	:	Vapors may form explosive mixture with air.
10.4. Conditions to avoid	:	Heat, flames and sparks.
10.5. Incompatible materials	:	Copper, silver, cadmium and zinc and their alloys; mercury, tin, acids, alcohols, aldehydes, halogens and oxidizers. Ammonia can form explosive compounds when combined with mercury. May react violently with oxidants. May react violently with acids. Reacts with water to form corrosive alkalis. Overexposure to the atmosphere results in water absorption.
10.6. Hazardous decomposition products	:	No decomposition if stored normally.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure

Effects on Eye	:	Causes eye burns. May cause blindness. Causes severe eye burns. May cause permanent eye injury.
Effects on Skin	:	Causes skin burns. Contact with liquid may cause cold burns/frostbite. Causes skin burns.
Inhalation Effects	:	Toxic by inhalation. Can cause severe eye, skin and respiratory tract burns.

Irritating to respiratory system. Can cause severe lung damage. May be fatal if inhaled. Delayed adverse effects possible. Prolonged exposure to small concentrations may result in pulmonary edema. Delayed fatal pulmonary edema possible.

Ingestion Effects : Ingestion is not considered a potential route of exposure.

Symptoms : Aspiration may cause pulmonary edema and pneumonitis. Coughing, irritation in the throat and nasal tract. May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product. Cough. Headache. Nausea.

Acute toxicity

Acute Oral Toxicity : No data is available on the product itself.

Acute Inhalation Toxicity : LC50 (1 h) : 4000 ppm Species : Rat.

Acute Dermal Toxicity : No data is available on the product itself.

Skin corrosion/irritation : Causes skin burns.

Serious eye damage/eye irritation : Risk of serious damage to eyes.

Sensitization. : No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity : This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : No data available.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

SECTION 12: Ecological information

12.1. Toxicity

Aquatic toxicity : LC50 (96 h) : 0.89 mg/l Species : Fish.
EC50 (48 h) : 101 mg/l Species : Daphnia magna.
May cause pH changes in aqueous ecological systems.

Toxicity to other : No data is available on the product itself.

organisms

12.2. Persistence and degradability

Biodegradability : Readily biodegradable

12.3. Bioaccumulative potential

Refer to Section 9 "Partition Coefficient (n-octanol/water)".

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

If applicable, refer to the extended section of the SDS for further information on CSA.

12.6. Other adverse effects

This product has no known eco-toxicological effects.

Effect on the ozone layer	:	No known effects from this product.
Ozone Depleting Potential	:	None
Effect on global warming	:	When discharged in large quantities may contribute to the greenhouse effect.
Global Warming Potential	:	None

SECTION 13: Disposal considerations

13.1. Waste treatment methods : In accordance with local and national regulations. Return unused product in original cylinder to supplier. Contact supplier if guidance is required. Must not be discharged to atmosphere. Refer to the EIGA code of practice Doc. 30 "Disposal of Gases", downloadable at http://www.eiga.org for more guidance on suitable disposal methods. List of hazardous waste codes: 16 05 04*: gases in pressure containers (including halons) containing hazardous substances.

Contaminated packaging : Return cylinder to supplier.

SECTION 14: Transport information

14.1. UN number

UN/ID No. : UN1005

14.2. UN proper shipping name

Transport by road/rail (ADR/RID)	:	AMMONIA, ANHYDROUS
Transport by air (ICAO-TI / IATA-DGR)	:	Ammonia, anhydrous
Transport by sea (IMDG)	:	AMMONIA, ANHYDROUS

14.3. Transport hazard class(es)

Label(s) : 2.3 (8)

Transport by road/rail (ADR/RID)
Class or Division : 2
ADR/RID Hazard ID no. : 268
Tunnel Code : (C/D)

Transport by sea (IMDG)
Class or Division : 2.3

14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable.
Transport by air (ICAO-TI / IATA-DGR) : Not applicable.
Transport by sea (IMDG) : Not applicable.

14.5. Environmental hazards

Transport by road/rail (ADR/RID)
Marine Pollutant : Yes

Transport by air (ICAO-TI / IATA-DGR)
Marine Pollutant : Yes

Transport by sea (IMDG)
Marine Pollutant : Yes
Segregation Group : Alkalis

14.6. Special precautions for user

Transport by road/rail (ADR/RID)

** NOTE: This product contains a substance that: 1) is regulated as a Marine Pollutant, or 2) meets the definition of toxic to the aquatic environment.

Transport by air (ICAO-TI / IATA-DGR)
Passenger and Cargo Aircraft : Transport forbidden
Cargo Aircraft only : Transport forbidden

Transport by sea (IMDG)

* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

** NOTE: This product contains a substance that: 1) is regulated as a Marine Pollutant, or 2) meets the definition of toxic to the aquatic environment.

Further Information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

SECTION 15: Regulatory information

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

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.
	TCSI	Included on Inventory.

Other Regulations
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.

COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Regulation (EC) No 1272/2008 the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

15.2. Chemical safety assessment

A CSA has been carried out. Applicable EXPOSURE SCENARIOS are available at the following link:
www.airproducts.com/esds/7664-41-7

SECTION 16: Other information

Ensure all national/local regulations are observed.

Hazard Statements:
H221 Flammable gas.
H280 Contains gas under pressure; may explode if heated.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H400 Very toxic to aquatic life
H411 Toxic to aquatic life with long lasting effects.

Indication of Method:
Flammable gases Category 2 Flammable gas. Calculation method

Gases under pressure Liquefied gas. Contains gas under pressure; may explode if heated. Calculation method

Acute toxicity Category 3 Toxic if inhaled. Calculation method

Skin corrosion Category 1B Causes severe skin burns and eye damage. Calculation method

Serious Eye Damage Category 1 Causes serious eye damage. Calculation method

Acute aquatic toxicity. Category 1 Very toxic to aquatic life Calculation method

Chronic aquatic toxicity Category 2 Toxic to aquatic life with long lasting effects. Calculation method

Abbreviations and acronyms:
ATE - Acute Toxicity Estimate
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
EINECS - European Inventory of Existing Commercial Chemical Substances
ELINCS - European List of Notified Chemical Substances
CAS# - Chemical Abstract Service number
PPE - Personal Protection Equipment
Kow - octanol-water partition coefficient
DNEL - Derived No Effect Level
LC50 - Lethal Concentration to 50 % of a test population
LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose)
NOEC - No Observed Effect Concentration
PNEC - Predicted No Effect Concentration
RMM - Risk Management Measure
OEL - Occupational Exposure Limit
PBT - Persistent, Bioaccumulative and Toxic
vPvB - Very Persistent and Very Bioaccumulative
STOT - Specific Target Organ Toxicity
CSA - Chemical Safety Assessment
EN - European Standard
UN - United Nations
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
IATA - International Air Transport Association
IMDG - International Maritime Dangerous Goods
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
WGK - Water Hazard Class

Key literature references and sources for data:
ECHA - Guidance on the compilation of safety data sheets
ECHA - Guidance on the application of the CLP Criteria
ARIEL database

Prepared by : Air Products and Chemicals, Inc. Global EH&S Department

For additional information, please visit our Product Stewardship web site at
http://www.airproducts.com/productstewardship/

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws. COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.