SAFETY DATA SHEET

Creation Date 23-Nov-2009 **Revision Date** 01-Jul-2016 **Revision Number** 5

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identification

Product Description: **Ammonia solution 35%**
Cat No. : **A/3240/PB15, A/3240/PB17**
Molecular Formula H5 N O
Reach Registration Number 01-2119488876-14 (for the anhydrous form)

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

Recommended Use Laboratory chemicals.
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company Fisher Scientific UK
Bishop Meadow Road, Loughborough,
Leicestershire LE11 5RG, United Kingdom
E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

Chemtrec US: (800) 424-9300
Chemtrec EU: 001 (202) 483-7616
Tel: 01509 231166

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Based on available data, the classification criteria are not met

Health hazards

Skin Corrosion/irritation	Category 1 B (H314)
Serious Eye Damage/Eye Irritation	Category 1 (H318)
Specific target organ toxicity - (single exposure)	Category 3 (H335)

Environmental hazards

Acute aquatic toxicity	Category 1 (H400)
Chronic aquatic toxicity	Category 2 (H411)

2.2. Label elements

Signal Word **Danger**

Hazard Statements

H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation
H410 - Very toxic to aquatic life with long lasting effects

Precautionary Statements

P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
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 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
P310 - Immediately call a POISON CENTER or doctor/ physician

2.3. Other hazards

Results of PBT and vPvB assessment
In accordance with Annex XIII of the REACH Regulation, inorganic substances do not require assessment

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No	EC-No.	Weight %	CLP Classification - Regulation (EC) No 1272/2008
Ammonium hydroxide	1336-21-6	215-647-6	35	Skin Corr. 1B (H314) Eye Dam. 1 (H318) STOT SE 3 (H335) Aquatic Acute 1 (H400) Aquatic Chronic 2 (H411)
Ammonia	7664-41-7	EEC No. 231-635-3	-	Flam. Gas 2 (H221) Skin Corr. 1B (H314) Acute Tox. 3 (H331) Aquatic Acute 1 (H400) Aquatic Chronic 2 (H411) (EUH071)
Water	7732-18-5	231-791-2	65	-

Reach Registration Number	01-2119488876-14 (for the anhydrous form)

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General Advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Immediate medical attention is required.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing before re-use. Call a physician immediately.

Ingestion Do not induce vomiting. Never give anything by mouth to an unconscious person. Clean mouth with water. Call a physician immediately.

Inhalation If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove from exposure, lie down. Call a physician immediately.

Protection of First-aiders Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

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

Causes burns by all exposure routes. . Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

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

Notes to Physician Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. CO_2, dry chemical, dry sand, alcohol-resistant foam.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous Combustion Products
Nitrogen oxides (NOx), Thermal decomposition can lead to release of irritating gases and vapors.

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional ecological information. Avoid release to the environment. Collect spillage.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. After cleaning, flush away traces with water.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Use only under a chemical fume hood. Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Do not ingest. Do not breathe vapors or spray mist.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits
List source(s):

Component	European Union	The United Kingdom	France	Belgium	Spain
Ammonia	TWA: 20 ppm 8 hr TWA: 14 mg/m³ 8 hr STEL: 50 ppm 15 min STEL: 36 mg/m³ 15 min	STEL: 35 ppm 15 min STEL: 25 mg/m³ 15 min TWA: 25 ppm 8 hr TWA: 18 mg/m³ 8 hr	TWA / VME: 10 ppm (8 heures). restrictive limit TWA / VME: 7 mg/m³ (8 heures). restrictive limit STEL / VLCT: 20 ppm. restrictive limit STEL / VLCT: 14 mg/m³. restrictive limit	TWA: 20 ppm 8 uren TWA: 14 mg/m³ 8 uren STEL: 50 ppm 15 minuten STEL: 36 mg/m³ 15 minuten	STEL / VLA-EC: 50 ppm (15 minutos). STEL / VLA-EC: 36 mg/m³ (15 minutos). TWA / VLA-ED: 20 ppm (8 horas) TWA / VLA-ED: 14 mg/m³ (8 horas)

Component	Italy	Germany	Portugal	The Netherlands	Finland
Ammonium hydroxide					STEL: 50 ppm 15 minuutteina STEL: 36 mg/m³ 15 minuutteina
Ammonia	TWA: 20 ppm 8 ore. Media Ponderata nel Tempo TWA: 14 mg/m³ 8 ore. Media Ponderata nel Tempo STEL: 50 ppm 15 minuti. Breve termine STEL: 36 mg/m³ 15 minuti. Breve termine	TWA: 20 ppm (8 Stunden). AGW - exposure factor 2 TWA: 14 mg/m³ (8 Stunden). AGW - exposure factor 2 TWA: 20 ppm (8 Stunden). MAK TWA: 14 mg/m³ (8 Stunden). MAK Höhepunkt: 40 ppm Höhepunkt: 28 mg/m³	STEL: 50 ppm 15 minutos STEL: 36 mg/m³ 15 minutos TWA: 20 ppm 8 horas TWA: 14 mg/m³ 8 horas	STEL: 36 mg/m³ 15 minuten TWA: 14 mg/m³ 8 uren	TWA: 20 ppm 8 tunteina TWA: 14 mg/m³ 8 tunteina STEL: 50 ppm 15 minuutteina STEL: 36 mg/m³ 15 minuutteina

Component	Austria	Denmark	Switzerland	Poland	Norway
Ammonia	MAK-KZW: 50 ppm 15	TWA: 20 ppm 8 timer	STEL: 40 ppm 15	STEL: 28 mg/m³ 15	TWA: 15 ppm 8 timer

	Minuten MAK-KZW: 36 mg/m³ 15 Minuten MAK-TMW: 20 ppm 8 Stunden MAK-TMW: 14 mg/m³ 8 Stunden	TWA: 14 mg/m³ 8 timer	Minuten STEL: 28 mg/m³ 15 Minuten TWA: 20 ppm 8 Stunden TWA: 14 mg/m³ 8 Stunden	minutach TWA: 14 mg/m³ 8 godzinach	TWA: 11 mg/m³ 8 timer TWA: 20 ppm 8 timer STEL: 15 ppm 15 minutter. STEL: 11 mg/m³ 15 minutter. STEL: 20 ppm 15 minutter. this Norm applies only on farmers during a transition period from 2013 to 2014 and at livestock production farms which were constructed before the year 2002

Component	Bulgaria	Croatia	Ireland	Cyprus	Czech Republic
Ammonia	TWA: 14.0 mg/m³ TWA: 20 ppm STEL : 50 ppm STEL : 36.0 mg/m³	kože TWA-GVI: 20 ppm 8 satima. TWA-GVI: 14 mg/m³ 8 satima. STEL-KGVI: 50 ppm 15 minutama. STEL-KGVI: 36 mg/m³ 15 minutama.	TWA: 20 ppm 8 hr. anhydrous TWA: 14 mg/m³ 8 hr. anhydrous STEL: 50 ppm 15 min STEL: 36 mg/m³ 15 min	STEL: 50 ppm STEL: 36 mg/m³ TWA: 20 ppm TWA: 14 mg/m³	TWA: 14 mg/m³ 8 hodinách. Ceiling: 36 mg/m³

Component	Estonia	Gibraltar	Greece	Hungary	Iceland
Ammonia	TWA: 20 ppm 8 tundides. TWA: 14 mg/m³ 8 tundides. STEL: 50 ppm 15 minutites. STEL: 36 mg/m³ 15 minutites.		STEL: 50 ppm STEL: 35 mg/m³ TWA: 50 ppm TWA: 35 mg/m³	STEL: 36 mg/m³ 15 percekben. CK TWA: 14 mg/m³ 8 órában. AK	STEL: 50 ppm 5 minutes STEL: 36 mg/m³ 5 minutes TWA: 20 ppm 8 klukkustundum. TWA: 14 mg/m³ 8 klukkustundum. Skin notation Ceiling: 40 ppm Ceiling: 28 mg/m³

Component	Latvia	Lithuania	Luxembourg	Malta	Romania
Ammonia	STEL: 50 ppm STEL: 36 mg/m³ TWA: 20 ppm TWA: 14 mg/m³	TWA: 20 ppm IPRD TWA: 14 mg/m³ IPRD STEL: 50 ppm STEL: 36 mg/m³	TWA: 20 ppm 8 Stunden TWA: 14 mg/m³ 8 Stunden STEL: 50 ppm 15 Minuten STEL: 36 mg/m³ 15 Minuten	TWA: 20 ppm TWA: 14 mg/m³ STEL: 50 ppm 15 minuti STEL: 36 mg/m³ 15 minuti	TWA: 20 ppm 8 ore TWA: 14 mg/m³ 8 ore STEL: 50 ppm 15 minute STEL: 36 mg/m³ 15 minute

Component	Russia	Slovak Republic	Slovenia	Sweden	Turkey
Ammonia	MAC: 20 mg/m³	Ceiling: 36 mg/m³ TWA: 20 ppm TWA: 14 mg/m³	TWA: 20 ppm 8 urah TWA: 14 mg/m³ 8 urah STEL: 50 ppm 15 minutah anhydrous STEL: 35 mg/m³ 15 minutah anhydrous	LLV: 20 ppm 8 timmar. LLV: 14 mg/m³ 8 timmar. CLV: 50 ppm 5 min CLV: 36 mg/m³ 5 min	TWA: 20 ppm 8 saat TWA: 14 mg/m³ 8 saat STEL: 50 ppm 15 dakika STEL: 36 mg/m³ 15 dakika

Biological limit values

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Monitoring methods

BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of

exposure to chemical and biological agents.

Derived No Effect Level (DNEL) See table for values; Workers

Route of exposure	Acute effects (local)	Acute effects (systemic)	Chronic effects (local)	Chronic effects (systemic)
Oral				
Dermal		6.8 mg/kg bw/day		6.8 mg/kg bw/day
Inhalation	36 mg/m³	47.6 mg/m³	14 mg/m³	47.6 mg/m³

Predicted No Effect Concentration (PNEC) See values below.

- **Fresh water** 0.0011 mg/l
- **Marine water** 0.0011 mg/l
- **Water Intermittent** 0.0068 mg/l

8.2. Exposure controls

Engineering Measures

Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

- **Eye Protection** Goggles (European standard - EN 166)
- **Hand Protection** Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Butyl rubber	> 480 minutes	0.5 mm	EN 374	(minimum requirement)
Viton (R)	> 480 minutes	0.4 mm		
Neoprene	> 480 minutes	0.45 mm		

- **Skin and body protection** Long sleeved clothing

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

- **Respiratory Protection** When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
  To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly
- **Large scale/emergency use** Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
  Recommended Filter type: Inorganic gases and vapours filter Type B Grey or Ammonia and organic ammonia derivatives filter Type K Green conforming to EN14387
- **Small scale/Laboratory use** Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
  Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141
  When RPE is used a face piece Fit Test should be conducted

- **Environmental exposure controls** Prevent product from entering drains. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Colorless	
Physical State	Liquid	
Odor	Ammonia-like	
Odor Threshold	5 ppm	
pH	> 12 @ 20°C	
Melting Point/Range	No data available	
Softening Point	No data available	
Boiling Point/Range	No information available	
Flash Point	No information available	**Method -** No information available
Evaporation Rate	No data available	
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	No data available	
Vapor Pressure	No data available	
Vapor Density	No data available	(Air = 1.0)
Specific Gravity / Density	0.88 - 0.91	
Bulk Density	Not applicable	Liquid
Water Solubility	soluble	
Solubility in other solvents	No information available	

Partition Coefficient (n-octanol/water)

Component	**log Pow**
Ammonia	-1.14

Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	Not explosive
Oxidizing Properties	Not oxidising

9.2. Other information

Molecular Formula	H5 N O
Molecular Weight	35.05

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

10.4. Conditions to avoid

Incompatible products. Excess heat.

10.5. Incompatible materials

Strong oxidizing agents. Acids. Metals. Aluminium. Zinc. copper. Copper alloys. Fluorine. Halogens.

10.6. Hazardous decomposition products

Nitrogen oxides (NOx). Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Product Information

(a) acute toxicity;

Oral Based on available data, the classification criteria are not met
Dermal Based on available data, the classification criteria are not met
Inhalation Based on available data, the classification criteria are not met

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ammonium hydroxide	-		
Ammonia	LD50 = 350 mg/kg (Rat)		LC50 = 2000 ppm (Rat) 4 h
Water	-		

(b) skin corrosion/irritation; Category 1 B

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;

Respiratory Based on available data, the classification criteria are not met
Skin Based on available data, the classification criteria are not met

(e) germ cell mutagenicity; Based on available data, the classification criteria are not met

(f) carcinogenicity; Based on available data, the classification criteria are not met

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; Based on available data, the classification criteria are not met

(h) STOT-single exposure; Category 3

Results / Target organs Respiratory system.

(i) STOT-repeated exposure; Based on available data, the classification criteria are not met

Target Organs No information available.

(j) aspiration hazard; Based on available data, the classification criteria are not met

Symptoms / effects,both acute and delayed Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects Very toxic to aquatic organisms. The product contains following substances which are hazardous for the environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Ammonium hydroxide	0.53 mg/l LC50 96h 0.75 - 3.4 mg/l LC50 96h 8.2 mg/L LC50 96h	EC50: 0.66 mg/L/48h	-	-
Ammonia	LC50: = 1.19 mg/L, 96h static (Poecilia reticulata) LC50: > 1.5 mg/L, 96h (Poecilia reticulata) LC50: = 5.9 mg/L, 96h static (Pimephales promelas)	EC50 = 25.4 mg/L 48h		EC50 = 2.0 mg/L 5 min

	LC50: 0.73 - 2.35 mg/L, 96h (Pimephales promelas) LC50: = 1.17 mg/L, 96h flow-through (Lepomis macrochirus) LC50: 0.26 - 4.6 mg/L, 96h (Lepomis macrochirus) LC50: = 0.44 mg/L, 96h (Cyprinus carpio)			

12.2. Persistence and degradability

Persistence Soluble in water, Persistence is unlikely, based on information available.

Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential Bioaccumulation is unlikely

Component	log Pow	Bioconcentration factor (BCF)
Ammonia	-1.14	No data available

12.4. Mobility in soil The product is water soluble, and may spread in water systems Will likely be mobile in the environment due to its water solubility. Highly mobile in soils

12.5. Results of PBT and vPvB assessment Results of PBT and vPvB assessment.
In accordance with Annex XIII of the REACH Regulation, inorganic substances do not require assessment.

12.6. Other adverse effects

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

Persistent Organic Pollutant This product does not contain any known or suspected substance

Ozone Depletion Potential This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues / Unused Products Should not be released into the environment. Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point.

European Waste Catalogue (EWC) According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

Other Information Do not dispose of waste into sewer. Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Large amounts will affect pH and harm aquatic organisms. Do not let this chemical enter the environment.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number UN2672
14.2. UN proper shipping name AMMONIA SOLUTION
14.3. Transport hazard class(es) 8
14.4. Packing group III

ADR

14.1. UN number UN2672
14.2. UN proper shipping name AMMONIA SOLUTION

14.3. Transport hazard class(es) 8
14.4. Packing group III

IATA

14.1. UN number UN2672
14.2. UN proper shipping name AMMONIA SOLUTION
14.3. Transport hazard class(es) 8
14.4. Packing group III

14.5. Environmental hazards Dangerous for the environment
Product is a marine pollutant according to the criteria set by IMDG/IMO

14.6. Special precautions for user No special precautions required

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

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

International Inventories X = listed

Component	EINECS	ELINCS	NLP	TSCA	DSL	NDSL	PICCS	ENCS	IECSC	AICS	KECL
Ammonium hydroxide	215-647-6	-		X	X	-	X	X	X	X	X
Ammonia	231-635-3	-		X	X	-	X	X	X	X	X
Water	231-791-2	-		X	X	-	X	-	X	X	X

Component	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Ammonia	50 tonne	200 tonne

National Regulations

Component	Germany - Water Classification (VwVwS)	Germany - TA-Luft Class
Ammonium hydroxide	WGK 2	
Ammonia	WGK 2	

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.
Take note of Dir 94/33/EC on the protection of young people at work
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3
H221 - Flammable gas
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H331 - Toxic if inhaled
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life
H411 - Toxic to aquatic life with long lasting effects

Legend

CAS - Chemical Abstracts Service
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic
TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
PNEC - Predicted No Effect Concentration
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
POW - Partition coefficient Octanol:Water
vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor
ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
MARPOL - International Convention for the Prevention of Pollution from Ships
ATE - Acute Toxicity Estimate
VOC - Volatile Organic Compounds

Key literature references and sources for data
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
First aid for chemical exposure, including the use of eye wash and safety showers.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
Chemical incident response training.

Creation Date	23-Nov-2009
Revision Date	01-Jul-2016
Revision Summary	SDS sections updated, 2, 5, 8, 9, 10, 11, 16.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet