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

1.1. Product identifier : Phosphine

Chemical formula : PH3

Synonyms : Phosphine, Hydrogen Phosphide, Phosphorated Hydrogen

REACH Registration Number: 01-2120138413-64

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

Use of the Substance/Mixture : General Industrial

Restrictions on Use : No data available.

1.3. Details of the supplier of the safety data sheet : Versum Materials UK, Limited
5th Floor
6 St. Andrew Street
London
EC4A 3AE

Email Address – Technical Information : techinfo@versummaterials.com

Telephone :

1.4. Emergency telephone number :

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Flammable gases - Category 1 H220:Extremely flammable gas.

Gases under pressure - Liquefied gas. H280:Contains gas under pressure; may explode if heated.
Acute toxicity - Inhalation Category 1 H330:Fatal if inhaled.
Skin corrosion - Category 1B H314:Causes severe skin burns and eye damage.
Acute aquatic toxicity. - Category 1 H400:Very toxic to aquatic life

2.2. Label elements

Hazard pictograms/symbols

Signal Word: Danger

Hazard Statements:

H220:Extremely flammable gas.
H280:Contains gas under pressure; may explode if heated.
H314:Causes severe skin burns and eye damage.
H330:Fatal if inhaled.
H400:Very toxic to aquatic life

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.
P271:Use only outdoors or in a well-ventilated area.
P280:Wear protective gloves/protective clothing/eye protection/face protection.
P284:Wear respiratory protection.

Response : P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P377 :Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 :Eliminate all ignition sources if safe to do so.

Disposal : P501:Disposal of contents/container to be specified in accordance with regulations.

2.3. Other hazards

May ignite spontaneously in contact with air.
Inhalation may be fatal.
Use a back flow preventative device in the piping.
Use only with equipment purged with and inert gas or evacuated prior to discharge.
Use only with equipment of compatible materials of construction, rated for cylinder pressure.
Do not open valve until connected to equipment prepared for use.
When returning cylinder install valve outlet cap or plug leak tight.
Close valve after each use and when empty.
Extremely flammable liquefied gas.
May form explosive mixtures in air.
Vapors may spread long distances and ignite.
Immediate fire and explosion hazard exists when mixed with air at concentrations exceeding the lower flammability limit (LFL).
Do not breathe gas.
Direct contact with liquid can cause frostbite.
Self contained breathing apparatus (SCBA) may be required.

Environmental Effects

Dangerous for the environment.

SECTION 3: Composition/information on ingredients

3.1. Substances

Components	EINECS / ELINCS Number	CAS Number	Concentration (Volume)
Phosphine	232-260-8	7803-51-2	100 %

Components	Classification (CLP)	REACH Reg. #
Phosphine	Flam. gas 1 ;H220 Press. Gas (Liq.) ;H280 Skin Corr. 1B ;H314 Eye Dam. 1 ;H318 Aquatic Acute 1 ;H400 Acute Tox. Inha 2 ;H330	01-2120138413-64

If REACH registration numbers do not appear the substance is either exempt from registration, does not meet the minimum volume threshold for registration, or the registration date has not yet come due.
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 : Prompt medical attention is required in all cases of exposure. Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

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 : If liquid product comes in contact with skin, avoid breathing vapor. Remove contaminated clothing and flush with plenty of lukewarm water for several minutes. Wash frost-bitten areas with plenty of water. Do not remove clothing. Cover wound with sterile dressing.

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. In case of shortness of breath, give oxygen. Consult a doctor.

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

Symptoms : Headache. Nausea. Lachrymation. Cyanosis. Shortness of breath. Vomiting. Abdominal pain. Vertigo. Inhalation may provoke the following symptoms: Fatigue. Pulmonary irritation and edema.

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

Treatment : If exposed or concerned: Get medical attention/advice.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Extinguishing media which must not be used for safety reasons. : Carbon dioxide (CO_2).

5.2. Special hazards arising from the substance or mixture

: May ignite spontaneously in contact with air. Cylinders containing this product do not have a pressure relief device. Gas is heavier than air and may collect in low areas or travel along the ground where there may be an ignition source present. Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. If possible, shut off the source of gas and allow the fire to burn itself out. 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). Extinguish fire only if gas flow can be stopped. Move away from container and cool with water from a protected position. Keep adjacent cylinders cool by spraying with large amounts of water until the fire burns itself out. Combustion by-products may be toxic. Do not allow run-off from firefighting to enter drains or water courses.

5.3. Advice for firefighters

: Use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

: Evacuate personnel to safe areas. Remove all sources of ignition. 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. Never enter a confined space or other area where the flammable gas concentration is greater the 10% of its lower flammable limit. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ventilate the area.

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. Approach suspected leak areas with caution. Keep area evacuated and free from ignition sources until any spilled liquid has evaporated. (Ground free from frost).
Additional advice	:	Large releases may require considerable downwind evacuation. 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

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. 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. 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. Ensure equipment is adequately earthed.

7.2. Conditions for safe storage, including any incompatibilities

Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Full containers should be stored so that oldest stock is used first. 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. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Smoking should be prohibited within storage areas or while handling product or containers. Display "No Smoking or Open Flames" signs in the storage areas. The amounts of flammable or toxic gases in storage should be kept to a minimum. Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance whit local regulations. Provide sufficient air exchange and/or exhaust in work rooms.

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)

Phosphine	Short Term Exposure Limit (STEL): EH40 WEL	0.2 ppm	0.28 mg/m3
Phosphine	Time Weighted Average (TWA): EU ELV	0.1 ppm	0.14 mg/m3
Phosphine	Short Term Exposure Limit (STEL): EU ELV	0.2 ppm	0.28 mg/m3

Phosphine	Time Weighted Average (TWA): EH40 WEL	0.1 ppm	0.14 mg/m3
Phosphine	Time Weighted Average (TWA): EU SCOELS	0.1 ppm	0.14 mg/m3
Phosphine	Short Term Exposure Limit (STEL): EU SCOELS	0.2 ppm	0.28 mg/m3

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

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.

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 working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.

Eye/face Protection : Safety glasses recommended when handling cylinders.
Standard EN 166 - Personal eye-protection.

Skin and body protection : Cold temperatures may cause embrittlement of protective material resulting in breakage and exposure.
Contact with cold evaporating liquid on gloves or suit may cause cryogenic burns or frostbite.
Consider the use of flame resistant anti-static safety clothing.
Standard EN ISO 14116 - Limited flame spread materials.
Standard EN ISO 1149-5 - Protective clothing: Electrostatic properties.
Safety shoes are recommended when handling cylinders.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

Special instructions for : Ensure adequate ventilation, especially in confined areas. Provide good

protection and hygiene		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	:	Odor can persist. Poor warning properties at low concentrations. Rotten fish.
(d) Density	:	0.0014 g/cm3 (0.087 lb/ft3) at 21 °C (70 °F) Note: (as vapor)
(e) Relative Density	:	0.74 (water = 1)
(f) Melting point / freezing point	:	-209 °F (-134 °C)
(g) Boiling point/range	:	-126 °F (-88 °C)
(h) Vapor pressure	:	501.81 psia (34.60 bara) at 68 °F (20 °C)
(i) Water solubility	:	0.3 g/l
(j) Partition coefficient (n-octanol/water)	:	Not applicable.
(k) pH	:	Not applicable.
(l) Viscosity	:	Not applicable.
(m) Particle characteristics	:	No data available.
(n) Upper and lower explosion / flammability limits	:	95 %(V) / 1.6 %(V)
(o) Flash point	:	Not applicable.
(p) Autoignition temperature	:	< 0 °C
(q) Decomposition	:	No data available.

temperature

9.2. Other information

Explosive properties	:	No data available.
Oxidizing properties	:	No data available.
Molecular Weight	:	34 g/mol
Odor threshold	:	No data available.
Evaporation rate	:	Not applicable.
Flammability (solid, gas)	:	Refer to product classification in Section 2
Specific Volume	:	0.709 m3/kg (11.36 ft3/lb) at 21 °C (70 °F)
Upper flammability limit	:	95 %(V)
Lower flammability limit	:	1.6 %(V)
Relative vapor density	:	1.2 (air = 1)

SECTION 10: Stability and reactivity

10.1. Reactivity	:	Refer to possibility of hazardous reactions and/or incompatible materials sections.
10.2. Chemical stability	:	Stable under normal conditions.
10.3. Possibility of hazardous reactions	:	No data available.
10.4. Conditions to avoid	:	Heat, flames and sparks.
10.5. Incompatible materials	:	Aluminium. Copper. Oxidizing agents. Oxygen.

10.6. Hazardous decomposition products	:	Phosphorus. Hydrogen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure

Effects on Eye	:	May cause eye irritation. Contact with liquid may cause cold burns/frostbite.
Effects on Skin	:	Contact with liquid may cause cold burns/frostbite.
Inhalation Effects	:	Fatal intoxication possible with low concentrations. Irritant and a general systemic poison. May be fatal if inhaled.
Ingestion Effects	:	Ingestion is not considered a potential route of exposure.
Symptoms	:	Headache. Nausea. Lachrymation. Cyanosis. Shortness of breath. Vomiting. Abdominal pain. Vertigo. Inhalation may provoke the following symptoms: Fatigue. Pulmonary irritation and edema.

Acute toxicity

Acute Oral Toxicity	:	No data is available on the product itself.
Acute Inhalation Toxicity	:	LC50 (1 h) : 20 ppm Species : Rat.
Acute Dermal Toxicity	:	No data is available on the product itself.
Skin corrosion/irritation	:	Reacts with water to form corrosive acids.
Serious eye damage/eye irritation	:	Reacts with water to form corrosive acids.
Sensitization.	:	No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity	:	No data available.

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)	:	Phosphine is an irritant to the eyes and airway and is a central nervous system depressant. Injury to the kidneys and other organs may also occur. Mechanisms of injury are not well defined but presumably involve damage to enzyme systems. Injury to the kidneys may result in albuminuria and hematuria. Severe exposure to phosphine may be lethal. Absorption of phosphine may be associated with disturbances in sight, speech and motor functions. Manifestations of chronic phosphorous poisoning may occur, namely, skeletal injury. Chronic exposure may cause skeletal changes, cardiac abnormalities, pulmonary and liver dysfunction, jaundice, and kidney inflammation.
Aspiration hazard	:	No data available.

SECTION 12: Ecological information

12.1. Toxicity

Aquatic toxicity	:	May cause pH changes in aqueous ecological systems.
Toxicity to other organisms	:	No data is available on the product itself.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

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

12.4. Mobility in soil

Because of its high volatility, the product is unlikely to cause ground pollution.

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

Toxic to aquatic organisms.

Effect on the ozone layer		
Ozone Depleting Potential	:	No data available.
Global Warming Potential	:	No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods	:	Destruction via incineration followed by scrubbing is the most commonly used method. In accordance with local and national regulations. Contact supplier if guidance is required. Return unused product in original cylinder to supplier. 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 dangerous substances.
Contaminated packaging	:	Return cylinder to supplier.

SECTION 14: Transport information

ADR

UN/ID No.	:	UN2199
Proper shipping name	:	PHOSPHINE
Class or Division	:	2
Tunnel Code	:	(D)
Label(s)	:	2.3 (2.1)
Marine Pollutant	:	Yes

** 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.

IATA

Transport Forbidden

IMDG

UN/ID No.	:	UN2199
Proper shipping name	:	PHOSPHINE
Class or Division	:	2.3
Label(s)	:	2.3 (2.1)
RQ Substance	:	Yes
Marine Pollutant	:	Yes
Segregation Group:	:	None

* 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.

RID

UN/ID No.	:	UN2199
Proper shipping name	:	PHOSPHINE
Class or Division	:	2
Label(s)	:	2.3 (2.1)
Marine Pollutant	:	Yes

** 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 in bulk according to Annex II of Marpol and the IBC Code
For complete transportation information, contact customer service.

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.

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.

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.

Control of Substances Hazardous to Health Regulations 2002 (as amended)

Health and Safety at Work etc. Act 1974

Management of Health and Safety at Work Regulations (Northern Ireland) 2000 c.388, and as amended

The Health and Safety at Work etc. Act 1974 (Application to Environmentally Hazardous Substances) Regulations 2002 (England and Wales and Scotland) 11 March 2002 c.282, and as amended

Health and Safety at Work Order (Application to Environmentally Hazardous Substances) Regulations (Northern Ireland) 2003 (Northern

Ireland) 14 March 2003 c52, and as amended

The Control of Major Accident Hazards Regulations 2015 c483

The Control of Major Accident Hazards Regulations (Northern Ireland) 2015 c325

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2011 c1885, and as amended

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations with amendments (Northern Ireland) 2011 c365

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 c.407

The Water Environment Regulations (Northern Ireland) 2017 c.81

Pollution Prevention and Control Act 1999 c.24

The Fluorinated Greenhouse Gases Regulations 2015 c.310

The Fluorinated Greenhouse Gases Regulations (Northern Ireland) 2015 c.425

The Acetylene Safety (England and Wales and Scotland) Regulations 2014 c.1639

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972 c.917

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations (Northern Ireland) 1975 c.256

Dangerous Substances and Explosive Atmospheres Regulations (Northern Ireland) 2003 c.152

The Dangerous Substances and Explosive Atmospheres Regulations 2002 c.2776

Pollution Prevention and Control Act 1999

The Environmental Permitting (England and Wales) Regulations 2016

Ozone Depleting Substances Regulations 2015

15.2. Chemical safety assessment

If this product does not contain exposure scenarios, the components in this product are either exempt from REACH, do not meet the minimum volume threshold for a CSA, or the CSA has not yet been completed.

SECTION 16: Other information

Ensure all national/local regulations are observed.

Hazard Statements:
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H330 Fatal if inhaled.
H400 Very toxic to aquatic life

Indication of Method:
Flammable gases Category 1 Extremely flammable gas. Calculation method

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

Acute toxicity Category 1 Fatal if inhaled. Calculation method

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

Acute aquatic toxicity. Category 1 Very toxic to aquatic life 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 : Versum Materials, Product Regulatory Department

For additional information, please visit Versum Materials' Product Stewardship web site.
http://www.versummaterials.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.