

SAFETY DATA SHEET

DY-MARK MINE MARKING STD ALL COLOURS

Infosafe No.: HXUSI
ISSUED Date : 20/08/2021
ISSUED by: DY-MARK

Section 1 - Identification

Product Identifier

DY-MARK MINE MARKING STD ALL COLOURS

Company Name

DY-MARK

Address

89 Formation Street Wacol
QLD 4076 Australia

Telephone/Fax Number

Tel: +61 7 3327 3004

Fax: +61 7 3327 3009

Emergency Phone Number

+61 7 3327 3099

E-mail Address

info@dymark.com.au

Recommended use of the chemical and restrictions on use

Relevant identified uses:

The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing.

Before starting consider control of exposure by mechanical ventilation.

Application is by spray atomisation from a hand held aerosol pack.

Use according to manufacturer's directions.

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Other Names

Name	Product Code
DY-MARK MINE MARKING STD ALL COLOURS	38013501 HZ BLACK
DY-MARK MINE MARKING STD ALL COLOURS	38013502 HZ RED
DY-MARK MINE MARKING STD ALL COLOURS	38013503 HZ BLUE
DY-MARK MINE MARKING STD ALL COLOURS	38013504 HZ GREEN
DY-MARK MINE MARKING STD ALL COLOURS	38013505 HZ YELLOW
DY-MARK MINE MARKING STD ALL COLOURS	38013506 HZ ORANGE
DY-MARK MINE MARKING STD ALL COLOURS	38013511 HZ WHITE
DY-MARK MINE MARKING STD ALL COLOURS	38013513 HZ GREY
DY-MARK MINE MARKING STD ALL COLOURS	38033501 VERT BLACK
DY-MARK MINE MARKING STD ALL COLOURS	38033502 VERT RED
DY-MARK MINE MARKING STD ALL COLOURS	38033503 VERT BLUE
DY-MARK MINE MARKING STD ALL COLOURS	38033504 VERT GREEN
DY-MARK MINE MARKING STD ALL COLOURS	38033505 VERT YELLOW
DY-MARK MINE MARKING STD ALL COLOURS	38033506 VERT ORANGE
DY-MARK MINE MARKING STD ALL COLOURS	38033511 VERT WHITE
DY-MARK MINE MARKING STD ALL COLOURS	38913501 BLACK HORIZ
DY-MARK MINE MARKING STD ALL COLOURS	38913502 RED HORIZ
DY-MARK MINE MARKING STD ALL COLOURS	38913503 BLUE HORIZ
DY-MARK MINE MARKING STD ALL COLOURS	38913504 GREEN HORIZ
DY-MARK MINE MARKING STD ALL COLOURS	38913505 YELLOW HORIZ
DY-MARK MINE MARKING STD ALL COLOURS	38913506 ORANGE HORIZ
DY-MARK MINE MARKING STD ALL COLOURS	38913511 WHITE HORIZ
DY-MARK MINE MARKING STD ALL COLOURS	38933501 BLACK UPRIGHT
DY-MARK MINE MARKING STD ALL COLOURS	38933502 RED UPRIGHT
DY-MARK MINE MARKING STD ALL COLOURS	38933503 BLUE UPRIGHT
DY-MARK MINE MARKING STD ALL COLOURS	38933504 GREEN UPRIGHT
DY-MARK MINE MARKING STD ALL COLOURS	38933505 YELLOW UPRIGHT
DY-MARK MINE MARKING STD ALL COLOURS	38933506 ORANGE UPRIGHT
DY-MARK MINE MARKING STD ALL COLOURS	38933511 WHITE UPRIGHT

Additional Information

Website: <http://www.dymark.com.au>

Chemical Name: Not Applicable

Other means of identification: Not Available

Section 2 - Hazard(s) Identification

GHS classification of the substance/mixture

[1] Aerosols Category 1, Acute Toxicity (Oral) Category 4, Aspiration Hazard Category 1, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2A, Specific Target Organ Toxicity - Single Exposure (Narcotic Effects) Category 3, Reproductive Toxicity Category 2, Specific Target Organ Toxicity - Repeated Exposure Category 2

Signal Word (s)

DANGER

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Hazard Statement (s)

AUH044 Risk of explosion if heated under confinement.
H222+H229 Extremely flammable aerosol. Pressurized container: may burst if heated.
H302 Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H361d Suspected of damaging the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.

Pictogram (s)

Flame, Exclamation mark, Health hazard



Precautionary Statement – Prevention

P201 Obtain special instructions before use.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P211 Do not spray on an open flame or other ignition source.
P251 Do not pierce or burn, even after use.
P260 Do not breathe mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P280(w) Wear protective gloves, protective clothing, eye protection and face protection.
P264 Wash all exposed external body areas thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

Precautionary Statement – Response

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P331 Do NOT induce vomiting.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.
P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of water and soap.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P330 Rinse mouth.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse.

Precautionary Statement – Storage

P405 Store locked up.
P410+P412 Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Precautionary Statement – Disposal

P501 Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

Other Information

Classification of the substance or mixture:
HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

Legend: 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

Section 3 - Composition and Information on Ingredients

Ingredients

Name	CAS	Proportion
Toluene	108-88-3	20-30 %weight
Resin	Not available	5-10 %weight
Acetone	67-64-1	5-15 %weight
Filler	Not Available	5-10 %weight
Propylene glycol monomethyl ether - alpha isomer	107-98-2	1-5 %weight
Dimethyl ether	115-10-6	10-30 %weight
Hydrocarbon propellant	68476-85-7.	10-30 %weight
PIGMENT	Not Available	1-20 %weight

Other Information

Substances:

See section below for composition of Mixtures

Mixtures:

Legend: 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available

Section 4 - First Aid Measures

Inhalation

If aerosols, fumes or combustion products are inhaled:

Remove to fresh air.

Lay patient down. Keep warm and rested.

Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

If breathing is shallow or has stopped, ensure clear airway and apply resuscitation, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

Transport to hospital, or doctor.

Ingestion

Avoid giving milk or oils.

Avoid giving alcohol.

Not considered a normal route of entry.

Skin

If solids or aerosol mists are deposited upon the skin:

Flush skin and hair with running water (and soap if available).

Remove any adhering solids with industrial skin cleansing cream.

DO NOT use solvents.

Seek medical attention in the event of irritation.

Eye

If aerosols come in contact with the eyes:

Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes with fresh running water.

Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

Transport to hospital or doctor without delay.

Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Indication of immediate medical attention and special treatment needed if necessary

Treat symptomatically.

For lower alkyl ethers:

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BASIC TREATMENT

Establish a patent airway with suction where necessary.
Watch for signs of respiratory insufficiency and assist ventilation as necessary.
Administer oxygen by non-rebreather mask at 10 to 15 l/min.
A low-stimulus environment must be maintained.
Monitor and treat, where necessary, for shock.
Anticipate and treat, where necessary, for seizures.
DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

ADVANCED TREATMENT

Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
Positive-pressure ventilation using a bag-valve mask might be of use.
Monitor and treat, where necessary, for arrhythmias.
Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
Drug therapy should be considered for pulmonary oedema.
Hypotension without signs of hypovolaemia may require vasopressors.
Treat seizures with diazepam.
Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.

Ethers may produce anion gap acidosis. Hyperventilation and bicarbonate therapy might be indicated.

Haemodialysis might be considered in patients with impaired renal function.

Consult a toxicologist as necessary.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

Following acute or short term repeated exposures to toluene:

Toluene is absorbed across the alveolar barrier, the blood/air mixture being 11.2/15.6 (at 37 degrees C.) The concentration of toluene, in expired breath, is of the order of 18 ppm following sustained exposure to 100 ppm. The tissue/blood proportion is 1/3 except in adipose where the proportion is 8/10.

Metabolism by microsomal mono-oxygenation, results in the production of hippuric acid. This may be detected in the urine in amounts between 0.5 and 2.5 g/24 hr which represents, on average 0.8 gm/gm of creatinine. The biological half-life of hippuric acid is in the order of 1-2 hours.

Primary threat to life from ingestion and/or inhalation is respiratory failure.

Patients should be quickly evaluated for signs of respiratory distress (eg cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases ($pO_2 < 50$ mm Hg or $pCO_2 > 50$ mm Hg) should be intubated.

Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial damage has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.

A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.

Epinephrine (adrenaline) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.

Lavage is indicated in patients who require decontamination; ensure use.

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant: o-Cresol in urine

Index: 0.5 mg/L

Sampling Time: End of shift

Comments: B

Determinant: Hippuric acid in urine

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Index: 1.6 g/g creatinine
Sampling Time: End of shift
Comments: B, NS
Determinant: Toluene in blood
Index: 0.05 mg/L
Sampling Time: Prior to last shift of workweek
NS: Non-specific determinant; also observed after exposure to other material
B: Background levels occur in specimens collected from subjects NOT exposed

Section 5 - Firefighting Measures

Specific Methods

Alert Fire Brigade and tell them location and nature of hazard.
May be violently or explosively reactive.
Wear breathing apparatus plus protective gloves.
Prevent, by any means available, spillage from entering drains or water course.
If safe, switch off electrical equipment until vapour fire hazard removed.
Use water delivered as a fine spray to control fire and cool adjacent area.
DO NOT approach containers suspected to be hot.
Cool fire exposed containers with water spray from a protected location.
If safe to do so, remove containers from path of fire.
Equipment should be thoroughly decontaminated after use.

Specific hazards arising from the chemical

Fire Incompatibility:

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Fire/Explosion Hazard:

Liquid and vapour are highly flammable.
Severe fire hazard when exposed to heat or flame.
Vapour forms an explosive mixture with air.
Severe explosion hazard, in the form of vapour, when exposed to flame or spark.
Vapour may travel a considerable distance to source of ignition.
Heating may cause expansion or decomposition with violent container rupture.
Aerosol cans may explode on exposure to naked flames.
Rupturing containers may rocket and scatter burning materials.
Hazards may not be restricted to pressure effects.
May emit acrid, poisonous or corrosive fumes.
On combustion, may emit toxic fumes of carbon monoxide (CO).
Combustion products include:
Carbon dioxide (CO₂)
Other pyrolysis products typical of burning organic material.
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

Hazchem Code

Not Applicable

Decomposition Temperature

Not Available

Extinguishing Media - Small Fires

Water spray, dry chemical or CO₂

Extinguishing Media - Large Fires

Water spray or fog.

Section 6 - Accidental Release Measures

Emergency Procedures

See section 8

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Environmental Precautions

See section 12

Methods and materials for containment and cleaning up (Small Spills)

Clean up all spills immediately.

Avoid breathing vapours and contact with skin and eyes.

Wear protective clothing, impervious gloves and safety glasses.

Shut off all possible sources of ignition and increase ventilation.

Wipe up.

If safe, damaged cans should be placed in a container outdoors, away from all ignition sources, until pressure has dissipated.

Undamaged cans should be gathered and stowed safely.

Methods and materials for containment and cleaning up (Large Spills)

Remove leaking cylinders to a safe place if possible.

Release pressure under safe, controlled conditions by opening the valve.

DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.

Clear area of personnel and move upwind.

Alert Fire Brigade and tell them location and nature of hazard.

May be violently or explosively reactive.

Wear breathing apparatus plus protective gloves.

Prevent, by any means available, spillage from entering drains or water courses

No smoking, naked lights or ignition sources.

Increase ventilation.

Stop leak if safe to do so.

Water spray or fog may be used to disperse / absorb vapour.

Absorb or cover spill with sand, earth, inert materials or vermiculite.

If safe, damaged cans should be placed in a container outdoors, away from ignition sources, until pressure has dissipated.

Undamaged cans should be gathered and stowed safely.

Collect residues and seal in labelled drums for disposal.

Other Information

Personal Protective Equipment advice is contained in Section 8 of the SDS.

Section 7 - Handling and Storage

Precautions for Safe Handling

Safe handling:

Avoid all personal contact, including inhalation.

Wear protective clothing when risk of exposure occurs.

Use in a well-ventilated area.

Prevent concentration in hollows and sumps.

DO NOT enter confined spaces until atmosphere has been checked.

Avoid smoking, naked lights or ignition sources.

Avoid contact with incompatible materials.

When handling, DO NOT eat, drink or smoke.

DO NOT incinerate or puncture aerosol cans.

DO NOT spray directly on humans, exposed food or food utensils.

Avoid physical damage to containers.

Always wash hands with soap and water after handling.

Work clothes should be laundered separately.

Use good occupational work practice.

Observe manufacturer's storage and handling recommendations contained within this SDS.

Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Other information:

Keep dry to avoid corrosion of cans. Corrosion may result in container perforation and internal pressure may eject contents of can

Store in original containers in approved flammable liquid storage area.

DO NOT store in pits, depressions, basements or areas where vapours may be trapped.

No smoking, naked lights, heat or ignition sources.

Keep containers securely sealed. Contents under pressure.

Store away from incompatible materials.

Store in a cool, dry, well ventilated area.

Avoid storage at temperatures higher than 40 deg C.

Store in an upright position.

Protect containers against physical damage.

Check regularly for spills and leaks.

Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container:

Aerosol dispenser.

Check that containers are clearly labelled.

Storage incompatibility:

Avoid reaction with oxidising agents

FLAMMABLES: +

EXPLOSIVES: X

ACUTE TOXIC: +

OXIDISERS: X

HARMFUL: +

IRRITANT: +

CORROSIVE: +

X - Must not be stored together

O - May be stored together with specific preventions

+ - May be stored together

Note: Depending on other risk factors, compatibility assessment based on the table above may not be relevant to storage situations, particularly where large volumes of dangerous goods are stored and handled. Reference should be made to the Safety Data Sheets for each substance or article and risks assessed accordingly.

Occupational exposure limit values

Control parameters:

Occupational Exposure Limits (OEL):

INGREDIENT DATA:

Source: Australia Exposure Standards

Ingredient: toluene

Material name: Toluene

TWA: 50 ppm / 191 mg/m³

STEL: 574 mg/m³ / 150 ppm

Peak: Not Available

Notes: Not Available

Source: Australia Exposure Standards

Ingredient: acetone

Material name: Acetone

TWA: 500 ppm / 1185 mg/m³

STEL: 2375 mg/m³ / 1000 ppm

Peak: Not Available

Notes: Not Available

Source: Australia Exposure Standards

Ingredient: propylene glycol monomethyl ether - alpha isomer

Material name: Propylene glycol monomethyl ether

TWA: 100 ppm / 369 mg/m³

STEL: 553 mg/m³ / 150 ppm

Peak: Not Available

Notes: Not Available

Source: Australia Exposure Standards

Ingredient: dimethyl ether

Material name: Dimethyl ether

TWA: 400 ppm / 760 mg/m³

STEL: 950 mg/m³ / 500 ppm

Peak: Not Available

Notes: Not Available

Source: Australia Exposure Standards

Ingredient: hydrocarbon propellant

Material name: LPG (liquified petroleum gas)

TWA: 1000 ppm / 1800 mg/m³

STEL: Not Available

Peak: Not Available

Notes: Not Available

Emergency Limits:

Ingredient: toluene

TEEL-1: Not Available

TEEL-2: Not Available

TEEL-3: Not Available

Ingredient: acetone

TEEL-1: Not Available

TEEL-2: Not Available

TEEL-3: Not Available

Ingredient: propylene glycol monomethyl ether - alpha isomer

TEEL-1: 100 ppm

TEEL-2: 160 ppm

TEEL-3: 660 ppm

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Ingredient: dimethyl ether
TEEL-1: 3,000 ppm
TEEL-2: 3800* ppm
TEEL-3: 7200* ppm

Ingredient: hydrocarbon propellant
TEEL-1: 65,000 ppm
TEEL-2: 2.30E+05 ppm
TEEL-3: 4.00E+05 ppm

Ingredient: toluene
Original IDLH: 500 ppm
Revised IDLH: Not Available

Ingredient: acetone
Original IDLH: 2,500 ppm
Revised IDLH: Not Available

Ingredient: propylene glycol monomethyl ether - alpha isomer
Original IDLH: Not Available
Revised IDLH: Not Available

Ingredient: dimethyl ether
Original IDLH: Not Available
Revised IDLH: Not Available

Ingredient: hydrocarbon propellant
Original IDLH: 2,000 ppm
Revised IDLH: Not Available

Engineering Controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.

Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection.

Provide adequate ventilation in warehouse or closed storage areas.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant: Aerosols, (released at low velocity into zone of active generation)

Speed: 0.5-1 m/s

Type of Contaminant: Direct spray, spray painting in shallow booths, gas discharge (active generation into zone of rapid air motion)

Speed: 1-2.5 m/s (200-500 f/min.)

Within each range the appropriate value depends on:

Lower end of the range:

- 1: Room air currents minimal or favourable to capture
- 2: Contaminants of low toxicity or of nuisance value only.
- 3: Intermittent, low production.
- 4: Large hood or large air mass in motion

Upper end of the range:

- 1: Disturbing room air currents
- 2: Contaminants of high toxicity
- 3: High production, heavy use

4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Respiratory Protection

Type AX Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor: up to 5 x ES

Half-Face Respirator: AX-AUS / Class 1

Full-Face Respirator: -

Powered Air Respirator: AX-PAPR-AUS / Class 1

Required Minimum Protection Factor: up to 25 x ES

Half-Face Respirator: Air-line*

Full-Face Respirator: AX-2

Powered Air Respirator: AX-PAPR-2

Required Minimum Protection Factor: up to 50 x ES

Half-Face Respirator: -

Full-Face Respirator: AX-3

Powered Air Respirator: -

Required Minimum Protection Factor: 50+ x ES

Half-Face Respirator: -

Full-Face Respirator: Air-line**

Powered Air Respirator: -

^ - Full-face

A (All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide (HCN), B3 = Acid gas or hydrogen cyanide (HCN), E = Sulfur dioxide (SO₂), G = Agricultural chemicals, K = Ammonia (NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds (below 65 degC)

Positive pressure, full face, air-supplied breathing apparatus should be used for work in enclosed spaces if a leak is suspected or the primary containment is to be opened (e.g. for a cylinder change)

Air-supplied breathing apparatus is required where release of gas from primary containment is either suspected or demonstrated.

Eye and Face Protection

Safety glasses with side shields.

Chemical goggles.

Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

Hand Protection

No special equipment needed when handling small quantities.

OTHERWISE:

For potentially moderate exposures:

Wear general protective gloves, eg. light weight rubber gloves.

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For potentially heavy exposures:

Wear chemical protective gloves, eg. PVC. and safety footwear.

Recommended material(s):

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection:

Dy-Mark Mine Marking Std All Colours

Material: BUTYL

CPI: C

Material: BUTYL/NEOPRENE

CPI: C

Material: CPE

CPI: C

Material: HYPALON

CPI: C

Material: NATURAL RUBBER

CPI: C

Material: NATURAL+NEOPRENE

CPI: C

Material: NEOPRENE

CPI: C

Material: NEOPRENE/NATURAL

CPI: C

Material: NITRILE

CPI: C

Material: NITRILE+PVC

CPI: C

Material: PE/EVAL/PE

CPI: C

Material: PVA

CPI: C

Material: PVC

CPI: C

Material: PVDC/PE/PVDC

CPI: C

Material: SARANEX-23

CPI: C

Material: SARANEX-23 2-PLY

CPI: C

Material: TEFLON

CPI: C

Material: VITON

CPI: C

Material: VITON/CHLOROBUTYL

CPI: C

Material: VITON/NEOPRENE

CPI: C

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

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Body Protection

The clothing worn by process operators insulated from earth may develop static charges far higher (up to 100 times) than the minimum ignition energies for various flammable gas-air mixtures. This holds true for a wide range of clothing materials including cotton.

Avoid dangerous levels of charge by ensuring a low resistivity of the surface material worn outermost.

BRETHERRICK: Handbook of Reactive Chemical Hazards.

Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.

For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).

Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot and shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds. Electrical resistance must range between 0 to 500,000 ohms. Conductive shoes should be stored in lockers close to the room in which they are worn. Personnel who have been issued conductive footwear should not wear them from their place of work to their homes and return.

No special equipment needed when handling small quantities.

OTHERWISE:

Overalls.

Skin cleansing cream.

Eyewash unit.

Do not spray on hot surfaces.

Section 9 - Physical and Chemical Properties

Properties	Description	Properties	Description
Form	Liquid	Appearance	Coloured flammable liquid; not miscible with water. Supplied as an aerosol pack. Contents under PRESSURE. Contains highly flammable hydrocarbon propellant.
Odour	Not Available	Melting/Freezing Point	Not Available
Boiling Point	Not Available	Decomposition Temperature	Not Available
Solubility in Water	Immiscible	pH	Not Applicable (as supplied) Not Applicable (as a solution (Not Available%))
Vapour Pressure	Not Available	Relative Vapour Density (Air=1)	Not Available
Evaporation Rate	Not Available	Physical State	Liquid
Odour Threshold	Not Available	Viscosity	Not Available
Volatile Component	Not Available	Partition Coefficient: n-octanol/water (log value)	Not Available
Surface Tension	Not Available	Flash Point	-81°C (propellant)
Flammability	HIGHLY FLAMMABLE.	Auto-Ignition Temperature	Not Available
Explosion Limit - Upper	Not Available	Explosion Limit - Lower	Not Available
Explosion Properties	Not Available	Molecular Weight	Not Applicable
Oxidising Properties	Not Available	Initial boiling point and boiling range	Not Available
Relative Density	Not Available (Water = 1)		

Other Information

Taste: Not Available

Gas group: Not Available

VOC g/L: Not Available

Section 10 - Stability and Reactivity

Reactivity

See section 7

Chemical Stability

Elevated temperatures.

Presence of open flame.

Product is considered stable.

Hazardous polymerisation will not occur.

Possibility of hazardous reactions

See section 7

Conditions to Avoid

See section 7

Incompatible Materials

See section 7

Hazardous Decomposition Products

See section 5

Section 11 - Toxicological Information

Toxicology Information

Dy-Mark Mine Marking Std All Colours

TOXICITY: Not Available

IRRITATION: Not Available

Toluene

TOXICITY:

Dermal (rabbit) LD50: 12124 mg/kg[2]

Inhalation (Rat) LC50; >13350 ppm4h[2]

Oral (Rat) LD50; 636 mg/kg[2]

IRRITATION:

Eye (rabbit): 2mg/24h - SEVERE

Eye (rabbit): 0.87 mg - mild

Eye (rabbit): 100 mg/30sec - mild

Eye: adverse effect observed (irritating)[1]

Skin (rabbit): 20 mg/24h-moderate

Skin (rabbit): 500 mg - moderate

Skin: adverse effect observed (irritating)[1]

Skin: no adverse effect observed (not irritating)[1]

Acetone

TOXICITY:

Dermal (rabbit) LD50: 20000 mg/kg[2]

Inhalation (Mouse) LC50; 44 mg/L4h[2]

Oral (Rat) LD50; 5800 mg/kg[2]

IRRITATION:

Eye (human): 500 ppm - irritant

Eye (rabbit): 20mg/24hr -moderate

Eye (rabbit): 3.95 mg - SEVERE

Eye: adverse effect observed (irritating)[1]

Skin (rabbit): 500 mg/24hr - mild

Skin (rabbit): 395mg (open) - mild

Skin: no adverse effect observed (not irritating)[1]

Propylene glycol monomethyl ether - alpha isomer

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TOXICITY:

Dermal (rat) LD50: >2000 mg/kg[1]

Inhalation (Rat) LC50; >6 mg/l4h[2]

Oral (Rat) LD50; 3739 mg/kg[1]

IRRITATION:

Eye (rabbit) 230 mg mild

Eye (rabbit) 500 mg/24 h. - mild

Eye (rabbit): 100 mg SEVERE

Skin (rabbit) 500 mg open - mild

Dimethyl ether

TOXICITY:

Inhalation (Rat) LC50; >20000 ppm4h[1]

IRRITATION: Not Available

Hydrocarbon propellant

TOXICITY:

Inhalation (Rat) LC50; 658 mg/l4h[2]

IRRITATION: Not Available

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

ACETONE:

For acetone:

The acute toxicity of acetone is low. Acetone is not a skin irritant or sensitizer, but it removes fat from the skin, and it also irritates the eye. Animal testing shows acetone may cause macrocytic anaemia. Studies in humans have shown that exposure to acetone at a level of 2375 mg/cubic metre has not caused neurobehavioural deficits.

PROPYLENE GLYCOL MONOMETHYL ETHER - ALPHA ISOMER:

NOTE: For PGE - mixed isomers: Exposure of pregnant rats and rabbits to the substance did not give rise to teratogenic effects at concentrations up to 3000 ppm. Foetotoxic effects were seen in rats but not in rabbits at this concentration; maternal toxicity was noted in both species.

HYDROCARBON PROPELLANT:

No significant acute toxicological data identified in literature search. inhalation of the gas

Dy-Mark Mine Marking Std All Colours & PROPYLENE GLYCOL MONOMETHYL ETHER - ALPHA ISOMER:

For propylene glycol ethers (PGEs):

Typical propylene glycol ethers include propylene glycol n-butyl ether (PnB); dipropylene glycol n-butyl ether (DPnB); dipropylene glycol methyl ether acetate (DPMA) and tripropylene glycol methyl ether (TPM).

Testing of a wide variety of propylene glycol ethers has shown that propylene glycol-based ethers are less toxic than some ethers of the ethylene series. The common toxicities associated with the lower molecular weight homologues of the ethylene series, such as adverse effects on the reproductive organs, the developing embryo and foetus, blood or thymus gland, are not seen with the commercial-grade propylene glycol ethers.

In the ethylene series, metabolism of the terminal hydroxyl group produces an alkoxyacetic acid. The reproductive and developmental toxicities of the lower molecular weight homologues in the ethylene series are due specifically to the formation of methoxyacetic and ethoxyacetic acids.

Longer chain homologues in the ethylene series are not associated with reproductive toxicity, but can cause haemolysis in sensitive species, also through formation of an alkoxyacetic acid. The predominant alpha isomer of all the PGEs (which is thermodynamically favoured during manufacture of PGEs) is a secondary alcohol incapable of forming an alkoxypropionic acid. In contrast, beta-isomers are able to form the alkoxypropionic acids and these are linked to birth defects (and possibly, haemolytic effects). The alpha isomer comprises more than 95% of the isomeric mixture in the commercial product, and therefore PGEs show relatively little toxicity. One of the main metabolites of the propylene glycol ethers is propylene glycol, which is of low toxicity and completely metabolized in the body.

As a class, PGEs have low acute toxicity via swallowing, skin exposure and inhalation. PnB and TPM are moderately irritating to the eyes, in animal testing, while the remaining members of this category caused little or no eye irritation. None caused skin sensitization.

Animal testing showed that repeat dosing caused few adverse effects. Animal testing also shows that PGEs do not cause skin effects or reproductive toxicity. Commercially available PGEs have not been shown to cause birth defects. Available instance indicates that

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propylene glycol ethers are unlikely to possess genetic toxicity.

Dy-Mark Mine Marking Std All Colours & TOLUENE:

For toluene:

Acute toxicity: Humans exposed to high levels of toluene for short periods of time experience adverse central nervous system effects ranging from headaches to intoxication, convulsions, narcosis (sleepiness) and death. When inhaled or swallowed, toluene can cause severe central nervous system depression, and in large doses has a narcotic effect. 60mL has caused death. Death of heart muscle fibres, liver swelling, congestion and bleeding of the lungs and kidney injury were all found on autopsy.

Exposure to inhalation at a concentration of 600 parts per million for 8 hours resulted in the same and more serious symptoms including euphoria (a feeling of well-being), dilated pupils, convulsions and nausea. Exposure to 10000-30000 parts per million (1-3%) has been reported to cause narcosis and death. Toluene can also strip the skin of lipids, causing skin inflammation.

Subchronic/chronic effects: Repeat doses of toluene cause adverse central nervous system effects and can damage the upper airway, the liver and the kidney. Adverse effects occur from both swallowing and inhalation. In humans, a reported lowest level causing adverse effects on the nervous system is 88 parts per million. In one case, toluene caused heart sensitization and death. In several cases of "glue sniffing", damage to the cerebellum was noted. Workers chronically exposed to toluene fumes have reported reduced white cell counts.

Developmental/Reproductive toxicity: Exposure to high levels of toluene can result in adverse effects in the developing foetus. Several studies have indicated that high levels of toluene can also adversely affect the developing offspring in laboratory animals. In children who were exposed to toluene before birth, as a result of solvent abuse by the mother, variable growth, a small head, central nervous system dysfunction, attention deficits, minor facial and limb abnormalities, and developmental delay were seen.

Absorption: Studies in humans and animals have shown that toluene is easily absorbed through the lungs and gastrointestinal tract, with much less being absorbed through the skin.

Distribution: Animal studies show that toluene may be distributed in the body fat, bone marrow, spinal nerves, spinal cord and brain white matter, with lower levels in the blood, kidney and liver. Toluene has generally been found to accumulate in fatty tissue, and in highly vascularised tissues.

Metabolism: Inhaled or ingested toluene may be metabolized to benzyl alcohol, after which it is further oxidized to benzaldehyde and benzoic acid. Benzoic acid is sometimes conjugated with glycine to form hippuric acid or reacted with glucuronic acid to form benzoyl glucuronide.

O-cresol and p-cresol formed by ring hydroxylation are considered minor metabolites.

Excretion: Toluene is mainly (60-70%) excreted through the urine as hippuric acid. Benzoyl glucuronide accounts for 10-20% of excretion, and unchanged toluene through exhaled air also accounts for 10-20%. Excretion of hippuric acid is usually complete within 24 hours of exposure.

TOLUENE & ACETONE:

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

Acute Toxicity: Data available to make classification

Ingestion

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

Not normally a hazard due to physical form of product.

Considered an unlikely route of entry in commercial/industrial environments

Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed.

Inhalation

Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.

Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

PGME has an offensive odour, and may cause drowsiness and unconsciousness if higher concentrations are inhaled, and severe reactions involving the eyes, nose and throat.

Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.

Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.

WARNING: Intentional misuse by concentrating/inhaling contents may be lethal.

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Following inhalation, ethers cause lethargy and stupor. Inhaling lower alkyl ethers results in headache, dizziness, weakness, blurred vision, seizures and possible coma.

Inhalational exposure to diethyl ether may cause immediate unconsciousness, inco-ordination, blurring of vision, headache, dizziness and death depending on dose and extent of exposure. It is a weak heart sensitiser in dogs.

Skin

The material may accentuate any pre-existing dermatitis condition.

Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

Spray mist may produce discomfort.

Harmful amounts of PGME may be absorbed through the skin following extensive prolonged contact; this may result in drowsiness, unconsciousness and depression.

Open cuts, abraded or irritated skin should not be exposed to this material.

The material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.

Alkyl ethers may defat and dehydrate the skin producing dermatoses. Absorption may produce headache, dizziness, and central nervous system depression.

Skin Corrosion/Irritation

Data available to make classification

Eye

Not considered to be a risk because of the extreme volatility of the gas.

There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain.

Eye contact with alkyl ethers (vapour or liquid) may produce irritation, redness and tears.

Serious Eye Damage/Irritation

Data available to make classification

Respiratory Sensitisation

Data either not available or does not fill the criteria for classification

Skin Sensitisation

Data either not available or does not fill the criteria for classification

Carcinogenicity

Data either not available or does not fill the criteria for classification

Reproductive Toxicity

Data available to make classification

STOT - Single Exposure

Data available to make classification

STOT - Repeated Exposure

Data available to make classification

Aspiration Hazard

Data available to make classification

Mutagenicity

Data either not available or does not fill the criteria for classification

Chronic Effects

This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.

Based on experience with animal studies, exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Main route of exposure to the gas in the workplace is by inhalation.

When taken repeatedly, PGME may cause damage to liver and kidney, drowsiness and even unconsciousness and death. There is no evidence of damage to the sex organs. However, it has led to multiple pregnancies in rats and rabbits, but sperm destruction in dogs. Animal testing also shows high doses can delay bone development.

Principal routes of exposure are by accidental skin and eye contact and by inhalation of vapours especially at higher temperatures.

Intentional abuse (glue sniffing) or occupational exposure to toluene can result in chronic habituation. Chronic abuse has caused inco-ordination, tremors of the extremities (due to widespread cerebrum withering), headache, abnormal speech, temporary memory loss, convulsions, coma, drowsiness, reduced colour perception, blindness, nystagmus (rapid, involuntary eye movements),

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hearing loss leading to deafness and mild dementia.

Section 12 - Ecological Information

Ecotoxicity

Dy-Mark Mine Marking Std All Colours

Endpoint: Not Available

Test Duration (hr): Not Available

Species: Not Available

Value: Not Available

Source: Not Available

Toluene

Endpoint: NOEC(ECx)

Test Duration (hr): 168h

Species: Crustacea

Value: 0.74mg/L

Source: 5

Endpoint: LC50

Test Duration (hr): 96h

Species: Fish

Value: 5-35mg/l

Source: 4

Endpoint: EC50

Test Duration (hr): 48h

Species: Crustacea

Value: 3.78mg/L

Source: 5

Endpoint: EC50

Test Duration (hr): 96h

Species: Algae or other aquatic plants

Value: >376.71mg/L

Source: 4

Acetone

Endpoint: NOEC(ECx)

Test Duration (hr): 12h

Species: Fish

Value: 0.001mg/L

Source: 4

Endpoint: LC50

Test Duration (hr): 96h

Species: Fish

Value: 3744.6-5000.7mg/L

Source: 4

Endpoint: EC50

Test Duration (hr): 48h

Species: Crustacea

Value: 6098.4mg/L

Source: 5

Endpoint: EC50

Test Duration (hr): 96h

Species: Algae or other aquatic plants

Value: 9.873-27.684mg/l

Source: 4

Propylene glycol monomethyl ether - alpha isomer

Endpoint: EC50(ECx)

Test Duration (hr): 168h

Species: Algae or other aquatic plants

Value: >1000mg/l

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Source: 1
Endpoint: LC50
Test Duration (hr): 96h
Species: Fish
Value: $\geq 1000\text{mg/l}$
Source: 2
Endpoint: EC50
Test Duration (hr): 72h
Species: Algae or other aquatic plants
Value: $>500\text{mg/l}$
Source: 2
Endpoint: EC50
Test Duration (hr): 48h
Species: Crustacea
Value: 23300mg/l
Source: 1
Endpoint: EC50
Test Duration (hr): 96h
Species: Algae or other aquatic plants
Value: $>1000\text{mg/l}$
Source: 2

Dimethyl ether
Endpoint: NOEC(ECx)
Test Duration (hr): 48h
Species: Crustacea
Value: $>4000\text{mg/l}$
Source: 1
Endpoint: LC50
Test Duration (hr): 96h
Species: Fish
Value: 1783.04mg/l
Source: 2
Endpoint: EC50
Test Duration (hr): 48h
Species: Crustacea
Value: $>4400\text{mg/L}$
Source: 2
Endpoint: EC50
Test Duration (hr): 96h
Species: Algae or other aquatic plants
Value: 154.917mg/l
Source: 2

Hydrocarbon propellant
Endpoint: EC50(ECx)
Test Duration (hr): 96h
Species: Algae or other aquatic plants
Value: 7.71mg/l
Source: 2
Endpoint: LC50
Test Duration (hr): 96h
Species: Fish
Value: 24.11mg/l
Source: 2
Endpoint: EC50
Test Duration (hr): 96h
Species: Algae or other aquatic plants
Value: 7.71mg/l
Source: 2

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Endpoint: EC50(ECx)
Test Duration (hr): 96h
Species: Algae or other aquatic plants
Value: 7.71mg/l
Source: 2
Endpoint: LC50
Test Duration (hr): 96h
Species: Fish
Value: 24.11mg/l
Source: 2
Endpoint: EC50
Test Duration (hr): 96h
Species: Algae or other aquatic plants
Value: 7.71mg/l
Source: 2

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

For Ketones: Ketones, unless they are alpha, beta--unsaturated ketones, can be considered as narcosis or baseline toxicity compounds.

Aquatic Fate: Hydrolysis of ketones in water is thermodynamically favourable only for low molecular weight ketones. Reactions with water are reversible with no permanent change in the structure of the ketone substrate. Ketones are stable to water under ambient environmental conditions. When pH levels are greater than 10, condensation reactions can occur which produce higher molecular weight products. Under ambient conditions of temperature, pH, and low concentration, these condensation reactions are unfavourable. Based on its reactions in air, it seems likely that ketones undergo photolysis in water.

Terrestrial Fate: It is probable that ketones will be biodegraded by micro-organisms in soil and water.

Ecotoxicity: Ketones are unlikely to bioconcentrate or biomagnify.

For Propylene Glycol Ethers: log Kow's range from 0.309 for TPM to 1.523 for DPnB. Calculated BCFs range from 1.47 for DPnB to 3.16 for DPMA and TPM, indicating low bioaccumulation. Henry's Law Constants are low for all category members, ranging from 5.7×10^{-9} atm-m³/mole for TPM to 2.7×10^{-9} atm-m³/mole for PnB.

Environmental Fate: Most are liquids at room temperature and all are water-soluble.

Atmospheric Fate: In air, the half-life due to direct reactions with photochemically generated hydroxyl radicals, range from 2.0 hours for TPM to 4.6 hours for PnB.

Aquatic/Terrestrial Fate: Most propylene glycol ethers are likely to partition roughly equally into the soil and water compartments in the environment with small to negligible amounts remaining in other environmental compartments (air, sediment, and aquatic biota). In water, most members of this family are "readily biodegradable" under aerobic conditions. In soil, biodegradation is rapid for PM and PMA.

Ecotoxicity: Propylene glycol ethers are unlikely to persist in the environment. Acute aquatic toxicity testing indicates low toxicity for both ethers and acetates.

Most ethers are very resistant to hydrolysis, and the rate of cleavage of the carbon-oxygen bond by abiotic processes is expected to be insignificant.

Direct photolysis will not be an important removal process since aliphatic ethers do not absorb light at wavelengths >290 nm

For Toluene:

Log Kow : 2.1-3;

Log Koc : 1.12-2.85;

Koc : 37-260;

Log Kom : 1.39-2.89;

Half-life (hr) air : 2.4-104;

Half-life (hr) H₂O surface water : 5.55-528;

Half-life (hr) H₂O ground : 168-2628;

Half-life (hr) soil : <48-240;

Henry's Pa m³ /mol : 518-694;

Henry's atm m³ /mol : 5.94;

E-03BOD 5 0.86-2.12, 5%COD - 0.7-2.52, 21-27%;

ThOD - 3.13 ; BCF - 1.67-380;

Log BCF - 0.22-3.28.

Atmospheric Fate: The majority of toluene evaporates to the atmosphere from the water and soil. The main degradation pathway for toluene in the atmosphere is reaction with photochemically produced hydroxyl radicals. The estimated atmospheric half life for

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toluene is about 13 hours. Toluene is also oxidized by reactions with atmospheric nitrogen dioxide, oxygen, and ozone, but these are minor degradation pathways. Photolysis is not considered a significant degradative pathway for toluene.

Terrestrial Fate: Toluene is moderately retarded by adsorption to soils rich in organic material, therefore, transport to ground water is dependent on soil composition. In unsaturated topsoil containing organic material, it has been estimated that 97% of the toluene is adsorbed to the soil and only about 2% is in the soil-water phase and transported with flowing groundwater. There is little retardation in sandy soils and 2-13% of the toluene was estimated to migrate with flowing water; the remainder was volatilized, biodegraded, or unaccounted for. In saturated deep soils with no soil-air phase, about 48% may be transported with flowing groundwater. In surface soil, volatilization to air is an important fate process for toluene. In the environment, biodegradation of toluene to carbon dioxide occurs with a typical half life of 1-7 days.

Aquatic Fate: An important fate process for toluene is volatilization, the rate of which depends on the amount of turbulence in the surface water. The volatilization of toluene from static water has a half life of 1-16 days, whereas from turbulent water the half life is 5-6 hours. Degradation of toluene in surface water occurs primarily by biodegradation with a half life of less than one day under favorable conditions (presence of microorganisms, microbial adaptation, and optimum temperature). Biodegradation also occurs in shallow groundwater and in salt water (at a reduced rate). No data are available on anaerobic degradation of toluene in deep ground water conditions where aerobic degradation would be minimal.

Ecotoxicity: Bioaccumulation in the food chain is predicted to be low. Toluene has moderate acute toxicity to aquatic organisms. Toluene is, on the average, slightly toxic to fathead minnow, guppies and goldfish and not acutely toxic to bluegill or channel catfish and crab. Toluene, on the average, is slightly toxic to crustaceans specifically, shrimp species including grass shrimp and daggerblade grass shrimp. Toluene has a negative effect on green algae during their growth phase.

DO NOT discharge into sewer or waterways.

For Acetone:

Log Kow : -0.24;

Half-life (hr) air : 312-1896;

Half-life (hr) H₂O surface water : 20;

Henry's atm m³ /mol : 3.67E-05

BOD 5: 0.31-1.76, 46-55%

COD: 1.12-2.07

ThOD: 2.2BCF: 0.69.

Environmental Fate: The relatively long half-life allows acetone to be transported long distances from its emission source.

Atmospheric Fate: Acetone preferentially locates in the air compartment when released to the environment. In air, acetone is lost by photolysis and reaction with photochemically produced hydroxyl radicals; the estimated half-life of these combined processes is about 22 days. Air Quality Standards: none available.

Terrestrial Fate: Very little acetone is expected to reside in soil, biota, or suspended solids and has low propensity for soil absorption and a high preference for moving through the soil and into the ground water. Acetone released to soil volatilizes although some may leach into the ground where it rapidly biodegrades. Soil Guidelines: none available.

Aquatic Fate: A substantial amount of acetone can also be found in water. Acetone is highly soluble and slightly persistent in water, with a half-life of about 20 hours Drinking Water Standard: none available.

Ecotoxicity: Acetone does not concentrate in the food chain, is minimally toxic to aquatic life and is considered to be readily biodegradable. Testing shows that acetone exhibits a low order of toxicity for brook trout, fathead minnow, Japanese quail, ring-neck pheasant and water fleas. Low toxicity for aquatic invertebrates. For aquatic plants, NOEC: 5400-7500 mg/L. Acetone vapours were shown to be relatively toxic to flour beetle and flour moths and their eggs. The direct application of acetone liquid to the body of the insects or surface of the eggs did not, however, cause any mortality. The ability of acetone to inhibit cell multiplication has been examined in a wide variety of microorganisms. Mild to moderate toxicity occurred in bacteria exposed to acetone for 6-4 days however, overall data indicates a low degree of toxicity for acetone. The only exception to these findings was the results obtained with the flagellated protozoa (*Entosiphon sulcatum*).

Persistence and degradability

Ingredient: toluene

Persistence: Water/Soil: LOW (Half-life = 28 days)

Persistence: Air: LOW (Half-life = 4.33 days)

Ingredient: acetone

Persistence: Water/Soil: LOW (Half-life = 14 days)

Persistence: Air: MEDIUM (Half-life = 116.25 days)

Ingredient: propylene glycol monomethyl ether - alpha isomer

Persistence: Water/Soil: LOW (Half-life = 56 days)

Persistence: Air: LOW (Half-life = 1.7 days)

Ingredient: dimethyl ether

Persistence: Water/Soil: LOW

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Persistence: Air: LOW

Mobility

Mobility in soil:

Ingredient: toluene

Mobility: LOW (KOC = 268)

Ingredient: acetone

Mobility: HIGH (KOC = 1.981)

Ingredient: propylene glycol monomethyl ether - alpha isomer

Mobility: HIGH (KOC = 1)

Ingredient: dimethyl ether

Mobility: HIGH (KOC = 1.292)

Bioaccumulative Potential

Ingredient: toluene

Bioaccumulation: LOW (BCF = 90)

Ingredient: acetone

Bioaccumulation: LOW (BCF = 0.69)

Ingredient: propylene glycol monomethyl ether - alpha isomer

Bioaccumulation: LOW (BCF = 2)

Ingredient: dimethyl ether

Bioaccumulation: LOW (LogKOW = 0.1)

Section 13 - Disposal Considerations

Waste Disposal

Product / Packaging disposal:

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.

Where in doubt contact the responsible authority.

Consult State Land Waste Management Authority for disposal.

Discharge contents of damaged aerosol cans at an approved site.

Allow small quantities to evaporate.

DO NOT incinerate or puncture aerosol cans.

Bury residues and emptied aerosol cans at an approved site.

Section 14 - Transport Information

UN Number

1950

Proper Shipping Name

AEROSOLS

Transport Hazard Class

2.1

Hazchem Code

Not Applicable

EPG Number

2D1

IERG Number

49

IATA UN Number

1950

IATA Proper Shipping Name

Aerosols, flammable

IATA Transport Hazard Class

2.1

IMDG UN Number

1950

IMDG Proper Shipping Name

AEROSOLS

IMDG Transport Hazard Class

2.1

Additional Information

Labels Required:

Marine Pollutant: NO

HAZCHEM: Not Applicable

Land transport (ADG):

UN number: 1950

UN proper shipping name: AEROSOLS

Transport hazard class(es):

Class: 2.1

Subrisk: Not Applicable

Packing group: Not Applicable

Environmental hazard: Not Applicable

Special precautions for user:

Special provisions: 63 190 277 327 344 381

Limited quantity: 1000ml

Air transport (ICAO-IATA / DGR):

UN number: 1950

UN proper shipping name: Aerosols, flammable

Transport hazard class(es):

ICAO/IATA Class: 2.1

ICAO / IATA Subrisk: Not Applicable

ERG Code: 10L

Packing group: Not Applicable

Environmental hazard: Not Applicable

Special precautions for user:

Special provisions: A145 A167 A802

Cargo Only Packing Instructions: 203

Cargo Only Maximum Qty / Pack: 150 kg

Passenger and Cargo Packing Instructions: 203

Passenger and Cargo Maximum Qty / Pack: 75 kg

Passenger and Cargo Limited Quantity Packing Instructions: Y203

Passenger and Cargo Limited Maximum Qty / Pack: 30 kg G

Sea transport (IMDG-Code / GGVSee):

UN number: 1950

UN proper shipping name: AEROSOLS

Transport hazard class(es):

IMDG Class: 2.1

IMDG Subrisk: Not Applicable

Packing group: Not Applicable

Environmental hazard: Not Applicable

Special precautions for user:

EMS Number: F-D, S-U

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Special provisions: 63 190 277 327 344 381 959

Limited Quantities: 1000 ml

Transport in bulk according to Annex II of MARPOL and the IBC code:

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code:

Product name: toluene

Group: Not Available

Product name: acetone

Group: Not Available

Product name: propylene glycol monomethyl ether - alpha isomer

Group: Not Available

Product name: dimethyl ether

Group: Not Available

Product name: hydrocarbon propellant

Group: Not Available

Transport in bulk in accordance with the ICG Code:

Product name: toluene

Ship Type: Not Available

Product name: acetone

Ship Type: Not Available

Product name: propylene glycol monomethyl ether - alpha isomer

Ship Type: Not Available

Product name: dimethyl ether

Ship Type: Not Available

Product name: hydrocarbon propellant

Ship Type: Not Available

Section 15 - Regulatory Information

Regulatory Information

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

Toluene is found on the following regulatory lists:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

Acetone is found on the following regulatory lists:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australian Inventory of Industrial Chemicals (AIIC)

Propylene glycol monomethyl ether - alpha isomer is found on the following regulatory lists:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

Dimethyl ether is found on the following regulatory lists:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australian Inventory of Industrial Chemicals (AIIC)

Hydrocarbon propellant is found on the following regulatory lists:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

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National Inventory Status:

National Inventory: Australia - AIIC / Australia Non-Industrial Use

Status: Yes

National Inventory: Canada - DSL

Status: Yes

National Inventory: Canada - NDSL

Status: No (toluene; acetone; propylene glycol monomethyl ether - alpha isomer; dimethyl ether; hydrocarbon propellant)

National Inventory: China - IECSC

Status: Yes

National Inventory: Europe - EINEC / ELINCS / NLP

Status: Yes

National Inventory: Japan - ENCS

Status: Yes

National Inventory: Korea - KECI

Status: Yes

National Inventory: New Zealand - NZIoC

Status: Yes

National Inventory: Philippines - PICCS

Status: Yes

National Inventory: USA - TSCA

Status: Yes

National Inventory: Taiwan - TCSI

Status: Yes

National Inventory: Mexico - INSQ

Status: Yes

National Inventory: Vietnam - NCI

Status: Yes

National Inventory: Russia - FBEPH

Status: Yes

Legend:

Yes = All CAS declared ingredients are on the inventory

No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

Poisons Schedule

N/A

Hazard Rating Systems

Flammability: 4

Toxicity: 2

Body Contact: 2

Reactivity: 1

Chronic: 2

0 = Minimum

1 = Low

2 = Moderate

3 = High

4 = Extreme

Section 16 - Any Other Relevant Information

Version Number

13.1

Revisions Made

SDS Version Summary:

Version: 12.1

Date of Update: 01/11/2019

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Sections Updated: One-off system update. NOTE: This may or may not change the GHS classification

Version: 13.1

Date of Update: 20/08/2021

Sections Updated: Classification change due to full database hazard calculation/update

Key Abbreviations or Acronyms Used

Definitions and abbreviations:

PC-TWA: Permissible Concentration-Time Weighted Average

PC-STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit

IDLH: Immediately Dangerous to Life or Health Concentrations

ES: Exposure Standard

OSF: Odour Safety Factor

NOAEL: No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value

LOD: Limit Of Detection

OTV: Odour Threshold Value

BCF: BioConcentration Factors

BEI: Biological Exposure Index

AIIC: Australian Inventory of Industrial Chemicals

DSL: Domestic Substances List

NDSL: Non-Domestic Substances List

IECSC: Inventory of Existing Chemical Substance in China

EINECS: European INventory of Existing Commercial chemical Substances

ELINCS: European List of Notified Chemical Substances

NLP: No-Longer Polymers

ENCS: Existing and New Chemical Substances Inventory

KECI: Korea Existing Chemicals Inventory

NZIoC: New Zealand Inventory of Chemicals

PICCS: Philippine Inventory of Chemicals and Chemical Substances

TSCA: Toxic Substances Control Act

TCSI: Taiwan Chemical Substance Inventory

INSQ: Inventario Nacional de Sustancias Químicas

NCI: National Chemical Inventory

FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Empirical Formula & Structural Formula

Not Applicable

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User Codes

User Title Label	User Codes
Wis Numbers	00693523
Wis Numbers	00693540
Wis Numbers	02813457
Wis Numbers	03402931
Wis Numbers	03402948
Wis Numbers	03402965
Wis Numbers	03607509
Wis Numbers	03607560
Wis Numbers	03622741
Wis Numbers	03885476
Wis Numbers	04050410
Wis Numbers	05477390

Other Information

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

This SDS has been transcribed into Infosafe GHS format from an original, issued by the manufacturer on the date shown. Any disclaimer by the manufacturer may not be included in the transcription.

END OF SDS

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