

SAFETY DATA SHEET

DY-MARK BALLMARKER INK T400 ALL COLOURS

Infosafe No.: XAFK4
ISSUED Date : 01/11/2019
ISSUED by: DY-MARK

1. Identification

GHS Product Identifier

DY-MARK BALLMARKER INK T400 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: Ink.

Other Names

| Name |
|-----------------|
| 11010101 BLACK |
| 11010102 RED |
| 11010103 BLUE |
| 11010104 GREEN |
| 11010105 YELLOW |
| 11010106 ORANGE |
| 11010111 WHITE |
| 11010201 BLACK |
| 11010202 RED |
| 11010203 BLUE |
| 11010204 GREEN |
| 11010205 YELLOW |
| 11010211 WHITE |

Additional Information

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

Other means of identification: Not Available

2. Hazard Identification

GHS classification of the substance/mixture

[1] Flammable Liquid Category 2, Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 2, Eye Irritation Category 2A

Signal Word (s)

DANGER

Hazard Statement (s)

H225 Highly flammable liquid and vapour.

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

Pictogram (s)

Flame, Exclamation mark



Precautionary statement – Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting/intrinsically safe equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement – Response

P321 Specific treatment (see advice on this label).

P362 Take off contaminated clothing and wash before reuse.

P370+P378 In case of fire: Use alcohol resistant foam or normal protein foam for extinction.

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 or doctor/physician if you feel unwell.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P330 Rinse mouth.

P332+P313 If skin irritation occurs: Get medical advice/attention.

Precautionary statement – Storage

P403+P235 Store in a well-ventilated place. Keep cool.

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

3. Composition/information on ingredients

Ingredients

| Name | CAS | Proportion |
|---------------------------------|---------------|---------------|
| Ethanol | 64-17-5 | 30-70 %weight |
| Ethylene glycol monobutyl ether | 111-76-2 | 10-30 %weight |
| Pigment (lead-free) | Not Available | <30 %weight |
| Resin | Not available | <15 %weight |

Other Information

Substances:

See section below for composition of Mixtures

Mixtures:

NOTE: Manufacturer has supplied full ingredient information to allow assessment.

4. First-aid measures

Inhalation

If fumes or combustion products are inhaled remove from contaminated area.

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.

Apply artificial respiration if not breathing, 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

If poisoning occurs, contact a doctor or Poisons Information Centre.

If swallowed do NOT induce vomiting.

If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

Observe the patient carefully.

Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious

Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.

Seek medical advice.

Skin

If skin contact occurs:

Immediately remove all contaminated clothing, including footwear.

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

Seek medical attention in event of irritation.

Eye contact

If this product comes in contact with the eyes:

Immediately hold eyelids apart and flush the eye continuously with 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.

Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.

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

Followed acute or short term repeated exposures to ethylene glycol monoalkyl ethers and their acetates:

Hepatic metabolism produces ethylene glycol as a metabolite.

Clinical presentation, following severe intoxication, resembles that of ethylene glycol exposures.

Monitoring the urinary excretion of the alkoxyacetic acid metabolites may be a useful indication of exposure.

[Ellenhorn and Barceloux: Medical Toxicology]

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For acute or short term repeated exposures to ethylene glycol:

Early treatment of ingestion is important. Ensure emesis is satisfactory.

Test and correct for metabolic acidosis and hypocalcaemia.

Apply sustained diuresis when possible with hypertonic mannitol.

Evaluate renal status and begin haemodialysis if indicated. [I.L.O]

Rapid absorption is an indication that emesis or lavage is effective only in the first few hours. Cathartics and charcoal are generally not effective.

Correct acidosis, fluid/electrolyte balance and respiratory depression in the usual manner. Systemic acidosis (below 7.2) can be treated with intravenous sodium bicarbonate solution.

Ethanol therapy prolongs the half-life of ethylene glycol and reduces the formation of toxic metabolites.

Pyridoxine and thiamine are cofactors for ethylene glycol metabolism and should be given (50 to 100 mg respectively) intramuscularly, four times per day for 2 days.

Magnesium is also a cofactor and should be replenished. The status of 4-methylpyrazole, in the treatment regime, is still uncertain.

For clearance of the material and its metabolites, haemodialysis is much superior to peritoneal dialysis.

[Ellenhorn and Barceloux: Medical Toxicology]

It has been suggested that there is a need for establishing a new biological exposure limit before a workshift that is clearly below 100 mmol ethoxy-acetic acids per mole creatinine in morning urine of people occupationally exposed to ethylene glycol ethers. This arises from the finding that an increase in urinary stones may be associated with such exposures.

Laitinen J., et al: Occupational & Environmental Medicine 1996; 53, 595-600

5. Fire-fighting measures

Suitable Extinguishing Media

Foam.

Dry chemical powder.

BCF (where regulations permit).

Carbon dioxide.

Water spray or fog - Large fires only.

Specific Hazards Arising From The Chemical

Fire Incompatibility:

Avoid contamination with strong oxidising agents as ignition may result.

Fire/Explosion Hazard:

Liquid and vapour are highly flammable.

Severe fire hazard when exposed to heat, flame and/or oxidisers.

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 / decomposition with violent rupture of containers.

On combustion, may emit toxic fumes of carbon monoxide (CO)

Other combustion products include:

Carbon dioxide (CO₂)

Hazchem Code

•3YE

Decomposition Temperature

Not Available

Precautions in connection with Fire

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

May be violently or explosively reactive.

Wear breathing apparatus plus protective gloves in the event of a fire.

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

Consider evacuation (or protect in place).

Fight fire from a safe distance, with adequate cover.

If safe, switch off electrical equipment until vapour fire hazard removed.

Use water delivered as a fine spray to control the fire and cool adjacent area.

Avoid spraying water onto liquid pools.

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.

6. Accidental release measures

Emergency Procedures

See section 8

Clean-up Methods - Small Spillages

Remove all ignition sources.

Clean up all spills immediately.

Avoid breathing vapours and contact with skin and eyes.

Control personal contact with the substance, by using protective equipment.

Contain and absorb small quantities with vermiculite or other absorbent material.

Wipe up.

Collect residues in a flammable waste container.

Clean-up Methods - Large Spillages

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 course.

Consider evacuation (or protect in place).

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.

Contain spill with sand, earth or vermiculite.

Use only spark-free shovels and explosion proof equipment.

Collect recoverable product into labelled containers for recycling.

Absorb remaining product with sand, earth or vermiculite.

Collect solid residues and seal in labelled drums for disposal.

Wash area and prevent runoff into drains.

If contamination of drains or waterways occurs, advise emergency services.

Environmental Precautions

See section 12

Other Information

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

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, heat or ignition sources.

When handling, DO NOT eat, drink or smoke.

Vapour may ignite on pumping or pouring due to static electricity.

DO NOT use plastic buckets.

Earth and secure metal containers when dispensing or pouring product.

Use spark-free tools when handling.

Avoid contact with incompatible materials.

Keep containers securely sealed.

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.

Other information:

Store in original containers in approved flame-proof area.

No smoking, naked lights, heat or ignition sources.

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

Keep containers securely sealed.

Store away from incompatible materials in a cool, dry well ventilated area.

Protect containers against physical damage and check regularly for leaks.

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

Conditions for safe storage, including any incompatibilities

Suitable container:

Packing as supplied by manufacturer.

Plastic containers may only be used if approved for flammable liquid.

Check that containers are clearly labelled and free from leaks.

Storage incompatibility:

Avoid storage with oxidising agents, acids and alkalis.

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

8. Exposure controls/personal protection

Occupational exposure limit values

Control parameters:

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OCCUPATIONAL EXPOSURE LIMITS (OEL):

INGREDIENT DATA:

Source: Australia Exposure Standards

Ingredient: ethanol

Material name: Ethyl alcohol

TWA: 1000 ppm / 1880 mg/m³

STEL: Not Available

Peak: Not Available

Notes: Not Available

Source: Australia Exposure Standards

Ingredient: ethylene glycol monobutyl ether

Material name: 2-Butoxyethanol

TWA: 20 ppm / 96.9 mg/m³

STEL: 242 mg/m³ / 50 ppm

Peak: Not Available

Notes: Not Available

EMERGENCY LIMITS:

Ingredient: ethanol

Material name: Ethanol: (Ethyl alcohol)

TEEL-1: Not Available

TEEL-2: Not Available

TEEL-3: 15000* ppm

Ingredient: ethylene glycol monobutyl ether

Material name: Butoxyethanol, 2-; (Glycol ether EB)

TEEL-1: 60 ppm

TEEL-2: 120 ppm

TEEL-3: 700 ppm

Ingredient: ethanol

Original IDLH: 3,300 ppm

Revised IDLH: Not Available

Ingredient: ethylene glycol monobutyl ether

Original IDLH: 700 ppm

Revised IDLH: Not Available

Appropriate 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 operating 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: Solvent, vapours, degreasing etc., evaporating from tank (in still air)

Air Speed: 0.25-0.5 m/s (50-100 f/min)

Type of Contaminant: Aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)

Air Speed: 0.5-1 m/s (100-200 f/min.)

Type of Contaminant: Direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)

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

Type of Contaminant: Grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).

Air Speed: 2.5-10 m/s (500-2000 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 A 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 10 x ES

Half-Face Respirator: A-AUS

Full-Face Respirator: -

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

Required Minimum Protection Factor: up to 50 x ES

Half-Face Respirator: -

Full-Face Respirator: A-AUS / Class 1

Powered Air Respirator: -

Required Minimum Protection Factor: up to 100 x ES

Half-Face Respirator: -

Full-Face Respirator: A-2

Powered Air Respirator: A-PAPR-2 ^

^ - 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)

Eye Protection

No special equipment for minor exposure i.e. when handling small quantities.

OTHERWISE:

Safety glasses with side shields.

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

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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

Neoprene gloves
PVC gloves

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 Ballmarker Ink T400 All Colours

Material: BUTYL

CPI: A

Material: PE/EVAL/PE

CPI: A

Material: NEOPRENE

CPI: B

Material: NITRILE

CPI: B

Material: PVC

CPI: B

Material: NAT+NEOPR+NITRILE

CPI: C

Material: NATURAL RUBBER

CPI: C

Material: NATURAL+NEOPRENE

CPI: C

Material: NITRILE+PVC

CPI: C

Material: PVA

CPI: C

Material: SARANEX-23

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.

Footwear

Rubber boots

Body Protection

No special equipment needed when handling small quantities.

OTHERWISE:

Overalls.

Barrier cream.

Eyewash unit.

9. Physical and chemical properties

| Properties | Description | Properties | Description |
|-------------------------|-----------------------|---|---|
| Form | Liquid | Appearance | Coloured high viscosity ink with sweet solvent odour; mixes with water. |
| Odour | Not Available | Decomposition Temperature | Not Available |
| Solubility in Water | Miscible | pH | Not Available (as supplied) Not Available (as a solution (1%)) |
| Vapour Pressure | Not Available | 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 | Not Available |
| Surface Tension | Not Available | Flash Point | 13°C |
| 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 | 80°C |
| Relative density | 0.85-1.00 (Water = 1) | Melting/Freezing Point | Not Applicable |

Other Information

Taste: Not Available

Gas group: Not Available

VOC g/L: Not Available

10. Stability and reactivity

Reactivity

See section 7

Chemical Stability

Unstable in the presence of incompatible materials.

Product is considered stable.

Hazardous polymerisation will not occur.

Conditions to Avoid

See section 7

Incompatible materials

See section 7

Hazardous Decomposition Products

See section 5

Possibility of hazardous reactions

See section 7

11. Toxicological Information

Toxicology Information

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Dy-Mark Ballmarker Ink T400 All Colours

TOXICITY: Not Available

IRRITATION: Not Available

Ethanol

TOXICITY:

Inhalation (rat) LC50: 124.7 mg/l/4H[2]

Oral (rat) LD50: =1501 mg/kg[2]

IRRITATION:

Eye (rabbit): 500 mg SEVERE

Eye (rabbit): 100mg/24hr-moderate

Eye: adverse effect observed (irritating)[1]

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

Skin (rabbit): 400 mg (open)-mild

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

Ethylene glycol monobutyl ether

TOXICITY:

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

Inhalation (rat) LC50: 449.48655 mg/l/4H[2]

Oral (rat) LD50: 250 mg/kg[2]

IRRITATION:

Eye (rabbit): 100 mg SEVERE

Eye (rabbit): 100 mg/24h-moderate

Eye: adverse effect observed (irritating)[1]

Skin (rabbit): 500 mg, open; mild

Skin: adverse effect observed (irritating)[1]

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

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

ETHYLENE GLYCOL MONOBUTYL ETHER:

NOTE: Changes in kidney, liver, spleen and lungs are observed in animals exposed to high concentrations of this substance by all routes. **

ASCC (NZ) SDS

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

For ethylene glycol monoalkyl ethers and their acetates (EGMAEs):

Typical members of this category are ethylene glycol propylene ether (EGPE), ethylene glycol butyl ether (EGBE) and ethylene glycol hexyl ether (EGHE) and their acetates.

EGMAEs are substrates for alcohol dehydrogenase isozyme ADH-3, which catalyzes the conversion of their terminal alcohols to aldehydes (which are transient metabolites). Further, rapid conversion of the aldehydes by aldehyde dehydrogenase produces alkoxyacetic acids, which are the predominant urinary metabolites of mono substituted glycol ethers.

Acute Toxicity: Oral LD50 values in rats for all category members range from 739 (EGHE) to 3089 mg/kg bw (EGPE), with values increasing with decreasing molecular weight. Four to six hour acute inhalation toxicity studies were conducted for these chemicals in rats at the highest vapour concentrations practically achievable. Values range from LC0 > 85 ppm (508 mg/m³) for EGHE, LC50 > 400ppm (2620 mg/m³) for EGBEA to LC50 > 2132 ppm (9061 mg/m³) for EGPE. No lethality was observed for any of these materials under these conditions. Dermal LD50 values in rabbits range from 435 mg/kg bw (EGBE) to 1500 mg/kg bw (EGBEA). Overall these category members can be considered to be of low to moderate acute toxicity. All category members cause reversible irritation to skin and eyes, with EGBEA less irritating and EGHE more irritating than the other category members. EGPE and EGBE are not sensitisers in experimental animals or humans. Signs of acute toxicity in rats, mice and rabbits are consistent with haemolysis (with the exception of EGHE) and non-specific CNS depression typical of organic solvents in general.

Alkoxyacetic acid metabolites, propoxyacetic acid (PAA) and butoxyacetic acid (BAA), are responsible for the red blood cell hemolysis. Signs of toxicity in humans deliberately ingesting cleaning fluids containing 9-22% EGBE are similar to those of rats, with the exception of haemolysis.

Although decreased blood haemoglobin and/or haemoglobinuria were observed in some of the human cases, it is not clear if this was due to haemolysis or haemodilution as a result of administration of large volumes of fluid. Red blood cells of humans are many-fold more resistant to toxicity from EGPE and EGBE in vitro than those of rats.

Repeat dose toxicity: The fact that the NOAEL for repeated dose toxicity of EGBE is less than that of EGPE is consistent with red

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blood cells being more sensitive to EGBE than EGPE. Blood from mice, rats, hamsters, rabbits and baboons were sensitive to the effects of BAA in vitro and displayed similar responses, which included erythrocyte swelling (increased haematocrit and mean corpuscular hemoglobin), followed by hemolysis. Blood from humans, pigs, dogs, cats, and guinea pigs was less sensitive to haemolysis by BAA in vitro.

Mutagenicity: In the absence and presence of metabolic activation, EGBE tested negative for mutagenicity in Ames tests conducted in *S. typhimurium* strains TA97, TA98, TA100, TA1535 and TA1537 and EGHE tested negative in strains TA98, TA100, TA1535, TA1537 and TA1538. In vitro cytogenicity and sister chromatid exchange assays with EGBE and EGHE in Chinese Hamster Ovary Cells with and without metabolic activation and in vivo micronucleus tests with EGBE in rats and mice were negative, indicating that these glycol ethers are not genotoxic.

Carcinogenicity: In a 2-year inhalation chronic toxicity and carcinogenicity study with EGBE in rats and mice a significant increase in the incidence of liver haemangiosarcomas was seen in male mice and forestomach tumours in female mice. It was decided that based on the mode of action data available, there was no significant hazard for human carcinogenicity.

Reproductive and developmental toxicity. The results of reproductive and developmental toxicity studies indicate that the glycol ethers in this category are not selectively toxic to the reproductive system or developing fetus, developmental toxicity is secondary to maternal toxicity. The repeated dose toxicity studies in which reproductive organs were examined indicate that the members of this category are not associated with toxicity to reproductive organs (including the testes).

Results of the developmental toxicity studies conducted via inhalation exposures during gestation periods on EGPE (rabbits -125, 250, 500 ppm or 531, 1062, or 2125 mg/m³ and rats - 100, 200, 300, 400 ppm or 425, 850, 1275, or 1700 mg/m³), EGBE (rat and rabbit - 25, 50, 100, 200 ppm or 121, 241, 483, or 966 mg/m³), and EGHE (rat and rabbit - 20.8, 41.4, 79.2 ppm or 124, 248, or 474 mg/m³) indicate that the members of the category are not teratogenic.

The NOAELs for developmental toxicity are greater than 500 ppm or 2125 mg/m³ (rabbit-EGPE), 100 ppm or 425 mg/m³ (rat-EGPE), 50 ppm or 241 mg/m³ (rat EGBE) and 100 ppm or 483 mg/m³ (rabbit EGBE) and greater than 79.2 ppm or 474 mg/m³ (rat and rabbit-EGHE).

Animal testing showed that exposure to ethylene glycol monobutyl ether resulted in toxicity to both the mother and the embryo. Reproductive effects were thought to be less than that of other monoalkyl ethers of ethylene glycol.

Chronic exposure may cause anaemia, with enlargement and fragility of red blood cells. It is thought that in animals butoxyethanol may cause generalized clotting and bone infarction. In animals, 2-butoxyethanol also increased the rate of some cancers, including liver cancer.

For ethylene glycol:

Ethylene glycol is quickly and extensively absorbed throughout the gastrointestinal tract. Limited information suggests that it is also absorbed through the airways; absorption through skin is apparently slow. Following absorption, it is distributed throughout the body. In humans, it is initially metabolized by alcohol dehydrogenase to form glycoaldehyde, which is rapidly converted to glycolic acid and glyoxal. These breakdown products are oxidized to glyoxylate, which may be further metabolized to formic acid, oxalic acid, and glycine. Breakdown of both glycine and formic acid can generate carbon dioxide, which is one of the major elimination products of ethylene glycol. In addition to exhaled carbon dioxide, ethylene glycol is eliminated in the urine as both the parent compound and glycolic acid. Elimination is rapid and occurs within a few hours.

Respiratory effects: Respiratory system involvement occurs 12-24 hours after swallowing sufficient amounts of ethylene glycol. Symptoms include hyperventilation, shallow rapid breathing, and generalized swelling of the lungs with calcium oxalate deposits occasionally appearing in the lungs. Respiratory system involvement appears to be dose-dependent and occurs at the same time as cardiovascular changes. Later, there may be other changes compatible with adult respiratory distress syndrome (ARDS). Swelling of the lung can be a result of heart failure, ARDS, or aspiration of stomach contents. Symptoms related to acidosis such as fast or excessive breathing are frequently observed; however, major symptoms such as swelling of the lung and inflammation of the bronchi and lungs are relatively rare, and are usually seen only in extreme poisoning.

Cardiovascular effects: Cardiovascular system involvement in humans occurs at the same time as respiratory system involvement, during the second phase of ethylene glycol poisoning by swallowing, which is 12-24 hours after acute exposure. The symptoms of poisoning involving the heart include increased heart rate, heart enlargement and ventricular gallop. There may also be high or low blood pressure, which may progress to cardiogenic shock. In lethal cases, inflammation of the heart muscle has been observed at autopsy. Cardiovascular involvement appears to be rare and usually seen after swallowing higher doses of ethylene glycol. In summary, acute exposure to high levels of ethylene glycol can cause serious cardiovascular effects in humans. The effects of a long-term, low-dose exposure are unknown.

Gastrointestinal effects: Common early acute effects of swallowing ethylene glycol include nausea, vomiting with or without blood, heartburn and abdominal cramping and pain. One patient showed intermittent diarrhea and pain, and after surgery, deposition of oxalate crystals was shown to have occurred.

Musculoskeletal effects: Reported musculoskeletal effects in cases of acute ethylene glycol poisoning include diffuse muscle tenderness and pain, associated with high levels of creatinine in the blood, and jerks and contractions associated with low calcium.

Liver effects: Autopsies carried out on people who died following acute ethylene glycol poisoning showed deposition of calcium oxalate in the liver as well as hydropic and fatty degeneration and cell death (necrosis) of the liver.

Kidney effects: Adverse kidney effects are seen during the third stage of ethylene glycol poisoning, 2-3 days after acute exposure. Calcium oxalate crystals are deposited in the tubules and are seen in the urine. There may also be degeneration and death of tubule cells, and inflammation of the tubule interstitium. If untreated, the degree of kidney damage progresses and leads to blood and

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protein in the urine, decreased kidney function, reduction in urine output and ultimately, kidney failure. With adequate supportive therapy, kidney function can return to normal or near normal.

Metabolic effects: Metabolic changes can occur within 12 hours of exposure to ethylene glycol. There may be metabolic acidosis, caused by accumulation of glycolic acid in the blood and therefore a reduction in blood pH. The anion gap is increased, due to increased unmeasured anions (mainly glycolate).

Effects on the nervous system: Adverse reactions involving the nervous system are among the first symptoms to appear in humans after ethylene glycol is swallowed. These early effects are also the only symptoms caused by unmetabolised ethylene glycol. Together with metabolic effects (see above), they occur from 0.5-12 hours after exposure and are considered to be part of the first stage in ethylene glycol poisoning.

Inco-ordination, slurred speech, confusion and sleepiness are common in the early stages, as are irritation, restlessness and disorientation. Later, there may be effects on cranial nerves (which may be reversible over many months). Swelling of the brain (cerebrum) and crystal deposits of calcium oxalate in the walls of the small blood vessels of the brain were found at autopsy in people who died after acute ethylene glycol poisoning.

Reproductive effects: Animal testing showed that ethylene glycol may affect fertility, survival of fetuses and the male reproductive organs.

Effects on development: Animal studies indicate that birth defects may occur after exposure in pregnancy; there may also be reduction in foetal weight.

Cancer: No studies are known regarding cancer effects in humans or animal, after skin exposure to ethylene glycol.

Genetic toxicity: No human studies available, but animal testing results are consistently negative.

ETHANOL & ETHYLENE GLYCOL MONOBUTYL ETHER:

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

Severe acute exposure by ingestion may cause kidney damage, haemoglobinuria, (blood in urine). Considered an unlikely route of entry in commercial/industrial environments. The liquid is discomforting to the gastro-intestinal tract and may cause dizziness, disorientation, mental confusion, slurred speech. Ingestion may result in nausea, abdominal irritation, pain and vomiting.

Inhalation

Symptoms may be same as intoxication, drunkenness. The vapour is discomforting to the upper respiratory tract.

Inhalation hazard is increased at higher temperatures.

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.

With

Dizziness, disorientation, mental confusion, slurred speech

If exposure to highly concentrated solvent atmosphere is prolonged this may lead to narcosis, unconsciousness, even coma and possible death.

Not considered an irritant through normal use.

Skin

The liquid is discomforting to the skin and may cause drying of the skin, which may lead to dermatitis.

Toxic effects may result from skin absorption.

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

The material may accentuate any pre-existing skin condition.

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.

Eye

The liquid may produce eye discomfort causing temporary smarting and blinking.

The vapour is discomforting to the eyes.

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Skin corrosion/irritation

Data available to make classification

Serious eye damage/irritation

Data available to make classification

Mutagenicity

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

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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 either not available or does not fill the criteria for classification

STOT-single exposure

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

STOT-repeated exposure

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

Aspiration Hazard

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

Chronic Effects

Chronic exposure may cause anaemia, macrocytosis, abnormally large red cells and abnormal red cell fragility.

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

Prolonged or continuous skin contact with the liquid may cause defatting with drying, cracking, irritation and dermatitis following.

12. Ecological information

Ecotoxicity

Dy-Mark Ballmarker Ink T400 All Colours

ENDPOINT: Not Available

TEST DURATION (HR): Not Available

SPECIES: Not Available

VALUE: Not Available

SOURCE: Not Available

Ethanol

ENDPOINT: LC50

TEST DURATION (HR): 96

SPECIES: Fish

VALUE: 11-mg/L

SOURCE: 2

ENDPOINT: EC50

TEST DURATION (HR): 48

SPECIES: Crustacea

VALUE: 2mg/L

SOURCE: 4

ENDPOINT: EC50

TEST DURATION (HR): 96

SPECIES: Algae or other aquatic plants

VALUE: 17.921mg/L

SOURCE: 4

ENDPOINT: NOEC

TEST DURATION (HR): 2016

SPECIES: Fish

VALUE: 0.000375mg/L

SOURCE: 4

Ethylene glycol monobutyl ether

ENDPOINT: LC50

TEST DURATION (HR): 96

SPECIES: Fish

VALUE: 1-700mg/L

SOURCE: 2

ENDPOINT: EC50

TEST DURATION (HR): 48

SPECIES: Crustacea

VALUE: ca.1-800mg/L

SOURCE: 2

ENDPOINT: EC50

TEST DURATION (HR): 72

SPECIES: Algae or other aquatic plants

VALUE: 1-840mg/L

SOURCE: 2

ENDPOINT: NOEC

TEST DURATION (HR): 24

SPECIES: Crustacea

VALUE: >1-mg/L

SOURCE: 2

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 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

Persistence and degradability

Ingredient: ethanol

Persistence: Water/Soil: LOW (Half-life = 2.17 days)

Persistence: Air: LOW (Half-life = 5.08 days)

Ingredient: ethylene glycol monobutyl ether

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

Persistence: Air: LOW (Half-life = 1.37 days)

Mobility

Mobility in soil:

Ingredient: ethanol

Mobility: HIGH (KOC = 1)

Ingredient: ethylene glycol monobutyl ether

Mobility: HIGH (KOC = 1)

Bioaccumulative Potential

Ingredient: ethanol

Bioaccumulation: LOW (LogKOW = -0.31)

Ingredient: ethylene glycol monobutyl ether

Bioaccumulation: LOW (BCF = 2.51)

13. Disposal considerations

Waste Disposal

Product / Packaging disposal:

Consult manufacturer for recycling options and recycle where possible .

Consult State Land Waste Management Authority for disposal.

Incinerate residue at an approved site.

Recycle containers if possible, or dispose of in an authorised landfill.

14. Transport information

U.N. Number

1210

UN proper shipping name

PRINTING INK, flammable

Transport hazard class(es)

3

Sub.Risk

Not Applicable

Packing Group

II

Hazchem Code

•3YE

IERG Number

16

UN Number (Air Transport, ICAO)

1210

IATA/ICAO Proper Shipping Name

Printing ink flammable; Printing ink related material (including printing ink thinning or reducing compound), flammable

IATA/ICAO Hazard Class

3

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IATA/ICAO Packing Group

II

IATA/ICAO Sub Risk

Not Applicable

IMDG UN No

1210

IMDG Proper Shipping Name

PRINTING INK flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable

IMDG Hazard Class

3

IMDG Sub. Risk

Not Applicable

IMDG Pack. Group

II

IMDG Subsidiary Risk

Not Applicable

Other Information

Labels Required:

Marine Pollutant: NO

HAZCHEM: ·3YE

Land transport (ADG):

UN number: 1210

UN proper shipping name: PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable

Transport hazard class(es):

Class: 3

Subrisk: Not Applicable

Packing group: II

Environmental hazard: Not Applicable

Special precautions for user:

Special provisions: 163 367

Limited quantity: 5 L

Air transport (ICAO-IATA / DGR):

UN number: 1210

UN proper shipping name: Printing ink flammable; Printing ink related material (including printing ink thinning or reducing compound), flammable

Transport hazard class(es):

ICAO/IATA Class: 3

ICAO / IATA Subrisk: Not Applicable

ERG Code: 3L

Packing group: II

Environmental hazard: Not Applicable

Special precautions for user:

Special provisions: A3 A72 A192

Cargo Only Packing Instructions: 364

Cargo Only Maximum Qty / Pack: 60 L

Passenger and Cargo Packing Instructions: 353

Passenger and Cargo Maximum Qty / Pack: 5 L

Passenger and Cargo Limited Quantity Packing Instructions: Y341

Passenger and Cargo Limited Maximum Qty / Pack: 1 L

Sea transport (IMDG-Code / GGVSee):

UN number: 1210

UN proper shipping name: PRINTING INK flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable

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Transport hazard class(es):
IMDG Class: 3
IMDG Subrisk: Not Applicable
Packing group: II
Environmental hazard: Not Applicable
Special precautions for user:
EMS Number: F-E, S-D
Special provisions: 163 367
Limited Quantities: 5 L

Transport in bulk according to Annex II of MARPOL and the IBC code:
Not Applicable

15. Regulatory information

Regulatory information

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

ETHANOL IS FOUND ON THE FOLLOWING REGULATORY LISTS:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Inventory of Chemical Substances (AICS)

ETHYLENE GLYCOL MONOBUTYL ETHER IS FOUND ON THE FOLLOWING REGULATORY LISTS:

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Inventory of Chemical Substances (AICS)

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

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

National Inventory Status:

National Inventory: Australia - AICS

Status: Yes

National Inventory: Canada - DSL

Status: Yes

National Inventory: Canada - NDSL

Status: No (ethanol; ethylene glycol monobutyl ether)

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 - ARIPS

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 and are not exempt from listing (see specific ingredients in

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brackets)

Poisons Schedule

N/A

Hazard Rating Systems

Flammability: 3

Toxicity: 2

Body Contact: 2

Reactivity: 0

Chronic: 0

0 = Minimum

1 = Low

2 = Moderate

3 = High

4 = Extreme

16. Other Information

User Codes

| User Title Label | User Codes |
|------------------|------------|
| Wis Numbers | 00286093 |
| Wis Numbers | 03809554 |
| Wis Numbers | 04118529 |
| Wis Numbers | 04136957 |
| Wis Numbers | 04865164 |
| Wis Numbers | 05300539 |
| Wis Numbers | 07995817 |

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Other Information

Version No: 7.1.1.1

Safety Data Sheet according to WHS and ADG requirements

SDS Version Summary:

Version: 6.1.1.1

Issue Date: 16/06/2016

Sections Updated: Name

Version: 7.1.1.1

Issue Date: 01/11/2019

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

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.

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

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

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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