

ACCU Dyne Test Marker Pens

GMS Pacific

Chemwatch Hazard Alert Code: 3

Chemwatch: 7132-71

Issue Date: 09/02/2022

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Safety Data Sheet according to WHS and ADG requirements

S.GHS.AUS.EN

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

Product Identifier

| | |
|-------------------------------|----------------------------|
| Product name | ACCU Dyne Test Marker Pens |
| Synonyms | Not Available |
| Other means of identification | Not Available |

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

| | |
|--------------------------|--|
| Relevant identified uses | Used to determine the surface tension of plastic films. For industrial use only. |
|--------------------------|--|

Details of the supplier of the safety data sheet

| | |
|-------------------------|--|
| Registered company name | GMS Pacific |
| Address | 278 Ferntree Gully Rd, Notting Hill VIC 3168 |
| Telephone | +61 3 9535 9777 |
| Fax | +61 3 9535 9780 |
| Website | https://gmspacific.com |
| Email | info@gmspacific.com |

Emergency telephone number

| | |
|-----------------------------------|---------------|
| Association / Organisation | Not Available |
| Emergency telephone numbers | Not Available |
| Other emergency telephone numbers | Not Available |


SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

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| Poisons Schedule | S6 |
| Classification [1] | Acute Toxicity (Oral) Category 4, Acute Toxicity (Dermal) Category 4, Acute Toxicity (Inhalation) Category 4, Reproductive Toxicity Category 1B |
| Legend: | 1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI |

Label elements

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| GHS label elements |  |
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SIGNAL WORD **DANGER**

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Hazard statement(s)

| | |
|-------------|---|
| H302 | Harmful if swallowed. |
| H312 | Harmful in contact with skin. |
| H332 | Harmful if inhaled. |
| H360 | May damage fertility or the unborn child. |

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

| | |
|-------------|--|
| P201 | Obtain special instructions before use. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P281 | Use personal protective equipment as required. |
| P261 | Avoid breathing mist/vapours/spray. |
| P270 | Do not eat, drink or smoke when using this product. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |

Precautionary statement(s) Response

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| P308+P313 | IF exposed or concerned: Get medical advice/attention. |
| P363 | Wash contaminated clothing before reuse. |
| 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. |
| P304+P340 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| P330 | Rinse mouth. |

Precautionary statement(s) Storage

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| P405 | Store locked up. |
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Precautionary statement(s) Disposal

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| P501 | Dispose of contents/container in accordance with local regulations. |
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

| CAS No | %[weight] | Name |
|-----------|-----------|--|
| 110-80-5 | 1-100 | <u>ethylene glycol monoethyl ether</u> |
| 75-12-7 | 0-99 | <u>formamide</u> |
| 2185-86-6 | 0.2 | <u>C.I. Basic Blue 11</u> |
| 7732-18-5 | NotSpec. | <u>water</u> |

SECTION 4 FIRST AID MEASURES

Description of first aid measures

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| Eye Contact | <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> ▶ Wash out immediately 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. ▶ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. |
| Skin Contact | <p>If skin contact occurs:</p> <ul style="list-style-type: none"> ▶ 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. |

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| Inhalation | <ul style="list-style-type: none"> ▶ 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 | <ul style="list-style-type: none"> ▶ For advice, contact a Poisons Information Centre or a doctor at once. ▶ Urgent hospital treatment is likely to be needed. ▶ 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. ▶ Transport to hospital or doctor without delay. |

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

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]

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

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- ▶ Water spray or fog.
- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

Special hazards arising from the substrate or mixture

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| Fire Incompatibility | ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result |
|-----------------------------|--|

Advice for firefighters

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|------------------------------|--|
| Fire Fighting | <ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear full body protective clothing with breathing apparatus. ▶ Prevent, by any means available, spillage from entering drains or water course. ▶ Use water delivered as a fine spray to control fire and cool adjacent area. ▶ Avoid spraying water onto liquid pools. ▶ DO NOT approach containers suspected to be hot. |
| Fire/Explosion Hazard | <ul style="list-style-type: none"> ▶ Combustible. ▶ Slight fire hazard when exposed to heat or flame. ▶ Heating may cause expansion or decomposition leading to violent rupture of containers. ▶ On combustion, may emit toxic fumes of carbon monoxide (CO). ▶ May emit acrid smoke. |

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| | <ul style="list-style-type: none"> ▶ Mists containing combustible materials may be explosive. <p>Combustion products include:</p> <ul style="list-style-type: none"> , carbon dioxide (CO₂) , nitrogen oxides (NO_x) , other pyrolysis products typical of burning organic material. <p>May emit poisonous fumes. May emit corrosive fumes.</p> <p>WARNING: Long standing in contact with air and light may result in the formation of potentially explosive peroxides.</p> |
| HAZCHEM | Not Applicable |

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

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| Minor Spills | <ul style="list-style-type: none"> ▶ 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 spill with sand, earth, inert material or vermiculite. ▶ Wipe up. |
| Major Spills | <p>Moderate hazard.</p> <ul style="list-style-type: none"> ▶ Clear area of personnel and move upwind. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves. ▶ Prevent, by any means available, spillage from entering drains or water course. ▶ No smoking, naked lights or ignition sources. |

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

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

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| Safe handling | <ul style="list-style-type: none"> ▶ DO NOT allow clothing wet with material to stay in contact with skin <p>The tendency of many ethers to form explosive peroxides is well documented. Ethers lacking non-methyl hydrogen atoms adjacent to the ether link are thought to be relatively safe</p> <ul style="list-style-type: none"> ▶ DO NOT concentrate by evaporation, or evaporate extracts to dryness, as residues may contain explosive peroxides with DETONATION potential. ▶ Any static discharge is also a source of hazard. ▶ Before any distillation process remove trace peroxides by shaking with excess 5% aqueous ferrous sulfate solution or by percolation through a column of activated alumina. ▶ Distillation results in uninhibited ether distillate with considerably increased hazard because of risk of peroxide formation on storage. ▶ Add inhibitor to any distillate as required. <p>The substance accumulates peroxides which may become hazardous only if it evaporates or is distilled or otherwise treated to concentrate the peroxides. The substance may concentrate around the container opening for example.</p> <p>Purchases of peroxidisable chemicals should be restricted to ensure that the chemical is used completely before it can become peroxidised.</p> <ul style="list-style-type: none"> ▶ A responsible person should maintain an inventory of peroxidisable chemicals or annotate the general chemical inventory to indicate which chemicals are subject to peroxidation. An expiration date should be determined. The chemical should either be treated to remove peroxides or disposed of before this date. ▶ 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. |
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| Other information | <ul style="list-style-type: none"> ▶ Store in original containers. ▶ Keep containers securely sealed. ▶ No smoking, naked lights or ignition sources. ▶ Store in a cool, dry, well-ventilated area. ▶ Store away from incompatible materials and foodstuff containers. ▶ Protect containers against physical damage and check regularly for leaks. |
|--------------------------|--|

Conditions for safe storage, including any incompatibilities

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|--------------------------------|---|
| Suitable container | <ul style="list-style-type: none"> ▶ Polyethylene or polypropylene container. ▶ Packing as recommended by manufacturer. ▶ Check all containers are clearly labelled and free from leaks. |
| Storage incompatibility | <ul style="list-style-type: none"> ▶ Avoid reaction with oxidising agents |

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

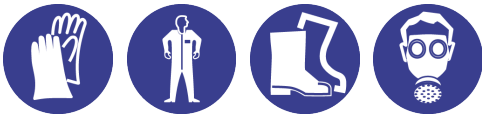
| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|------------------------------|---------------------------------|-----------------|-------------------|---------------|---------------|-------|
| Australia Exposure Standards | ethylene glycol monoethyl ether | 2-Ethoxyethanol | 18 mg/m3 / 5 ppm | Not Available | Not Available | Sk |
| Australia Exposure Standards | formamide | Formamide | 18 mg/m3 / 10 ppm | Not Available | Not Available | Sk |

EMERGENCY LIMITS

| Ingredient | Material name | TEEL-1 | TEEL-2 | TEEL-3 |
|---------------------------------|-------------------|--------|-----------|----------|
| ethylene glycol monoethyl ether | Ethoxyethanol, 2- | 15 ppm | 1,000 ppm | 6000 ppm |
| formamide | Formamide | 30 ppm | 110 ppm | 650 ppm |

| Ingredient | Original IDLH | Revised IDLH |
|---------------------------------|---------------|---------------|
| ethylene glycol monoethyl ether | 6,000 ppm | 500 ppm |
| formamide | Not Available | Not Available |
| C.I. Basic Blue 11 | Not Available | Not Available |
| water | Not Available | Not Available |

Exposure controls

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| Appropriate engineering controls | <p>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.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>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.</p> |
| Personal protection |  |
| Eye and face protection | <ul style="list-style-type: none"> ▶ 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. |
| Skin protection | See Hand protection below |

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| Hands/feet protection | <ul style="list-style-type: none"> ▶ Wear chemical protective gloves, e.g. PVC. ▶ Wear safety footwear or safety gumboots, e.g. Rubber <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly.</p> <ul style="list-style-type: none"> ▶ Neoprene rubber gloves |
| Body protection | See Other protection below |
| Other protection | <ul style="list-style-type: none"> ▶ Overalls. ▶ P.V.C. apron. ▶ Barrier cream. ▶ Skin cleansing cream. ▶ Eye wash unit. |
| Thermal hazards | Not Available |

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:
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| Material | CPI |
|-------------------|-----|
| BUTYL | C |
| NAT+NEOPR+NITRILE | C |
| NATURAL RUBBER | C |
| NEOPRENE | C |
| NITRILE | C |
| PE/EVAL/PE | C |
| PVA | C |
| PVC | C |
| SARANEX-23 | C |
| VITON | 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.

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 | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|------------------------------------|----------------------|----------------------|------------------------|
| up to 10 x ES | A-AUS | - | A-PAPR-AUS / Class 1 |
| up to 50 x ES | - | A-AUS / Class 1 | - |
| up to 100 x ES | - | A-2 | 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)

Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| | | | |
|------------------------|--|--|---------------|
| Appearance | Blue liquid with a mild, non-residual odour; mixes with water.[The solvent mixture is contained in an enclosed marking pen assembly. The potential for ignition of the contents of each pen is low. However if the boxes of pens are involved in a fire the solvent will vapourise and ignite. | | |
| Physical state | Liquid | Relative density (Water = 1) | 0.93-1.13 |
| Odour | Not Available | Partition coefficient n-octanol / water | Not Available |
| Odour threshold | Not Available | Auto-ignition temperature (°C) | Not Available |

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|---|---------------------------|---|----------------|
| pH (as supplied) | Not Available | Decomposition temperature | Not Available |
| Melting point / freezing point (°C) | -90 to 2 (freezing point) | Viscosity (cSt) | Not Available |
| Initial boiling point and boiling range (°C) | 135-210 | Molecular weight (g/mol) | Not Applicable |
| Flash point (°C) | Not Applicable | Taste | Not Available |
| Evaporation rate | 0.32-0.6 BuAC = 1 | Explosive properties | Not Available |
| Flammability | Not Applicable | Oxidising properties | Not Available |
| Upper Explosive Limit (%) | 15.6 | Surface Tension (dyn/cm or mN/m) | Not Available |
| Lower Explosive Limit (%) | 1.7 | Volatile Component (%vol) | 100 |
| Vapour pressure (kPa) | 0.08-3.75 | Gas group | Not Available |
| Solubility in water (g/L) | Miscible | pH as a solution (1%) | Not Available |
| Vapour density (Air = 1) | 3.1 | VOC g/L | Not Available |

SECTION 10 STABILITY AND REACTIVITY

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| Reactivity | See section 7 |
| Chemical stability | <ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ 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

Information on toxicological effects

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|---------------------|---|
| Inhaled | <p>Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. 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.</p> <p>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.</p> <p>Effects and symptoms caused by hydrogen cyanide depends on the intensity and duration of exposure. Short term inhalation of 20-40 ppm hydrogen cyanide may result in slight symptoms, while 270 ppm can be fatal in one minute. Inhalation overexposure to ethylene glycol monoethyl ether may result in headache, nausea and vomiting. Vapours have an objectionable odour at high concentrations.</p> <p>Acute effects from inhalation of high vapour concentrations may be chest and nasal irritation with coughing, sneezing, headache and even nausea.</p> |
| Ingestion | <p>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.</p> <p>Rats fed formamide for up to ten days, at 1.5 g/kg, all died. Autopsy indicated a cumulative effect with changes characteristic of gastritis and malnutrition</p> <p>Ingestion of ethylene glycol monoethyl ether may cause headache, nausea, vomiting, dizziness and weakness. Swallowing of other than a minor quantity may cause kidney, liver and blood forming organ damage.</p> <p>At sufficiently high doses the material may be hepatotoxic (i.e. poisonous to the liver). At sufficiently high doses the material may be nephrotoxic (i.e. poisonous to the kidney).</p> |
| Skin Contact | <p>Skin contact with the material may be harmful; systemic effects may result following absorption.</p> <p>There is some evidence to suggest that the material may cause mild but significant 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.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> |

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| Eye | <p>Irritation of the eyes may produce a heavy secretion of tears (lachrymation).</p> <p>The vapour when concentrated has pronounced eye irritation effects and this gives some warning of high vapour concentrations. If eye irritation occurs seek to reduce exposure with available control measures, or evacuate area. 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.</p> |
| Chronic | <p>Ample evidence exists from experimentation that reduced human fertility is directly caused by exposure to the material. Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material.</p> <p>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p> <p>Repeated exposure to formamide may affect the central nervous system and may cause liver and kidney damage. Rats treated with 3000 mg/kg formamide by semiocclusive patches to the skin, 6 hours/day, 5 days/week for 3 months showed general poor health including a number of organ weight changes. Rats receiving 300 mg/kg developed polycythaemia. Formamide is listed as a 'suggested' teratogen. This possible hazard should be discussed with all employees who may become pregnant.</p> <p>Although it has been reported that application of formamide to the skin of pregnant mice resulted in the inhibition of foetal growth and foetal malformations, gross foetal abnormalities were not observed following dermal application to rats. Repeated exposure to high concentrations of ethylene glycol monoethyl ether (over 400 parts per million) may injure the bone marrow and blood cells (causing tiredness and pallor), kidney (causing changes in urine appearance and output or fluid in the legs) and liver (causing loss of appetite, jaundice, and sometimes pain in the right upper abdomen). In laboratory inhalation studies, birth defects, increased foetal deaths and delayed foetal development have been observed in the offspring of female animals exposed during pregnancy. It may cause birth defects, toxicity to the foetus and damage to the testis.</p> <p>Ethylene glycol esters and their ethers cause wasting of the testicles, reproductive changes, infertility and changes to kidney function. Shorter chain compounds are more dangerous.</p> <p>Chronic exposure to cyanides and certain nitriles may result in interference to iodine uptake by thyroid gland and its consequent enlargement. This occurs following metabolic conversion of the cyanide moiety to thiocyanate.</p> |

| ACCU Dyne Test Marker Pens | TOXICITY | IRRITATION |
|---------------------------------|---|-----------------------------------|
| | Not Available | Not Available |
| ethylene glycol monoethyl ether | TOXICITY | IRRITATION |
| | dermal (rat) LD50: 3900 mg/kg ^[2] | Eye (human): 6000 ppm - irritant |
| | Inhalation (rat) LC50: >4000 ppm/4hr ^[2] | Eye (rabbit): 50 mg - moderate |
| | Oral (rat) LD50: 1746 mg/kg ^[1] | Skin (rabbit): 500 mg (open)-mild |
| formamide | TOXICITY | IRRITATION |
| | dermal (rat) LD50: >3000 mg/kg ^[1] | Eye (rabbit): 23 mg |
| | Inhalation (rat) LC50: >21 mg/l/4hr ^[1] | |
| | Inhalation (rat) LC50: >3900 ppm/6hr ^[2] | |
| | Oral (rat) LD50: ca.3200 mg/kg ^[1] | |
| C.I. Basic Blue 11 | TOXICITY | IRRITATION |
| | Oral (rat) LD50: 960 mg/kg ^[2] | Not Available |
| water | TOXICITY | IRRITATION |
| | Oral (rat) LD50: >90000 mg/kg ^[2] | 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 | |

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| ETHYLENE GLYCOL MONOETHYL ETHER | <p>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.</p> <p>For ethylene glycol monoalkyl ethers and their acetates (EGMAEs):</p> <p>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.</p> <p>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.</p> <p>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</p> |
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|---------------------------|--|
| | these chemicals in rats at the highest vapour concentrations practically achievable. Values range from LC0 > 85 ppm (508 mg/m ³) for EGHE, LC50 > 400ppm (2620 mg/m ³) for EGBEA to LC50 > 2132 ppm (9061 mg/m ³) for EGPE. NOTE: Recent animal tests have confirmed that this material causes testicular atrophy and severe reproductive hazards. There have been no specific human studies, but the consistency of the animal experiments emphasizes that human exposure should be dramatically reduced. |
| FORMAMIDE | for formamide: Acute toxicity: Toxicokinetic studies with rats or mice following a single oral administration showed that formamide was rapidly and completely absorbed in rats and mice, with peak plasma levels occurring within 2 h. The elimination half-life was about 15 h in rats and 4-6 h in mice. The metabolism and distribution of formamide were studied in rats and mice treated with 14C-labelled formamide via intravenous injection or inhalation exposure. The results showed that about 30% of formamide was excreted unchanged in urine within 72 h; about 30% (for rats) or 50% (for mice) was excreted as carbon dioxide in breath, and only a minor quantity (1-3%) was excreted in the faeces. It was suggested that cytochrome P450 2E1 was the primary enzyme of formamide metabolism Repeat dose toxicity: In repeated-dose short-term and subchronic toxicity studies, the main effects found in rats or mice include changes in haematological parameters, irrespective of route of exposure. In a subchronic study, an oral LOAEL of 40 mg/kg-bw per day was determined based on significant increases in haematocrit values, haemoglobin concentrations and erythrocyte counts in both male and female F344/N rats administered 0, 10, 20, 40, 80 or 160 mg formamide/kg-bw per day by gavage, 5 days/week for 14 weeks. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis). |
| C.I. BASIC BLUE 11 | Carcinogenic by RTECS criteria. |
| WATER | No significant acute toxicological data identified in literature search. |

| | | | |
|--|---|---------------------------------|---|
| Acute Toxicity | ✔ | Carcinogenicity | ⊘ |
| Skin Irritation/Corrosion | ⊘ | Reproductivity | ✔ |
| Serious Eye Damage/Irritation | ⊘ | STOT - Single Exposure | ⊘ |
| Respiratory or Skin sensitisation | ⊘ | STOT - Repeated Exposure | ⊘ |
| Mutagenicity | ⊘ | Aspiration Hazard | ⊘ |

Legend: ✖ – Data available but does not fill the criteria for classification
✔ – Data required to make classification available
⊘ – Data Not Available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

| Ingredient | Endpoint | Test Duration (hr) | Species | Value | Source |
|---------------------------------|----------|--------------------|-------------------------------|--------------|--------|
| ethylene glycol monoethyl ether | LC50 | 96 | Fish | 894.204mg/L | 3 |
| ethylene glycol monoethyl ether | EC50 | 48 | Crustacea | 1892.94mg/L | 2 |
| ethylene glycol monoethyl ether | EC50 | 72 | Algae or other aquatic plants | >1000mg/L | 1 |
| ethylene glycol monoethyl ether | EC50 | 96 | Crustacea | >0.1mg/L | 1 |
| ethylene glycol monoethyl ether | NOEC | 504 | Crustacea | >100mg/L | 1 |
| formamide | LC50 | 96 | Fish | 3303.011mg/L | 3 |
| formamide | EC50 | 48 | Crustacea | >500mg/L | 1 |
| formamide | EC50 | 96 | Algae or other aquatic plants | >500mg/L | 1 |
| formamide | EC0 | 24 | Crustacea | =500mg/L | 1 |
| formamide | NOEC | 96 | Fish | =1080mg/L | 1 |
| C.I. Basic Blue 11 | LC50 | 96 | Fish | 1.506mg/L | 3 |
| C.I. Basic Blue 11 | EC50 | 96 | Algae or other aquatic plants | 1.938mg/L | 3 |
| C.I. Basic Blue 11 | EC50 | 384 | Crustacea | 0.381mg/L | 3 |

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - 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

ACCU Dyne Test Marker Pens

Data

DO NOT discharge into sewer or waterways.

Persistence and degradability

| Ingredient | Persistence: Water/Soil | Persistence: Air |
|---------------------------------|---------------------------|------------------|
| ethylene glycol monoethyl ether | LOW (Half-life = 56 days) | Not Available |
| formamide | LOW | LOW |
| C.I. Basic Blue 11 | HIGH | HIGH |
| water | LOW | LOW |

Bioaccumulative potential

| Ingredient | Bioaccumulation |
|---------------------------------|--------------------------|
| ethylene glycol monoethyl ether | LOW (LogKOW = -0.32) |
| formamide | LOW (LogKOW = -1.51) |
| C.I. Basic Blue 11 | MEDIUM (LogKOW = 4.2983) |
| water | LOW (LogKOW = -1.38) |

Mobility in soil

| Ingredient | Mobility |
|---------------------------------|----------------------|
| ethylene glycol monoethyl ether | HIGH (KOC = 1) |
| formamide | HIGH (KOC = 1.498) |
| C.I. Basic Blue 11 | LOW (KOC = 51320000) |
| water | LOW (KOC = 14.3) |

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

| | |
|-------------------------------------|---|
| Product / Packaging disposal | <ul style="list-style-type: none"> ▶ Containers may still present a chemical hazard/ danger when empty. ▶ Return to supplier for reuse/ recycling if possible. <p>Otherwise:</p> <ul style="list-style-type: none"> ▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. ▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product. <p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> ▶ Reduction ▶ Reuse ▶ Recycling ▶ Disposal (if all else fails) <p>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type.</p> <ul style="list-style-type: none"> ▶ 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. ▶ Recycle wherever possible or consult manufacturer for recycling options. ▶ Consult State Land Waste Authority for disposal. ▶ Bury or incinerate residue at an approved site. ▶ Recycle containers if possible, or dispose of in an authorised landfill. |
|-------------------------------------|---|

SECTION 14 TRANSPORT INFORMATION

Labels Required

Continued...

ACCU Dyne Test Marker Pens

| | |
|-------------------------|----------------|
| Marine Pollutant | NO |
| HAZCHEM | Not Applicable |

Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

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

Not Applicable

SECTION 15 REGULATORY INFORMATION

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

ETHYLENE GLYCOL MONOETHYL ETHER(110-80-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards

Australia Inventory of Chemical Substances (AICS)

Australia Hazardous Substances Information System - Consolidated Lists

FORMAMIDE(75-12-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards

Australia Inventory of Chemical Substances (AICS)

Australia Hazardous Substances Information System - Consolidated Lists

C.I. BASIC BLUE 11(2185-86-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

WATER(7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

| National Inventory | Status |
|-------------------------------|--|
| Australia - AICS | Y |
| Canada - DSL | N (C.I. Basic Blue 11) |
| Canada - NDSL | N (water; formamide; ethylene glycol monoethyl ether) |
| China - IECSC | Y |
| Europe - EINEC / ELINCS / NLP | Y |
| Japan - ENCS | N (water; C.I. Basic Blue 11) |
| Korea - KECI | N (C.I. Basic Blue 11) |
| New Zealand - NZIoC | N (C.I. Basic Blue 11) |
| Philippines - PICCS | Y |
| USA - TSCA | Y |
| Legend: | Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets) |

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

| Name | CAS No |
|---------------------------------|----------------------|
| ethylene glycol monoethyl ether | 110-80-5, 96231-36-6 |

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net

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

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