

# 1,2-DIMETHOXYETHANE

GHS Safety Data Sheet

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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### PRODUCT NAME

1,2-DIMETHOXYETHANE

### OTHER NAMES

C4-H10-O2, EGDME, "ethylene glycol dimethyl ether", Glyme, monoglyme, methylglyme, "glycol dimethyl ether", "alpha, beta-dimethoxyethane", "dimethyl cellosolve", dimethylcellosolve, "ethylene dimethyl ether", dimethoxymethane, "monoethylene glycol dimethyl ether", "glycol ether", "2, 5-dioxahexane"

### PROPER SHIPPING NAME

1,2-DIMETHOXYETHANE  
1,2-DIMETHYLOXYETHANE

### PRODUCT USE

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

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.

Solvent, facilitates the formation of alkali-metal-hydrocarbon adducts;

### SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

technical@sdfine.com

Telephone: 91- 22- 24959898

Telephone: 91- 22- 24959899

Fax: 91- 22- 24937232

### HAZARD RATINGS

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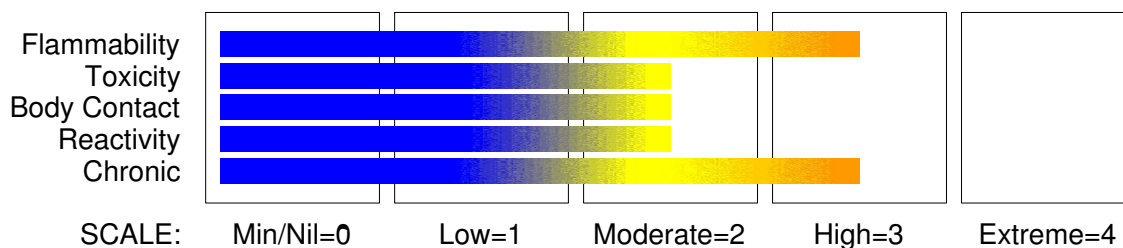
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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION



## Section 2 - HAZARDS IDENTIFICATION

### GHS Classification

Acute Toxicity (Inhalation) Category 4

Acute Toxicity (Oral) Category 5

Eye Irritation Category 2B

Flammable Liquid Category 2

Reproductive Toxicity Category 1B

Respiratory Irritation Category 3



### EMERGENCY OVERVIEW

#### HAZARD

DANGER

Determined by using GHS criteria:

H335 H225 H332 H303 H320 H360 H360

May cause respiratory irritation

Highly flammable liquid and vapour

Harmful if inhaled

May be harmful if swallowed

Causes eye irritation

May damage fertility

May damage the unborn child

#### PRECAUTIONARY STATEMENTS

##### Prevention

Ground/bond container and receiving equipment.

Do not handle until all safety precautions have been read and understood.

Use only non-sparking tools.

Wash hands thoroughly after handling.

Use only outdoors or in a well ventilated area.

Avoid breathing dust/fume/gas/mist/vapours/spray.

Obtain special instructions before use.

Keep container tightly closed.

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## Section 2 - HAZARDS IDENTIFICATION

Use personal protective equipment as required.  
Keep away from heat/sparks/open flame - No smoking.  
Take precautionary measures against static discharge  
Use explosion-proof electrical/ventilating/lighting/equipment  
Wear protective gloves and eye/face protection.

### Response

If exposed or concerned: Get medical attention advice.  
If eye irritation persists, get medical advice/attention.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.  
Specific treatment: refer to Label or MSDS.  
If on skin or hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.  
Call a POISON CENTER or doctor/physician if you feel unwell.  
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

### Storage

Store locked up.

### Disposal

Dispose of contents and container in accordance with relevant legislation.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME                  | CAS RN   | %    |
|-----------------------|----------|------|
| 1, 2- dimethoxyethane | 110-71-4 | > 99 |

## Section 4 - FIRST AID MEASURES

### SWALLOWED

- 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.

### EYE

- If this product comes in contact with the eyes:
- 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.
  - If pain persists or recurs seek medical attention.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled

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## Section 4 - FIRST AID MEASURES

personnel.

### SKIN

If skin or hair contact occurs:

- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

### INHALED

- 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.

### NOTES TO PHYSICIAN

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.

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## Section 5 - FIRE FIGHTING MEASURES

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### EXTINGUISHING MEDIA

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

### FIRE FIGHTING

- 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).
- 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.

### FIRE/EXPLOSION HAZARD

- Liquid and vapour are highly flammable.
  - Severe fire hazard when exposed to heat, flame and/or oxidisers.
  - Vapour may travel a considerable distance to source of ignition.
  - Heating may cause expansion or decomposition leading to violent rupture of containers.
  - On combustion, may emit toxic fumes of carbon monoxide (CO).
- Combustion products include: carbon dioxide (CO<sub>2</sub>), other pyrolysis products typical of burning organic material.
- Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

### FIRE INCOMPATIBILITY

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

### Personal Protective Equipment

Gloves, boots (chemical resistant).  
Breathing apparatus.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### EMERGENCY PROCEDURES

#### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

- Contain and absorb small quantities with vermiculite or other absorbent material.
- Wipe up.
- Collect residues in a flammable waste container.

### MAJOR SPILLS

- 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.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

1,2-dimethoxyethane 1000 ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

1,2-dimethoxyethane 75 ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:

1,2-dimethoxyethane 10 ppm

The threshold concentration below which most people will experience no appreciable risk of health effects:

1,2-dimethoxyethane 3.5 ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

|                 |               |               |              |
|-----------------|---------------|---------------|--------------|
| Very Toxic (T+) | $\geq 0.1\%$  | Toxic (T)     | $\geq 3.0\%$ |
| R50             | $\geq 0.25\%$ | Corrosive (C) | $\geq 5.0\%$ |
| R51             | $\geq 2.5\%$  |               |              |
| else            | $\geq 10\%$   |               |              |

where percentage is percentage of ingredient found in the mixture

### SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X



X



X



X



X



+

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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+: May be stored together  
O: May be stored together with specific preventions  
X: Must not be stored together

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

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## Section 7 - HANDLING AND STORAGE

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### PROCEDURE FOR HANDLING

Contains low boiling substance:

Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.

- Check for bulging containers.
  - Vent periodically
  - Always release caps or seals slowly to ensure slow dissipation of vapours.
  - 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 storing and handling recommendations.
  - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
- 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.
- Purchases of peroxidisable chemicals should be restricted to ensure that the chemical is used completely before it can become peroxidised.
- 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.
  - The person or laboratory receiving the chemical should record a receipt date on the bottle. The individual opening the container should add an opening date.
  - Unopened containers received from the supplier should be safe to store for 18 months.
  - Opened containers should not be stored for more than 12 months.

### SUITABLE CONTAINER

- Packing as supplied by manufacturer.

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## Section 7 - HANDLING AND STORAGE

- Plastic containers may only be used if approved for flammable liquid.
- Check that containers are clearly labelled and free from leaks.
- For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C)
- For manufactured product having a viscosity of at least 250 cSt. (23 deg. C)
- Manufactured product that requires stirring before use and having a viscosity of at least 20 cSt (25 deg. C)
  - (i) : Removable head packaging;
  - (ii) : Cans with friction closures and
  - (iii) : low pressure tubes and cartridges may be used.
- Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages
- In addition, where inner packagings are glass and contain liquids of packing group I there must be sufficient inert absorbent to absorb any spillage, unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

### STORAGE INCOMPATIBILITY

Glycol ethers may form peroxides under certain conditions. In the presence of strong bases or the salts of strong bases, at elevated temperatures, the potential exists for runaway reactions. Contact with aluminium should be avoided. Release of hydrogen gas may result.

Avoid reaction with oxidising agents.

Rotate all stock to prevent ageing. Use on FIFO (First In-First Out) basis.

### STORAGE REQUIREMENTS

Easily peroxidisable. Products formed as a result of peroxidation are not only safety hazards but may chemically alter the chemical behavior of the parent compound. Should have a warning label affixed bearing the date of receipt in the laboratory and the date on which the label was first opened. Store-room items should have the label affixed by the Store-room whilst for non- storeroom items or materials synthesised in the laboratory , an individual chemist should be responsible for warning labels.

WARNING: This product may form peroxides to a hazardous level by concentration (by distillation, evaporation, etc.) Should be evaluated every twelve months after opening, redated if safe or else discarded. The oxidation of iodide to iodine or the conversion of colourless ferrothiocyanate to red ferrithiocyanate by peroxides are simple and convenient tests for most peroxides. Before distilling or evaporating test for peroxides. Leave at least 10% bottoms. Use a shield when evaporating or distilling mixtures which may contain peroxidisable compounds. Store away from heat and light. Particular attention should be paid to the adequacy of the closure on storage containers.

Peroxides may be removed by;

- passing the material over a column of ordinary activated alumina (care should be taken in disposal of the activated alumina);
- shaking with a concentrated solution of ferrous salt (provided the carrier solvent is water-insoluble);
- agitation with an approximately equimolar mixture of ferrous sulfate and sodium bisulfate;

- commercial quantities may be treated with a 5% solution of aqueous sodium carbonate.

Jackson et al: Control of Peroxizable Compounds; Safety in the Chemical Laboratory, Journal of Chemical Education; Vol 47, 1970, pp A175-A188

When solvents have been freed from peroxides by percolation through a column of activated alumina, the adsorbed peroxides must promptly be desorbed by treatment with polar

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## Section 7 - HANDLING AND STORAGE

solvents, methanol or water, which must in turn be discarded safely.

- 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 storing and handling recommendations.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- 1, 2- dimethoxyethane:

CAS:110- 71- 4 CAS:173201- 80- 4

### MATERIAL DATA

No exposure limits set by NOHSC or ACGIH.

CEL TWA: 0.5 ppm, 2 mg/m<sup>3</sup> (calculated as 1/5 x STEL:)

OEL STEL: 2.5 ppm, 10 mg/m<sup>3</sup>

(Russian Standard is 10 mg/m<sup>3</sup> equals 2.5 ppm calculated.)

[SigmAld]

### PERSONAL PROTECTION



### EYE

- 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 lens 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].

### HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

### 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: 1, 2- dimethoxyethane

Protective Material CPI \*.

BUTYL A

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.

### RESPIRATOR

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.

| Protection Factor | Half- Face Respirator | Full- Face Respirator | Powered Air Respirator |
|-------------------|-----------------------|-----------------------|------------------------|
| 10 x ES           | A- AUS                | -                     | A- PAPR- AUS           |
| 50 x ES           | -                     | A- AUS                | -                      |
| 100 x ES          | -                     | A- 2                  | A- PAPR- 2 ^           |

^ - Full-face.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult your

Occupational Health and Safety Advisor.

### ENGINEERING CONTROLS

For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion -resistant.

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.

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### Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Type of Contaminant:  
solvent, vapours, degreasing etc., evaporating from tank (in still air).  
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)  
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)

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

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

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.

### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

#### APPEARANCE

Clear highly flammable liquid, soluble in water. Strong ether like odour

#### PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Molecular Weight: 90.14

Melting Range (°C): - 58

Solubility in water (g/L): Miscible

pH (1% solution): Not available

Volatile Component (%vol): 100

Relative Vapour Density (air=1): 3.1

Lower Explosive Limit (%): 1.6

Autoignition Temp (°C): 745

State: Liquid

Boiling Range (°C): 82- 83 (85)

Specific Gravity (water=1): 0.867

pH (as supplied): Not available

Vapour Pressure (kPa): 6.4 @ 20°C

Evaporation Rate: Fast

Flash Point (°C): 2

Upper Explosive Limit (%): 10.4

Decomposition Temp (°C): Not Available

Viscosity: Not Available

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

Segregate from strong oxidisers.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual. Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce considerable gastrointestinal discomfort and may be harmful or toxic if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

##### EYE

Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

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.

##### SKIN

Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

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.

##### INHALED

Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.

Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas

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## Section 11 - TOXICOLOGICAL INFORMATION

exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

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

Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.

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

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.

Acute effects from inhalation of high concentrations of vapour are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterised by headache and dizziness, increased reaction time, fatigue and loss of co-ordination.

### CHRONIC HEALTH EFFECTS

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

There is sufficient evidence to provide a strong presumption that human exposure to the material may result in impaired fertility on the basis of: - clear evidence in animal studies of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a secondary non-specific consequence of other toxic effects.

There is sufficient evidence to provide a strong presumption that human exposure to the material may result in developmental toxicity, generally on the basis of:

- clear results in appropriate animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects.

Exposure to the material may cause concerns for human fertility, on the basis that similar materials provide some evidence of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects, but which are not a secondary non-specific consequence of other toxic effects.

Studies with some ethylene glycol ethers and their esters indicate reproductive changes, testicular atrophy, infertility and kidney function changes. The metabolic acetic acid derivatives of the glycol ethers, not the ether itself, have been found to be the proximal reproductive toxin in animals. The potency of these metabolites decrease significantly as the chain length of the ether increases. Consequently glycol ethers with longer substituents (e.g diethylene glycols, triethylene glycols) have not generally been associated with reproductive effects. One of the most sensitive indicators of toxic effects observed from many of the glycol ethers is an increase in the erythrocytic osmotic fragility in rats. This appears to be related to the development of haemoglobinuria (blood in the urine) at higher exposure levels or as a result of chronic exposure. Ethylene glycol ethers and acetates are mainly metabolised to alkoxyacetic acids but there is also a minor pathway through ethylene glycol to oxalic acid. The main pathway of ethylene glycol ethers is associated with significant clinical or experimental health effects, but the minor pathway is also interesting because formation of urinary stones depends principally upon urinary concentration of oxalate and calcium. In one study (1) the tendency to form urinary stones was 2.4 times higher amongst silk-screen printers exposed to ethylene glycol ethers, than among office workers. (1) Laitinen J., et al: Occupational Environmental Medicine 1996, 53 595-600.

continued...

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## Section 11 - TOXICOLOGICAL INFORMATION

Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS].

Reproductive effects in animal testing indicate need for careful consideration before allowing any exposure.

### TOXICITY AND IRRITATION

#### TOXICITY

Oral (mouse) TDLo: 361 mg/kg

Inhalation (rat) LC50: 3000 ppm/4h

Animal testing shows material is a reproductive effector:

#### IRRITATION

Nil Reported

Studies with some ethylene glycol ethers and their esters indicate reproductive changes, testicular atrophy, infertility and kidney function changes. The metabolic acetic acid derivatives of the glycol ethers, not the ether itself, have been found to be the proximal reproductive toxin in animals. The potency of these metabolites decrease significantly as the chain length of the ether increases. Consequently glycol ethers with longer substituents (e.g diethylene glycols, triethylene glycols) have not generally been associated with reproductive effects. One of the most sensitive indicators of toxic effects observed from many of the glycol ethers is an increase in the erythrocytic osmotic fragility in rats. This appears to be related to the development of haemoglobinuria (blood in the urine) at higher exposure levels or as a result of chronic exposure. Ethylene glycol ethers and acetates are mainly metabolised to alkoxyacetic acids but there is also a minor pathway through ethylene glycol to oxalic acid. The main pathway of ethylene glycol ethers is associated with significant clinical or experimental health effects, but the minor pathway is also interesting because formation of urinary stones depends principally upon urinary concentration of oxalate and calcium. In one study (1) the tendency to form urinary stones was 2.4 times higher amongst silk-screen printers exposed to ethylene glycol ethers, than among office workers. (1) Laitinen J., et al: Occupational Environmental Medicine 1996, 53 595-600.

## Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.

## Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible.
  - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
  - Dispose of by: Burial in a licenced land-fill or Incineration in a licenced apparatus (after admixture with suitable combustible material).
  - Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
  - Containers may still present a chemical hazard/ danger when empty.
  - Return to supplier for reuse/ recycling if possible.
- Otherwise:
- 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 MSDS and observe all notices pertaining to the product.

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## Section 14 - TRANSPORTATION INFORMATION

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Labels Required: FLAMMABLE LIQUID  
HAZCHEM: 2[Y]E

### UNDG:

|                                                             |      |                |      |
|-------------------------------------------------------------|------|----------------|------|
| Dangerous Goods Class:                                      | 3    | Subrisk:       | None |
| UN Number:                                                  | 2252 | Packing Group: | II   |
| Shipping Name: 1,2-DIMETHOXYETHANE<br>1,2-DIMETHYIOXYETHANE |      |                |      |

### Air Transport IATA:

|                                                             |      |                    |      |
|-------------------------------------------------------------|------|--------------------|------|
| ICAO/IATA Class:                                            | 3    | ICAO/IATA Subrisk: | None |
| UN/ID Number:                                               | 2252 | Packing Group:     | II   |
| ERG Code:                                                   | 3L   |                    |      |
| Shipping name: 1,2-DIMETHOXYETHANE<br>1,2-DIMETHYIOXYETHANE |      |                    |      |

### Maritime Transport IMDG:

|                                                             |            |                |      |
|-------------------------------------------------------------|------------|----------------|------|
| IMDG Class:                                                 | 3          | IMDG Subrisk:  | None |
| UN Number:                                                  | 2252       | Packing Group: | II   |
| EMS Number:                                                 | F- E, S- D |                |      |
| Shipping name: 1,2-DIMETHOXYETHANE<br>1,2-DIMETHYIOXYETHANE |            |                |      |

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## Section 15 - REGULATORY INFORMATION

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### REGULATIONS

1,2-dimethoxyethane (CAS: 110-71-4) is found on the following regulatory lists;  
OECD Representative List of High Production Volume (HPV) Chemicals

No data available for 1,2-dimethoxyethane as CAS: 173201-80-4.

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## Section 16 - OTHER INFORMATION

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### INGREDIENTS WITH MULTIPLE CAS NUMBERS

| Ingredient Name | CAS |
|-----------------|-----|
|-----------------|-----|

continued...

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## Section 16 - OTHER INFORMATION

1, 2- dimethoxyethane

110- 71- 4, 173201- 80- 4

### REPRODUCTIVE HEALTH GUIDELINES

Established occupational exposure limits frequently do not take into consideration reproductive end points that are clearly below the thresholds for other toxic effects. Occupational reproductive guidelines (ORGs) have been suggested as an additional standard. These have been established after a literature search for reproductive no -observed-adverse effect-level (NOAEL) and the lowest-observed-adverse-effect-level (LOAEL). In addition the US EPA's procedures for risk assessment for hazard identification and dose-response assessment as applied by NIOSH were used in the creation of such limits. Uncertainty factors (UFs) have also been incorporated.

| Ingredient            | ORG        | UF   | Endpoi<br>nt | CR | Adeq<br>TLV |
|-----------------------|------------|------|--------------|----|-------------|
| 1, 2- dimethoxyethane | 0.18 mg/m3 | 1000 | D            | NA | -           |

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time -weighted average unless specified otherwise.

CR = Cancer Risk/10000; UF = Uncertainty factor:

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

D = Developmental; R = Reproductive; TC = Transplacental carcinogen

Jankovic J., Drake F.: A Screening Method for Occupational Reproductive  
American Industrial Hygiene Association Journal 57: 641-649 (1996).

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