

# POWERS FIRE - POWER

Chemwatch Material Safety Data Sheet  
Issue Date: 19-Dec-2006  
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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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### PRODUCT NAME

POWERS FIRE - POWER

### SYNONYMS

### PROPER SHIPPING NAME

AEROSOLS

### PRODUCT USE

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

### SUPPLIER

Company: Powers Fasteners Australasia Pty Ltd  
Address:  
Factory 3, 205 Abbots Road  
Dandenong South  
VIC 3175  
Australia  
Telephone: +61 3 8787 5888  
Telephone: 1800 677 872 (freecall)  
Fax: +61 3 8787 5899

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## Section 2 - HAZARDS IDENTIFICATION

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### STATEMENT OF HAZARDOUS NATURE

**HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.**

### POISONS SCHEDULE

None

### RISK

Extremely flammable.  
Harmful by inhalation.

Irritating to eyes, respiratory system and skin.

May cause SENSITISATION by inhalation.  
May cause SENSITISATION by skin contact.

Risk of explosion if heated under confinement.

### SAFETY

Keep container in a well ventilated place.  
Avoid exposure - obtain special instructions before use.

To clean the floor and all objects contaminated by this material, use water and detergent.

Keep container tightly closed.

Keep away from food, drink and animal feeding stuffs.

Take off immediately all contaminated clothing.  
In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.

If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container

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or label).  
This material and its container must be disposed  
of as hazardous waste.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME   | CAS RN     | %            |
|--|------------|--------------|
| MDI oligomer   | 9016-87-9  | 30-60        |
| tris(2- chloroisopropyl)phosphate<br>halogenated polyetherpolyol | 13674-84-5 | 1-24<br>1-10 |
| tetrafluoroethane  | 811-97-2   | 1-10         |
| dimethyl ether   | 115-10-6   | 1-10         |
| iso- butane  | 75-28-5.   | 1-10         |

## Section 4 - FIRST AID MEASURES

### SWALLOWED

Not considered a normal route of entry.

### EYE

If aerosols come in contact with the eyes:

- Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If solids or aerosol mists are deposited upon the skin:

- Flush skin and hair with running water (and soap if available).
- Remove any adhering solids with industrial skin cleansing cream.
- DO NOT use solvents.
- Seek medical attention in the event of irritation.

### INHALED

If aerosols, fumes or combustion products are inhaled:

- Remove to fresh air.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- If breathing is shallow or has stopped, ensure clear airway and apply resuscitation, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

### NOTES TO PHYSICIAN

Treat symptomatically.

For sub-chronic and chronic exposures to isocyanates:

- This material may be a potent pulmonary sensitiser which causes bronchospasm even in patients without prior airway hyperreactivity.
- Clinical symptoms of exposure involve mucosal irritation of respiratory and

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Section 4 - FIRST AID MEASURES

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gastrointestinal tracts.

- Conjunctival irritation, skin inflammation (erythema, pain vesiculation) and gastrointestinal disturbances occur soon after exposure.
- Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.
- Some cross-sensitivity occurs between different isocyanates.
- Noncardiogenic pulmonary edema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.
- Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.
- Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may be useful for ingestion.
- Mydriatics, systemic analgesics and topical antibiotics (Sulamyd) may be used for corneal abrasions.
- There is no effective therapy for sensitised workers.

[Ellenhorn and Barceloux; Medical Toxicology]

NOTE: Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the concentration and duration of exposure. They induce smooth muscle contraction which leads to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV1, may not represent sensitivity.

[Karol & Jin, Frontiers in Molecular Toxicology, pp 56-61, 1992].

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## Section 5 - FIRE FIGHTING MEASURES

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### EXTINGUISHING MEDIA

SMALL FIRE:

- Water spray, dry chemical or CO2

LARGE FIRE:

- Water spray or fog.

### 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.
- If safe, switch off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### FIRE/EXPLOSION HAZARD

- Liquid and vapour are flammable.
- Moderate fire hazard when exposed to heat or flame.
- Vapour forms an explosive mixture with air.
- Moderate explosion hazard when exposed to heat or flame.
- Vapour may travel a considerable distance to source of ignition.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- Aerosol cans may explode on exposure to naked flame.
- Rupturing containers may rocket and scatter burning materials.
- Hazards may not be restricted to pressure effects.
- May emit acrid, poisonous or corrosive fumes.

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- On combustion, may emit toxic fumes of carbon monoxide (CO).
- Combustion products include: carbon dioxide (CO<sub>2</sub>), isocyanates, and minor amounts of, hydrogen cyanide, hydrogen chloride, phosgene, hydrogen fluoride, nitrogen oxides (NO<sub>x</sub>), phosphorus oxides (PO<sub>x</sub>), other pyrolysis products typical of burning organic material.
- Flooding quantities of water only.
- Small quantities of water in contact with hot liquid may react violently with generation of a large volume of rapidly expanding hot sticky semi-solid foam.
  - Presents additional hazard when fire fighting in a confined space.
  - Cooling with flooding quantities of water reduces this risk.

## FIRE INCOMPATIBILITY

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

## HAZCHEM: 2Y

### Personal Protective Equipment

- Breathing apparatus.
- Gas tight chemical resistant suit.
- Limit exposure duration to 1 BA set 30 mins.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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## EMERGENCY PROCEDURES

### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Wear protective clothing, impervious gloves and safety glasses.
- Shut off all possible sources of ignition and increase ventilation.
- Wipe up.
- If safe, damaged cans should be placed in a container outdoors, away from all ignition sources, until pressure has dissipated.
- Undamaged cans should be gathered and stowed safely.

### 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 courses
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapour.
- Absorb or cover spill with sand, earth, inert materials or vermiculite.
- If safe, damaged cans should be placed in a container outdoors, away from ignition sources, until pressure has dissipated.
- Undamaged cans should be gathered and stowed safely.
- Collect residues and seal in labelled drums for disposal.

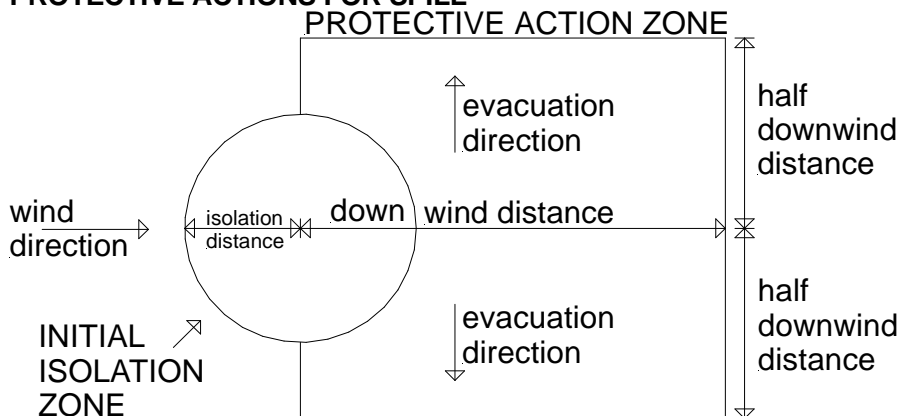
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Section 6 - ACCIDENTAL RELEASE MEASURES

## PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

|                              |          |
|------------------------------|----------|
| Isolation Distance           | -        |
| Downwind Protection Distance | 8 metres |
| IERG Number                  | 49       |

## FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".  
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 126 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

## 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:

|                   |            |
|-------------------|------------|
| tetrafluoroethane | 150000 ppm |
| dimethyl ether    | 60000 ppm  |
| iso-butane        | 15000 ppm  |

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

|                   |           |
|-------------------|-----------|
| tetrafluoroethane | 50000 ppm |
| dimethyl ether    | 50000 ppm |
| iso-butane        | 4000 ppm  |

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

|                   |          |
|-------------------|----------|
| tetrafluoroethane | 3000 ppm |
| dimethyl ether    | 3000 ppm |
| iso-butane        | 2400 ppm |

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

|                   |          |
|-------------------|----------|
| tetrafluoroethane | 1000 ppm |
| dimethyl ether    | 1000 ppm |
| iso-butane        | 800 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

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

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- DO NOT incinerate or puncture aerosol cans.
- DO NOT spray directly on humans, exposed food or food utensils.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

### SUITABLE CONTAINER

- Aerosol dispenser.
- Check that containers are clearly labelled.

### STORAGE INCOMPATIBILITY

- Avoid contamination with water, alkalies and detergent solutions.
- Material reacts with water and generates gas, pressurises containers with even drum rupture resulting.
- DO NOT reseal container if contamination is suspected.
- Open all containers with care.
- Avoid reaction with oxidising agents.

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Section 7 - HANDLING AND STORAGE

## STORAGE REQUIREMENTS

Rotate all stock to prevent ageing. Use on FIFO (First In-First Out) basis.  
Keep dry to avoid corrosion of cans. Corrosion may result in container perforation and internal pressure may eject contents of can.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

| Source                       | Material   | TWA<br>ppm | TWA<br>mg/m <sup>3</sup> | STEL<br>ppm | STEL<br>mg/m <sup>3</sup> | Peak<br>ppm | Peak<br>mg/m <sup>3</sup> | TWA<br>F/CC |
|------------------------------|--|------------|--------------------------|-------------|---------------------------|-------------|---------------------------|-------------|
| Australia Exposure Standards | MDI oligomer (Isocyanates, all (as- NCO))        |            | 0.02                     |             | 0.07                      |             |                           |             |
| Australia Exposure Standards | tetrafluoroethane (1, 1, 1, 2-Tetrafluoroethane) | 1, 000     | 4240                     |             |                           |             |                           |             |
| Australia Exposure Standards | dimethyl ether (Dimethyl ether)                  | 400        | 760                      | 500         | 950                       |             |                           |             |
| Australia Exposure Standards | iso- butane (Butane)                             | 800        | 1, 900                   |             |                           |             |                           |             |

The following materials had no OELs on our records

- tris(2-chloroisopropyl)phosphate: CAS:13674-84-5

### MATERIAL DATA

Not available. Refer to individual constituents.

#### INGREDIENT DATA

##### MDI OLIGOMER:

Some jurisdictions require that health surveillance be conducted on occupationally exposed workers. This should emphasise:

- demography, occupational and medical history and health advice
- completion of a standardised respiratory questionnaire
- physical examination of the respiratory system and skin
- standardised respiratory function tests such as FEV1, FVC and FEV1/FVC.

##### TRIS(2-CHLOROISOPROPYL)PHOSPHATE:

No exposure limits set by NOHSC or ACGIH.

##### TETRAFLUOROETHANE:

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus

increasing the risk of overexposure.

Studies show that HFC 134a is practically nontoxic by inhalation. The acute lethal effects occur at levels exceeding 500000 ppm whilst the threshold for cardiac sensitisation occurs at about 75000 ppm. Repeated exposures at 50000 ppm for 13 weeks did not produce significant toxicity in animals. Limited studies have shown the substance not to be a carcinogen, or to exhibit mutagenic effects. Exposures up to 300000 ppm and 40000 ppm did not produce teratogenic effects in rats and rabbits respectively. The workplace environmental exposure level (WEEL), recommended by the AIHA, is thought to be protective against cardiac sensitisation and systemic injury.

### DIMETHYL ETHER:

The no-effect-level for dimethyl ether is somewhere between 2000 ppm (rabbits) and 50,000 ppm (humans) with possible cardiac sensitisation occurring around 200,000 ppm (dogs). The AIHA has adopted a safety factor of 100 in respect to the 50,000 ppm level in its recommendation for a workplace environmental exposure level (WEEL) which is thought to protect against both narcotic and sensitising effects. This level is consistent with the TLV-TWA of 400 ppm for diethyl ether and should be easily achievable using current technologies. The use of the traditionally allowable excursion of 1.25 to the level of 6.25 ppm is felt to be more than adequate as an upper safe limit of exposure.

Human data:

50,000 ppm (12 mins): Feelings of mild intoxication.

75,000 ppm (12 mins): As above plus slight lack of attenuation.

82,000 ppm (12 mins): Some incoordination, slight blurring of vision

(30 mins): As above plus analgesia of the face and rushing of blood to the face.

100,000 ppm (10-20 mins): Narcotic symptoms

(64 mins) : Sickness (assumed to be nausea)

144,000 ppm (36 mins): Unconsciousness

### ISO-BUTANE:

Isobutane Odour Threshold Value: 1.2 ppm

## 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

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

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

No special equipment needed when handling small quantities.

#### OTHERWISE:

For potentially moderate exposures:

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

For potentially heavy exposures:

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

NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

### OTHER

No special equipment needed when handling small quantities.

#### OTHERWISE:

- Overalls.
- Skin cleansing cream.
- Eyewash unit.
- Do not spray on hot surfaces.

### RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

| Breathing Zone Level<br>ppm (volume) | Maximum Protection<br>Factor | Half- face Respirator | Full- Face Respirator |
|--------------------------------------|------------------------------|-----------------------|-----------------------|
| 1000                                 | 10                           | AX- AUS P             | -                     |
| 1000                                 | 50                           | -                     | AX- AUS P             |
| 5000                                 | 50                           | Airline *             | -                     |
| 5000                                 | 100                          | -                     | AX- 2 P               |
| 10000                                | 100                          | -                     | AX- 3 P               |
|                                      | 100+                         |                       | Airline**             |

\* - Continuous Flow

\*\* - Continuous-flow or positive pressure demand.

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

For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

### ENGINEERING CONTROLS

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

Provide adequate ventilation in warehouse or closed storage areas.

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

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

|   |                              |
|---|------------------------------|
| Type of Contaminant:<br>aerosols, (released at low velocity into zone of active generation)                     | Speed:<br>0.5- 1 m/s         |
| direct spray, spray painting in shallow booths, gas discharge (active generation into zone of rapid air motion) | 1- 2.5 m/s (200- 500 f/min.) |

Within each range the appropriate value depends on:

| Lower end of the range                                     | Upper end of the range            |
|--|-----------------------------------|
| 1: Room air currents minimal or favourable to capture      | 1: Disturbing room air currents   |
| 2: Contaminants of low toxicity or of nuisance value only. | 2: Contaminants of high toxicity  |
| 3: Intermittent, low production.                           | 3: High production, heavy use     |
| 4: Large hood or large air mass in motion                  | 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

Supplied as an aerosol pack. Contents under PRESSURE. Contains highly flammable hydrocarbon propellant. Coloured liquid spray; does not mix with water.

### PHYSICAL PROPERTIES

Liquid.  
Gas.  
Does not mix with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Immiscible  
pH (1% solution): Not Applicable  
Volatile Component (%vol): 16 (VOC content)  
Relative Vapour Density (air=1): >1  
Lower Explosive Limit (%): Not Available  
Autoignition Temp (°C): Not Available  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water= 1): Not Available  
pH (as supplied): Not Applicable  
Vapour Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Available  
Upper Explosive Limit (%): Not Available  
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

- Elevated temperatures.
- Presence of open flame.
- Product is considered stable.
- Hazardous polymerisation will not occur.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

Not normally a hazard due to physical form of product.  
Considered an unlikely route of entry in commercial/industrial environments.  
Ingestion may result in nausea, abdominal irritation, pain and vomiting.

##### EYE

The material may be irritating to the eye, with prolonged contact causing inflammation.  
Repeated or prolonged exposure to irritants may produce conjunctivitis.  
Eye contact with alkyl ethers (vapour or liquid) may produce irritation, redness and tears.

##### SKIN

The material may accentuate any pre-existing dermatitis condition.  
Spray mist may produce discomfort.  
Fluorocarbons remove natural oils from the skin, causing irritation, dryness and sensitivity.  
Alkyl ethers may defat and dehydrate the skin producing dermatoses. Absorption may produce headache, dizziness, and central nervous system depression.

##### INHALED

Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.  
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.  
WARNING: Intentional misuse by concentrating/inhaling contents may be lethal.

##### CHRONIC HEALTH EFFECTS

Principal routes of exposure are by accidental skin and eye contact and by inhalation of vapours especially at higher temperatures.  
Persons with a history of asthma or other respiratory problems or are known to be sensitised, should not be engaged in any work involving the handling of isocyanates. [CCTRADE-Bayer, APMF].  
Animal testing shows that polymeric MDI can damage the nasal cavities and lungs, causing inflammation and increased cell growth.  
Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.  
Skin contact with the material is more likely to cause a sensitisation reaction in some

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## Section 11 - TOXICOLOGICAL INFORMATION

persons compared to the general population.

Respiratory sensitisation may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping.

Sensitisation may result in allergic dermatitis responses including rash, itching, hives or swelling of extremities.

Isocyanate vapours are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs.

Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia. Digestive effects include nausea and vomiting. Breathing difficulties may occur unpredictably after a period of tolerance and after skin contact. Allergic inflammation of the skin can occur, with rash, itching, blistering, and swelling of the hands and feet. Sensitive people can react to very low levels and should not be exposed to this material.

WARNING: Aerosol containers may present pressure related hazards.

### TOXICITY AND IRRITATION

Not available. Refer to individual constituents.

#### MDI OLIGOMER:

product

Oral (rat) LD50: 43000 mg/kg

Eye (rabbit): 100 mg - mild

Dermal (rabbit) LD50: >9400 mg/kg

Inhalation (rat) LC50: 490 mg/m<sup>3</sup>/4h

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

#### TRIS(2-CHLOROISOPROPYL)PHOSPHATE:

TOXICITY

Oral (rat) LD50: 2800- 4200 mg/kg\*

Dermal (rabbit) LD50: >5000 mg/kg\*

Inhalation (rat) LC50: >4.6 mg/kl/4H\*

Oral (Rat) LD50: 1500 mg/kg

Intravenous (Mouse) LD50: 56 mg/kg

IRRITATION

Skin (rabbit): Mild (24h)\*

Eye (rabbit): non- irritating\*

\*[Akzo Nobel]

#### TETRAFLUOROETHANE:

TOXICITY

Inhalation (Rat) LC50: 1500000 mg/m<sup>3</sup>/4h

Inhalation (Mouse) LC50: 1700000 mg/m<sup>3</sup>/2h

Inhalation (Rat) LC50: >80% vol 15 mins \*

Inhalation (Rat) LC50: >60% vol 4 h \*

\* with added oxygen - ZhongHao New Chemical Materials MSDS

Excessive concentration can have a narcotic effect; inhalation of high concentrations of decomposition products can cause lung oedema.

IRRITATION

#### DIMETHYL ETHER:

TOXICITY

Inhalation (rat) LC50: 308000 mg/m<sup>3</sup>

IRRITATION

Nil Reported

#### ISO-BUTANE:

Not available. Refer to individual constituents.

| MATERIAL     | CARCINOGEN | REPROTOXIN | SENSITISER | SKIN |
|--------------|------------|------------|------------|------|
| MDI oligomer | IARC:3     |            | AUOEL      |      |

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## Section 11 - TOXICOLOGICAL INFORMATION

### CARCINOGEN

IARC: International Agency for Research on Cancer (IARC) Carcinogens: MDI oligomer  
Category: 3

### SENSITISER

AUOEL: Australia Exposure Standards - Sensitisers: MDI oligomer

## Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant: Not Determined

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

#### MDI OLIGOMER:

Aquatic toxicity:

Fish (Brachydanio rerio) 96h LC0: >1000 mg/l \*

(Daphnia) 24h EC50: >1000 mg/l \*

Bacterial toxicity (activated sludge microorganism) 3h EC50: >100 mg/l \*

\* [Bayer]

#### TRIS(2-CHLOROISOPROPYL)PHOSPHATE:

DO NOT discharge into sewer or waterways.

Aquatic toxicity:

96h EC50: 47 mg/l

(daphnia magna) 21 day NOEC: 32 mg/l

Not readily biodegradable.

[Akzo Nobel]

#### TETRAFLUOROETHANE:

In addition to carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), the greenhouse gases mentioned in the Kyoto Protocol include synthetic substances that share the common feature of being highly persistent in the atmosphere and exhibiting very high specific radiative forcing (radiative forcing is the change in the balance between radiation coming into the atmosphere and radiation out; a positive radiative forcing tends on average to warm the surface of the earth). These synthetic substances include hydrocarbons that are partially fluorinated (HCFs) or totally fluorinated (PFCs) as well as sulfur hexafluoride (SF<sub>6</sub>).

The greenhouse potential of these substances, expressed as multiples of that of CO<sub>2</sub>, are within the range of 140 to 11,700 for HFCs, from 6500 to 9,200 for PFCs and 23,900 for SF<sub>6</sub>. Once emitted into the atmosphere, these substances have an impact on the environment for decades, centuries, or in certain instances, for thousands of years.

Many of these substances have only been commercialised for a few years, and still only contribute only a small percentage of those gases released to the atmosphere by humans (anthropogenic) which increase the greenhouse effect. However, a rapid increase can be seen in their consumption and emission, and therefore in their contribution to the anthropogenic increase in the greenhouse effect.

Since the adoption of the Kyoto Protocol, new fluorinated substances have appeared on the market, which are stable in air and have a high greenhouse potential; these include nitrogen trifluoride (NF<sub>3</sub>) and fluoroethers.

Persistence and Degradation:

Ozone Destruction Potential (PDO) = 0 (R11=1)

Greenhouse Effect Potential (ESP) = 0.27 (R11=1)

Decomposed comparatively rapidly in the lower atmosphere (troposphere).

Atmospheric lifetime is 15.6 years. Products of decomposition will be

highly dispersed and hence will have a very low concentration.

Does not

influence photochemical smog (i.e. is not a VOC under the terms of the

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UNECE agreement). Does not deplete ozone.

Effect on Effluent Treatment:

Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

[ICI]

DIMETHYL ETHER:

Water solubility (mg/l): 35300

log Kow (Sangster 1997): 0.1

log Kow: 0.1-0.12

Koc: 14

Half-life (hr) air: 528

Half-life (hr) H<sub>2</sub>O surface water: 2.6-30

Henry's atm m<sup>3</sup>/mol: 9.78E-04

BCF: 1.7

Bioaccumulation: not sig

processes Abiotic: RxnOH\*

ISO-BUTANE:

log Kow (Sangster 1997): 2.76

Refrigerant Gas: Saturated Hydrocarbons have zero ozone depletion potential

(ODP) and will photodegrade under atmospheric conditions.

[Calor Gas]

Half-life (hr) air: 17

Bioaccumulation: not sig

Degradation Biological: resist

processes Abiotic: RxnOH\*, photol&hydrol not sig

## Section 13 - DISPOSAL CONSIDERATIONS

Treat isocyanate spills with sufficient amounts of isocyanate decontaminant preparation. Typically, such a preparation may consist of: sawdust: 20 parts by weight Kieselguhr 40 parts by weight plus a mixture of {ammonia (s.g. 0.880) 8% v/v non-ionic surfactant 2% v/v water 90% v/v}. Let stand for 24 hours.

- Consult State Land Waste Management Authority for disposal.
- Discharge contents of damaged aerosol cans at an approved site.
- Allow small quantities to evaporate.
- DO NOT incinerate or puncture aerosol cans.
- Bury residues and emptied aerosol cans at an approved site.

## Section 14 - TRANSPORTATION INFORMATION



Labels Required: FLAMMABLE GAS  
HAZCHEM: 2Y

UNDG:

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## Section 14 - TRANSPORTATION INFORMATION

|                         |      |                |      |
|-------------------------|------|----------------|------|
| Dangerous Goods Class:  | 2.1  | Subrisk:       | None |
| UN Number:              | 1950 | Packing Group: | None |
| Shipping Name: AEROSOLS |      |                |      |

### Air Transport IATA:

|                                    |      |                    |      |
|------------------------------------|------|--------------------|------|
| ICAO/IATA Class:                   | None | ICAO/IATA Subrisk: | None |
| UN/ID Number:                      | 1950 | Packing Group:     | None |
| ERG Code:                          | -    |                    |      |
| Shipping Name: Aerosols, flammable |      |                    |      |

### Maritime Transport IMDG:

|                         |            |                   |                |
|-------------------------|------------|-------------------|----------------|
| IMDG Class:             | 2          | IMDG Subrisk:     | SP63           |
| UN Number:              | 1950       | Packing Group:    | None           |
| EMS Number:             | F- D, S- U | Marine Pollutant: | Not Determined |
| Shipping Name: AEROSOLS |            |                   |                |

## Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE: None

### REGULATIONS

MDI oligomer (CAS: 9016-87-9) is found on the following regulatory lists;

- Australia - New South Wales Hazardous Substances Requiring Health Surveillance
- Australia - Tasmania Hazardous Substances Requiring Health Surveillance
- Australia - Western Australia Hazardous Substances Requiring Health Surveillance
- Australia Exposure Standards
- Australia Hazardous Substances Requiring Health Surveillance
- Australia High Volume Industrial Chemical List (HVICL)
- Australia Inventory of Chemical Substances (AICS)
- Australia Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations 1994 - Hazardous Substances Requiring Health Surveillance
- Australia Poisons Schedule
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6

IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk  
International Agency for Research on Cancer (IARC) Carcinogens  
OECD Representative List of High Production Volume (HPV) Chemicals

tris(2-chloroisopropyl)phosphate (CAS: 13674-84-5) is found on the following regulatory lists;

- Australia Inventory of Chemical Substances (AICS)
- OECD Representative List of High Production Volume (HPV) Chemicals

tetrafluoroethane (CAS: 811-97-2) is found on the following regulatory lists;

- Australia Exposure Standards
- Australia High Volume Industrial Chemical List (HVICL)
- Australia Inventory of Chemical Substances (AICS)
- OECD Representative List of High Production Volume (HPV) Chemicals

dimethyl ether (CAS: 115-10-6) is found on the following regulatory lists;

- Australia Exposure Standards
- Australia Inventory of Chemical Substances (AICS)

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- 6 Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule  
International Council of Chemical Associations (ICCA) - High Production Volume List  
OECD Representative List of High Production Volume (HPV) Chemicals

iso-butane (CAS: 75-28-5) is found on the following regulatory lists;

Australia - Australia New Zealand Food Standards Code - Food Additives - Schedule 2  
Miscellaneous additives permitted in accordance with GMP in processed foods specified in  
Schedule 1

Australia - Australia New Zealand Food Standards Code - Processing Aids - Permitted  
extraction solvents

Australia Exposure Standards

Australia Inventory of Chemical Substances (AICS)

International Council of Chemical Associations (ICCA) - High Production Volume List

OECD Representative List of High Production Volume (HPV) Chemicals

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## Section 16 - OTHER INFORMATION

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