

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 1 of 16

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

POWERS KF2

SYNONYMS

"KF2 - 380 ml tube"

PROPER SHIPPING NAME

POLYESTER RESIN KIT

PRODUCT USE

Material is mixed and used in accordance with manufacturers directions. 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. Resin anchor system cartridge includes resin and catalyst that are mixed and cured in the bolthole by the screwing action of bolting.

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

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

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

POISONS SCHEDULE

S5

RISK

Flammable.
Harmful by inhalation.

Irritating to eyes and skin.

Limited evidence of a carcinogenic effect.

May cause SENSITISATION by skin contact.

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 away from food, drink and animal feeding stuffs.

Take off immediately all contaminated clothing.
In case of contact with eyes, rinse with plenty

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 2 of 16
Section 2 - HAZARDS IDENTIFICATION

of water and contact Doctor or Poisons Information Centre.
If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container or label).
This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
sealed twin compartment cartridge one compartment containing polyester resin (unsaturated) styrene inorganic filler	100-42-5	25-50
second compartment containing dibenzoyl peroxide as catalyst/hardener	94-36-0	<3.5

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

EYE

If this product comes in contact with the eyes:

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

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 3 of 16
Section 4 - FIRST AID MEASURES

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis 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

For acute or short term repeated exposures to styrene:

INHALATION:

- Severe exposures should have cardiac monitoring to detect arrhythmia.
- Catecholamines, especially epinephrine (adrenaline) should be used cautiously (if at all).
- Aminophylline and inhaled beta-two selective bronchodilators (e.g. salbutamol) are the drugs of choice for treatment of bronchospasm.

INGESTION:

- Ipecac syrup should be given for ingestions exceeding 3ml (styrene)/kg.
- For patients at risk of aspiration because of obtundation, intubation should precede lavage.
- Pneumonitis is a significant risk. Watch the patient closely in an upright (alert patient) or left lateral head-down position (obtunded patient) to reduce aspiration potential. [Ellenhorn and Barceloux: Medical Toxicology]

BIOLOGICAL EXPOSURE INDEX - BEI

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

Determinant	Index	Sampling Time	Comments
1. Mandelic acid in urine	800 mg/gm creatinine	End of shift	NS
2. Phenylglyoxylic acid in urine	300 mg/gm creatinine	Prior to next shift	NS
	240 mg/gm creatinine	End of shift	NS
3. Styrene in venous blood	100 mg/gm creatinine	Prior to next shift	SQ
	0.55 mg/L	End of shift	
	0.02 mg/L	Prior to next shift	SQ

NS: Non-specific determinant; also seen after exposure to other materials.

SQ: Semi-quantitative determinant - Interpretation may be ambiguous; should be used as a screening test or confirmatory test.

B: Background levels occur in specimens collected from subjects NOT exposed.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 4 of 16

Section 5 - FIRE FIGHTING MEASURES

- Water spray or fog - Large fires only.

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.
- 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.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 500 metres in all directions.

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

Combustion products include: carbon monoxide (CO), carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.

May emit clouds of acrid smoke.

FIRE INCOMPATIBILITY

Avoid reaction with oxidising agents, strong acids, peroxides, ferrous salts, metal halides, alkalies and ultra-violet radiation.

HAZCHEM: None

Personal Protective Equipment

Breathing apparatus.

Gas tight chemical resistant suit.

Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

Accidentally activated or crushed cartridges rapidly become hot and give off vapour, so are best dropped in a bucket of water. Care: several cartridges in a small amount of water may cause water to boil. Add more water.

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.

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 5 of 16

Section 6 - ACCIDENTAL RELEASE MEASURES

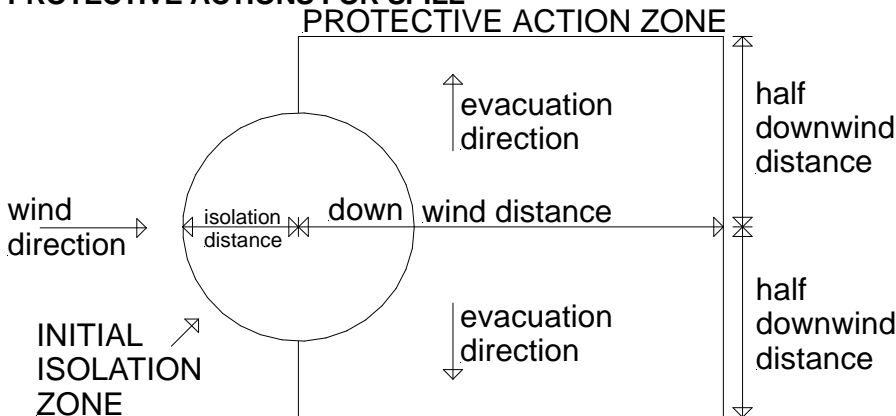
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapour.
- Contain spill with sand, earth or vermiculite.
- Use 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.

Contain spill / secure load if safe to do so

Accidentally activated or crushed cartridges rapidly become hot and give off vapour, so are best dropped in a bucket of water. Care: several cartridges in a small amount of water may cause water to boil. Add more water.

Bundle / collect recoverable product and label for recycling.

PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance	15 metres
Downwind Protection Distance	100 metres
IERG Number	15

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

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 6 of 16

Section 6 - ACCIDENTAL RELEASE MEASURES

a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide 127 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:

styrene 1000 ppm

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

protective action is:

styrene 250 ppm

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

styrene 50 ppm

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

styrene 50 ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
-----------------	---------	-----------	---------

R50	>= 0.25%	Corrosive (C)	>= 5.0%
-----	----------	---------------	---------

R51	>= 2.5%		
-----	---------	--	--

else	>= 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 overexposure 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 generation of static electricity.
- DO NOT use plastic buckets.
- Earth all lines and equipment.
- Use spark-free tools when handling.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- 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.

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 7 of 16
Section 7 - HANDLING AND STORAGE

- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

SUITABLE CONTAINER

Cartridge.

STORAGE INCOMPATIBILITY

Contamination with polymerisation catalysts - peroxides, persulfates, oxidising agents - also strong acids, strong alkalis, will cause polymerisation with exotherm - generation of heat.

Polymerisation of large quantities may be violent - even explosive.

Uncured material corrodes copper and its alloys.

STORAGE REQUIREMENTS

- Store in original containers in approved flammable liquid storage area.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- No smoking, naked lights, heat or ignition sources.
- Keep containers securely sealed.
- 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.

Store below 20 deg. C. and protect from frost. Refer to use-by date on cartridge.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Australia Exposure Standards	styrene (Styrene, monomer)	50	213	100	426			
Australia Exposure Standards	dibenzoyl peroxide (Benzoyl peroxide)		5					

The following materials had no OELs on our record under the following CAS

- dibenzoyl peroxide:

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m ³)	Revised IDLH Value (ppm)
styrene		700
dibenzoyl peroxide	1, 500	

ODOUR SAFETY FACTOR (OSF)

OSF=63 (STYRENE)

MATERIAL DATA

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 8 of 16

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

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 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.

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class A or B.

The Odour Safety Factor (OSF) is defined as:

$OSF = \frac{\text{Exposure Standard (TWA) ppm}}{\text{Odour Threshold Value (OTV) ppm}}$

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities
B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted
D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

INGREDIENT DATA

STYRENE:

Odour Threshold: 0.017 to 1.9 with a geometric average threshold of 0.32 ppm.

NOTE:Detector tubes measuring styrene at greater than 10 ppm are available.

The recommended TLV-TWA and STEL is based on the influence of styrene exposure on the central and peripheral nervous systems At the TWA, total

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 9 of 16

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

daily styrene exposure to the standard 70 kg medium-frame man who inhales 10 m³ and who retains 70% of the inspired compound is 21 mg/kg with 0.5 mg/kg absorbed through the skin. The total absorbed dose can be increased six-fold with physical work and increased respiration rate. Measurement of styrene and its metabolites in the urine can be an indication of recent exposure though this approach may be limited by factors such as the influence of alcohol consumption on styrene pharmacodynamics. Exposure at or below the TLV-TWA is thought to protect the worker against the significant risks of narcosis, neuropathies and irritation although other findings suggest that neuro-optical effects are significant amongst workers exposed at 4 ppm.

DIBENZOYL PEROXIDE:

The recommendation for the TLV-TWA is based on the absence of subjective symptoms of irritation of the nose and throat in humans exposed to 5.25 mg/m³. Whether this is sufficiently low to prevent cumulative effects in man is not known.

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

Neoprene rubber gloves.

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

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

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

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

Maximum Protection

Half- face Respirator

Full- Face Respirator

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 10 of 16

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

ppm (volume)	Factor		
1000	10	A- AUS P	-
1000	50	-	A- AUS P
5000	50	Airline *	-
5000	100	-	A- 2 P
10000	100	-	A- 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

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

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Paste with a sickly sweet odour; does not mix with water. Supplied in a sealed twin compartment cartridge. Contents liberated and mixed down hole only at time of fixing anchor bolt. When components mix the catalyst rapidly causes the resin to solidify with generation of heat and, in open spaces, evolution of irritating styrene vapour. When used as designed, in a bolt hole, little styrene is generated and the product presents minimal risk.

PHYSICAL PROPERTIES

Does not mix with water.

Sinks in water.

Molecular Weight: Not Applicable
Melting Range (°C): Not Applicable
Solubility in water (g/L): Immiscible
pH (1% solution): Not Applicable
Volatile Component (%vol): Not Available
Relative Vapour Density (air=1): >1
Lower Explosive Limit (%): Not Available
Autoignition Temp (°C): 490
State: Manufactured

Boiling Range (°C): Not Available
Specific Gravity (water =1): 1.80 when mixed.
pH (as supplied): Not Applicable
Vapour Pressure (kPa): 1.0 @ 20 degC
Evaporation Rate: Not Available
Flash Point (°C): 32
Upper Explosive Limit (%): Not Available
Decomposition Temp (°C): Not Available
Viscosity: Not Available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 11 of 16

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

- Stable under controlled storage conditions provided material contains adequate stabiliser/inhibitor.
 - Bulk storages may have special storage requirements.
-

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Considered an unlikely route of entry in commercial/industrial environments. Ingestion may result in nausea, pain, vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

EYE

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

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. 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. Absorption by skin may readily exceed vapour inhalation exposure. Symptoms for skin absorption are the same as for inhalation.

INHALED

Inhalation hazard is increased at higher temperatures. Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination. Inhalation of vapour may aggravate a pre-existing respiratory condition such as asthma, bronchitis, emphysema. During curing a small amount of vapour may be emitted from the small exposed surface of the hole.

CHRONIC HEALTH EFFECTS

Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. Sensitisation may result in allergic dermatitis responses including rash, itching, hives or swelling of extremities. Excessive exposure to styrene may occur if capsules are crushed. High vapour concentrations may have a toxic and anaesthetic effects, which may lead to unconsciousness or death. At 400-1000 ppm, the vapour may produce systemic effects such as dizziness, nausea and headache. Exposure at 1000 ppm can rapidly lead to unconsciousness. Exposure at 10000 ppm may cause death in less than one hour. Exposure to styrene may aggravate central nervous system disorders, chronic

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 12 of 16

Section 11 - TOXICOLOGICAL INFORMATION

respiratory disease, skin disease, kidney disease and liver disease.

TOXICITY AND IRRITATION

Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. 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.

STYRENE:

TOXICITY

Oral (rat) LD50: 5000 mg/kg effects

Inhalation (human) TClO: 0.02 mg/m³

Inhalation (human) TClO: 600 ppm

Inhalation (rat) LC50: 3750 ppm *

Inhalation(human)LCLo: 10000 ppm/30m.

Inhalation (rat): 24000 mg/m³/4h

IRRITATION

Skin (human): 500 mg - no skin

Skin (rabbit): 100% - Moderate

Eye (rabbit): 18 mg

Skin (rabbit): 500 mg - Mild

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

WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.

DIBENZOYL PEROXIDE:

TOXICITY

Oral (rat) LD50: 7710 mg/kg

Inhalation (human) TClO: 12 mg/m³

(@ 50%)

IRRITATION

Eye (rabbit): 500 mg/24h - Mild

Skin effects (MAK): very weak

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.

MATERIAL	CARCINOGEN	REPROTOXIN	SENSITISER	SKIN
styrene	IARC:Group 2B			
dibenzoyl peroxide	IARC:Group 3			

CARCINOGEN

IARC: International Agency for Research on Cancer (IARC) Carcinogens: styrene Category:

Group 2B: Possibly carcinogenic to humans

CARCINOGEN

IARC: International Agency for Research on Cancer (IARC) Carcinogens: dibenzoyl

peroxide Category: Group 3: Not classifiable as to carcinogenicity to humans

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet
Issue Date: 12-Oct-2006
NC317ECP

CHEMWATCH 59224
Revision No:2
CD 2006/3 Page 13 of 16

Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant: Not Determined

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

STYRENE:

Hazardous Air Pollutant:	Yes
Fish LC50 (96hr.) (mg/l):	25.1- 74.8
Algae IC50 (72hr.) (mg/l):	67- 200
log Kow (Prager 1995):	2.95
log Kow (Sangster 1997):	3.05
BOD5:	0.55- 1.95
ThOD:	3.07
Half- life Soil - High (hours):	672
Half- life Soil - Low (hours):	336
Half- life Air - High (hours):	7.3
Half- life Air - Low (hours):	0.9
Half- life Surface water - High (hours):	672
Half- life Surface water - Low (hours):	336
Half- life Ground water - High (hours):	5040
Half- life Ground water - Low (hours):	672
Aqueous biodegradation - Aerobic - High (hours):	672
Aqueous biodegradation - Aerobic - Low (hours):	336
Aqueous biodegradation - Anaerobic - High (hours):	2688
Aqueous biodegradation - Anaerobic - Low (hours):	1344
Aqueous biodegradation - Removal secondary treatment - High (hours):	99%
Aqueous biodegradation - Removal secondary treatment - Low (hours):	8%
Photooxidation half- life air - High (hours):	7.3
Photooxidation half- life air - Low (hours):	0.9

DO NOT discharge into sewer or waterways.

log Kow: 2.95-3.05

Koc: 270-550

Half-life (hr) air: 3.5-9

Half-life (hr) H₂O surface water: 3

Henry's atm m³/mol: 2.81E-03

BOD 5 if unstated: 0.55-2.45,65%

COD: 2.80-2.88

ThOD: 3.07

BCF: 13.5

Toxicity Fish: LC50(96)0.87-0.95ppm

Nitrif. inhib.: 75% inhib at 175mg/L

DIBENZOYL PEROXIDE:

Half- life Soil - High (hours):	48
Half- life Soil - Low (hours):	4
Half- life Air - High (hours):	510
Half- life Air - Low (hours):	51
Half- life Surface water - High (hours):	168
Half- life Surface water - Low (hours):	24
Half- life Ground water - High (hours):	336
Half- life Ground water - Low (hours):	48
Aqueous biodegradation - Aerobic - High (hours):	168
Aqueous biodegradation - Aerobic - Low (hours):	24

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 14 of 16

Section 12 - ECOLOGICAL INFORMATION

Aqueous biodegradation - Anaerobic - High (hours):	672
Aqueous biodegradation - Anaerobic - Low (hours):	96
Photolysis maximum light absorption - High (nano- m):	275
Photolysis maximum light absorption - Low (nano- m):	235
Photooxidation half- life air - High (hours):	510
Photooxidation half- life air - Low (hours):	51

Section 13 - DISPOSAL CONSIDERATIONS

If used in accordance with instructions, the only item to be disposed of will be the empty cartridge.
Solidified material may be buried.

Section 14 - TRANSPORTATION INFORMATION



Labels Required: FLAMMABLE LIQUID
HAZCHEM: None

UNDG:

Dangerous Goods Class:	3	Subrisk:	None
UN Number:	3269	Packing Group:	III
Shipping Name:	POLYESTER RESIN KIT		

Air Transport IATA:

ICAO/IATA Class:	3	ICAO/IATA Subrisk:	None
UN/ID Number:	3269	Packing Group:	III
ERG Code:	3L		
Shipping Name:	Polyester resin kit A		

Maritime Transport IMDG:

IMDG Class:	3	IMDG Subrisk:	None
UN Number:	3269	Packing Group:	III
EMS Number:	F- E, S- D	Marine Pollutant:	Not Determined
Shipping Name:	POLYESTER RESIN KIT		

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE: S5

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 15 of 16

Section 15 - REGULATORY INFORMATION

REGULATIONS

styrene (CAS: 100-42-5) is found on the following regulatory lists;

Australia - Australian Capital Territory Environment Protection Regulation

Pollutants entering waterways - Domestic water quality

Australia Dangerous Goods Code Draft 7th Edition - Goods too Dangerous to be Transported

Australia Exposure Standards

Australia High Volume Industrial Chemical List (HVICL)

Australia Inventory of Chemical Substances (AICS)

Australia National Pollutant Inventory

Australia Poisons Schedule

IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk

International Agency for Research on Cancer (IARC) Carcinogens

International Air Transport Association (IATA) Dangerous Goods Regulations

OECD Representative List of High Production Volume (HPV) Chemicals

WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water

dibenzoyl peroxide (CAS: 94-36-0) is found on the following regulatory lists;

Australia - Australia New Zealand Food Standards Code - Processing Aids - Permitted bleaching agents, washing and peeling agents and in water used as an ingredient in other foods

Australia Dangerous Goods Code Draft 7th Edition - Organic Peroxides

Australia Exposure Standards

Australia Inventory of Chemical Substances (AICS)

Australia Poisons Schedule

International Agency for Research on Cancer (IARC) Carcinogens

International Air Transport Association (IATA) Dangerous Goods Regulations

OECD Representative List of High Production Volume (HPV) Chemicals

Section 16 - OTHER INFORMATION

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	Endpoint	CR	Adeq TLV
styrene	85 mg/m3	NA	D	0.3	-

This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.

Issue Date: 12-Oct-2006

continued...

POWERS KF2

Chemwatch Material Safety Data Sheet

Issue Date: 12-Oct-2006

NC317ECP

CHEMWATCH 59224

Revision No:2

CD 2006/3 Page 16 of 16

Section 16 - OTHER INFORMATION

Print Date: 12-Oct-2006