



BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 1 of 12

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

BRUSHABLE CERAMIC RESIN #691-145

SYNONYMS

CP0012/1A, "RS Components"

PRODUCT USE

Protection against bi-metallic corrosion, pitting, cavitation and chemicals sealings, rebuilding heat exchange tube sheets and coating water boxes.

■ Base or Part A of a 2 pack epoxy adhesive.

Requires that the two parts be mixed by hand or mixer before use, in accordance with manufacturers directions. Mix only as much as is required. Do not return the mixed material to the original containers.

SUPPLIER

Company: RS Components

Company: RS Components

Address:

Address:

Units 30 & 31

25 Pavesi Street

Warehouse World

Smithfield

761 Great South Road

NSW2164

Penrose Auckland

AUS

Telephone: 1300 656 636

Emergency Tel: 1800 039 008

Emergency Tel: 03 9573 3112

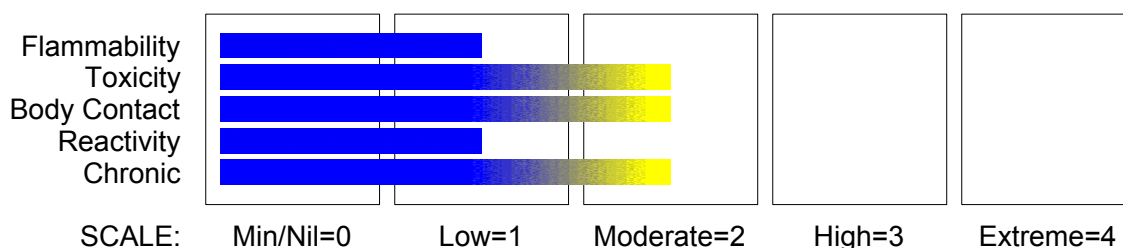
Fax: 1300 656 696

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

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

CHEMWATCH HAZARD RATINGS



continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 2 of 12

Section 2 - HAZARDS IDENTIFICATION



POISONS SCHEDULE

S5

RISK

- Harmful if swallowed.
- Irritating to eyes and skin.
- May cause SENSITISATION by skin contact.
- Toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.
- Skin contact may produce health damage*.
- May produce discomfort of the respiratory system*.
- Limited evidence of a carcinogenic effect*.
- Possible respiratory sensitiser*.
- May possibly affect fertility*.

* (limited evidence).

SAFETY

- Do not breathe gas/fumes/vapour/spray.
- Avoid exposure - obtain special instructions before use.
- To clean the floor and all objects contaminated by this material use water and detergent.
- This material and its container must be disposed of in a safe way.
- Keep away from food drink and animal feeding stuffs.
- 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 or label).
- Use appropriate container to avoid environmental contamination.
- Avoid release to the environment. Refer to special instructions/Safety data sheets.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
bisphenol A/ epichlorohydrin resin, liquid	25068-38-6	30-60

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.

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 3 of 12

Section 4 - FIRST AID MEASURES

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:
 - Remove all contaminated clothing, including footwear
 - Remove adhering sticky material using a waterless hand cleaner
 - Flush skin and hair with soap and running water, repeating as required .
 - In event of visible or subsequent irritation seek medical attention.

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

- Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

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.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- Do not approach containers suspected to be hot.
- 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

- Combustible.
 - Slight fire hazard when exposed to heat or flame.
 - Heating may cause expansion or decomposition leading to violent rupture of containers.
 - On combustion, may emit toxic fumes of carbon monoxide (CO).
 - May emit acrid smoke.
 - Mists containing combustible materials may be explosive.
- Other combustion products include: carbon dioxide (CO₂) and aldehydes.

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 4 of 12

Section 5 - FIRE FIGHTING MEASURES

FIRE INCOMPATIBILITY

- Avoid contamination with strong oxidising agents as ignition may result.

HAZCHEM: None

PERSONAL PROTECTION

Glasses:

Safety Glasses.

Chemical goggles.

Gloves:

PVC chemical resistant type.

Nitrile.

Neoprene.

Respirator:

Type A-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Slippery when spilt.
- 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.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable, labelled container for waste disposal.

MAJOR SPILLS

- Slippery when spilt.
- Moderate hazard.
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- 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.

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid cross contamination between the two liquid parts of product (kit).
- If two part products are mixed or allowed to mix in proportions other than manufacturer's recommendation, polymerisation with gelation and evolution of heat (exotherm) may occur.
- This excess heat may generate toxic vapour.

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 5 of 12

Section 7 - HANDLING AND STORAGE

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

SUITABLE CONTAINER

- Plastic drum.
- Metal can or drum
- Packaging as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

- Avoid reaction with amines, mercaptans, strong acids and oxidising agents.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+ X + X X +

+: May be stored together

O: May be stored together with specific preventions

X: Must not be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- bisphenol A/ epichlorohydrin resin, liquid:

CAS:25068- 38- 6 CAS:25085- 99- 8

ODOUR SAFETY FACTOR (OSF)

OSF=0.54 (bisphenol A/ epichlorohydrin resin, liquid)

- Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 6 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ 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

MATERIAL DATA

BRUSHABLE CERAMIC RESIN #691-145:

- None assigned. Refer to individual constituents.

BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:

■ 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 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.

For epichlorohydrin

Odour Threshold Value: 0.08 ppm

NOTE: Detector tubes for epichlorohydrin, measuring in excess of 5 ppm, are commercially available.

Exposure at or below the recommended TLV-TWA is thought to minimise the potential for adverse respiratory, liver, kidney effects. Epichlorohydrin has been implicated as a human skin sensitiser, hence individuals who are hypersusceptible or otherwise unusually responsive to certain chemicals may NOT be adequately protected from adverse health effects.

Odour Safety Factor (OSF)

OSF=0.54 (EPICHLOROHYDRIN).

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 7 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTION



EYE

- Safety glasses with side shields; or as required,
- 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

- Barrier cream and • Nitrile gloves or • Neoprene gloves or • Rubber gloves.
- PVC gloves.
- Protective footwear.

OTHER

- Overalls.
- Skin cleansing cream.
- Eyewash unit.

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 ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
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

- Use in a well-ventilated area or Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards, otherwise PPE is required. General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 8 of 12

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

effectively remove the contaminant.

Type of Contaminant: solvent, vapours, degreasing etc., evaporating from tank (in still air)	Air Speed: 0.25- 0.5 m/s (50- 100 f/min)
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)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

1: Room air currents minimal or favourable to capture

2: Contaminants of low toxicity or of nuisance value only

3: Intermittent, low production.

4: Large hood or large air mass in motion

Upper end of the range

1: Disturbing room air currents

2: Contaminants of high toxicity

3: High production, heavy use

4: Small hood - local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Pale yellow, viscous liquid with a mild odour; does not mix with water.

PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Molecular Weight: Not applicable

Specific Gravity (water=1): Not available

pH (1% solution): Not applicable

Evaporation Rate: Not available

Boiling Range (°C): Not available

Solubility in water (g/L):
Immiscible

Vapour Pressure (kPa): Not available

Relative Vapour Density (air=1):
Not available

Melting Range (°C): Not available

pH (as supplied): 7.0

Volatile Component (%vol): Not available

Flash Point (°C): >204

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 9 of 12

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Lower Explosive Limit (%): Not available

Upper Explosive Limit (%): Not available

Autoignition Temp (°C): Not available

Decomposition Temp (°C): Not available

State: Liquid

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- Considered an unlikely route of entry in commercial/industrial environments.

The material is highly discomforting and harmful if swallowed.

Ingestion may result in nausea, abdominal irritation, pain and vomiting.

EYE

- The material is moderately discomforting to the eyes and is capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/ or other transient eye damage/ ulceration.

The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SKIN

- The material is moderately discomforting to the skin and is capable of causing skin reactions which may lead to dermatitis and skin sensitisation from repeated exposures over long periods or from a single acute exposure.

Epoxy materials may cause allergic and/or contact dermatitis responses, which may occur on exposure or may become apparent only after repeated exposures. Sensitisation is possible. Photoallergic dermatitis may result from contact with the material. This type of response can be elicited only in individuals who have been previously allergically sensitised to the chemical agent and appropriate radiation. Photoallergic dermatitis presents, clinically, as an eczematous dermatitis in sun-exposed areas.

The material may accentuate any pre-existing skin condition.

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

INHALED

- The vapour is discomforting to the upper respiratory tract and repeated exposure may cause sensitisation and/or allergic reactions.

Inhalation of vapour may result in nausea, headache.

Inhalation of vapour is more likely at higher than normal temperatures.

CHRONIC HEALTH EFFECTS

- Principal routes of exposure are usually by skin contact and inhalation of vapour.

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

Sensitisation reactions may appear suddenly after repeated symptom free exposures.

Sensitisation may give severe responses to very low levels of exposure, in situations where exposure may

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 10 of 12

Section 11 - TOXICOLOGICAL INFORMATION

occur.

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

For the resin component:

Oral (rat) LD50: 1140 mg/kg

Dermal (rabbit) LD50: >2000 mg/kg

Inhalation (rabbit) LC50: No deaths in saturated air for 8 hours.

IRRITATION

[RS Components]

BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Oral (rat) LD50: 11400 mg/kg

■ 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.

Oxiranes (including glycidyl ethers and alkyl oxides, and epoxides) exhibit many common characteristics with respect to animal toxicology. One such oxirane is ethyloxirane; data presented here may be taken as representative.

for 1,2-butylene oxide (ethyloxirane):

Ethyloxirane increased the incidence of tumours of the respiratory system in male and female rats exposed via inhalation. Significant increases in nasal papillary adenomas and combined alveolar/bronchiolar adenomas and carcinomas were observed in male rats exposed to 1200 mg/m³ ethyloxirane via inhalation for 103 weeks. There was also a significant positive trend in the incidence of combined alveolar/bronchiolar adenomas and carcinomas. Nasal papillary adenomas were also observed in 2/50 high-dose female rats with none occurring in control or low-dose animals. In mice exposed chronically via inhalation, one male mouse developed a squamous cell papilloma in the nasal cavity (300 mg/m³) but other tumours were not observed. Tumours were not observed in mice exposed chronically via dermal exposure. When trichloroethylene containing 0.8% ethyloxirane was administered orally to mice for up to 35 weeks, followed by 0.4% from weeks 40 to 69, squamous-cell carcinomas of the forestomach occurred in 3/49 males (p=0.029, age-adjusted) and 1/48 females at week 106. Trichloroethylene administered alone did not induce these tumours and they were not observed in control animals. Two structurally related substances, oxirane (ethylene oxide) and methyloxirane (propylene oxide), which are also direct-acting alkylating agents, have been classified as carcinogenic.

IRRITATION

Eye (rabbit): 100mg - Mild

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

BRUSHABLE CERAMIC RESIN #691-145:

For the resin:

Biodegradability: Not readily biodegradable. Provisionally classified as not inherently biodegradable in the absence of appropriate test results.

Bioaccumulation: Expected to be moderate to high.

Aquatic Toxicity:

Acute Bacterial Toxicity (*pseudomonas fluorescens*) EC50: >1000 mg/l/6hrs

Acute Fish Toxicity (rainbow trout) LC50: 1.2 mg/l/96hrs

Ecotoxicity: Moderately toxic to aquatic animals, non-toxic to algae,

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 11 of 12

Section 12 - ECOLOGICAL INFORMATION

insignificant toxicity to micro-organisms.

[RS Components]

BISPHENOL A/ EPICHLOROHYDRIN RESIN, LIQUID:

- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

- Significant environmental findings are limited. Oxiranes (including glycidyl ethers and alkyl oxides, and epoxides) exhibit common characteristics with respect to environmental fate and ecotoxicology. One such oxirane is ethyloxirane and data presented here may be taken as representative.

- for 1,2-butylene oxide (ethyloxirane):

Environmental fate: Ethyloxirane is highly soluble in water and has a very low soil-adsorption coefficient, which suggests that if released to water, adsorption of ethyloxirane to sediment and suspended solids is not expected. Volatilisation of ethyloxirane from water surfaces would be expected based on the moderate estimated Henry's Law constant. If ethyloxirane is released to soil, it is expected to have low adsorption and thus very high mobility. Volatilisation from moist soil and dry soil surfaces is expected, based on its vapour pressure. It is expected that ethyloxirane exists solely as a vapour in ambient atmosphere, based on its very high vapour pressure. Ethyloxirane may also be removed from the atmosphere by wet deposition processes, considering its relatively high water solubility.

Persistence: The half-life in air is about 5.6 days from the reaction of ethyloxirane with photochemically produced hydroxyl radicals which indicates that this chemical meets the persistence criterion in air (half-life of = 2 days)*.

Ethyloxirane is hydrolysable, with a half-life of 6.5 days, and biodegradable up to 100% degradation and is not expected to persist in water. A further model-predicted biodegradation half-life of 15 days in water obtained and used to predict the half-life of this chemical in soil and sediment by applying Boethling's extrapolation factors ($t_{1/2\text{water}} : t_{1/2\text{soil}} : t_{1/2\text{sediment}} = 1 : 1 : 4$) (Boethling 1995). According to these values, it can be concluded that ethyloxirane does not meet the persistence criteria in water and soil (half-lives = 182 days) and sediments (half-life = 365 days).

Experimental and modelled log Kow values of 0.68 and 0.86, respectively, indicate that the potential for bioaccumulation of ethyloxirane in organisms is likely to be low. Modelled bioaccumulation -factor (BAF) and bioconcentration -factor (BCF) values of 1 to 17 L/kg indicate that ethyloxirane does not meet the bioaccumulation criteria (BCF/BAF = 5000)*

Ecotoxicity:

Experimental ecotoxicological data for ethyloxirane (OECD 2001) indicate low to moderate toxicity to aquatic organisms. For fish and water flea, acute LC50/EC50 values vary within a narrow range of 70-215 mg/L; for algae, toxicity values exceed 500 mg/L, while for bacteria they are close to 5000 mg/L

* Persistence and Bioaccumulation Regulations (Canada 2000).

- DO NOT discharge into sewer or waterways.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
Brushable Ceramic Resin #691- 145		No data		
bisphenol A/ epichlorohydrin resin, liquid	HIGH	No data	LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Material may be disposed of by controlled burning in an approved incinerator or buried in an approved landfill.
- Prior to disposal in a landfill the material should be mixed with the other component and reacted to render

continued...

BRUSHABLE CERAMIC RESIN #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-65

Version No:2.0

CD 2009/3 Page 12 of 12

Section 13 - DISPOSAL CONSIDERATIONS

the material inert.

- Extreme caution should be taken when heating the resin/curing agent mix.
- Recycle containers where possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None (ADG6)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE: S5

REGULATIONS

Regulations for ingredients

bisphenol A/ epichlorohydrin resin, liquid (CAS: 25068-38-6,25085-99-8) is found on the following regulatory lists;

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

No data for Brushable Ceramic Resin #691-145 (CW: 4523-65)

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
bisphenol A/ epichlorohydrin resin, liquid	25068- 38- 6, 25085- 99- 8

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

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

www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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: 19-Feb-2008

Print Date: 5-Feb-2010

This is the end of the MSDS.



BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 1 of 15

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

BRUSHABLE CERAMIC HARDENER #691-145

SYNONYMS

CP0012/1A, "RS Components"

PROPER SHIPPING NAME

CORROSIVE LIQUID, N.O.S.(contains diethylenetriamine)

PRODUCT USE

Protection against bi-metallic corrosion, pitting and cavitation, chemical sealing, rebuilding heat exchange tube sheets and coating water boxes.

■ Curing agent or Part B of a 2 pack epoxy system.

Requires that the two parts be mixed by hand or mixer before use, in accordance with manufacturers directions. Mix only as much as is required. Do not return the mixed material to the original containers.

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.

SUPPLIER

Company: RS Components

Company: RS Components

Address:

Address:

Units 30 & 31

25 Pavesi Street

Warehouse World

Smithfield

761 Great South Road

NSW2164

Penrose Auckland

AUS

Telephone: 1300 656 636

Emergency Tel: 1800 039 008

Emergency Tel: 03 9573 3112

Fax: 1300 656 696

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

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

COMBUSTIBLE LIQUID, regulated under AS1940 for Bulk Storage purposes only.

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

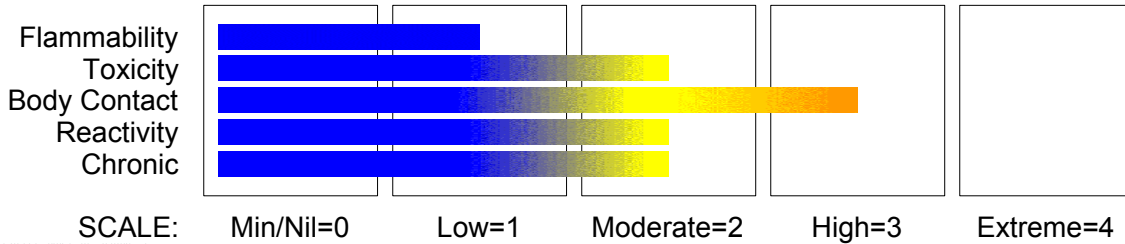
CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 2 of 15

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS



POISONS SCHEDULE

S5

RISK

- Harmful in contact with skin and if swallowed.
 - Causes burns.
 - Risk of serious damage to eyes.
 - May cause SENSITISATION by skin contact.
 - Harmful to aquatic organisms.
 - Inhalation may produce health damage*.
 - Cumulative effects may result following exposure*.
 - Limited evidence of a carcinogenic effect*.
 - Possible respiratory sensitiser*.
- * (limited evidence).

SAFETY

- Never add water to this product.
- Keep locked up.
- Do not breathe gas/fumes/vapour/spray.
- Avoid contact with eyes.
- Wear suitable protective clothing.
- Keep container dry.
- Use only in well ventilated areas.
- Keep container in a well ventilated place.
- Keep container tightly closed.
- Take off immediately all contaminated clothing.
- In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).
- This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
diethylenetriamine	111-40-0	30-60

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor.
- If swallowed do NOT induce vomiting.

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 3 of 15

Section 4 - FIRST AID MEASURES

- 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 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 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, without delay.

NOTES TO PHYSICIAN

- Treat symptomatically.

For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
- Oxygen is given as indicated.
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.

Alkalis continue to cause damage after exposure.

INGESTION:

- Milk and water are the preferred diluents

No more than 2 glasses of water should be given to an adult.

- Neutralising agents should never be given since exothermic heat reaction may compound injury.
- * Catharsis and emesis are absolutely contra-indicated.
- * Activated charcoal does not absorb alkali.
- * Gastric lavage should not be used.

Supportive care involves the following:

- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 4 of 15

Section 4 - FIRST AID MEASURES

- Injury should be irrigated for 20-30 minutes.
- Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

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

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding 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

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

May emit corrosive fumes.

Other combustion products include: amines and nitrogen oxides (NO_x).

FIRE INCOMPATIBILITY

- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.
- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

HAZCHEM: 4W

Personal Protective Equipment

Gas tight chemical resistant suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- DO NOT touch the spill material . Clean up all spills immediately.
- Wear impervious gloves and safety glasses.
- Avoid breathing vapours and contact with skin and eyes.
- Wipe up and absorb small quantities with vermiculite or other absorbent material.
- Place spilled material in clean, dry, sealable, labelled container.

MAJOR SPILLS

- DO NOT touch the spill material . Clear area of personnel.
- Alert Fire Brigade and tell them location and nature of hazard.

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

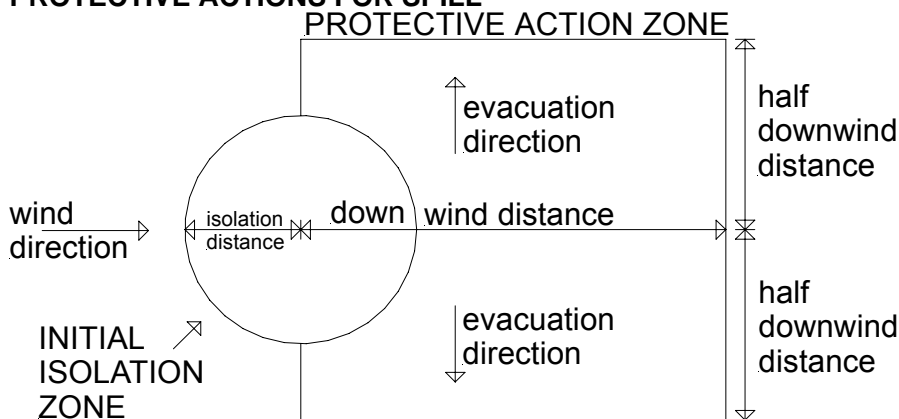
Version No:2.0

CD 2009/3 Page 5 of 15

Section 6 - ACCIDENTAL RELEASE MEASURES

- Wear full body protective clothing with breathing apparatus.
 - Prevent, by any means available, spillage from entering drains or water courses.
- If contamination of drains or waterways occurs, advise emergency services.
Absorb or cover spill with sand, earth, inert material or vermiculite.
Recover uncontaminated product in clean, dry, labelled containers.
Collect recoverable product into labelled containers for recycling.
Collect residues and seal in labelled drums for disposal.
Shut off all possible sources of ignition and increase ventilation.
Use a solvent to clean the area.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.

PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	250 metres
IERG Number	37

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 154 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

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

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 6 of 15

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Use good occupational work practice.
- Avoid generating and breathing vapour.
- Avoid contact with skin and eyes.
- Wear personal protective equipment when handling.
- When handling, DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling. Work clothes should be laundered separately.
- Use in a well-ventilated area.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers. Avoid contact with incompatible materials.
- Avoid cross contamination between the two liquid parts of product (kit).
- If two part products are mixed or allowed to mix in proportions other than manufacturer's recommendation, polymerisation with gelation and evolution of heat (exotherm) may occur.
- This excess heat may generate toxic vapour.

SUITABLE CONTAINER

- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.
- DO NOT USE brass or copper containers / stirrers.
- DO NOT use aluminium, galvanised or tin-plated containers.

STORAGE INCOMPATIBILITY

Avoid storage with oxidisers, strong acids and bases.
Keep containers sealed; the material absorbs carbon dioxide from the air.

STORAGE REQUIREMENTS

- Store in original containers.
 - Keep containers securely sealed.
 - No smoking, naked lights or ignition sources.
 - Store in a cool, dry, well-ventilated area.
 - Store away from incompatible materials and foodstuff containers.
 - Protect containers against physical damage and check regularly for leaks.
 - Observe manufacturer's storing and handling recommendations.
 - Keep dry . Store between 15 and 30 deg. C.
- Store away from foodstuff containers.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+



+



+



+



X



+

+: May be stored together

O: May be stored together with specific preventions

X: Must not be stored together

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet
Issue Date: 19-Feb-2008
NA317TC

CHEMWATCH 4523-66
Version No:2.0
CD 2009/3 Page 7 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	Notes
Australia Exposure Standards	diethylenetriamine (Diethylene triamine)	1	4.2	Sk

MATERIAL DATA

BRUSHABLE CERAMIC HARDENER #691-145:

- None assigned. Refer to individual constituents.

DIETHYLENETRIAMINE:

■ 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 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.

PERSONAL PROTECTION



OR

EYE

- Safety glasses with side shields; or as required,
- 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].

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 8 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

HANDS/FEET

- Barrier cream and • PVC gloves or • Nitrile gloves.
- Protective footwear or • PVC boots.
- DO NOT use solvent to clean the skin . • Skin cleansing cream.

OTHER

- Overalls and PVC apron.
 - Ensure that there is ready access to eye wash unit.
- Ensure there is ready access to an emergency 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 ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	AK- AUS P	-
1000	50	-	AK- AUS P
5000	50	Airline *	-
5000	100	-	AK- 2 P
10000	100	-	AK- 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

■ Use in a well-ventilated area.

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25- 0.5 m/s (50- 100 f/min)
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)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

Upper end of the range

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 9 of 15

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

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

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.

In confined spaces where there is inadequate ventilation, wear full-face air supplied breathing apparatus. Refer also to protective measures for the other component used with the product. Read both MSDS before using; store and attach MSDS together.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Black alkaline liquid with a mild ammonia odour; mixes with water.

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Corrosive.

Alkaline.

Molecular Weight: Not applicable

Boiling Range (°C): >200

Melting Range (°C): Not available

Specific Gravity (water=1): 1.07

Solubility in water (g/L):

pH (as supplied): 11.0

pH (1% solution): Not available

Miscible

Vapour Pressure (kPa): 0.05 @ 20 deg C

Volatile Component (%vol): Not available

Evaporation Rate: >1 BuAc=1

Relative Vapour Density (air=1): >1

Flash Point (°C): 93

Lower Explosive Limit (%): Not available

Upper Explosive Limit (%): Not available

Autoignition Temp (°C): Not available

Decomposition Temp (°C): Not available

State: Liquid

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

• Presence of incompatible materials . • Presence of elevated temperatures.

Product is considered stable under normal handling conditions.

Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 10 of 15

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Considered an unlikely route of entry in commercial/industrial environments.

The liquid is highly discomforting and toxic if swallowed and is capable of causing burns to mouth, throat, oesophagus, with extreme discomfort, pain.

Ingestion may result in nausea, abdominal irritation, pain and vomiting.

Aliphatic and alicyclic amines are generally well absorbed from the gut. Corrosive action may cause tissue damage throughout the gastrointestinal tract. Detoxification is thought to occur in the liver, kidney and intestinal mucosa with the enzymes, monoamine oxidase and diamine oxidase (histaminase) having a significant role.

Ingestion of amine epoxy-curing agents (hardeners) may cause severe abdominal pain, nausea, vomiting or diarrhoea. The vomitus may contain blood and mucous. If death does not occur within 24 hours there may be an improvement in the patients condition for 2-4 days only to be followed by the sudden onset of abdominal pain, board-like abdominal rigidity or hypo-tension; this indicates that delayed gastric or oesophageal corrosive damage has occurred.

EYE

■ The liquid is corrosive to the eyes and may cause burns.

The vapour is highly discomforting to the eyes.

Vapours of volatile amines cause eye irritation with lachrymation, conjunctivitis and minor transient corneal oedema which results in "halos" around lights (glauropsia, "blue haze", or "blue-grey haze"). Vision may become misty and halos may appear several hours after workers are exposed to the substance

This effect generally disappears spontaneously within a few hours of the end of exposure, and does not produce physiological after-effects. However oedema of the corneal epithelium, which is primarily responsible for vision disturbances, may take more than one or more days to clear, depending on the severity of exposure. Photophobia and discomfort from the roughness of the corneal surface also may occur after greater exposures. Although no detriment to the eye occurs as such, glauropsia predisposes an affected individual to physical accidents and reduces the ability to undertake skilled tasks such as driving a vehicle.

Direct local contact with the liquid may produce eye damage which may be permanent in the case of the lower molecular weight species.

The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SKIN

■ Volatile amine vapours produce primary skin irritation and dermatitis. Direct local contact, with the lower molecular weight liquids, may produce skin burns. Percutaneous absorption of simple aliphatic amines is known to produce lethal effects often the same as that for oral administration. Cutaneous sensitisation has been recorded chiefly due to ethyleneamines. Histamine release following exposure to many aliphatic amines may result in "triple response" (white vasoconstriction, red flare and wheal) in human skin.

The liquid is corrosive to the skin and may even cause burns if exposure is prolonged or skin reactions which may lead to dermatitis and may cause in some cases, sensitisation.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

■ Many amine compounds are sensitisers and some are absorbed through intact skin.

Toxic effects may result from skin absorption.

Exposure limits with "skin" notation indicate that vapour and liquid may be absorbed through intact skin.

Absorption by skin may readily exceed vapour inhalation exposure. Symptoms for skin absorption are the same as for inhalation. Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

Bare unprotected skin should not be exposed to this material.

The material may accentuate any pre-existing dermatitis condition.

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 11 of 15

Section 11 - TOXICOLOGICAL INFORMATION

Amine epoxy-curing agents (hardeners) may produce primary skin irritation and sensitisation dermatitis in predisposed individuals. Cutaneous reactions include erythema, intolerable itching and severe facial swelling. Blistering, with weeping of serious fluid, and crusting and scaling may also occur. Individuals exhibiting "amine dermatitis" may experience a dramatic reaction upon re-exposure to minute quantities. Highly sensitive persons may even react to cured resins containing trace amounts of unreacted amine hardener. Minute quantities of air-borne amine may precipitate intense dermatological symptoms in sensitive individuals. Prolonged or repeated exposure may produce tissue necrosis.

INHALED

■ The vapour is discomforting to the upper respiratory tract and repeated exposure may cause sensitisation and/or allergic reactions.

Inhalation hazard is increased at higher temperatures.

Inhalation of amine vapours may cause irritation of the mucous membranes of the nose and throat and lung irritation with respiratory distress and cough. Single exposures to near lethal concentrations and repeated exposures to sublethal concentrations produces tracheitis, bronchitis, pneumonitis and pulmonary oedema. Aliphatic and alicyclic amines are generally well absorbed from the respiratory tract. Systemic effects include headache, nausea, faintness and anxiety. These effects are thought to be transient and are probably related to the pharmacodynamic action of the amines. Histamine release by aliphatic amines may produce bronchoconstriction and wheezing.

Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later.

Inhalation of epoxy resin amine hardener vapours (including polyamines and amine adducts) may produce bronchospasm and coughing episodes lasting days after cessation of the exposure. Even faint traces of these vapours may trigger an intense reaction in individuals showing "amine asthma". The literature records several instances of systemic intoxications following the use of amines in epoxy resin systems.

The material may produce respiratory tract irritation. Symptoms of pulmonary irritation may include coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and a burning sensation.

Unlike most organs, the lung can respond to a chemical insult or a chemical agent, by first removing or neutralising the irritant and then repairing the damage (inflammation of the lungs may be a consequence).

The repair process (which initially developed to protect mammalian lungs from foreign matter and antigens) may, however, cause further damage to the lungs (fibrosis for example) when activated by hazardous chemicals.

Often, this results in an impairment of gas exchange, the primary function of the lungs. Therefore prolonged exposure to respiratory irritants may cause sustained breathing difficulties.

CHRONIC HEALTH EFFECTS

■ Principal routes of exposure are usually by skin contact with liquid and inhalation of vapour or inhalation of vapour from the curing material.

Inhalation hazard is increased at higher temperatures.

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

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

Sensitisation reactions may appear suddenly after repeated symptom free exposures.

Sensitisation may give severe responses to very low levels of exposure, in situations where exposure may occur.

TOXICITY AND IRRITATION

■ Not available. Refer to individual constituents.

DIETHYLENETRIAMINE:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Oral (rat) LD50: 1080 mg/kg

Dermal (rabbit) LD50: 1090 mg/kg

Inhalation (Rat) LC: 70 mg/m³/4h

Intraperitoneal (Rat) LD50: 74 mg/kg

Intraperitoneal (Mouse) LD50: 71 mg/kg

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's

IRRITATION

Skin (rabbit):500 mg Open Moderate

Skin (rabbit): 10 mg/24h - SEVERE

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 12 of 15

Section 11 - TOXICOLOGICAL INFORMATION

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.

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may produce severe skin irritation after prolonged or repeated exposure, and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) thickening of the epidermis.

Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis. Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.

Handling ethyleneamine products is complicated by their tendency to react with other chemicals, such as carbon dioxide in the air, which results in the formation of solid carbamates. Because of their ability to produce chemical burns, skin rashes, and asthma-like symptoms, ethyleneamines also require substantial care in handling. Higher molecular weight ethyleneamines are often handled at elevated temperatures further increasing the possibility of vapor exposure to these compounds.

Because of the fragility of eye tissue, almost any eye contact with any ethyleneamine may cause irreparable damage, even blindness. A single, short exposure to ethyleneamines, may cause severe skin burns, while a single, prolonged exposure may result in the material being absorbed through the skin in harmful amounts. Exposures have caused allergic skin reactions in some individuals. Single dose oral toxicity of ethyleneamines is low. The oral LD50 for rats is in the range of 1000 to 4500 mg/kg for the ethyleneamines. In general, the low-molecular weight polyamines have been positive in the Ames assay, increase sister chromatid exchange in Chinese hamster ovary (CHO) cells, and are positive for unscheduled DNA synthesis although they are negative in the mouse micronucleus assay. It is believed that the positive results are based on its ability to chelate copper.

For alkyl polyamines:

The alkyl polyamines cluster consists of organic compounds containing two terminal primary amine groups and at least one secondary amine group. Typically these substances are derivatives of ethylenediamine, propylenediamine or hexanediamine. The molecular weight range for the entire cluster is relatively narrow, ranging from 103 to 232

Acute toxicity of the alkyl polyamines cluster is low to moderate via oral exposure and a moderate to high via dermal exposure. Cluster members have been shown to be eye irritants, skin irritants, and skin sensitisers in experimental animals. Repeated exposure in rats via the oral route indicates a range of toxicity from low to high hazard. Most cluster members gave positive results in tests for potential genotoxicity.

Limited carcinogenicity studies on several members of the cluster showed no evidence of carcinogenicity. Unlike aromatic amines, aliphatic amines are not expected to be potential carcinogens because they are not expected to undergo metabolic activation, nor would activated intermediates be stable enough to reach target macromolecules.

Polyamines potentiate NMDA induced whole-cell currents in cultured striatal neurons.

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 13 of 15

Section 11 - TOXICOLOGICAL INFORMATION

SKIN				
diethylenetriamine	Australia Exposure Standards - Skin		Notes	Sk

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

BRUSHABLE CERAMIC HARDENER #691-145:

Marine Pollutant: Not Determined

DIETHYLENETRIAMINE:

■ log Kow (Prager 1995): - 1.27

■ Harmful to aquatic organisms.

■ For alkyl polyamines:

All members of this cluster are miscible or soluble in water. The estimated value of log Kows-range from 3.67 to 1.8 is consistent with the available experimental water solubilities. Vapour pressures range from 1.1×10^{-6} hPa to 0.31 hPa. Estimated and experimental pKbs are in a relatively narrow range of 9.68 to 10.7.

Environmental fate:

Members of this cluster are expected to have varying degrees of mobility in the soil. Low vapor pressure and Henry's Law Constants suggest that these compounds are not expected to be in the vapor phase. Modeling suggests that all members of this cluster are likely to react rapidly with photochemically produced hydroxyl radicals with half-lives on the order of an hour, but with little material in the vapor phase, it is not expected to be a predominant removal pathway for these chemicals. Experimental data and results from estimation models indicate that all members of this cluster have the potential to biodegrade aerobically under environmental conditions. Fugacity models indicate that the members of this cluster are likely to partition predominately to soil and water. All chemicals in this cluster are expected to have low environmental persistence. Measured and estimated bioconcentration factors for members of this cluster indicate a low potential for bioaccumulation.

Ecotoxicity:

Evaluation of the available experimental and estimated aquatic toxicity data indicate acute toxicity to fish is low. Daphnia aquatic toxicity is generally low. Algae appear to be the most sensitive organism with several members of the cluster having measured or estimated toxicity values indicative of moderate toxicity. Chronic toxicity for all cluster members is estimated; it is generally low for fish and algae, but high for daphnia.

■ for diethylenetriamine (DETA)

Environmental fate:

DETA is miscible with water and inherently biodegradable.

log Kow : -2.27

The material will leach into ground water and is not expected to be biodegradable. No significant degree of bioaccumulation is anticipated.

Evaporated material is expected to photodegrade following reaction with hydroxy radicals; the half-life in air is thought to be less than a day.

DETA does not form N-nitrosamines at concentrations equal to or greater than the detection limit (500 mg/L) during a 2-week incubation period in sewage or lake water samples.

The formation of N-nitrosamines from DETA in soil could not be determined with confidence utilizing the available analytical techniques

Ecotoxicity:

A large spill could be toxic to biomass in a treatment plant or could be toxic to fish.

Daphnia magna LC50: 17 mg/l *

Fish LC50: (Pimephales promelas) 332 mg/l*

Artemia salina LC50: 710 mg/l *

*[ITW Ramset / Red Head]

Ecotoxicological data indicate that at acute exposure DETA is not toxic to algae and fish but harmful to daphnids.

■ For ethyleneamines:

Adsorption of the ethyleneamines correlates closely with both the cation exchange capacity (CEC) and organic

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 14 of 15

Section 12 - ECOLOGICAL INFORMATION

content of the soil. Soils with increased CEC and organic content exhibited higher affinities for these amines. This dependence of adsorption on CEC and organic content is most likely due to the strong electrostatic interaction between the positively charged amine and the negatively charged soil surface.

- Prevent, by any means available, spillage from entering drains or water courses.
- DO NOT discharge into sewer or waterways.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
Brushable Ceramic Hardener #691- 145		No data		
diethylenetriamine	LOW	No data	LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

- Consult manufacturer for recycling options and recycle where possible .
- Consult State Land Waste Management Authority for disposal.
- Incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION



Labels Required: CORROSIVE
HAZCHEM: 4W (ADG6)

Land Transport UNDG:

Class or division:	8	Subsidiary risk:	None
UN No.:	1760	UN packing group:	II
Shipping Name: CORROSIVE LIQUID, N.O.S. (contains diethylenetriamine)			

Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	None
UN/ID Number:	1760	Packing Group:	II
Special provisions:	A3		
Shipping Name: CORROSIVE LIQUID, N.O.S. *(CONTAINS DIETHYLENETRIAMINE)			

Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	None
UN Number:	1760	Packing Group:	II
EMS Number:	F- A, S- B	Special provisions:	274 944
Limited Quantities:	1 L	Marine Pollutant:	Not Determined
Shipping Name: CORROSIVE LIQUID, N.O.S.(contains diethylenetriamine)			

continued...

BRUSHABLE CERAMIC HARDENER #691-145

Chemwatch Independent Material Safety Data Sheet

Issue Date: 19-Feb-2008

NA317TC

CHEMWATCH 4523-66

Version No:2.0

CD 2009/3 Page 15 of 15

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE: S5

REGULATIONS

Regulations for ingredients

diethylenetriamine (CAS: 111-40-0) is found on the following regulatory lists;

"Australia Exposure Standards", "Australia Hazardous Substances", "Australia Inventory of Chemical Substances (AICS)", "GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "OECD Representative List of High Production Volume (HPV) Chemicals"

No data for Brushable Ceramic Hardener #691-145 (CW: 4523-66)

Section 16 - OTHER INFORMATION

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

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

www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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: 19-Feb-2008

Print Date: 5-Feb-2010

This is the end of the MSDS.