
MATERIALS SAFETY DATA SHEET

WEAR RESISTANT CERAMIC PUTTY

PART A

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME: TUFFY ENDURO PART A – 7kg
PRODUCT CODE: TF12

SUPPLIER: Tuff Stuff Technologies Pty Ltd
ABN: 46 130 510 315 | ACN: 130510315
63 Daraya Rd Blacktown, 2148
Phone/Fax: 1300 45 99 39
Email: Sales@tuffstufftech.com | Web: www.tuffstufftech.com

Emergency Phone: 1300 45 99 39

2. HAZARD IDENTIFICATION

HAZARDOUS SUBSTANCE NON DANGEROUS GOODS
(According to the criteria of NOHSC and ADG Code 6)

Signal Word: Xi; irritant;
Risk Phrases: R20/21 harmful by inhalation and in contact with skin
R36/R38; irritating to respiratory system eyes and skin
R43 mass cause sensitisation by skin contact

Safety Phrases: S24/25 Avoid contact with skin and eyes
S28 After contact with skin wash with soap and water
S37/39 Wear suitable eye/face protection and gloves
S61 Avoid release into the environment. Refer to special instruction/safety data sheets.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Name:	CAS RN	%
bisphenol A/ epichlorohydrin resin, liquid	25068-38-6	>60
Aliphatic Glycidyl Ether	68609-97-2	low
Other substances not determined to be hazardous		to 100%

V.High >60, High 30 - 60, Med 10 - 29, Low 1 - 9, V.Low <1

All the constituents of this product are listed on the Australian Inventory of Chemical Substances (AICS) and National Registration Authority (NRA) approved active constituents.

4. FIRST AID MEASURES

GENERAL INFORMATION

Avoid contact with skin and eyes. In case of accident or if you feel unwell, seek medical advice immediately. Show label or this safety data sheet to doctor in attendance.

INHALATION

Move the exposed person to fresh air at once. Contact physician if discomfort continues.

INGESTION

Rinse mouth thoroughly, Do not induce vomiting. Rinse mouth with water. If vomiting occurs, the head should be kept low so that stomach vomit does not enter the lungs. Never make an unconscious person vomit or drink fluids. Get medical attention immediately!

SKIN CONTACT

Remove affected person from source of contamination. Wash skin thoroughly with soap and warm water for several minutes. Contact physician if irritation persists.

EYE CONTACT

Promptly wash eyes with plenty of clean water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. Contact physician if irritation persists.

5. FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA

Fire can be extinguished using: Alcohol resistant foam. Carbon Dioxide (CO₂). Dry Chemicals.

SPECIFIC HAZARDS

Avoid breathing fire vapours.

PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SPECIAL FIRE FIGHTING PROCEDURES

Keep upwind to avoid fumes. Avoid water in straight hose stream; will scatter and spread fire. Cool containers exposed to flames with water until fire is out. Keep run-off water out of sewers and watercourses. Dike for water control.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear protective clothing as described in Section 8 of this safety data sheet.

ENVIRONMENTAL PRECAUTIONS

Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

SPILL CLEAN UP METHODS

Absorb with sand or other inert absorbent. Transfer to a container for disposal. Containers with collected spillage must be properly labeled with correct contents and hazard symbol.

7. HANDLING AND STORAGE

PROCEDURE FOR HANDLING

DO NOT allow clothing wet with material to stay in contact with skin. 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

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. 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION



EXPOSURE CONTROLS

The following materials had no OELs as according to HSIS (Hazard Substance Information System): bisphenol A/ epichlorohydrin resin, liquid: CAS:25068- 38- 6 CAS:25085- 99- 8.

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 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.

INGREDIENT DATA

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.

Odour Threshold Value for epichlorohydrin: 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).

PERSONAL PROTECTION

EYE

Safety glasses with side shield. 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. [CDCNIOSH Current Intelligence Bulletin 59].

HANDS/FEET

When handling liquid-grade epoxy resins wear chemically protective gloves (e.g nitrile or nitrile-butadiene rubber), boots and aprons. DO NOT use cotton or leather (which absorb and concentrate the resin), polyvinyl chloride, rubber or polyethylene gloves (which absorb the resin). DO NOT use barrier creams containing emulsified fats and oils as these may absorb the resin; silicone-based barrier creams should be reviewed prior to use. Suitability and durability of glove type is dependent on usage. Factors such as: frequency and duration of contact, chemical resistance of glove material, glove thickness and dexterity, are important in the selection of 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. Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

OTHER

Overalls; P.V.C. apron; Barrier cream; Skin cleansing cream; Eye wash unit.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

9. EXPOSURE CONTROLS/PERSONAL PROTECTION

APPEARANCE:	Solid
COLOUR:	Grey
ODOUR:	Slight Odour.
SOLUBILITY:	Insoluble in water
BOILING POINT:	(°C) > 260 RELATIVE DENSITY 2.8 @ 20 °C
VAPOUR PRESSURE:	Not known
EVAPORATION RATE:	Not known
pH-VALUE:	CONC. SOLUTION 7.0 @ 20° C
FLASH POINT:	(°C) > 204
AUTO IGNITION TEMP:	(°C) > 300° C

10. STABILITY AND REACTIVITY

STABILITY

Stable under normal temperature conditions and recommended use.
Reaction with hardener component will generate heat, mixing large volumes should be avoided.

CONDITIONS TO AVOID

Avoid heat, flames and other sources of ignition.

MATERIALS TO AVOID

Avoid contact with: Strong acids. Strong oxidising agents. Amines.

HAZARDOUS DECOMPOSITION PRODUCTS

Fire or high temperatures create: Nitrous gases (NO_x). Oxides of: Carbon monoxide (CO). Carbon dioxide (CO₂). Vapours/gases/fumes of: Acids – Organic, Aldehydes.

11. TOXICOLOGICAL INFORMATION

Name: EPOXY RESIN (Number Average MW ≤700)

Toxic Dose 1 - LD 50 >2000 mg/kg (oral rat)

Toxic Dose 2 - LD 50 >2000 mg/kg (oral rat)

INGESTION

May cause discomfort.

SKIN CONTACT

Irritating to skin. This product contains a small amount of sensitizing substance which may provoke an allergic reaction among sensitive individuals after repeated contact.

EYE CONTACT

May cause irritation to eyes.

HEALTH WARNINGS

This material contains epoxy resin, which may cause sensitisation and development of allergy.

ROUTE OF ENTRY:

Inhalation, Ingestion, Skin and/or eye contact.

12. ECOLOGICAL INFORMATION

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/ safety data sheets.

13. DISPOSAL INFORMATION

DISPOSAL METHODS

Mix resin and hardener components completely to create a nonhazardous solid that can be disposed as general waste. Dispose of waste and residues in accordance with local authority requirements.

14. TRANSPORT INFORMATION

Not classified as Dangerous Goods by (ADG-6) (Australia).
International regulations (IMDG, IATA, ADR/RID):
DG CLASS: 9: Miscellaneous dangerous substances and articles,
SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (EPOXY RESIN (Number average MW <= 700))
UN NUMBER: 3082
PACK GROUP: III
Marine Pollutant: No.

15. REGULATORY INFORMATION

POISONS SCHEDULE: S5 (SUSDP)

16. OTHER INFORMATION

ISSUE DATE: 08 FEBRUARY 2010
CONTACT POINT: TECHNICAL CONTACT 1300 45 99 39

PART B

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME: TUFFY ENDURO HARDENER – PART B
PRODUCT CODE: TF02

SUPPLIER: Tuff Stuff Technologies Pty Ltd
ABN: 46 130 510 315 | ACN: 130510315
63 Daraya Rd Blacktown, 2148
Phone/Fax: 1300 45 99 39
Email: Sales@tuffstufftech.com
Web: www.tuffstufftech.com

Emergency Phone: 1300 45 99 39

2. HAZARD IDENTIFICATION

HAZARDOUS SUBSTANCE. DANGEROUS GOODS
(According to the criteria of NOHSC and the ADG Code)

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.
Possible risk of impaired fertility.
Possible risk of irreversible effects.

SAFETY

Keep locked up.
Keep container in a well ventilated place.
Avoid exposure - obtain special instructions before use.
To clean the floor and all objects contaminated by this material, use water and detergent.
Keep container tightly closed.
Take off immediately all contaminated clothing.
In case of accident unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).

3. COMPOSITION/INFORMATION ON INGREDIENTS

Name:	CAS RN	%
diethylenetriamine	111-40-0	>50
bisphenol A	80-05-7	0-50
phenol	108-95-2	0-1

4. FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

EYE

If this product comes in contact with the eyes:

- 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 or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

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:

- Injury should be irrigated for 20-30 minutes.

Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]. If exposure has been severe and/or symptoms marked, observation in hospital for 48 hours should be considered due to possibility of delayed pulmonary oedema.

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. When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

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. Combustion products include, carbon dioxide (CO₂), nitrogen oxides (NO_x), other pyrolysis products typical of burning organic material. May emit corrosive fumes.

FIRE INCOMPATIBILITY

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

HAZCHEM

3X

Personal Protective Equipment

PERSONAL PROTECTION EQUIPMENT

Breathing apparatus.

Gas tight chemical resistant suit.

Limit exposure duration to 1 BA set - 30 mins.

6. ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- 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

- Clear area of personnel and move upwind.
- 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.
- Consider evacuation (or protect in place).
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

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

diethylenetriamine 100 ppm
bisphenol A 500 mg/m³
irreversible or other serious effects or symptoms which could
impair an individual's ability to take protective action is:
diethylenetriamine 2 ppm
bisphenol A 50 mg/m³
other than mild, transient adverse effects
without perceiving a clearly defined odour is:
diethylenetriamine 1 ppm
bisphenol A 30 mg/m³
The threshold concentration below which most people.
will experience no appreciable risk of health effects:
diethylenetriamine 1 ppm
bisphenol A 10 mg/m³
American Industrial Hygiene Association (AIHA)
Ingredients considered according exceed 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.

7. HANDLING AND STORAGE

PROCEDURE FOR HANDLING

DO NOT allow clothing wet with material to stay in contact with skin. 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

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. 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION



EXPOSURE CONTROLS

The following materials had no OELs as according to HSIS (Hazard Substance Information System):
 bisphenol A/ epichlorohydrin resin, liquid: CAS:25068- 38- 6 CAS:25085- 99- 8.

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	peak	peak
Australian Exposure Standards	Diethylene 1 4.2 triamine	1	4.2				
Australian Exposure Standards	Phenol	1	4				
NDA (CAS: 80-05-7)	Bisphenol A						

ODOUR SAFETY FACTOR (OSF)

OSF=25 (bisphenol A)

Exposed individuals are NOT 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 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	"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

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.

Ingredient	ORG	UF	Endpoint	CR	TLV
					Adeq
bisphenol A	0.3 mg/m ³	1000	D	NA	-
phenol	3.6 mg/m ³	1000	D	NA	

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

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

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

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

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

INGREDIENT DATA

DIETHYLENETRIAMINE:

Not available. Refer to individual constituents.

BISPHENOL A:

REL TWA: 5 mg/m³ [Dow Chemical]

MAK value: 5 mg/m³

- measured as the inhalable fraction of the aerosol.

MAK Category I Peak Limitation: For local irritants Allows excursions of twice the MAK value for 5 minutes at a time, 8 times per shift. Designated S(P) in List of MAK values: Danger of photo-contact sensitisation. MAK Group C: There is no reason to fear risk of damage to the developing embryo when MAK and BAT values are observed. MAK values, and categories and groups are those recommended within the Federal Republic of Germany.

PHENOL:

Odour Threshold Value: 0.060 ppm (detection)

IDLH Level: 250 ppm

NOTE: Detector tubes for phenol, measuring in excess of 1 ppm, are commercially available.

Systemic absorption by all routes may induce convulsions with damage to the lungs and central nervous system.

Exposure at or below the recommended TLV-TWA is thought to protect the worker from respiratory, cardiovascular, hepatic, renal and neurological toxicity. Workers or volunteers exposed at or below 5.2 ppm have experienced no ill-effects. Because phenol as a vapour, liquid or solid can penetrate the skin causing systemic effects, a skin notation is considered necessary. Although ACGIH has not recommended a STEL it is felt that ACGIH excursion limits (15 ppm limited to a total duration of 30 minutes with brief excursions limited to no more than 25 ppm) and NIOSH Ceiling values are sufficiently similar so as to provide the same margin of safety.

PERSONAL PROTECTION

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- 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

Elbow length PVC gloves.

Wear safety footwear. When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots. 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 Maximum Protection Half-face Full-Face
Level ppm (volume) Factor Respirator 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

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

9. EXPOSURE CONTROLS/PERSONAL PROTECTION

APPEARANCE

Amber liquid with an amine odour; partly mixes with water.

PHYSICAL PROPERTIES

Liquid. Corrosive. Alkaline.

Molecular Weight: Not Applicable Boiling Range (°C): >207

Melting Range (°C): Not Available Specific Gravity (water=1): 1.02

Solubility in water (g/L): Partly Miscible pH (as supplied): Not Applicable

pH (1% solution): Not Available Vapour Pressure (kPa): <0.013 @ 20 degC

Volatile Component (%vol): Not Available Evaporation Rate: Not Available

Relative Vapour Density (air=1): >1 Flash Point (°C): >93.3 (Setaflash)

Lower Explosive Limit (%): 1.4 Upper Explosive Limit (%): Not Available

Autoignition Temp (°C): Not Available Decomposition Temp (°C): Not Available

State: Liquid

10. STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY

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

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. Ingestion of alkaline corrosives may produce burns around the mouth, ulcerations and swellings of the mucous membranes, profuse saliva production, with an inability to speak or swallow. Both the oesophagus and stomach may experience burning pain; vomiting and diarrhoea may follow. Epiglottal swelling may result in respiratory distress and asphyxia; shock can occur. Narrowing of the oesophagus, stomach or stomach valve may occur immediately or after a long delay (weeks to years). Severe exposure can perforate the oesophagus or stomach leading to infections of the chest or abdominal cavity, with low chest pain, abdominal stiffness and fever. All of the above can cause death. Amines without benzene rings when swallowed are absorbed throughout the gut. Corrosive action may cause damage throughout the gastrointestinal tract. They are removed through the liver, kidney and intestinal mucosa by enzyme breakdown. Ingestion of amine epoxy-curing agents (hardeners) may cause severe abdominal pain, nausea, vomiting or diarrhoea. The vomitus may contain blood and mucus. 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, boardlike abdominal rigidity or hypotension; this indicates that delayed gastric or oesophageal corrosive damage has occurred.

EYE

If applied to the eyes, this material causes severe eye damage. Direct eye contact with corrosive bases can cause pain and burns. There may be swelling, epithelium destruction, clouding of the cornea and inflammation of the iris. Mild cases often resolve; severe cases can be prolonged with complications such as persistent swelling, scarring, permanent cloudiness, bulging of the eye, cataracts, eyelids glued to the eyeball and blindness. Vapours of volatile amines irritate the eyes, causing excessive secretion of tears, inflammation of the conjunctiva and slight swelling of the cornea, resulting in "halos" around lights. This effect is temporary, lasting only for a few hours. However this condition can reduce the efficiency of undertaking skilled tasks, such as driving a car. Direct eye contact with liquid volatile amines may produce eye damage, permanent for the lighter species. The liquid produces a high level of eye discomfort and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.

SKIN

Skin contact with the material may be harmful; systemic effects may result following absorption. The material can produce severe chemical burns following direct contact with the skin. Skin contact with alkaline corrosives may produce severe pain and burns; brownish stains may develop. The corroded area may be soft, gelatinous and necrotic; tissue destruction may be deep. Volatile amine vapours produce irritation and inflammation of the skin. Direct contact can cause burns. They may be absorbed through the skin and cause similar effects to swallowing, leading to death. The skin may exhibit whiteness, redness and wheals. Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later. 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. This material is a photosensitiser. Certain individuals working with this substance may show allergic reaction of the skin under sunlight. This results in sensitivity to sunburn (may be severe) unless protective covering and 15+PF sunscreen are used. Responses may vary from sunburn-like effects to swelling and blistering lesions only appearing many hours later. 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. This material is a photosensitiser. Certain individuals working with this substance may show allergic reaction of the skin under sunlight. This results in sensitivity to sunburn (may be severe) unless protective covering and 15+PF sunscreen are used. Responses may vary from sunburn-like effects to swelling and blistering lesions.

INHALED

Not normally a hazard due to non-volatile nature of product. The material can cause respiratory irritation in some persons. The body's response to irritation can cause further lung damage. Inhaling corrosive bases may irritate the respiratory tract. Symptoms include cough, choking, pain and damage to the mucous membrane. In severe cases, lung swelling may develop, sometimes after a delay of hours to days. There may be low blood pressure, a weak and rapid pulse, and crackling sounds. Inhalation of amine vapours may cause irritation of the mucous membrane of the nose and throat, and lung irritation with respiratory distress and cough. Swelling and inflammation of the respiratory tract is seen in serious cases; with headache, nausea, faintness and anxiety. There may also be wheezing. Inhalation of epoxy resin amine hardeners (including polyamines and amine adducts) may produce bronchospasm and coughing episodes lasting several 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 instances of systemic intoxications following the use of amines in epoxy resin systems.

CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. Sensitisation may give severe responses to very low levels of exposure, i.e. hypersensitivity. Sensitised persons should not be allowed to work in situations where exposure may occur. Inhalation of epoxy resin amine hardeners (including polyamines and amine adducts) may produce bronchospasm and coughing episodes lasting several 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. Sensitisation may result in allergic dermatitis responses including rash, itching, hives or swelling of extremities.

TOXICITY AND IRRITATION

TOXICITY IRRITATION

Oral (None) LD50: >2000 mg/kg

Dermal (None) LD50: 400-2000 mg/kg

DIETHYLENETRIAMINE:

TOXICITY IRRITATION

Oral (rat) LD50: 1080 mg/kg Skin (rabbit): 500 mg open Moderate

Dermal (rabbit) LD50: 1090 mg/kg Skin (rabbit): 10 mg/24h - SEVE

SEVERE

BISPHENOL A:

TOXICITY IRRITATION

Oral (rat) LD50: 3250 mg/kg Skin (rabbit): 250 mg open - mild

Inhalation (rat) LC50: 200 ppm Skin (rabbit): 500 mg/24h - mild

Dermal (rabbit) LD50: 3000 mg/kg Eye (rabbit): 0.25 mg/24h-SEVERE

PHENOL:

TOXICITY IRRITATION

Oral (rat) LD50: 317 mg/kg Skin (rabbit): 500 mg/24hr - SEVERE

Oral (human) LDLo: 140 mg/kg Skin (rabbit): 500 mg open -SEVERE

Inhalation (rat) LC50: 316 mg/m³ Eye (rabbit): 5 mg - SEVERE

Dermal (rabbit) LD50: 850 mg/kg Eye (rabbit): 100 mg rinse - mild

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.

12. ECOLOGICAL INFORMATION

Prevent, by any means available, spillage from entering drains or water
Refer to data for ingredients, which follows:

DIETHYLENETRIAMINE:

log Kow (Prager 1995): -1.27

Harmful to aquatic organisms.

Ecotoxicity:

LC50: 17 mg/l (Daphnia magna)*

LC50: 332 mg/l (Pimephales promelas)*

LC50: 710 mg/l (Artemia salina)*

*[ITW Ramset / Red Head]

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. A large spill could be toxic to biomass in a treatment plant or could be toxic to fish. Evaporated material is expected to photodegrade following reaction with hydroxy radicals; the half-life in air is thought to be less than a day.

BISPHENOL A:

log Kow : 3.32

Kow : 314-1524

Half-life (hr) air : 4

Half-life (hr) H2O surface water : 96

BCF : 42-96

Toxicity Fish: LC50(96)42mg/L

processes Abiotic: violent,fast decomp.in H2O

PHENOL:

Hazardous Air Pollutant: Yes

Fish LC50 (96hr.) (mg/l): 0.001-56

Daphnia magna EC50 (48hr.) (mg/l): 56

Algae IC50 (72hr.) (mg/l): 4.6-7.5

BCF<100: 7.6

log Kow (Prager 1995): 1.46

log Kow (Sangster 1997): 1.5

log Pow (Verschueren 1983): 1.46

BOD5: 1.68

COD: 2.33

ThOD: 2.26

Half-life Soil - High (hours): 240

Half-life Soil - Low (hours): 24

Half-life Air - High (hours): 22.8

Half-life Air - Low (hours): 2.28

Half-life Surface water - High (hours): 56.5

Half-life Surface water - Low (hours): 5.3

Half-life Ground water - High (hours): 168

Half-life Ground water - Low (hours): 12

Aqueous biodegradation - Aerobic - High (hours): 84

Aqueous biodegradation - Aerobic - Low (hours): 6

Aqueous biodegradation - Anaerobic - High (hours): 672

Aqueous biodegradation - Anaerobic - Low (hours): 192

Aqueous biodegradation - Removal secondary treatment - High (hours): 99.90%

Aqueous biodegradation - Removal secondary treatment - Low (hours): 90%

Aqueous photolysis half-life - High (hours): 173

Aqueous photolysis half-life - Low (hours): 46

Photolysis maximum light absorption - High (nano-m): 269

Aqueous photolysis half-life - High (hours): 173

Aqueous photolysis half-life - Low (hours): 46

Photooxidation half-life water - High (hours): 3840

Photooxidation half-life water - Low (hours): 77

Photooxidation half-life air - High (hours): 22.8

Photooxidation half-life air - Low (hours): 2.28

The material is classified as an ecotoxin* because the Fish LC50 (96 hours) is

less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment) Appendix 8, Table 1
Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993 Commission of the
European Communities.

log Kow : 1.46-1.5

Koc : 39-148

Half-life (hr) air : 0.25-16

Half-life (hr) H2O surface water : 19-100

Henry's atm m3 /mol: 3.97E-07

BOD 5 if unstated: 1.68

COD : 2.28-2.37

ThOD : 2.26-2.40

BCF : 1.9-277

Nitrif. inhib. : 50% inhib at 9mg/L

13. DISPOSAL INFORMATION

DISPOSAL METHODS

Mix resin and hardener components completely to create a nonhazardous solid that can be disposed as
general waste.

Dispose of waste and residues in accordance with local authority requirements.

14. TRANSPORT INFORMATION

Shipping Name:

AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.

Dangerous Goods Class: 8

Subrisk: None

UN/NA Number: 2079

Packing Group: II

Labels Required: corrosive

Additional Shipping Information:

International Transport Regulations:

IMO Dangerous Goods class: 2079

IMO Packing group: None

IATA Dangerous goods class: 8

Cargo Instructions: 812

Cargo Max: 30 L

Passenger Instructions: 808

Passenger Max: 1 L

Special Provisions: None, None

15. REGULATORY INFORMATION

POISONS SCHEDULE

S5

REGULATIONS

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

Australian Inventory of Chemical Substances (AICS)

Australian Poisons Schedule

bisphenol A (CAS: 80-05-7) is found on the following regulatory lists:

Australian Inventory of Chemical Substances (AICS)

Australia High Volume Industrial Chemical List (HVICL)

phenol (CAS: 108-95-2) is found on the following regulatory lists:

Australian Inventory of Chemical Substances (AICS)

Australian Poisons Schedule

Australia High Volume Industrial Chemical List (HVICL)

16. OTHER INFORMATION

ISSUE DATE: 08 FEBRUARY 2010

CONTACT POINT: TECHNICAL CONTACT 1300 45 99 39