



MATERIAL SAFETY DATA SHEET

FILE NO.: E2V3
MSDS DATE: 06/02/2009
MSDS No.: E2060209

Product: E2

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: E2 Epoxy, Part A (Resin)
PRODUCT CODES: E2ML50, E2ML250, E2QT1A, E2GL1A, E2GL5A
COMPANY NAME: SmartAdhesives LLC
ADDRESS: San Francisco, CA 94129

EMERGENCY PHONE: Chemtrec: 1-800-424-9300

PRODUCT USE: Part A of two part Epoxy adhesive; Industrial use
ISSUE DATE: 6-02-2009

SECTION 2: INGREDIENTS

<u>INGREDIENT</u>	<u>C.A.S. No.</u>	<u>% by Wt.</u>
Epoxy resin	25068-38-6	70-95%
Epoxy resin with CTBN rubber	Trade Secret	≤15%
Amorphous silica	67762-90-7	4 -8%

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Normal physical form – viscous liquid

IMMEDIATE HEALTH AND ENVIRONMENTAL HAZARDS

Warning: causes eye and skin irritation. May cause allergic skin reaction and respiratory tract irritation. Heated material can cause thermal burns.

POTENTIAL ACUTE HEALTH EFFECTS

EYE CONTACT: Irritating to eyes. Heated material can cause thermal burns.

SKIN CONTACT: Irritating to skin. May cause skin sensitization by skin contact. Heated material can cause thermal burns.

INHALATION: Slightly irritating to the respiratory system.

INGESTION: Not expected to be harmful under normal conditions of use.

POTENTIAL CHRONIC HEALTH EFFECTS

CHRONIC EFFECTS: No known significant effects or critical hazards.

CARCINOGENICITY: No known significant effects or critical hazards.

MUTAGENICITY: No known significant effects or critical hazards.

TERATOGENICITY: No known significant effects or critical hazards.

DEVELOPMENTAL EFFECTS:

No known significant effects or critical hazards.

FERTILITY EFFECTS: No known significant effects or critical hazards.

TARGET ORGANS: Review Section 3 and 11 for additional assessments.

OVER EXPOSURE SIGNS/SYMPTOMS

INHALATION: Adverse symptoms may include respiratory tract irritation and coughing.

INGESTION: No specific data.

SKIN: Adverse symptoms may include irritation and redness.
EYES: Adverse symptoms may include pain or irritation, watering, and redness.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
 Pre-existing skin disorders may be aggravated by over-exposure to this product.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Seek medical attention.

SKIN CONTACT: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. For contact with hot product, flush contaminated skin with large amounts of cold water to dissipate heat. Cover with clean cotton sheeting or gauze. Get medical attention immediately.

INHALATION: Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

INGESTION: Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

PROTECTION OF FIRST AID PERSONNEL:
 In the event of body contact with molten material, immediately cool with running water; do not attempt to remove material from skin. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS:
 No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been digested or inhaled.

SECTION 5: FIRE FIGHTING MEASURES

FLAMABLE PROPERTIES
 In a fire or if heated, a pressure increase will occur and the container may burst.

FLAMMABLE LIMITS
LEL - Not determined (% by volume)
UEL - Not determined (% by volume)

FLASH POINT: 484°F (251°C) Pensky-Martens Closed Cup ASTM D 93

EXTINGUISHING MEDIA: Use an extinguishing agent suitable for the surrounding fire. There are no agents known to be not suitable.

SPECIAL EXPOSURE HAZARDS: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Decomposition products may include the following materials: carbon oxides.

FIRE FIGHTERS PROTECTION**SPECIAL FIRE FIGHTING PROCEDURES:**

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: ACCIDENTAL RELEASE MEASURES**ACCIDENTAL RELEASE MEASURES:****PERSONAL PRECAUTIONS**

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

ENVIRONMENTAL PRECAUTIONS

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

SPILL CLEAN UP METHODS

- Large Spill:** Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike in spill with sand, earth or other non-combustible material to prevent from spreading. Prevent entry into sewers, water courses, basements or confined areas. For molten material, allow the product to cool and solidify. Vacuum or sweep up material and place in a designated, labeled waste container. Use absorbent to soak up remaining liquid. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.
- Small Spill:** Stop leak if without risk. Move containers from spill area. For molten material, allow the product to cool and solidify. Vacuum or sweep up material and place in a designated, labeled waste container. Use absorbent to soak up remaining liquid. Dispose of via a licensed waste disposal contractor.

SECTION 7: HANDLING AND STORAGE**HANDLING:**

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container..

STORAGE:

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Do not store near heat or open flames. Use appropriate containment to avoid environmental contamination. Note: This resin may be handled, shipped and stored at elevated temperature in bulk.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**RECOMMENDED MONITORING PROCEDURES:**

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

HYGIENE MEASURES:

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

RESPIRATORY PROTECTION:

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

EYE PROTECTION:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

SKIN PROTECTION:

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

EXPOSURE CONTROLS:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

EXPOSURE GUIDELINES:

	Std	Type	Limit
Amorphous Silica	CMRG	CEIL	5 mg/m3

CMRG: Chemical Manufacturer Recommended Guideline

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

COLOR & APPEARANCE:	Clear, viscous liquid	VAPOR PRESSURE (mmHg):	0.03 mbar @ 77°F (25 °C)
ODOR THRESHOLD:	Not available	VAPOR DENSITY (AIR=1):	Not available
PHYSICAL FORM:	Liquid	SPECIFIC GRAVITY (H2O=1):	1.18
FLAMMABLE LIMITS:	Not available	EVAPORATION RATE:	Not available
pH AS SUPPLIED:	Not available	SOLUBILITY IN WATER:	Negligible
BOILING POINT:	> 500°F (260°C)	VISCOSITY:	50,000 – 90,000 cP
FLASH POINT:	484°F (251°C)		

(Pensky-Martens Closed Cup ASTM D 93)

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guarantee analysis of any specific lot or as specifications for the product.

SECTION 10: STABILITY AND REACTIVITY

STABILITY: The product is stable.

MATERIAL AND CONDITIONS TO AVOID (STABILITY):

Avoid strong oxidizers.

Reactive or incompatible with the following materials: oxidizing materials, strong acids, and strong alkalis.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

Carbon oxides

HAZARDOUS POLYMERIZATION: Under normal conditions of storage and use, hazardous polymerization will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

Epoxy Resin Oral LD50: 30,000 mg/Kg (Rat)
 Oral LD50: 20,000 mg/Kg (Mouse)
 Oral LD50: 19.8 mg/Kg (Rabbit)
 Dermal LD50: > 1,200 mg/Kg (Rat)
 Dermal LD50: > 1,270 mg/Kg (Mouse)

CARCINOGENICITY:

Epoxy Resin

ACGIH	Not classified
IARC	Not classified
NTP	Not listed
OSHA	Not regulated
EEC	Not classified

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No known significant effects or critical hazards.

OTHER ADVERSE EFFECTS: No known significant effects or critical hazards.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of completely cured (or polymerized) wastes in a sanitary landfill. The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

NOTE: Please consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION
 Not regulated.

WATER TRANSPORTATION Not regulated.

AIR TRANSPORTATION Not regulated.

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

HCS CLASSIFICATION: Irritating material. Sensitizing material.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):

302 HAZARD CATEGORIES:
 None.

311/312 HAZARD CATEGORIES:
 Immediate (acute) health hazard.

313 REPORTABLE INGREDIENTS:

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.
None required.

STATE REGULATIONS:

Massachusetts RTK Substances

None required.

New Jersey RTK Hazardous Substances

None required.

Pennsylvania RTK Hazardous Substances

None required.

California Prop. 65:

WARNING: This product contains a chemical known to the State of California to cause cancer. Oxirane, (phenoxyethyl)- 122-60-1

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:

**Hazardous Material
Information System III
(U.S.A.)**

Health : 2
Flammability: 1
Physical hazards : 0
Chronic :

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: E2 Epoxy, Part B (Hardener)
PRODUCT CODES: E2ML50, E2ML250, E2QT1B, E2GL1B, E2GL5B
COMPANY NAME: SmartAdhesives LLC
ADDRESS: San Francisco, CA 94129

EMERGENCY PHONE: Chemtrec: 1-800-424-9300

PRODUCT USE: Part B of two part Epoxy adhesive; Industrial use
ISSUE DATE: 6-02-2009

SECTION 2: INGREDIENTS

<u>INGREDIENT:</u>	<u>C.A.S. No.</u>	<u>% by Wt.</u>
Mercaptan-amine blend	(Trade Secret)	88-100%
Cycloaliphatic diamine	2579-20-6	≤12%

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Normal physical form - transparent liquid

IMMEDIATE HEALTH AND ENVIRONMENTAL HAZARDS

Low hazard for usual industrial or commercial handling. Causes irritation to respiratory tract if inhaled.

ROUTE OF ENTRY Skin contact

POTENTIAL HEALTH EFFECTS

- EYE CONTACT:** Similar materials are not classified as eye irritants
- SKIN CONTACT:** Causes skin irritation. May cause an allergic skin reaction.
- INHALATION:** Considered slightly toxic. Causes respiratory tract irritation.
- INGESTION:** May be harmful if swallowed.

POTENTIAL CHRONIC HEALTH EFFECTS

None known.

SECTION 4: FIRST AID MEASURES

- EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Do not rub eyes; mechanical action may cause corneal damage. Seek medical attention immediately.
- SKIN CONTACT:** Wash thoroughly with soap and plenty of warm water. If irritation should develop, seek medical attention.
- INHALATION:** Move to fresh air. If adverse health effects develop, seek medical attention.
- INGESTION:** Drink two glasses of water. If vomiting occurs naturally, keep airway clear. Get medical attention immediately. **DO NOT GIVE ANYTHING BY MOUTH IF THE VICTIM IS RAPIDLY LOSING CONSCIOUSNESS, OR IS UNCONSCIOUS OR CONVULSING.**

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS:

SECTION 5: FIRE FIGHTING MEASURES

FLAMABLE PROPERTIES

FLAMMABLE LIMITS

LEL - Not determined (% by volume)
UEL - Not determined (% by volume)

FLASH POINT: > 200.1 °F (>93.4°C) (Flash Point, Pensky-Martens)

EXTINGUISHING MEDIA: Use Dry Chemical, Water Spray, Carbon Dioxide, or Foam.

FIRE FIGHTERS PROTECTION**SPECIAL FIRE FIGHTING PROCEDURES:**

Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by fire fighters. Do not enter a confined space without full bunker gear, including a positive pressure NIOSH approved self-contained breathing apparatus.

ADDITIONAL FIRE FIGHTING ADVICE:

In case of fire, keep containers cool with water spray.

HAZARDOUS COMBUSTIBLE PRODUCTS:

carbon monoxide, sulphur oxides, nitrogen oxides, carbon dioxide

SECTION 6: ACCIDENTAL RELEASE MEASURES**ACCIDENTAL RELEASE MEASURES:****PERSONAL PRECAUTIONS**

Wear adequate personal protective clothing and equipment.

ENVIRONMENTAL PRECAUTIONS

Add dry material to absorb spill (if large spill, dike to contain)

SPILL CLEAN UP METHODS

Pick up spilled material and containerize for recovery or disposal. Flush area with water to remove residues.

SECTION 7: HANDLING AND STORAGE

HANDLING: No particular measures required.

STORAGE: Do not store near epoxy resins.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION: Local exhaust ventilation recommended.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. When respiratory protection is required for certain operations, use an approved positive-pressure supplied - air respirator. Avoid breathing vapors which may be produced under some conditions such as heating or applications. Avoid breathing aerosols and mists. Use NIOSH / MSHA approved respiratory protection equipment when airborne exposure is excessive. Observe OSHA regulations for respirator use (29 CFR 1910.134).

EYE PROTECTION: Wear tight fitting goggles.

SKIN PROTECTION: Use chemical resistant gloves and suitable protective clothing.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

COLOR & APPEARANCE: transparent, yellowish liquid

ODOR: of sulfur

PHYSICAL FORM: Liquid

DENSITY: 1.130 g/cm³

SOLUBILITY IN WATER: Negligible (< 0.1%)

VISCOSITY: 14,000 – 20,000 cP

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guarantee analysis of any specific lot or as specifications for the product.

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of storage and handling.

MATERIAL AND CONDITIONS TO AVOID (STABILITY):
 No known conditions to avoid.
 Avoid oxidizers.

HAZARDOUS DECOMPOSITION: No decomposition if used according to specifications. No dangerous decomposition products if used for intended purpose.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION
 Any toxicology information included in this section is based upon data associated with the components or an analogous product.

ACUTE ORAL TOXICITY: LD 50 > 2000 mg/kg body weight

SKIN IRRITATION: Moderately irritating (Experiment)

EYE IRRITATION: Slightly irritating, does not require labeling

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION The ecological evaluation of the product is based on data from the raw material and/or comparable substances.

AQUATIC PLANT/ALGAE TOXICITY:
 EC50 > 100 mg product/l

ULTIMATE BIODEGENERATION:
 The product is poorly biodegradable

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of completely cured (or polymerized) wastes in a sanitary landfill. Waste must be disposed of in an approved chemical waste landfill or incinerate in accordance with federal, state and local environmental control regulations.

NOTE: Please consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION
 Not dangerous goods

AIR TRANSPORTATION (ICAO/IATA)
PROPER SHIPPING NAME: Aviation regulated liquid n.o.s. (Polymercaptan)
HAZARD CLASS: 9
DANGER LABELS: 9
ID NUMBER: UN 3334
PACKING GROUP: None

ADDITIONAL INFO: No dangerous good according to ADR/RID/ADNR. Carriage in accordance with 1.1.4.2.1 ADR/RID/ADNR
RQ: None

WATER TRANSPORTATION

Not dangerous goods

The transportation information provided represents the regulatory transport classification of the product without consideration to packaging, quantity, or modal restrictions and exceptions. It is the user's responsibility to determine the appropriate packaging and modal requirements and/or limitations for the product quantity being shipped.

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT):

This product and/or all of its components are either include on or exempt from the T.S.C.A. Inventory of Chemical Substances.

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT):

None.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):

302 HAZARD CATEGORIES:

None.

311/312 HAZARD CATEGORIES:

None.

313 REPORTABLE INGREDIENTS:

None.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65

No California Proposition 65 listed chemicals are known to be present.

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:

NFPA Rating (US)	Value
Health	1
Fire	1
Reactivity	0
Special Hazard	

HMIS Rating (US)	Value
Health	1
Flammability	1
Reactivity	0

DISCLAIMER: The material in this Material Safety Data Sheet (MSDS) is, to the best of our knowledge, accurate as of the date issued. However, neither SmartAdhesives nor any of its subsidiaries or agents assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that may exist. Given the quantity of variables that affect use and application of our products, many of which are within the user's control and unique to each user's knowledge, SMARTADHESIVES MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE.

