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PHYSICAL ELECTRONICS
6509 FLYING CLOUD DR
EDEN PRAIRIE, MN. 55344

INT'L REF# _____

DATE: 07-02-96
FAX REF: CACA0701

PAGE 1 OF 6

TO: CAL TECH
DENISE DURANCE

TEL: 818-395-3980

FAX: 818-304-9834

FAX REF: PHONE CALL

DATED: 07-02-96

RE: MSDS FOR VAC SEAL

SEE THE ATTACHED DOCUMENTS. THERE ARE FOUR SHEETS, TWO FOR THE HARDENER AND TWO FOR THE RESIN. I AM INCLUDING A COPY OF THE SPECIFICATIONS FOR THE CATALOG.

REGARDS

Lee B

LEE BRANDT



U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

MATERIAL SAFETY DATA SHEET

DATE: 2/7/86

H HEALTH	2
F FLAMMABILITY	1
R REACTIVITY	0
P PROTECTION	See Section VII

SECTION I

MANUFACTURER'S NAME TRA-CON, INC.	COMPANY TELEPHONE NUMBER (817) 391-8860	EMERGENCY TELEPHONE NUMBER CHEMTREC (800) 424-9300
ADDRESS (Number, Street, City, State and ZIP Code) 66 NORTH STREET, MEDFORD, MA 02165		
CHEMICAL NAME AND SYNONYMS: Epoxy Adhesive Coresealant	TRADE NAME AND SYNONYMS: VAC-SEAL HARDENER	
CHEMICAL FAMILY: Aliphatic Alkylamine Mixture	FORMULA: Mixture (All ingredients listed in Federal TSCA Inventory)	
HAZARD LABEL REQUIRED?	CARCINOGEN NONE	MUTAGEN NONE
	NEUROTOXIN NONE	TERATOGEN NONE
	OTHER NONE	

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	CAS #	%	TLV (UNF)
Diethylenetriamine	111-40-0	10 - 30	1 ppm
		70 - 90	

Other ingredients (if any) per OSHA 1910.1200 (d)(2)(i)(c)(1) which may compose less than 1% of the composition, and/or which are non-hazardous or not listed on the Massachusetts Hazardous Substance List.
* TLV values not established at this time.

OSHA Title III, Section 315: not listed

SECTION III - PHYSICAL DATA

BOILING POINT (°F)	> 300	SPECIFIC GRAVITY (H ₂ O = 1)	1.1
VAPOR PRESSURE (mm Hg.) @ 77°F	< 1	PERCENT VOLATILE BY VOLUME (%)	< 1
VAPOR DENSITY (air = 1)	> 2	EVAPORATION RATE (BuAc = 1)	low
SOLUBILITY IN WATER:	partial		

APPEARANCE AND ODOR: Clear, light amber liquid, low viscosity liquid, ammoniacal odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT (Method Used): > 200°F (setaflash)	FLAMMABLE LIMITS: N/A	LEL: N/A	UEL: N/A
EXTINGUISHING MEDIA: Dry chemicals, chemical foam, carbon dioxide, water.			
SPECIAL FIRE FIGHTING PROCEDURES: Avoid breathing smoke. Addition of water may reduce flame intensity.			
UNUSUAL FIRE AND EXPLOSION HAZARDS: Toxic gases may be liberated; handle as combustible; store in a cool place.			

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VAC-SEAL HARDENER

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

THRESHOLD LIMIT VALUE:
LD50 (rats) > 500 mg/kg; Dermal LD50 1400 mg/kg. TLV-TWA 1 ppm.

EFFECTS OF OVEREXPOSURE:
Eye or mouth contact may cause serious burns; material is also a strong sensitizer.

EMERGENCY AND FIRST AID PROCEDURES:

- EYES:** Flush with water, get medical attention.
- SKIN:** Wash with soap and water; remove contaminated clothing.
- INHALATION:** Remove to fresh air.
- INGESTION:** No known antidote but give milk or water; do NOT induce vomiting if swallowed; get medical attention.
- PRIMARY ENTRY ROUTE:** Skin, eyes, inhalation.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Avoid contact with metals corroded by liquid amines; avoid high temperatures.
	STABLE	X	

INCOMPATIBILITY (Materials to Avoid):
Strong acids and bases, strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon monoxide, carbon dioxide, aldehydes, phenol.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID: Chlorinated compounds; exotherms when used to cure epoxy resin.
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Prevent skin and eye contact. Soak up in absorbent material, or scrape up, and transfer to disposal container. Wipe up remaining residue with solvents, observing solvent flammability cautions, or use detergents.

WASTE DISPOSAL METHOD:
Dispose of as hazardous waste according to local, state and federal regulations. Disposal method can be land burial or chemical incineration as regulated by all governmental agencies.

SECTION VII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): Air supplied or organic canister, mask in confined areas.

VENTILATION	LOCAL EXHAUST:	Recommended	SPECIAL: N/A
	MECHANICAL (General):	Recommended	OTHER: N/A

PROTECTIVE GLOVES: Rubber or plastic disposable. **EYE PROTECTION:** Safety glasses or goggles

OTHER PROTECTIVE EQUIPMENT: As required to prevent all body contact; eye bath and/or safety shower.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE:
For Industrial Use Only: **WARNING:** May cause sensitization, irritation, or other allergic responses. Avoid eye and/or skin contact and prolonged inhalation of vapors.

OTHER PRECAUTIONS:
Store in a cool place in closed containers.

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U.S. DEPARTMENT OF LABOR
 Occupational Safety and Health Administration

MATERIAL SAFETY DATA SHEET

DATE: 2/7/99

H	HEALTH	1
F	FLAMMABILITY	1
R	REACTIVITY	0
P	PROTECTION	See Section VII

SECTION I

MANUFACTURER'S NAME TRA-CON, INC.	COMPANY TELEPHONE NUMBER (617) 391-5550	EMERGENCY TELEPHONE NUMBER CHEMTREC (800) 424-9300
ADDRESS (Number, Street, City, State and ZIP Code) 88 NORTH STREET, MEDFORD, MA 02188		
CHEMICAL NAME AND SYNONYMS: Epoxy Adhesive Resin	TRADE NAME AND SYNONYMS: VAC-SEAL RESIN	
CHEMICAL FAMILY: Bis-A-Epichlorohydrin Epoxides	FORMULA: Mixture (All ingredients listed in Federal TSCA Inventory)	
HAZARD LABEL REQUIRED? NONE	CARCINOGEN NONE	MUTAGEN NONE
	NEUROTOXIN NONE	TERATOGEN NONE
		OTHER NONE

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	CAS #	%	TLV (Units)
Epoxy resin mixture based on 4,4'-isopropylidenediphenol epichlorohydrin resin and/or similar isomers	25068-38-6	80 - 100	*
Other ingredients (if any) per OSHA 1910.1200 (b)(2)(i)(c)(1) which may compose less than 1% of the composition, and/or which are non-hazardous or not listed on the Massachusetts Hazardous Substance List. * TLV values not established at this time.		up to 20	*

SARA Title III, Section 313: not listed

SECTION III - PHYSICAL DATA

BOILING POINT (°F)	> 350	SPECIFIC GRAVITY (H ₂ O=1)	1.3
VAPOR PRESSURE (mm Hg.) @ 77°F	< 1	PERCENT VOLATILE BY VOLUME (%)	< 0.2
VAPOR DENSITY (air = 1)	> 1	EVAPORATION RATE (BuAc = 1)	low
SOLUBILITY IN WATER	low		

APPEARANCE AND ODOR: Light amber liquid, mild odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT (Method Used): > 200°F(COC)	FLAMMABLE LIMITS: N/A	LEL: N/A	UEL: N/A
EXTINGUISHING MEDIA: Dry chemicals, chemical foam, carbon dioxide, water.			
SPECIAL FIRE FIGHTING PROCEDURES: Avoid breathing smoke. Addition of water may reduce flame intensity.			
UNUSUAL FIRE AND EXPLOSION HAZARDS: Toxic gases may be liberated; handle as combustible; store in a cool place.			

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VAC-SEAL RESIN

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

THRESHOLD LIMIT VALUE:
LD50 (rats) > 4 grams/kg.

EFFECTS OF OVEREXPOSURE :
Repeated contact or breathing of vapors may cause irritation; material is also a strong sensitizer. Eye and skin contact may cause transient irritation.

EMERGENCY AND FIRST AID PROCEDURES

EYES : Flush with water, get medical attention.
SKIN : Wash with soap and water; remove contaminated clothing.
INHALATION : Remove to fresh air.
INGESTION : No known antidote but give milk or water; induce vomiting if large amount swallowed.
PRIMARY ENTRY ROUTE (S): Skin, eyes, inhalation.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID : Avoid uncontrolled excess heating over long periods; avoid uncontrolled amine reactions.
	STABLE	X	

INCOMPATIBILITY :
Strong acids and bases, strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS :
Carbon monoxide, carbon dioxide, aldehydes, phenol.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID : High temperatures, strong acids; certain organics, metallic acids.
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED :
Prevent skin and eye contact. Soak up in absorbent material, or scrape up, and transfer to disposal container. Wipe up remaining residue with solvents, observing solvent flammability cautions, or use detergents.

WASTE DISPOSAL METHOD:
Dispose of as hazardous waste according to local, state and federal regulations. Disposal method can be land burial or chemical incineration as regulated by all governmental agencies.

SECTION VII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): Air supplied or organic canister, mask in confined areas.

VENTILATION	LOCAL EXHAUST :	Recommended	SPECIAL : N/A
	MECHANICAL (General):	Recommended	OTHER : N/A

PROTECTIVE GLOVES : Rubber or plastic disposable. EYE PROTECTION : Safety glasses or goggles

OTHER PROTECTIVE EQUIPMENT : As required to prevent all body contact; eye bath and/or safety shower.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE :
For Industrial Use Only: WARNING: May cause sensitization, irritation, or other allergic responses. Avoid eye and/or skin contact and prolonged inhalation of vapors.

OTHER PRECAUTIONS :
Store in a cool place in closed containers. Handle per Hazard Potential of Hardener.

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Specifications:

Viscosity after mixing:	12,000 cps
Specific gravity:	1/18
Operating temperature range:	-60°C to 150°C
Heat distortion temperature:	103°C
Tensile strength:	8,800 psi
Compressive strength:	15,600 psi
Flexural strength:	12,900 psi
Flexural modulus:	3.8 x 10 ⁵ psi
Elongation:	4.3%
Hardness, Shore D:	87
Coefficient of expansion:	6 x 10 ⁵ cm/cm/ °C
Dielectric constant at 1000 Hz:	3.9
Power factor	at 25°C at 1000 Hz: 0.02 at 100°C at 1000 Hz: 0.04
Dielectric strength:	420V/mil
Volume resistivity	at 25°C: 6.2 x 10 ¹⁵ ohm/cm at 100°C: 9.8 x 10 ¹² ohm/cm
Water absorption, 30 days at 25°C:	0.18%
Izod impact:	0.22 ft-lb/in. of notch
Solvent (24-hour soak):	Methyl Chloride
Shelf Life:	6 mo

VAC-SEAL EPOXY RESIN

Model No.
2886000

Description	Shipping Weight	
Vac-Seal epoxy resin (6 pkg./box).....	1 lb	0.5 kg

When ordering, please give model number, size, and complete description. Please order from the factory; call 1-800-237-3603, 1-612-828-6157 in Minnesota.