

**MATERIAL SAFETY DATA SHEET- OPTICON 224® CURING AGENT**

Page #1

24 HOUR EMERGENCY NUMBER  
CHEMTREC 800-424-9300

DATE OF PRINT: JANUARY 1, 2001

HAZARD RATINGS:

ACUTE HEALTH 3	FIRE 1	REACTIVITY 0	HAZARD RATING - LEAST-0 SLIGHT-1 MODERATE-2 HIGH-3 EXTREME- 4
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**SECTION I****PRODUCT NAME: OPTICON 224® CURING AGENT, (HARDENER)**

CHEMICAL NAME: TRIETHYLENETETRAMINE

CHEMICAL FAMILY: ALIPHATIC AMINE

**SECTION II-A****PRODUCT / INGREDIENTS**

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	OPTICON 224® CURING AGENT		
1	TRIETHYLENETETRAMINE	112-24-3	100

**SECTION II-B****ACUTE TOXICITY DATA**

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	2.5 G/KG (RAT)	805 MG/KG (RABBIT)	NO DATA AVAILABLE

**SECTION III****HEALTH INFORMATION**

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

**EYE CONTACT**

CORROSIVE TO THE EYES AND MAY CAUSE SEVERE DAMAGE INCLUDING BLINDNESS. VAPORS MAY BE IRRITATING.

**SKIN CONTACT**

CORROSIVE TO THE SKIN. MAY CAUSE SKIN SENSITIZATION. MAY BE TOXIC IF ABSORBED THROUGH SKIN.

**INHALATION**

VAPORS / MIST MAY BE CORROSIVE TO UPPER RESPIRATORY TRACT. REPEATED EXPOSURE CAN RESULT IN LUNG DAMAGE. MAY CAUSE RESPIRATORY TRACT SENSITIZATION. MAY BE TOXIC IF INHALED.

**INGESTION**

NOT EXPECTED TO BE A RELEVANT ROUTE OF EXPOSURE. HOWEVER, CORROSIVE AND MAY CAUSE SEVERE AND PERMANENT DAMAGE TO MOUTH, THROAT AND STOMACH. MAY BE MODERATELY TOXIC IF SWALLOWED.

( CONTINUED ON PAGE #2 )

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 SECTION IV OCCUPATIONAL EXPOSURE LIMITS  
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NO.	OSHA		TLV/TWA	ACGIH	TLV/STEL	OTHER
	PEL/TWA	PEL/CEILING				
P	NONE ESTABLISHED					

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 SECTION V EMERGENCY AND FIRST AID PROCEDURES  
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EYE CONTACT

IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. RINSE CONTINUOUSLY WITH WATER WHILE ON WAY TO GET MEDICAL ATTENTION.

SKIN CONTACT

IMMEDIATELY REMOVE CONTAMINATED CLOTHING OR SHOES. WIPE EXCESS FROM SKIN AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. USE SOAP IF READILY AVAILABLE, OR FOLLOW BY THOROUGHLY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING UNTIL THOROUGHLY DECONTAMINATED. GET MEDICAL ATTENTION.

INHALATION

REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION

DO NOT INDUCE VOMITING. GIVE ONE GLASS OF WATER UNLESS VICTIM IS DROWSY, CONVULSING, OR UNCONSCIOUS. SEEK MEDICAL ATTENTION IMMEDIATELY.

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 SECTION VI SUPPLEMENTAL HEALTH INFORMATION  
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TRIEthylenetetramine (TETA) HAS BEEN FOUND TO BE A DIRECT ACTING MUTAGEN IN THE AMES ASSAY. IT GAVE POSITIVE RESULTS WITH AND WITHOUT ACTIVATION.

TETA WAS FETOTOXIC AND TERATOGENIC WHEN FED TO RATS AT 0.83% AND 1.67% OF DIET. WHEN APPLIED DERMALLY TO THE SKIN OF PREGNANT GUINEA PIGS, THERE WAS A 90% ABORTION RATE OR DEATH OF FETUS WITH DEVELOPMENTAL ANOMALIES. THESE EFFECTS ARE BELIEVED TO BE SECONDARY TO COPPER DEFICIENCY, RESULTING FROM THE CHELATING ACTIVITY OF TETA.

( CONTINUED ON PAGE #3 )

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**SECTION X (CONTINUE)****EMPLOYEE PROTECTION**

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**ADDITIONAL PROTECTIVE MEASURES**

USE VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. EYE WASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE AVAILABLE FOR EMERGENCY USE.

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**SECTION XI****ENVIRONMENTAL PROTECTION**

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**SPILL OR LEAK PROCEDURES**

DANGER, CORROSIVE. PREVENT ALL BODILY CONTACT WITH SPILL MATERIAL. WEAR APPROPRIATE RESPIRATOR AND FULL-BODY PROTECTIVE CLOTHING. -SMALL SPILLS- SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL AND PLACE IN NON-LEAKING CONTAINER AND SEAL TIGHTLY FOR PROPER DISPOSAL.

TETA IS RESISTANT TO BIODEGRADATION IN BIOLOGICAL WASTE WATER TREATMENT PLANTS. IT COULD BE TOXIC TO THE BIOMASS IN A TREATMENT PLANT AND COULD BE TOXIC TO FISH

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**SECTION XII****SPECIAL PRECAUTIONS**

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DANGER! CORROSIVE, CAUSES BURNS TO THE EYES, SKIN AND RESPIRATORY TRACT. MAY CAUSE SKIN SENSITIZATION. MAY BE TOXIC IF ABSORBED THROUGH SKIN. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. DO NOT BREATHE VAPORS OR MIST. CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, CAN CONTAIN HAZARDOUS PRODUCT RESIDUES. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING, APPLYING COSMETIC, OR USING TOILET FACILITIES. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE. CONTAMINATED LEATHER ARTICLES INCLUDING SHOES CANNOT BE DECONTAMINATED AND SHOULD BE DESTROYED TO PREVENT REUSE.

HEATING THIS CURING AGENT IN THE PRESENCE OF AIR MAY CAUSE THERMAL AND OXIDATIVE DECOMPOSITION. WITH SOME EPOXY RESINS, IT MAY PRODUCE EXOTHERMIC REACTIONS WHICH IN LARGE MASSES CAN CAUSE RUNAWAY POLYMERIZATION AND CHARRING OF THE REACTANTS. FUMES AND VAPORS FROM THE THERMAL AND CHEMICAL DECOMPOSITIONS VARY WIDELY IN COMPOSITION AND TOXICITY. DO NOT BREATHE FUMES. USE A NIOSH-APPROVED RESPIRATOR AS REQUIRED TO PREVENT OVER EXPOSURE. IN ACCORD WITH 29 CFR 1910.134, USE EITHER A ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES. MISUSE OF EMPTY CONTAINERS CAN BE HAZARDOUS. CUTTING OR WELDING OF EMPTY CONTAINERS MIGHT CAUSE FIRE, EXPLOSION OR TOXIC FUMES FROM RESIDUES. DO NOT PRESSURIZE CONTAINERS TO EMPTY THEM.

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**SECTION XIII****TRANSPORTATION REQUIREMENTS**

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**DEPARTMENT OF TRANSPORTATION CLASSIFICATION:**

CLASS 8 (CORROSIVE MATERIAL), II

**D.O.T. PROPER SHIPPING NAME:**

TRIETHYLENETETRAMINE

**OTHER REQUIREMENTS:**

UN2259, GUIDE 60.

( CONTINUED ON PAGE #5 )

24 HOUR EMERGENCY NUMBER  
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ACUTE HEALTH 3	FIRE 2	REACTIVITY 0	HAZARD RATING - LEAST-0 SLIGHT-1 MODERATE-2 HIGH-3 EXTREME- 4
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**SECTION I NAME**

PRODUCT NAME: OPTICON 224®  
CHEMICAL NAME: MIXTURE  
CHEMICAL FAMILY: EPOXY RESINS

**SECTION II-A PRODUCT / INGREDIENTS**

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	OPTICON 224®	MIXTURE	100
1	BISPHENOL A / EPICHLOROHYDRIN RESIN	25068-38-6	**
2	N-BUTYL GLYCIDYL	2426-08-8	**

COMPONENT 1 IS AN EPOXY RESIN PRODUCED BY THE CONDENSATION REACTION OF EPICHLOROHYDRIN AND BISPHENOL-A. THESE RAW MATERIALS ARE CONSUMED IN THE PROCESS. RESIDUAL LEVELS OF EPICHLOROHYDRIN ARE TYPICALLY 2-3 PPM IN THE PRODUCT.

\*THIS EPOXY RESIN IS A MIXTURE OF THE ABOVE TWO COMPONENTS. THE PERCENTAGE OF EACH OF THESE INGREDIENTS IS PROPRIETARY INFORMATION IN ACCORDANCE WITH 29 CFR 1910.1200.

**SECTION II-B ACUTE TOXICITY DATA**

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	9.0 G/KG (RAT)	NO DATA AVAILABLE	NO DATA AVAILABLE
1	11-A/K (RAT)	>20 ML/KG (RABBIT)	NO DATA AVAILABLE
1	15.6 G/KG (MOUSE)		
2	1.53 G/KG (MOUSE)	788 M G/KG (RABBIT)	>3500 PPM / 0H (MOUSE)
2	2.26 G/KG (RAT)		1030 PPM / 8H (RAT)

**SECTION III HEALTH INFORMATION**

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

**EYE CONTACT**  
BASED ON SIMILAR PRODUCT TESTING, PRODUCT MAY BE SEVERELY IRRITATING TO THE EYES. MAY CAUSE CORNEAL DAMAGE.

( CONTINUED ON PAGE #2 )

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**SECTION III (CONT.)** **HEALTH INFORMATION**

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**SKIN CONTACT**  
 BASED ON HUMAN EXPERIENCE, COMPONENT 2 IS EXTREMELY IRRITATING TO THE SKIN AND MAY CAUSE SKIN DAMAGE. COMPONENT 2 IS A SKIN SENSITIZER AND BASED ON THE PRESENCE OF COMPONENT 2 PRODUCT MAY BE TOXIC IF ABSORBED THROUGH SKIN.

**INHALATION**  
 BASED ON HUMAN EXPERIENCE, COMPONENT 2 MAY CAUSE IRRITATION OF RESPIRATORY TRACT. BASED ON COMPONENT 2 TESTING, PRODUCT MAY PRODUCE CENTRAL NERVOUS SYSTEM (CNS) DEPRESSION. ALTHOUGH NO SPECIFIC INFORMATION IS KNOWN, BASED ON SKIN SENSITIZATION EXPERIENCE IN HUMANS. COMPONENT 2 MAY ALSO BE A RESPIRATORY TACT SENSITIZER. BECAUSE OF ITS LOW VOLATILITY, HOWEVER, SIGNIFICANT EXPOSURE BY THE INHALATION ROUTE IS UNLIKELY UNDER MOST AMBIENT CONDITIONS, BUT VAPORS, AEROSOLS, AND MIST MAY BE FORMED DURING SOME APPLICATIONS, BASED ON TESTING, PRODUCT MAY BE MODERATELY TOXIC. MAY BE HARMFUL IF INHALED.

**INGESTION**  
 BASED ON SIMILAR PRODUCT TESTING, PRODUCT MAY BE SLIGHTLY TOXIC. BASED ON THE PRESENCE OF COMPONENT 2, PRODUCT MAY CAUSE CNS DEPRESSION.

**SIGNS AND SYMPTOMS**  
 IRRITATION AS NOTED ABOVE. SKIN SENSITIZATION (ALLERGY) MAY BE EVIDENCED BY RASHES, ESPECIALLY HIVES. RESPIRATORY TRACT SENSITIZATION (E.G., ALLERGY, ASTHMA) MAY BE EVIDENCED BY WHEEZING WITH SHORTNESS OF BREATH AND COUGH. EARLY TO MODERATE CNS DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS, AND NAUSEA; IN EXTREME CASE, UNCONSCIOUSNESS AND DEATH MAY OCCUR.

**AGGRAVATED MEDICAL CONDITIONS**  
 PREEXISTING EYE, SKIN AND RESPRIATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. PREEXISTING SKIN OR RESPRIATORY TRACT ALLERGIES MAY INCREASE THE CHANCE OF DEVELOPING INCREASED ALLERGY SYMPTOMS FROM EXPOSURE TO THIS PRODUCT.

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SECTION IV			OCCUPATIONAL EXPOSURE LIMITS			
NO.	PEL/TWA OSHA	PEL/ CEILING	TLV /TWA	ACGIH	TLV /STEL	OTHER
P	NONE ESTABLISHED					
1	NONE ESTABLISHED					
2	25 PPM		25 PPM (SKIN)			

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**SECTION V** **EMERGENCY AND FIRST AID PROCEDURES**

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**EYE CONTACT**  
 IMMEDIATELY FLUSH WITH LARGE AMOUNT OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

**SKIN CONTACT**  
 IMMEDIATELY REMOVE CONTAMINATED CLOTHING AND SHOES, WIPE EXCESS FROM SKIN AND FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. USE SOAP IF READILY AVAILABLE., OR FOLLOW BY THOROUGHLY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING UNTIL THOROUGHLY CLEANED. GET MEDICAL ATTENTION.

**INHALATION**  
 REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

( CONTINUED ON PAGE #3 )

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**SECTION V (CONTINUED)****EMERGENCY AND FIRST AID PROCEDURES**

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**INGESTION**

DO NOT INDUCE VOMITING. GIVE ONE GLASS OF WATER UNLESS VICTIM IS DROWSY, UNCONSCIOUS, OR CONVULSING. OTHERWISE, GIVE NO MORE THAN 2 GLASSES OF WATER AND INDUCE VOMITING BY GIVING 30CC (2 TABLESPOONS) SYRUP OF IPECAC.\* IF IPECAC IS UNAVAILABLE, GIVE 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO THE BACK OF THE VICTIM'S THROAT. KEEP VICTIM'S HEAD BELOW HIPS WHILE VOMITING. GET MEDICAL ATTENTION.

**NOTE TO PHYSICIAN**

\* IF VICTIM IS A CHILD, GIVE NO MORE THAN 1 GLASS OF WATER AND 15CC (1 TABLESPOON) SYRUP OF IPECAC. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

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**SECTION VI****SUPPLEMENTAL HEALTH INFORMATION**

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COMPONENT 1: CHRONIC STUDIES: RECENT 2-YEAR BIOASSAYS IN MICE EXPOSED BY THE DERMAL ROUTE TO A RESIN SIMILAR TO COMPONENT 1, THE DIGLYCIDYL ETHER OF BISPHENOL A (DGEBA), OR TO OTHER COMMERCIAL RESINS WHICH ARE COMPOSED PREDOMINANTLY OF DGEBA HAVE YIELDED VERY LIMITED EVIDENCE OF WEAK CARCINOGENICITY. DGEBA IS A COMPONENT OF THIS RESIN. THE AUTHORS OF THIS WORK CONCLUDED THAT THE RENAL TUMOR EVIDENCE WITH THIS RESIN "WAS OF NO BIOLOGICAL SIGNIFICANCE" AND THAT THE RESIN "IS NOT A SYSTEMIC CARCINOGEN WHEN APPLIED TO THE DORSAL SKIN OF MICE." BASED UPON THIS AND ALL OTHER AVAILABLE INFORMATION, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) CONCLUDED (1988) THAT DGEBA WAS NOT CLASSIFIABLE AS A CARCINOGEN (IARC GROUP 3) BASED ON THE FOLLOWING: HUMAN EVIDENCE - INADEQUATE; ANIMAL EVIDENCE - INADEQUATE.

BOTH A RESIN SIMILAR TO COMPONENT 1 AND DGEBA, ITS MAJOR CONSTITUENT, HAVE PROVED TO BE INACTIVE WHEN TESTED BY IN VIVO MUTAGENICITY ASSAYS. THEY HAVE BOTH SHOWN ACTIVITY IN VITRO MICROBIAL MUTAGENICITY SCREENING TESTS AND HAVE PRODUCED CHROMOSOMAL ABERRATIONS IN CULTURED RAT LIVER CELLS. THE SIGNIFICANCE OF THIS INFORMATION TO MAN IS UNKNOWN.

NOTE: THIS PRODUCT CONTAINS (TRACE 2-3 PPM, TYPICAL) RESIDUAL QUANTITIES OF EPICHLOROHYDRIN (ECH), CAS NO. 106-89-8. IT IS VERY UNLIKELY THAT NORMAL WORK PRACTICES WITH THIS PRODUCT COULD RESULT IN MEASURABLE ECH CONCENTRATIONS IN THE WORK PLACE ATMOSPHERE. NEVERTHELESS, YOU SHOULD BE AWARE THAT ECH HAS BEEN REPORTED TO PRODUCE CANCER IN LABORATORY ANIMALS AND TO PRODUCE MUTAGENIC CHANGES IN BACTERIA AND CULTURED HUMAN CELLS. IT HAS BEEN CLASSIFIED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AS A PROBABLE HUMAN CARCINOGEN (IARC GROUP 2A) BASED ON THE FOLLOWING CONCLUSIONS: HUMAN EVIDENCE - INADEQUATE; ANIMAL EVIDENCE - SUFFICIENT. IT HAS BEEN CLASSIFIED AS AN ANTICIPATED HUMAN CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM (NTP).

NOTE: ADDITIONAL TOXICOLOGICAL INFORMATION

COMPONENT 2: RATS EXPOSED TO N-BUTYL GLYCIDYL ETHER AT 150 PPM FOR 50 7-HOUR EXPOSURES DEMONSTRATED SIGNIFICANTLY RETARDED GROWTH. IN THE SAME STUDY, THERE WAS 50% MORTALITY IN RATS EXPOSED AT 300 PPM. WITH ADDITIONAL SIGNS OF TOXICITY IN THE SURVIVORS. TESTICULAR ATROPHY WAS OBSERVED IN RATS EXPOSED AT 300 PPM, BUT THE RATS WERE JUVENILE, OBSCURING THE SIGNIFICANCE, IF ANY, OF THE RESULT.

IN A 28 DAY INHALATION STUDY, RATS EXPOSED AT 188 PPM SHOWED DECREASED BODY WEIGHT AND CHANGES IN BLOOD CHEMISTRY. SEVERE IRRITATION OF THE UPPER RESPIRATORY TRACT WAS OBSERVED IN RATS EXPOSED AT 94 PPM AND 188 PPM.

N-BGE HAS TESTED POSITIVE IN A NUMBER OF IN VITRO GENETIC TOXICITY ASSAYS WITH AND WITHOUT METABOLIC ACTIVATION. MIXED RESULTS WERE OBSERVED IN THE DOMINANT LETHAL AND THE MOUSE MICRONUCLEUS TESTS.

( CONTINUED ON PAGE #4 )

**SECTION VII**

**PHYSICAL DATA**

BOILING POINT: NOT AVAILABLE  
(DEG F)

SPECIFIC GRAVITY: 1.13  
(H2O=1)

VAPOR PRESSURE: 1  
(MM HG)

MELTING POINT: NOT AVAILABLE  
(DEG F)

SOLUBILITY: NEGLIGIBLE  
(IN WATER)

VAPOR DENSITY: 4.5  
(AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE • 1): NOT AVAILABLE

APPEARANCE AND ODOR: LIGHT YELLOW LIQUID.

**SECTION VIII**

**FIRE AND EXPLOSION HAZARDS**

FLASH POINT AND METHOD:  
164 DEG F (SETAFLASH)

FLAMMABLE LIMITS /X VOLUME IN AIR  
LOWER: N/AV                      UPPER: N/AV

**EXTINGUISHING MEDIA**

USE WATER FOG, CARBON DIOXIDE (CO2), DRY CHEMICAL, ALCOHOL FOAM.

**SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS**

CAUTION. COMBUSTIBLE. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE-EXPOSED CONTAINERS WITH WATER.

**UNUSUAL FIRE AND EXPLOSION HAZARD**

CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREA EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

**SECTION IX**

**REACTIVITY**

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

**CONDITIONS AND MATERIALS TO AVOID:**

AVOID HEAT, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS. CAN REACT VIGOROUSLY WITH STRONG OXIDIZING AGENTS, STRONG LEWIS OR MINERAL ACIDS, AND STRONG MINERAL AND ORGANIC BASES, ESPECIALLY PRIMARY AND SECONDARY ALIPHATIC AMINES. REACTIONS WITH SOME CURING AGENTS MAY PRODUCE CONSIDERABLE HEAT.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

CARBON MONOXIDE, ALDEHYDES AND ACIDS MAY BE FORMED DURING COMBUSTION.

**SECTION X**

**EMPLOYEE PROTECTION**

**RESPIRATORY PROTECTION**

DO NOT BREATHE VAPOR / MISTS WHICH MAY BE PRODUCED UNDER SOME CONDITIONS SUCH AS HEATING OR APPLICATIONS OF UNCURED MATERIAL IN LARGE SURFACE AREAS. IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVER EXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER A FULL-FACE, ATMOSPHERE-SUPPLYING RESPIRATOR OR AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

**PROTECTIVE CLOTHING**

DO NOT GET IN EYES. WEAR CHEMICAL GOGGLES IF THERE IS A POTENTIAL CONTACT WITH EYES. DO NOT GET ON SKIN, ON CLOTHING. WEAR CHEMICAL-RESISTANT PROTECTIVE CLOTHING SUCH AS GLOVES, OTHER CLOTHING OR APRON, OVERSHOES AND A FACE-SHIELD SUITABLE TO POTENTIAL EXPOSURE.

(CONTINUED ON PAGE 5)

## SECTION V (CONTINUED)

## EMERGENCY AND FIRST AID PROCEDURES

## INGESTION

DO NOT INDUCE VOMITING. GIVE ONE GLASS OF WATER UNLESS VICTIM IS DROWSY, UNCONSCIOUS, OR CONVULSING. OTHERWISE, GIVE NO MORE THAN 2 GLASSES OF WATER AND INDUCE VOMITING BY GIVING 30CC ( 2 TABLESPOONS) SYRUP OF IPECAC.\* IF IPECAC IS UNAVAILABLE, GIVE 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO THE BACK OF THE VICTIM'S THROAT. KEEP VICTIM'S HEAD BELOW HIPS WHILE VOMITING. GET MEDICAL ATTENTION.

## NOTE TO PHYSICIAN:

\* IF VICTIM IS A CHILD, GIVE NO MORE THAN 1 GLASS OF WATER AND 15CC (1 TABLESPOON) SYRUP OF IPECAC. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

## SECTION VI

## SUPPLEMENTAL HEALTH INFORMATION

COMPONENT 1: CHRONIC STUDIES: RECENT 2-YEAR BIOASSAYS IN MICE EXPOSED BY THE DERMAL ROUTE TO A RESIN SIMILAR TO COMPONENT 1, THE DIGLYCIDYL ETHER OF BISPHENOL A (DGEBA). OR TO OTHER COMMERCIAL RESINS WHICH ARE COMPOSED PREDOMINANTLY OF DGEBA HAVE YIELDED VERY LIMITED EVIDENCE OF WEAK CARCINOGENICITY. DGEBA IS A COMPONENT OF THIS RESIN. THE AUTHORS OF THIS WORK CONCLUDED THAT THE RENAL TUMOR EVIDENCE WITH THIS RESIN "WAS OF NO BIOLOGICAL SIGNIFICANCE" AND THAT THE RESIN "IS NOT A SYSTEMIC CARCINOGEN WHEN APPLIED TO THE DORSAL SKIN OF MICE." BASED UPON THIS AND ALL OTHER AVAILABLE INFORMATION. THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) CONCLUDED (1988) THAT DGEBA WAS NOT CLASSIFIABLE AS A CARCINOGEN (IARC GROUP 3) BASED ON THE FOLLOWING: HUMAN EVIDENCE - INADEQUATE; ANIMAL EVIDENCE - INADEQUATE.

BOTH A RESIN SIMILAR TO COMPONENT 1 AND DGEBA, ITS MAJOR CONSTITUENT, HAVE PROVED TO BE INACTIVE WHEN TESTED BY IN VIVO MUTAGENICITY ASSAYS. THEY HAVE BOTH SHOWN ACTIVITY IN VITRO MICROBIAL MUTAGENICITY SCREENING TESTS AND HAVE PRODUCED CHROMOSOMAL ABERRATIONS IN CULTURED RAT LIVER CELLS. THE SIGNIFICANCE OF THIS INFORMATION TO MAN IS UNKNOWN.

NOTE: THIS PRODUCT CONTAINS (TRACE 2-3 PPM, TYPICAL) RESIDUAL QUANTITIES OF EPICHLOROHYDRIN (ECH), CAS NO. 106-89-8. IT IS VERY UNLIKELY THAT NORMAL WORK PRACTICES WITH THIS PRODUCT COULD RESULT IN MEASURABLE ECH CONCENTRATIONS IN THE WORK PLACE ATMOSPHERE. NEVERTHELESS, YOU SHOULD BE AWARE THAT ECH HAS BEEN REPORTED TO PRODUCE CANCER IN LABORATORY ANIMALS AND TO PRODUCE MUTAGENIC CHANGES IN BACTERIA AND CULTURED HUMAN CELLS. IT HAS BEEN CLASSIFIED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AS A PROBABLE HUMAN CARCINOGEN (IARC GROUP 2A) BASED ON THE FOLLOWING CONCLUSIONS: HUMAN EVIDENCE - INADEQUATE; ANIMAL EVIDENCE - SUFFICIENT. IT HAS BEEN CLASSIFIED AS AN ANTICIPATED HUMAN CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM (NTP).

## NOTE: ADDITIONAL TOXICOLOGICAL INFORMATION

COMPONENT 2: RATS EXPOSED TO N-BUTYL GLYCIDYL ETHER AT 150 PPM FOR 50 7-HOUR EXPOSURES DEMONSTRATED SIGNIFICANTLY RETARDED GROWTH. IN THE SAME STUDY, THERE WAS 50% MORTALITY IN RATS EXPOSED AT 300 PPM. WITH ADDITIONAL SIGNS OF TOXICITY IN THE SURVIVORS. TESTICULAR ATROPHY WAS OBSERVED IN RATS EXPOSED AT 300 PPM, BUT THE RATS WERE JUVENILE, OBSCURING THE SIGNIFICANCE, IF ANY, OF THE RESULT.

IN A 28 DAY INHALATION STUDY, RATS EXPOSED AT 188 PPM SHOWED DECREASED BODY WEIGHT AND CHANGES IN BLOOD CHEMISTRY. SEVERE IRRITATION OF THE UPPER RESPIRATORY TRACT WAS OBSERVED IN RATS EXPOSED AT 94 PPM AND 188 PPM.

N-BGE HAS TESTED POSITIVE IN A NUMBER OF IN VITRO GENETIC TOXICITY ASSAYS WITH AND WITHOUT METABOLIC ACTIVATION. MIXED RESULTS WERE OBSERVED IN THE DOMINANT LETHAL AND THE MOUSE MICRONUCLEUS TESTS.

( CONTINUED ON PAGE #4 )



**SECTION X (CONTINUED)**

**EMPLOYEE PROTECTION**

**ADDITIONAL PROTECTIVE MEASURES**

USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. EYE WASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE AVAILABLE FOR EMERGENCY USE.

**SECTION XI**

**ENVIRONMENTAL PROTECTION**

**SPILL OR LEAK PROCEDURES**

CAUTION. COMBUSTIBLE. ....SMALL SPILLS..... SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL AND PLACE IN NON-LEAKING CONTAINER AND SEAL TIGHTLY FOR PROPER DISPOSAL.

**SECTION XII**

**SPECIAL PRECAUTIONS**

HEATING THIS RESIN ABOVE 300 DEG. F IN THE PRESENCE OF AIR MAY CAUSE SLOW OXIDATIVE DECOMPOSITION. ABOVE 500 DEG.F, POLYMERIZATION MAY OCCUR. SOME CURING AGENTS E.G. ALIPHATIC POLYAMINES I CAN PRODUCE EXOTHERMIC REACTIONS WHICH IN LARGE MASSES CAN CAUSE RUNAWAY POLYMERIZATION AND CHARRING OF THE REACTANTS. FUMES AND VAPORS FROM THE THERMAL AND CHEMICAL DECOMPOSITIONS VARY WIDELY IN COMPOSITION AND TOXICITY. **DO NOT BREATHE FUMES.** USE A NIOSH-APPROVED RESPIRATOR AS REQUIRED TO PREVENT OVER EXPOSURE. IN ACCORD WITH 29 CFR 1910.134, USE EITHER A ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

WARNING! COMBUSTIBLE LIQUID. STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES. MISUSE OF EMPTY CONTAINERS CAN BE HAZARDOUS. CUTTING OR WELDING OF EMPTY CONTAINERS MIGHT CAUSE FIRE, EXPLOSION OR TOXIC FUMES FROM RESIDUES. DO NOT PRESSURIZE CONTAINERS TO EMPTY THEM.

DANGER! SKIN SENSITIZER. POTENTIAL RESPIRATORY TRACT SENSITIZER. IRRITATING TO THE EYES AND SKIN. CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, CAN CONTAIN HAZARDOUS PRODUCT RESIDUES. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING, APPLYING COSMETIC, OR USING TOILET FACILITIES. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE. CONTAMINATED LEATHER ARTICLES INCLUDING SHOES CANNOT BE DECONTAMINATED AND SHOULD BE DESTROYED TO PREVENT REUSE.

**SECTION XIII**

**TRANSPORTATION REQUIREMENTS**

**DEPARTMENT OF TRANSPORTATION CLASSIFICATION:**

COMBUSTIBLE LIQUID, III

**D.O.T. PROPER SHIPPING NAME:**

RESIN SOLUTION

**OTHER REQUIREMENTS:**

UN1866, GUIDE 26. NOT REGULATED BY D.O.T. IF IN A CONTAINER OF 119 GALLONS OR LESS.

**SECTION XIV**

**OTHER REGULATORY CONTROLS**

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA /TSCA INVENTORY OF CHEMICAL SUBSTANCES.

PROTECTION OF STRATOSPHERE OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990) : PER CFR PART 82. THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCE.

( CONTINUED ON PAGE 6 )

**SECTION XIII (CONTINUED)****TRANSPORTATION REQUIREMENTS**

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

**SECTION XV****STATE REGULATORY INFORMATION**

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCTS SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	PERCENT	STATE CODE
BUTYL GLYCIDYL ETHER (CAS NO: 2426-08-6)	*	FL, IL, MA, ME, MN, RI, NJ, PA
EPICHLOROHYDRIN (CAS NO: 106-89-8)	2-3 PPM	CA65C, MA
PHENYL GLYCIDYL ETHER (CAS NO: 122-60-1)	*	CA65C
DIGLYCIDYL ETHER (CAS NO: 2239-07-5)	*	MA

CA65C= THE CHEMICAL IDENTIFIED WITH THIS CODE IS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

\*THE SPECIFIC PROPORTION OF THIS COMPONENT IS CONSIDERED TRADE SECRET INFORMATION.

**SECTION XVI****SPECIAL NOTES**

REGULATORY INFORMATION: (NOT MEANT TO BE ALL-INCLUSIVE--SELECTED REGULATIONS REPRESENTED).

NOTICE: THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT AS OF THE EFFECTIVE DATE SHOWN ABOVE. HOWEVER, HUGHES ASSOCIATES MAKES NO WARRANTY, EXPRESS OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. HUGHES ASSOCIATES ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. REGULATORY REQUIREMENTS ARE SUBJECT TO CHANGE AND MAY DIFFER FROM ONE LOCATION TO ANOTHER; IT IS THE BUYER'S RESPONSIBILITY TO ENSURE THAT ITS ACTIVITIES COMPLY WITH FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS. THE SPECIFIC INFORMATION HEREIN IS MADE FOR THE PURPOSE OF COMPLYING WITH NUMEROUS FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS AND REGULATIONS. SEE MSDS SHEET FOR HEALTH AND SAFETY INFORMATION.