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## Material Safety Data Sheets

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**Alumilite Corporation**  
**315 E. North St.**  
**Kalamazoo, MI 49007**  
**269 488-4000**  
**Emergency Telephone: Chemtrec 1-800-424-9300**

### SECTION I - PRODUCT IDENTIFICATION

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**TRADE NAME AND SYNONYMS:** REPLICATOR 421 A [OR REPLICATOR 421 PART A]  
**CHEMICAL FAMILY:** POLYMETHYLENE POLYPHENYL ISOCYANATE SOLUTION  
**FORMULA:** MIXTURE

### SECTION II – INGREDIENTS

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NOTE: SEE FINAL PAGE FOR DEFINITIONS OF ABBREVIATIONS AND SYMBOLS.

THIS MATERIAL SAFETY DATA SHEET IS PREPARED TO COMPLY WITH UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS). UNLISTED INGREDIENTS ARE BELOW SPECIFIED REPORTING LEVELS AND/OR ARE NOT HAZARDOUS PER THE OSHA STANDARD AND/OR ARE NOT FOUND ON THE WHMIS INGREDIENT DISCLOSURE LIST.

METHYLENE BISPHENYL ISOCYANATE (MDI) CAS# 101-68-8 15% TLV UNITS .02 PPM  
(VAPOR PRESSURE <.0001 mmHg @ 25 DEGREES C.)  
AROMATIC PETROLEUM HYDROCARBON CAS# 64742-95-6 3% TLV UNITS 50 PPM  
(VAPOR PRESSURE <10 mmHg @ 25 DEGREES C.)

SKIN ABSORPTION MAY CONTRIBUTE TO THE OVERALL EXPOSURE TO THIS MATERIAL. APPROPRIATE MEASURES SHOULD BE TAKEN TO PREVENT ABSORPTION SO THAT THE TLV WILL NOT BE INVALIDATED.

PROPRIETARY MIXTURE \* TRADE SECRET

C.A.S. NOS. AVAILABLE ON ALL INGREDIENTS ON AN EMERGENCY BASIS.

**THE MIXTURE CONTAINS NO KNOWN CARCINOGENS.**

### SECTION III - PHYSICAL DATA

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BOILING POINT: >300 DEGREES F.  
VAPOR PRESSURE: <10 mmHg @ 25 DEGREES C.  
VAPOR DENSITY: (AIR=1) APPROXIMATELY 8.0  
SPECIFIC GRAVITY: (WATER =1) 1.7  
SOLUBILITY IN WATER: REACTS WITH WATER  
PERCENT VOLATILE BY VOLUME: 5-10%  
EVAPORATION RATE: (BUTYL ACETATE = 1) <.2  
APPEARANCE AND ODOR: BROWN LIQUID, SLIGHT AROMATIC ODOR

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA

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FLASH POINT: >300 DEGREES F COC.  
FLAMMABLE LIMITS: N.E.  
EXTINGUISHING MEDIA: USE TYPE ABC EXTINGUISHER  
SPECIAL FIRE-FIGHTING PROCEDURE: FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS IN ADDITION TO NORMAL PROTECTIVE TURNOUT CLOTHING.  
UNUSUAL FIRE AND EXPLOSION HAZARDS: AVOID WATER CONTAMINATION IN CLOSED CONTAINERS OR CONFINED AREAS. (CARBON DIOXIDE EVOLVED - EXOTHERMIC, DANGEROUS PRESSURE CAN DEVELOP.)

## SECTION V - HEALTH HAZARD DATA

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THRESHOLD LIMIT VALUE: .02 PPM ON MDI, MIXTURE N.E.

EFFECTS OF ACUTE EXPOSURE:

EYES - MAY CAUSE TEARING

SKIN - MINOR IRRITATION MAY OCCUR

INHALATION - BREATHLESSNESS, SEVERE COUGHING, CHEST DISCOMFORT

INGESTION - ORAL LD50 FOR RATS IS >15000 MG/KG ON MDI.

EFFECTS OF CHRONIC EXPOSURE: NONE KNOWN

NOTE: SMALL % OF POPULATION MAY DEVELOP ALLERGIC SENSITIVITY LEADING TO ASTHMA-LIKE SYMPTOMS ON SUBSEQUENT EXPOSURES BELOW THE TLV OF MDI.

### EMERGENCY AND FIRST AID PROCEDURES:

**EYES: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR 15 MINUTES; CONTACT PHYSICIAN.**

**SKIN - WASH WITH SOAP AND WATER.**

**INGESTION: DO NOT INDUCE VOMITING. GIVE ONE GLASS OF WATER OR MILK, CONTACT PHYSICIAN IMMEDIATELY.**

**IF ANY IRRITATION OR OTHER SYMPTOMS PERSIST, SEE A PHYSICIAN.**

## SECTION VI - CHEMICAL REACTIVITY

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STABILITY: STABLE UNDER NORMAL CONDITIONS

CONDITIONS TO AVOID: AVOID TEMPERATURES ABOVE 120 DEGREES F.

INCOMPATIBILITY (MATERIALS TO AVOID) : WATER, STRONG BASES, ALCOHOLS, METAL COMPOUNDS

HAZARDOUS DECOMPOSITION PRODUCTS: @ 500 DEGREES F. - CARBON MONOXIDE, NITROGEN OXIDES, TRACES OF HYDROGEN CYANIDE.

HAZARDOUS POLYMERIZATION: MAY OCCUR

CONDITIONS TO AVOID: CONTAMINATION BY MOISTURE, CONTAMINATED CONTAINERS SHOULD BE LEFT VENTED

## SECTION VII - SPILL OR LEAK PROCEDURES

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STEPS TO BE TAKEN: ABSORB ON ABSORBENT MATERIAL.

WASTE DISPOSAL: DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. DO NOT DISCHARGE INTO PUBLIC WATERWAYS OR SEWERS

## SECTION VIII - SPECIAL PROTECTION AND PROCEDURES

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RESPIRATORY PROTECTION: USE NIOSH APPROVED EQUIPMENT IF AIRBORNE EXPOSURE IS EXCESSIVE.

VENTILATION: FACE VELOCITY - 60 FPM; USE ONLY WITH ADEQUATE VENTILATION.

PROTECTIVE EQUIPMENT: CHEMICAL RESISTANT PROTECTIVE GLOVES; FOR EYE AND FACE PROTECTION A FACE SHIELD IS RECOMMENDED. A CHEMICAL RESISTANT APRON AND OTHER PROTECTIVE GEAR MAY BE USED AS NEEDED TO REDUCE CHANCES OF CONTACT.

## SECTION IX - SPECIAL PRECAUTIONS

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HANDLING AND STORAGE: USE GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES EMPLOYED WITH ANY INDUSTRIAL CHEMICAL.

WORKPLACE: PRACTICE GOOD HOUSEKEEPING. CLEAN UP SPILLS PROMPTLY.

PERSONAL HYGIENE: WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, AFTER EACH SHIFT, OR AFTER ANY CONTACT WITH PRODUCT. LAUNDRY WORK CLOTHES FREQUENTLY.

NPCA HMIS RATING: HEALTH 2; FLAMMABILITY 1; REACTIVITY 1; PERSONAL PROTECTION F.

DUST RESPIRATORS ARE ONLY NECESSARY WHEN PERFORMING OPERATIONS SUCH AS GRINDING, MACHINING, OR POLISHING THE CAST PRODUCTS.

## SECTION X - TRANSPORTATION INFORMATION

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DOT PROPER SHIPPING NAME: DIPHENYLMETHANE - 4,4'- DIISOCANATE  
DOT HAZARD CLASS: NON-REGULATED  
IMO / IMDG HAZARD CLASS: NON-REGULATED  
ICAO / IATA HAZARD CLASS: NON-REGULATED

## SECTION XI - REGULATORY INFORMATION

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TOXIC SUBSTANCES CONTROL ACT (TSCA): ALL INGREDIENTS ARE ON THE TSCA CHEMICAL SUBSTANCE INVENTORY

CERCLA AND SARA REGULATIONS (40 CFR 355, 370, & 372): SECTION 313 SUPPLIER NOTIFICATION. THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT OF 1986 AND OF 40 CFR 372:  
15% MDI LISTED AS METHYLENE BIS(PHENYLISOCYANATE) MBI CAS NO. 101-68-8

SARA HAZARD CATEGORY: THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA HAZARD CATEGORIES PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED UNDER APPLICABLE CONDITIONS, TO MEET THE FOLLOWING CATEGORIES:

AN IMMEDIATE HEALTH HAZARD, A DELAYED HEALTH HAZARD, A REACTIVE HAZARD

WHMIS INFORMATION: THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) CLASSIFICATION FOR THIS PRODUCT IS D1B, D2A, D2B

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To the best of our knowledge, the information contained herein is accurate. However Alumilite does not assume 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. All materials may present unknown hazards and should be handled with care. Although we have described herein all of the hazards to which we are currently aware, we cannot guarantee that these are the only hazards which exist. While the descriptions, designs, data, and information contained herein are presented in good faith and believed to be accurate, it is provided for your guidance only. Further, you expressly understand and agree that the descriptions, designs, data, and information furnished by Alumilite hereunder are given gratis and Alumilite assumes no obligation or liability for the description, designs, data, and information given or results obtained, all such being given and accepted at your risk.

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## SYMBOLS AND ABBREVIATIONS

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N.A.: NOT APPLICABLE  
N.E.: NOT ESTABLISHED  
>: GREATER THAN  
<: LESS THAN  
C.A.S. NO.: CHEMICAL ABSTRACT SERVICE NUMBER  
TLV: THRESHOLD LIMIT VALUE (UNITS)  
PPM: PARTS PER MILLION  
mmHg: MILLIMETERS OF MERCURY  
FPM: FEET PER MINUTE  
NIOSH: NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH  
NPCA: NATIONAL PAINT & COATINGS ASSOCIATION  
HMIS: HAZARDOUS MATERIAL IDENTIFICATION SYSTEM  
COC: CLEVELAND OPEN CUP

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### SECTION I - PRODUCT IDENTIFICATION

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**TRADE NAME AND SYNONYMS:** REPLICATOR 421 B [OR REPLICATOR 421 PART B]  
**CHEMICAL FAMILY:** POLYETHER POLYOL SOLUTION  
**FORMULA:** MIXTURE

### SECTION II – INGREDIENTS

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NOTE: SEE FINAL PAGE OF MSDS FOR DEFINITIONS OF ABBREVIATIONS AND SYMBOLS.

THIS MATERIAL DATA SHEET IS PREPARED TO COMPLY WITH UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS). UNLISTED INGREDIENTS ARE BELOW SPECIFIED REPORTING LEVELS AND/OR ARE NOT HAZARDOUS PER THE OSHA STANDARD AND/OR ARE NOT FOUND ON THE WHMIS INGREDIENT DISCLOSURE LIST.

AROMATIC PETROLEUM HYDROCARBON CAS# 64742-95-6 4% TLV UNITS 50 PPM  
(VAPOR PRESSURE <10 mmHg @ 25 DEGREES C.)

PROPRIETARY MIXTURE \* TRADE SECRET

C.A.S. NO.S AVAILABLE ON ALL INGREDIENTS ON AN EMERGENCY BASIS.

**THE MIXTURE CONTAINS NO KNOWN CARCINOGENS.**

### SECTION III - PHYSICAL DATA

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BOILING POINT: >300 DEGREES F.  
VAPOR PRESSURE: <10 mmHg @ 25 DEGREES C.  
VAPOR DENSITY: (AIR=1) N.E.  
SPECIFIC GRAVITY: (WATER =1) 1.7  
SOLUBILITY IN WATER: 15-25%  
PERCENT VOLATILE BY VOLUME: 5-10%  
EVAPORATION RATE: <BUTYL ACETATE = 1 > <1  
APPEARANCE AND ODOR: BLUE LIQUID, SLIGHT AROMATIC ODOR

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA

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FLASH POINT: >300 DEGREES F. COC  
FLAMMABLE LIMITS: N.E.  
EXTINGUISHING MEDIA: USE TYPE ABC EXTINGUISHER  
SPECIAL FIRE-FIGHTING PROCEDURE: FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS IN ADDITION TO NORMAL PROTECTIVE TURNOUT CLOTHING.

### SECTION V - HEALTH HAZARD DATA

---

THRESHOLD LIMIT VALUE: N.E.; 50 PPM RECOMMENDED ON MIXTURE  
EFFECTS OF ACUTE EXPOSURE:  
EYES - MAY CAUSE TEARING  
SKIN - MINOR IRRITATION MAY OCCUR

INGESTION - N.E.  
INHALATION - N.E.  
EFFECTS OF CHRONIC EXPOSURE: NONE KNOWN

**EMERGENCY AND FIRST AID PROCEDURES:**

**EYES: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR 15 MINUTES; CONTACT PHYSICIAN.**

**SKIN: WASH WITH SOAP AND WATER.**

**INGESTION: DO NOT INDUCE VOMITING, GIVE ONE GLASS OF WATER OR MILK; CONTACT PHYSICIAN IMMEDIATELY.**

**INHALATION: REMOVE FROM CONTAMINATED AREA; ADMINISTER OXYGEN.**

**IF ANY IRRITATION OR OTHER SYMPTOMS PERSIST, SEE A PHYSICIAN.**

**SECTION VI - CHEMICAL REACTIVITY**

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STABILITY: STABLE UNDER NORMAL CONDITIONS  
CONDITIONS TO AVOID: AVOID TEMPERATURES ABOVE 120 DEGREES F.  
INCOMPATIBILITY (MATERIALS TO AVOID): N.E.  
HAZARDOUS DECOMPOSITION PRODUCTS: SMOKE, FUMES, CARBON MONOXIDE  
HAZARDOUS POLYMERIZATION: NONE KNOWN

**SECTION VII - SPILL OR LEAK PROCEDURES**

---

STEPS TO BE TAKEN: ABSORB ON ABSORBENT MATERIAL.  
WASTE DISPOSAL: DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. DO NOT DISCHARGE INTO PUBLIC WATERWAYS OR SEWERS.

**SECTION VIII - SPECIAL PROTECTION AND PROCEDURES**

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RESPIRATORY PROTECTION: USE NIOSH APPROVED EQUIPMENT IF AIRBORNE EXPOSURE IS EXCESSIVE.  
VENTILATION: FACE VELOCITY - 60 FPM; USE ONLY WITH ADEQUATE VENTILATION.  
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HANDLING AND STORAGE: USE GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES EMPLOYED WITH ANY INDUSTRIAL CHEMICAL.

WORKPLACE: PRACTICE GOOD HOUSEKEEPING, CLEAN UP SPILLS PROMPTLY.  
PERSONAL HYGIENE: WASH THOROUGHLY WITH SOAP AND WATER BEFORE EATING, AFTER EACH SHIFT, OR AFTER ANY POSSIBLE CONTACT WITH PRODUCT. LAUNDRY WORK CLOTHES FREQUENTLY.

NPCA HMIS RATING: HEALTH 2; FLAMMABILITY 1; REACTIVITY 0; PERSONAL PROTECTION F.

DUST RESPIRATORS ARE ONLY NECESSARY WHEN PERFORMING OPERATIONS SUCH AS GRINDING, MACHINING, OR POLISHING THE CAST PRODUCT.

**SECTION X - TRANSPORTATION INFORMATION**

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DOT HAZARD CLASS: NON-REGULATED  
IMO / IMDG HAZARD CLASS: NON-REGULATED  
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**SECTION XI - REGULATORY INFORMATION**

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SARA HAZARD CATEGORY: THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA "HAZARD CATEGORIES PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED UNDER APPLICABLE CONDITIONS, TO MEET THE FOLLOWING CATEGORIES: AN IMMEDIATE HEALTH HAZARD

WHMIS INFORMATION: THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) CLASSIFICATION FOR THIS PRODUCT IS UNDETERMINED.

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  - COC: CLEVELAND OPEN CUP
- REVISION DATE: 02/04/05      REVIEWED BY: J. L. WILSON