

CROSSFIELD PRODUCTS CORPORATION

www.crossfieldproducts.com

3000 E. Harcourt St.
 Rancho Dominguez, CA 90221 (Headquarters)
 (310)-886-9100 (8:00 AM – 5:00 PM Pacific Time)

140 Valley Rd.
 Roselle Park, NJ 07204
 (908)-245-2800 (8:00 AM – 5:00 PM Eastern Time)

SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

<u>TRADE NAME (AS LABELED):</u>	MiraTop SL Liquid, Part B
<u>CHEMICAL NAME/CLASS:</u>	Polyisocyanate Curative
<u>PRODUCT USE:</u>	Decking Curative
<u>SUPPLIER/MANUFACTURER'S NAME:</u>	Crossfield Products Corp.
<u>ADDRESS: (West Coast):</u>	3000 E. Harcourt St. Rancho Dominguez, CA 90221 (Headquarters)
<u>ADDRESS: (East Coast):</u>	140 Valley Rd. Roselle Park, NJ 07204
<u>EMERGENCY PHONE:</u>	CHEMTREC: 800-424-9300
<u>DATE OF PREPARATION:</u>	March 27, 2019
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2. HAZARD(S) IDENTIFICATION



GHS classification:

Acute toxicity (Inhalation) – Category 4
 Skin irritation – Category 2
 Eye irritation - Category 2B
 Respiratory sensitization – Category 1
 Skin sensitization – Category 1
 Specific target organ toxicity (single exposure) – Category 3 (Respiratory System)
 Specific target organ toxicity (repeated exposure) – Category 1 (Respiratory Tract)

Signal Word: (Danger)

Hazard Statements:

H315: Causes skin irritation
 H317: May cause an allergic skin reaction.
 H320: Causes eye irritation
 H332: Harmful if inhaled
 H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
 H335: May cause respiratory irritation
 H373: May Cause damage to organs (Olfactory) through prolonged or repeated exposure (inhalation)

Precautionary Statements:

P260: Do not breath dust / fume / gas / mist / vapor / spray
 P264: Wash with plenty of water and soap thoroughly after handling. Respiratory Protection Standard (29 CFR 1910.134) or regional standards.
 P271: Use only outdoors or in a well-ventilated place
 P272: Contaminated work clothing must not be allowed out of the workplace
 P280: Wear protective gloves / protective clothing / eye protection / face protection
 P284: (In case of inadequate ventilation) wear respiratory protection
 P312: Call a POISON CENTER or doctor/physician if you feel unwell.
 P314: Get Medical attention if you feel unwell.
 P303+P352: IF ON SKIN: Wash with plenty of soap and water
 P333+P311: If skin irritation or rash occurs: Call a POISON CENTER or doctor/physician.

P304+P340: IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
 P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P308+P311: If exposed or concerned: Call a POISON CENTER or doctor/physician.
 P337+P311: If eye irritation persists: Call a POISON CENTER or doctor/physician.
 P362: Take of contaminate clothing and wash before reuse

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P235: Keep cool

P501: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards(s) not otherwise classified (HNOC): No specific dangers known, if the regulation/notes for storage and handling are considered.

Inhalation: Inhalation of isocyanate mists or vapors may cause respiratory irritation, breathlessness, chest discomfort and reduced pulmonary function. Overexposure well above the PEL may result in bronchitis, bronchial spasms and pulmonary edema. Lon-term exposure to isocyanates has been reported to cause lung damage, including reduced lung function which may be permanent. Acute or chronic overexposure to isocyanates may cause sensitization in some individuals, resulting in allergic respiratory reactions including wheezing, shortness of breath and difficulty breathing. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Skin and eyes: avoid contact with skin and eyes. Skin or eye contact may cause irritation.

Ingestion: May cause irritation of the digestive tract with symptoms that include abdominal pain, nausea, vomiting, and diarrhea.

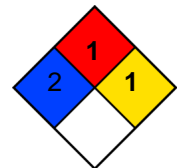
Carcinogenicity: No carcinogenic substances as defined by IARC, NTP, and/or OSHA.

HMIS-RATINGS (SCALE 0 – 4)

HEALTH	2
FLAMMABILITY	1
REACTIVITY	1

Health = 2
 Fire = 1
 Reactivity = 1

NFPA RATING



3. COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV mg/m ³	STEL mg/m ³	PEL mg/m ³	STEL mg/m ³	IDLH mg/m ³	
4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8	50 - 75	TWA 0.005 ppm	NE	NE	NE	NE	OSHA Z-1 Ceiling Limit Value 0.02 ppm/0.2 mg/m ³
Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9	25 - 50	TWA 0.005 ppm	NE	NE	NE	NE	OSHA Z-1 Ceiling Limit Value 0.02 ppm/0.2 mg/m ³
Methylenediphenyl diisocyanate	26447-40-5	7 - 10	NE	NE	NE	NE	NE	
Isocyanic acid, polymethylenepolyphenylene ester, polymer with alpha-hydro-omega-hydroxypoly(oxy-1,2-ethanediyl)	57636-09-6	1 - 3	NE	NE	NE	NE	NE	
Benezene, 1,1'-methylenebis[4-isocyanatoo-, homopolymer]	25686-28-6	1 - 3	NE	NE	NE	NE	NE	
1,3-Diazetidone, 2,4'-dione, 1,3-bis[4-(4-isocyanatophenyl)methyl]phenyl	17589-24-1	.03 - 1	NE	NE	NE	NE	NE	
2,4'-Diphenylmethane Diisocyanate (MDI)	5873-54-1	≤ 0.2	NE	NE	NE	NE	NE	
Water and other ingredients. The other ingredients are each present in less than 1 percent concentration in this product.		Balance	The components present in the balance of this product do not contribute any significant, additional hazards. All hazard information pertinent to this product has been presented in the remaining sections of this Material Safety Data Sheet, per the requirements of Federal Occupational Safety and Health Hazard Communication Standard (29 CFR 1910.1200).					
VOC Component = 0 g/L			As Applied (Part of multi-component system) = 0 g/L					

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

4. FIRST-AID MEASURES

Inhalation: Remove the affected individual into fresh air and deep the person calm. Assist in breathing if necessary. Immediate medical attention is required.

Skin: Remove contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

Eye: In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

Ingestion: rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

Addition Information:

Symptoms: The most important known symptoms and effects are described in the labeling (see section 2) and/or in section 11: Eye irritation, skin irritation, allergic symptoms

Hazards: Symptoms can appear later.

Hazard Information on Diphenylmethane-4,4'-diisocyanate (MDI): Respiratory sensitization may result in allergic (asthma-like) sign in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.

Indication of any immediate medical attention and special treatment needed – Note to physician

Antidote: Specific antidotes or neutralizers to isocyanates do not exist.

Treatment: Treatment should be supportive and based on the judgement of the Physician in response to the reaction of the patient.

5. FIRE-FIGHTING MEASURES

FLASH POINT, °C (method): About 200°C (392°F) Closed Cup

AUTOIGNITION TEMPERATURE, °C: ND

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): NE

Upper (UEL): NE

FIRE EXTINGUISHING MATERIALS:

Water Spray: YES

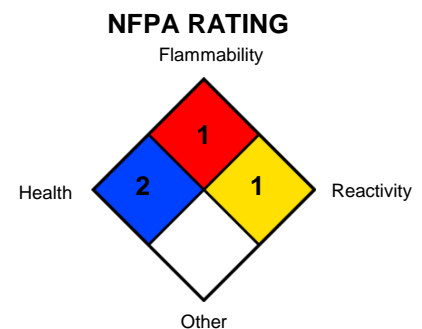
Foam: YES

Halon: ND

Carbon Dioxide: YES

Dry Chemical: YES

Other: Any "ABC" Class.



UNUSUAL FIRE AND EXPLOSION HAZARDS: Run-off from fire control may cause pollution. Keep fire-exposed containers cool with water spray to prevent rupture due to excessive heat. High pressure water hose may spread product from broken containers increasing contamination. If involved in a fire, this product may decompose to produce a variety of compounds (i.e. carbon monoxide, carbon dioxide, aldehydes, nitrogen oxides and compounds). Emergency responders must wear the proper personal protective equipment suitable for the situation to which they are responding. Products of combustion are irritating to the respiratory tract and may cause breathing difficulty. Symptoms may be delayed several hours or longer depending upon the extent of exposure.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed containers, if it can be done without risk to firefighters. If possible, prevent run-off water from entering storm drains, bodies of water, or other environmentally sensitive areas. If necessary, discard or decontaminate fire response equipment before returning such equipment to service.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

The proper personal protective equipment for incidental releases (e.g.-1 L of the product released in a well-ventilated area) use impermeable gloves, specific for the material handled, goggles, face shield, and appropriate body protection. In the event of a large release, use impermeable gloves, specific for the material handled, chemically resistant suit and boots, and hard-hat. Self Contained Breathing Apparatus or respirator may be required where engineering controls are not adequate or conditions for potential exposure exist. When respirators are required, Select NIOSH/MSHA approved based on actual or potential airborne concentrations in accordance with latest OSHA and/or ANSI recommendations. Absorb spilled liquid with polypads or other suitable absorbent materials. Neutralize residue with sodium bicarbonate and water rinse. Decontaminate the area thoroughly. Test area with litmus paper to confirm neutralization. Place all spill residue in a suitable container. Dispose of in accordance with Federal, State, and local hazardous waste disposal regulations (see Section 13, Disposal Considerations).

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash hands after handling this product. Do not eat or drink while handling this material. Remove contaminated clothing immediately. Discard contaminated clothing items, or launder before re-use. Inform anyone handling such contaminated laundry of the hazards associated with this product. Use ventilation and other engineering controls to minimize potential exposure to this product.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing mists or sprays generated by this product. Use in a well-ventilated location.

For Non-Bulk Containers: Open containers slowly, on a stable surface. Containers of this product must be properly labeled. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers, or in a diked area, as appropriate. Store containers away from incompatible chemicals. Keep container tightly closed when not in use. Wash thoroughly after using this material. Storage areas should be made of fire-resistant materials. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Empty containers may contain residual liquid, therefore, empty containers should be handled with care.

Bulk Containers: All tanks and pipelines which contain this material must be labeled. Perform routine maintenance on tanks or pipelines which contain this product. Report all leaks immediately to the proper personnel.

Tank Car Shipments: Tank cars carrying this product should be loaded and unloaded in strict accordance with tank-car manufacturer's recommendation and all established on-site safety procedures. Appropriate personal protective equipment must be used (see Section 8, Engineering Controls and Personal Protective Equipment.). All loading and unloading equipment must be inspected, prior to each use. Loading and unloading operations must be attended, at all times. Tank cars must be level, brakes must be set or wheels must be locked or blocked prior to loading or unloading. Tank car (for loading) or storage tank (for unloading) must be verified to be correct for receiving this product and be properly prepared, prior to starting the transfer operations. Hoses must be verified to be clean and free of incompatible chemicals, prior to connection to the tank car or vessel. Valves and hoses must be verified to be in the correct positions, before starting transfer operations. A sample (if required) must be taken and verified (if required) prior to starting transfer operations. All lines must be blown-down and purged before disconnecting them from the tank car or vessel.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment before maintenance begins by a triple-rinse with water followed, if necessary, by using sodium bicarbonate and an additional rinse. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: If required use a corrosion-resistant ventilation system separate from other exhaust ventilation systems to ensure that there is no potential for overexposure to sprays, or mists of this product and that exposures are below those in section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS:

Positive pressure, full-facepiece Self Contained Breathing Apparatus; or positive pressure, full-facepiece Self Contained Breathing Apparatus with an auxiliary positive pressure Self Contained Breathing Apparatus.

EYE PROTECTION: Splash goggles or safety glasses. Face-shields are recommended when the operation can generate splashes, sprays or mists.

HAND PROTECTION: Wear appropriate gloves for routine industrial use. Use appropriate gloves for spill response, as stated in Section 6 of this MSDS (Accidental Release Measures).

BODY PROTECTION: Use body protection appropriate for task. Cover-all, rubber aprons, or chemical protective clothing made from natural rubber are generally acceptable, depending upon the task.



Dust Respirator



Safety Glasses



Safety Gloves



Synthetic Apron

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): ND

SPECIFIC GRAVITY (water = 1): 1.23

SOLUBILITY IN WATER: Insoluble. (Reacts slowly)

VAPOR PRESSURE, mm Hg @ 25 °C: NA

ODOR: Earthy, musty

LOG WATER/OIL DISTRIBUTION COEFFICIENT: Not available.

EVAPORATION RATE (n-BuAc=1): ND

MELTING/FREEZING POINT: Not established.

BOILING POINT: >200 °C (392 °F)

pH: NA

APPEARANCE AND COLOR: This is a dark brown liquid with a musty odor.

HOW TO DETECT THIS SUBSTANCE (warning properties): ND

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Thermal decomposition products of this solution can include a variety of compounds. (i.e. Carbon dioxide, carbon monoxide, oxides of nitrogen, dense black smoke, isocyanate, isocyanic acid, other undetermined compounds.).

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Water, amines, strong bases, alcohols, copper alloys.

HAZARDOUS POLYMERIZATION: Will not occur by itself. Considerable exothermic reaction with amine resins is possible.

CONDITIONS TO AVOID: Avoid exposure or contact to extreme temperatures and incompatible chemicals.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Additional toxicology information for components greater than 1 percent in concentration is provided below.

Acute Toxicity

Assessment of acute toxicity: Inhalation of vapors may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Inhalation exposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema. Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed.

Information based on Diphenylmethane-4,4'-diisocyanate (MDI)

LD50 Oral Rat (male/female)	>2,000 mg/kg	(Directive 84/449/EEC, B.1)
LC50 rat (male/female)	2.0 mg/L,	(OECD Guideline 403) An aerosol was tested
LD50 rabbit (male/female)	>9,400 mg/kg	

Assessment other acute effects

Assessment of STOT single: Causes temporary irritation of the respiratory tract.
 Irritation/corrosion: Assessment of irritating effects; Irritating to eyes, respiratory system and skin. Skin contact may result in dermatitis, either irritative or allergic

Information based on Diphenylmethane-4,4'-diisocyanate (MDI)

Skin Corrosion/Irritation (Rabbit, Draize Test): Irritating
 Eye Corrosion/Irritation (Rabbit, Draize Test): Irritating

Sensitization:

Sensitization after skin contact possible. The substance may cause sensitization of the respiratory tract. As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the PEL/TLV. These symptoms, which include chest tightness, wheezing, cough, shortness of breath, or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including a decrease in lung function, which may be permanent. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material, or even as a result of vapor-only exposure. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Information based on Diphenylmethane-4,4'-diisocyanate (MDI)

Buehler test (guinea pig): Sensitizing
 Local Lymph Node Assay (Mouse, LLNA) Sensitizing. Can cause skin sensitization.
 Skin Corrosion/Irritation (Guinea Pig): Sensitizing. Note: Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.

Chronic Toxicity/Effects

Assessment of repeated dose toxicity: The substance may cause damage to the olfactory epithelium after repeated inhalation. The substance may cause damage to the lung after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure.

Information based on Diphenylmethane-4,4'-diisocyanate (MDI)

Experimental/calculated data: rat (Wistar) (male/female) Inhalation 2 years, 6 hr/day 0,0.2, 1, 6 mg/m³, olfactory epithelium
 NOAEL: 0.2 mg/m³
 LOAEL: 1 mg/m³

The substance may cause damage to the olfactory epithelium after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Genetic Toxicity

Assessment of mutagenicity: The substance was mutagenic in various bacterial test systems; however, these results could not be confirmed in tests with mammals.

Information based on Diphenylmethane-4,4'-diisocyanate (MDI)

Genetic toxicity in vitro: OECD Guideline 471 Ames-test *Salmonella typhimurium*: with and without metabolic activation, ambiguous.

Genetic toxicity in vivo: OECD Guideline 474 Micronucleus assay rat (male) Inhalation negative. No clastogenic effect reported.

Carcinogenicity

Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure.

Experimental/calculated data: OECD Guideline 453 rat Inhalation 0, 0.2, 1.6 mg/m³. Result: Lung tumors

Reproductive Toxicity

Assessment of reproduction toxicity: Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Teratogenicity

Assessment of teratogenicity: The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Development

OECD Guideline 414 rat Inhalation 0, 1.4, 12 mg/m³

NOAEL Mat.: 4 mg/m³

NOAEL Teratog.: 4 mg/m³

The substance did not cause malformation in animal studies: however, toxicity to development was observed at high doses that were toxic to the parental animals.

Symptoms of Exposure

Eye irritation, skin irritation, allergic symptoms

Medical conditions aggravated by overexposure. The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing. Medical supervision of all employees who handle or come into contact with isocyanates is recommended. Contact may aggravate pulmonary disorders. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Pre-employment and periodic medical examinations with respiratory function tests (FEV₁, FVC as a minimum) are suggested. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

12. ECOLOGICAL INFORMATION

Toxicity:

Assessment of aquatic toxicity: There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Based on long-term (chronic) toxicity study data, the product is very likely not harmful to aquatic organisms.

The product may hydrolyze. The test result may be partially due to degradation products. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Toxicity to fish

LC₀ (96 h) > 1,000 mg/l, *Brachydanio rerio* (OECD Guideline 203, static)

Aquatic invertebrates

EC₅₀ (24 h) > 1,000 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)

Aquatic plants

EC₀ (72 h) 1,640 mg/l (growth rate), *Scenedesmus subspicatus* (OECD Guideline 201, static)

Microorganisms/Effect on activated sludge**Toxicity to microorganisms**

OECD Guideline 209 aquatic aerobic bacteria from a domestic water treatment plant/EC50 (3 h): > 100 mg/l

Persistence and degradability

Assessment biodegradation and elimination (H₂O): Not readily biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.

Elimination information

0 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge) Poorly biodegradable.

Assessment of stability in water

In contact with water the substance will hydrolyze slowly.

Information on Stability in Water Hydrolysis

t_{1/2} 20 h (25 °C)

Bioaccumulation Potential

Assessment of bioaccumulation potential: Significant accumulation in organisms is not to be expected. Bioconcentration factor: 200 (28 d), *Cyprinus carpio* (OECD Guideline 305 E).

Mobility in soil

Assessment of transport between environmental compartments: The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is not expected.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. It may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

14. TRANSPORTATION INFORMATION**Land transport**

USDOT Not classified as a dangerous good under transport regulations

Sea transport

IMDG Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO Not classified as a dangerous good under transport regulations

Further information

DOT: This product is regulated if the amount in a single receptacle exceeds the Reportable Quantity (RQ) – 5000 lbs.

Please refer to Section 15 of this MSDS for the RQ for this product.

15. REGULATORY INFORMATION**Federal Regulations Registration Status:**

TSCA listed

EPCRA 311/312 (Hazard categories): Acute; Chronic

EPCRA 313:

CAS Number 9016-87-9

Chemical name: 101-68-8 Diphenylmethane-4,4'-diisocyanate (MDI) P-MDI

CERCLA RQ 5000 LBS

CAS Number 9016-87-9; 101- 68-8

Chemical name P-MDI; Diphenylmethane-4,4'-diisocyanate (MDI)

State regulations

State RTK MA, NJ, PA

MA, NJ, PA

NJ

CAS Number 9016-87-9

101-68-8

26447-40-5

Chemical name P-MDI

Diphenylmethane-4,4'-diisocyanate (MDI)

Methylenediphenyl diisocyanate

CALIFORNIA PROPOSITION 65: The components of this product are not known to the state of California to cause cancer, birth defects or other reproductive harm.

Canadian DSL: All the components of this product are on the Canadian DSL.

WHMIS Classification:

D1A - Poisonous and infectious material - Immediate and serious effects - Very toxic

D2A - Poisonous and infectious material - Other effects - Very toxic

D2B - Poisonous and infectious material - Other effects - Toxic



D1A - Very Toxic



D2A - Very Toxic



D2B - Toxic

WHMIS Health Effects Criteria Met by this Chemical:

D1A - Acute lethality - very toxic - immediate

D2A - Respiratory tract sensitization - very toxic - other

D2B - Skin irritation - toxic - other

D2B - Skin Sensitization - toxic - other

16. OTHER INFORMATION

PREPARED BY:

BILL BEACH

CROSSFIELD PRODUCTS CORP,

THIS INFORMATION IS DRAWN FROM RECOGNIZED SOURCES BELIEVED TO BE RELIABLE. CROSSFIELD PRODUCTS CORP. MAKES NO GUARANTEES NOR ASSUMES ANY LIABILITY IN CONNECTION WITH THIS INFORMATION. THE USER SHOULD BE AWARE OF CHANGING TECHNOLOGY, RESEARCH, REGULATIONS AND ANALYTICAL PROCEDURES THAT MAY REQUIRE CHANGES HEREIN. THE ABOVE DATA IS SUPPLIED UPON THE CONDITION THAT PERSONS WILL EVALUATE THIS INFORMATION AND THEN DETERMINE ITS SUITABILITY FOR THEIR USE.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour **Time Weighted Average (TWA)**, the 15-minute **Short Term Exposure Limit**, and the instantaneous **Ceiling Level**. Skin adsorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called Recommended Exposure Levels (**RELs**). When no exposure guidelines are established, an entry of **NE** is made for reference.

HMIS HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard:

0 (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime over-exposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime over-exposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]) and boiling points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0**

(material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the **National Fire Protection Association (NFPA)**. Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDL_o**, the lowest dose to cause a symptom and **TCL_o** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause death. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Other acronyms used are: **Superfund Amendments and Reauthorization Act (SARA)**; the **Toxic Substance Control Act (TSCA)**; Marine Pollutant status according to the **DOT**; California's Safe Drinking Water Act (**Proposition 65**); the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the materials package label.