

MATERIAL SAFETY DATA SHEET

NORMAC ADHESIVE PRODUCTS INC.

R-HARDENER

Section 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Products Name: R-HARDENER
Chemical Family: Isocyanates
Chemical Name: Isocyanate dissolved in a chlorinated hydrocarbon solvent.
Applications: Rubber Adhesive curative accelerator.

Supplier's Name: Normac Adhesive Products Inc.
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Prepared by: Regulatory Affairs Group of Normac Adhesive Products Inc.
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Section 2 – HAZARD(S) IDENTIFICATION

WHMIS Hazardous Class: D1A TOXIC MATERIALS causing immediate and serious effects.
 D2A VERY TOXIC MATERIALS causing other effects
 D2B TOXIC MATERIALS causing other effects

NFPA RATINGS: HEALTH 3; FLAMMABILITY 1; INSTABILITY: 0
HMIS RATINGS: HEALTH 3; FLAMMABILITY 1; INSTABILITY: 0

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

GHS Classification

Acute toxicity – Oral	Category 4
Skin corrosion/irritation	Category 2
Skin sensitisation	Category 1
Serious eye damage/eye irritation	Category 2A
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Specific target organ toxicity (repeated exposure)	Category 2
Flammable liquids	Category 3
Respiratory sensitisation	Category 1
Respiratory system Specific target organ toxicity -repeated exposure, Inhalation	Category 2

Signal word: **Danger**

Hazard statements

Harmful if swallowed Causes skin irritation Causes serious eye irritation May cause cancer May cause respiratory irritation. May cause drowsiness or dizziness May cause damage to organs through prolonged or repeated exposure

H226	Flammable liquid and vapor
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs (Respiratory system) through prolonged or repeated exposure if inhaled.

Precautionary statement(s)

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280	Wear protective gloves.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor/ physician.

Symbols/Pictograms



Section 3- COMPOSITION / INFORMATION ON INGREDIENTS

	Cas No.	Percentage (W/W)	Exposure Limits	
			ACGIH	OHSA
Dichloromethane	75-09-2	70 – 90*	50 ppm TLV-TWA 125 ppm (Ceiling)	25 ppm TWA
4,4' Diphenylmethane diisocyanate	101-68-8	10 – 30*	0.005 ppm.	0.02 ppm

**Exact percentages are withheld as a trade secret however the health and environmental hazard effects stated in this SDS describe the effects of the highest concentration of each ingredient; in compliance with (ST/SG/AC.10/30/Rev.6) and (29 CFR 1910.1200).*

Section 4 - FIRST AID MEASURES

Eye Contact:	Flush eyes immediately with water for at least 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention immediately.
Skin Contact:	Flush skin in running water or shower for a minimum of 20 minutes, start flushing while removing clothing. If irritation persists, repeat flushing. If irritation, redness, or a burning sensation develops and persists, obtain medical attention. Prolonged or repeated exposure may cause skin irritation and lead to dermatitis. Repeated contact may cause drying, flaking, and cracking of skin.
Inhalation:	Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is

SDS R-Hardener Rev.17

no breathing AND no pulse. Obtain medical attention immediately. Toxic! Product is irritating to the nose, throat and respiratory tract. May cause cardiac arrhythmia, nausea and vomiting, headache, dizziness, loss of coordination, central nervous system (CNS) depression, liver and kidney damage. High vapour concentration may cause irregular heartbeat, numbness, double vision, reduced eyesight, blurred vision, unconsciousness and death. Minimal anaesthetic or narcotic effects may be seen in the range of 500-1000 ppm. Higher levels may cause dizziness and sensation of drunkenness.

Ingestion: Seek immediate medical attention. Do NOT Induce vomiting. If victim is alert and not convulsing, rinse mouth out and give ½ to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or Poison Control Centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an Emergency facility. Toxic! This product causes irritation, a burning sensation of the mouth and throat and abdominal pain. Ingestion of very high levels may cause central nervous system (CNS) depression, liver damage and kidney damage.

Note to Physicians: This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available to prevent aspiration. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Only administer adrenaline after careful consideration following overexposure. Increased sensitivity of the heart to adrenaline may be caused by overexposure to this product. Treatment based on sound judgment of physician and individual reactions of patient. Medical conditions that may be aggravated by exposure to this product include neurological and cardiovascular disorders, diseases of the skin, eyes or respiratory tract, pre-existing liver and kidney disorders.

Persons with angina or other cardiovascular diseases should not be exposed to this product. Adrenalin and similar sympathomimetic drugs should be avoided following exposure as cardiac arrhythmia may result with possible subsequent cardiac arrest.

Section 5 – FIRE FIGHTING MEASURES

Flash Point: NONE. This product does not flash
Flash Point Method: Tag Closed Cup.
Auto Ignition Temp: 556 °C
Flammable Limits in air (%): Lower: 14% Upper: 22%
Extinguishing Media: Use DRY Chemicals. CO2. alcohol foam or water spray.
Special Exposure Hazards: Isolate and restrict area access. Stop leak only if safe to do so. Move containers from fire area if you can do so without risk. Fight fire from a safe distance and from a protected location. Use fine water spray or fog to control fire spread and cool adjacent structures or containers.
This material may produce a floating fire hazard in extreme fire conditions. Chlorinated hydrocarbon vapours concentrated in a

SDS R-Hardener Rev.17

**Hazardous Decomposition/
Combustion Materials:**

poorly ventilated area can be ignited with a high intensity source of heat. Vapours are heavier than air and may “travel” to a source of ignition (i.e. Pilot lights, heaters etc.) some distance away and then “flash back” to the point of product discharge causing an explosion and fire. Closed containers exposed to heat may explode. Spilled material may cause floors and contact surfaces to become slippery. Thermal decomposition products are toxic and may include hydrogen chloride, phosgene, chlorine, and oxides of carbon and nitrogen, hydrogen cyanide and traces of isocyanates.

Special Protective Equipment:

Wear protective clothing and self-contained breathing apparatus.

NFPA RATINGS:

HEALTH 3; FLAMMABILITY 1; INSTABILITY: 0

HMIS RATINGS:

HEALTH 3; FLAMMABILITY 1; INSTABILITY: 0

Section 6 – ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment.

Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed. Prevent contamination of soil. Consult Local authorities.

Procedure for Clean Up:

Immediately evacuate the area. Isolate hazard area and restrict access. Prevent contamination of waterways. Absorb with an inert dry material and place in an appropriate waste disposal container. Large spills, dike and pump into suitable containers. Clean up all residual with absorbent material. Place in appropriate container. Notify applicable government authority if release is reportable or could adversely affect the environment. Ventilate the area thoroughly.

Section 7 – HANDLING AND STORAGE

Handling:

For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid inhalation of chemical. DO NOT handle or store near an open flame, heat, or other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. DO NOT pressurize, cut, heat or weld containers. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personal protective equipment. Avoid splash filling. Use normal “good” industrial hygiene and housekeeping practices. Containers exposed to heat may be under internal pressure. These should be cooled and carefully vented before opening. A face shield and apron should be worn.

Storage:

Store in a cool, dry, well ventilated area, away from heat and ignition sources. Keep containers tightly closed. Store out of direct sunlight and on an impermeable floor. Do not store in aluminium containers. Attacks some types of rubber, plastics and coatings. Confirm suitability of a material before using.

Section 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Local exhaust ventilation is required to maintain exposure to within applicable limits. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH approved respirator. In case of spill or leak resulting in unknown concentration, use a NIOSH approved supplied air respirator.

Gloves: Impervious chemical resistant gloves. Viton gloves. Polyvinyl alcohol gloves. Ethyl Vinyl Alcohol Laminate (EVAL).

Skin Protection: Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.

Eyes: Chemical goggles; also wear a face shield if splashing hazard exists.

Other Personal Protective Data: Ensure that eyewash stations and safety showers are proximal to the work station location.

Ingredients	Exposure Limit	Exposure Limit	Immediately Dangerous to or Health – IDLH
	ACGIH	OHSA	
Dichloromethane	50 ppm TLV-TWA 125 ppm (Ceiling)	25 ppm TWA	2,300 ppm
4,4'-Diphenylmethane diisocyanate	0.005 ppm TLV-TWA	0.02 ppm	

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid.

Colour: Amber coloured.

Specific Gravity: 1.33 g/cc @ 20°C

Boiling Point: 40°C

Melting/Freezing Point: -96°C

Vapour Pressure: 550 mm Hg @ 55°C

Vapour Density (air = 1) 2.93

Volatility by Volume %: 70 - 90%

Viscosity: 1 – 10 cps.

Appearance: Clear, colourless, viscous liquid.

Odour: Ether like odour – irritating at high temperatures

Odour Threshold: 150 ppm (detection) to 230 ppm (recognition)

Evaporation Rate: 1.5 – 2.59 (butyl acetate = 1.0)

Section 10 – STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions.

Hazardous Polymerization: Will not occur under normal conditions.

Conditions to Avoid: High temperatures, sparks, open flames and all sources of ignition.

Materials to Avoid: Strong oxidizers, liquid oxygen, caustics, methanol, amines, nitric acid, finely powdered aluminium, 1,1,1-Trichloroethane and aromatic

SDS R-Hardener Rev.17

Hazardous decomposition	hydrocarbons. Chemically active compounds, alkali metals, lithium, potassium-sodium alloys, magnesium, dinitrogen tetroxide, potassium tert-Butoxide. This product can react explosively with Perchloric Acid and Dimethyl Sulfoxide (DMSO). At high temperatures and in the presence of water, methylene chloride can corrode iron, some stainless steels, copper and aluminium. Attacks some types of rubber, plastics and coatings.
Products:	Hydrogen chloride, chlorine, phosgene, oxides of carbon and nitrogen, hydrogen cyanide and traces of isocyanates.

Section 11 – TOXICOLOGICAL INFORMATION

Principle Routes of Exposure:

Ingestion:	May result in irritation of the mouth and gastrointestinal tract. May cause same effects as detailed under inhalation. Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury. Aspiration Pneumonitis: signs/symptoms can include coughing, difficulty in breathing, wheezing, coughing up blood and pneumonia, which can be fatal.	
Skin Contact:	Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis). A single exposure is not likely to result in the material being absorbed through the skin in harmful amounts.	
Inhalation:	This product is primarily a central nervous system depressant. Central Nervous Depression: signs/symptoms can include headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness. Fatalities following severe acute exposure to various chlorinated solvents have been attributed to ventricular fibrillation.	
Eye Contact:	Causes moderate to severe irritation, experienced as discomfort or pain, excessive blinking and tear production.	
Additional Information:	Observations in animals include liver and kidney effects.	
Toxicological Data:	Dichloromethane diisocyanate	4,4'-Diphenylmethane
Oral LD50:	985 – 1,600 mg/kg (rat).	>10,000 mg/kg .
Dermal LD50:	Not Available.	Not available.
Inhalation LC50:	76,000 mg/m ³ (rat, 4hr).	370-490 mg/ m ³ (rat, 4hr).
Carcinogenicity:	IARC – Group 2A. ACGIH – Listed.	Not Listed Not Listed
Carcinogenicity Comment:	Dichloromethane (Methylene Chloride) is classified as a suspected carcinogen by IARC (IARC-2A), NTP (National Toxicology Program) (NTP-R) and NIOSH (National Institute for Occupational Safety and Health) (NIOSH-Ca).	
Reproductive Toxicity:	Reproductive tests in animals have been negative.	
Mutagenicity Toxicity:	Methylene Chloride can pass through the placenta and can be excreted in maternal milk. Did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother.	
Teratogenicity Toxicity:	Teratogenicity tests in animals have been negative.	
Respiratory/Skin Sensitization:	4,4'-Diphenylmethane diisocyanate is a skin irritant and sensitizer.	
Other Relevant Studies:	Dichloromethane depressed the central nervous system (CNS) of rats exposed for 10 minutes to extremely high concentrations (7,000	

SDS R-Hardener Rev.17

– 12,000 ppm). Symptoms included muscular incoordination, loss of righting reflex, stupor and shallow respiration.

Cardiac arrhythmias have occurred in dogs inhaling 500-5,000 ppm. Cardiac sensitization to adrenalin was produced in dogs exposed for 5 minutes to 1.9-3.4% (19,000 – 34,000 ppm). Elevated levels of carboxyhemoglobin (a reversible condition of carbon monoxide binding to red blood cells) were seen in guinea pigs exposed to 560, 5,000 and 11,000 ppm methylene chloride for 6 hours. Elevated carboxyhemoglobin levels were seen in dogs, monkeys and rats exposed for 24 hours to 5,000 ppm.

Liver injury was seen in male and female rats exposed to 1,000 ppm during a two-year study. Kidney injury was also seen in male rats exposed to 2,000 ppm and in female rats exposed to 4,000 ppm. Slight liver effects and kidney injury were seen in rats exposed to 25 to 100 ppm continuously for 100 days.

Synergistic Materials:

Exposure to a combination of carbon monoxide and methylene chloride must be limited. Where the carbon monoxide concentration equals its exposure limit (25 ppm – ACGIH), there should be no exposure to dichloromethane.

Cigarette smoking is also a source of carbon monoxide. Smokers should be especially cautious when working with this product.

Alcohols may interact synergistically with chlorinated solvents.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicological Information:	Ecotoxicity – Fish Species		Ecotoxicity Freshwater
	Data	Acute Crustaceans Toxicity:	
	Algae		
Dichloromethane:	LC50 (Rainbow Trout) 10.9 mg/L	Not Available	EC50 (Selenastrum capricornutum) 660 mg/L
	LC50 (Fathead Minnow) 330 mg/L.		
	LC50 (Bluegill) 220 mg/L		
4,4'-Dicphenylmethane diisocyanate	LC50 (water flea) >500 mg/L.	Not Available	EC50 (Bacteriae) >100 mg/L
Other Information:	Bioconcentration potential is low. Potential for mobility in soil is very high. Not readily biodegradable.		
Environmental Fate:	Not available. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers. Acute toxicity to aquatic invertebrates.		
Biodegradability:	Not available.		

Section 13 – DISPOSAL CONSIDERATIONS

Disposal of Waste Method:	Disposal of all wastes must be done in accordance with local, state/provincial and federal regulations.
Contaminated Packaging:	Empty containers should be recycled or disposed of through an approved waste management facility.

Section 14 – TRANSPORT INFORMATION

Proper Shipping Name: Toxic Liquid, Organic, N.O.S.
(Dichloromethane Solution)

TDG (IATA and IMO): CI. 6.1 UN 2810 PG. III

Hazard Label / Placards: TOXIC

Section 15 – REGULATORY INFORMATION

U.S. TSCA Inventory Status: All compounds of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All compounds of this product are either on the Domestic Substances List (DSL); the Non-Domestic Substances List (NDSL) or exempt.

Note: Not available.

US Regulatory Rules

CECLA/SARA Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA Section 313:
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R-HARDENER components:	Not Listed	Listed	Listed
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California Proposition 65:	Listed.
MA Right to Know List:	Listed.
New Jersey Right-to-know List:	Listed.
Pennsylvania Right to Know List:	Listed.

WHMIS Hazardous Class: D1A TOXIC MATERIALS causing immediate and serious effects.
D2A VERY TOXIC MATERIALS causing other effects
D2B TOXIC MATERIALS causing other effects

NFPA RATINGS: HEALTH 3; FLAMMABILITY 1; INSTABILITY: 0
HMIS RATINGS: HEALTH 3; FLAMMABILITY 1; INSTABILITY: 0

Section 16 – OTHER INFORMATION

All employees or contractors etc. who use this product must have access to this Safety Data Sheet.

This information is furnished without warranty, representation, inducement or licence of any kind, except that it is accurate to the best of Normac Adhesive Products Inc. knowledge or is obtained from sources believed by Normac Adhesive Products Inc. to be accurate. Normac Adhesive Products Inc. makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use or reliance on same. Customers are encouraged to conduct their own tests.

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END OF SDS

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