

SECTION 1 - IDENTIFICATION

Manufacturer:	Isothermal Protective Coatings, Inc.
Address:	1950 O'Day Road, Pearland, TX 77581
Telephone:	800-237-8759
Product Identifier:	Isoclear™ Hardener
Recommended Use:	Protective Coating

SECTION 2 - HAZARD IDENTIFICATION

**HAZARD CLASSIFICATION
(EFFECTS OF EXPOSURE):**

<i>Skin:</i>	Sensitization - Category 1
<i>Inhalation:</i>	Toxicity - Category 4
Signal Word:	Danger
Hazard Statements:	<ul style="list-style-type: none"> - Contains Monomeric Hexamethylene-1, 6- Diisocyanate. - Causes skin irritation. - May cause allergic skin reaction. - May cause allergic respiratory reaction. - May cause eye irritation. - May be harmful if aerosol or mist is inhaled. - Closed containers may explode under extreme heat or when contaminated with water. - Do Not seal containers that have been contaminated with water.

Pictograms:



Precautionary Statements

<i>Prevention:</i>	<ul style="list-style-type: none"> - Do Not handle until all safety precautions have been read and understood. - Keep container tightly closed. - Protect from moisture. - Avoid breathing spray. - Do Not get in eyes, on skin, or on clothing. - Wear protective gloves/protective clothing/eye protection/face protection.
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Response:	<ul style="list-style-type: none"> - Wash contaminated clothing before reuse. - Rinse skin with water/shower. - In case of fire use water fog, Carbon Dioxide, foam or dry chemical to extinguish. - Rinse mouth. Do Not induce vomiting - If in eyes: Rinse cautiously with water for 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing - If inhaled: Remove person to fresh air and keep comfortable for breathing.
Storage:	<ul style="list-style-type: none"> - Store in a well ventilated place. - Keep container tightly closed.
Disposal:	<ul style="list-style-type: none"> - Waste disposal should be in accordance with existing federal, state and local environmental control laws. - Incineration is the preferred method.

SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS #	Approx %
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	85
Polyisocyanate Based on HDI	Trade Secret	15
Hexamethylene -1, 6- Diisocyanate	822-06-0	<0.2

SECTION 4 - FIRST AID MEASURES

Skin:	<ul style="list-style-type: none"> - Immediately remove contaminated clothing and shoes. - Wash off with soap and water. Use lukewarm water if possible. - Wash contaminated clothing before reuse. - For severe exposures, immediately get under safety shower and begin rinsing. - Get medical attention if irritation develops and persists.
Eyes:	<ul style="list-style-type: none"> - Immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. - Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Then remove contact lenses, if easily removable and continue eye irrigation for not less than 15 minutes. - Get medical attention if irritation develops.
Inhalation:	<ul style="list-style-type: none"> - Move to an area free from further exposure. - Get medical attention immediately. - Administer oxygen or artificial respiration as needed. - Asthmatic symptoms may develop and may be immediate or delayed up to several hours. - Extreme asthmatic reactions can be life threatening.

Ingestion:

- **Do Not** induce vomiting.
- Wash mouth out with water.
- **Do Not** give anything by mouth to an unconscious person.
- Get medical attention.

Notes to Physician:

Eyes:

- Stain for evidence of corneal injury.
- If cornea is burned, instill antibiotic/steroid preparation as needed.
- Work place vapors could produce reversible corneal epithelial edema impairing vision.

Skin:

- This compound is ask insensitizer.
- Treat symptomatically as for contact dermatitis or thermal burn.

Ingestion:

- Treat symptomatically
- There is no specific antidote.
- Inducing vomiting is contraindicated because of the irritating nature of the compound.

Inhalation:

- Treatment is essentially symptomatic.
- An individual having adermalor pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

SECTION 5 - FIRE FIGHTING MEASURES

Extinguishing media:

- Carbon dioxide (CO²)
- Dry chemical
- Foam
- Water spray for large fires.

Special firefighting procedures:

- Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots, and gloves.
- Avoid contact with product.
- Decontaminate equipment and protective clothing prior to reuse.
- During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion.
- Exposure to heated diisocyanate can be extremely dangerous.

Unusual fire & explosion hazards:

- Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO² formed).
- Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.
- Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spill Procedures:

- Evacuate non-emergency personnel.
- Isolate the area and prevent access.
- Remove ignition sources.
- Notify management.
- Put on protective equipment.
- Control source of the leak.
- Ventilate.
- Contain the spill to prevent spread into drains, sewers, water supplies, or soil.
- Call ChemTrec at 800-424-9300 or 703-527-3887 for assistance and advice.

Major Spill or Leak (Standing Liquid):

- To minimize vapor, cover the spillage with firefighting foam (AFFF).
- Released material may be pumped into closed, but not sealed, metal container for disposal.
- Process can generate heat.

Minor Spill or Leak (Wet Surface):

- Cover spill area with suitable absorbent material (Kitty Litter, Oil-Dri, etc.).
- Saturate absorbent material with neutralization solution and mix. Wait 15 minutes.
- Collect material in open-head metal containers.
- Repeat applications of decontamination solution, with scrubbing, followed by absorbent until the surface is decontaminated.
- Check for residual surface contamination. Swype* test kits have been used for this purpose.
- Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (CO²) escape

**Additional Spill Procedures/
Neutralization:**

Neutralization solutions:

- Colorimetric Laboratories Inc. (CLI) decontamination solution.
- A mixture of 75% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10) and 5% n-propanol.
- A mixture of 80% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10).

SECTION 7 - HANDLING AND STORAGE

Precautions for safe handling:

- **Do Not** breath vapors, mists, or dusts.
- Use adequate ventilation to keep airborne isocyanate levels below the exposure limits.
- Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded.
- Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation.
- This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations.
- Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist.
- Avoid contact with skin and eyes.
- Wear appropriate eye and skin protection.
- Wash thoroughly after handling.

- **Do Not** breathe smoke and gases created by overheating or burning this material.
- Decomposition products can be highly toxic and irritating.
- Store in tightly closed containers to prevent moisture contamination.
- **Do Not** reseal if contamination is suspected

Recommendations on the conditions for safe storage:

- Storage Temperature:
Minimum: 15.56°C (60°F)
Maximum: 50°C (122°F)
- Storage Period: 6 months at 25°C (77°F) after receipt of material by customer

Further Information on Storage Conditions:

- Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.
- Store separate from food products

SECTION 8 - EXPOSURE CONTROL / PERSONAL PROTECTION

Exposure limits:

Chemical Name	PEL	TWA
Homopolymer of Hexamethylene Diisocyanate	0.5 mg/m ³ (TWA)	WEEL 10 mg/m ³ (aerosol)
Hexamethylene -1. 6- Diisocyanate	0.005 ppm (TWA)	ACGIH 20 ppm

Engineering controls:

- Use local exhaust ventilation to assure that the air is below established exposure limits.
- When such controls are not feasible to achieve full protection, the use of respirators and other personal protective equipment is mandated.
- Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination.
- Curing ovens must be ventilated to prevent emissions into the workplace.
- If oven off-gases are not vented properly (i.e. they are released into the work area), it is possible to be exposed to airborne monomeric HDI.

Individual protection measures:

- Gloves should be worn; nitrile rubber gloves, butyl rubber gloves, neoprene gloves.
- Avoid all skin contact.
- Depending on the conditions of use, cover as much of the exposed area as possible with appropriate clothing to prevent skin contact.

Inhalation protection:

- A respirator that is recommended or approved for use in isocyanate-containing environments (air-purifying or fresh air-supplied) may be necessary for spray applications or other situations such as high temperature use which may produce inhalation exposures.
- A supplied-air respirator (either positive pressure or continuous flow-type) is recommended. Before an air-purifying respirator can be used, air monitoring must be performed to measure airborne concentrations of HDI monomer and HDI polyisocyanate.
- Specific conditions under which air-purifying respirators can be used are outlined in the following sections. Observe OSHA regulations for respirator use (29 CFR 1910.134).

Spray Application:

1. Good industrial hygiene practice dictates that when isocyanate-based coatings are spray applied, some form of respiratory protection should be worn.
2. During the spray application of coatings containing this product the use of a supplied-air (either positive pressure or continuous flow• type) respirator is mandatory when ONE OR MORE of the following conditions exists: the airborne isocyanate concentrations are not known; or the airborne isocyanate monomer concentrations exceed 0.05 ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); or the airborne polyisocyanate (polymeric, oligomeric) concentrations exceed 5 mg/m³ averaged over 8 hours or 10 mg/m³ averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits); or operations are performed in a confined space (See OSHA Confined Space Standard, 29 CFR 1910.146)

3. A properly fitted air-purifying (combination organic vapor and particulate) respirator, proven by test to be effective in isocyanate-containing spray paint environments, and used in accordance with all recommendations made by the manufacturer, can be used when ALL of the following conditions are met: The airborne isocyanate monomer concentrations are known to be below 0.05 ppm averaged over eight (8) hours (10 times 8 hour TWA exposure limit); and the airborne polyisocyanate (polymeric, oligomeric) concentrations are known to be below 5 mg/m³ averaged over 8 hours or 10 mg/m³ averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits); and a NIOSH-certified End of Service Life Indicator or a change schedule based upon objective information or data is used to ensure that cartridges are replaced before the end of their service life.
4. Prefilters should be changed whenever breathing resistance increases due to particulate buildup.

Non-Spray Operations:

1. During non-spray operations such as mixing, batch-making, brush or roller application, etc. at elevated temperatures (for example, heating of material or application to a hot substrate), it is possible to be exposed to airborne isocyanate vapors.
2. When the coatings system is applied in a non-spray manner, a supplied-air (either positive pressure or continuous flow-type) respirator is mandatory when ONE OR MORE of the following conditions exists: the airborne isocyanate concentrations are not known; or the airborne isocyanate monomer concentrations exceed 0.05ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); or the airborne polyisocyanate (polymeric, oligomeric) concentrations exceed 5 mg/m³ averaged over 8 hours or 10 mg/m³ averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits); or operations are performed in a confined space (See OSHA Confined Space Standard, 29 CFR 1910.146).
3. A properly fitted air-purifying (combination organic vapor and particulate) respirator, proven by test to be effective in isocyanate containing paint environments, and used in accordance with all recommendations made by the manufacturer, can be used when ALL of the following conditions are met: the airborne concentrations of the isocyanate monomer are below 0.05 ppm averaged over eight (8) hours (10 times the 8 hour TWA exposure limit); and the airborne polyisocyanate (polymeric, oligomeric) concentrations are known to be below 5 mg/m³ averaged over eight (8) hours or 10 mg/m³ averaged over 15 minutes (10 times the 8 hour TWA or the 15 minute STEL exposure limits) and a NIOSH-certified End of Service Life Indicator or a change schedule based upon objective information or data is used to ensure that cartridges are replaced before the end of their service life.
4. Prefilters should be changed whenever breathing resistance increases due to particulate buildup.

Eye protection:

- When directly handling liquid product, eye protection is required. Eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is greater risk of splash

Medical Surveillance:

- Employees who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation.
- A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas.
- Employees who have a history of adult asthma should be restricted from work with isocyanates.
- Employees with a history of prior isocyanate sensitization should be excluded from further work with isocyanates.
- A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted.

Additional Protective Measures:

- Emergency showers and eye wash stations should be available.
- Educate and train employees in the safe use and handling of this product.
- Follow all label instructions.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Newtonian liquid
Physical state:	Liquid
Color:	Clear pale yellow
Odor:	Almost odorless
Odor threshold:	None established
Melting point/freezing point:	None established
Initial boiling point and boiling range:	None established
Initial boiling point and boiling range:	Decomposes
Flash point:	185°C (365°F) (Pensky-Martens closed cup) (ASTM D-93)
Evaporation rate:	Not volatile
Flammability (solid, gas):	Combustible at elevated temperature
Upper/lower flammability or explosive limits:	None established
Vapor pressure:	5.2 x 10 ⁻⁹ @68°F (20°C) mm Hg
Relative density:	1.15 kg/lt
Solubility:	Insoluble - reacts slowly with water to liberate CO ² gas
Partition coefficient: n-octanol/water:	None established
Auto-ignition temperature:	445°C (833°F)
Decomposition temperature:	181°C (357.8°F)
Viscosity:	800 centipoise @ 20°C (68°F)



SECTION 10 - STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions of handling, use and storage.
Hazardous Polymerization:	Contact with moisture, other materials that react with isocyanates, or temperatures above 350°F (177°C), may cause polymerization
Conditions to Avoid:	- Heat flames and sparks. - Protect from freezing
Materials to Avoid:	Water, amines, strong bases, alcohols, copper alloys.
Hazardous Decomposition Products:	By fire and high heat: Carbon dioxide (CO ²), carbon monoxide (CO), oxides of nitrogen (NO _x), dense black smoke, hydrogen cyanide, isocyanate, isocyanic acid, other undetermined compounds

SECTION 11 - TOXICOLOGICAL INFORMATION

Likely routes of exposure:	
<i>Oral:</i>	Harmful
<i>Inhalation:</i>	Harmful and irritating to lungs and nasal cavity
<i>Dermal:</i>	Irritating
Effects from short and long term exposure:	Mutagenicity and genetic toxicity in vivo (rat) negative Sensitization - dermal (Guinea pig) negative

Chemical Name	Oral LD50 (rat)	Dermal LD50 (rabbit)	Inhalation LC50 (rat)
Homopolymer of Hexamethylene Diisocyanate	>5,000 mg/kg	>5,000 mg/kg	390-453 mg/m ³ (4 hr)

Chronic Health Effects have not been determined. The following information is available on major components:

Chemical Name	Oral LOEL	Oral NOEL	Inhalation NOAEL (rat)
Homopolymer of Hexamethylene Diisocyanate	N/A	N/A	Irritation to lungs and nasal cavity 3 wks: 3.7 - 4.3 mg/m ³

SECTION 12 - ECOLOGICAL INFORMATION

Data from toxicity test:

Chemical Name	Algae/Aquatic Plants - EC50	Fish - LC0	Toxicity to Microorganism EC50	Crustacea (Aquatic Invertebrates) EC0
Homopolymer of Hexamethylene Diisocyanate	>1,000 mg/l (green algae) Scenedesmus subspicatus 72 h	>100 mg/l Zebra fish (Brachydanio rerio) 96 h	>1,000 ,g/l (Activated sludge microorganism) 3h	>100 mg/l Water flea (Daphnia magna) 48 h

Biodegradation: 0%, Exposure time: 20 days, Not readily biodegradable.

Bioaccumulation potential: Not expected

Mobility in soil: Not expected

Other adverse effects: None established

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Method:

- Waste disposal should be in accordance with existing federal, state and local environmental control laws.
- Incineration is the preferred method.

Empty Container Precautions:

- Empty containers retain product residue; observe all precautions for product.
- Do Not** heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed.
- Do Not** reuse without thorough commercial cleaning and reconditioning.
- If container is to be disposed, ensure all product residues are removed prior to disposal

SECTION 14 - TRANSPORT INFORMATION

UN #	NA3082
UN proper shipping name:	Other regulated substances, liquid, n.o.s. (contains Hexamethylene-1,6-Diisocyanate)
Hazard class:	9
Packing group:	III
Environmental hazards:	Not a marine pollutant
Guidance on transport in bulk:	N/A
RSPA/DOT Regulated Components:	Hexamethylene-1,6-Diisocyanate Reportable Quantity: 9074 kg (20005 lb)
Sea transport (IMDG)	Non-Regulated
Air transport (ICAO/IATA)	Non-Regulated
Additional Transportation Information	When in individual containers of less than the Product RQ, this material ships as non-regulated.

Transport labels required: Class 9



SECTION 15: REGULATORY INFORMATION

U.S. Federal Regulations:

SARA 311-312 Hazard Categories:

Acute Health Hazard, Chronic Health Hazard

US State Right to Know Regulations: New Jersey, Massachusetts, Pennsylvania, Rhode Island

Chemical Name	CAS #
Homopolymer of Hexamethylene Diisocyanate	28182-81-2
N,N-dimethylcyclohexylamine	98-94-2
Hexamethylene-1,6-Diisocyanate	822-06-0

CA Prop 65: To the best of our knowledge this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

SECTION 16 - OTHER INFORMATION (HMIS RATING)

Health	2*
Flammability	1
Physical Hazard	1
Personal Protection	H

* Chronic health hazard

Disclaimer: Isothermal Protective Coatings, Inc. believes, to the best of its knowledge, information and belief, the information contained herein to be accurate and reliable as of the issue date of this Safety Data Sheet (SDS). However, because the conditions of handling, use, and storage of these materials are beyond Isothermal Protective Coatings, Inc. control, we assume no responsibility or liability for personal injury or property damage incurred by the use of these materials and makes no warranty, expressed or implied, regarding the accuracy or reliability of the data or results obtained from their use. All materials may present unknown hazards and should be used with caution. The information and recommendations contained in the SDS are offered for the users' consideration and examination. It is the responsibility of the user to determine the final suitability of this information and data and to comply with all applicable international, federal, state and local laws and regulations.