Material Safety Data Sheet (Component A)

Industrial Polymers, Inc.
3250 South Sam Houston Parkway East
Ho[illegible]n, Texas 77047

Chemtrec emergency phone 1-800-424-9300
Product data information (713) 943-8451
Fax (713) 943-1525

Da[illegible] January 1, 2001

Product Identification

Chemical family: Aliphatic Isocyanate Mixture.
Product name: CrystalCast 9015, 9016, 9024, 9028, 9030, 9035, 9040 & 9050.
Formula: The specific chemical formula for this material is a trade secret of Industrial Polymers, Inc.
Synonyms: H12 CrystalCast 9015, 9016, 9024, 9028, 9030, 9035, 9040 & 9050.

Composition Information / Ingredients

Ingredient Name / CAS Number	Exposure Limits	Concentration
Dicyclohexylmethane – 4,4 Diisocyanate CAS number 5124-30-1	OSHA: .01 ppm ceiling ACGIH: .005 ppm TWA	40%

These limits are based on those promulgated by the 1989 OSHA Air Contaminates Standard 29, CFR 1910.1000.

Hazardous Material Identification

Primary route(s) of entry: skin absorption, inhalation and ingestion.
Acute inhalation: vapors or mist at concentrations above the TLV can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat and lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (fever and chills) has also been reported. These symptoms can be delayed up to several hours after exposure.
Chronic inhalation: as a result of previous repeated over exposure or a single large dose, certain individuals develop isocyanate at levels well below the TLV. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthma 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. Overexposure to isocyanates has also been reported to cause lung damage (including decrease in lung function), which may be permanent. Sensitization can either be temporary or permanent.
Acute skin contact: isocyanates react with skin protein and moisture and can cause irritation, which may include the following symptoms, reddening, swelling, rash, scaling or blistering. Cured material is difficult to remove.
Chronic skin contact: prolonged contact can cause reddening, swelling, rash, scaling, blistering and in some cases, skin sensitization. Individuals who have skin sensitization can develop these symptoms from contact with liquid or vapors. Animal tests have indicated thet respiratory sensitization can result from skin contact. This data reinforces the need to prevent skin contact (see Toxicological information).
Ac[illegible]e contact: liquid, aerosols or vapors are irritating and can cause tearing, reddening and swelling. If left untreated, comeal damage can occur and injury is slow to heal. H[illegible]er, damage is usually reversible (see Emergency and first aid procedure) for treatment.
Acute ingestion: can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting and diarrhea.
Chronic ingestion: none found.
Medical conditions aggravated by exposure: asthma, other respiratory disorders (bronchitis, emphysema and bronchial hyperactivity), skin allergies and eczema.

Emergency and first aid procedure

Eyes: flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Refer individual to physician or ophthalmologist for immediate follow-up.
Skin: remove contaminated clothing. Wash affected skin thoroughly with soap and water. Wash contaminated clothing thoroughly before reuse. For severe exposures, get under safety shower after removing clothing, then get medical attention. For lesser exposures, seek medical attention if irritation develops or persists after the area is washed.
Inhalation: move to an area free from risk of further exposure. Administer oxygen or artificial respiration if needed. Obtain medical attention. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Consult physician should this occur.
Ingestion: do not induce vomiting. Give 1 to 2 cups of milk or water to drink. Do not give anything by mouth to an unconscious person. Consult physician.
Note to physician:
Eyes: stain for evidence of comeal injury. If cornea is burned, install antibiotic stercid preparation frequently. Work place vapors have produced reversible corneal epithelial edema impairing vision.
Skin: this compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burns. If burned, treat as thermal burn.
Ingestion: treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound.
Respiratory: this compound is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

Fire and explosion hazard data

Flash point: 390° F (198.8° C) Pensky-Martens Closed cup (ASTM-D-93).
Extinguishing media: dry chemical, carbon dioxide, foam, and water spray for large fires.
Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by firefighters. At temperatures greater the 400° F (204° C) polymerization and decomposition can occur, which can cause pressure build-up in closed containers. Explosive rupture is possible, therefore use cold water to cool fire-exposed containers.

Accidental release measures

Chemtrec must be immediately notified when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.

Spe[illegible]ecautions and storage data

Storage temperature: 64° F (18° C) minimum, 86° F (30° C) maximum.
Shelf life: 1 year
Special sensitivity: if container is exposed to high heat, 400° F (204° C) it can be pressurized and possibly rupture. This material reacts slowly with water to form CO2 gas. This gas can cause sealed containers to expand and possibly rupture.

Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Avoid contact with skin and eyes. Do not breathe aerosols or vapors. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposure to lower concentrations. Exposure to vapors of heated material can be extremely dangerous. Employee education and training in the safe use and handling of this compound are required under the OSHA Hazard Communication Standard.

Personal protection

Eye protection: liquid chemical goggles are required. Vapor resistant goggles should be worn when contact lenses are in use. In a splash hazard environment chemical goggles should be used in combination with a full-face shield.
Skin protection: permeation resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol) are required. However, please note that PVA degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area covered by the cream to a minimum.
Ventilation: local exhaust should be used to maintain levels below the TLV whenever material is processed. Standard reference sources regarding industrial ventilation (ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation.
Respirator: Concentrations greater than the TLV can occur when material is sprayed, heated or used in a poorly ventilated area. In such cases, or whenever concentrations exceed the TLV or are not known, respiratory protection must be worn. A supplied air respirator (either positive pressure or continuous flow type) is required. In an emergency situation, a self-contained breathing apparatus may be used. Observe OSHA regulations for respirator use (29 CFR 1910.134).
Medical surveillance: medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include pre-employment and periodic medical examinations with pulmonary function tests (FEC, FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once a person is diagnosed as sensitized to an isocyanate, no further exposure should be permitted.
Additional protective measures: safety showers and eyewash stations should be available. Educate and train employees in safe use of product. Follow all label instructions. For additional information, contact Industrial Polymers, Inc.

Physical properties

Appearance: thin liquid.
Odor: aromatic.
Color: clear.
Boiling point: greater than 300° F.
Specific gravity: 1.074.
Percent volatile by volume: 0.
Evaporation rate (ether = 1): N/A.
Vapor density (air = 1): N/A.
Solubility in water (percent): reacts slowly.

Stability and reactivity

Stability: this is a stable material.
Hazardous polymerization: may occur, contact with moisture, other materials, which react with isocyanates or temperatures about 400° F (204° C) may cause polymerization.
Incompatibilities: water, amines, strong bases or alcohols will cause some corrosion to copper alloys and aluminum.
Instability conditions: contamination with water and high temperatures above 400° F (204° C).
Decomposition products: by high heat and fire, carbon monoxide, oxides of nitrogen, traces of HCN, vapors or aerosols.

Toxicological information

Toxicity data for: Dicyclohexylmethane – 4,4' – Diisocyanate.
Acute toxicity:
Oral LD50: 1065 mg/kg (rat).
Dermal LD50: greater than 10000 mg/kg (rabbit).
Inhalation LC50: the 4-hour LC50 for Dicyclohexylmethane – 4,4' – Diisocyanate in rats 430 mg/m3 – 295 mg/m3 (28 ppm) 4-hour (male rat).
Eye effects: slight to moderate irritation.
Skin effects: slight to moderate irritation.
Sensitization: Dicyclohexylmethane – 4,4' – Diisocyanate has been shown to produce dermal sensitization in laboratory animals. Evidence of respiratory sensitization has also been observed in guinea pigs. In addition, there is some evidence suggestive of cross-sensitization between different types of diisocyanates.
Chronic toxicity: in a combined chronic inhalation toxicity/oncogenicity study, rats were exposed to an aerosol of Dicyclohexylmethane – 4,4' – Diisocyanate for 6-hours per day, 5 days per week for one to two years. The exposure concentrations were 0, 0.2, 1.0 and 6.0 mg/m3. Microscopic examination of tissue revealed the effects of irritation to the nasal cavity and lungs in animals exposed to 1.0 and 6.0 mg/m3. The No Observable Effect Level (NOEL) was 0.2 mg/m3.
Mutagenicity: Ames Test, negative for mutagenicity with and without liver enzyme activation.

Ecological information

No data

Disposal considerations

Waste disposal method: waste must be disposed of in accordance with local, state and federal environmental control regulations. Incineration is the preferred method.
Empty container precautions: empty containers must be handled with care due to product residue. Decontaminate containers prior to disposal. Empty decontaminated containers should be crushed to prevent reuse. Do not heat or cut empty container with electric or gas torch (see Fire and explosion hazard data and Stability and reactivity). Gases may be highly toxic.

Shipping information

Proper shipping name: Liquid Resin non-regulated.
DOT hazard classification: none.
UN/NA number: none.
Packaging group: none.
DOT labels required: none.
DOT placards required: none.
Freight class: 55.

Regulatory Information

NTP, IARC or regulate by OSHA as carcinogens.
NTP – not listed.
IAR[illegible] not listed.
OS[illegible] not regulated.
Othe[illegible] – see results of two-year inhalation study in Toxicological information.

Material Safety Data Sheet (Component B)

Product Identification

Chemical family: Hydroxy Terminated Poly (oxyalkylene) Polyol.
Product name: CrystalCast 9015, 9016, 9024, 9028, 9030, 9035, 9040 & 9050.
Formula: The specific chemical formula for this material is a trade secret of Industrial Polymers, Inc.
Chemical name: Blend of Polyol and Aromatic Diamine.
Synonyms: Polyether triol.
C.A.S. number: 9082-00-2.
Percentage range: 80-90%.

Composition Information / Ingredients

Ingredient Name / CAS Number	Exposure Limits	Concentration
Proprietary Aryl Mercury Compound	OSHA: PEL 0.1 mg/m3 – ceiling ACGIH: TLV 0.1 mg/m3 TWA	0.083% by weight

Hazardous Material Identification

Primary route(s) of entry: skin absorption, inhalation and ingestion.
Eyes: eye irritant, flush with water, seek medical attention if irritation persist.
Skin: skin irritant, wash any substance off skin with water, and seek medical attention if irritation persist.
Ingestion: immediately drink water to dilute. Induce vomiting. Consult a physician.
Inhalation: This product is not a inhalation hazard at room temperature. Vapors or aerosol can be generated from heating or spraying and may cause respiratory irritetion.
Chronic: this product contains a extremely small amount of a aryl mercury compound (0.083%). In general, long-term exposure to mercury compounds have been found to cause adverse reproductive, central nervous system and kidney effects.
Carcinogenicity: not designated as a carcinogen by NPT, IARC or OSHA.

Emergency and first aid procedure

Eyes: flush with water, seek medical attention if irritation persist.
Ski[illegible]sh any substance off skin with water, seek medical attention if irritation persist.
Ing[illegible]: immediately drink water to dilute. Induce vomiting. Consult a physician.

Fire and explosion hazard data

Flammable: no.
Combustible: no.
Pyrophoric: no.
Flash point: 300-500° F (150-260° C) test method – Cleveland Open Cup
Auto ignition temperature: no data.
Flammable limits (percent volume in air): LEL – no data, UEL – no data.

Accidental release measures

Reportable quantity: N/A (per 40 CFR 300.4).
Spill mitigation procedure: stop source of spill as soon as possible and notify appropriate personnel.
Air release: N/A.
Water release: this material is slightly soluble in water and may be subject to emulsification. Divert flow of water and contain that which is contaminated. Remove as a liquid utilizing a vacuum or pumping system as possible.
Land spill: dike spill area and begin to remove as a liquid. If unable to do so, then absorb in clay, sand or a commercial absorbent and containerize for disposal.
Spill residues: Dispose of per guidelines under Section XII-Waste Disposal
Personal protection for emergency spill and fire fighting situations: In case of fire, use normal fire fighting equipmenL Additional respiratory protection is necessary when a spill or fire involving this product occurs. You are recommended to use a cartridge type NIOSHA/ OSHA approved respirator with dust/mist cartridges. Additionat protective clothing must be wom to prevent personal contact with this material. Those items include but are not limited to; boots, hardhat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit.

Special precautions and storage data

Do not take internally, avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water.
Storage conditions: do not store at temperatures above 49° C (120° F)
Other: Product is hydroscopic; protect with padding of dry nitrogen. Calcium chloride drying system with silica gel on the vents can also be used.
Product compatibility: minimum 1 year (closed container).
Incompatible materials for packaging: use glass or vinyl lined containers.
Recommended lined steel (Amercoat No. 23 vinyl coating 5-coat system); 304SS incompatible materials.
For storage or transport: strong oxidizers.

Personal protection

Per[illegible] protection: gloves, apron and safety glasses
Ven[illegible]n: local exhaust ventilation is racommended if vapors, mists or aerosols are generated. Otherwise, use general exhaust ventilation.
Eye protection: use safety glasses with side shields.
Respirator: not normally required at room temperature. In the absence of good ventilation, or vapor or mists generated through heating or spray applications use supplied air respirator equipped with organic vapor cartridges.
Protective clothing typa: this includes: gloves, apron and safety glasses.

Physical properties

Appearance: clear
Freezing point: no data.
Boiling point: no data.
Decomposition temperature: no data.
Specific gravity: 0.9 – 1.1.
Bulk Density: N/A.
pH @ 25° C: 4 – 8 in. 10/6 isopropanol/water.
Vapor pressure @ 25° C: 0.01 – 3.5 mm Hg.
Solubility in water: soluble to slightly soluble.
Volatiles, percent by volume: 0.
Evaporation rate: N/A.
Vapor density: no data.
Molecular weight: N/A mixture.
Odor: slightly musty to odorless.
Coefficient of oil/water distribution: no data.

Stability and reactivity

Conditions under which this product may be unstable:
- Temperatures above: no data.
- Mechanical shock or impact: no.
- Electrical (static) discharge: no.
- Other: no.
- Hazardous polymerization: will not occur.
- Incompatible materials: strong oxidizers.
- Hazardous decomposition products: carbon monoxide, carbon dioxide and other fragments, which have not been identified.

Summary of reactivity:
- Oxidizer: no.
- Pyrophoric: no.
- Organic Peroxide: no.
- Water reactivity: no.

Toxicological information

No data

Ecological information

No data

Disposal considerations

If this product becomes a waste uncured form (component B only), does meet the criteria of a hazardous waste as defined under 40 CFR 261, (D009) of Subpart C.
As a hazardous liquid waste, it should be disposed of in accordance with local, state and federal regulations by incineration.
Care must be taken to prevent environmental contamination form the use of this material. The user of this material has the responsibility to dispose of unused material, and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.

Shipping information

This material is not regulated as a DOT hazardous material.
Proper shipping name: Liquid resin non-regulated.
DOT hazard classification: none.
UN/NA number: none.
Packaging group: none.
DOT labels required: none.
DOT placards required: none.
Freight class: 55.

Regulatory information

Toxic Substances Control Act: this substance is listed on the Toxic Substance Control Act inventory.
Superfund amendments and reauthorization Act Title III:
- Hazard categories: per 40 CFR 370.2:

Emergency planning and community right to know, per 40 CFR APP A:
- Extremely hazardous substance-threshold planning quantity: none established.

Supplier notification requirements, per 40 CFR 372.45: none established.

Other information

The information in this Material Safety Data Sheet should be provided to all that will use, handle, store, transport, or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations and management and for persons working with or handling this product. Industrial Polymers, Inc. believes this information to be reliable and up to date as of the date of publication, but makes no warranty that it is.

Prepared by: C. Boddie
Approval date: 01/01
Supercedes 01/00