

SAFETY DATA SHEET

OSHA HCS (29 CFR 1910.1200)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Product Name / Trade Name ISO-Guard™ ISO-101, Part B

Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s) Curing Agent for Urethane Coating

Details of the supplier of the safety data sheet

Company Identification Res-Tek, Inc.
110 Riverside Drive
Cartersville, Georgia 30120
United States of America

Telephone 1-888-737-8351 / 1-770-427-4034

Emergency telephone number

CHEMTREC 24 hr. 1-800-424-9300 / 1 (703) 527-3887 (Collect calls accepted)

SECTION 2: HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity - Category 4
Specific target Organ toxicity - Category 3 (respiratory system)
Skin Sensitization - Category 1

GHS Label Elements



Signal Word

WARNING

Hazard Statements

H317: May cause an allergic skin reaction.
H332: Harmful if inhaled
H335: May cause respiratory irritation

Precautionary Statements

Prevention P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
P264: Wash hands thoroughly after handling.
P363: Wash contaminated clothing before reuse.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response	<p>P301+P330+P331 :IF SWALLOWED: rinse mouth. Do NOT induce vomiting. P303+P361+P353 :IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P304+340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P310 :Immediately call a POISON CENTER or doctor/physician. P333+P313 :If skin irritation or rash occurs: Get medical advice/attention. P363 :Wash contaminated clothing before reuse.</p>
Disposal	P501:Disposal of contents/container to be specified in accordance with regulations.
Hazards not otherwise classified	

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Composition/information on ingredients	CAS No.	Concentration (Weight)
Homopolymer of Hexamethylene Diisocyanate	28182-81-2	95% - 100%
Hexamethylene-1,6-Diisocyanate	822-06-0	0.1% - 1%

CHEMICAL FAMILY: Aliphatic Polyisocyanate

SECTION 4: FIRST AID MEASURES



Description of first aid measures

General Advice	Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.
Eye Contact	In case of contact, 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.
Skin Contact	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.
Ingestion	Do NOT induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.
Inhalation	If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Move to

fresh air.

Most important symptoms/effects
- acute and delayed

Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat. Skin disorders, Allergies and Asthma.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Carbon dioxide (CO ₂). Dry chemical. Water spray for large fires
Unsuitable Extinguishing Media	High Volume water jet
Fire Fighting Procedure	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.
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
Unusual Fire/Explosion Hazards	Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO ₂ 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

Personal Precautions, Protective Equipment & Emergency Procedures	Wear suitable protective clothing, gloves and eye/face protection. Use self-contained breathing apparatus and chemically protective clothing. Evacuate personnel to safe areas.
Environmental precautions	Construct a dike to prevent spreading.
Methods for cleaning up	Contact Res-Tek, Inc. for advice. Approach suspected leak areas with caution. Place in appropriate chemical waste container.
Additional Information	Open enclosed spaces to outside atmosphere. If possible, stop flow of product.

SECTION 7: HANDLING AND STORAGE

Handling	Do not breathe 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
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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.

Storage

Storage Period:

6 Months @ 25 °C (77 °F): after receipt of material by customer

Storage Temperature

Minimum: -34 °C (-29.2 °F)

Maximum: 50 °C (122 °F)

Storage Conditions

Store separate from food products.

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.

Substances to Avoid

Water, Amines, Strong bases, Alcohols, Copper alloys

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures/Hygiene

Provide readily accessible eye wash stations and safety showers.
Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

Good industrial hygiene practice dictates that worker protection should be achieved through engineering controls, such as ventilation, whenever feasible. 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.

Personal protection equipment

Respiratory 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.

Hand protection



Butyl-rubber Nitrile rubber. Neoprene gloves.
Impervious gloves. PVC disposable gloves.

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection



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

Skin and body protection

Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact.,
Gloves, long sleeved shirts and pants.

Special instructions for protection and hygiene

All applicants 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. Applicants who have a history of adult asthma should be restricted from work with isocyanates.

Exposure Limits

Hexamethylene-1,6-Diisocyanate (822-06-0)
(28182-81-2)

US. ACGIH Threshold Limit Values 0.005 ppm
Time Weighted Average (TWA):

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid. Colorless to light yellow
Odor	Odorless
Odor threshold	No data available
pH	No data available
Melting point/range	No data available
Boiling point/range	Not applicable @ 1,013 hPa, decomposition
Flash point	358 °F (181 °C)
Evaporation rate	No data available
Flammability (solid, gas)	Not applicable
Upper/lower explosion/flammability limit	Not applicable
Vapor pressure	9.3 x 10 ⁻⁶ mmHg at 70 °F (21 °C)
Water solubility	Insoluble – Reacts slowly with water to liberate CO ₂ gas
Relative vapor density	Not applicable
Relative density	9.66 lb/gal at 70° (21°C)
Partition coefficient (n-octanol/water)	No data available
Auto-ignition temperature	896 °F (480 °C)
Decomposition temperature	No data available.
Viscosity	2,500 cPs @ 70°F (21°C)

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability	Stable under normal conditions.
Conditions to avoid	Heat, flames and sparks.
Materials to avoid	Water, Amines, Strong bases, Alcohols, Copper alloys
Hazardous decomposition product(s)	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
Possibility of hazardous Reactions/Reactivity	Contact with moisture, other materials that react with isocyanates, or temperatures above 350° F (177° C), may cause polymerization

SECTION 11: TOXICOLOGICAL INFORMATION

Likely routes of exposure
Skin contact
Inhalation
Eye contact

Acute Toxicity
Isocyanate vapors or mist at concentrations above the exposure limits or guidelines can irritate (burning sensation) the mucous membranes in the

respiratory tract (nose, throat, lungs) with symptoms of runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing difficulty). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the exposure limits or guidelines with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the exposure limits or guidelines may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g. fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

May cause skin irritation with symptoms of reddening, itching, and swelling. Can cause sensitization. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

May cause eye irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing.

May cause irritation of the digestive tract; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Chronic Toxicity

As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to isocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to isocyanates at levels well below the exposure limits or guidelines. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. 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. Sensitization can be permanent.

Prolonged contact with skin can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with isocyanates can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

Toxicity Data for Homopolymer of Hexamethylene Diisocyanate

Toxicity Note

Acute Oral Toxicity

Acute Inhalation Toxicity

Data is based on a similar product, including residual monomer.

LD50: > 5000 mg/kg (rat, female) (OECD Test Guideline 423)

LC50: 0.554 mg/l, 4 h (rat)

The test atmosphere generated in the animal study is not representative of workplace environments, how the substance is placed on the market, and how it can reasonably be expected to be used. Therefore the test result cannot be directly applied for the purpose of assessing hazard. Based on the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

rabbit, slight irritant

Skin Irritation

Eye Irritation

rabbit, slight irritant

Sensitization

Skin sensitization according to Magnusson/Kligmann (maximizing test):

positive (guinea pig, OECD Test Guideline 406)

Repeated Dose Toxicity

Subchronic inhalation toxicity, rat:

Test concentration – 0.4, 3.4 and 21.0 mg aerosol/m³ exposure time - 13 weeks (6 hours a day, 5 days a week) 3.4 mg/m³ was tolerated without damage (NOEL), 21.0 mg/m³ caused increase of lung weight. No evidence of histopathological changes in the upper and central respiratory passages. Unspecific changes in the lower respiratory tract; these are attributed to the product's primary irritation potential. Evidence of damage to organs other than the organs of respiration was not found.

Mutagenicity

Genetic Toxicity in Vitro:

Salmonella/microsome test (Ames test): No indication of mutagenic effects.

Genetic Toxicity in Vivo:

Micronucleus test: negative (mouse)

Toxicity Data for Hexamethylene-1,6-Diisocyanate

Acute Oral Toxicity

LD50: 746 mg/kg (rat, male) (OECD Test Guideline 401)

LD50: 959 mg/kg (rat, male) (OECD Test Guideline 401)

Acute Inhalation Toxicity

LC50: 0.124 mg/l, 4 h (rat, male/female) (OECD Test Guideline 403)

Acute Dermal Toxicity

LD50: > 7000 mg/kg (rat, male/female) (OECD Test Guideline 402)

Skin Irritation

rabbit, OECD Test Guideline 404, Corrosive

Eye Irritation

rabbit, OECD Test Guideline 405, Corrosive

Sensitization

dermal: sensitizer (guinea pig, Maximization Test (GPMT))

Other isocyanates have been shown to produce dermal and respiratory sensitization in several species (guinea pigs, mice, rabbits, dogs). In addition, there is some evidence to suggest that cross-sensitization between different types of diisocyanates may occur.

dermal: sensitizer (Human, Case Report)

Respiratory sensitization: sensitizer (guinea pig)

Repeated Dose Toxicity

2 years, inhalation: NOAEL: < 0.005 ppm, LOAEL: 0.005 ppm, (rat, Male/Female, 6 hrs./day 5 days/week) Irritation to lungs and nasal cavity.

Mutagenicity

Genetic Toxicity in Vitro:

Salmonella/microsome test (Ames test): negative (Salmonella typhimurium,

Metabolic Activation: with/without)

Point mutation in mammalian cells (HPRT test): negative (Metabolic

Activation: with/without)

Genetic Toxicity in Vivo:

Micronucleus test: negative (mouse, male/female, Inhalative).

Carcinogenicity

Rat, male/female, Inhalative, 2 yrs., 6 hours/day, 5 days/week, Did not show carcinogenic effects in animal experiments.

Toxicity to Reproduction/Fertility

Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test, Inhalative, 6 hours/day 7 days/week, (rat, male/female) NOAEL (F2): 0.3 ppm Fertility and

developmental toxicity tests did not reveal any effect on reproduction.

Developmental Toxicity/Teratogenicity

Rat, female, inhalation, gestation days 0 - 19, daily, NOAEL (teratogenicity): >0.3 ppm, NOAEL (maternal): < 0.3 ppm No Teratogenic effects observed at doses tested. No fetotoxicity observed at doses tested.

Neurological Effects

Rats exposed by inhalation, 6 hours/day, for approximately 3 weeks, to concentrations as high as 0.3 ppm showed no neurobehavioral effects or damage to nerve tissues.

Carcinogenicity

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

SECTION 12: ECOLOGICAL INFORMATION

Ecological Data for Homopolymer of Hexamethylene Diisocyanate

Biodegradation	1 %, Exposure time: 28 d, i.e. not readily degradable
Acute and Prolonged Toxicity to Fish	LC50: > 100 mg/l (Danio rerio (zebra fish), 96 h)
Acute Toxicity to Aquatic Invertebrates	EC50: > 100 mg/l (Daphnia magna (Water flea), 48 h)
Toxicity to Aquatic Plants	ErC50: > 100 mg/l, (scenedesmus subspicatus, 72 h)
Toxicity to Microorganisms	EC50: > 100 mg/l, (activated sludge, 3 h)
Additional Ecotoxicological Remarks	Data is based on a similar product, including residual monomer.

Ecological Data for Hexamethylene-1,6-Diisocyanate

Biodegradation	aerobic, 42 %, Exposure time: 28 d, i.e. not readily degradable
Bioaccumulation	value calculated, 57.6 BCF An accumulation in aquatic organisms is not to be expected. value calculated, 3.2 BCF An accumulation in aquatic organisms is not to be expected. Studies of hydrolysis products.
Acute and Prolonged Toxicity to Fish	LC0: >= 82.8 mg/l (Danio rerio (zebra fish), 96 h)
Acute Toxicity to Aquatic Invertebrates	EC0: >= 89.1 mg/l (Daphnia magna (Water flea), 48 h)
Toxicity to Aquatic Plants	ErC50: > 77.4 mg/l, (Desmodemus subspicatus (Green algae), 72 h)
Toxicity to Microorganisms	EC50: 842 mg/l, (activated sludge, 3 h)

SECTION 13: DISPOSAL CONSIDERATIONS

Waste from residues / unused products

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

Contaminated packaging

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

DOT	Non-regulated
IATA	Non-regulated
IMDG	Non-regulated
TDG	Non-regulated
Further information	The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact Res-Tek, Inc.

SECTION 15: REGULATORY INFORMATION

United States Federal Regulations

US Toxic Substance Control Act (TSCA) 12(b) Component(s):	Listed on the TSCA Inventory.
US. EPA CERCLA Hazardous Substances (40 CFR 302) Components:	None
SARA Section 311/312 Hazard Categories:	Acute Health Hazard
US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A) Components:	None
US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required Components:	None
US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):	Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the SDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists: Weight percent	Components	CAS-No.
>=95%	Homopolymer of Hexamethylene Diisocyanate	28182-81-2
0.1 - 1%	Hexamethylene-1,6-Diisocyanate	822-06-0
New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists: Weight percent	Components	CAS-No.
0.1 - 1%	Hexamethylene-1,6-Diisocyanate	822-06-0

California 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.

Based on information provided by our suppliers, this product is considered "DRC Conflict Free" as defined by the SEC Conflict Minerals Final Rule (Release No. 34-67716; File No. S7-40-10; Date: 2012-08-22).

SECTION 16: OTHER INFORMATION

HMIS Rating

Health	3
Flammability	1
Physical hazard	0
Revision Date	07/25/2017

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