PUR-Guard™ Single Component Primer

SAFETY DATA SHEET

OSHA HCS (29 CFR 1910.1200)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Chemical Name	Mixture
Product Name **/** Trade Name	PUR-Guard™ Single Component Primer
CAS No.	Mixture

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

Hazard classification

GHS Classification: Skin Irrit. 2, Eye Irrit. 2A, Resp. Sens. 1, Skin Sens. 1, Acute Tox. (inhalation) 4, STOT SE 3 (Respiratory system)

Label elements

Hazard pictograms

Signal Word(s) **DANGER**

Hazard Statement(s)

Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
Harmful if inhaled.
May cause allergy or asthma symtoms or breathing difficulties if inhaled.
May cause respiratory irritation.

Precautionary Statements

Prevention

Avoid breathing dust/ fumes/ gas/ mist/ vapors/ spray.
Wash skin thoroughly after handling
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/eye protection/face protection.
In case of inadequate ventilation wear respiratory protection

Hazards not otherwise classified None known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	Concentration
Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly[oxy(methyl-1,2-ethanediyl)]	53862-89-8	30% – 50%
propylene carbonate	108-32-7	10% – 20%
4,4'-methylenediphenyl diisocyanate	101-68-8	10% - 20%
Diphenylmethanediisocyanate	9016-87-9	10% - 20%
Diphenylmethane-2,4'- diisocyanate	5873-54-1	5% - 10%
Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-methyl-.omega.- hydroxypoly(oxy-1,2-ethanediyl)	70644-56-3	1% - 5%

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Inhalation

If breathed in, move person into fresh air. Call a physician or poison control centre immediately. Keep patient warm and at rest. Keep respiratory tract clear. If breathing is difficult, give oxygen. If breathing is irregular or stopped, administer artificial respiration. If unconscious, place in recovery position and seek medical advice. Consult a physician immediately if symptoms such as shortness of breath or asthma are observed. A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitised persons. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin Contact

In case of contact, immediately flush skin with soap and plenty of water. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before reuse. Thoroughly clean shoes before reuse. Call a physician if irritation develops or persists. An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-TamTM, PEG-400) or corn oil may be more effective than soap and water.

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If easy to do, remove contact lens, if worn. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

Ingestion

Gently wipe or rinse the inside of the mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Keep respiratory tract clear. Keep at rest. If a person vomits when lying on his back, place him in the recovery position. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

Protection of first aid personnel	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If potential for exposure exists refer to Section 8 for specific personal protective equipment. First Aid responders should pay attention to self-protection and use the recommended protective clothing.
Notes to Physician	Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours. The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.
Most important symptoms and effects, both acute and delayed	Severe allergic skin reactions, bronchiospasm and anaphylactic shock. This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapor or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable extinguishing media	Foam. Carbon dioxide (CO2). Dry powder
Unsuitable extinguishing media	Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous.

Special hazards arising from the substance or mixture

Specific hazards	Do not allow run-off from fire fighting to enter drains or water courses. The pressure in sealed containers can increase under the influence of heat. Exposure to decomposition products may be a hazard to health.
Hazardous combustion products	Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). Nitrogen oxides (NOx) Hydrogen cyanide (hydrocyanic acid)
Specific extinguishing methods	Cool containers/tanks with water spray.
Special protective equipment for fire-fighters	Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.
Further information	Standard procedure for chemical fires. Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Prevent fire extinguishing water from contaminating surface water or the ground water system. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Immediately evacuate personnel to safe areas. Use personal protective equipment. If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Only qualified personnel equipped with suitable protective equipment may intervene. For additional precautions and advice on safe handling, see section 7. Never return spills in original containers for re-use. Make sure that there is a sufficient amount of neutralizing/ absorbent material near the storage area. The danger areas must be delimited and identified using relevant warning and safety signs. Treat recovered material as described in the section "Disposal considerations". For disposal considerations see section 13.

Environmental precautions

Do not allow uncontrolled discharge of product into the environment. Do not allow material to contaminate ground water system. Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. Local authorities should be advised if significant spillages cannot be contained. If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and material for containment and cleaning up

Small spills:

Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Clean contaminated surface thoroughly. Sweep up or vacuum up spillage and collect in suitable container for disposal. Neutralize small spillages with decontaminant. The compositions of liquid decontaminants are given in Section 16. Remove and dispose of residues.

Large spills:

If the product is in its solid form:
Spilled MDI flakes should be picked up carefully. The area should be vacuum cleaned to remove remaining dust particles completely.
If the product is in its liquid form:
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Leave to react for at least 30 minutes. Shovel into open-top drums for further decontamination. Wash the spillage area with water. Test atmosphere for MDI vapor. Keep in suitable, closed containers for disposal.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Avoid formation of aerosol. Do not breathe vapors or spray mist. Do not breathe vapors/dust. Do not swallow. Do not get in eyes or mouth or on skin. Do not get on skin or clothing. Avoid exposure - obtain special instructions before use. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Keep container closed when not in use. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Conditions for safe storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labelled containers. Observe label precautions. Protect from moisture. Electrical installations / working materials must comply with the technological safety standards. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Materials to avoid

Acids, amines, bases, metals, water

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters/permissible concentration	Basis
4,4'-methylenediphenyl diisocyanate	101-68-8	TWA	0.005 ppm	ACGIH

Personal protection equipment

Respiratory protection

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hand protection

Examples of glove materials that might provide suitable protection include: Butyl rubber, Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol copolymers laminated ("EVAL"), Polychloroprene (Neoprene*), Nitrile/butadiene rubber ("nitrile" or "NBR"), Polyvinyl chloride ("PVC" or "vinyl"), Fluoroelastomer (Viton*).

Eye/face protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Chemical splash goggles. Always wear eye protection when the potential for inadvertent eye contact with the product cannot be excluded. Ensure that eyewash stations and safety showers are close to the workstation location.

Skin and body protection

Impervious clothing. Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' , Tyvek Pro 'F' disposable coverall.

Special instructions for protection and hygiene

Handle in accordance with good industrial hygiene and safety practice. Wash face, hands and any exposed skin thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Wash hands before breaks and at the end of workday.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid.
Odor	No data available.
Odor threshold	No data available.
pH	No data available.
Melting point /range	No data available.
Boiling point/range	No data available.
Flash Point	>110°C Method: closed cup
Evaporation rate (Butyl Acetate = 1)	No data available.
Flammability (solid, gas)	No data available.

Lower explosion limit	No data available.
Upper explosion limit	No data available.
Vapor pressure	No data available.
Relative vapor density	No data available.
Relative density	No data available.
Water solubility	No data available.
Partition coefficient: n-octanol/water	No data available.
Autoignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	No data available.
Molecular weight	No data available.
Density	No data available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity — No dangerous reaction known under conditions of normal use.

Chemical stability — Stable under normal conditions.

Conditions to avoid — Extremes of temperature and direct sunlight.
Exposure to air or moisture over prolonged periods.

Materials to avoid — Acids, amines, bases, metals, water.

Hazardous decomposition products — Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke. Hydrocarbons Hydrogen cyanide (hydrocyanic acid) Burning produces noxious and toxic fumes.

Possibility of hazardous reactions/reactivity — Reaction with water (moisture) produces CO2-gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents. MDI is insoluble with, and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating carbon dioxide gas.

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Likely routes of exposure — No data available.

Carcinogenicity — No data available.

IARC — No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH — No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

OSHA — No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP — No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Component: Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly[oxy(methyl-1,2-ethanediyl)]

Acute toxicity

Acute oral toxicity	LD50 (Rat, male): > 10,000 mg/kg Method: OECD Test Guideline 401
Skin corrosion/irritation	Species: Rabbit Method: OECD Test Guideline 404 Result: Skin irritation
Serious eye damage/eye irritation	Species: Rabbit Result: Mild eye irritation Method: OECD Test Guideline 405
Sensitization	Exposure routes: Skin Species: Mouse Result: May cause sensitisation by skin contact. Exposure routes: Respiratory Tract Species: Guinea pig Result: May cause sensitisation by inhalation.

Germ cell mutagenicity

Genotoxicity in vitro	Concentration: 200 ug/plate Metabolic activation: with and without metabolic activation Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative
Genotoxicity in vivo	Application Route: Inhalation Exposure time: 3 Weeks Dose: 118 mg/m3 Method: OECD Test Guideline 474 Result: negative

Chronic toxicity or effects from long-term exposure

Carcinogenicity	Species: Rat, (male and female) Application Route: Inhalation Exposure time: 24 month(s) Dose: 1 mg/m³ Frequency of Treatment: 5 daily Method: OECD Test Guideline 453 Result: positive Target Organs: Lungs

Reproductive toxicity

Effects on foetal development	Species: Rat, male and female Application Route: Inhalation Method: OECD Test Guideline 414 Result: No teratogenic effects
Specific target organ systemic toxicity (single exposure)	Exposure routes: inhalation (dust/mist/fume) Target Organs: Respiratory system Assessment: May cause respiratory irritation.
Specific target organ systemic toxicity (repeated exposure)	Species: Rat, male and female : 0.2 mg/m3 Exposure time: 2 yr Number of exposures: 5 d Method: OECD Test Guideline 453

Component: propylene carbonate

Acute toxicity

Acute oral toxicity	LD50 (Rat, male and female): 33,520 mg/kg
Skin corrosion/irritation	Species: Rabbit Assessment: No skin irritation Method: OECD Test Guideline 404 Result: No skin irritation
Serious eye damage/eye irritation	Species: Rabbit Result: Eye irritation Assessment: Irritating to eyes. Method: OPPTS 870.2400
Sensitization	Exposure routes: Skin Species: Humans Result: Does not cause skin sensitisation.

Germ cell mutagenicity

Genotoxicity in vitro	Concentration: 5000 ug/plate Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative Metabolic activation: negative Method: OECD Test Guideline 482 Result: negative
Genotoxicity in vivo	Application Route: Intraperitoneal injection Dose: 1666 mg/kg Method: OECD Test Guideline 474 Result: negative

Chronic toxicity or effects from long-term exposure

Carcinogenicity	Species: Mouse, (male) Application Route: Dermal Exposure time: 104 weeks Dose: 1500 - 2000 mg/kg Frequency of Treatment: 2 daily Method: OECD Test Guideline 451 Result: negative

Reproductive toxicity

Effects on fertility	Species: Rat Application Route: Oral Method: OECD Test Guideline 414 Result: negative
Effects on foetal development	Species: Rat, male and female Application Route: Oral General Toxicity Maternal: No observed adverse effect level: 1,000 mg/kg body weight Method: OECD Test Guideline 414 Result: No teratogenic effects
Specific target organ systemic toxicity (repeated exposure)	Species: Rat, male and female : > 5000 mg/kg, 100 mg/m3 Application Route: Ingestion Test atmosphere: dust/mist Exposure time: 2,232 h Number of exposures: 6 h Method: OECD Test Guideline 413

Component: 4,4'-methylenediphenyl diisocyanate

Acute toxicity

Acute oral toxicity	LD50 (Rat, male): > 10,000 mg/kg Method: OECD Test Guideline 401
Skin corrosion/irritation	Species: Rabbit Method: OECD Test Guideline 404 Result: Irritating to skin.
Serious eye damage/eye irritation	Species: Rabbit Result: Mild eye irritation
Sensitization	Exposure routes: Skin Species: Mouse Method: OECD Test Guideline 429 Result: May cause sensitisation by skin contact. Exposure routes: Respiratory Tract Species: Guinea pig Result: May cause sensitisation by inhalation.
Assessment	May cause sensitisation by inhalation and skin contact.

Germ cell mutagenicity

Genotoxicity in vitro	Concentration: 200 ug/plate Metabolic activation: with and without metabolic activation Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative
Genotoxicity in vivo	Application Route: Inhalation Exposure time: 3 Weeks Dose: 118 mg/m3 Method: OECD Test Guideline 474 Result: negative

Chronic toxicity or effects from long-term exposure

Carcinogenicity	Species: Rat, (male and female) Application Route: Inhalation Exposure time: 24 month(s) Dose: 1 mg/m³ Frequency of Treatment: 5 daily Method: OECD Test Guideline 453 Result: positive Target Organs: Lungs

Reproductive toxicity

Effects on foetal development	Species: Rat, female Application Route: Inhalation General Toxicity Maternal: No observed adverse effect level: 4 mg/m³ Method: OECD Test Guideline 414 Result: No teratogenic effects

Specific target organ systemic toxicity (single exposure)	Exposure routes: Inhalation Target Organs: Respiratory Tract Assessment: May cause respiratory irritation.
Specific target organ systemic toxicity (repeated exposure)	Species: Rat, male and female : 0.2 mg/m3 Exposure time: 2 yr Number of exposures: 5 d Method: OECD Test Guideline 453

Component: Diphenylmethanediisocyanate

Acute toxicity

Acute oral toxicity	LD50 (Rat, male): > 10,000 mg/kg Method: OECD Test Guideline 401
Skin corrosion/irritation	Species: Rabbit Assessment: Irritating to skin. Method: OECD Test Guideline 404 Result: Skin irritation
Serious eye damage/eye irritation	Species: Rabbit Result: Irritation to eyes, reversing within 7 days Assessment: Mild eye irritant Method: OECD Test Guideline 405
Sensitization	Exposure routes: Skin Species: Guinea pig Method: OECD Test Guideline 406 Result: May cause sensitisation by skin contact. Exposure routes: Respiratory Tract Species: Rat Result: May cause sensitisation by inhalation.
Assessment	May cause an allergic skin reaction., May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Germ cell mutagenicity

Genotoxicity in vitro	Concentration: 200 ug/plate Metabolic activation: with and without metabolic activation Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative
Genotoxicity in vivo	Application Route: Inhalation Result: Not classified due to inconclusive data. Application Route: Inhalation Exposure time: 3 Weeks Dose: 113 mg/m3 Method: OECD Test Guideline 474 Result: negative
Assessment	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Chronic toxicity or effects from long-term exposure

Carcinogenicity	Species: Rat, (male and female) Application Route: Inhalation Exposure time: 24 month(s) Dose: 1 mg/m³ Frequency of Treatment: 5 daily Method: OECD Test Guideline 453 Result: positive

Reproductive toxicity

Effects on fertility	Species: Rat, male and female Application Route: Inhalation Method: OECD Test Guideline 414 Remarks: No significant adverse effects were reported
Effects on foetal development	Species: Rat, male and female Application Route: Inhalation General Toxicity Maternal: 4 mg/m³ Method: OECD Test Guideline 414 Result: No teratogenic effects
Assessment	No toxicity to reproduction No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

Specific target organ systemic toxicity (single exposure)	Exposure routes: Inhalation Target Organs: Respiratory Tract Assessment: May cause respiratory irritation.
Specific target organ systemic toxicity (repeated exposure)	Species: Rat, male and female : 0.2 mg/m3 Test atmosphere: dust/mist Exposure time: 2 yr Number of exposures: 5 d Method: OECD Test Guideline 453

Component: Diphenylmethane-2,4'-diisocyanate

Skin corrosion/irritation	Species: Rabbit Assessment: Irritant Method: OECD Test Guideline 404 Result: Irritating to skin.
Serious eye damage/eye irritation	Species: Humans Result: Irritation to eyes, reversing within 7 days Assessment: Mild eye irritant Method: OECD Test Guideline 405 Remarks: Mild eye irritation
Sensitization	Exposure routes: Skin Species: Mouse Assessment: May cause sensitisation by skin contact. Result: Causes sensitisation. Exposure routes: Respiratory Tract Species: Guinea pig Assessment: May cause sensitisation by inhalation. Result: Causes sensitisation.

Assessment	Mild eye irritation
Germ cell mutagenicity	
Genotoxicity in vitro	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	Application Route: Inhalation Exposure time: 3 Weeks Dose: 118 mg/m3 Method: OECD Test Guideline 474 Result: negative
Chronic toxicity or effects from long-term exposure	
Carcinogenicity	Species: Rat, (male and female) Application Route: Inhalation Exposure time: 24 month(s) Dose: 1 mg/m³ Frequency of Treatment: 5 daily Method: OECD Test Guideline 453 Result: positive Target Organs: Lungs
Reproductive toxicity	
Effects on fertility	Species: Rat, female Application Route: Inhalation Method: OECD Test Guideline 414 Result: Animal testing did not show any effects on fertility. Species: Rat, male and female Application Route: Inhalation Method: OECD Test Guideline 414 Result: Animal testing did not show any effects on fertility.
Effects on foetal development	Species: Rat, male and female Application Route: Inhalation General Toxicity Maternal: No observed adverse effect level: 4 mg/m³ Method: OECD Test Guideline 414 Result: No teratogenic effects
Specific target organ systemic toxicity (single exposure)	Exposure routes: Inhalation Target Organs: Respiratory system Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.
Specific target organ systemic toxicity (repeated exposure)	Species: Rat, male and female : 0.2 mg/m3 Exposure time: 2 yr Number of exposures: 5 d Method: OECD Test Guideline 453
Assessment	Mild eye irritation

Component: Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-methyl-.omega.-hydroxypoly(oxy-1,2-ethanediyl)

Acute toxicity

Acute oral toxicity	LD50 (Rat, male): > 10,000 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	Acute toxicity estimate: 1.71 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
Acute dermal toxicity	Acute toxicity estimate : > 5,000 mg/kg Method: Calculation method
Acute toxicity other routes of administration)	No data available

Skin corrosion/irritation

Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
GLP: no

Serious eye damage/eye irritation

Species: Rabbit
Result: Mild eye irritation
Method: OECD Test Guideline 405
GLP: yes

Sensitization

Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

Exposure routes: Respiratory Tract
Species: Rat
Result: May cause sensitisation by inhalation.

Germ cell mutagenicity

Genotoxicity in vitro	Concentration: 200 ug/plate Metabolic activation: with and without metabolic activation Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative
Genotoxicity in vivo	Application Route: Inhalation Result: Not classified due to inconclusive data.
	Application Route: Inhalation Exposure time: 3 Weeks Dose: 113 mg/m3 Method: OECD Test Guideline 474 Result: negative

Chronic toxicity or effects from long-term exposure

Carcinogenicity	Species: Rat, (male and female) Application Route: Inhalation Exposure time: 24 month(s) Dose: 1 mg/m³ Frequency of Treatment: 5 daily Method: OECD Test Guideline 453 Result: negative

Reproductive toxicity

Effects on foetal development	Species: Rat, male and female Application Route: Inhalation General Toxicity Maternal: No observed adverse effect level: 4 mg/m³ Method: OECD Test Guideline 414 Result: No teratogenic effects
Specific target organ systemic toxicity (single exposure)	Exposure routes: inhalation (dust/mist/fume) Target Organs: Respiratory system Assessment: May cause respiratory irritation.
Specific target organ systemic toxicity (repeated exposure)	Species: Rat, male and female : 0.2 mg/m3 Test atmosphere: dust/mist Exposure time: 2 yr Number of exposures: 5 d Method: OECD Test Guideline 453 Species: Rat, male and female LOEC: 1.1 mg/m3 Test atmosphere: dust/mist Exposure time: 336 h Number of exposures: 6 h Method: OECD Test Guideline 412
Aspiration toxicity	No data available
Experience with human exposure	
General Information	No data available
Inhalation	No data available
Skin contact	No data available
Eye contact	No data available
Ingestion	No data available
Toxicology, Metabolism, Distribution	No data available
Neurological Effects	No data available
Further information	No data available

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity Assessment

Hazardous to the ozone layer

Ozone depletion potential	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information – Product Global warming potential (GWP)	No data available

Component: Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-hydro-.omega.-hydroxypoly[oxy(methyl-1,2-ethanediyl)]:

Toxicity to fish	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 24 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211
Toxicity to microorganisms	EC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 209
Toxicity to soil dwelling organisms	NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg Exposure time: 336 h Method: OECD Test Guideline 207

Persistance and Degradability

Biodegradability	Inoculum: Domestic sewage Concentration: 30 mg/l Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d Method: Inherent Biodegradability: Modified MITI Test (II)
Stability in water	Degradation half life(DT50): 6 d Method: No information available. Remarks: Fresh water

Bioaccumulative Potential

Bioaccumulation	Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 200 Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	log Pow: 4.51 (20 °C) pH: 7 Method: OECD Test Guideline 117

Component: propylene carbonate

Toxicity to fish	LC50 (Cyprinus carpio (Carp)): > 1,000 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.1. Remarks: No-observed-effect level

Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202 Remarks: No-observed-effect level
Toxicity to algae	ErC50 (Selenastrum capricornutum (green algae)): > 929 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201 ErC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): > 900 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to microorganisms	EC50 (Pseudomonas putida): 25,619 mg/l Exposure time: 16 h Test Type: static test Test substance: Fresh water Method: DIN 38 412 Part 8

Persistance and Degradability

Biodegradability	Concentration: 20 mg/l Result: Readily biodegradable. Biodegradation: 83.5 % Exposure time: 29 d Method: OECD Test Guideline 301B
Partition coefficient: n-octanol/water	log Pow: -0.5 (20 °C)

Component: 4,4'-methylenediphenyl diisocyanate

Toxicity to fish	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 24 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211
Toxicity to soil dwelling organisms	NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg Exposure time: 336 h Method: OECD Test Guideline 207

Persistance and Degradability

Biodegradability	Inoculum: Domestic sewage Concentration: 30 mg/l Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d Method: Inherent Biodegradability: Modified MITI Test (II)
Stability in water	Degradation half life(DT50): 20 hrs (25 °C) Method: No information available. Remarks: Fresh water

Bioaccumulative Potential

Bioaccumulation	Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 200 Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	log Pow: 4.51 (20 °C) pH: 7 Method: OECD Test Guideline 117

Component: Diphenylmethanediisocyanate

Toxicity to fish	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 203 LC0: > 1,000 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 24 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae	EC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): > 1,640 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211
Toxicity to microorganisms	EC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 209
Toxicity to soil dwelling organisms	EC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg Exposure time: 336 h Method: OECD Test Guideline 207

Persistance and Degradability

Biodegradability	Inoculum: Domestic sewage Concentration: 30 mg/l Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d Method: Inherent Biodegradability: Modified MITI Test (II)
Stability in water	Degradation half life(DT50): 0.8 d (25 °C) Method: No information available. Remarks: Fresh water

Bioaccumulative Potential

Bioaccumulation	Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 200 Remarks: Bioaccumulation is unlikely.

Component: Diphenylmethane-2,4'- diisocyanate

Toxicity to fish	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 24 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211
Toxicity to microorganisms	EC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 209
Toxicity to soil dwelling organisms	NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg Exposure time: 336 h Method: OECD Test Guideline 207

Persistance and Degradability

Biodegradability	Inoculum: Domestic sewage Concentration: 30 mg/l Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d Method: Inherent Biodegradability: Modified MITI Test (II)

Bioaccumulative Potential

Bioaccumulation	Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 200 Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	log Pow: 4.51 (20 °C) pH: 7 Method: OECD Test Guideline 117

Component: Isocyanic acid, polymethylenepolyphenylene ester, polymer with .alpha.-methyl-.omega.-hydroxypoly(oxy-1,2-ethanediyl):

Toxicity to fish	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 24 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae	EC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): > 1,640 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to fish (Chronic toxicity)	NOEC (Oncorhynchus mykiss (rainbow trout)): > 10000 mg/kg Exposure time: 112 d Test Type: static test Test substance: Fresh water
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211 NOEC (Daphnia magna (Water flea)): > 10,000 mg/l Exposure time: 112 d Test Type: static test Test substance: Fresh water
Toxicity to microorganisms	EC50 (activated sludge): > 100 mg/l Exposure time: 3 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 209
Toxicity to soil dwelling organisms	EC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg Exposure time: 336 h Method: OECD Test Guideline 207
Plant toxicity	No data available
Sediment toxicity	No data available
Toxicity to terrestrial organisms	No data available
Ecotoxicology Assessment	No data available
Acute aquatic toxicity	
Chronic aquatic toxicity	No data available
Toxicity Data on Soil	No data available
Other organisms relevant to the environment	No data available

Persistance and Degradability

Biodegradability	Inoculum: Domestic sewage Concentration: 30 mg/l Result: Not biodegradable Biodegradation: 0 % Exposure time: 28 d Method: Inherent Biodegradability: Modified MITI Test (II)
Biochemical Oxygen Demand (BOD)	No data available
Chemical Oxygen Demand (COD)	No data available
BOD/COD	No data available
ThOD	No data available
BOD/ThOD	No data available
Dissolved organic carbon (DOC)	No data available
Physio-chemical removability	No data available
Stability in water	Degradation half life(DT50): 0.8 d (25 °C) Method: No information available. Remarks: Fresh water
Photodegradation	No data available
Impact on Sewage Treatment	No data available

Mobility in soil

Mobility	No data available
Distribution among environmental compartments	No data available
Stability in soil	No data available

Other adverse effects

Environmental fate and pathways	No data available
Results of PBT and vPvB assessment	No data available
Endocrine disrupting potential	No data available
Adsorbed organic bound halogens (AOX)	No data available

SECTION 13: DISPOSAL CONSIDERATIONS

Waste from residues/unused products	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: TRANSPORT INFORMATION

IATA	Not regulated as dangerous goods
IMDG	Not regulated as dangerous goods
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable for product as supplied

DOT Classification

UN/ID/NA number	NA 3082
Proper shipping name	OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate)
Class or division	9
Packing group	III
Labels	CLASS 9
ERG Code	171
Marine pollutant	No

SECTION 15: REGULATORY INFORMATION

EPCRA – Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
4,4'-methylenediphenyl diisocyanate	101-68-8	5000	31885
chlorobenzene	108-90-7	100	*
ethylene oxide	75-21-8	10	*
formaldehyde	50-00-0	100	*
1,4-dioxane	123-91-1	100	*
acetaldehyde	75-07-0	1000	*
*Calculated RQ exceeds reasonably attainable upper limit.			

SARA 311/312 Hazards Acute Health Hazard

SARA 313 The following components are subject to reporting levels established by SARA Title III, Section 313:

4,4'-methylenediphenyl diisocyanate	101-68-8	10 – 20%
Diphenylmethanediisocyanate	9016-87-9	10 – 20%

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61): 4,4'-methylenediphenyl diisocyanate 101-68-8 15.681%

California Prop. 65

WARNING! This product contains a chemical known to the State of California to cause cancer.

ethylene oxide	75-21-8
formaldehyde	50-00-0
1,4-dioxane	123-91-1
acetaldehyde	75-07-0

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

ethylene oxide	75-21-8
Ethylene glycol mono methyl ether	109-86-4

TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

U.S. Toxic Substance Control Act (TSCA) Section 12(b) export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

Country	Regulatory list	Notification
USA	TSCA	On the inventory, or in compliance with the inventory
EU	EINECS	Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer
Canada	DSL	All components of this product are on the Canadian DSL
Australia	AICS	On the inventory, or in compliance with the inventory
Japan	ENCS	Not in compliance with the inventory
South Korea	KECI	On the inventory, or in compliance with the inventory

China	IECSC	On the inventory, or in compliance with the inventory
Philippines	PICCS	Not in compliance with the inventory
New Zealand	NZIoC	On the inventory, or in compliance with the inventory
Taiwan	TCSI	On the inventory, or in compliance with the inventory
Switzerland	CH INV	The formulation contains substances listed on the Swiss Inventory, On the inventory, or in compliance with the inventory

SECTION 16: OTHER INFORMATION

Hazard Rating System HMIS

Health: 2
Flammability: 1
Physical hazard: 0

Liquid decontaminants (percentages by weight or volume) :

Decontaminant 1 : *- sodium carbonate : 5 - 10 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 2 : *- concentrated ammonia solution : 3 - 8 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %

Decontaminant 1 reacts slower with diisocyanates but is more environmentally friendly than decontaminant 2.
Decontaminant 2 contains ammonia. Ammonia presents health hazards. (See supplier safety information.)

Information source and references

This SDS is prepared by Res-Tek from information supplied by internal references within our company.

Disclaimer: We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.