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MATERIAL SAFETY DATA SHEET

PUFFIN HICRETE 300 SDT BASE B

TRADE NAME : PUFFIN HICRETE 300 SDT BASE B

1. IDENTIFICATION OF SUBSTANCE AND COMPANY

Identification of Substance or Preparation
Chemical description : Alipathic Isocyanate
Recommendation : Hardener

Company / Undertaking Identificaation Supplier
PT.Indowijaya Sakti Teguh
Jl.Pangeran Jayakarta No. 121/3-4, Jakarta Pusat, 10730. Indonesia
Phone : +6221 6231 3238
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2. HAZARD IDENTIFICATION

Classification of the substance or mixture

- **FLAMMABLE LIQUIDS - Category 3**
- **ACUTE TOXICITY (inhalation) - Category 4**
- **SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2**
- **SKIN SENSITISATION - Category 2**
- **SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3**
- **SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects) Category 3**

GHS Label elements
Hazard pictograms :

Signal word : Warning.

Hazard statements:
Flammable liquid and vapour.
Harmful if inhaled.
Causes serious eye irritation.
May cause an allergic skin irritation and reaction
May cause respiratory irritation.
May cause drowsiness or dizziness

Precautionary statements

Prevention: Avoid breathing vapour. Wear protective gloves. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Use only outdoors or in a wellventilated area. Wash hands thoroughly after handling
Response: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
Storage : Store locked up. Store in a well-ventilated place. Keep cool
Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations

Other hazards which do not result in classification: Persons who suffer from hypersensitivity of the respiratory tract (e.g. asthmatics and chronic bronchitis sufferers) should avoid handling this product. Symptoms affecting the respiratory tract can also occur several hours after overexposure.

3. COMPOSITION/INFORMATION ON INGREDIENTS:

3.1 substances

Hazardous components
diphenylmethane-diisocyanate, isomers and homologues
Concentration [wt.-%]: <= 100
CAS-No.: 9016-87-9
Classification (1272/2008/CE): Acute Tox. 4 Inhalative H332 Skin Irrit. 2 H315 Eye Irrit. 2 H319 Resp. Sens. 1 H334 Skin Sens. 1 H317 Carc. 2 H351 STOT SE 3 H335 STOT RE 2 Inhalative H373
Specific threshold concentration (GHS):
Eye Irrit. 2 H319 >= 5 %
Skin Irrit. 2 H315 >= 5 %
Resp. Sens. 1 H334 >= 0.1 %
STOT SE 3 H335 >= 5 %
The product is a REACH-polymer: no registration number, no exposure scenarios.
Candidate List of Substances of Very High Concern for Authorisation
This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

4. FIRST AID MEASURES

Description of first aid measures

1. **Eye contact :** Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
2. **Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing.If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
3. **Skin contact :** Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse
4. **Ingestion :** Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband..

Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritations

Inhalation : Harmful if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation

Skin contact : May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following: pain or irritation watering redness

Inhalation : Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness

Skin contact : Adverse symptoms may include the following: irritation redness

Ingestion : No specific data

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

5. FIRE FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Flammable liquid and vapour. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous thermal decomposition products: Decomposition products may include the following materials:

carbondioxide, carbon monoxide ,nitrogen oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in

hazard area. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with noncombustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary

measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and wellventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

8. EXPOSURE CONTROLS PERSONAL PROTECTION

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
hexamethylene-di-isocyanate	**Workplace Safety and Health Act (Singapore, 2/2006).** PEL (long term): 0.005 ppm 8 hours. PEL (long term): 0.034 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying to EN 166 should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : There is no one glove material or combination of materials that will give unlimited resistance to any individual or combination of chemicals.

The breakthrough time must be greater than the end use time of the product.

The instructions and information provided by the glove manufacturer on use, storage, maintenance and replacement must be followed.

Gloves should be replaced regularly and if there is any sign of damage to the glove material.

Always ensure that gloves are free from defects and that they are stored and used correctly.

The performance or effectiveness of the glove may be reduced by physical/ chemical damage and poor maintenance.

Barrier creams may help to protect the exposed areas of the skin but should not be applied once exposure has occurred.

Wear suitable gloves tested to EN374.

Recommended, gloves(breakthrough time) > 8 hours: Teflon, polyvinyl alcohol (PVA), 4H

May be used, gloves(breakthrough time) 4 - 8 hours: butyl rubber, nitrile rubber, PVC, Viton®

Not recommended, gloves(breakthrough time) < 1 hour: neoprene, PE

For right choice of glove materials, with focus on chemical resistance and time of penetration, seek advice by the supplier of chemical resistant gloves. The user must check that the final choice of type of glove selected for handling this product is the most appropriate and takes into account the particular conditions of use, as included in the user's risk assessment

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For

the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearaance

Physical state	**:** Liquid.
Colour	**:** Brown
Odour	**:** Musty
Odour threshold	**:** Not Available
PH	**:** NotApplicable
Melting/freezing point	**:** NotApplicable
Boiling point	**: >**300 °C (
Flash point	**:** Closed cup: 200°C (
Burning time	**:** Not applicable
Burning rate	**:** Not applicable
Evaporation rate	**:** Highest known value: 1 (n-butyl acetate) Weighted average: 0.73compared with butyl acetate
Flammability (solid, gas)	**:** Not applicable

Lower and upper explosive (flammable) limits : 0.8 - 7.6%

Vapour pressure	**: <0.00001 in pa**(at 20°C)
Vapour density	**:** Not establised
Relative density	**:** 1.238 g/cm³
Solubility	**:** Insoluble in the following materials: cold water and hot water.
Solubility in water	**:** Not available.
Partition coefficient: noctanol/water	**:** Not available.
Auto-ignition temperature.	**:** Lowest known value: 333°C (631.4°F) (2-methoxy-1-methylethyl acetate).
Decomposition temperature	**:** Not available.
SADT	**:** Not available

Viscosity **:** Dynamic: Highest known value: 3851.69 cP (hexane, 1,6-diisocyanato-, homopolymer) Weighted average: 3422.31 cP
Kinematic: Highest known value: 1.13 cSt (2-methoxy-1-methylethyl acetate)
Weighted average: 0.94 cSt
Kinematic (40C): >20.5 cSt

10. STABILITY AND REACTIVITY

Reactivity: No specific test data related to reactivity available for this product or its ingredients.
Chemical Stability : The product is stable.

Possibility of Hazardous reaction : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions: oxidising agents, strong alkalis, strong acids

Hazardous Decomposition Products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SADT **:** Not available.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity, oral

diphenylmethane-diisocyanate, isomers and homologues LD50 rat, male/female: > 10,000 mg/kg Method: OECD Test Guideline 401

Acute toxicity, dermal diphenylmethane-diisocyanate, isomers and homologues LD50 rabbit, male/female: > 9,400 mg/kg Method: OECD Test Guideline 402

Acute toxicity, inhalation diphenylmethane-diisocyanate, isomers and homologues LC50 rat, male/female: 0.31 mg/l, 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 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 expert judgment and the weight of the evidence, a modified classification for acute inhalation toxicity is justified.

Assessment: Harmful if inhaled. Converted acute toxicity point estimate 1.5 mg/l Test atmosphere: dust/mist Method: Expert judgement

Primary skin irritation diphenylmethane-diisocyanate, isomers and homologues Species: rabbit Result: slight irritant Method: OECD Test Guideline 404

Primary mucosae irritation diphenylmethane-diisocyanate, isomers and homologues Species: rabbit Result: non-irritant Method: OECD Test Guideline 405 Toxicological studies of a comparable product.

Sensitisation diphenylmethane-diisocyanate, isomers and homologues Skin sensitisation according to Magnusson/Kligmann (maximizing test): Species: Guinea pig Result: negative Classification: Does not cause skin sensitization. Method: OECD Test Guideline 406

Skin sensitization (local lymph node assay (LLNA)): Species: Mouse Result: positive Classification: May cause sensitization by skin contact. Method: OECD Test Guideline 429 Toxicological studies of a comparable product. Respiratory sensitization Species: rat Result: positive Classification: May cause sensitization by inhalation. Subacute, subchronic and prolonged toxicity diphenylmethane-diisocyanate, isomers and homologues NOAEL: 0,2 mg/m3 LOAEL (Lowest observable adverse effect level): 1 mg/m3 Application Route: Inhalative Species: rat, male/female Dose Levels: 0 - 0,2 - 1 - 6 mg/m3 For inspection purposes only. Exposure duration: 2 a Frequency of treatment: 6 hours a day, 5 days a week Target Organs: Lungs, Nasal inner lining Test substance: as aerosol Method: OECD Test Guideline 453 Findings: Irritation to nasal cavity and to lungs. Studies of a comparable product.

Carcinogenicity diphenylmethane-diisocyanate, isomers and homologues Species: rat, male/female Application Route: Inhalative Dose Levels: 0 - 0,2 - 1 - 6 mg/m3 Test substance: as aerosol Exposure duration: 2 a Frequency of treatment: 6 hours/day, 5 days/week Method: OECD Test Guideline 453 Occurrence of tumors in the highest dose group.

Reproductive toxicity/Fertility diphenylmethane-diisocyanate, isomers and homologues No data available.

Reproductive toxicity/Teratogenicity diphenylmethane-diisocyanate, isomers and homologues NOAEL (teratogenicity): 12 mg/m³ NOAEL (maternal): 4 mg/m³ NOAEL (developmental toxicity): 4 mg/m³ Species: rat, female Application Route: Inhalative Dose Levels: 0 - 1 - 4 - 12 mg/m3 Frequency of treatment: 6 hours/day (Exposure duration: 10 days (day 6 - 15 p.c.)) Test period: 20 d Test substance: as aerosol Method: OECD Test Guideline 414 NOAEL (developmental toxicity): 4 mg/m3 Did not show teratogenic effects in animal experiments.

Genotoxicity in vitro diphenylmethane-diisocyanate, isomers and homologues Test type: Salmonella/microsome test (Ames test) Test system: Salmonella typhimurium Metabolic activation: with/without Result: negative Method: OECD Test Guideline 471

Genotoxicity in vivo diphenylmethane-diisocyanate, isomers and homologues Test type: Micronucleus test Species: rat, male Application Route: Inhalative (exposure period: 3x1h/day over 3 weeks) Result: negative Method: OECD Test Guideline 474 Studies of a comparable product.

STOT evaluation – one-time exposure diphenylmethane-diisocyanate, isomers and homologues Route of exposure: Inhalative Target Organs: Respiratory Tract May cause respiratory irritation.

STOT evaluation – repeated exposure diphenylmethane-diisocyanate, isomers and homologues Route of exposure: Inhalative Target Organs: Respiratory Tract May cause damage to organs through prolonged or repeated exposure

Aspiration toxicity diphenylmethane-diisocyanate, isomers and homologues Based on available data, the classification criteria are not met.

CMR Assessment diphenylmethane-diisocyanate, isomers and homologues Carcinogenicity: Suspected of causing cancer by inhalation (Carc. 2). Mutagenicity: In vitro an in vivo tests did not show mutagenic effects. Based on available data, the classification criteria are not met. Teratogenicity: Did not show teratogenic effects in animal experiments. Based on available data, the classification criteria are not met. Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Toxicology Assessment diphenylmethane-diisocyanate, isomers and homologues Acute effects: Harmful if inhaled. The product causes irritation of eyes, skin and mucous membranes. Sensitization: May cause sensitization by inhalation and skin contact.

Additional information diphenylmethane-diisocyanate, isomers and homologues Special properties/effects: Over-exposure entails the risk of concentration-dependent irritating effects on eyes, nose throat, and respiratory tract. Delayed appearance of the complaints and development of hypersensitivity (difficult breathing, coughing, asthma) are possible. Hypersensitive persons may suffer from these effects even at low isocyanate concentrations, including concentrations below the UK Workplace Exposure Limit (WEL). Prolonged contact with the skin may cause tanning and irritant effects. Degradable

12. ECOLOGICAL INFORMATION

Do not allow to escape into waterways, wastewater or soil.

Please find below the data available to us

Toxicity Acute Fish toxicity diphenylmethane-diisocyanate, isomers and homologues LC50 > 1,000 mg/l Test type: Acute Fish toxicity Species: Danio rerio (zebra fish) Exposure duration: 96 h Method: OECD Test Guideline 203

Acute toxicity for daphnia diphenylmethane-diisocyanate, isomers and homologues EC50 > 1,000 mg/l Test type: static test Species: Daphnia magna (Water flea) Exposure duration: 24 h Method: OECD Test Guideline 202

Chronic toxicity to daphnia diphenylmethane-diisocyanate, isomers and homologues NOEC (Reproduction) > 10 mg/l Species: Daphnia magna (Water flea) Exposure duration: 21 d Method: OECD Test Guideline 202

Acute toxicity for algae diphenylmethane-diisocyanate, isomers and homologues ErC50 > 1,640 mg/l Test type: Growth inhibition Species: scenedesmus subspicatus Exposure duration: 72 h Method: OECD

Acute bacterial toxicity diphenylmethane-diisocyanate, isomers and homologues EC50 > 100 mg/l Test type: Respiration inhibition Species: activated sludge Exposure duration: 3 h Method: OECD Test Guideline 209

Toxicity to soil dwelling organisms diphenylmethane-diisocyanate, isomers and homologues NOEC (mortality) > 1,000 mg/kg Species: Eisenia fetida (earthworms) Exposure duration: 14 d Method: OECD Test Guideline 207

Toxicity to terrestrial plants diphenylmethane-diisocyanate, isomers and homologues NOEC (seedling emergence) > 1,000 mg/kg Species: Avena sativa (oats) Exposure duration: 14 d Method: OECD Test Guideline 208

NOEC (Growth rate) > 1,000 mg/kg Species: Avena sativa (oats) Exposure duration: 14 d Method: OECD Test Guideline 208

NOEC (seedling emergence) > 1,000 mg/kg Species: Lactuca sativa (lettuce) Exposure duration: 14 d Method: OECD Test Guideline 208

NOEC (Growth rate) > 1,000 mg/kg Species: Lactuca sativa (lettuce) Exposure duration: 14 d Method: OECD Test Guideline 208

Ecotoxicology Assessment diphenylmethane-diisocyanate, isomers and homologues Acute aquatic toxicity: Based on available data, the classification criteria are not met. Chronic aquatic toxicity: There is no evidence of a chronic aquatic toxicity. Toxicity Data on Soil: Not expected to adsorb on soil. The substance is graded as non-critical to soil-dwelling organisms. Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

Persistence and degradability

Biodegradability diphenylmethane-diisocyanate, isomers and homologues Test type: aerobic Inoculum: activated sludge Biodegradation: 0 %, 28 d, i.e. not inherently degradable Method: OECD Test Guideline 302 C According to the results of tests of biodegradability this product is not readily biodegradable.

Stability in water diphenylmethane-diisocyanate, isomers and homologues Test type: Hydrolysis Half life: 20 h at 25 °C The substance hydrolyzes rapidly in water. Studies of a comparable product.

Photodegradation diphenylmethane-diisocyanate, isomers and homologues Test type: Phototransformation in air Temperature: 25 °C

sensitizer: OH-radicals Concentration sensibilisator: 500,000 1/cm3 Half-life indirect photolysis: 0.92 d Method: SRC - AOP (calculation) After evaporation or exposure to the air, the product will be moderately degraded by photochemical processes. Studies of a comparable product.

Bioaccumulative potential

Bioaccumulation diphenylmethane-diisocyanate, isomers and homologues Bioconcentration factor (BCF): < 14 Species: Cyprinus carpio (Carp) Exposure duration: 42 d Concentration: 0.2 mg/l Method: OECD Test Guideline 305 C An accumulation in aquatic organisms is not to be expected. The substance hydrolyzes rapidly in water. Studies of hydrolysis products.

Mobility in soil No data available. E

Environmental distribution diphenylmethane-diisocyanate, isomers and homologues no data available

Results of PBT and vPvB assessment diphenylmethane-diisocyanate, isomers and homologues This substance does not meet the criteria for classification as PBT or vPvB.

Other adverse effects Isocyanate reacts with water at the interface forming CO2 and a solid insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by watersoluble solvents. Previous experience shows that polyurea is inert and non-.

13.DISPOSAL CONSIDERATION

Disposal Methods : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and nonrecyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Do not allow to enter drains or watercourses. Material and/or container must be disposed of as hazardous waste.

14. TRANSPORT INFORMATION

	UN	IMDG	IATA
UN number	UN1263	UN1263	UN1263
UN proper shipping name	Paint	Paint	Paint
Transport hazard class(es)	3 	3 	3 
Packing group	III	III	III
Environmental hazards	No.	No.	No.
Additional information	-	Emergency schedules F-E, S-E	-

Additional information
Transport in accordance with ADR/RID, IMDG/IMO and ICAO/IATA and national regulation.
ADR / RID : Tunnel restriction code: (D/E)
Hazard identification number: 30
IMDG :.
Special precautions for user : transport within user's premises : always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

15. REGULATORY INFORMATION

Singapore - hazardous chemicals under government control
None.

16. OTHER INFORMATION

Key to abbreviations :

- **ATE =** Acute Toxicity Estimate
- **BCF =** Bioconcentration Factor
- **GHS =** Globally Harmonized System of Classification and Labelling of Chemicals
- **IATA =** International Air Transport Association
- **IBC =** Intermediate Bulk Container
- **IMDG =** International Maritime Dangerous Goods
- **LogPow**= logarithm of the octanol/water partition coefficient
- **MARPOL** = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- **UN** = United Nations.

References : Not available.

NOTES

PT.INDOWIJAYA SAKTI TEGUH has a responsibility to take reasonable care for our own health and safety and the health and safety of others who may be affected by our acts or omissions. This M.S.D.S. at the date of issue has Health and Safety Information of the product, and how to safely handle and use this product in the workplace.

All information given is our best knowledge, and because we cannot anticipate or control the conditions of the end use of this products, prior to usage, each user must determine by reviewing this M.S.D.S, Safe Handling and usage of this products in the Workplace.

PT.INDOWIJAYA SAKTI TEGUH believe this information to be reliable, and in good faith, but no guarantees or warranties of any kind are made as to its accuracy, suitability to particulate applications due to variations in methods, conditions and equipment. When PT.INDOWIJAYA SAKTI TEGUH provides information and service involving skill, assistance, judgment, recommendations, and or advise this is done on the best of our knowledge only; information is not be relied upon.

Full scale testing and performance of the product is the responsibility of the end user. For further information or classification of certain points to ensure that the user has made a proper assessment and reasonable precautions have been applied, please contact PT.INDOWIJAYA SAKTI TEGUH.