



MATERIAL SAFETY DATA SHEET

LUPRANATE T-80 EX KOREA (30219025/SDS-GEN-SG/EN)

Version : 6.0

Revision Date: 10.11.2010

Issuing Date: 06.02.2012

Section 1 - Chemical Product and Company Identification

Identification of the substance or preparation

Product name : LUPRANATE T-80 EX KOREA (30219025/SDS-GEN-SG/EN)
Chemical name : Toluene Diisocyanate (TDI)
Synonyms : Methylphenylene diisocyanate * Tolylene diisocyanate * Toluene diisocyanate 80/20, TDI 80/20 * Toluene diisocyanate 100, TDI 100 * Toluene diisocyanate 65, TDI 65
Molecular Formula : $\text{CH}_3\text{C}_6\text{H}_3(\text{NCO})_2$
Chemical Family : Aromatic Isocyanates

Relevant identified uses of the substance/preparation

Component for the manufacture of urethane polymers.

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Section 2 - Composition, Information on Ingredients

Component/ Chemical Nature

Components	CAS-No	Percent %
Toluene Diisocyanate	26471-62-5	100

Section 3 - Hazards Identification

Classification of the substance and mixture:

Acute toxicity: Cat. 1 (Inhalation - vapour)

Carcinogenicity: Cat. 2

Serious eye damage/eye irritation: Cat. 2

Skin corrosion/irritation: Cat. 2

Specific target organ toxicity following single exposure: Cat. 3 (irritating to respiratory system)

Respiratory sensitizer: Cat. 1

Skin sensitizer: Cat. 1

Chronic hazards to the aquatic environment: Cat. 3

Acute hazards to the aquatic environment: Cat. 3

Label elements and precautionary statement:

Pictogram:



Signal word :

Danger

Hazard Statement:

Suspected of causing cancer. Fatal if inhaled. Causes serious eye irritation. May cause respiratory irritation. Causes skin irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Harmful to aquatic life. Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.

Precautionary Statements (Response):

IF exposed or concerned: Get medical advice/attention.

Precautionary Statements (Storage):

Store in a well-ventilated place. Keep container tightly closed.

Precautionary Statements (Disposal):

Dispose of contents/container to hazardous or special waste collection point.

Contains isocyanates. See information supplied by the manufacturer.



Section 4 - First Aid Measures

General advice:

Immediately remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:

After contact with skin, wash immediately with plenty of water. Consult a doctor if skin irritation persists.

On contact with eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

Immediately rinse mouth and then drink plenty of water, do not induce vomiting, seek medical .

Note to physician:

Hazards: Symptoms can appear later. Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote, administer corticosteroid dose aerosol to prevent pulmonary odema.

Section 5 - Firefighting Measures

Suitable extinguishing media:

dry powder, carbon dioxide, alcohol-resistant foam, water spray

Specific hazards:

carbon monoxide, carbon dioxide, hydrogen cyanide, nitrogen oxides, isocyanate The substances/groups of substances mentioned can be released in case of fire.

Special protective equipment:

Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:

Keep containers cool by spraying with water if exposed to fire. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Section 6 - Accidental Release Measures

Personal precautions:

Use personal protective clothing. Use breathing apparatus if exposed to vapours/dust/aerosol. Ensure adequate ventilation.

Environmental precautions:

Do not empty into drains. Do not discharge into the subsoil/soil.



Methods for cleaning up or taking up:

For large amounts: Pump off product.

For residues: Pick up with suitable absorbent material. Dispose of absorbed material in accordance with regulations.

Neutralize with a solution of 5 - 10 % Sodium carbonate, 0,2 - 2 % detergents and 90 - 95 % water.

Section 7 - Handling and Storage

Handling

Provide suitable exhaust ventilation at the processing machines. Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. When handling heated product, vapours of the product should be ventilated, and respiratory protection used. Wear respiratory protection when spraying. Danger of bursting when sealed gastight. Protect against moisture. Products freshly manufactured from isocyanates can contain incompletely reacted isocyanates and other dangerous substances.

Storage

Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases.

Suitable materials for containers: carbon steel (iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), tin (tinplate), Stainless steel 1.4301 (V2) Unsuitable materials for containers: paper, board

Further information on storage conditions: Keep container tightly closed in a cool, well-ventilated place. Protect against moisture. Formation of CO₂ and build up of pressure possible. Danger of bursting when sealed gastight.

Storage stability:

Protect against moisture.

If moisture enters isocyanate containers, CO₂ forms and pressure builds up.

Section 8 - Exposure Controls, Personal Protection

Components with workplace control parameters

toluene-2,6-diisocyanate, 91-08-7;

TWA value 0.005 ppm (ACGIHTLV)

STEL value 0.02 ppm (ACGIHTLV)

4-methyl-m-phenylene diisocyanate, 584-84-9;

TWA value 0.005 ppm (ACGIHTLV)

STEL value 0.02 ppm (ACGIHTLV)

TWA value 0.036 mg/m³ ; 0.005 ppm (OEL (SG))

STEL value 0.14 mg/m³ ; 0.02 ppm (OEL (SG))

Personal protective equipment

Respiratory protection:

Respiratory protection in case of vapour/aerosol release. Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A) Particle filter with high efficiency for solid and liquid particles (e.g. EN 143 or 149, Type P3 or FFP3).

Suitable respiratory protection for higher concentrations or long-term effect: Self-contained breathing apparatus



Hand protection:

Chemical resistant protective gloves (EN 374) Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):
nitrile rubber (NBR) - 0.4 mm coating thickness
butyl rubber (butyl) - 0.7 mm coating thickness
chloroprene rubber (CR) - 0.5 mm coating thickness
Unsuitable materials
polyvinylchloride (PVC) - 0.7 mm coating thickness
Polyethylene-Laminate (PE laminate) - ca. 0.1 mm coating thickness

Eye protection:

Safety glasses with side-shields (frame goggles) (e.g. EN 166)

Body protection:

safety shoes (e.g. according to EN 20346)

General safety and hygiene measures:

Do not breathe vapour/spray. With products freshly manufactured from isocyanates body protection and chemical resistant protective gloves is recommended. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Keep away from food, drink and animal feeding stuffs. No eating, drinking, smoking or tobacco use at the place of work. Take off immediately all contaminated clothing. Hands and/or face should be washed before breaks and at the end of the shift. At the end of the shift the skin should be cleaned and skin-care agents applied.

Section 9 - Physical and Chemical Properties

Form	: liquid
Colour	: colourless to yellowish
Odour	: characteristic, pungent
Odour threshold	: not applicable
pH value	: not applicable
Melting point	: 10 - 14 °C
Boiling point	: approx. 250 °C (1,013 hPa)
Flash point	: approx. 131 °C
Flammability (solid/gas)	: not applicable
Lower explosion limit	: 0.9 %(V)
Upper explosion limit	: 9.5 %(V)
Ignition temperature	: > 600 °C
Thermal decomposition	: 230 °C
Vapour pressure	: 1.4 Pa (20 °C) 2.3 Pa (25 °C) 19 Pa (50 °C)
Density	: 1.22 g/cm ³ (25 °C) (DIN 51757)
Relative density	: 1.22 (20 °C)
Solubility in water	: Hydrolyzes to form water-insoluble compounds.
Partitioning coefficient n-octanol/water (log Pow)	: not applicable
Viscosity, dynamic	: 3 - 6 mPa.s (25 °C)
Molar mass	: 174.16 g/mol



Section 10 - Stability and Reactivity

Conditions to avoid:

Temperature: < 15 °C

Avoid moisture.

Thermal decomposition: 230 °C

Substances to avoid:

copper, zinc, tin, acids, alcohols, amines, water, Alkalines, copper alloys, aluminum compounds, strong oxidizing agents

Corrosion to metals: No corrosive effect on metal.

Hazardous reactions:

Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with substances which contain active hydrogen.

No hazardous decomposition products if stored and handled as prescribed/indicated.

Section 11 - Toxicological Information

Acute toxicity

Assessment of acute toxicity:

Of very high toxicity after short-term inhalation. Of low toxicity after single ingestion. Virtually nontoxic after a single skin contact.

Experimental/calculated data:

LD50 rat (oral): 4,130 mg/kg (OECD Guideline 401)

LC50 rat (by inhalation): 0.48 mg/l 1 h (OECD Guideline 403)

The vapour was tested.

LD50 rabbit (dermal): > 9,400 mg/kg (OECD Guideline 402)

Irritation

Assessment of irritating effects:

Irritating to eyes, respiratory system and skin.

Experimental/calculated data:

Skin corrosion/irritation rabbit: Irritant.

Serious eye damage/irritation rabbit: Irritant. (Draize test)

Respiratory/Skin sensitization

Assessment of sensitization:

The substance may cause sensitization of the respiratory tract. Sensitization after skin contact possible. Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.

Experimental/calculated data:

Mouse Local Lymph Node Assay (LLNA) mouse: skin sensitizing (OECD Guideline 429)

Germ cell mutagenicity

Assessment of mutagenicity:

The substance was mutagenic in various test systems with bacterias and cell cultures; however, these results could not be confirmed in tests with mammals.



Carcinogenicity

Assessment of carcinogenicity:

Indication of possible carcinogenic effect in animal tests. A clear indication of an increased risk of cancer in humans has so far not been shown. In long-term studies, a carcinogenic effect was observed when the substance was given orally to laboratory animals(gavage). Not carcinogenic in laboratory animals after long-term inhalation exposures.

Reproductive toxicity

Assessment of reproduction toxicity:

The results of animal studies gave no indication of a fertility impairing effect.

Developmental toxicity

Assessment of teratogenicity:

No indications of a developmental toxic / teratogenic effect were seen in animal studies.

Specific target organ toxicity (single exposure):

Assessment of STOT single:

Causes temporary irritation of the respiratory tract.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

The substance may cause damage to the lung even after repeated inhalation of low doses, as shown in animal studies. The substance may cause damage to the upper respiratory tract even after repeated inhalation, as shown in animal studies.

Aspiration hazard

No aspiration hazard expected.

Section 12 - Ecological Information

Ecotoxicity

Assessment of aquatic toxicity:

Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. The product may hydrolyse. The test result maybe partially due to degradation products.

Toxicity to fish:

LC50 (96 h) 133 mg/l, Oncorhynchus mykiss (OECD Guideline 203, static)

Aquatic invertebrates:

EC50 (48 h) 12.5 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

The details of the toxic effect relate to the nominal concentration.

Aquatic plants:

EC50 (96 h) 3,230 mg/l (growth rate), Skeletonema costatum (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration. (96 h) 4,300 mg/l (growth rate), Chlorella vulgaris (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration.



Microorganisms/Effect on activated sludge:

EC50 (3 h) > 100 mg/l, activated sludge (OECD Guideline 209, aquatic)

Chronic toxicity to aquatic invertebrates:

No observed effect concentration (21 d), 1.1 mg/l, Daphnia magna (OECD Guideline 211, static)

The details of the toxic effect relate to the nominal concentration.

Soil living organisms:

LC50 (14 d) > 1,000 mg/kg, Eisenia foeti da (OECD Guideline 207, artificial soil)

Terrestrial plants:

No observed effect concentration (14 d), Avena sativa (OECD Guideline 208)

No observed effect concentration (14 d), Lactuca sativa (OECD Guideline 208)

Mobility

Assessment transport between environmental compartments:

Due to the product characteristics the test is impossible.

Persistence and degradability

Elimination information:

0 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge, domestic, non-adapted) Poorly biodegradable.

Assessment of stability in water:

In contact with water the substance will hydrolyse rapidly.

Bioaccumulation potential

Assessment bioaccumulation potential:

Accumulation in organisms is not to be expected. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

Other adverse effects

Adsorbable organically-bound halogen (AOX):

This product contains no organically-bound halogen.

Additional information

Other ecotoxicological advice:

Do not release untreated into natural waters. Do not allow to enter soil, waterways or waste water channels.

Section 13 - Disposal Considerations

Incinerate in suitable incineration plant, observing local authority regulations.

Dispose of isocyanate waste in dry containers and never mix together with other wastes (reaction, dangerous pressure build up).

Contaminated packaging:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.



Section 14 - Transport Information

Domestic transport:

Hazard class: 6.1
Packing group: II
ID number: UN 2078
Hazard label: 6.1
Proper shipping name: TOLUENE DIISOCYANATE

Sea transport

IMDG
Hazard class: 6.1
Packing group: II
ID number: UN 2078
Hazard label: 6.1
Marine pollutant: NO
Proper shipping name: TOLUENE DIISOCYANATE

Air transport

IATA/ICAO
Hazard class: 6.1
Packing group: II
ID number: UN 2078
Hazard label: 6.1
Proper shipping name: TOLUENE DIISOCYANATE

Section 15 - Regulatory Information

Regulations of the European union (Labelling)

EC-Number: 247-722-4

Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances:

Hazard symbol(s)

T+ Very toxic

R-phrases(s)

R26 Very toxic by inhalation.
R36/37/38 Irritating to eyes, respiratory system and skin.
R42/43 May cause sensitization by inhalation and skin contact.
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R40 Limited evidence of a carcinogenic effect.

S-phrases(s)

S23.5 Do not breathe vapour.
S36/37 Wear suitable protective clothing and gloves.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61 Avoid release to the environment. Refer to special instructions/safety data sheets.



Contains isocyanates. Observe manufacturer's instructions.

Hazard determining component(s) for labelling: TOLYLIDENEDIISOCYANATE

Other regulations

as in Annex I of Directive 67/548/EEC

Carc. Cat. 3 - Category 3: Substances which cause concern for man due to possible carcinogenic effects, however, since sufficient information is not available a satisfactory assessment cannot be made.

not applicable

Section 16 - Additional Information

Recommended use: polyurethane component, industrial chemicals

Vertical lines in the left hand margin indicate an amendment from the previous version.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. The data do not describe the product's properties (product specification). Neither should any agreed property nor the suitability of the product for any specific purpose be deduced from the data contained in the safety data sheet. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed