SAFETY DATA SHEET
according to the Hazardous Products Regulations

REPLAST EASY 3.5 MIN, Component B

Version	Revision Date:	SDS Number:	Date of last issue: 11/10/2022
4.0	12/18/2023	5242493-00006	Date of first issue: 10/30/2019

SECTION 1. IDENTIFICATION

Product name	:	REPLAST EASY 3.5 MIN, Component B
Product code	:	893.50007B
Other means of identification	:	No data available

Manufacturer or supplier's details

Company name of supplier	:	Würth Canada Limited
Address	:	345 Hanlon Creek Blvd GUELPH, ON N1C 0A1
Telephone	:	+1 (905) 564 6225
Telefax	:	+1 (905) 564 3671
Emergency telephone	:	Emergencies involving a spill, fire, explosion or exposure: CHEMTREC (24/7): 1-800-424-9300 Transport related emergencies: CANUTEC (24/7): 1-613-996-6666 or * 666 (cell) Urgences impliquant un déversement, incendie, explosion ou exposition: CHEMTREC (24/7): 1-800-424-9300 Urgences liées au transport: CANUTEC (24/7): 1-613-996-6666 ou * 666 (cellulaire)
E-mail address	:	prodsafe@wurth.ca

Recommended use of the chemical and restrictions on use

Recommended use	:	Adhesives
Restrictions on use	:	Not applicable

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

Acute toxicity (Inhalation)	:	Category 4
Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Respiratory sensitization	:	Category 1
Skin sensitization	:	Sub-category 1A

Carcinogenicity	:	Category 2
Specific target organ toxicity - single exposure	:	Category 3
Specific target organ toxicity - repeated exposure (Inhalation)	:	Category 2 (Respiratory Tract)

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements :

H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H373 May cause damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.

Precautionary Statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves, protective clothing, eye protection and face protection.
P284 Wear respiratory protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical attention.
P333 + P313 If skin irritation or rash occurs: Get medical atten-

tion.
P337 + P313 If eye irritation persists: Get medical attention.
P342 + P311 If experiencing respiratory symptoms: Call a doctor.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents and container to an approved waste disposal plant.

Other hazards

Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	Common Name/Synonym	CAS-No.	Concentration (% w/w)
4,4'-Diphenylmethane diisocyanate	Benzene, 1,1'-methylenebis[4-isocyanato-	101-68-8	>= 10 - < 30 *
Diphenylmethane diisocyanate, isomers and homologues	Polymethylene polyphenyl polyisocyanate	9016-87-9	>= 10 - < 30 *
Talc	Talc (Mg3H2(SiO3)4)	14807-96-6	>= 10 - < 30 *
Diphenylmethane 2,4'-Diisocyanate	o-(p-isocyanatobenzyl)phenyl isocyanate	5873-54-1	>= 5 - < 10 *
2,2'-Methylenediphenyl diisocyanate	Benzene, 1,1'-methylenebis[2-isocyanato-	2536-05-2	>= 1 - < 5 *
Silicon dioxide	Silica	7631-86-9	>= 1 - < 5 *
Hydroxyalkanoic acid, compd. with aminoheterocycle polymer with hydroxyalkanoic acid, alkyltriamine, lactone and lactone	Octadecanoic acid, 12-hydroxy-,compd. with aziridine polymer with N1-(2-aminoethyl)-1,2-ethanediamine, 12-	1309457-61-1	>= 1 - < 5 *

	hydroxyoctade-canoic acid,		
4-Isocyanatosulpho-nyltoluene	Benzenesulfonyl isocyanate, 4-methyl-	4083-64-1	>= 0.1 - < 1 *
Methylenediphenyl diisocyanate, oligo-mers, reaction prod-ucts with 2-ethylhexan-l-ol	Isocyanic acid, polymethylene-polyphenylene ester, 2-ethyl-1-hexanol-blocked	147993-65-5	>= 0.1 - < 1 *
Tributyl phosphate	Phosphoric acid tributyl ester	126-73-8	>= 0.1 - < 1 *
Tosyl chloride	Benzenesulfonyl chloride, 4-methyl-	98-59-9	>= 0.1 - < 1 *

* Actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Get medical attention.
Wash clothing before reuse.
Thoroughly clean shoes before reuse.

In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.
If easy to do, remove contact lens, if worn.
Get medical attention.

If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention.
Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
Harmful if inhaled.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.
Suspected of causing cancer.

		May cause damage to organs through prolonged or repeated exposure if inhaled. Respiratory symptoms, including pulmonary edema, may be delayed. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).
Protection of first-aiders	:	First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).
Notes to physician	:	Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical Water spray in large fire situations
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during fire fighting	:	Vapors may form explosive mixtures with air. Exposure to combustion products may be a hazard to health. If the temperature rises there is danger of the vessels bursting due to the high vapor pressure.
Hazardous combustion products	:	Hydrogen cyanide (hydrocyanic acid) Isocyanates Carbon oxides Nitrogen oxides (NOx) Cyanides
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
Environmental precautions	:	Avoid release to the environment.

		Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g., by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. After approximately one hour, transfer to waste container and do not seal, due to evolution of carbon dioxide. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation	:	If sufficient ventilation is unavailable, use with local exhaust ventilation.
Advice on safe handling	:	Do not get on skin or clothing. Do not breathe mist or vapors. Do not swallow. Do not get in eyes. Wash skin thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment Keep container tightly closed. Keep away from water. Protect from moisture. Already sensitized individuals, and those susceptible to asthma, allergies, chronic or recurrent respiratory disease, should consult their physician regarding working with respiratory irritants or sensitizers. Take care to prevent spills, waste and minimize release to the environment.
Conditions for safe storage	:	Keep in properly labeled containers. Store locked up. Protect from moisture. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations.

Materials to avoid : Do not store with the following product types:
Strong oxidizing agents
Gases

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
4,4'-Diphenylmethane diisocyanate	101-68-8	TWA	0.005 ppm	CA BC OEL
		C	0.01 ppm	CA BC OEL
		TWA	0.005 ppm	CA ON OEL
		C	0.02 ppm	CA ON OEL
		TWAEV	0.005 ppm 0.051 mg/m³	CA QC OEL
		TWA	0.005 ppm	ACGIH
Diphenylmethane diisocyanate, isomers and homologues	9016-87-9	TWA	0.005 ppm 0.07 mg/m³	CA AB OEL
		TWAEV	0.005 ppm 0.051 mg/m³	CA QC OEL
		TWA	0.005 ppm	CA BC OEL
		C	0.01 ppm	CA BC OEL
		TWA	0.005 ppm	ACGIH
Talc	14807-96-6	TWAEV (respirable dust)	2 mg/m³	CA QC OEL
		TWA (Respirable particulates)	2 mg/m³	CA AB OEL
		TWA (Respirable)	2 mg/m³	CA BC OEL
		TWA	2 fibres per cubic centimeter	CA ON OEL
		TWA (Respirable fraction)	2 mg/m³	CA ON OEL
		TWA (Respirable particulate matter)	2 mg/m³	ACGIH
Diphenylmethane 2,4'-Diisocyanate	5873-54-1	C	0.02 ppm 0.2 mg/m³	OSHA Z-1
		TWA	0.005 ppm 0.05 mg/m³	NIOSH REL
		C	0.02 ppm 0.2 mg/m³	NIOSH REL
		TWA	0.005 ppm	ACGIH
2,2'-Methylenediphenyl diisocyanate	2536-05-2	TWA	0.005 ppm	CA BC OEL

		C	0.01 ppm	CA BC OEL
		TWA	0.005 ppm	ACGIH
Silicon dioxide	7631-86-9	TWAEV (respirable dust)	6 mg/m³	CA QC OEL
Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol	147993-65-5	TWAEV	0.005 ppm 0.051 mg/m³	CA QC OEL
		TWA	0.005 ppm	CA BC OEL
		C	0.01 ppm	CA BC OEL
Tributyl phosphate	126-73-8	TWA	0.2 ppm 2.2 mg/m³	CA AB OEL
		TWA	0.2 ppm	CA BC OEL
		TWAEV (inhalable fraction and vapour)	5 mg/m³	CA QC OEL
		TWA (Inhalable fraction and vapor)	5 mg/m³	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Tributyl phosphate	126-73-8	Acetylcholinesterase activity	In red blood cells	End of shift	70 % of an individual's baseline	ACGIH BEI
		Butyrylcholinesterase activity	In serum or plasma	End of shift	60 % of an individual's baseline	ACGIH BEI

Engineering measures : Processing may form hazardous compounds (see section 10).
Minimize workplace exposure concentrations.
If sufficient ventilation is unavailable, use with local exhaust ventilation.

Personal protective equipment

Respiratory protection : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

Filter type : Combined particulates and organic vapor type

Hand protection
Material : PVA
Break through time : <= 300 min
Glove thickness : >= 0.08 mm

Remarks : Choose gloves to protect hands against chemicals depending

on the concentration specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

Eye protection : Wear the following personal protective equipment:
Safety goggles

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.
When using do not eat, drink or smoke.
Contaminated work clothing should not be allowed out of the workplace.
Wash contaminated clothing before re-use.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	light green
Odor	:	mild
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	200 °C
Flash point	:	> 93.4 °C Method: closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable

Flammability (liquids)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	3 hPa (25 °C)
Relative vapor density	:	No data available
Density	:	1.26 g/cm³ (25 °C)
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions. Polymerizes at high temperatures with evolution of carbon dioxide.
Possibility of hazardous reactions	:	Vapors may form explosive mixture with air. Isocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact; these reactions can become violent. Contact is increased by stirring or if the other material mixes with the isocyanate. Exothermic reaction with acids, amines and alcohols Reacts with water to form carbon dioxide and heat Isocyanates are not soluble in water and sink to the bottom, but react slowly at the interface. The reaction forms carbon

dioxide gas and a layer of solid polyurea.
Hazardous decomposition products will be formed upon contact with water or humid air.

Conditions to avoid : Exposure to moisture.

Incompatible materials : Oxidizing agents
Acids
Bases
Water
Alcohols
Amines
Ammonia
Aluminum
Zinc
Brass
Tin
Copper
Galvanized metals
Humid air

Hazardous decomposition products : No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity

Harmful if inhaled.

Product:

Acute oral toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Acute inhalation toxicity : Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.

Acute toxicity estimate: 2.31 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

4,4'-Diphenylmethane diisocyanate:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 2.24 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Remarks: Based on data from similar materials

Diphenylmethane diisocyanate, isomers and homologues:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2.24 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Talc:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Remarks: Based on data from similar materials

Diphenylmethane 2,4'-Diisocyanate:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): 0.515 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Remarks: Based on data from similar materials

2,2'-Methylenediphenyl diisocyanate:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat, male): 0.527 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 9,400 mg/kg
Remarks: Based on data from similar materials

Silicon dioxide:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	:	LC50 (Rat): > 2.08 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit): > 5,000 mg/kg

Hydroxyalkanoic acid, compd. with aminoheterocycle polymer with hydroxyalkanoic acid, alkyltriamine, lactone and lactone:

Acute oral toxicity	:	LD50 (Mouse): 400 - 2,000 mg/kg
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg

4-Isocyanatosulphonyltoluene:

Acute oral toxicity	:	LD50 (Rat): 2,330 mg/kg Remarks: Based on data from similar materials
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity Remarks: Based on data from similar materials

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 423
Acute inhalation toxicity	:	Acute toxicity estimate: 1.5 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Expert judgment Remarks: Based on data from similar materials
Acute dermal toxicity	:	LD50 (Rabbit): > 5,000 mg/kg Remarks: Based on data from similar materials

Tributyl phosphate:

Acute oral toxicity	:	LD50 (Rat): 1,552 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 4.242 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 3,100 mg/kg

Tosyl chloride:

Acute oral toxicity : LD50 (Rat): 4,680 mg/kg

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Components:

4,4'-Diphenylmethane diisocyanate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Skin irritation
Remarks : Based on data from similar materials

Diphenylmethane diisocyanate, isomers and homologues:

Species : Rabbit
Result : Skin irritation

Talc:

Species : Rabbit
Result : No skin irritation

Diphenylmethane 2,4'-Diisocyanate:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Skin irritation
Remarks : Based on data from similar materials

2,2'-Methylenediphenyl diisocyanate:

Result : Skin irritation
Remarks : Based on national or regional regulation.

Silicon dioxide:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

4-Isocyanatosulphonyltoluene:

Result : Skin irritation
Remarks : Based on national or regional regulation.

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Species : Rabbit

Method : OECD Test Guideline 404
Result : No skin irritation

Tributyl phosphate:

Result : Skin irritation
Remarks : Based on national or regional regulation.

Tosyl chloride:

Species : Rabbit
Result : Skin irritation

Serious eye damage/eye irritation

Causes serious eye irritation.

Components:

4,4'-Diphenylmethane diisocyanate:

Result : Irritation to eyes, reversing within 7 days
Remarks : Based on national or regional regulation.

Diphenylmethane diisocyanate, isomers and homologues:

Result : Irritation to eyes, reversing within 7 days

Talc:

Species : Rabbit
Result : No eye irritation

Diphenylmethane 2,4'-Diisocyanate:

Result : Irritation to eyes, reversing within 21 days
Remarks : Based on national or regional regulation.

2,2'-Methylenediphenyl diisocyanate:

Result : Irritation to eyes, reversing within 7 days
Remarks : Based on national or regional regulation.

Silicon dioxide:

Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405

4-Isocyanatosulphonyltoluene:

Result : Irritation to eyes, reversing within 21 days
Remarks : Based on national or regional regulation.

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Species : Rabbit
Result : No eye irritation

Method : OECD Test Guideline 405

Tributyl phosphate:

Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405

Tosyl chloride:

Species : Rabbit
Result : Irreversible effects on the eye

Respiratory or skin sensitization

Skin sensitization

May cause an allergic skin reaction.

Respiratory sensitization

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Components:

4,4'-Diphenylmethane diisocyanate:

Test Type : Buehler Test
Routes of exposure : Skin contact
Species : Guinea pig
Result : positive

Assessment : Probability or evidence of skin sensitization in humans

Routes of exposure : Inhalation
Species : Rat
Result : positive
Remarks : Based on data from similar materials

Assessment : Probability of respiratory sensitization in humans based on animal testing

Diphenylmethane diisocyanate, isomers and homologues:

Test Type : Buehler Test
Routes of exposure : Skin contact
Species : Guinea pig
Result : positive
Remarks : Based on data from similar materials

Assessment : Probability or evidence of skin sensitization in humans

Routes of exposure : inhalation (dust/mist/fume)
Species : Rat
Result : positive

Assessment : Probability of respiratory sensitization in humans based on animal testing

Talc:

Routes of exposure	:	Skin contact
Species	:	Humans
Result	:	negative

Diphenylmethane 2,4'-Diisocyanate:

Routes of exposure	:	Inhalation
Species	:	Rat
Result	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	Probability or evidence of skin sensitization in humans
Assessment	:	Probability of respiratory sensitization in humans based on animal testing

2,2'-Methylenediphenyl diisocyanate:

Test Type	:	Local lymph node assay (LLNA)
Routes of exposure	:	Skin contact
Species	:	Mouse
Result	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	Probability or evidence of skin sensitization in humans
Routes of exposure	:	inhalation (dust/mist/fume)
Species	:	Guinea pig
Result	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	Probability of respiratory sensitization in humans based on animal testing

4-Isocyanatosulphonyltoluene:

Test Type	:	Local lymph node assay (LLNA)
Routes of exposure	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	negative
Remarks	:	Based on data from similar materials
Routes of exposure	:	Inhalation
Result	:	positive
Assessment	:	May cause sensitization by inhalation.
Remarks	:	Based on national or regional regulation.

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Test Type	:	Local lymph node assay (LLNA)

Routes of exposure	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	positive
Assessment	:	Probability or evidence of skin sensitization in humans
Routes of exposure	:	inhalation (dust/mist/fume)
Species	:	Guinea pig
Remarks	:	Based on data from similar materials
Assessment	:	Probability of respiratory sensitization in humans based on animal testing

Tributyl phosphate:

Routes of exposure	:	Skin contact
Species	:	Guinea pig
Result	:	negative

Tosyl chloride:

Test Type	:	Local lymph node assay (LLNA)
Routes of exposure	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	positive
Assessment	:	Probability or evidence of high skin sensitization rate in humans

Germ cell mutagenicity

Not classified based on available information.

Components:

4,4'-Diphenylmethane diisocyanate:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Rat Application Route: inhalation (dust/mist/fume) Method: OECD Test Guideline 474 Result: negative

Diphenylmethane diisocyanate, isomers and homologues:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)

Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative

Talc:

Genotoxicity in vitro : Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: negative

Genotoxicity in vivo : Test Type: Chromosome aberration test in vitro
Species: Rat
Application Route: Ingestion
Result: negative

Diphenylmethane 2,4'-Diisocyanate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative
Remarks: Based on data from similar materials

2,2'-Methylenediphenyl diisocyanate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative
Remarks: Based on data from similar materials

Silicon dioxide:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo : Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Rat
Application Route: Ingestion
Result: negative

4-Isocyanatosulphonyltoluene:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Method: OECD Test Guideline 474
Result: negative
Remarks: Based on data from similar materials

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative
Remarks: Based on data from similar materials

Tributyl phosphate:

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: negative

Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Rat
Application Route: Ingestion
Result: negative

Tosyl chloride:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Result: positive

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection

Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Suspected of causing cancer.

Components:

4,4'-Diphenylmethane diisocyanate:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 Years
Result	:	positive
Remarks	:	Based on data from similar materials
Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

Diphenylmethane diisocyanate, isomers and homologues:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 Years
Result	:	positive
Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

Talc:

Species	:	Mouse
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 Years
Result	:	negative

Diphenylmethane 2,4'-Diisocyanate:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 Years
Result	:	positive
Remarks	:	Based on data from similar materials
Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

2,2'-Methylenediphenyl diisocyanate:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 Years
Result	:	positive
Remarks	:	Based on data from similar materials
Carcinogenicity - Assess-	:	Limited evidence of carcinogenicity in animal studies

ment | Remarks: Based on national or regional regulation.

Silicon dioxide:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	103 weeks
Result	:	negative

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 Years
Result	:	positive
Remarks	:	Based on data from similar materials
Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

Tributyl phosphate:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	24 month(s)
Result	:	positive
Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

Reproductive toxicity

Not classified based on available information.

Components:

4,4'-Diphenylmethane diisocyanate:

Effects on fetal development	:	Test Type: Embryo-fetal development Species: Rat Application Route: inhalation (dust/mist/fume) Result: negative Remarks: Based on data from similar materials

Diphenylmethane diisocyanate, isomers and homologues:

Effects on fetal development	:	Test Type: Embryo-fetal development Species: Rat Application Route: inhalation (dust/mist/fume) Result: negative

Talc:

Effects on fetal development	:	Test Type: Embryo-fetal development Species: Rat Application Route: Ingestion Result: negative

Diphenylmethane 2,4'-Diisocyanate:

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

2,2'-Methylenediphenyl diisocyanate:

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

Silicon dioxide:

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rat
Application Route: Ingestion
Result: negative

4-Isocyanatosulphonyltoluene:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 416
Result: negative
Remarks: Based on data from similar materials

Effects on fetal development : Test Type: Prenatal development toxicity study (teratogenicity)
Species: Rabbit
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 414
Result: negative
Remarks: Based on data from similar materials

Tributyl phosphate:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rat
Application Route: Ingestion
Result: negative

Tosyl chloride:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Effects on fetal development : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

STOT-single exposure

May cause respiratory irritation.

Components:

4,4'-Diphenylmethane diisocyanate:

Assessment : May cause respiratory irritation.

Diphenylmethane diisocyanate, isomers and homologues:

Assessment : May cause respiratory irritation.

Diphenylmethane 2,4'-Diisocyanate:

Assessment : May cause respiratory irritation.

2,2'-Methylenediphenyl diisocyanate:

Assessment : May cause respiratory irritation.

4-Isocyanatosulphonyltoluene:

Assessment : May cause respiratory irritation.

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Assessment : May cause respiratory irritation.

STOT-repeated exposure

May cause damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.

Components:

4,4'-Diphenylmethane diisocyanate:

Routes of exposure	:	inhalation (dust/mist/fume)
Target Organs	:	Respiratory Tract
Assessment	:	Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Diphenylmethane diisocyanate, isomers and homologues:

Routes of exposure	:	inhalation (dust/mist/fume)
Target Organs	:	Respiratory Tract
Assessment	:	Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Diphenylmethane 2,4'-Diisocyanate:

Routes of exposure	:	inhalation (dust/mist/fume)
Target Organs	:	Respiratory Tract
Assessment	:	Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

2,2'-Methylenediphenyl diisocyanate:

Routes of exposure	:	inhalation (dust/mist/fume)
Target Organs	:	Respiratory Tract
Assessment	:	Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Routes of exposure	:	inhalation (dust/mist/fume)
Target Organs	:	Respiratory Tract
Assessment	:	Shown to produce significant health effects in animals at concentrations of >0.02 to 0.2 mg/l/6h/d.

Repeated dose toxicity

Components:

4,4'-Diphenylmethane diisocyanate:

Species	:	Rat
NOAEL	:	0,2 mg/m3
LOAEL	:	1 mg/m3
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 y
Remarks	:	Based on data from similar materials

Diphenylmethane diisocyanate, isomers and homologues:

Species	:	Rat
NOAEL	:	1.4 mg/m3
LOAEL	:	4.1 mg/m3
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	13 Weeks

Diphenylmethane 2,4'-Diisocyanate:

Species	:	Rat
NOAEL	:	0,2 mg/m3
LOAEL	:	1 mg/m3
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 y
Remarks	:	Based on data from similar materials

2,2'-Methylenediphenyl diisocyanate:

Species	:	Rat
NOAEL	:	0.0002 mg/l
LOAEL	:	0.001 mg/l
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 y
Remarks	:	Based on data from similar materials

Silicon dioxide:

Species	:	Rat
NOAEL	:	1.3 mg/m³
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	13 Weeks

4-Isocyanatosulphonyltoluene:

Species	:	Rat
NOAEL	:	214 mg/kg
LOAEL	:	738 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 Days
Method	:	OECD Test Guideline 408
Remarks	:	Based on data from similar materials

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Species	:	Rat
LOAEL	:	0.05 mg/kg
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	90 Days
Remarks	:	Based on data from similar materials

Tributyl phosphate:

Species	:	Mouse
LOAEL	:	> 300 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 Days

Tosyl chloride:

Species	:	Rat
LOAEL	:	150 mg/kg
Application Route	:	Ingestion

Exposure time : 34 Days
Method : OECD Test Guideline 422

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

4,4'-Diphenylmethane diisocyanate:

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): > 3,000 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 129.7 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 1,640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOEC (Desmodesmus subspicatus (green algae)): 1,640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 10 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50: > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

Diphenylmethane diisocyanate, isomers and homologues:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1,000 mg/l
Exposure time: 96 h

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 1,640 mg/l
Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chron- : NOEC (Daphnia magna (Water flea)): > 10 mg/l
Exposure time: 21 d

ic toxicity)

Talc:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 100,000 mg/l
Exposure time: 24 h

Diphenylmethane 2,4'-Diisocyanate:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1,000 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 1,640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOEC (Desmodesmus subspicatus (green algae)): 1,640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): >= 10 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50: > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

2,2'-Methylenediphenyl diisocyanate:

Toxicity to fish : LC0 (Oryzias latipes (Japanese medaka)): > 3,000 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 129.7 mg/l
Exposure time: 24 h
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 1,640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOELR (Desmodesmus subspicatus (green algae)): 1,640 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 10 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50: > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

Silicon dioxide:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 10,000 mg/l
Exposure time: 96 h
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
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 10,000 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOEC (Desmodesmus subspicatus (green algae)): 10,000 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Hydroxyalkanoic acid, compd. with aminoheterocycle polymer with hydroxyalkanoic acid, alkyltriamine, lactone and lactone:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 1 - 10 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l
Exposure time: 48 h

4-Isocyanatosulphonyltoluene:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 45 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 30 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials EC10 (Pseudokirchneriella subcapitata (green algae)): 23 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Toxicity to fish	:	LL50 (Danio rerio (zebra fish)): > 100 mg/l Exposure time: 96 h Test substance: Water Accommodated Fraction Method: Directive 67/548/EEC, Annex V, C.1.
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 2 mg/l Exposure time: 48 h Test substance: Water Accommodated Fraction Method: Directive 67/548/EEC, Annex V, C.2.
Toxicity to algae/aquatic plants	:	EL50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: Directive 67/548/EEC, Annex V, C.3.
Toxicity to microorganisms	:	EC50: > 10,000 mg/l Exposure time: 3 h Method: 88/302/EC

Tributyl phosphate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 4.2 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 2.6 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Desmodesmus subspicatus (green algae)): 2.8 mg/l Exposure time: 72 h EC10 (Desmodesmus subspicatus (green algae)): 0.92 mg/l Exposure time: 72 h
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 0.82 mg/l Exposure time: 95 d
Toxicity to daphnia and other	:	NOEC (Daphnia magna (Water flea)): 0.87 mg/l

aquatic invertebrates (Chronic toxicity)		Exposure time: 21 d
Toxicity to microorganisms	:	EC50: 100 mg/l Exposure time: 3 h Method: OECD Test Guideline 209

Tosyl chloride:

Toxicity to fish	:	LC50 (Oryzias latipes (Japanese medaka)): > 100 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 334 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l Exposure time: 72 h NOEC (Pseudokirchneriella subcapitata (green algae)): 2.6 mg/l Exposure time: 72 h
Toxicity to microorganisms	:	EC10: 240 mg/l Exposure time: 3 h Remarks: Based on data from similar materials

Persistence and degradability

Components:

4,4'-Diphenylmethane diisocyanate:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 302 Remarks: Based on data from similar materials

Diphenylmethane diisocyanate, isomers and homologues:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d

Diphenylmethane 2,4'-Diisocyanate:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d Remarks: Based on data from similar materials

2,2'-Methylenediphenyl diisocyanate:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Remarks: Based on data from similar materials

4-Isocyanatosulphonyltoluene:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 86 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
Remarks: Based on data from similar materials

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Tributyl phosphate:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 92 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Tosyl chloride:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 60 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Bioaccumulative potential

Components:

4,4'-Diphenylmethane diisocyanate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200

Partition coefficient: n-octanol/water : log Pow: 4.51

Diphenylmethane 2,4'-Diisocyanate:

Partition coefficient: n-octanol/water : log Pow: 4.51

2,2'-Methylenediphenyl diisocyanate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Concentration: 92 - 200 mg/l
Remarks: Based on data from similar materials

4-Isocyanatosulphonyltoluene:

Partition coefficient: n-octanol/water : log Pow: 0.6

Methylenediphenyl diisocyanate, oligomers, reaction products with 2-ethylhexan-l-ol:

Partition coefficient: n-octanol/water : log Pow: 4.51

Tributyl phosphate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 6.9 - 20

Partition coefficient: n-octanol/water : log Pow: 4

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Do not dispose of waste into sewer.

Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

UN/ID No.	:	UN 3334
Proper shipping name	:	Aviation regulated liquid, n.o.s. (4,4'-Diphenylmethane diisocyanate, Diphenylmethane diisocyanate, isomers and homologues)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964

Packing instruction (passenger aircraft) : 964

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

Domestic regulation

TDG
Not regulated as a dangerous good

Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

Volatile organic compounds (VOC) content
CANADIAN ENVIRONMENTAL PROTECTION ACT, 1999 - Guidelines for VOC in Consumer Products
VOC content: 0 %

The ingredients of this product are reported in the following inventories:

DSL : All chemical substances in this product comply with the CEPA 1999 and NSNR and are on or exempt from listing on the Canadian Domestic Substances List (DSL).

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
CA AB OEL	:	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
CA BC OEL	:	Canada. British Columbia OEL
CA ON OEL	:	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.
CA QC OEL	:	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
CA AB OEL / TWA	:	8-hour Occupational exposure limit
CA BC OEL / TWA	:	8-hour time weighted average
CA BC OEL / C	:	ceiling limit
CA ON OEL / C	:	Ceiling Limit (C)

CA ON OEL / TWA	:	Time-Weighted Average Limit (TWA)
CA QC OEL / TWAEV	:	Time-weighted average exposure value
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / C	:	Ceiling value not be exceeded at any time.
OSHA Z-1 / C	:	Ceiling

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Sources of key data used to compile the Material Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/
Revision Date	:	12/18/2023
Date format	:	mm/dd/yyyy

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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