

## 1 Identification

### Product identifier

Trade name: 617P39 - Diisocyanate, Component B

### Recommended use and restrictions on use

General use: Curing agent for orthopedic procedures.  
Reserved for industrial and professional use.

### Initial supplier identifier

Company name: Otto Bock HealthCare Canada Ltd.

Street/POB-No.: 5470 Harvester Road

Postal code, city: Burlington, ON L7L 5N5, CA  
Canada

WWW: www.ottobock.ca

Email: info.canada@ottobock.com

Telephone: (800) 665-3327

Telefax: (800) 463-3659

Department responsible for information:

Mark Agro, Telephone: (800) 665-3327 (9 am - 5 pm)

Additional information:

Corporate headquarters:  
Ottobock SE & Co. KGaA  
Max-Näder-Straße 15  
Duderstadt  
Germany

### Emergency telephone number

COLLECT, Telephone: (613) 996-6666

## 2 Hazard identification

### Classification

Acute Toxicity 4 (inhalative)

Skin Irritation 2

Eye Irritation 2A

Respiratory Sensitizer 1

Sensitization - skin 1

Carcinogenicity 2

Specific Target Organ Toxicity (Single Exposure) 3

Specific Target Organ Toxicity (Repeated Exposure) 2

Harmful if inhaled.

Causes skin irritation.

Causes serious eye irritation.

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

May cause an allergic skin reaction.

Suspected of causing cancer.

May cause respiratory irritation.

May cause damage to organs through prolonged or repeated exposure.

### Information elements

Symbols:



Signal word:

**Danger**

**Hazard statements:**

- 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.

**Precautionary statements:**

- Obtain special instructions before use.
- Do not breathe fume/gas/mist/vapours/spray.
- Wash hands and face thoroughly after handling.
- Use only outdoors or in a well-ventilated area.
- Contaminated work clothing should not be allowed out of the workplace.
- Wear protective gloves/protective clothing/eye protection.
- In case of inadequate ventilation wear respiratory protection.
- IF ON SKIN: Wash with plenty of water/soap.
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- IF exposed or concerned: Get medical advice/attention.
- Call a POISON CENTER/doctor if you feel unwell.
- Specific treatment (see 'First aid' on this label).
- If skin irritation occurs: Get medical advice/attention.
- If skin irritation or rash occurs: Get medical advice/attention.
- If eye irritation persists: Get medical advice/attention.
- If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
- Take off contaminated clothing and wash it before reuse.
- Store in a well-ventilated place. Keep container tightly closed.
- Store locked up.
- Dispose of contents/container to hazardous or special waste collection point.

### Other hazards known to the supplier with respect to the product

Persons with over-sensitive breath ways (e.g. asthma, chronic bronchitis) are not allowed to use the product due to safety regulations.

vapours and aerosols are the main dangers to the respiratory tract.

Respiratory symptoms may still occur several hours after overexposure.

This product should not be used under conditions of poor ventilation unless a protective mask with an appropriate gas filter (i.e. type A1 according to standard EN 14387) is used.

Special danger of slipping by leaking/spilling product.

## 3 Composition/Information on ingredients

### Material/substance

**Chemical name:** 1,1'-Methylenebis(4-isocyanatobenzene) and its oligomeric reaction products with [(methylethylene)bis(oxy)]dipropanol.

Modified diphenylmethane diisocyanate (MDI). % by weight: approx. 100%

Contains 4,4'-Methylenediphenyl diisocyanate and Diphenylmethane-2,4'-diisocyanate.

Contains Phenyl isocyanate (in traces).

CAS-Number: 75880-28-3

Hazardous ingredients:

CAS No.	Designation	Content	Classification
CAS 101-68-8	4,4'-Methylenediphenyl diisocyanate	50 - 75 %	Acute Toxicity 4 (inhalative). Skin Irritation 2. Eye Irritation 2A. Respiratory Sensitizer 1. Sensitization - skin 1. Carcinogenicity 2. Specific Target Organ Toxicity (Single Exposure) 3. Specific Target Organ Toxicity (Repeated Exposure) 2.
CAS 5873-54-1	Diphenylmethane-2,4'- diisocyanate	0.1 - 1 %	Acute Toxicity 4 (inhalative). Skin Irritation 2. Eye Irritation 2A. Respiratory Sensitizer 1. Sensitization - skin 1. Carcinogenicity 2. Specific Target Organ Toxicity (Single Exposure) 3. Specific Target Organ Toxicity (Repeated Exposure) 2.

The actual concentration or concentration range is withheld as a trade secret.

### 4 First-aid measures

#### Description of necessary first-aid measures

General information:	First aider: Pay attention to self-protection! If medical advice is needed, have product container or label at hand. Remove immediately any soiled or soaked clothing and shoes for decontamination and disposal.
In case of inhalation:	Move victim to fresh air. Put victim at rest and keep warm. In case of respiratory difficulties seek medical attention.
In case of swallowing:	Rinse mouth and drink large quantities of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Immediately get medical attention.
In case of skin contact:	Immediately clean with water and soap and, if available, apply a generous amount of polyethylene glycol 400. In case of skin irritation, consult a physician.
In case of eye contact:	Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. Subsequently consult an ophthalmologist.

#### Most important symptoms and effects, whether acute or delayed

Product causes irritation of respiratory tracts and may possibly increase sensitivity of skin and respiratory tracts. Delayed occurrence of discomfort and development of hypersensitivity are possible even at low concentrations of isocyanates. Susceptible persons may develop ailments and allergic reactions with some delay.  
In case of inhalation: Irritation of nose, throat, lung,  
Breathing difficulties, cramp feeling in breast  
After eye contact: Upon direct contact with eyes may cause burning, tearing, redness.

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

Product causes irritation of respiratory tracts and may possibly increase sensitivity of skin and respiratory tracts. Treatment of the acute irritation or bronchial narrowing is mainly symptomatic. Depending on the scale of exposition, as well as aches and pains resulting, long-term medical care may be required.  
Symptoms of poisoning can only emerge after several hours; medical supervision is therefore essential for at least 48 hours.

## 5 Fire-fighting measures

### Suitable and unsuitable extinguishing media

Suitable extinguishing media:

Carbon dioxide, foam, extinguishing powder.  
In case of large fires: Also Water spray jet.

Unsuitable extinguishing media:

Full water jet

### Specific hazards arising from the product

On heating or in case of fire toxic gases may form.  
In case of fire may be liberated: Nitrogen oxides (NO<sub>x</sub>), Isocyanate vapours, traces of hydrogen cyanide, nitrous fumes, carbon monoxide.

### Special protective equipment and precautions for fire-fighters

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

Additional information:

Heating causes rise in pressure with risk of bursting.  
Cool endangered containers with water spray and, if possible, remove from danger zone.  
Do not allow water used to extinguish fire to enter drains, ground or waterways.

## 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Avoid exposure. Provide adequate ventilation. Avoid contact with the substance.  
Do not breathe fume/gas/mist/vapours/spray. Keep unprotected people away. Wear appropriate protective equipment.  
Take off contaminated clothing and wash it before reuse.  
In case of inadequate ventilation wear respiratory protection.

Environmental precautions:

Do not allow to penetrate into soil, waterbodies or drains.  
In case of release, notify competent authorities.

### Methods and material for containment and cleaning up

Cover with moist liquid binding material (e.g. sand, chemical agent with calcium silicahydrate). After approximately 1 hour, mechanically collect in an open waste container (CO<sub>2</sub> build-up).  
keep moist and allow to stand in a secure area for 7 to 14 days.  
Dispose of waste according to applicable legislation.

Additional information:

Special danger of slipping by leaking/spilling product.

## 7 Handling and storage

### Precautions for safe handling

Advices on safe handling: Obtain special instructions before use.  
Provide adequate ventilation, and local exhaust as needed.  
Vent high concentrations of aerosols and/or fumes from the work area. Airflow should move away from persons. The effectiveness of the facilities must be checked at regular intervals.  
Wear appropriate protective equipment. Take off immediately all contaminated clothing and wash it before reuse.  
Avoid contact with skin and eyes. Do not breathe fume/gas/mist/vapours/spray. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work.  
Work place should be equipped with a shower and an eye rinsing apparatus.

Precautions against fire and explosion:

Keep away from sources of ignition - No smoking.

### Conditions for safe storage, including any incompatibilities

Requirements for storerooms and containers:

Keep container tightly closed and in a well-ventilated place.  
Keep container dry. Keep only in the original container.  
Protect from heat and direct sunlight.  
Store containers in upright position. Sensitive to cold from 25 °C. Sensitive to heat and warmth from 50 °C.

Hints on joint storage:

Keep away from food, drink and animal feedingstuffs.  
keep away from: Water, acids, alkalis, amines, alcohols.

Further details:

Do not allow the product to enter the ground.  
Only trained personnel may be allowed to enter storage area.

## 8 Exposure controls/Personal protection

### Control parameters

Occupational exposure limit values:

CAS No.	Designation	Type	Limit value
101-68-8	4,4'-Methylenediphenyl diisocyanate	Canada: Alberta, OEL 8 hour	0.05 mg/m <sup>3</sup> ; 0.005 ppm
		Canada: BC, OEL Ceiling	0.01 ppm
		Canada: BC, OEL TWA	0.005 ppm
		Canada: Ontario, OEL Ceiling	0.02 ppm
		Canada: Ontario, OEL TWA	0.005 ppm
		Canada: Québec, VEMP	0.051 mg/m <sup>3</sup> ; 0.005 ppm
103-71-9	Phenyl isocyanate	Canada: BC, OEL STEL	0.015 ppm (may be absorbed through the skin)
		Canada: BC, OEL TWA	0.005 ppm (may be absorbed through the skin)
		Canada: Ontario, OEL STEL	0.015 ppm (may be absorbed through the skin)
		Canada: Ontario, OEL TWA	0.005 ppm (may be absorbed through the skin)
		Canada: Québec, VECD	0.015 ppm (may be absorbed through the skin)
		Canada: Québec, VEMP	0.005 ppm (may be absorbed through the skin)
5873-54-1	Diphenylmethane-2,4'-diisocyanate	Canada: BC, OEL Ceiling	0.01 ppm
		Canada: BC, OEL TWA	0.005 ppm

### Appropriate engineering controls

Provide good ventilation and/or an exhaust system in the work area. Execute works under fume hood. Airflow should move away from persons. The effectiveness of the facilities must be checked at regular intervals.

### Individual protection measures, such as personal protective equipment

**Respiratory protection:** Respiratory protection must be worn whenever the TLV (WEL) levels have been exceeded. In case of inadequate ventilation wear respiratory protection. Use combination filter type A2-P2 according to OSHA Standard - 29 CFR: 1910.134 or ANSI Z88.2.

**Hand protection:** Protective gloves according to OSHA Standard - 29 CFR: 1910.138.  
Glove material:  
Polychloroprene - CR ( $\geq 0,5$  mm) Breakthrough time:  $>480$  min.  
Nitrile rubber - NBR ( $\geq 0,35$  mm) Breakthrough time:  $>480$  min.  
Butyl caoutchouc (butyl rubber) - IIR ( $\geq 0,5$  mm) Breakthrough time:  $>480$  min.  
Fluororubber (Viton) - FKM ( $\geq 0,4$  mm) Breakthrough time:  $>480$  min.  
natural rubber - NR ( $\geq 0,5$  mm) Breakthrough time:  $>480$  min.  
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

**Eye protection:** Tightly sealed goggles according to OSHA Standard - 29 CFR: 1910.133 or ANSI Z87.1-2010.

Body protection: Wear suitable protective clothing.

General hygiene considerations:

Obtain special instructions before use.

Take off immediately all contaminated clothing and wash it before reuse.

Avoid contact with skin and eyes. Do not breathe fume/gas/mist/vapours/spray. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work.

Work place should be equipped with a shower and an eye rinsing apparatus.

### Environmental exposure controls

Refer to 6.: Section "Environmental precautions".

## 9 Physical and chemical properties

### Information on basic physical and chemical properties

Physical state at 20 °C and 101.3 kPa	liquid
Colour:	Form: Viscous Yellowish
Odour:	Weak aromatic
Odour threshold:	No data available
Melting point and freezing point:	No data available
Boiling point or initial boiling point and boiling range:	> 300 °C (DIN 53171, 1013 hPa)
Flammability:	No data available
Lower and upper explosion limit or lower and upper flammability limit:	No data available
Flash point/flash point range:	222 °C (DIN 2719, 1013hPa)
Evaporation rate:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	approx. 230 °C
pH:	No data available
Dynamic viscosity:	at 20 °C: 1,089 mPa*s (DIN 53019)
Water solubility:	at 15 °C: immiscible
Partition coefficient — n-octanol/water:	No data available
Vapour pressure:	at 20 °C: 7 hPa (EG A 4) at 50 °C: 25 hPa (EG A 4)
Density and/or relative density	at 20 °C: 1.208 g/mL (DIN 51757)
Vapour density:	No data available
Particle characteristics:	Not applicable

### Additional information

Ignition temperature:	495 °C (DIN 51794)
Drop point/drop range:	-18 °C (DIN ISO 3016)
Additional information:	Vapour pressure at 20 °C Diphenylmethane diisocyanate: <0,00001 hPa

## 10 Stability and reactivity

Reactivity: Refer to subsection "Possibility of hazardous reactions".

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions:

Reactions with alcohols, amines, liquid acids and bases.  
Contact with Water liberates carbon dioxide.  
Heating causes rise in pressure with risk of bursting.

Conditions to avoid: Protect from moisture contamination. Protect from direct sunlight. Protect from frost.  
Keep away from heat sources, sparks and open flames.

Incompatible materials: Water, acids, alkalis, amines, alcohols

Hazardous decomposition products:

Nitrogen oxides (NO<sub>x</sub>), Isocyanate vapours, traces of hydrogen cyanide, nitrous fumes, carbon monoxide.

## 11 Toxicological information

### Information on the likely routes of exposure

No data available

### Health hazard information

Acute toxicity (oral): Based on available data, the classification criteria are not met.

Acute toxicity (dermal): Based on available data, the classification criteria are not met.

Acute toxicity (inhalative): Acute Toxicity 4 (inhalative) = Harmful if inhaled.

Skin corrosion/irritation: Skin Irritation 2 = Causes skin irritation.

Serious eye damage/irritation: Eye Irritation 2A = Causes serious eye irritation.

Sensitisation to the respiratory tract: Respiratory Sensitizer 1 = May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin sensitisation: Sensitization - skin 1 = May cause an allergic skin reaction.

Germ cell mutagenicity/Genotoxicity: Based on available data, the classification criteria are not met.

Carcinogenicity: Carcinogenicity 2 = Suspected of causing cancer.

Reproductive toxicity: Based on available data, the classification criteria are not met.

Effects on or via lactation: Lack of data.

Specific target organ toxicity (single exposure): Specific Target Organ Toxicity (Single Exposure) 3 = May cause respiratory irritation.

Specific target organ toxicity (repeated exposure): Specific Target Organ Toxicity (Repeated Exposure) 2 = May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard: Based on available data, the classification criteria are not met.

Acute toxicity:

LD50 Rat, oral: > 15,800 mg/kg

LD50 Rabbit, dermal: > 7,940 mg/kg

LC50 Rat, inhalative vapour: > 0.48 mg/L/6h

LC50 Rat, inhalative dust/mist: 0.368 mg/L/4h

### Other information:

Concentration of the saturated vapour of 4,4'-Methylenediphenyl diisocyanate at 25 °C:  
0,09 mg/m<sup>3</sup>

Substance shown to be clearly carcinogenic in animal studies.

A long-term studie with rats over two years with mechanically produced, inhalable aerosols (aerodyn. diametre of 95% under 5 µm) of polymer MDI (PMDI) and concentrations of 0.2, 1.0 and 6.0 mg PMDI/m<sup>3</sup> showed the following results:

The group of animals exposed to the highest concentration suffered an increased incidence of lung tumours, persistent inflammatory changes to the nose, respiratory tract and lungs, and yellowish deposits in the respiratory tract and lungs.

The animals in the 1.0 mg/m<sup>3</sup> group exhibited slight irritation and inflammatory changes to the nose, respiratory tract and lungs, but did not develop lung tumours and/or deposits.

Animals in the 0.2 mg/m<sup>3</sup> group suffered no irritation: this concentration was therefore deemed to constitute the 'no-effect level'.

### Symptoms

Product causes irritation of respiratory tracts and may possibly increase sensitivity of skin and respiratory tracts. Delayed occurrence of discomfort and development of hypersensitivity are possible even at low concentrations of isocyanates. Susceptible persons may develop ailments and allergic reactions with some delay.

In case of inhalation: Irritation of nose, throat, lung,

Breathing difficulties, cramp feeling in breast

After eye contact: Upon direct contact with eyes may cause burning, tearing, redness.

## 12 Ecological information

### Ecotoxicity

#### Aquatic toxicity:

Algae toxicity:

ErC50 Scenedesmus subspicatus: > 1,64 mg/l/72h (OECD 201)

Bacterial toxicity:

EC50 activated sludge: > 100 mg/l/3h (OECD 209)

Daphnia toxicity:

EC50 Daphnia magna: > 1,000 mg/l/24h (OECD 202)

NOEC Daphnia magna: > 10 mg/l/21d (OECD 202)

Fish toxicity:

LC50 Danio rerio (zebrafish): > 1,000 mg/l/96h (OECD 203)

#### Further details:

Solubility in water: not miscible

### Persistence and degradability

#### Further details:

Product is not biodegradable.

Forms carbon dioxide and turns into a hard and insoluble by-product (poly urea) on the water's edge. This reaction is intensified by surface-active substances (e.g. liquid soaps) or water soluble solvents. Based upon current knowledge, poly urea is inert and will not decompose.

### Bioaccumulative potential

BCF Cyprinus carpio (Common Carp): 200/28d (OECD 305E)

#### Partition coefficient — n-octanol/water:

No data available

### Mobility in soil

No data available

### Other adverse effects

General information: Do not allow to penetrate into soil, waterbodies or drains.

## 13 Disposal considerations

### Waste treatment methods

#### Product

Recommendation: Dispose of waste according to applicable legislation.  
Do not dispose of with household waste.  
Do not empty into drains.

#### Package

Recommendation: Empty carefully and completely, if possible.  
Dispose of waste according to applicable legislation.  
Non-contaminated packages may be recycled.

## 14 Transport information

### UN number

TDG, IMDG, IATA-DGR: not applicable

### UN proper shipping name

TDG, IMDG, IATA-DGR: Not restricted

### Transport hazard class

TDG, IMDG, IATA-DGR: not applicable

### Packing group

TDG, IMDG, IATA-DGR: not applicable

### Environmental hazards

Marine pollutant: no

### Special precautions in connection with transport or conveyance either within or outside the premises

#### Canada: Transportation of Dangerous Goods (TDG)

Shipping name: Not restricted

#### Sea transport (IMDG)

Proper shipping name: Not restricted  
Marine pollutant: no

### Air transport (IATA)

Proper shipping name: Not restricted

### Further information

Sensitive to cold from 25 °C. Sensitive to heat and warmth from 50 °C.  
keep away from: food, acids, alkalis.

## 15 Regulatory information

### National regulations - Canada

Product: DSL: listed  
4,4'-Methylenediphenyl diisocyanate: DSL: listed  
CEPA Schedule 1: listed  
Phenyl isocyanate: DSL: listed  
Diphenylmethane-2,4'-diisocyanate: DSL: listed  
CEPA Schedule 1: listed

### Further regulations, limitations and legal requirements

No data available

## 16 Other information

Additional safety measures for handling newly-molded PUR-parts:  
Depending on the processing parameters during production, polyurethane parts with uncovered surfaces which are produced using this raw material may contain traces of substances starting and reaction products with hazardous properties at the surface. Wear textile protective gloves that are coated with nitrile rubber, PVC, or PUR (or better), when demolding or handling newly-molded form parts in general. Protective gloves must be changed regularly, in particular following intensive contact with the product. Wearing protective clothing appropriate for usual handling conditions of newly-molded PUR-parts is recommended (long sleeves, if necessary)

Text for labelling: Contains isocyanates (1,1'-Methylenebis(4-isocyanatobenzene) and its oligomeric reaction products with [(methylethylene)bis(oxy)]dipropanol).  
As from 24 August 2023 adequate training is required before industrial or professional use.  
Revision date: 2/3/2026  
Date of first version: 29/5/2008  
Reason of change: Changes in section 8: Occupational exposure limit values

### Abbreviations and acronyms:

Acute Toxicity: Acute toxicity  
 AS/NZS: Australian Standards/New Zealand Standards  
 BCF: Bioconcentration Factor  
 Carcinogenicity: Carcinogenicity  
 CAS: Chemical Abstracts Service  
 CEPA: Canadian Environmental Protection Act  
 CFR: Code of Federal Regulations  
 CLP: Classification, Labelling and Packaging  
 DMEL: Derived minimal effect level  
 DNEL: Derived no-effect level  
 DSL: Domestic Substances List  
 EC: European Community  
 EC50: Effective Concentration 50%  
 EmS: Emergency Response Procedures for Ships Carrying Dangerous Goods  
 EN: European Standard  
 EQ: Excepted quantities  
 Eye Irritation: Eye irritation  
 IATA: International Air Transport Association  
 IATA-DGR: International Air Transport Association – Dangerous Goods Regulations  
 IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk  
 IMDG Code: International Maritime Dangerous Goods Code  
 IMO: International Maritime Organization  
 LC50: Median lethal concentration  
 LD50: Lethal dose 50%  
 MARPOL: Maritime Pollution: The International Convention for the Prevention of Pollution from Ships  
 NOEC: No Observed Effect Concentration  
 OEL: Occupational Exposure Limit Value  
 OSHA: Occupational Safety and Health Administration  
 PBT: Persistent, bioaccumulative and toxic  
 PNEC: Predicted no-effect concentration  
 PVC: Polyvinyl chloride  
 REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals  
 Respiratory Sensitizer: Sensitisation to the respiratory tract  
 Sensitization - skin: Skin sensitisation  
 Skin Irritation: Skin irritation  
 STOT RE: Specific target organ toxicity - repeated exposure  
 STOT SE: Specific target organ toxicity - single exposure  
 TDG: Transportation of Dangerous Goods Regulation in Canada  
 TLV: Threshold Limit Value  
 TRGS: Technical Rules for Hazardous Substances  
 vPvB: Very persistent and very bioaccumulative  
 WEL: Workplace Exposure Limit

### Department issuing data sheet

Contact person: see section 1: Department responsible for information

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.