

617P39 - Diisocyanate, Component B

Material number 617P39

Page:

1 of 12

1. Product and company 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

E-mail: 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 phone number

COLLECT, Telephone: (613) 996-6666
Transport:
CONSULTANK Lutz Harder GmbH (Contract QUALI003)
Telephone: +49 (0)178-4337434 (from USA: 01149 178 4337434)

2. Hazards identification

Emergency overview

Appearance: Physical state at 20 °C and 101.3 kPa: liquid

Form: Viscous

Color: Yellowish

Odor: Weak aromatic

 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.

Hazard 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/vapors/spray.
- Avoid breathing dust/fume/gas/mist/vapors/spray.
- Wear protective gloves/protective clothing/eye protection.
- In case of inadequate ventilation wear respiratory protection.
- 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.
- If experiencing respiratory symptoms: Call a POISON CENTER/doctor.

Regulatory status

This material is considered hazardous by the WHMIS in Canada.

Hazards not otherwise classified

Persons with over-sensitive breath ways (e.g. asthma, chronic bronchitis) are not allowed to use the product due to safety regulations.
Vapors 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.
see section 11: Toxicological information

3. Composition / Information on ingredients

Chemical characterisation: 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

Relevant ingredients:

CAS No.	Designation	Concentration	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.

4. 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.
Following 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.
After 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.
After 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.

Most important symptoms and effects, both acute and 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 difficulty, cramp feeling in breast
After eye contact: Upon direct contact with eyes may cause burning, tearing, redness.

Information to physician

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

Flash point/flash point range:

222 °C (DIN 2719, 1013hPa)

Auto-ignition temperature: No data available

Suitable extinguishing media:

Carbon dioxide, foam, extinguishing powder.

In case of large fires: Also Water spray jet.

Extinguishing media which must not be used for safety reasons:

Full water jet

Specific hazards arising from the chemical

On heating or in case of fire toxic gases may form.

In case of fire may be liberated: Nitrogen oxides (NO_x), Isocyanate vapors, 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:

Avoid exposure. Provide adequate ventilation. Avoid contact with the substance.

Do not breathe fume/gas/mist/vapors/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 for clean-up:

Cover with moist liquid binding material (e.g. sand, chemical agent with calcium silicate hydrate). After approximately 1 hour, mechanically collect in an open waste container (CO₂ 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

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/vapors/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.

Specific use(s)

Curing agent for orthopedic procedures.

Storage

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

Exposure guidelines

Occupational exposure limit values:

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

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.

See also information in chapter 7, section storage.

Personal protection equipment (PPE)

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

Skin protection: Wear suitable protective clothing.

Protective gloves according to OSHA Standard - 29 CFR: 1910.138.

Glove material:

Polychloroprene - CR (>= 0,5 mm) Breakthrough time: >480 min.

Nitrile rubber - NBR (>= 0,35 mm) Breakthrough time: >480 min.

Butyl caoutchouc (butyl rubber) - IIR (>= 0,5 mm) Breakthrough time: >480 min.

Fluororubber (Viton) - FKM (>= 0,4 mm) Breakthrough time: >480 min.

natural rubber - NR (>= 0,5 mm) Breakthrough time: >480 min.

Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

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.

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/vapors/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

Appearance:	Physical state at 20 °C and 101.3 kPa: liquid Form: Viscous Color: Yellowish
Odor:	Weak aromatic
Odor threshold:	No data available
pH:	No data available
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	> 300 °C (DIN 53171, 1013 hPa)
Flash point/flash point range:	222 °C (DIN 2719, 1013hPa)
Evaporation rate:	No data available
Flammability:	No data available
Explosion limits:	No data available
Vapor pressure:	at 20 °C: 7 hPa (EG A 4) at 50 °C: 25 hPa (EG A 4)
Vapor density:	No data available
Density:	at 20 °C: 1.208 g/mL (DIN 51757)
Water solubility:	at 15 °C: immiscible
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Thermal decomposition:	approx. 230 °C
Viscosity, dynamic:	at 20 °C: 1,089 mPa*s (DIN 53019)
Ignition temperature:	495 °C (DIN 51794)
Drop point/drop range:	-18 °C (DIN ISO 3016)
Additional information:	Vapor 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_x), Isocyanate vapors, traces of hydrogen cyanide, nitrous fumes, carbon monoxide.

Thermal decomposition:

approx. 230 °C

11. Toxicological information

Toxicological tests

Acute toxicity:

LD50 Rat, oral: > 15,800 mg/kg
LD50 Rabbit, dermal: > 7,940 mg/kg
LC50 Rat, inhalative vapor: > 0.48 mg/L/6h
LC50 Rat, inhalative dust/mist: 0.368 mg/L/4h

Toxicological effects:

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.

Other information:

Concentration of the saturated vapor of 4,4'-Methylenediphenyl diisocyanate at 25 °C:
0,09 mg/m³

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/m³ 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/m³ 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/m³ 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 difficulty, 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

Mobility in soil

No data available

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.

Additional ecological information

Volatile organic compounds (VOC):

0 % by weight

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

13. Disposal considerations

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

ADR/RID, IMDG, IATA-DGR:

not applicable

UN proper shipping name

ADR/RID, IMDG, IATA-DGR:

Not restricted

Transport hazard class(es)

ADR/RID, IMDG, IATA-DGR:

not applicable

Packing group

ADR/RID, IMDG, IATA-DGR:

not applicable

Environmental hazards

Marine pollutant:

no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No data available

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

4,4'-Methylenediphenyl diisocyanate: DSL: listed

Phenyl isocyanate: DSL: listed

Diphenylmethane-2,4'-diisocyanate: DSL: listed

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 labeling:

Contains >= 24 % 1,1'-Methylenebis(4-isocyanatobenzene) and its oligomeric reaction products with [(methylethylene)bis(oxy)]dipropylol, 50 - 75 % 4,4'-Methylenediphenyl diisocyanate, 0.1 - 1 % Diphenylmethane-2,4'-diisocyanate. Safety data sheet available on request.

Contains isocyanates (1,1'-Methylenebis(4-isocyanatobenzene) and its oligomeric reaction products with [(methylethylene)bis(oxy)]dipropylol).

As from 24 August 2023 adequate training is required before industrial or professional use.

Hazard rating systems:



NFPA Hazard Rating:

Health: 2 (Moderate)

Fire: 1 (Slight)

Reactivity: 3 (Serious)

HMIS Version III Rating:

Health: 2 (Moderate) - Chronic effects

Flammability: 1 (Slight)

Physical Hazard: 3 (Serious)

Personal Protection: X = Consult your supervisor

HEALTH	*	2
FLAMMABILITY		1
PHYSICAL HAZARD		3
		X

Abbreviations and acronyms:

Acute Toxicity: Acute toxicity
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
AS/NZS: Australian Standards/New Zealand Standards
BCF: Bioconcentration Factor
Carcinogenicity: Carcinogenicity
CAS: Chemical Abstracts Service
CFR: Code of Federal Regulations

617P39 - Diisocyanate, Component B

Material number 617P39

Revision date: 30/12/2022
Version: 8.1
Replaces version: 8.0
Language: en-CA
Date of print: 2/9/2025

Page: 12 of 12

CLP: Classification, Labelling and Packaging
DMEL: Derived minimal effect level
DNEL: Derived no-effect level
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
RID: Regulations Concerning the International Carriage of Dangerous Goods by Rail
Sensitization - skin: Skin sensitisation
Skin Irritation: Skin irritation
STOT RE: Specific target organ toxicity - repeated exposure
STOT SE: Specific target organ toxicity - single exposure
TLV: Threshold Limit Value
TRGS: Technical Rules for Hazardous Substances
vPvB: Very persistent and very bioaccumulative
WEL: Workplace Exposure Limit
WHMIS: Workplace Hazardous Materials Information System

Reason of change: General revision

Date of first version: 29/5/2008

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.