


1 Identification

- **Product identifier**
- **Product name:** **Isophorone Diisocyanate (IPDI)**
- **Chemical name :** 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate
- **CAS Number:** 4098-71-9
- **EC number:**
223-861-6
- **Relevant identified uses of the substance or mixture and uses advised against**
Relevant identified uses :
Chemical intermediate
Uses advised against:
For further information, refer to section 16.
- **Application of the substance / the mixture**
For further information, refer to the product technical data sheet.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Vencorex US, Inc.
6213 Highway 322 E
Freeport TX 77541
USA
Tel.: +1 979 238 8660
Fax: +1 979 233 3218
www.vencorex.com
- **Information department:** productinfo@vencorex.com
- **Emergency telephone number:**
FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT:
CHEMTREC 800-424-9300 within the United States or 703-527-3887 for international collect calls.
Vencorex Chemtrec Customer Number: CCN227304

2 Hazard(s) identification

- **Classification of the substance or mixture**
Acute Tox. 1 H330 Fatal if inhaled.
Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Corr. 1C H314 Causes severe skin burns and eye damage.
Skin Sens. 1 H317 May cause an allergic skin reaction.
- **Label elements**
- **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**

GHS05 GHS06 GHS08
- **Signal word** Danger
- **Hazard-determining components of labeling:**
3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate
- **Hazard statements**
H330 Fatal if inhaled.
H314 Causes severe skin burns and eye damage.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
- **Precautionary statements**
P260 Do not breathe dust/fume/gas/mist/vapours/spray.

Safety Data Sheet acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 1)

- P284 In case of inadequate ventilation wear respiratory protection.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P309+P311 IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.
- P302+P350 IF ON SKIN: Gently wash with plenty of soap and water.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.

• **Hazard description:**

DANGER! TOXIC IF INHALED. HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN. SENSITIZER. SEVERE EYE, SKIN AND RESPIRATORY TRACT IRRITANT. REACTS WITH COMMON MATERIALS INCLUDING WATER, ALCOHOLS, BASES AND AMINES RELEASING LARGE AMOUNTS OF CARBON DIOXIDE.

• **Classification system:**

• **NFPA ratings (scale 0 - 4)**



Health = 3
Fire = 1
Reactivity = 1

• **HMIS-ratings (scale 0 - 4)**

HEALTH	3
FIRE	1
REACTIVITY	1

Health = 3
Fire = 1
Reactivity = 1

• **Other hazards**

Combustible liquid.

On contact with water or humidity:
carbon dioxide is released.

Hazardous reactions occur on contact with many common products. (Refer to the list of incompatible materials section 10: "Stability-Reactivity").

• **Results of PBT and vPvB assessment**

- **PBT:** No.
- **vPvB:** No.

3 Composition/information on ingredients

- **Chemical characterization: Substances**
- **Identification number(s)**
- **EC number:** 223-861-6

• **Chemical components:**

CAS: 4098-71-9	3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	> 99.5%
EINECS: 223-861-6		

4 First-aid measures

• **Description of first aid measures**

• **General information:**

Use appropriate protective equipment when treating a contaminated person.

Immediately remove any clothing soiled by the product.

Place contaminated clothing in a sealed bag for disposal.

Remove breathing apparatus only after contaminated clothing have been completely removed.

In case of irregular breathing or respiratory arrest provide artificial respiration.

(Contd. on page 3)

Safety Data Sheet acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 2)

- **After inhalation:**
Quickly move the person away from the contaminated area.
Make the affected person rest.
Always obtain medical advice immediately.
Show this sheet to the doctor.
- **After skin contact:**
Wash with soap and water.
Wash immediately and thoroughly for a prolonged period (at least 15 minutes).
In case of inflammation (redness, irritation, ...) obtain medical attention.
Show this sheet to the doctor.
- **After eye contact:**
Immediately rinse with plenty of running water for a prolonged period, (at least 15 minutes) while keeping the eyes wide open.
Always obtain medical advice immediately, even if there are no symptoms.
Show this sheet to the doctor.
- **After swallowing:**
NEVER attempt to induce vomiting. Rinse mouth out with water.
Do not give anything to drink.
Always obtain medical attention immediately.
Show this sheet to the doctor.
- **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
- **Danger**
Skin contact may aggravate existing skin disease. Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis.
- **Indication of any immediate medical attention and special treatment needed**
All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
Treat symptomatically. No specific antidote available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
Multi-purpose powders
Carbon dioxide
Alcohol resistant foam
- **For safety reasons unsuitable extinguishing agents:** Water
- **Special hazards arising from the substance or mixture**
Combustible liquid.
During combustion toxic vapors are released.
- **Advice for firefighters**
- **Protective equipment:**
Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.
- **Additional information**
Stay upwind.
Evacuate the personnel away from the fumes.
In case of fire close by:
Cool down the containers/equipment exposed to heat with a water spray. Ensure that there is NO direct contact between the water and the product.
Do not breathe fumes.
Do NOT attempt to fight the fire without suitable protective equipment.
If there is a fire close by and if packaging has not been damaged:
Use suitable extinguishers.

USA

(Contd. on page 4)

Safety Data Sheet acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 3)

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Avoid contact with the eyes and skin.
Do not breathe vapours.
Do NOT approach from DOWNWIND.
Do NOT attempt to take action WITHOUT suitable protective equipment.
Self-contained breathing apparatus.
Full impermeable protective clothing and equipment.
Mark out the contaminated area with signs and prevent access to unauthorized personnel.
Keep people at a distance and stay upwind.

- **Environmental precautions:**

Do not allow to enter sewers/ surface or ground water.
Contain the spilled material by binding.

- **Methods and material for containment and cleaning up:**

Do NOT spray water into packaging which has been damaged or overturned.
Pump up the product into a spare container suitably labelled.
Recover the cleaning water for subsequent disposal.

Large spill:

Absorb non-recoverable liquid with inert absorbent material.
Wash contaminated area with large amounts of water.

Small spill:

Cover with:

- slaked lime (calcium hydroxide).

- **Reference to other sections**

See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Precautions for safe handling**

Ensure good ventilation/aspiration at the workplace.
Closed system.
Avoid contact with water or humidity.
Avoid the formation or spread of mists in the atmosphere.
Avoid any direct contact with the product.
Comply with instructions for use (refer to technical sheet).
NEVER pour water onto this product.

- **Conditions for safe storage, including any incompatibilities**

- **Storage:**

The floor of the depot should be impermeable and designed to form a water-tight basin.
Store in cool, dry conditions in well sealed receptacles.
Store receptacle in a well ventilated area.
Store away from incompatible materials.

- **Requirements to be met by storerooms and receptacles:**

Store only in the original receptacle.
Watertight packaging.
Stainless steel container under dry inert gas.
Packaging materials recommended :
Stainless steel.
Coated steels.
Unsuitable material for receptacle:
Materials other than those recommended.

- **Specific end use(s)** No further relevant information available.

USA

(Contd. on page 5)

Safety Data Sheet

acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 4)

8 Exposure controls/personal protection

- **Control parameters**
- **Components with limit values that require monitoring at the workplace:**
The recommended limits SHOULD NOT be exceeded.

4098-71-9 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate

REL	Short-term value: 0.18 mg/m ³ , 0.02 ppm Long-term value: 0.045 mg/m ³ , 0.005 ppm Skin
TLV	0.045 mg/m ³ , 0.005 ppm

- **TLV (Threshold Limit Value established by ACGIH)**

4098-71-9	3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	0.005 ppm
-----------	---	-----------

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**

4098-71-9	3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate
-----------	---

- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Extraction to remove vapours at their source.
Only process in a closed system.
Ensure good ventilation of the work station.
Special medical surveillance.
Compulsory atmospheric monitoring.
Personal protective equipment available close by in case of emergency.
Safety shower.
Eye wash.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
- **Breathing equipment:**
Wear respiratory device with filter in case of insufficient ventilation.
When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.
- **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- **Material of gloves** PVC gloves
- **Eye protection:**

Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.
Eye contact should be prevented through use of chemical safety glasses with side shields or splash proof goggles. An emergency eye wash must be readily accessible to the work area.



Tightly sealed goggles

(Contd. on page 6)

Safety Data Sheet

acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 5)

- **Body protection:**
Protective clothing with elasticated cuffs and closed neck.
Boots made of PVC.

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

Form: Liquid
Color: Colourless to pale yellow.

- **Odor:** Pungent

- **pH-value:** Not applicable (reacts with water).

- **Change in condition**

Melting point/Melting range: ≈ - 60 °C
Boiling point/Boiling range: 310 °C (590 °F)

- **Flash point:** 150 °C (302 °F)

- **Ignition temperature:** 430 °C (806 °F)

- **Decomposition temperature:** > 260 °C (> 500 °F)

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**

Lower: 0.7 Vol %

Upper: 4.5 Vol %

- **Oxidizing properties** Not oxidizing.

- **Vapor pressure at 20 °C (68 °F):** 0.000635 hPa

- **Density at 20 °C (68 °F):** 1.06 g/cm³ (8.846 lbs/gal)

- **Solubility in / Miscibility with**

Water: Reacts.
Ketones: Soluble.
aromatic hydrocarbons: Soluble.
chlorinated hydrocarbons: Soluble.
esters : Soluble.

- **Segregation coefficient (n-octanol/water):** Not applicable (reacts with water and/or octanol).

- **Viscosity:**

Dynamic at 20 °C (68 °F): 15 mPas

Organic solvents: 0.0 %

- **Other information** No further relevant information available.

10 Stability and reactivity

- **Reactivity**

- **Chemical stability**

- **Thermal decomposition / conditions to be avoided:**

Stable at ambient temperature.

On contact with humidity, carbon dioxide (CO₂) is released, which may cause a pressure build-up if the container is hermetically sealed.

- **Possibility of hazardous reactions**

Reacts with:

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 6)

- acids.
- alcohols.
- amines.
- bases.
- water and aqueous solutions.
- protic solvents.

with a great release of CO₂, and hence a risk of a pressure build-up in confined areas, and forms an insoluble solid precipitate.

- **Conditions to avoid**

extreme heat
open flame
moisture
ignition sources

- **Incompatible materials:** No further relevant information available.

- **Hazardous decomposition products:**

On combustion or on thermal decomposition (pyrolysis) releases:
Toxic gases.
Carbon monoxide (CO)
Carbon dioxide (CO₂)

11 Toxicological information

- **Information on toxicological effects**

- **Acute toxicity:**

- **LD/LC50 values:**

Fatal if inhaled.
Not harmful if swallowed.
Not harmful by skin contact.
Unpublished reports.

4098-71-9 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate

Oral	LD50	4814 mg/kg (rat) (OECD 401)
Dermal	LD50	> 7000 mg/kg (rat) (OECD 402)
Inhalative	LC50/4h	0.03 mg/l (rat) (OECD 403)

- **Primary irritant effect:**

- **on the skin:**

Causes severe burns.
(OECD 404)
Unpublished reports.

- **on the eye:**

Causes serious eye damage.
(OECD 405)
Unpublished reports.

- **Inhalation:**

May cause respiratory irritation.
Unpublished reports.

- **Additional toxicological information:**

- **Carcinogenic categories**

- **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

- **Sensitization**

(OECD 406) (Guinea-pig)
Unpublished reports.
Human data available.
May cause sensitisation by inhalation and skin contact.

- **Carcinogenicity:** Not considered to be carcinogen.

(Contd. on page 8)

Safety Data Sheet

acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 7)

- **Mutagenicity:**

Is not considered genotoxic.
Unpublished reports.

- **Reproductive toxicity:**

No teratogenic effects have been observed.
By analogy, not considered as toxic to fertility (internal evaluation).
Unpublished reports.

4098-71-9 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate		
Inhalative	NOAEC Dvlp/Mat Tox	0.929 mg/m ³ (rat) (OECD 414)

12 Ecological information

- **Toxicity**

- **Aquatic toxicity:**

4098-71-9 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	
EC50/48h (static)	27 mg/l (Daphnia magna) (EU C.2, aqua)
ErC50(0-72h) (static)	> 70 mg/l (Desmodesmus subspicatus) (EU C.3 (aqua))
LC50/96h (static)	4 mg/l (Chaetogammarus marinus) (expert judgment, marin) > 72 mg/l (Brachydanio rerio) (EU C.1, aqua)
NOEC/72h (static)	4.4 mg/l (Desmodesmus subspicatus) (EU C.3, aqua)

- **Persistence and degradability**

The product is not readily biodegradable.

4098-71-9 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	
BOD28	0 % (bacteria) (EU C.4-D)
DT50	1.8 d (Photolysis) (AOPWIN v1.90) 0.84 h (Hydrolysis) (23 °C)

- **Behavior in environmental systems:**

- **Components:**

Ultimate destination of the product: SOIL and SEDIMENT.
(Mackay Level 1)

- **Bioaccumulative potential** No further relevant information available.

- **Mobility in soil** No further relevant information available.

- **Other information:**

Formation of insoluble polyurea and/or amine derivative.
Degradation product:
3-aminomethyl-3,5,5-trimethylcyclohexylamine (CAS n°2855-13-2)

- **Ecotoxicological effects:**

- **Remark:** No data available.

- **Behavior in sewage processing plants:**

Unpublished reports.

4098-71-9 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	
EC50/3h (static)	263 mg/l (bacteria) (OECD 209)

- **Results of PBT and vPvB assessment**

- **PBT:** No.

- **vPvB:** No.

- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**

- **Recommendation:**

Discharging waste into rivers and drains is forbidden.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 8)

Incinerate at a licensed installation.

Disposal must be made according to federal, state and local regulations.

· **Uncleaned packagings:**

Contaminated packaging materials must be disposed of in the same manner as the product.

· **Recommendation:**

Allow it to drain thoroughly.

Thoroughly emptied and clean packagings may be recycled.

Disposal must be made according to official regulations.

14 Transport information

· **UN Number**

· **DOT, ADR, IMDG, IATA**

UN2290

· **Proper shipping name (Technical Name)**

· **DOT, ADR, IMDG, IATA**

ISOPHORONE DIISOCYANATE

· **Transport hazard class(es)**

· **DOT**



· **Class**

6.1 Toxic substances

· **Label**

6.1

· **ADR, IMDG, IATA**



· **Class**

6.1 Toxic substances

· **Label**

6.1

· **Packing group**

· **DOT, ADR, IMDG, IATA**

III

· **Environmental hazards:**

· **Marine pollutant (environmentally hazardous mark) :**

No

· **Special precautions for user**

Warning: Toxic substances

· **Hazard identification number :**

60

· **EMS Number:**

F-A,S-A

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not applicable.

· **Transport/Additional information:**

The above regulatory prescriptions are those valid on the date of publication of this sheet. However, given the possible evolution of transport regulations for hazardous materials and in the event of the SDS in your possession dating back more than 12 months, it is advisable to check their validity with your sales office.

(Contd. on page 10)

USA

Safety Data Sheet acc. to OSHA HCS

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 9)

· Passenger aircraft :	Packing instruction: 655 - Maximum net quantity per package: 60 L
· Cargo aircraft :	Packing instruction: 663 - Maximum net quantity per package: 220 L

15 Regulatory information

- **National legislation**
- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara Section 312**
 - Fire Hazard - NO
 - Reactive Hazard - YES
 - Release of Pressure - NO
 - Acute Health Hazard - YES
 - Chronic Health Hazard - YES
- **Section 355 (extremely hazardous substances):**
SARA EHS TPQ: 500 lbs

4098-71-9	3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate
-----------	---

- **Section 313 (Specific toxic chemical listings):**

4098-71-9	3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate
-----------	---

- **Carcinogenic categories**

- **EPA (Environmental Protection Agency)**

Substance is not listed.

- **IARC (International Agency for Research on Cancer)**

Substance is not listed.

- **NTP (National Toxicology Program)**

Substance is not listed.

- **Inventory status:**

- **Australian Inventory of Chemical Substances (AICS)**

Substance is listed.

- **Canadian Domestic Substance List (DSL)**

Substance is listed.

- **Canadian Non Domestic Substance List (NDSL)**

Substance is not listed.

- **Chinese Chemical Inventory of Existing Chemical Substances (CIECS)**

Substance is listed.

- **European EINECS/ELINCS Listing**

Substance is listed.

- **Japan Existing and New chemical Substance List (ENCS)**

Substance is listed.

- **Korea Existing Chemical Inventory (KECI)**

Substance is listed.

- **Philippines Inventory of Chemicals and Chemical Substances (PICCS)**

Substance is listed.

- **TSCA listing**

Substance is listed.

(Contd. on page 11)

**Safety Data Sheet
acc. to OSHA HCS**

01/23/2015

Version: 5

Reviewed on 01/23/2015

Product name: Isophorone Diisocyanate (IPDI)

(Contd. of page 10)

- **Other regulations, limitations and prohibitive regulations**
- **State of California, Proposition 65:**

- **Chemicals known to cause cancer:**

Substance is not listed.

- **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

- **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

- **Chemicals known to cause developmental toxicity:**

Substance is not listed.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Contact:** Service HSE Vencorex
- **Date of preparation / last revision** 01/23/2015 / 4
- * **Data compared to the previous version altered.**

USA