



SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 25.02.2013

Version 11.11

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Catalogue No.	820797
Product name	Diphenylmethane 4,4'-diisocyanate (mixture of di-and triisocyanates) for synthesis
REACH Registration Number	A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Chemical for synthesis For additional information on uses please refer to the Merck Chemicals portal (www.merck-chemicals.com).
-----------------	---

1.3 Details of the supplier of the safety data sheet

Company	Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0
Responsible Department	EQ-RS * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number **Please contact the regional company representation in your country.**

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Carcinogenicity, Category 2, H351
Acute toxicity, Category 4, Inhalation, H332
Specific target organ toxicity - repeated exposure, Category 2, H373
Eye irritation, Category 2, H319
Specific target organ toxicity - single exposure, Category 3, H335
Skin irritation, Category 2, H315
Respiratory sensitisation, Category 1, H334
Skin sensitisation, Category 1, H317

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification (67/548/EEC or 1999/45/EC)

Carc.Cat.3	Carcinogenic Category 3	R40
Xn	Harmful	R20 - 48/20
Xi	Irritant	R36/37/38
		R42/43

For the full text of the R-phrases mentioned in this Section, see Section 16.

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Danger

Hazard statements

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

Precautionary statements

Prevention

P281 Use personal protective equipment as required.

Response

P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

Reduced labelling (≤125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H351 Suspected of causing cancer.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.

Precautionary statements



P281 Use personal protective equipment as required.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

Index-No. 615-005-00-9

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

Labelling (67/548/EEC or 1999/45/EC)

<i>Symbol(s)</i>	 Xn	Harmful
<i>R-phrases(s)</i>	20-36/37/38-40-42/43-48/20	Harmful by inhalation. Irritating to eyes, respiratory system and skin. Limited evidence of a carcinogenic effect. May cause sensitisation by inhalation and skin contact. Harmful: danger of serious damage to health by prolonged exposure through inhalation.
<i>S-phrases(s)</i>	23-36/37-45	Do not breathe vapour. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
EC-No.	202-966-0	EC Label
Reduced labelling (≤125 ml)		
<i>Symbol(s)</i>	 Xn	Harmful
<i>R-phrases(s)</i>	20-42/43-40-48/20	Harmful by inhalation. May cause sensitisation by inhalation and skin contact. Limited evidence of a carcinogenic effect. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Do not breathe vapour. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
<i>S-phrases(s)</i>	23-36/37-45	

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	C ₁₅ H ₁₀ N ₂ O ₂ (Hill)
CAS-No.	101-68-8
Index-No.	615-005-00-9
EC-No.	202-966-0
Molar mass	250,25 g/mol

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical Name (Concentration)

CAS-No.	Registration number	Classification
<i>diphenylmethane-4,4'-diisocyanate (<= 100 %)</i>		
101-68-8	*)	Carcinogenicity, Category 2, H351 Acute toxicity, Category 4, H332 Specific target organ toxicity - repeated exposure, Category 2, H373 Eye irritation, Category 2, H319 Specific target organ toxicity - single exposure, Category 3, H335 Skin irritation, Category 2, H315 Respiratory sensitisation, Category 1, H334 Skin sensitisation, Category 1, H317

*) A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

For the full text of the H-Statements mentioned in this Section, see Section 16.

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

Hazardous components (1999/45/EC)

Chemical Name (Concentration)

CAS-No.	Classification
<i>diphenylmethane-4,4'-diisocyanate (<= 100 %)</i>	
101-68-8	Carc.Cat.3; R40 Xn, Harmful; R20-48/20 Xi, Irritant; R36/37/38 R42/43

For the full text of the R-phrases mentioned in this Section, see Section 16.

3.2 Mixture

not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice

First aider needs to protect himself.

After inhalation: fresh air. If breathing stops: immediately apply artificial respiration, if necessary oxygen. Immediately call in physician.

After skin contact: wash off with plenty of water. Remove contaminated clothing. Consult a physician.

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician. Subsequently administer: activated charcoal (20 - 40 g in 10% slurry).

4.2 Most important symptoms and effects, both acute and delayed

irritant effects, Allergic reactions, Cough, Shortness of breath

The following applies to isocyanates in general: strong irritations after contact with eyes and skin. Mucosal irritations, coughing, and dyspnoea after inhalation. Inhalation may lead to the formation of oedemas in the respiratory tract. In given circumstances cardiotoxic.

4.3 Indication of any immediate medical attention and special treatment needed

Laxative: Sodium sulfate (1 tablespoon/1/4 l water).

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media

Water, Foam

5.2 Special hazards arising from the substance or mixture

Combustible.

Vapours are heavier than air and may spread along floors.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapours possible in the event of fire.

Fire may cause evolution of:

nitrogen oxides

May not get in touch with:

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

Water

Caution! in contact with water product releases:
Carbon dioxide (CO₂)

5.3 Advice for firefighters

Special protective equipment for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Cool closed containers exposed to fire with water spray. Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapours, aerosols. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

6.2 Environmental precautions

Do not empty into drains.

6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Observe label precautions.

Advice on protection against fire and explosion

When heated strongly. Risk of bursting.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Tightly closed. Dry. Protected from light. Keep locked up or in an area accessible only to qualified or authorised persons.

Store at +15°C to +25°C.

7.3 Specific end use(s)

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection

Safety glasses

Hand protection

splash contact:

Glove material:	butyl-rubber
Glove thickness:	0,7 mm
Break through time:	> 120 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 898 Butoject® (splash contact). The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet (>,<) supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment

protective clothing

Respiratory protection

required when vapours/aerosols are generated.

Recommended Filter type: Filter B-(P3)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls

Do not empty into drains.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form liquid

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

Colour	brown
Odour	weakly aromatic
Odour Threshold	No information available.
pH	No information available.
Melting point	ca. 10 °C
Boiling point/boiling range	196 °C at 7 hPa
Flash point	196 °C Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	0,4 %(V)
Upper explosion limit	No information available.
Vapour pressure	0,066 hPa at 20 °C
Relative vapour density	8,6
Relative density	1,239 g/cm ³ at 20 °C
Water solubility	2 g/l at 20 °C (decomposition)
Partition coefficient: n-octanol/water	No information available.
Auto-ignition temperature	No information available.
Decomposition temperature	> 200 °C
Viscosity, dynamic	ca.210 mPa.s at 25 °C
Explosive properties	Not classified as explosive.
Oxidizing properties	none

9.2 Other data

Ignition temperature	> 600 °C
----------------------	----------

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

SECTION 10. Stability and reactivity

10.1 Reactivity

tends to polymerise
Forms explosive mixtures with air on intense heating.
Decomposition with CO₂ development.

10.2 Chemical stability

sensitive to frost
In case of decomposition in closed containers and tubes risk of bursting due to buildup of overpressure.

10.3 Possibility of hazardous reactions

Violent reactions possible with:
Water, alkalines, Alcohols, Amines, acids

10.4 Conditions to avoid

Strong heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.
Exposure to moisture.
Keep away from direct sunlight.

10.5 Incompatible materials

nonferrous metals, Copper, Copper alloys, Mild steel, Zinc

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity

LD50 rat: > 5.000 mg/kg (External MSDS)

Acute inhalation toxicity

LC50 rat: 0,49 mg/l; 4 h Aerosol (Lit.)

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages: damage of respiratory tract
absorption

Acute dermal toxicity

LD50 rabbit: > 9.000 mg/kg (External MSDS)

Skin irritation

Causes skin irritation.

Eye irritation

Causes serious eye irritation.

Sensitisation

Sensitisation test: guinea pig

Result: positive

(HSDB)

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

May cause an allergic skin reaction.

Germ cell mutagenicity

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

This information is not available.

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

CMR effects

Carcinogenicity:

Suspected of causing cancer.

Specific target organ toxicity - single exposure

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard

This information is not available.

11.2 Further information

The following applies to isocyanates in general: strong irritations after contact with eyes and skin. Mucosal irritations, coughing, and dyspnoea after inhalation. Inhalation may lead to the formation of oedemas in the respiratory tract. In given circumstances cardiotoxic. Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates

EC50 Daphnia magna (Water flea): 0,35 mg/l; 24 h (Lit.)

Toxicity to algae

IC50 Desmodesmus subspicatus (green algae): 1,5 mg/l; 72 h (Lit.)

12.2 Persistence and degradability

Biodegradability

Not readily biodegradable.

12.3 Bioaccumulative potential

No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects

Additional ecological information

Discharge into the environment must be avoided.

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 UN number UN 2810
14.2 Proper shipping name TOXIC LIQUID, ORGANIC, N.O.S.
(METHYLENEDIPHENYLENE DIISOCYANATE)
14.3 Class 6.1
14.4 Packing group II
14.5 Environmentally hazardous --
14.6 Special precautions for user yes
Tunnel restriction code E

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 UN number UN 2810
14.2 Proper shipping name TOXIC LIQUID, ORGANIC, N.O.S.
(METHYLENEDIPHENYLENE DIISOCYANATE)
14.3 Class 6.1
14.4 Packing group II
14.5 Environmentally hazardous --
14.6 Special precautions for user no

Sea transport (IMDG)

14.1 UN number UN 2810
14.2 Proper shipping name TOXIC LIQUID, ORGANIC, N.O.S.
(METHYLENEDIPHENYLENE DIISOCYANATE)
14.3 Class 6.1
14.4 Packing group II
14.5 Environmentally hazardous --
14.6 Special precautions for user yes
EmS F-A S-A

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

Not relevant

SECTION 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 820797
Product name Diphenylmethane 4,4'-diisocyanate (mixture of di- and triisocyanates) for synthesis

Major Accident Hazard Legislation 96/82/EC
Directive 96/82/EC does not apply

Occupational restrictions Take note of Dir 94/33/EC on the protection of young people at work. Take note of Dir 92/85/EEC on the safety and health at work of pregnant workers.

National legislation

Storage class 10

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

SECTION 16. Other information

Full text of H-Statements referred to under sections 2 and 3.

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 through prolonged or repeated exposure.

Full text of R-phrases referred to under sections 2 and 3

R20 Harmful by inhalation.
R36/37/38 Irritating to eyes, respiratory system and skin.
R40 Limited evidence of a carcinogenic effect.
R42/43 May cause sensitisation by inhalation and skin contact.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Training advice

Provide adequate information, instruction and training for operators.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.