4,4'-methylenediphenyl diisocyanate, diphenylmethane-4,4'-diisocyanate@2,2'-methylenediphenyl diisocyanate@ Diphenylmethane-2,2'-diisocyanate@ o-(p-isocyanatobenzyl)phenyl isocyanate@Diphenylmethane-2,4'-diisocyanate@Methylenediphenyl diisocyanate@ MDI@ 4,4´-MDI

Name (English): 4,4'-methylenediphenyl diisocyanate, diphenylmethane-4,4'-diisocyanate@2,2'-methylenediphenyl diisocyanate@ Diphenylmethane-2,2'-diisocyanate@ o-(p-isocyanatobenzyl)phenyl isocyanate@Diphenylmethane-2,4'-diisocyanate@Methylenediphenyl diisocyanate@ MDI@ 4,4´-MDI

IDENTIFICATION NUMBERS

- **CAS:** 101-68-8
- **EC/EINECS:** 202-966-0
- **International Chemical Safety Card (ICSC):** 0298

MORE INFORMATION

- **Molecular Formula:** C15H10N2O2
- **Synonyms:** 4,4'-diisocianato de difenilmetano, 4,4´-metilen-bis-fenil isocianato, diisocianato de difenilmetano, 4,4'-metilenodifenil diisocianato, metileno difenileno diisocianato, diisocianato de 2,2'-metilendifenilo, diisocianato de 2,2'-difenilmetano, diisocianato de metilendifenilo, diisocianato de 2,4'-difenilmetano, isocianato de o-(p-isocianatobencil)fenilo

USES

adhesive, paint, coating agent, additive, varnish, hardener, foaming agent, binder, binder, elastomer

⚠ **Black list — Substances particularly hazardous to the environment or health**

CLASSIFICATION AND LABELLING (Regulation 1272/2008)

Symbols



GHS07

Acute toxicity (oral, dermal, inhalation



GHS08

Respiratory sensitisation

Signal word: **Danger**

H Phrases

H351 : Suspected of causing cancer

Carc. (Cat. 2) : Carcinogenicity

H332 : Harmful if inhaled

Acute Tox. (Cat. 4 *) : Acute toxicity

H373 : May cause damage to organs through prolonged or repeated exposure

STOT RE (Cat. 2 *) : Specific target organ toxicity - repeated exposure

H319 : Causes serious eye irritation

Eye Irrit. (Cat. 2) : Serious eye damage/eye irritation

H335 : May cause respiratory irritation

STOT SE (Cat. 3) : Specific target organ toxicity - single exposure

H315 : Causes skin irritation

Skin Irrit. (Cat. 2) : Skin corrosion/irritation

H334 : May cause allergy or asthma symptoms or breathing difficulties if inhaled

Resp. Sens. (Cat. 1) : Respiratory/skin sensitization

H317 : May cause an allergic skin reaction

Skin Sens. (Cat. 1) : Respiratory/skin sensitization

Notes

- R.1272-Note C
- R.1272-Note 2

Labelling

Concentration	Labelling
C >= 5 %	Xi; R36/37/38
C >= 0,1 %	R42
C >= 5 %	Irrit. oc., 2; H319
C >= 5 %	Irrit. cut., 2; H315
C >= 0,1 %	Sens. resp., 1; H334
C >= 5 %	STOT única, 3; H335

Specific health risks

According to IARC

Substances classified as carcinogens or mutagens Category 2 under the CLP Regulation (GHS), bearing H351 and/or H341 phrases. These are substances suspected of causing cancer or heritable genetic mutations in humans.

IARC GROUP	IARC VOLUME
Grupo 3	(VOL. 19, SUPL. 7, VOL. 71; 1999)

Occupational Exposure Limits (OEL)

Daily exposure limit values (VLA-ED) published by the Spanish National Institute of Safety and Health at Work (INSST). They represent the average concentration of a chemical agent in the worker's breathing zone, measured or calculated in a time-weighted manner for an 8-hour daily working period. (https://www.insst.es/valores-limites-de-exposicion)

Carcinogens and mutagens (Regulation 1272/2008)

Substances classified as carcinogenic or mutagenic under Regulation 1272/2008

Sensitisers

Substances with skin or respiratory sensitisation potential

Specific environmental risks

Volatile organic compounds

Volatile Organic Compounds (VOCs) regulated by Directive 1999/13/EC on the limitation of VOC emissions from certain activities, and by Royal Decrees 117/2003 and 227/2006. Substances contributing to tropospheric ozone formation that are subject to emission limits in industrial activities.

Environmental regulations

LPCIC (EPER)

Priority substances and specific pollutants within the EU water policy framework, established by the Water Framework Directive (2000/60/EC) and the Priority Substances Directive (2008/105/EC and amendments). Substances posing significant risk to European surface waters and subject to Environmental Quality Standards (EQS).

EPER WATER	EPER AIR
	1

EPER SOIL

EPER Air

Substances from List 2 of Annex III of the IPPC Directive (integrated into the Industrial Emissions Directive 2010/75/EU). Pollutants that may affect surface and groundwater bodies and must be considered in the integrated environmental authorisation of industrial installations.

Restriction/prohibition regulations

Restricted substances under REACH

Substances listed in Annex XVII of the REACH Regulation (EC) No 1907/2006, subject to restrictions on their manufacture, placing on the market or use. Restrictions may be total or partial, limiting specific applications, maximum concentrations or user groups.

NOTES

1. Shall not be used as substances on their own, as a constituent in other substances or in mixtures for industrial and professional use(s) after 24 August 2023, unless: (a) the concentration of diisocyanates individually and in combination is less than 0,1 % by weight, or (b) the employer or self-employed ensures that industrial or professional user(s) have successfully completed training on the safe use of diisocyanates prior to the use of the substance(s) or mixture(s). 2. 2. Shall not be placed on the market as substances on their own, as a constituent in other substances or in mixtures for industrial and professional use(s) after 24 February 2022, unless: (a) the concentration of diisocyanates individually and in combination is less than 0,1 % by weight, or (b) the supplier ensures that the recipient of the substance(s) or mixture(s) is provided with information on the requirements referred to in point (b) of paragraph 1 and the following statement is placed on the packaging, in a manner that is visibly distinct from the rest of the label information: “As from 24 August 2023 adequate training is required before industrial or professional use”. 3. For the purpose of this entry “industrial and professional user(s)” means any worker or self-employed worker handling diisocyanates on their own, as a constituent in other substances or in mixtures for industrial and professional use(s) or supervising these tasks. 4. The training referred to in point (b) of paragraph 1 shall include the instructions for the control of dermal and inhalation exposure to diisocyanates at the workplace without prejudice to any national occupational exposure limit value or other appropriate risk management measures at national level. Such training shall be conducted by an expert on occupational safety and health with competence acquired by relevant vocational training. That training shall cover as a minimum: (a) the training elements in point (a) of paragraph 5 for all industrial and professional use(s). (b) the training elements in points (a) and (b) of paragraph 5 for the following uses: - handling open mixtures at ambient temperature (including foam tunnels); — spraying in a ventilated booth; — application by roller; — application by brush; — application by dipping and pouring; — mechanical post treatment (e.g. cutting) of not fully cured articles which are not warm anymore; — cleaning and waste; — any other uses with similar exposure through the dermal and/or inhalation route; (c) the training elements in

Substances under CoRAP evaluation

Substances included in the Community Rolling Action Plan (CoRAP) of the REACH Regulation. These are substances selected for evaluation by EU Member States due to indications of risk to human health or the environment, with the aim of clarifying whether regulatory action is warranted.

YEAR	MEMBER STATE
2013	Estonia

INITIAL GROUNDS FOR CONCERN

Human health/CMR; Sensitiser; Environment/Suspected PBT; Exposure/Wide dispersive use; Consumer use; Aggregated tonnage

Substances under PACT evaluation

Substances under active regulatory monitoring through ECHA's PACT (Public Activities Coordination Tool). Allows tracking which regulatory authorities are examining a substance and what potential regulatory actions are being considered (restriction, SVHC identification, harmonised classification, etc.).

MEMBER STATE	ACTIVITY
Estonia	Hazard assessment
LAST UPDATE	**SCOPE**
2019-01-28T00:00:00	PBT

REACH sensitisers

Substances identified as respiratory or skin sensitisers under the REACH Regulation. Includes substances that, without necessarily having a CLP classification, have been assessed by ECHA as potentially allergenic in occupational exposure contexts.