

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name **4,4'-Methylenebis(phenyl isocyanate)**  
 Stock number: L15740, 36627  
 CAS Number: 101-68-8  
 EC number: 202-966-0  
 Index number: 615-005-00-9

**1.2 Relevant identified uses of the substance**

or mixture and uses advised against. No further relevant information available.  
 Identified use: SU24 Scientific research and development

**1.3 Details of the supplier of the safety data sheet**


Manufacturer/Supplier: Alfa Aesar GmbH & Co.KG  
 A Johnson Matthey Company  
 Zeppelinstr. 7b  
 76185 Karlsruhe / Germany  
 Tel: +49 (0) 721 84007 280  
 Fax: +49 (0) 721 84007 300  
 Email: tech@alfa.com  
 www.alfa.com  
 Product safety Tel + +049 (0) 7275 988687-0  
 Carechem 24: +44 (0) 1235 239 670 (Multi-language emergency number)  
 Poison Information Center Mainz  
 www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

Informing department:


1.4 Emergency telephone number:

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008

 GHS06 skull and crossbones

Acute Tox. 2 H330 Fatal if inhaled.

 GHS08 health hazard

Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Carc. 2 H351 Suspected of causing cancer.

STOT RE 2 H373 May cause damage to the lung, the blood tissue and the immune system through prolonged or repeated exposure. Route of exposure: Inhalative, Dermal.


 GHS07

Skin Irrit. 2 H315 Causes skin irritation.

Eye Irrit. 2 H319 Causes serious eye irritation.

Skin Sens. 1 H317 May cause an allergic skin reaction.


STOT SE 3 H335 May cause respiratory irritation.

**Classification according to Directive 67/548/EEC or Directive 1999/45/EC** Xn; Harmful

R20-40-48/20: Harmful by inhalation. Limited evidence of a carcinogenic effect. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

 Xn; Sensitising

R42/43: May cause sensitisation by inhalation and skin contact.

 Xi; Irritant

R36/37/38: Irritating to eyes, respiratory system and skin.

**Information concerning particular hazards**

for human and environment: Not applicable

Other hazards that do not result in classification: No information known.

**2.2 Label elements  
Labelling according to Regulation (EC) No 1272/2008**

Hazard pictograms

Signal word

Hazard statements

The substance is classified and labelled according to the CLP regulation.

GHS06, GHS08

Danger

H330 Fatal if inhaled.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

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

H317 May cause an allergic skin reaction.

H351 Suspected of causing cancer.

H335 May cause respiratory irritation.

H373 May cause damage to the lung, the blood tissue and the immune system through prolonged or repeated exposure. Route of exposure: Inhalative, Dermal.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves / protective clothing.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P310 Immediately call a POISON CENTER or doctor/physician.

**Precautionary statements****2.3 Other hazards**

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

**SECTION 3: Composition/information on ingredients****3.1 Substances**

CAS# Designation: 101-68-8 4,4'-Methylenebis(phenyl isocyanate)

Identification number(s):

EC number: 202-966-0

Index number: 615-005-00-9

**SECTION 4: First aid measures****4.1 Description of first aid measures**

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.  
Seek immediate medical advice.

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<b>After skin contact</b>	Instantly wash with water and soap and rinse thoroughly.
<b>After eye contact</b>	Seek immediate medical advice.
<b>After swallowing</b>	Rinse opened eye for several minutes under running water. Then consult doctor.
<b>4.2 Most important symptoms and effects, both acute and delayed</b>	Seek medical treatment.
<b>4.3 Indication of any immediate medical attention and special treatment needed</b>	No further relevant information available.

**SECTION 5: Firefighting measures**

<b>5.1 Extinguishing media</b>	CO <sub>2</sub> , extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.
<b>Suitable extinguishing agents</b>	
<b>5.2 Special hazards arising from the substance or mixture</b>	If this product is involved in a fire, the following can be released: Carbon monoxide and carbon dioxide Nitrogen oxides (NO <sub>x</sub> )
<b>5.3 Advice for firefighters</b>	
<b>Protective equipment:</b>	Wear self-contained breathing apparatus. Wear full protective suit.

**SECTION 6: Accidental release measures**

<b>6.1 Personal precautions, protective equipment and emergency procedures</b>	Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation
<b>6.2 Environmental precautions:</b>	Do not allow material to be released to the environment without proper governmental permits. Do not allow product to reach sewage system or water bodies. Do not allow to enter the ground/soil.
<b>6.3 Methods and material for containment and cleaning up:</b>	Dispose of contaminated material as waste according to item 13. Ensure adequate ventilation.
<b>Prevention of secondary hazards:</b>	No special measures required.
<b>6.4 Reference to other sections</b>	See Section 7 for information on safe handling See section 8 for information on personal protection equipment. See Section 13 for information on disposal.

**SECTION 7: Handling and storage**

<b>7.1 Precautions for safe handling</b>	Handle under dry protective gas. Keep containers tightly sealed. Ensure good ventilation/exhaustion at the workplace.
<b>Information about protection against explosions and fires:</b>	No information known.
<b>7.2 Conditions for safe storage, including any incompatibilities</b>	
<b>Storage</b>	
<b>Requirements to be met by storerooms and containers:</b>	Store in freezer (-20°C).
<b>Information about storage in one common storage facility:</b>	Protect from heat. Store away from water. Store away from oxidizing agents.
<b>Further information about storage conditions:</b>	Store under dry inert gas. This product is moisture sensitive. Store in freezer (-20°C). Keep container tightly sealed. Store in cool, dry conditions in well sealed containers. Protect from humidity and keep away from water.
<b>7.3 Specific end use(s)</b>	No further relevant information available.

**SECTION 8: Exposure controls/personal protection**

<b>Additional information about design of technical systems:</b>	Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
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**8.1 Control parameters**
**Components with critical values that require monitoring at the workplace:**
**101-68-8 4,4'-Methylenebis(phenyl isocyanate) (100,0%)**

AGW (Germany)	0,05 mg/m <sup>3</sup> 1;=2=(I);DFG, 11, 12, Sa, Y
PEL (USA)	Short-term value: C 0,2 mg/m <sup>3</sup> , C 0,02 ppm
REL (USA)	Short-term value: C 0,2* mg/m <sup>3</sup> , C 0,02* ppm Long-term value: 0,05 mg/m <sup>3</sup> , 0,005 ppm *10-min
TLV (USA)	0,051 mg/m <sup>3</sup> , 0,005 ppm

**Ingredients with biological limit values:**
**101-68-8 4,4'-Methylenebis(phenyl isocyanate) (100,0%)**

BGW (Germany)	10 µg/g Kreatinin U b 4,4'-Diaminodiphenylmethan
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**Additional information:** No data

**8.2 Exposure controls**
**Personal protective equipment**
**General protective and hygienic measures**

	The usual precautionary measures should be adhered to in handling the chemicals. Keep away from foodstuffs, beverages and food. Instantly remove any soiled and impregnated garments. Wash hands during breaks and at the end of the work. Do not inhale gases / fumes / aerosols. Avoid contact with the eyes and skin. Maintain an ergonomically appropriate working environment.
<b>Breathing equipment:</b>	Use breathing protection with high concentrations.
<b>Protection of hands:</b>	Check protective gloves prior to each use for their proper condition. The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
<b>Material of gloves</b>	Impervious gloves

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**Penetration time of glove material:** Not determined  
**Eye protection:** Safety glasses  
 Face protection  
**Body protection:** Protective work clothing.

**SECTION 9: Physical and chemical properties****9.1 Information on basic physical and chemical properties****General Information**

**Appearance:**  
**Form:** Crystalline  
**Colour:** White  
**Smell:** Weak, characteristic  
**Odour threshold:** Not determined.

**pH-value:** Not applicable.

**Change in condition**  
**Melting point/Melting range:** 41-44 °C  
**Boiling point/Boiling range:** 194 °C  
**Sublimation temperature / start:** Not determined

**Flash point:** 196 °C  
**Inflammability (solid, gaseous):** Not determined.  
**Ignition temperature:** >600 °C  
**Decomposition temperature:** Not determined  
**Self-inflammability:** Not determined.

**Critical values for explosion:**  
**Lower:** 0,4 Vol %  
**Upper:** Not determined

**Steam pressure at 20 °C:** 0,066 hPa  
**Density at 20 °C:** 1,239 g/cm<sup>3</sup>  
**Relative density:** Not determined.  
**Vapour density:** Not applicable.  
**Evaporation rate:** Not applicable.

**Solubility in / Miscibility with**  
**Water at 20 °C:** 2 g/l  
**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**  
**dynamic at 43 °C:** 5 mPas  
**kinematic:** Not applicable.

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

**SECTION 10: Stability and reactivity**

**10.1 Reactivity:** No information known.  
**10.2 Chemical stability:** Stable under recommended storage conditions.

**Thermal decomposition / conditions to be avoided:** No decomposition if used and stored according to specifications.

**10.3 Possibility of hazardous reactions:** Reacts with strong oxidizing agents

**10.5 Incompatible materials:** Water/moisture  
 Oxidizing agents  
 Heat

**10.6 Hazardous decomposition products:** Carbon monoxide and carbon dioxide  
 Nitrogen oxides (NO<sub>x</sub>)

**SECTION 11: Toxicological information****11.1 Information on toxicological effects**

**Acute toxicity:** Harmful if inhaled.  
 The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

**LD/LC50 values that are relevant for classification:**

**Skin irritation or corrosion:** No data  
 Causes skin irritation.  
**Eye irritation or corrosion:** Causes serious eye irritation.  
**Sensitization:** May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
 May cause an allergic skin reaction.

**Germ cell mutagenicity:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.

**Carcinogenicity:** Suspected of causing cancer.  
 EPA-D: Not classifiable as to human carcinogenicity: inadequate human and animal evidence of carcinogenicity or no data are available.  
 IARC-3: Not classifiable as to carcinogenicity to humans.

**Reproductive toxicity:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for components in this product.

**Specific target organ system toxicity - repeated exposure:** May cause damage to the lung, the blood tissue and the immune system through prolonged or repeated exposure. Route of exposure: Inhalative, Dermal.

**Specific target organ system toxicity - single exposure:** May cause respiratory irritation.

**Aspiration hazard:** No effects known.  
**Experience with humans:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for components in this product.

**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

**SECTION 12: Ecological information**

**12.1 Toxicity**  
**Aquatic toxicity:** No further relevant information available.

**12.2 Persistence and degradability:** No further relevant information available.

**12.3 Bioaccumulative potential:** No further relevant information available.

**12.4 Mobility in soil:** No further relevant information available.

**Additional ecological information:**

**General notes:** Do not allow material to be released to the environment without proper governmental permits.  
 Water hazard class 1 (Self-assessment): slightly hazardous for water.  
 Do not allow undiluted product or large quantities of it to reach ground water, water bodies or sewage system.  
 Avoid transfer into the environment.

**12.5 Results of PBT and vPvB assessment**

**PBT:** Not applicable.

**vPvB:** Not applicable.

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DE/E

**Safety data sheet**  
according to 1907/2006/EC, Article 31

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12.6 Other adverse effects No further relevant information available.

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**SECTION 13: Disposal considerations****13.1 Waste treatment methods Recommendation**

Hand over to disposers of hazardous waste.  
Must be specially treated under adherence to official regulations.  
Consult state, local or national regulations for proper disposal.

**Uncleaned packagings: Recommendation:**

Disposal must be made according to official regulations.

**SECTION 14: Transport information****UN-Number ADR, IMDG, IATA**

UN2811

**14.2 UN proper shipping name ADR IMDG, IATA**

2811 TOXIC SOLID, ORGANIC, N.O.S. (4,4'-Methylenebis(phenyl isocyanate))  
TOXIC SOLID, ORGANIC, N.O.S. (4,4'-Methylenebis(phenyl isocyanate))

**14.3 Transport hazard class(es) ADR****Class Label IMDG, IATA**

6.1 (T2) Toxic substances.  
6.1

**Class Label**

6.1 Toxic substances.  
6.1

**Packing group ADR, IMDG, IATA**

III

**14.5 Environmental hazards:**

Not applicable.

**14.6 Special precautions for user Kemler Number:**

Warning: Toxic substances.  
60

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

Not applicable.

**Transport/Additional information:****ADR Excepted quantities (EQ): Limited quantities (LQ) Transport category Tunnel restriction code**

E1  
5 kg  
2  
E

**UN "Model Regulation":**

UN2811, TOXIC SOLID, ORGANIC, N.O.S. (4,4'-Methylenebis(phenyl isocyanate)), 6.1, III

**SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****Australian Inventory of Chemical Substances**

Substance is listed.

**Standard for the Uniform Scheduling of Drugs and Poisons**

Substance is not listed.

**National regulations****Information about limitation of use:**

Employment restrictions concerning young persons must be observed.  
For use only by technically qualified individuals.

**Water hazard class:**

Water hazard class 1 (Self-assessment): slightly hazardous for water.

**Other regulations, limitations and prohibitive regulations****ELINCS (European List of Notified Chemical Substances)**

Substance is not listed.

**Substances of very high concern (SVHC) according to REACH, Article 57**

Substance is not listed.

**REACH - Pre-registered substances**

Substance is listed.

**15.2 Chemical safety assessment:**

A Chemical Safety Assessment has not been carried out.

**SECTION 16: Other information**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing data specification sheet:** Health, Safety and Environmental Department.**Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)  
IMDG: International Maritime Code for Dangerous Goods  
IATA: International Air Transport Association  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals  
EINECS: European Inventory of Existing Commercial Chemical Substances  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent

DE/E