

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

**1.1 Product identifier**  
Trade name: **4-Formylmorpholine**  
Stock number: B233T5, L15941  
CAS Number: 4394-85-8  
EC number: 224-518-3

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

**Informing department:** Carechem 24: +44 (0) 1235 239 670 (Multi-language emergency number)  
**1.4 Emergency telephone number:** Poison Information Center Mainz  
www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

**SECTION 2: Hazards identification**

**2.1 Classification of the substance or mixture**  
Classification according to Regulation (EC) No 1272/2008 The substance is not classified as hazardous to health or the environment according to the CLP regulation.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC Not applicable

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 Not applicable

Hazard pictograms Not applicable

Signal word Not applicable

Hazard statements Not applicable

**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: 4394-85-8 4-Formylmorpholine  
Identification number(s):  
EC number: 224-518-3

**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.

After skin contact Instantly wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.

After eye contact Rinse opened eye for several minutes under running water. Then consult doctor.  
After swallowing Seek medical treatment.

**4.2 Most important symptoms and effects, both acute and delayed** No further relevant information available.

**4.3 Indication of any immediate medical attention and special treatment needed** No further relevant information available.

**SECTION 5: Firefighting measures**

**5.1 Extinguishing media**  
Suitable extinguishing agents CO<sub>2</sub>, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.

**5.2 Special hazards arising from the substance or mixture**  
If this product is involved in a fire, the following can be released:  
Carbon monoxide and carbon dioxide  
Nitrogen oxides (NO<sub>x</sub>)

**5.3 Advice for firefighters**  
Protective equipment: Wear self-contained breathing apparatus.  
Wear full protective suit.

**SECTION 6: Accidental release measures**

**6.1 Personal precautions, protective equipment and emergency procedures** Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation

**6.2 Environmental precautions:** 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.

**6.3 Methods and material for containment and cleaning up:** Collect mechanically.  
No special measures required.

**Prevention of secondary hazards:** See Section 7 for information on safe handling  
See section 8 for information on personal protection equipment.  
See Section 13 for information on disposal.

**6.4 Reference to other sections**

**SECTION 7: Handling and storage**

**7.1 Precautions for safe handling** Keep containers tightly sealed.  
Store in cool, dry place in tightly closed containers.

**Information about protection against explosions and fires:** No information known.

**Trade name 4-Formylmorpholine**

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

**Storage Requirements to be met by storerooms and containers:** No special requirements.

**Information about storage in one common storage facility:** Store away from oxidizing agents.  
Store away from water.

**Further information about storage conditions:** This product is hygroscopic.  
Store under dry inert gas.  
Keep container tightly sealed.  
Store in cool, dry conditions in well sealed containers.  
Protect from humidity and keep away from water.

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

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

**Additional information about design of technical systems:** Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

**8.1 Control parameters**

**Components with critical values that require monitoring at the workplace:** Not required.

**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.  
Maintain an ergonomically appropriate working environment.

**Breathing equipment:** Use breathing protection with high concentrations.

**Protection of hands:** 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.

**Material of gloves** Impervious gloves

**Penetration time of glove material** Not determined

**Eye protection:** Safety glasses

**Body protection:** Protective work clothing.

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

**General Information**

**Appearance:**

**Form:** Low melting solid

**Colour:** Colourless

**Smell:** Odourless

**Odour threshold:** Not determined.

**pH-value (250 g/l) at 20 °C:** 10

**Change in condition**

**Melting point/Melting range:** 20-23 °C

**Boiling point/Boiling range:** 239-241 °C

**Sublimation temperature / start:** Not determined

**Flash point:** 118 °C

**Inflammability (solid, gaseous)** Not determined.

**Ignition temperature:** 345 °C

**Decomposition temperature:** Not determined

**Self-inflammability:** Not determined.

**Danger of explosion:** Product is not explosive.

**Critical values for explosion:**

**Lower:** 1,2 Vol %

**Upper:** 8,2 Vol %

**Steam pressure at 50 °C:** 1 hPa

**Density** Not determined

**Relative density** Not determined.

**Vapour density** Not applicable.

**Evaporation rate** Not applicable.

**Solubility in / Miscibility with**

**Water:** Soluble

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**

**dynamic at 50 °C:** 4,1 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** No dangerous reactions known

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

**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:** No effects known.

**LD/LC50 values that are relevant for classification:** No data

**Skin irritation or corrosion:** Causes mild irritant effect.

**Eye irritation or corrosion:** Causes mild irritant effect.

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DE/E

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

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<b>Sensitization:</b>	No sensitizing effect known.
<b>Germ cell mutagenicity:</b>	No effects known.
<b>Carcinogenicity:</b>	No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
<b>Reproductive toxicity:</b>	No effects known.
<b>Specific target organ system toxicity - repeated exposure:</b>	No effects known.
<b>Specific target organ system toxicity - single exposure:</b>	No effects known.
<b>Aspiration hazard:</b>	No effects known.
<b>Additional toxicological information:</b>	To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

**SECTION 12: Ecological information**

<b>12.1 Toxicity</b>	
<b>Aquatic toxicity:</b>	No further relevant information available.
<b>12.2 Persistence and degradability</b>	No further relevant information available.
<b>12.3 Bioaccumulative potential</b>	No further relevant information available.
<b>12.4 Mobility in soil</b>	No further relevant information available.
<b>Additional ecological information:</b>	
<b>General notes:</b>	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.
<b>12.5 Results of PBT and vPvB assessment</b>	
<b>PBT:</b>	Not applicable.
<b>vPvB:</b>	Not applicable.
<b>12.6 Other adverse effects</b>	No further relevant information available.

**SECTION 13: Disposal considerations**

<b>13.1 Waste treatment methods</b>	
<b>Recommendation</b>	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.
<b>Uncleaned packagings:</b>	
<b>Recommendation:</b>	Disposal must be made according to official regulations.
<b>Recommended cleaning agent:</b>	Water, if necessary with cleaning agent.

**SECTION 14: Transport information**

<b>UN-Number</b>	
<b>ADR, IMDG, IATA</b>	None
<b>14.2 UN proper shipping name</b>	
<b>ADR, IMDG, IATA</b>	None
<b>14.3 Transport hazard class(es)</b>	
<b>ADR, IMDG, IATA</b>	
<b>Class</b>	None
<b>Packing group</b>	
<b>ADR, IMDG, IATA</b>	None
<b>14.5 Environmental hazards:</b>	Not applicable.
<b>14.6 Special precautions for user</b>	Not applicable.
<b>14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable.
<b>Transport/Additional information:</b>	Not dangerous according to the above specifications.

**SECTION 15: Regulatory information**

<b>15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture</b>	
<b>Australian Inventory of Chemical Substances</b>	Substance is listed.
<b>Standard for the Uniform Scheduling of Drugs and Poisons</b>	Substance is not listed.
<b>National regulations</b>	
<b>Information about limitation of use:</b>	For use only by technically qualified individuals.
<b>Water hazard class:</b>	Water hazard class 1 (Self-assessment): slightly hazardous for water.
<b>Other regulations, limitations and prohibitive regulations</b>	
<b>ELINCS (European List of Notified Chemical Substances)</b>	Substance is not listed.
<b>Substances of very high concern (SVHC) according to REACH, Article 57</b>	Substance is not listed.
<b>REACH - Pre-registered substances</b>	Substance is listed.
<b>15.2 Chemical safety assessment:</b>	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.

<b>Department issuing data specification sheet:</b>	Health, Safety and Environmental Department.
<b>Abbreviations and acronyms:</b>	RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail) IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA) ICAO: International Civil Aviation Organization ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO) 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