

Safety data sheet

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BASF Safety data sheet according to the United Nations' Globally Harmonized System (UN GHS)

Date / Revised: 04.04.2024

Version: 5.0

Product: **PROPIONALDEHYDE**

(ID no. 30036725/SDS_GEN_00/EN)

Date of print 08.10.2025

1. Identification

Product identifier

PROPIONALDEHYDE

Chemical name: propanal; propionaldehyde

INDEX-Number: 605-018-00-8

CAS Number: 123-38-6

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

Relevant identified uses: Intermediate (isolated)

Details of the supplier of the safety data sheet

Company:

BASF SE

67056 Ludwigshafen

GERMANY

Operating Division Petrochemicals

Telephone: +49 621 60-42151

E-mail address: sds-petrochemicals@basf.com

Emergency telephone number

International emergency number:

Telephone: +49 180 2273-112

2. Hazards Identification

Classification of the substance or mixture

According to UN GHS criteria

Flam. Liq. 2
Acute Tox. 4 (Inhalation - vapour)
Acute Tox. 4 (oral)
Acute Tox. 5 (dermal)
Skin Irrit. 2
Eye Dam. 1
STOT SE 3 (irritating to respiratory system)
Aquatic Acute 3

For the classifications not written out in full in this section the full text can be found in section 16.

Label elements

Globally Harmonized System (GHS)

Pictogram:



Signal Word:

Danger

Hazard Statement:

H225	Highly flammable liquid and vapour.
H318	Causes serious eye damage.
H315	Causes skin irritation.
H313	May be harmful in contact with skin.
H335	May cause respiratory irritation.
H302 + H332	Harmful if swallowed or if inhaled.
H402	Harmful to aquatic life.

Precautionary Statements (Prevention):

P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves and eye protection or face protection.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe mist or vapour.
P243	Take action to prevent static discharges.
P273	Avoid release to the environment.
P241	Use explosion-proof electrical, ventilating and lighting equipment.
P264	Wash contaminated body parts thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P242	Use non-sparking tools.
P240	Ground and bond container and receiving equipment.

Precautionary Statements (Response):

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P310	Immediately call a POISON CENTER or physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P330	Rinse mouth.
P370 + P378	In case of fire: Use alcohol-resistant foam, carbon dioxide, dry powder or water spray for extinction.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Storage):

P233	Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Precautionary Statements (Disposal):

P501	Dispose of contents and container to hazardous or special waste collection point.
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Other hazardsAccording to UN GHS criteria

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

See section 12 - Results of PBT and vPvB assessment.

3. Composition/Information on Ingredients**Substances**Chemical nature

Propionaldehyde

CAS Number: 123-38-6
EC-Number: 204-623-0
INDEX-Number: 605-018-00-8

Hazardous ingredients (GHS)

According to UN GHS criteria

Propionaldehyde

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Content (W/W): $\geq 99,5\%$ - $\leq 100\%$	Flam. Liq. 2
CAS Number: 123-38-6	Acute Tox. 4 (Inhalation - vapour)
EC-Number: 204-623-0	Acute Tox. 4 (oral)
INDEX-Number: 605-018-00-8	Acute Tox. 5 (dermal)
	Skin Irrit. 2
	Eye Dam. 1
	STOT SE 3 (irr. to respiratory syst.)
	Aquatic Acute 3
	H225, H318, H315, H313, H335, H302 + H332, H402

For the classifications not written out in full in this section the full text can be found in section 16.

Mixtures

Not applicable

4. First-Aid Measures

Description of first aid measures

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

On skin contact:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

On contact with eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11., (Further) symptoms and / or effects are not known so far

Hazards: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11. (Further) symptoms and / or effects are not known so far

Indication of any immediate medical attention and special treatment needed

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures**Extinguishing media**

Suitable extinguishing media:

dry powder, water spray, carbon dioxide, alcohol-resistant foam

Unsuitable extinguishing media for safety reasons:

water jet

Additional information:

Use extinguishing measures to suit surroundings.

Special hazards arising from the substance or mixture

Vapours may form explosive mixture with air. Cool endangered containers with water-spray. Risk of bursting. Burning produces harmful and toxic fumes.

Advice for fire-fighters

Special protective equipment:

Wear a self-contained breathing apparatus. Special protective equipment for firefighters

Further information:

Containers/tanks should be cooled with water spray. Risk of bursting. In case of combustion evolution of dangerous gases possible. Combustion vapors of organic materials are basically classified as inhalation toxic substances. Vapours are heavier than air and may accumulate in low areas and travel a considerable distance up to the source of ignition. Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

6. Accidental Release Measures

High risk of slipping due to leakage/spillage of product.

Release of substance/product can cause fire or explosion. Shut off or stop source of leak. Shut off or stop released substance/product under safe conditions.

Pack in tightly closed containers for disposal.

Personal precautions, protective equipment and emergency procedures

Handle in accordance with good industrial hygiene and safety practice.

Avoid all sources of ignition: heat, sparks, open flame. Use antistatic tools.

Environmental precautions

Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

Pick up with suitable appliance and dispose of. Spills should be contained, solidified, and placed in suitable containers for disposal. Dispose of absorbed material in accordance with regulations.

7. Handling and Storage**Precautions for safe handling**

Handle in accordance with good industrial hygiene and safety practice.

Protection against fire and explosion:

Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy. It is recommended that all conductive parts of the machinery are grounded. Use explosion-proof apparatus and fittings.

Conditions for safe storage, including any incompatibilities

Segregate from alkalies and alkalizing substances.

Further information on storage conditions: Keep container tightly closed in a cool, well-ventilated place. Avoid all sources of ignition: heat, sparks, open flame.

Storage stability:

Storage temperature: $\leq 40\text{ }^{\circ}\text{C}$

Storage duration: ≤ 6 Months

The stated storage temperature should be noted.

Avoid prolonged storage.

This product should be processed as soon as possible.

The stability data given is only valid when stored under oxygen free inert gases or in containers that are impermeable to oxygen.

Keep under nitrogen.

Specific end use(s)

For the relevant identified use(s) listed in Section 1 the advice mentioned in this section 7 is to be observed.

8. Exposure Controls/Personal Protection**Control parameters**Components with occupational exposure limits

123-38-6: Propionaldehyde

Exposure controlsPersonal protective equipment

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Gas filter for gases/vapours of organic compounds (boiling point $<65\text{ }^{\circ}\text{C}$, f.e. EN 14387 Type AX)

Hand protection:

Chemical resistant protective gloves (EN ISO 374-1)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN ISO 374-1):

butyl rubber (butyl) - 0.7 mm coating thickness

Manufacturer's directions for use should be observed because of great diversity of types.

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Eye protection:

Tightly fitting safety goggles (splash goggles) (e.g. EN 166)

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust), chemical-protection suit (f.e. according to EN 14605), chemical protection overall (f.e. according to EN 13982) if dust is formed.

General safety and hygiene measures

Avoid inhalation of vapour. Avoid contact with the skin, eyes and clothing. Wearing of closed work clothing is required additionally to the stated personal protection equipment.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

State of matter:	liquid	
Form:	liquid	
Colour:	colourless	
Odour:	aldehyde-like	
Odour threshold:		
	not determined	
Melting point:	-81 °C (1.013 hPa) Literature data.	(other)
Boiling point:	47,6 °C (1.003,27 hPa)	(other)
Flammability:	Highly flammable.	(derived from flash - and boiling point)
Lower explosion limit:	For liquids not relevant for classification and labelling., The lower explosion point may be 5 - 15 °C below the flash point.	
Upper explosion limit:	For liquids not relevant for classification and labelling.	
Flash point:	-30 °C Literature data.	(other, closed cup)
Auto-ignition temperature:	195 °C	(DIN 51794)
Thermal decomposition:	No decomposition if stored and handled as prescribed/indicated.	

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pH value:	7,6 (20 °C)	
Viscosity, dynamic:	0,317 mPa.s (26,7 °C)	
Thixotropy:	Literature data. not thixotropic	
Solubility in water:	Literature data. 306 g/l (25 °C)	(other)
Solubility (qualitative) solvent(s):	organic solvents soluble	
Partitioning coefficient n-octanol/water (log Kow):	0,59 (20 °C)	(calculated)
Vapour pressure:	Literature data. 400,46 hPa (23,61 °C)	(BASF method)
	dynamic 1.256 hPa (55 °C)	(BASF method)
Relative density:	0,8047 (20 °C, 1.013 hPa)	(pycnometer)
Density:	0,8047 g/cm3 (20 °C, 1.013 hPa)	(pycnometer)
Relative vapour density (air):	2 (20 °C)	(calculated)
	Heavier than air.	

Particle characteristics

Particle size distribution: (other)

9.2. Other information**Information with regard to physical hazard classes**ExplosivesExplosion hazard: Based on the chemical structure (other)
there is no indication of explosive properties.Impact sensitivity: not shock-sensitive
Based on the chemical structure there is no shock-sensitivity.Oxidizing propertiesFire promoting properties: Based on its structural properties (other)
the product is not classified as oxidizing.Pyrophoric propertiesSelf-ignition temperature: Test type: Spontaneous self-ignition at room-temperature.
(Method: other)

not self-igniting

Substances and mixtures, which emit flammable gases in contact with waterFormation of flammable gases:
Forms no flammable gases in the presence of water.Corrosion to metals

No corrosive effect on metal.

Other safety characteristics

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Miscibility with water:	($< 15\text{ }^{\circ}\text{C}$) miscible in all proportions	
pKA:	The substance does not dissociate.	(other)
Adsorption/water - soil:	KOC: 1; log KOC: -0,007	(calculated)
Surface tension:		(other, other)
	Based on chemical structure, surface activity is not to be expected.	
Molar mass:	58,08 g/mol	
SAPT-Temperature:		
	Study scientifically not justified.	
Evaporation rate:		
	Value can be approximated from Henry's Law Constant or vapor pressure.	

10. Stability and Reactivity

Reactivity

When heated can give off ignitable vapours.

Corrosion to metals:	No corrosive effect on metal.	
Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

When finely distributed, self-ignition is possible. Reacts with acids, alkalies and oxidizing agents.

Conditions to avoid

No special precautions other than good housekeeping of chemicals.

Incompatible materials

Substances to avoid:
strong oxidizing agents

Hazardous decomposition products

Hazardous decomposition products:
No hazardous decomposition products if stored and handled as prescribed/indicated.

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:

Of moderate toxicity after single ingestion. Of low toxicity after short-term skin contact. Of moderate toxicity after short-term inhalation.

Experimental/calculated data:

LD50 rat (oral): 1.690 mg/kg (OECD Guideline 401)

LC50 rat (by inhalation): > 4,6 mg/l 4 h (OECD Guideline 403)

No mortality was observed. The vapour was tested.

LC50 rat (by inhalation): 9,5 - 19 mg/l 4000 - 8000 ppm 4 h

Mortality was observed. The vapour was tested.

LD50 rabbit (dermal): 2.460 mg/kg (OECD Guideline 402)

LD50 mouse (intraperitoneal): approx. 724 mg/kg

Irritation

Assessment of irritating effects:

May cause severe damage to the eyes. Skin contact causes irritation.

Experimental/calculated data:

Skin corrosion/irritation rabbit: non-irritant non-irritant (OECD Guideline 404)

The European Union (EU) has classified this substance with 'Irritating to skin'.

Serious eye damage/irritation rabbit: irreversible damage (OECD Guideline 405)

The European Union (EU) has classified this substance with 'Irritating to eyes'.

Respiratory/Skin sensitization

Assessment of sensitization:

Skin sensitizing effects were not observed in animal studies.

Experimental/calculated data:

Mouse Local Lymph Node Assay (LLNA) mouse: Non-sensitizing. (OECD Guideline 429)

Germ cell mutagenicity

Assessment of mutagenicity:

The substance was mutagenic in various cell culture test systems; however, these results could not be confirmed in tests with mammals.

Carcinogenicity

Assessment of carcinogenicity:

On the basis of currently available information, a final assessment is not possible.

Reproductive toxicity

Assessment of reproduction toxicity:

The results of animal studies gave no indication of a fertility impairing effect.

Developmental toxicity

Assessment of teratogenicity:

No data available.

Specific target organ toxicity (single exposure)

Assessment of STOT single:

Causes temporary irritation of the respiratory tract.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

After repeated exposure the prominent effect is local irritation.

Aspiration hazard

not applicable

12. Ecological Information

Toxicity

Assessment of aquatic toxicity:

Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish:

LC50 (96 h) 14 mg/l, Pimephales promelas (Fish test acute, static)

Aquatic invertebrates:

EC50 (48 h) 88,7 mg/l, Daphnia magna (Directive 84/449/EEC, C.2, static)

Aquatic plants:

EC50 (72 h) 260 mg/l, Scenedesmus subspicatus (DIN 38412 Part 9, static)

Microorganisms/Effect on activated sludge:

Toxic limit concentration (14 h) 124 mg/l, Pseudomonas putida (DIN 38412 Part 8, aquatic)

Chronic toxicity to fish:

No data available.

Chronic toxicity to aquatic invertebrates:

No data available.

Assessment of terrestrial toxicity:

No data available.

Persistence and degradability

Assessment biodegradation and elimination (H₂O):
Readily biodegradable (according to OECD criteria).

Elimination information:
approx. 91 - 97 % BOD of the ThOD (28 d) (OECD 301C; ISO 9408; 92/69/EWG, C.4-F) (aerobic, activated sludge) Readily biodegradable (according to OECD criteria).

Assessment of stability in water:
Substance is readily biodegradable, therefore hydrolysis is not expected to be relevant.
Information on Stability in Water (Hydrolysis):
No data available.

Bioaccumulative potential

Assessment bioaccumulation potential:
Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Bioaccumulation potential:
No data available.

Mobility in soil

Assessment transport between environmental compartments:
Volatility: The substance will slowly evaporate into the atmosphere from the water surface.
Adsorption in soil: Adsorption to solid soil phase is not expected.

Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

Other adverse effects

The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

Additional information

Adsorbable organically-bound halogen (AOX):
This product contains no organically-bound halogen.

13. Disposal Considerations

Waste treatment methods

Must be disposed of or incinerated in accordance with local regulations.

Contaminated packaging:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

14. Transport Information

Land transport

ADR

UN number or ID number: UN1275
UN proper shipping name: PROPIONALDEHYDE

Transport hazard class(es): 3
Packing group: II
Environmental hazards: no
Special precautions for user: Tunnel code: D/E

RID

UN number or ID number: UN1275
UN proper shipping name: PROPIONALDEHYDE

Transport hazard class(es): 3
Packing group: II
Environmental hazards: no
Special precautions for user: None known

Inland waterway transport

ADN

UN number or ID number: UN1275
UN proper shipping name: PROPIONALDEHYDE

Transport hazard class(es): 3
Packing group: II
Environmental hazards: no
Special precautions for user: None known

Transport in inland waterway vessel

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UN number or ID number: UN1275
UN proper shipping name: PROPIONALDEHYDE

Transport hazard class(es): 3, N3
Packing group: II
Environmental hazards: yes
Type of inland waterway vessel: C
Cargo tank design: 2
Cargo tank type: 2

Sea transport

IMDG

UN number or ID number: UN 1275
UN proper shipping name: PROPIONALDEHYDE

Transport hazard class(es): 3
Packing group: II
Environmental hazards: no
Marine pollutant: NO
Special precautions for user: EmS: F-E; S-D

Air transport

IATA/ICAO

UN number or ID number: UN 1275
UN proper shipping name: PROPIONALDEHYDE

Transport hazard class(es): 3
Packing group: II
Environmental hazards: No Mark as dangerous for the environment is needed
Special precautions for user: None known

Maritime transport in bulk according to IMO instruments

Maritime transport in bulk is not intended.

15. Regulatory Information

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

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

16. Other Information

Full text of classifications, hazard symbols and hazard statements, if mentioned in section 2 or 3:

Flam. Liq.	Flammable liquids
Acute Tox.	Acute toxicity
Skin Irrit.	Skin irritation
Eye Dam.	Serious eye damage
STOT SE	Specific target organ toxicity — single exposure
Aquatic Acute	Hazardous to the aquatic environment - acute
H225	Highly flammable liquid and vapour.
H318	Causes serious eye damage.
H315	Causes skin irritation.
H313	May be harmful in contact with skin.
H335	May cause respiratory irritation.
H302 + H332	Harmful if swallowed or if inhaled.
H402	Harmful to aquatic life.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Vertical lines in the left hand margin indicate an amendment from the previous version.