

# Safety Data Sheet

according to Regulations REACH 1907/2006/EC

|                           |                           |                  |
|---------------------------|---------------------------|------------------|
| REF: 744859.1             | Buffer MC4 (1000 mL)      | Page: 1/10       |
| Printing date: 14.01.2026 | Date of issue: 22.04.2025 | Version: 2.3.3.2 |

## SECTION 1: Identification of the substance/mixture and of the company

### 1.1 Product identifier

REF 744859.1  
 Product name Buffer MC4 (1000 mL)

REACH Registration number(s): see SECTION 3.1/3.2 or  
 A registration number for the substance(s) does not exist because the annual tonnage does not require registration or the substance or its use is excluded from registration.

1 x 1000 mL MC4 UFI: H0AV-936C-N20Q-S1VH

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

**Relevant identified uses**  
 Product for analytical use.  
 Exposure Scenario Classification according REACH, RIP 3.2 Codes: SU 0-2, PC 21, PROC 15, AC 0  
 The exposure scenario is integrated into sections 1-16.

**Uses advised against**  
 not described

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

**Manufactured by:**  
 MACHEREY-NAGEL GmbH & Co. KG  
 Valencienner Str. 11, 52355 Düren, Germany  
 Phone: +49 2421 969 0 E-mail: sds@mn-net.com (msds@mn-net.com)

### 1.4 Emergency telephone number

Outside Germany (DE): Call your regional Poisons Information Service or call local Life Saving Service.  
 DE: Gemeinsames Giftinformationszentrum (GGIZ)  
 99089 Erfurt tel. +49 361 730 730, <<https://www.ggiz-erfurt.de>>

You find our current versions of SDS in Internet: <<http://www.mn-net.com/SDS>>

## SECTION 2: Hazard identification

### 2.0 Classification of the complete product according to Regulation (EC) 1272/2008



|                              |                                  |
|------------------------------|----------------------------------|
| Signal word                  | WARNING                          |
| <b>Hazard identification</b> | <b>Hazard classes/categories</b> |
| H226                         | Flam. Liq. 3                     |
| H302                         | Acute Tox. 4 oral                |

### 2.1 Classification of the substance or mixture according to Regulation (EC) 1272/2008

1000 mL MC4



|                              |                                  |
|------------------------------|----------------------------------|
| Signal word                  | WARNING                          |
| <b>Hazard identification</b> | <b>Hazard classes/categories</b> |
| H226                         | Flam. Liq. 3                     |
| H302                         | Acute Tox. 4 oral                |



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REF: 744859.1

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Page: 2/10

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List of H phrases: see section 16.2

## 2.2 Label elements according regulation (EC) 1272/2008

According **CLP directive** inner packages must be only labelled with GHS symbol(s) and product identifier(s) (EU 1272/2008 Annex I - 1.5.1.2). Harmful chemicals/mixtures with signal word: **WARNING** and highly flammable chemicals/mixtures must not be labelled with H and P phrases **until 125 mL** (EU 1272/2008 Annex I - 1.5.2).

1000 mL MC4



GHS02



GHS07

Signal word: WARNING

H226, H302

Flammable liquid and vapour. Harmful if swallowed.

P210, P233, P240, P241, P242, P264W, P270, P280, P301+312, P303+361+353, P330, P370+378, P403+235, P501  
 Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof [electrical/ventilating/lighting] equipment. Use non-sparking tools. Wash with water thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Rinse mouth. In case of fire: Use suitable extinguisher media to extinguish. Store in a well-ventilated place. Keep cool. Dispose of contents/container to regulated waste treatment.

## Label elements of the complete product



GHS02



GHS07

Signal word: WARNING

H226, H302

Flammable liquid and vapour. Harmful if swallowed.

P210, P233, P240, P241, P242, P264W, P270, P280, P301+312, P303+361+353, P330, P370+378, P403+235, P501  
 Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof [electrical/ventilating/lighting] equipment. Use non-sparking tools. Wash with water thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Rinse mouth. In case of fire: Use suitable extinguisher media to extinguish. Store in a well-ventilated place. Keep cool. Dispose of contents/container to regulated waste treatment.

## 2.3 Other hazards

### Possible hazards from physicochemical properties

Flammable properties. Vapour forms explosive mixtures with air.

### Information pertaining to particular risks to human and possible symptoms

Cause after oral intake, impairments of health when ingested in small quantities.

### Information pertaining to particular risks to the environment

PBT: not applicable

vPvB: not applicable

### Possible endocrine disrupting effects

This substance/mixture contains components considered to have endocrinedisrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.



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Buffer MC4 (1000 mL)

Page: 3/10

Printing date: 14.01.2026

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Version: 2.3.3.2

## SECTION 3: Composition / information on ingredients

### 3.1 Substances or 3.2 Mixtures

#### 1000 mL MC4

|                   |   |             |              |
|-------------------|---|-------------|--------------|
| Substance name:   | <i>ethanol</i>  |             |              |
| CAS No.:          | 64-17-5   |             |              |
|                   | (denatured with 1% 2-butanone)                                    |             |              |
| Substance rating: | H225, Flam. Liq. 2  |             |              |
| Formula:          | C <sub>2</sub> H <sub>6</sub> O; C <sub>2</sub> H <sub>5</sub> OH |             |              |
| Pseudonym (de):   | Äthylalkohol, vergällter Spiritus                                 |             |              |
| REACH Reg. No.:   | 01-2119457610-43-xxxx   |             |              |
| EC No.:           | 200-578-6   | Indice No.: | 603-002-00-5 |
| Concentration:    | 20 - <35 %  |             |              |
| acc. CLP (GHS):   | H226, Flam. Liq. 3  |             |              |

|                   |   |             |              |
|-------------------|---|-------------|--------------|
| Substance name:   | <i>sodium perchlorate</i>                 |             |              |
| CAS No.:          | 7601-89-0                                 |             |              |
| Substance rating: | H271, Ox. Sol. 1, H302, Acute Tox. 4 oral |             |              |
| Formula:          | NaClO <sub>4</sub>                        |             |              |
| Pseudonym (de):   | Perchlorat (fest)                         |             |              |
| REACH Reg. No.:   | 01-2119540521-50-xxxx                     |             |              |
| EC No.:           | 231-511-9                                 | Indice No.: | 017-010-00-6 |
| Concentration:    | 15 - <40 %                                |             |              |
| acc. CLP (GHS):   | H302, Acute Tox. 4 oral                   |             |              |

### 3.3 Remarks

When not listed, mixtures are added with water [CAS No. 7732-18-5] to 100%.

List of H and P phrases: see section 16.2.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

Place insured person out of danger zone to fresh air immediately. Ensure quiet, warmth, and provide resuscitation if necessary. If necessary contact medical advice.

#### 4.1.1 After SKIN Contact

Remove contaminated clothing. Rinse the affected skin or mucous membrane thoroughly under running water. (If possible) use soap.

#### 4.1.2 After EYE Contact

After contact with the eyes rinse thoroughly under running water with the eyelid wide open with eye washing bottle, eye douche or running water (protect intact eye).

#### 4.1.3 After INHALATION of vapours

After inhalation of foam or vapour fresh air should be inhaled. Keep airways free. ---

#### 4.1.4 After ORAL Intake

After oral intake lots of water with activated charcoal supplement should be drunk after it has been ingested.

### 4.2 Most important symptoms and effects, both acute and delayed

There are no known delayed symptoms or effects for this product.

### 4.3 Indication of any immediate medical attention and special treatment needed

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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

#### 5.1.1 Suitable extinguishing media

Fire extinguishers appropriate to the fire classification, and, if applicable, a fire blanket must be available in a prominent location in the work area. All extinguishers like FOAM, WATER SPRAY, DRY POWDER, CARBON DIOXIDE can be used.



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# Safety Data Sheet

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Buffer MC4 (1000 mL)

Page: 4/10

Printing date: 14.01.2026

Date of issue: 22.04.2025

Version: 2.3.3.2

## 5.1.2 Unsuitable extinguishing media

no data available

## 5.2 Special hazards arising from the substance or mixture

WARNING: Flammable (GHS regulation). May form explosive vapour-air mixtures. Formation of hazardous and caustic vapour-air mixtures possible.

## 5.3 Advice for firefighters

No, for listed product. The substance/mixture is flammable. Product package burns like paper or plastic. Cool any undamaged containers in water, and remove from the danger zone if possible. Heating will lead to an increase in pressure, and a danger of bursting. Spray any vapours released with water. Retent fire water. Use only acid-resistant safety equipment.

For great amount - if necessary - protective breathing apparatus which is independent of the ambient air (isolated equipment), and sealed protective clothing is necessary in the event of a large-scale formation of toxic substances.

## 5.4 Additional information

Danger for environment **only in the event of a large-scale leakage** or formation of hazardous substances.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Do not breathe vapours. Wear suitable protective gloves (see 8.2.2). Keep product away from sources of ignition - No smoking. Regular staff training is necessary, indicating hazards and precautions on the basis of operating instructions. Restrictions on activity must be observed.

### 6.2 Environmental precautions

PBT: not applicable

vPvB: not applicable

### 6.3 Methods and material for containment and cleaning up

Bind any escaping liquid with inert absorbent. And dispose in accordance to local regulations for the disposal of hazardous chemicals.

Clean any contaminated equipment and floors with plenty of water.

Collect small amounts of leaked liquid and flush with water into drains.

### 6.4 Reference to other sections

see information in section 5.4,7,8 and 13

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Handling in accordance with the test instruction, that comes with the product.

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

Safe storage is guaranteed in the original packaging from MACHEREY-NAGEL. Storage class (German chemical industry): see chapter 12.1

Storage class (VCI): 3

Water hazard class (DE): 1

#### 7.2.1 Requirements for stock rooms and containers

Keep original product packages tightly closed during handling and storage.

### 7.3 Specific end use(s)

Product for analytical use.

## SECTION 8: Exposure controls /personal protection

### 8.1 Control parameters

#### 1000 mL MC4

Chemical: sodium perchlorate

CAS No.: 7601-89-0

DNEL: [derm] 2.16 mg/kg bw/day; [inh] 0.28 mg/m<sup>3</sup>

DNEL = Derived No-Effect Level (for workers)

TRGS 900 (DE):

-

E/e respirable

NIOSH:

not listed

[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period

OSHA:

not listed



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|                           |                           |                  |
|---------------------------|---------------------------|------------------|
| REF: 744859.1             | Buffer MC4 (1000 mL)      | Page: 5/10       |
| Printing date: 14.01.2026 | Date of issue: 22.04.2025 | Version: 2.3.3.2 |

Chemical: *ethanol* CAS No.: 64-17-5  
 DNEL: [derm] 343 mg/kg; [inh] 950 mg/m<sup>3</sup>  
DNEL = Derived No-Effect Level (for workers)  
 PNEC (fresh water): 0.96 mg/L  
PNEC = Predicted No Effect Concentration  
 TRGS 900 (DE): 200 ppm / 380 mg/m<sup>3</sup>  
E/e respirable  
 Short-term exposure factor: 4 (II), Y  
skin resorptive (H), respiratory sensitizable (Sa), skin sensitizable (Sh), teratogenic (Z) not securely excluded / (Y) certainly excluded  
 SUVA(CH) MAK value: 500 ppm / 960 mg/m<sup>3</sup>  
 NIOSH: [TWA] 1000 ppm / 1900 mg/m<sup>3</sup>  
[TWA] Time-weighted average to a reference period of 8 hours, [STEL] Short-term exposure limit related to a 15-minute period  
 OSHA: 1000 ppm / 1900 mg/m<sup>3</sup>

## 8.2 Exposure controls

Good ventilation and extraction system in the room, floor resistant to chemicals with floor drainage and washing facilities. The highest level of cleanliness must be maintained at the workplace.

### 8.2.1 Respiratory protection

No additional recommendations.

### 8.2.2 Skin protection / Hand protection

Yes, gloves according EN 374 (permeation time >30 min - level 2), consist of PVC (f.ex. from Ansell or KCL).

### 8.2.3 Eye / Face Protection

Yes, safety glasses according EN 166 with integrated side shields or wrap-around protection.

### 8.2.4 Skin protection

Recommended to avoid contamination with these hazards.

### 8.2.5 Personal hygiene

Eating, drinking, smoking, taking snuff and storage of food in work areas and at outdoor workplaces is prohibited. Avoid contact with the skin, eyes and clothing. Rinse any clothing on which the substance has been spilled, and soak it in water. Wash hands thoroughly with soap and water when stopping work and before eating, and then apply protective skin cream.

### 8.2.6 Thermal hazards

no data available

## 8.3 Limitation and monitoring of environmental exposure

Do not release product into environment.

# SECTION 9: Physical and chemical properties

## 9.1 Information on basic physical and chemical properties

### 1000 mL MC4

|   |                        |
|---|------------------------|
| a) State of aggregation:                      | liquid                 |
| b) Colour:                                    | colourless             |
| c) Odor:                                      | alcoholic              |
| d) Melting point:                             | no data available      |
| e) Boiling point:                             | 83,6 °C                |
| f) Flammability:                              | no data available      |
| g) Explosive limits (lower / upper):          | no data available      |
| h) Flash point:                               | 26 °C                  |
| i) Flashing temperature:                      | no data available      |
| j) Decomposition temperature:                 | no data available      |
| k) pH value:                                  | 4.5-5.5                |
| l) Kinematic viscosity:                       | no data available      |
| m) Solubility in water:                       | no data available      |
| n) Dispersion coefficient (K <sub>ow</sub> ): | no data available      |
| o) Vapour pressure (20°C):                    | no data available      |
| p) Specific gravity:                          | 1.06 g/cm <sup>3</sup> |
| q) Relative vapour density (air=1):           | no data available      |
| r) Particle size:                             | no data available      |

## 9.2 Other information



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Buffer MC4 (1000 mL)

Page: 6/10

Printing date: 14.01.2026

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Version: 2.3.3.2

## 9.2.1 Information on physical hazard classes

no data available

## 9.2.2 Other safety-related parameters

No data is available for the other parameters for the mixtures, since no registration and no chemical safety report is required.

□□

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

no further data available.

### 10.2 Chemical stability

no known instability.

### 10.3 Possibility of hazardous reactions

But avoid reactions with oxidizing agents. No further data available.

### 10.4 Conditions to avoid

But formation of explosive gases/vapours with air is possible. Use only in well ventilated rooms. No more required.

### 10.5 Incompatible materials

Avoid storage with oxidising substances.

### 10.6 Hazardous decomposition products

In the original package all parts/all reagents are safety and separated stored. Decompositions are not observed during the expiration period under recommended conditions.

## SECTION 11: Toxicological information

### 11.1 Information on the hazard classes according regulation (EC) 1272/2008

Following information is valid for pure substances. Quantitative data on the toxicity of this product are not available.

#### 1000 mL MC4

|  |                           |                                 |            |
|--|---------------------------|---------------------------------|------------|
| Chemical:  | <i>sodium perchlorate</i> | CAS No.:                        | 7601-89-0  |
| TSCA Inventory:  | listed                    | California Proposition 65 List: | not listed |
| Australia NICNAS:  | not listed                | Canada CEPA 1999:               | DSL Yes    |
| Japan CSCL/PRTR:   | not listed, Japan PDSCL:  |                                 | not listed |
| Japan ISHL:  | not listed                |                                 |            |
| South Korea TCCA:  | not listed                |                                 |            |
| Korea Exist.Chem.Inventory:  | KE-31569                  |                                 |            |
| LD50 orl rat :   | 2100 mg/kg                |                                 |            |
| Acute Effects: Cause after oral intake, impairments of health when ingested in small quantities. |                           |                                 |            |

|   |   |                                 |            |
|---|---|---------------------------------|------------|
| Chemical:                                       | <i>ethanol</i>  | CAS No.:                        | 64-17-5    |
| TSCA Inventory:                                 | listed  | California Proposition 65 List: | not listed |
| ACGIH:  | 1000 ppm  |                                 |            |
| Exposure Routes:                                | inhalation, ingestion, skin and/or eye contact  |                                 |            |
| Target Organs:                                  | Eyes, skin, respiratory system, central nervous system, liver, blood, reproductive system             |                                 |            |
| Symptoms:                                       | irritation eyes, skin, nose; headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; |                                 |            |
| liver damage; anemia; reproductive, teratogenic |   |                                 |            |
| Australia NICNAS:                               | not listed  | Canada CEPA 1999:               | DSL yes    |
| Japan CSCL/PRTR:                                | not listed, Japan PDSCL:  |                                 | not listed |
| Japan ISHL:                                     | listed ≥0,1%/≥0,1%, Article 57-2 (SDS required)   |                                 |            |
| South Korea TCCA:                               | not listed  |                                 |            |
| Korea Exist.Chem.Inventory:                     | KE-13217  |                                 |            |
| LD50 orl rat :                                  | 6200 mg/kg  |                                 |            |
| LC <sub>LoW</sub> ihl gpg :                     | 21,900 mg/L   |                                 |            |
| LC <sub>LoW</sub> orl hmn :                     | 1400 mg/kg  |                                 |            |
| LC50 ihl mus :                                  | 123,4 mg/L/4H   |                                 |            |
| LC50 ihl rat :                                  | 115,9-133,8 mg/L/4H   |                                 |            |
| LD50 orl mus :                                  | 3450 mg/kg  |                                 |            |
| TRGS 905 (DE):                                  | K5, M5, R <sub>F</sub> C  |                                 |            |



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REF: 744859.1

Buffer MC4 (1000 mL)

Page: 7/10

Printing date: 14.01.2026

Date of issue: 22.04.2025

Version: 2.3.3.2

## 11.2 Other hazards

### Possible endocrine disrupting effects

This substance/mixture contains components considered to have endocrinedisrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

### Other information

no additional data available

## SECTION 12: Ecological information

### 12.1 Toxicity

Following information is valid for pure substances.

#### 1000 mL MC4

Substance name: *sodium perchlorate* CAS-Nr.: 7601-89-0  
 Water hazard class (DE): 1 WGK No.: 0382  
 Storage class (VCI): 12

Substance name: *ethanol* CAS-Nr.: 64-17-5

PNEC (fresh water): 0.96 mg/L  
 PNEC = Predicted No Effect Concentration = concentration at which no effect on the environment is expected  
 LC50 daphnia magna/48h : >100 g/L  
 LC50 pimephales promelas/96h : 13.4-15.1 g/L  
 LC50 leuciscus idus/96h : [48h] 8.14 g/L  
 LC50 fish/96h : 13 g/L  
 EC50 daphnia/48h : 9.3-14.2 g/L  
 IC50 scenedesmus quadricauda/72h : [7d] 5000 mg/L  
 EC10 pseudomonas putita/16h : [EC5] 6500 mg/L  
 Water hazard class (DE): 1 WGK No.: 0096  
 Storage class (VCI): 3

### 12.2 Persistence and degradability

### 12.3 Bioaccumulative potential

Substance name: *ethanol* CAS-Nr.: 64-17-5  
 Dispersion coefficient (K<sub>ow</sub>): -0,31

### 12.4 Mobility in soil

### 12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

### 12.6 Endocrine disrupting properties

This substance/mixture contains components considered to have endocrinedisrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100.

### 12.7 Other adverse effects

no additional data available

## SECTION 13: Disposal considerations

Please observe local regulations for collection and disposal of hazardous waste and contact waste disposal company, where you will obtain information on laboratory waste disposal (waste code number 16 05 06).

### 13.1 Waste treatment methods

Normally it is possible to empty small amounts (diluted!) into drains.



# Safety Data Sheet

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|                           |                           |                  |
|---------------------------|---------------------------|------------------|
| REF: 744859.1             | Buffer MC4 (1000 mL)      | Page: 8/10       |
| Printing date: 14.01.2026 | Date of issue: 22.04.2025 | Version: 2.3.3.2 |

## SECTION 14: Transport information

- 14.1 UN number:** 1993
- 14.2 UN proper shipping name:** Flammable liquid, n.o.s. (ethanol mixture)
- 14.3 Class:** 3
- 14.4 Packing group:** III
  - Road transport ADR*
    - Classification code: F1
    - Limited Quantity: 5 L
    - Excepted Quantity: E 1
    - Special instructions: 274, 601
    - Tunnel restriction code: D/E
  - Air transport IATA DGR*
    - Limited Quantity: PAX: 355 max. quantity PAX: 60 L  
CAO: 366 max. quantity CAO: 220 L
    - Excepted Quantity: E 1
  - Maritime transport IMDG*
    - EmS: F-E, S-E
    - Special instructions: 223, 274, 955
    - Staukategorie: A

**14.5 Environmental hazards**  
none, contains only small quantities of hazardous substances

**14.6 Special precautions for user**  
not necessary

**14.7 Carriage in bulk by sea in accordance with IMO instruments**  
Not applicable.

## SECTION 15: Regulatory information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**  
 Dangerous Substances Protection Act (DE: Chemikaliengesetz - ChemG), Aug 2013, Stand: Okt 2020  
 Ordinance on protection against dangerous substances (E: Gefahrstoffverordnung - GefStoffV), Nov 2010, Stand: Mrz 2017  
 TRGS 201, Classification and labeling of activities involving hazardous substances, Feb 2017  
 TRGS 220, National aspects when preparing safety data sheets, Jan 2017  
 TRGS 400, Risk assessment for activities involving hazardous substances, Jul 2017  
 BekGS 408, Application of the GefStoffV and the TRGS with the entry into force of the CLP regulation, December 2009, status: Jan 2012  
 Betriebsicherheitsverordnung (BetrSichV), Sept 2002  
 MN leaflet/instructions for use, also at [www.mn-net.com](http://www.mn-net.com)  
 If necessary, observe other country-specific regulations.

**15.2 Chemical safety assessment**  
no data available

## SECTION 16: Other information

**16.1 Changes compared to the last version**  
Between versions 2.3.3.2 and 2.2.2.2 following changes were applied: - 1 product component data corrected - 1 composition data corrected

### 16.2 List of H and P phrases

- 16.2.1 List of relevant H phrases**
  - H226 Flammable liquid and vapour.
  - H302 Harmful if swallowed.
- 16.2.2 List of relevant P phrases**
  - P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
  - P233 Keep container tightly closed.
  - P240 Ground/bond container and receiving equipment.
  - P241 Use explosion-proof [electrical/ventilating/lighting] equipment.
  - P242 Use non-sparking tools.



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# Safety Data Sheet

according to Regulations REACH 1907/2006/EC

|                           |                           |                  |
|---------------------------|---------------------------|------------------|
| REF: 744859.1             | Buffer MC4 (1000 mL)      | Page: 9/10       |
| Printing date: 14.01.2026 | Date of issue: 22.04.2025 | Version: 2.3.3.2 |

|              |  |
|--------------|--|
| P264W        | Wash with water thoroughly after handling.   |
| P270         | Do not eat, drink or smoke when using this product.  |
| P280         | Wear protective gloves/protective clothing/eye protection/face protection.                               |
| P301+312     | IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.  |
| P303+361+353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. |
| P330         | Rinse mouth.   |
| P370+378     | In case of fire: Use suitable extinguisher media to extinguish.  |
| P403+235     | Store in a well-ventilated place. Keep cool.   |
| P501         | Dispose of contents/container to regulated waste treatment.  |

## 16.3 Recommended restriction on use

Only for professional user.  
 Look about employee restrictions for young people (f. ex. 94/33/EC or DE § 22 JArbSchG)!  
 Look about employee restrictions for pregnant women and nursing women (f.ex. 92/85/EEC or for DE §§ 11-13 MuSchG 2017)!  
 An individual package of this product or test kit has a moderate hazardous potential.

## 16.4 Sources of key data

KÜHN, BIRETT, Leaflets on hazardous materials, 2021  
 Directive 1999/92/EG Minimum requirements to improve the safety and health protection of workers at risk from potentially explosive atmospheres  
 SUVA .CH, limit values in the air at work 2009, revised on 01/2009  
 Regulation 790/2009/EU, adaptation of Regulation 1272/2008/EU to technical and scientific progress (1st ATP)  
 Regulation 453/2010/EU, adaptation of the REACH regulation 1907/2006/EG  
 Regulation 487/2013/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (4th ATP)  
 Regulation 1221/2015/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (7th ATP)  
 Regulation 776/2017/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (10th ATP)  
  
 Regulation 669/2018/EU, adaptation of Regulation 1272/2008/EC to technical and scientific progressText (11th ATP)  
 Regulation 1480/2018/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (13th ATP)  
 Regulation 521/2019/EU, adaptation of regulation 1272/2008/EG to technical and scientific progress (12th ATP)  
 TRGS 900, German rules of technology on limit values in the air at work, as of 03/2019  
 Regulation 217/2020/EU, adaptation of Annex VI, Part 3, of Regulation 1272/2008/EC to technical and scientific progress (14th ATP)  
 Regulation 878/2020/EU, adaptation of Annex II of the REACH regulation 1907/2006/EG  
 Regulation 1182/2020/EU, adaptation of Annex VI, Part 3, of Regulation 1272/2008/EC to technical and scientific progress (15th ATP)  
 Regulation 643/2021/EU, adaptation of Annex VI, Part 1, of Regulation 1272/2008/EC to technical and scientific progress (16th ATP)  
 Regulation 849/2021/EU, adaptation of Annex VI, Part 3, of Regulation 1272/2008/EC to technical and scientific progress (17th ATP)  
 Regulation 692/2022/EU, adaptation of Annex VI, Part 1, of Regulation 1272/2008/EC to technical and scientific progress (18th ATP)

### revisions/updates

Reason for revision: 2014-02 Corrected structure of the sections according to Regulation 453/2010/EU, if necessary  
 2014-04 adjustment according Regulation 487/2013/EU  
 2016-03 adjustment according Regulation 1221/2015/EU  
 2017-08 adjustment according the Ordinance on Ethanol Denaturation 2016/1867/EU  
 2017-11 adjustment according the ECHA registration dossier  
 2022-11 adjustment according Regulation 878/2020/EU

## 16.5 Further information

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## 16.6 Legend / Abbreviations

|       |   |
|-------|---|
| acc:  | according   |
| ADR:  | Convention concerning the International Carriage of Dangerous Goods by Road |
| Act:  | acute   |
| BAT:  | biological workplace tolerance value  |
| CAO:  | Cargo Aircraft Only   |
| Carc: | carcinogen  |
| CAS:  | Chemical Abstracts Service  |
| CLP:  | Classification, Labelling and Packaging regulation                          |
| CMR:  | carcinogen, mutagen, reproduction toxic                                     |
| Corr: | corrosive   |
| COD:  | chemical oxigen demand  |
| CSSL: | Chemical Substance Control Law (Jp)   |



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| Printing date: 14.01.2026 | Date of issue: 22.04.2025 | Version: 2.3.3.2 |

|                       |  |
|-----------------------|--|
| Dam:                  | damage   |
| DNEL:                 | Derived No-Effect Level (for workers)                                |
| derm:                 | dermal   |
| dog:                  | dog  |
| EC10:                 | Concentration causing a toxic effect in 10% of the test organisms    |
| EC:                   | European Community   |
| EC-Nr:                | Substance number of the EC substance inventory                       |
| EmS:                  | Guide to accident management measures on ships                       |
| EU:                   | European Union   |
| fish:                 | fish (not specified)   |
| GHS:                  | Global Harmonized System of Classification and Labeling of Chemicals |
| gpg:                  | guinea pig   |
| ICAO:                 | International Civil Aviation Organization                            |
| ihl:                  | inhaled  |
| IMDG:                 | International Maritime Dangerous Goods Code                          |
| intrav:               | intravenous  |
| ipt:                  | intraperitoneal  |
| ISHL:                 | Industrial Safety and Health Law (Jp)                                |
| LC50:                 | letale concentration 50%   |
| LD50:                 | letale dosis 50%   |
| leuciscus idus:       | fisch, ide, orfe   |
| MAK:                  | maximum workplace concentration                                      |
| Met:                  | Metall   |
| mus:                  | mouse  |
| Muta:                 | mutagen  |
| NIOSH:                | National Institute for Occupational Safety and Health (US)           |
| NRD:                  | Non-rapidly degradable   |
| onchorhynchus mykiss: | fish, rainbow trout  |
| orl:                  | oral   |
| OSHA:                 | Occupational Safety and Health Administration                        |
| PAX:                  | transport on passenger planes allowed                                |
| PBT:                  | persistent, bioaccumulating, toxic substance                         |
| pH:                   | pH value   |
| pimephales promelas:  | fish, fathead minnow   |
| PNEC:                 | Predicted No Effect Concentration                                    |
| PROC 15:              | Process category 'for laboratory use'                                |
| PRTR:                 | Law for PRTR and Promotion of Chemical Management (Jp)               |
| PVC:                  | polyvinyl chloride   |
| quail:                | bird, quail  |
| rat:                  | rat  |
| rbt:                  | rabbit   |
| RD:                   | rapidly degradable   |
| RE:                   | repeated   |
| REACH:                | Registration, Evaluation, Authorisation and Restriction of Chemicals |
| REF:                  | item number, reference number  |
| Reg.No.:              | rRegistration number   |
| Repr:                 | harmful to reproduction  |
| Resp:                 | respiratory  |
| RIP:                  | REACH Implementations Projects                                       |
| scu:                  | sub cutan  |
| SDS:                  | safety data sheet  |
| Sens:                 | sensitisation  |
| STEL:                 | short term exposure limit  |
| STOT:                 | Specific Target Organ Toxicity                                       |
| SVHC:                 | Substance of Very High Concern                                       |
| t/a:                  | tons per year  |
| TCCA:                 | Toxic Chemicals Control Act (S. Korea)                               |
| Tox:                  | toxic  |
| TSCA:                 | The Toxic Substances Control Act (US)                                |
| TWA:                  | time weighted average  |
| TRGS:                 | technical regulations (DE)   |
| vPvB:                 | very persistent, very bioaccumulating substance                      |

## 16.7 Training advice

Regular safety training. Multiple safety training of staffs about danger and protection by using hazards in working area. Additionally training and introduction of staffs for using these products.



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