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

1.1 Product identifiers

- **Product name**: Formalin solution, neutral buffered, 10%
- **Product Number**: HT501128
- **Brand**: Sigma

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

- **Identified uses**: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

- **Company**: Sigma-Aldrich Inc.
  3050 SPRUCE ST
  ST. LOUIS MO  63103
  UNITED STATES
- **Telephone**: +1 314 771-5765
- **Fax**: +1 800 325-5052

1.4 Emergency telephone

- **Emergency Phone #**: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

- Flammable liquids (Category 4), H227
- Acute toxicity, Oral (Category 4), H302
- Acute toxicity, Inhalation (Category 4), H332
- Skin sensitization (Category 1), H317
- Germ cell mutagenicity (Category 2), H341
- Carcinogenicity (Category 1B), H350
- Short-term (acute) aquatic hazard (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements
**2.3 Hazards not otherwise classified (HNOC) or not covered by GHS** - none

### SECTION 3: Composition/information on ingredients

#### 3.2 Mixtures

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>formaldehyde</td>
<td>Flam. Liq. 4; Acute Tox. 3;</td>
<td>&gt;= 1 - &lt; 5 %</td>
</tr>
</tbody>
</table>

CAS-No. 50-00-0
<table>
<thead>
<tr>
<th>EC-No.</th>
<th>200-001-8</th>
<th>Acute Tox. 2; Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Skin Sens. 1; Muta. 2; Carc. 1B; STOT SE 3; Aquatic Acute 2; H227, H301, H330, H311, H314, H318, H317, H341, H350, H335, H401</th>
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</thead>
<tbody>
<tr>
<td>Index-No.</td>
<td>605-001-00-5</td>
<td></td>
</tr>
<tr>
<td>Registration number</td>
<td>01-2119488953-20-XXXX</td>
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</tr>
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</table>

### Methanol

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>67-56-1</th>
<th>Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301, H331, H311, H370</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC-No.</td>
<td>200-659-6</td>
<td>Concentration limits: &gt; = 1 - &lt; 3 %</td>
</tr>
<tr>
<td>Index-No.</td>
<td>603-001-00-X</td>
<td></td>
</tr>
<tr>
<td>Registration number</td>
<td>01-2119433307-44-XXXX</td>
<td></td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

### SECTION 4: First aid measures

#### 4.1 Description of first-aid measures

**General advice**
Show this material safety data sheet to the doctor in attendance.

**If inhaled**
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

**In case of skin contact**
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.

**In case of eye contact**
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.
If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Not combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.
SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Storage class
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>formaldehyde</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
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<td>----------</td>
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<tr>
<td></td>
</tr>
<tr>
<td>OSHA specifically regulated carcinogen</td>
</tr>
<tr>
<td>OSHA specifically regulated carcinogen</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Potential Occupational Carcinogen</td>
</tr>
<tr>
<td>Methanol</td>
</tr>
<tr>
<td>Danger of cutaneous absorption</td>
</tr>
<tr>
<td>Danger of cutaneous absorption</td>
</tr>
<tr>
<td>ST</td>
</tr>
<tr>
<td>Potential for dermal absorption</td>
</tr>
<tr>
<td>TWA</td>
</tr>
<tr>
<td>Potential for dermal absorption</td>
</tr>
<tr>
<td>TWA</td>
</tr>
<tr>
<td>PEL</td>
</tr>
<tr>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
<tr>
<td>Skin</td>
</tr>
<tr>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
</tbody>
</table>
The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada

| TWA | 200 ppm  
| USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values) |
| Skin notation |
| STEL | 250 ppm 325 mg/m³  
| USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values) |
| Skin notation |

### Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Parameters</th>
<th>Value</th>
<th>Biological specimen</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>Methanol</td>
<td>15 mg/l</td>
<td>Urine</td>
<td>ACGIH - Biological Exposure Indices (BEI)</td>
</tr>
</tbody>
</table>

**Remarks**  End of shift (As soon as possible after exposure ceases)

### 8.2 Exposure controls

#### Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

#### Personal protective equipment

**Eye/face protection**

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

**Skin protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
- Material: Nitrile rubber
- Minimum layer thickness: 0.11 mm
- Break through time: 480 min
- Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
- Material: Nitrile rubber
- Minimum layer thickness: 0.11 mm
- Break through time: 480 min
- Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.
Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter type ABEK
The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- **a) Appearance** Form: liquid
  Color: colorless
- **b) Odor** No data available
- **c) Odor Threshold** No data available
- **d) pH** 6.5 - 7.5 at 10%
- **e) Melting point/freezing point** No data available
- **f) Initial boiling point and boiling range** 100 °C 212 °F at 1,013 hPa
- **g) Flash point** 85 °C (185 °F)
- **h) Evaporation rate** No data available
- **i) Flammability (solid, gas)** No data available
- **j) Upper/lower flammability or explosive limits** Upper explosion limit: 70 %(V)
  Lower explosion limit: 7 %(V)
- **k) Vapor pressure** 53 hPa at 39 °C (102 °F)
- **l) Vapor density** No data available
- **m) Density** 1.080 g/cm³
  Relative density No data available
- **n) Water solubility** completely misciblesoluble
- **o) Partition coefficient: n-octanol/water** No data available
- **p) Autoignition temperature** Not applicable
9.2 **Other safety information**
No data available

**SECTION 10: Stability and reactivity**

10.1 **Reactivity**
Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.2 **Chemical stability**
The product is chemically stable under standard ambient conditions (room temperature).

10.3 **Possibility of hazardous reactions**
Violent reactions possible with:
The generally known reaction partners of water.

10.4 **Conditions to avoid**
Strong heating.

10.5 **Incompatible materials**
Strong bases, Acids, Oxidizing agents, Alkali metals, Strong oxidizing agents, Amines,
Strong acids, Acid chlorides, Acid anhydrides, Reducing agents, Peroxides, Isocyanates,
Phenol, Aniline

10.6 **Hazardous decomposition products**
In the event of fire: see section 5

**SECTION 11: Toxicological information**

11.1 **Information on toxicological effects**

Mixture

**Acute toxicity**
Oral: No data available

Inhalation: No data available

Dermal: No data available

**Skin corrosion/irritation**
No data available

**Serious eye damage/eye irritation**
No data available
**Respiratory or skin sensitization**  
Mixture may cause an allergic skin reaction.

**Germ cell mutagenicity**  
Evidence of genetic defects.

**Carcinogenicity**  
Possible carcinogen.

- **IARC:** 1 - Group 1: Carcinogenic to humans (formaldehyde)
- **NTP:** Known - Known to be human carcinogen (formaldehyde)
- **OSHA:** OSHA specifically regulated carcinogen (formaldehyde)

**Reproductive toxicity**  
No data available

**Specific target organ toxicity - single exposure**  
No data available

**Specific target organ toxicity - repeated exposure**  
No data available

**Aspiration hazard**  
No data available

### 11.2 Additional Information

Methyl alcohol may be fatal or cause blindness if swallowed., Cannot be made non-poisonous., Effects due to ingestion may include:, Nausea, Dizziness, Gastrointestinal disturbance, Weakness, Confusion., Drowsiness, Unconsciousness, May cause convulsions. Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Handle in accordance with good industrial hygiene and safety practice.

- Liver - Irregularities - Based on Human Evidence
- Stomach - Irregularities - Based on Human Evidence

**Components**

**formaldehyde**

**Acute toxicity**
- LD50 Oral - Rat - 100 mg/kg
- Remarks: (Lit.)
- LC50 Inhalation - Rat - male and female - 4 h - < 0.57 mg/l - vapor  
  (OECD Test Guideline 403)
- LD50 Dermal - Rabbit - 270 mg/kg
- Remarks: (RTECS)
- No data available

**Skin corrosion/irritation**
- Skin - Rabbit
- Result: Causes burns. - 20 h
(OECD Test Guideline 404)

**Serious eye damage/eye irritation**
Remarks: Causes serious eye damage.

**Respiratory or skin sensitization**
Local lymph node assay (LLNA) - Mouse
Result: positive
(OECD Test Guideline 429)

**Germ cell mutagenicity**
Suspected of causing genetic defects.

**Carcinogenicity**
Presumed to have carcinogenic potential for humans

**Reproductive toxicity**
No data available

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

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

---

**Methanol**

**Acute toxicity**
Acute toxicity estimate Oral - 100.1 mg/kg
(Expert judgment)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Symptoms: Nausea, Vomiting
Acute toxicity estimate Inhalation - 4 h - 3.1 mg/l - vapor
(Expert judgment)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Symptoms: Irritation symptoms in the respiratory tract.
Acute toxicity estimate Dermal - 300.1 mg/kg
(Expert judgment)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Skin corrosion/irritation**
Skin - Rabbit
Result: No skin irritation
Remarks: (ECHA)
Remarks: Drying-out effect resulting in rough and chapped skin.

**Serious eye damage/eye irritation**
Eyes - Rabbit
Result: No eye irritation
Remarks: (ECHA)
**Respiratory or skin sensitization**  
Sensitisation test: - Guinea pig  
Result: negative  
(OECD Test Guideline 406)

**Germ cell mutagenicity**  
Based on available data the classification criteria are not met.  
Test Type: Ames test  
Test system: Salmonella typhimurium  
Result: negative  
Test Type: In vitro mammalian cell gene mutation test  
Test system: Chinese hamster lung cells  
Result: negative  
Method: OECD Test Guideline 474  
Species: Mouse - male and female - Bone marrow  
Result: negative

**Carcinogenicity**  
Did not show carcinogenic effects in animal experiments.

**Reproductive toxicity**  
Based on available data the classification criteria are not met.

**Specific target organ toxicity - single exposure**  
Causes damage to organs. - Eyes, Central nervous system  
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)  
Acute oral toxicity - Nausea, Vomiting  
Acute inhalation toxicity - Irritation symptoms in the respiratory tract.

**Specific target organ toxicity - repeated exposure**  
No data available

**Aspiration hazard**  
No data available

---

**SECTION 12: Ecological information**

12.1 **Toxicity**  
**Mixture**  
No data available

12.2 **Persistence and degradability**  
No data available

12.3 **Bioaccumulative potential**  
No data available

12.4 **Mobility in soil**  
No data available

12.5 **Results of PBT and vPvB assessment**  
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 **Endocrine disrupting properties**  
No data available
12.7 Other adverse effects
No data available

Components

**formaldehyde**
Toxicity to fish
 static test LC50 - Morone saxatilis - 6.7 mg/l - 96 h
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates
 static test EC50 - Daphnia pulex (Water flea) - 5.8 mg/l - 48 h
(OECD Test Guideline 202)

Toxicity to algae
 static test EC50 - Desmodesmus subspicatus (green algae) - 4.89 mg/l - 72 h
(OECD Test Guideline 201)

Toxicity to bacteria
 static test EC50 - activated sludge - 19 mg/l - 3 h
(OECD Test Guideline 209)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
 semi-static test NOEC - Daphnia magna (Water flea) - >= 6.4 mg/l - 21 d
(OECD Test Guideline 211)

**Methanol**
Toxicity to fish
 flow-through test LC50 - Lepomis macrochirus (Bluegill) - 15,400.0 mg/l - 96 h
(US-EPA)

Toxicity to daphnia and other aquatic invertebrates
 semi-static test EC50 - Daphnia magna (Water flea) - 18,260 mg/l - 96 h
(OECD Test Guideline 202)

Toxicity to algae
 static test ErC50 - Pseudokirchneriella subcapitata (green algae) - ca. 22,000.0 mg/l - 96 h
(OECD Test Guideline 201)

Toxicity to bacteria
 static test IC50 - activated sludge - > 1,000 mg/l - 3 h
(OECD Test Guideline 209)

Toxicity to fish (Chronic toxicity)
 NOEC - Oryzias latipes (Orange-red killifish) - 7,900 mg/l - 200 h
Remarks: (External MSDS)
SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product**
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

**DOT (US)**
NA-Number: 1993  
Class: NONE  
Packing group: III

Proper shipping name: Combustible liquid, n.o.s. (formaldehyde, Methanol)

Reportable Quantity (RQ): 2500 lbs

Poison Inhalation Hazard: No

**IMDG**
Not dangerous goods

**IATA**
Not dangerous goods

SECTION 15: Regulatory information

**SARA 302 Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>formaldehyde</td>
<td>50-00-0</td>
<td>2008-11-03</td>
</tr>
</tbody>
</table>

**SARA 313 Components**
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>formaldehyde</td>
<td>50-00-0</td>
<td>2008-11-03</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

**SARA 311/312 Hazards**

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
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<tr>
<td>water</td>
<td>7732-18-5</td>
<td>2008-11-03</td>
</tr>
<tr>
<td>formaldehyde</td>
<td>50-00-0</td>
<td>2008-11-03</td>
</tr>
</tbody>
</table>
Methanol

**Pennsylvania Right To Know Components**
formaldehyde  
CAS-No.: 50-00-0  
Revision Date: 2008-11-03

Methanol  
CAS-No.: 67-56-1  
Revision Date: 2007-07-01

disodium hydrogen orthophosphate  
CAS-No.: 7558-79-4  
Revision Date: 1993-04-24

**California Prop. 65 Components**
, which is/are known to the State of California to cause cancer, and formaldehyde  
CAS-No.: 50-00-0  
Revision Date: 2007-09-28

, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

**Methanol**

SECTION 16: Other information

**Further information**
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.7  
Revision Date: 08/31/2023  
Print Date: 10/07/2023