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
UFI: UPX0-P6EG-W992-2FFE
REACH No.: This product is a mixture. REACH Registration Number see section 3.

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Laboratory chemicals, Manufacture of substances
Uses advised against: This product is not intended for consumer use.

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
Classification according to Regulation (EC) No 1272/2008
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
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

**Labelling according Regulation (EC) No 1272/2008**

**Pictogram**

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Danger</th>
</tr>
</thead>
</table>

**Hazard statement(s)**

- H302 + H332: Harmful if swallowed or if inhaled.
- H317: May cause an allergic skin reaction.
- H341: Suspected of causing genetic defects.
- H350: May cause cancer.

**Precautionary statement(s)**

- P202: Do not handle until all safety precautions have been read and understood.
- P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
- P301 + P312: IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
- P302 + P352: IF ON SKIN: Wash with plenty of water.
- P304 + P340 + P312: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
- P308 + P313: IF exposed or concerned: Get medical advice/ attention.

**Supplemental Hazard Statements**

none

**Restricted to professional users.**

**Reduced Labeling (<= 125 ml)**

**Pictogram**

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Danger</th>
</tr>
</thead>
</table>

**Hazard statement(s)**

- H317: May cause an allergic skin reaction.
- H341: Suspected of causing genetic defects.
- H350: May cause cancer.

**Precautionary statement(s)**

- P202: Do not handle until all safety precautions have been read and understood.
- P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
- P302 + P352: IF ON SKIN: Wash with plenty of water.
- P308 + P313: IF exposed or concerned: Get medical advice/ attention.

**Supplemental Hazard Statements**

none
2.3 Other hazards
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.

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>Acute Tox. 3; Acute Tox. 2; Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Skin Sens. 1; Muta. 2; Carc. 1B; STOT SE 3; H301, H330, H311, H314, H318, H317, H341, H350, H335</td>
<td>&gt;= 25 %: Skin Corr. 1B, H314; 5 - &lt; 25 %: Skin Irrit. 2, H315; 5 - &lt; 25 %: Eye Irrit. 2, H319; &gt;= 5 %: STOT SE 3, H335; &gt;= 0,2 %: Skin Sens. 1, H317;</td>
</tr>
<tr>
<td></td>
<td>Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301, H331, H311, H370</td>
<td>&gt;= 10 %: STOT SE 1, H370; 3 - &lt; 10 %: STOT SE 2, H371;</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
Ingredients with workplace control parameters

8.2 Exposure controls
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.
The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

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**

**Respiratory protection**
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.

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.

**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) Physical state liquid
b) Color colorless
c) Odor No data available
d) Melting point/freezing point No data available
e) Initial boiling point and boiling range 100 °C at 1.013 hPa
f) Flammability (solid, gas)  No data available

g) Upper/lower flammability or explosive limits  Upper explosion limit: 70 % (V)  

h) Flash point  85 °C  Not applicable

i) Autoignition temperature  Not applicable

j) Decomposition temperature  No data available

k) pH  6.5 - 7.5 at 10%

l) Viscosity  Viscosity, kinematic: No data available  

m) Water solubility  completely miscible at 20 °C soluble

n) Partition coefficient: n-octanol/water  No data available

o) Vapor pressure  53 hPa at 39 °C

p) Density  1,080 g/cm³  

Relative density  No data available

q) Relative vapor density  No data available

r) Particle characteristics  No data available

s) Explosive properties  Not classified as explosive.

t) Oxidizing properties  none

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
Acute toxicity estimate Inhalation - 4 h - 12,01 mg/l - vapor (Calculation method)

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.

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

Endocrine disrupting properties

Product:
Assessment
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU)
2018/605 at levels of 0.1% or higher. 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.

**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)

**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**
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**

**Product:**
Assessment: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

**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) -
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**
No data available

**SECTION 14: Transport information**

**14.1 UN number**
ADR/RID: - IMDG: - IATA: -

**14.2 UN proper shipping name**
ADR/RID: Not dangerous goods IMDG: Not dangerous goods IATA: Not dangerous goods

**14.3 Transport hazard class(es)**
ADR/RID: - IMDG: - IATA: -

**14.4 Packaging group**
ADR/RID: - IMDG: - IATA: -
14.5 Environmental hazards
ADR/RID: no  IMGD Marine pollutant: no  IATA: no

14.6 Special precautions for user
No data available
Further information : No data available

SECTION 15: Regulatory information
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorisations and/or restrictions on use
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII):
- formaldehyde
- Methanol

Other regulations
Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.
Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information
Full text of H-Statements referred to under sections 2 and 3.

H225  Highly flammable liquid and vapor.
H301  Toxic if swallowed.
H302  
H302 + H332  Harmful if swallowed.
H311  Harmful if swallowed or if inhaled.
H314  Toxic in contact with skin.
H315  Causes severe skin burns and eye damage.
H317  Causes skin irritation.
H318  Toxic if swallowed or in contact with skin.
H319  Causes severe skin burns and eye damage.
H330  May cause an allergic skin reaction.
H331  Fatal if inhaled.
H332  May cause respiratory irritation.
H335  Suspected of causing genetic defects.
H341  May cause cancer.
H350  May cause an allergic skin reaction.
H370  Causes serious eye damage.
H371  Causes serious eye irritation.
Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50% of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Tox.4</td>
<td>H302</td>
</tr>
<tr>
<td>Acute Tox.4</td>
<td>H332</td>
</tr>
<tr>
<td>Skin Sens.1</td>
<td>H317</td>
</tr>
<tr>
<td>Muta.2</td>
<td>H341</td>
</tr>
<tr>
<td>Carc.1B</td>
<td>H350</td>
</tr>
</tbody>
</table>

Classification procedure:

Calculation method

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