 SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Contact information

General
Fluidigm Corporation
2 Tower Place, Suite 2000, South San Francisco, CA 94080
Main (U.S.): +1 (650) 266-6000
E-mail: techsupport@fluidigm.com

Emergency telephone number
+ (650) 266-6100 (outside US)
+ (866) 358-4354 (toll free)

Product identifier
Fix and Perm Buffer

Synonyms
None identified

Trade names
None identified

Chemical family
Mixture contains formaldehyde.

Relevant identified uses of the substance or mixture and uses advised against
For research use only. Not for use in diagnostic procedures.

Note
This SDS is written to address potential health and safety issues associated with the handling of the formulated product.

SECTION 2 - HAZARDS IDENTIFICATION

Classification of the substance or mixture

Globally Harmonized System [GHS]
Germ Cell Mutagenicity - Category 2. Carcinogenic - Category 2. Irritant (skin) - Category 2. Irritant (eye) - Category 2. Skin Sensitizer - Category 1. Specific Target Organ Toxicity (single exposure) - Category 3.

Other/Supplemental
AU Hazard Classification (NOHSC) Hazardous Substance. Hazardous goods.

Label elements

GHS hazard pictogram

GHS signal word
Danger

GHS hazard statements
SAFETY DATA SHEET

Product Identifier: Maxpar® Fix and Perm Buffer
Catalog ID numbers: 201067 (100 mL), S00092 (25 mL)
(includes Panel Kits within the following range of Catalog numbers: 201302-2013XX)

GHS precautionary statements

P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P261 - Avoid breathing mist or vapor. P264 - Wash hands thoroughly after handling. P271 - Use only outdoors or in a well-ventilated area. P272 - Contaminated work clothing should not be allowed out of the workplace. P280 - Wear protective gloves/eye protection/face protection. P302 + P352 - If on skin: Wash with plenty of soap and water. P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308 + P313 - If exposed or concerned: get medical advice/attention. P312 - Call a Poison Center or doctor/physician if you feel unwell. P332 + P313 - If skin irritation occurs: Get medical advice/attention. P337 + P313 - If eye irritation persists: Get medical advice/attention. P362 - Take off contaminated clothing and wash before reuse. P403 + P233 - Store in a well-ventilated place. Keep container tightly closed. P405 - Store locked up. P501 - Dispose of contents/container to location in accordance with local/regional/national/international regulations.

Other hazards

Mixture contains formaldehyde.

The major toxic effects caused by acute formaldehyde exposure via inhalation are eye, nose and throat irritation, effects on the nasal cavity, and asthma-like respiratory problems. Other effects include coughing, wheezing, chest pains, and bronchitis. Ingestion has resulted in corrosion of the gastrointestinal tract and inflammation and ulceration of the mouth, esophagus, and stomach. Skin exposure can cause irritation such as dermatitis and itching. Limited data suggests an association between formaldehyde exposure and an increased incidence of lung and nasopharyngeal cancer.

Note

This product is classified as hazardous according to Regulation EC No 1272/2008 (EU CLP) and Hazard Communication Standard No. 1910.1200 (US OSHA).

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS #</th>
<th>EINECS/ELINCS#</th>
<th>Amount</th>
<th>GHS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>200-001-8</td>
<td>1.6%</td>
<td>ATO3: H301; ATD3: H311; ATI1: H330; GCM2: H341; Carc1B: H350; SC1: H314; SS1: H317; EC1: H318; STOT-S3: H335</td>
</tr>
</tbody>
</table>

Note

The ingredients listed above are considered hazardous. The remaining components are non-hazardous and/or present at amounts below reportable limits. See Section 16 for full text of GHS classifications.

SECTION 4 - FIRST AID MEASURES

Description of first aid measures

Immediate Medical Attention Needed

Yes

Eye Contact

If easy to do, remove contact lenses, if worn. Immediately flush eyes with copious quantities of water for at least 15 minutes. If irritation occurs or persists, notify medical personnel and supervisor.

Skin Contact

Wash exposed area with soap and water and remove contaminated clothing/shoes. If irritation occurs or persists, notify medical personnel and supervisor.

Inhalation

Immediately move exposed subject to fresh air. If not breathing, give artificial respiration. If breathing is labored, administer oxygen. Immediately notify medical personnel and supervisor.

Ingestion

Do not induce vomiting unless directed by medical personnel. Do not give anything to drink unless directed by medical personnel. Never give anything by mouth to an unconscious person. Notify medical personnel and supervisor.

Protection of first aid responders

See Section 8 for Exposure Controls/Personal Protection recommendations.

Most important symptoms and effects, both acute and delayed

See Sections 2 and 11.
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Indication of immediate medical attention and special treatment needed, if necessary
Medical conditions aggravated by exposure: None known or reported. Treat symptomatically and supportively.

SECTION 5 - FIREFIGHTING MEASURES

Extinguishing media
Use water spray (fog), foam, dry powder, or carbon dioxide, as appropriate for surrounding fire and materials.

Specific hazards arising from the substance or mixture
No information identified. May emit carbon monoxide and carbon dioxide.

Flammability/Explosivity
Combustible liquid and vapor. Keep away from heat and flame. Vapors are heavier than air and may flow along surfaces to remote ignition sources and flashback.

Advice for firefighters
In case of a fire, keep containers cool with water and remove from fire area. Wear full protective clothing and an approved, positive pressure, self-contained breathing apparatus. Wash all equipment thoroughly after use. Dike area if possible to contain water for later disposal.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
If product is released or spilled, take proper precautions to minimize exposure by using appropriate personal protective equipment (see Section 8). Area should be adequately ventilated. Do not breathe mist/vapors/spray.

Environmental precautions
Do not empty into drains. Avoid release to the environment.

Methods and material for containment and cleaning up
DO NOT CAUSE MATERIAL TO BECOME AIRBORNE. For small spills, soak up material with absorbent, e.g., paper towels. For large spills, cordon off spill area and minimize the spreading of spilled material. Soak up material with absorbent. Collect spilled material, absorbent, and rinse water into suitable containers for proper disposal in accordance with applicable waste disposal regulations (see Section 13). Decontaminate the area twice with an appropriate solvent (see Section 9).

Reference to other sections
See Sections 8 and 13 for more information.

SECTION 7 - HANDLING AND STORAGE

Precautions for safe handling
Wash thoroughly after handling. Avoid breathing vapor or mist. Do not permit eating/drinking/smoking near this material.

Conditions for safe storage including any incompatibilities
Store at 2-8 °C in a well-ventilated area; keep container upright and tightly closed.

Specific end use(s)
No information identified.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Note
Dispose of broken vials/syringes in a sharp container.

Control Parameters/Occupational Exposure Limit Values

<table>
<thead>
<tr>
<th>Compound</th>
<th>Issuer</th>
<th>Type</th>
<th>OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>ACGIH, Portugal, Spain</td>
<td>STEL</td>
<td>2 ppm</td>
</tr>
<tr>
<td></td>
<td>Australia</td>
<td>TWA-8 HR</td>
<td>1 ppm (sensitizer)</td>
</tr>
<tr>
<td></td>
<td>Australia</td>
<td>TWA-8 HR/Ceiling/STEL</td>
<td>0.5 ppm (skin, sensitizer)</td>
</tr>
<tr>
<td></td>
<td>Austria</td>
<td>TWA-8 HR/Ceiling/STEL</td>
<td>0.5 ppm (skin, sensitizer)</td>
</tr>
<tr>
<td></td>
<td>Brazil</td>
<td>Ceiling</td>
<td>1.6 ppm</td>
</tr>
<tr>
<td></td>
<td>Bulgaria</td>
<td>TWA-8 HR/STEL</td>
<td>1/2 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Czech Republic</td>
<td>TWA-8 HR/Ceiling</td>
<td>0.5/1 mg/m³ (skin, sensitizer)</td>
</tr>
<tr>
<td></td>
<td>Denmark</td>
<td>Ceiling</td>
<td>0.3 ppm</td>
</tr>
<tr>
<td></td>
<td>Estonia, Sweden</td>
<td>TWA-8 HR/Ceiling</td>
<td>0.5/1 ppm (skin, sensitizer)</td>
</tr>
<tr>
<td></td>
<td>Finland</td>
<td>TWA-8 HR/Ceiling</td>
<td>0.3/1 ppm</td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>TWA-8 HR/STEL</td>
<td>0.5/1 ppm</td>
</tr>
<tr>
<td></td>
<td>Germany, Slovak Republic</td>
<td>TWA-8 HR/Ceiling</td>
<td>0.3/0.6 ppm (sensitizer)</td>
</tr>
</tbody>
</table>

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Product Identifier: Maxpar® Fix and Perm Buffer
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Exposure/Engineering controls
Control to the OEL for formaldehyde. Selection and use of containment devices and personal protective equipment should be based on a risk assessment of exposure potential. Material should be handled inside a closed process, ventilated enclosure, isolator or device of equivalent or better control that is suitable for vapors and gases.

Respiratory protection
Choice of respiratory protection should be appropriate to the task and the level of existing engineering controls. For routine handling tasks, an approved and properly worn powered air-purifying respirator equipped with chemical cartridges or canisters should provide ancillary protection based on the known or foreseeable limitations of existing engineering controls. For escape, use one of the following respirator options: A self-contained breathing apparatus operated in the demand or pressure-demand mode; or a full facepiece respirator having a chin-style, or a front-or back-mounted industrial-size, canister or cartridge approved for protection against formaldehyde.

Hand protection
Wear nitrile or other impervious gloves if skin contact is possible. Double gloves should be considered.

Skin protection
Wear appropriate gloves, lab coat, or other protective overgarment if skin contact is likely. Base the choice of skin protection on the job activity, potential for skin contact and solvents and reagents in use.

Eye/face protection
Wear safety glasses with side shields, chemical splash goggles, or full face shield, if necessary. Base the choice of protection on the job activity and potential for contact with eyes or face. An emergency eye wash station should be available.

Environmental Exposure Controls
Avoid release to the environment and operate within closed systems wherever practicable. Air and liquid emissions should be directed to appropriate pollution control devices. In case of spill, do not release to drains. Implement appropriate and effective emergency response procedures to prevent release or spread of contamination and to prevent inadvertent contact by personnel.

Other protective measures
Wash hands in the event of contact with this substance, especially before eating, drinking or smoking. Protective equipment is not to be worn outside the work area (e.g., in common areas or out-of-doors).

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>No information identified.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No information identified.</td>
</tr>
<tr>
<td>pH</td>
<td>No information identified.</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>5°F</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>&gt;200°F</td>
</tr>
</tbody>
</table>

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SAFETY DATA SHEET

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Flash point
No information identified.
Evaporation rate
No information identified.
Flammability (solid, gas)
No information identified.
Upper/lower flammability or explosive limits
No information identified.
Vapor pressure
1.3 mmHg @ 20°C
Vapor density
1.04 g/cm³
Relative density
No information identified.
Water solubility
Very soluble in water.
Solvent solubility
No information identified.
Partition coefficient (n-octanol/water)
No information identified.
Auto-ignition temperature
No information identified.
Decomposition temperature
No information identified.
Viscosity
No information identified.
Explosive properties
No information identified.
Oxidizing properties
No information identified.

Other information
Molecular weight
Not applicable (Mixture)
Molecular formula
Not applicable (Mixture)

SECTION 10 - STABILITY AND REACTIVITY
Reactivity
No information identified.
Chemical stability
Stable when stored as recommended.
Possibility of hazardous reactions
No information identified.
Conditions to avoid
Avoid contact with heat, sparks, flames or other ignition sources.
Incompatible materials
No information identified.
Hazardous decomposition products
No information identified.

SECTION 11 - TOXICOLOGICAL INFORMATION
Information on toxicological effects
Route of entry
May be absorbed by inhalation, skin contact and ingestion.

Acute toxicity

<table>
<thead>
<tr>
<th>Compound</th>
<th>Type</th>
<th>Route</th>
<th>Species</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>LD50</td>
<td>Oral</td>
<td>Rat</td>
<td>100 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>Oral</td>
<td>Mouse</td>
<td>42 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LD50</td>
<td>Dermal</td>
<td>Rabbit</td>
<td>270 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LC50 (4 hour)</td>
<td>Inhalation</td>
<td>Rat</td>
<td>0.48 mg/L</td>
</tr>
<tr>
<td></td>
<td>LC50 (4 hour)</td>
<td>Inhalation</td>
<td>Mouse</td>
<td>0.414 mg/L</td>
</tr>
</tbody>
</table>
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Irritation/Corrosion

Inhaled formaldehyde was irritating to rat eyes and the respiratory system and caused airway resistance at 1-50 ppm. It was irritating to rabbit skin at 5% and a 0.5% formaldehyde solution produced a slight and short-lasting inflammatory reaction.

Sensitization

Sensitization was observed in guinea pigs at ≥ 0.5 mg/m².

STOT-single exposure

Acute formaldehyde exposure in rats at inhaled levels of 1-50 ppm caused respiratory and hypotahalamic changes. High doses (>100 ppm) caused gastrointestinal (GI) effects.

STOT-repeated exposure/Repeat-dose toxicity

Inhalation data from several animal studies indicate that formaldehyde exposure results in neurotoxicity, liver toxicity and adverse effects on the respiratory system at occupationally relevant levels. In guinea pigs, skin exposed to 0.4-4% formaldehyde solution had an increased incidence of erythema and thicker skin. Oral administration of formaldehyde at ≥ 82 mg/kg/day for 18 months resulted in severe damage to the gastric mucosa of rats. The oral NOAEL was 15 mg/kg/day.

Reproductive toxicity

No data available.

Developmental toxicity

Formaldehyde was not a developmental toxicant in rodents at oral doses up to 185 mg/kg or inhaled doses up to 40 ppm. Reduced fetal body weight was observed at ≥ 20 ppm.

Genotoxicity

Formaldehyde was positive for genotoxicity in a battery of in vitro and in vivo tests, including an Ames assay, chromosomal aberration assays, and sister chromatid assays.

Carcinogenicity

Inhalation of 14.3 ppm formaldehyde for up to 2 years caused an increase in nasal squamous cell carcinomas in rats. Oral doses at ≥ 50 ppm increased the incidence of GI tumors. Formaldehyde is classified as an IARC 2B compound. Formaldehyde is listed as a known human carcinogen by OSHA. Formaldehyde is classified by ACGIH as a suspected human carcinogen. According to NTP, formaldehyde is a known carcinogen.

Aspiration hazard

No data available.

Human health data

See Section 2 - "Other hazards"

SECTION 12 - ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Compound</th>
<th>Type (LC50/96h)</th>
<th>Species</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formaldehyde</td>
<td>LC50/96h Fathead minnow</td>
<td>24.1 mg/L (flow-through)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50/96h Brachydanio rerio (zebrafish)</td>
<td>41 mg/L</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EC50/48h Daphnia magna</td>
<td>2 mg/L</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EC50/24h Daphnia magna</td>
<td>42 mg/L</td>
<td></td>
</tr>
</tbody>
</table>

Persistence and Degradability

Formaldehyde is readily biodegradable.

Bioaccumulative potential

The risk for bioaccumulation is low (BCF = 3).

Mobility in soil

Formaldehyde is expected to have a very high mobility in soil.

Results of PBT and vPvB assessment

Not performed.

Other adverse effects

No data identified.

Note

The environmental characteristics of this mixture have not been fully investigated. The above data are for the active ingredient and/or any other ingredient(s) where applicable. Releases to the environment should be avoided.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste treatment methods

Dispose of wastes in accordance to prescribed federal, state, and local guidelines, e.g., appropriately permitted chemical waste incinerator. Do not send down the drain or flush down the toilet. All wastes containing the material should be properly labeled. Rinse waters resulting from spill cleanups should be discharged in an environmentally safe manner, e.g., appropriately permitted municipal or on-site wastewater treatment facility.

SECTION 14 - TRANSPORT INFORMATION
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Transport
This product/mixture is not regulated as a hazardous material/dangerous good under EU ADR/RID, US DOT, Canada TDG, IATA, or IMDG.

UN number
None assigned.

UN proper shipping name
None assigned.

Transport hazard classes and packing group
None assigned.

Environmental hazards
Based on the available data, this mixture is not regulated as an environmental hazard or a marine pollutant.

Special precautions for users
Mixture not fully tested - avoid exposure.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

Hazardchem Code/HIN
None assigned.

SECTION 15 - REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
This SDS complies with the requirements under US, EU and GHS (EU CLP - Regulation EC No 1272/2008) guidelines. Consult your local/regional authorities for more information.

Chemical safety assessment
Not conducted.

WHMIS classification
GCM2: H341; Carc2: H351; SI2: H315; SS1: H317; EI2: H319; STOT-S3: H335

TSCA status
Formaldehyde is listed.

SARA section 313
Formaldehyde is listed.

California proposition 65
Formaldehyde is listed as carcinogenic.

Component Analysis - State
Formaldehyde is listed as hazardous in AZ, CA, CT, FL, HI, IL, IN, IO, MA, ME, MD, MN, NJ, NM, NV, PA, RI, TN, UT, VT, VA, WA, and WY.

Component Analysis – Chemical Inventory
Formaldehyde is listed in the chemical inventory of the following countries: Australia, Canada, China, EU, Japan, Korea, and New Zealand.

Additional information
No other information identified.

SECTION 16 - OTHER INFORMATION

NFPA Ratings
Formaldehyde
Health: 2
Fire: 0
Reactivity: 2

Full text of H phrases and GHS classifications

Sources of data
Information from published literature and internal company data.
SAFETY DATA SHEET

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SDS ID: MSDS-201067, Rev: 7.0

Catalog ID numbers: 201067 (100 mL), S00092 (25 mL)

Revision date: July 2020, Revision: 7.0.

Abbreviations

ACGIH - American Conference of Governmental Industrial Hygienists; ADR/RID - European Agreement Concerning the International Carriage of Dangerous Goods by Road/Rail; AIHA - American Industrial Hygiene Association; AZ – Arizona; CA – California; CAS# - Chemical Abstract Services Number; CLP - Classification, Labelling, and Packaging of Substances and Mixtures; CT – Connecticut; DNEL - Derived No Effect Level; DOT - Department of Transportation; EINECS - European Inventory of New and Existing Chemical Substances; ELINCS - European List of Notified Chemical Substances; EU - European Union; FL – Florida; GHS - Globally Harmonized System of Classification and Labeling of Chemicals; HI – Hawaii; IARC - International Agency for Research on Cancer; IDLH - Immediately Dangerous to Life or Health; IATA - International Air Transport Association; IO – Iowa; IMDG - International Maritime Dangerous Goods; IN – Indiana; MA – Massachusetts; ME – Maine; MD – Maryland; LOEL - Lowest Observed Effect Level; LOAEL - Lowest Observed Adverse Effect Level; NJ – New Jersey; NM – New Mexico; NIOSH - The National Institute for Occupational Safety and Health; NOEL - No Observed Effect Level; NOAEL - No Observed Adverse Effect Level; NTP - National Toxicology Program; NV – Nevada; OEL - Occupational Exposure Limit; OSHA - Occupational Safety and Health Administration; PA – Pennsylvania; PNEC - Predicted No Effect Concentration; SARA - Superfund Amendments and Reauthorization Act; STEL - Short Term Exposure Limit; RI – Rhode Island; TDG - Transportation of Dangerous Goods; TN – Tennessee; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UT – Utah; VA – Virginia; VT – Vermont; WA – Washington State; WHMIS - Workplace Hazardous Materials Information System; WY - Wyoming

Disclaimer

The statements contained herein are offered for informational purposes only and are based upon technical data. Fluidigm Corporation believes them to be accurate at the date of publication, but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Fluidigm Corporation) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should perform their own investigations to determine suitability of information and product for their particular purposes.