

SAFETY DATA SHEET

Product Identifier: Maxpar[®] Fix and Perm Buffer
Catalog ID number: 201067 (stand-alone)
 (includes Panel Kits within the following range of Catalog numbers: 201302-2013XX)

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

Contact information

General	Fluidigm Corporation 7000 Shoreline Court Suite 100, 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 H315 - Causes skin irritation. H317 - May cause allergic skin reaction. H319 - Causes serious eye irritation. H335 - May cause respiratory irritation. H341 - Suspected of causing genetic defects. H351 - Suspected of causing cancer.

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

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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

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

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.

Indication of immediate medical attention and special treatment needed, if necessary

Medical conditions aggravated by exposure: None known or reported. Treat symptomatically and supportively.

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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 sharps container.

Control Parameters/Occupational Exposure Limit Values

Compound	Issuer	Type	OEL
Formaldehyde	ACGIH, Portugal, Spain	Ceiling	0.3 ppm (sensitizer)
	Australia	STEL	2 ppm
	Australia	TWA-8 HR	1 ppm (sensitizer)
	Austria	TWA-8 HR/Ceiling/STEL	0.5 ppm (skin, sensitizer)
	Brazil	Ceiling	1.6 ppm
	Bulgaria	TWA-8 HR/STEL	1/2 mg/m ³
	Czech Republic	TWA-8 HR/Ceiling	0.5/1 mg/m ³ (skin, sensitizer)
	Denmark	Ceiling	0.3 ppm
	Estonia, Sweden	TWA-8 HR/Ceiling	0.5/1 ppm (sensitizer)
	Finland	TWA-8 HR/Ceiling	0.3/1 ppm
	France	TWA-8 HR/STEL	0.5/1 ppm

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Germany, Slovak Republic	TWA-8 HR/Ceiling	0.3/0.6 ppm (sensitizer)
Greece, Ireland, United Kingdom	TWA-8 HR/STEL	2 ppm
Hungary	TWA-8 HR/STEL	0.6 mg/m ³ (sensitizer, skin)
Latvia	TWA-8 HR	0.5 mg/m ³
Lithuania	TWA-8 HR/Ceiling	0.5/1.2 ppm (sensitizer)
Mexico	Ceiling	2 ppm
Netherlands	TWA-8 HR/STEL	0.15/0.5 mg/m ³
New Zealand, Sweden	Ceiling	1 ppm (sensitizer)
NIOSH	Ceiling (15 min)	0.1 ppm
NIOSH	IDLH	20 ppm
NIOSH	TWA-8 HR	0.016 ppm
Poland	TWA-8 HR/STEL	0.5/1 mg/m ³ (sensitizer, skin)
Romania	TWA-8 HR/STEL	1/2 ppm
Singapore	STEL	0.3 ppm
Slovenia	TWA-8 HR/STEL	0.5 ppm (skin)
OSHA	TWA-8 HR/STEL	0.75/2 ppm

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

Appearance Clear liquid

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Color	Colorless
Odor	No information identified.
Odor threshold	No information identified.
pH	No information identified.
Melting point/freezing point	5°F
Initial boiling point and boiling range	>200°F
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/cm ³
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.

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SECTION 11 - TOXICOLOGICAL INFORMATION

Information on toxicological effects

Route of entry May be absorbed by inhalation, skin contact and ingestion.

Acute toxicity

<u>Compound</u>	<u>Type</u>	<u>Route</u>	<u>Species</u>	<u>Dose</u>
Formaldehyde	LD50	Oral	Rat	100 mg/kg
	LD50	Oral	Mouse	42 mg/kg
	LD50	Dermal	Rabbit	270 mg/kg
	LC50 (4 hour)	Inhalation	Rat	0.48 mg/L
	LC50 (4 hour)	Inhalation	Mouse	0.414 mg/L

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 ³ 0.5 mg/m².

STOT-single exposure Acute formaldehyde exposure in rats at inhaled levels of 1-50 ppm caused respiratory and hypothalamic 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 ³ 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 ³ 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 ³ 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

Toxicity

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

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.

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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

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.

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SECTION 16 - OTHER INFORMATION

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

Full text of H phrases and GHS classifications ATO3 - Acute Toxicity (Oral) Category 3. H301 - Toxic if swallowed. ATO4 - Acute Toxicity (Oral) Category 4. H302 - Harmful if swallowed. ATD3 - Acute Toxicity (Dermal) Category 3. H311 - Toxic in contact with skin. ATI1 - Acute Toxicity (Inhalation) Category 1. AT12 - Acute Toxicity (Inhalation) Category 2. H330 - Fatal if inhaled. SS1 - Skin sensitizer Category 1. H317 - May cause an allergic skin reaction. SC1 - Skin corrosion Category 1. H314 - Causes severe skin burns and eye damage. SI2 - Skin irritant Category 2. H315 - Causes skin irritation. EC1 - Eye corrosion Category 1. H318 - Causes serious eye damage. EI2 - Eye irritant Category 2. H319 - Causes serious eye irritation. STOT-S3 - Specific Target Organ Toxicity Following Single Exposure Category 3. H335 - May cause respiratory irritation. GCM2 - Germ Cell Mutagenicity Category 2. H341 - Suspected of causing genetic defects. Carc1B - Carcinogenic Category 1B. H350 - May cause cancer. Carc2 - Carcinogenicity Category 2. H351 - Suspected of causing cancer.

Sources of data Information from published literature and internal company data.

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

Issue Date 29 July 2015

Revisions This is the first version of this SDS.

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.