



**Becton, Dickinson and Company**  
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# SAFETY DATA SHEET

## 1. Identification

### Product identifier

Product No.:	Product name:	Common name(s), synonym(s)
554722	BD Cytifix/Cytoperm™ Fixation and Permeabilization Solution	

### Other means of identification

**SDS number:** 088100005884

### Recommended use and restriction on use

**Recommended use:** Reserved for industrial and professional use. Scientific and industrial laboratory use. For research use only.

**Restrictions on use:** Not for use in diagnostic or therapeutic procedures.

### Manufacturer/Importer/Supplier/Distributor Information

#### Manufacturer

Company Name: BD Biosciences, Pharmingen  
Address: 10975 Torreyana Road  
92121 San Diego, CA USA  
Telephone: 1 877 232 8995 or 1 800 424 9300  
Fax:  
Contact Person: Technical Services  
E-mail: ResearchApplications@bd.com

**Emergency telephone number:** ChemTrec 1 800 424 9300

## 2. Hazard(s) identification

### Hazard Classification

#### Health Hazards

Skin sensitizer	Category 1
Germ Cell Mutagenicity	Category 2
Carcinogenicity	Category 1A

#### Environmental Hazards

Acute hazards to the aquatic environment	Category 3
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### Label Elements

**Hazard Symbol:**

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<b>Signal Word:</b>	Danger
<b>Hazard Statement:</b>	H317: May cause an allergic skin reaction. H341: Suspected of causing genetic defects. H350: May cause cancer. H402: Harmful to aquatic life.
<b>Precautionary Statements</b>	
<b>Prevention:</b>	P261: Avoid breathing dust/fume/gas/mist/vapors/spray. P272: Contaminated work clothing should not be allowed out of the workplace. P280: Wear protective gloves/protective clothing/eye protection/face protection. P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P281: Use personal protective equipment as required. P273: Avoid release to the environment.
<b>Response:</b>	P302+P352: IF ON SKIN: Wash with plenty of water/... P333+P313: If skin irritation or rash occurs: Get medical advice/attention. P308+P313: IF exposed or concerned: Get medical advice/attention. P321: Specific treatment (see on this label). P363: Wash contaminated clothing before reuse.
<b>Storage:</b>	P405: Store locked up.
<b>Disposal:</b>	P501: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.
<b>Other hazards which do not result in GHS classification:</b>	None.

### 3. Composition/information on ingredients



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## Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
Formaldehyde		50-00-0	3 - <5%

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## 4. First-aid measures

- General information:** Get immediate medical advice/attention. If medical advice is needed, have product container or label at hand.
- Ingestion:** If swallowed, rinse mouth with water (only if the person is conscious). Do NOT induce vomiting. Get medical attention immediately.
- Inhalation:** Get medical attention if any discomfort continues. Provide fresh air, warmth and rest, preferably in comfortable upright sitting position.
- Skin Contact:** Wash off promptly and flush contaminated skin with water. Promptly remove clothing if soaked through and flush skin with water. Get medical attention if symptoms occur. Wash contaminated clothing before reuse.
- Eye contact:** Important! Immediately rinse with water for 60 minutes. Get medical attention immediately.

### Most important symptoms/effects, acute and delayed

**Symptoms:** Symptoms may be delayed.

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

**Treatment:** Get immediate medical advice/attention. Wash off promptly and flush contaminated skin with water. Promptly remove clothing if soaked through and flush skin with water.

## 5. Fire-fighting measures

**General Fire Hazards:** Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate. Use water to keep fire exposed containers cool and disperse vapors.

### Suitable (and unsuitable) extinguishing media

**Suitable extinguishing media:** Water spray, fog, CO<sub>2</sub>, dry chemical, or alcohol resistant foam.

**Unsuitable extinguishing media:** Avoid water in straight hose stream; will scatter and spread fire.



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**Specific hazards arising from the chemical:** Fire or excessive heat may produce hazardous decomposition products.

**Special protective equipment and precautions for firefighters**

**Special fire fighting procedures:** No unusual fire or explosion hazards noted.

**Special protective equipment for fire-fighters:** Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

**6. Accidental release measures**

**Personal precautions, protective equipment and emergency procedures:** Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Wash thoroughly after dealing with a spillage. Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area. Contact local authorities in case of spillage to drain/aquatic environment.

**Methods and material for containment and cleaning up:** Stop leak if possible without any risk. Absorb spillage with suitable absorbent material. Collect for salvage or disposal. Prevent runoff from entering drains, sewers, or streams. See Section 8 of the SDS for Personal Protective Equipment. For waste disposal, see section 13 of the SDS.

**Environmental Precautions:** Do not release into the environment. Environmental manager must be informed of all major spillages.

**7. Handling and storage**

**Precautions for safe handling:** Wash at the end of each work shift and before eating, smoking and using the toilet. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes and avoid contact with skin and clothing. Wash promptly with soap and water if skin becomes contaminated. When using do not eat, drink or smoke. Read and follow manufacturer's recommendations. Use personal protective equipment as required.

**Conditions for safe storage, including any incompatibilities:** Store in tightly closed original container in a dry, cool and well-ventilated place.

**8. Exposure controls/personal protection**

**Control Parameters**

**Occupational Exposure Limits**

Chemical Identity	Type	Exposure Limit Values	Source
Formaldehyde	STEL	2 ppm	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	0.75 ppm	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)



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	ST ESL	24 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	AN ESL	2.7 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	ST ESL	12 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	AN ESL	5.4 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	ST ESL	30 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	AN ESL	3.3 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	AN ESL	6.6 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	ST ESL	15 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	STEL	2 ppm	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)
	TWA PEL	0.75 ppm	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)
	TWA A LV	0.5 ppm	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)
	OSHA_ACT	0.5 ppm	US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (02 2006)
	TWA	0.75 ppm	US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (02 2006)
	STEL	2 ppm	US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (02 2006)
	STEL	0.3 ppm	US. ACGIH Threshold Limit Values (03 2017)
	TWA	0.1 ppm	US. ACGIH Threshold Limit Values (03 2017)
	Ceil_Time	0.1 ppm	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Formaldehyde - as formaldehyde	Ceil_Time	0.1 ppm	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Formaldehyde	REL	0.016 ppm	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Formaldehyde - as formaldehyde	REL	0.016 ppm	US. NIOSH: Pocket Guide to Chemical Hazards (2005)

**Appropriate Engineering Controls**

Adequate ventilation should be provided whenever the material is heated or mists are generated.

**Individual protection measures, such as personal protective equipment**

**General information:**

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.



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<b>Eye/face protection:</b>	Chemical goggles and face shield are recommended.
<b>Skin Protection</b>	
<b>Hand Protection:</b>	Chemical resistant gloves
<b>Other:</b>	Wear a lab coat or similar protective clothing. Wear appropriate clothing to prevent repeated or prolonged skin contact.
<b>Respiratory Protection:</b>	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.
<b>Hygiene measures:</b>	Do not get in eyes. Wash hands after contact. Observe good industrial hygiene practices. Do not eat, drink or smoke when using the product. Wash promptly if skin becomes contaminated. Wash at the end of each work shift and before eating, smoking and using the toilet. Avoid contact with skin. Do not breathe dust/fume/gas/mist/vapors/spray.

## 9. Physical and chemical properties

### Appearance

<b>Physical state:</b>	liquid
<b>Form:</b>	liquid
<b>Color:</b>	Clear
<b>Odor:</b>	Odorless
<b>Odor threshold:</b>	No data available.
<b>pH:</b>	Not applicable
<b>Melting point/freezing point:</b>	The physical-chemical properties of this material have not been fully investigated.
<b>Initial boiling point and boiling range:</b>	No data available.
<b>Flash Point:</b>	The physical-chemical properties of this material have not been fully investigated.
<b>Evaporation rate:</b>	No data available.
<b>Flammability (solid, gas):</b>	No data available.
<b>Upper/lower limit on flammability or explosive limits</b>	
<b>Flammability limit - upper (%):</b>	No data available.
<b>Flammability limit - lower (%):</b>	No data available.
<b>Explosive limit - upper (%):</b>	No data available.
<b>Explosive limit - lower (%):</b>	No data available.
<b>Vapor pressure:</b>	No data available.
<b>Vapor density:</b>	No data available.
<b>Relative density:</b>	No data available.
<b>Solubility(ies)</b>	
<b>Solubility in water:</b>	Soluble
<b>Solubility (other):</b>	The physical-chemical properties of this material have not been



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**Partition coefficient (n-octanol/water):** fully investigated.  
**Auto-ignition temperature:** No data available.  
**Decomposition temperature:** No data available.  
**Viscosity:** Not determined.

## 10. Stability and reactivity

**Reactivity:** Product is not reactive under normal conditions and recommended use.  
Stable

**Chemical Stability:** No data available.

**Possibility of hazardous reactions:** Stable; however, may decompose if heated. None under normal conditions.

**Conditions to avoid:** Avoid exposure to high temperatures or direct sunlight.

**Incompatible Materials:** Strong oxidizing agents.

**Hazardous Decomposition Products:** By heating and fire, harmful vapors/gases may be formed.

## 11. Toxicological information

### Information on likely routes of exposure

**Ingestion:** Ingestion may cause severe irritation of the mouth, the esophagus and the gastrointestinal tract.

**Inhalation:** May cause irritation to the respiratory system.

**Skin Contact:** Causes skin irritation. Prolonged or repeated contact may cause skin sensitization in susceptible individuals.

**Eye contact:** May cause chemical eye burns. Avoid contact with eyes.

### Symptoms related to the physical, chemical and toxicological characteristics

**Ingestion:** No data available.

**Inhalation:** No data available.

**Skin Contact:** No data available.

**Eye contact:** No data available.



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### Information on toxicological effects

#### Acute toxicity (list all possible routes of exposure)

##### Oral

**Product:** ATEmix : 2,379.25 mg/kg

##### Dermal

**Product:** ATEmix: 6,423.98 mg/kg

##### Inhalation

**Product:** No data available.

#### Repeated dose toxicity

**Product:** No data available.

#### Skin Corrosion/Irritation

**Product:** May cause skin irritation.

#### Serious Eye Damage/Eye Irritation

**Product:** No data available.

#### Respiratory or Skin Sensitization

**Product:** Prolonged or repeated contact may cause skin sensitization in susceptible individuals.

#### Carcinogenicity

**Product:** May cause cancer.

#### IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Formaldehyde Overall evaluation: 1. Carcinogenic to humans.

#### US. National Toxicology Program (NTP) Report on Carcinogens:

Formaldehyde Known To Be Human Carcinogen.

#### US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

Formaldehyde  
Cancer





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### Germ Cell Mutagenicity

**In vitro**

**Product:** No data available.

**In vivo**

**Product:** Not applicable

### Reproductive toxicity

**Product:** No data available.

### Specific Target Organ Toxicity - Single Exposure

**Product:** Based on available data, the classification criteria are not met.

### Specific Target Organ Toxicity - Repeated Exposure

**Product:** Based on available data, the classification criteria are not met.

### Aspiration Hazard

**Product:** Based on available data, the classification criteria are not met.

**Other effects:** No data available.

## 12. Ecological information

### Ecotoxicity:

#### Acute hazards to the aquatic environment:

**Fish**

**Product:** No data available.

**Specified substance(s):**

Formaldehyde  
LC 50 (Striped bass (*Morone saxatilis*), 96 h): 6.7 mg/l  
LC 50 (Black bullhead (*Ameiurus melas*), 96 h): 25 mg/l  
LC 50 (*Morone saxatilis*, 96 h): 6.7 mg/l Experimental result, Key study

**Aquatic Invertebrates**

**Product:** No data available.

**Specified substance(s):**

Formaldehyde  
EC 50 (Water flea (*Daphnia pulex*), 48 h): 5.8 mg/l Intoxication  
EC 50 (*Daphnia pulex*, 48 h): 5.8 mg/l Experimental result, Key study

#### Chronic hazards to the aquatic environment:

**Fish**

**Product:** No data available.

**Specified substance(s):**



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Formaldehyde LC 50 (Danio rerio, 144 h): 6.9 mg/l Experimental result, Supporting study

**Aquatic Invertebrates**

**Product:** No data available.

**Specified substance(s):**  
Formaldehyde LOAEL (Ceriodaphnia dubia, 7 d): 6 mg/l Experimental result, Not specified

**Toxicity to Aquatic Plants**

**Product:** No data available.

**Specified substance(s):**  
Formaldehyde EC 50 (Green algae (Scenedesmus subspicatus), 72 h): 4.89 mg/l

**Persistence and Degradability**

**Biodegradation**

**Product:** No data available.

**Specified substance(s):**  
Formaldehyde Readily biodegradable  
97 % (2 Weeks) Detected in water. Experimental result, Key study

**BOD/COD Ratio**

**Product:** No data available.

**Bioaccumulative potential**

**Bioconcentration Factor (BCF)**

**Product:** No data available.

**Specified substance(s):**  
Formaldehyde Will not bio-accumulate.  
Bioconcentration Factor (BCF): < 1 Aquatic sediment Experimental result,  
Weight of Evidence study

**Partition Coefficient n-octanol / water (log Kow)**

**Product:** Log Kow: No data available.

**Mobility in soil:** No data available.

**Known or predicted distribution to environmental compartments**

Formaldehyde No data available.

**Other adverse effects:** No data available.

**13. Disposal considerations**

**General information:** Dispose of waste and residues in accordance with local authority requirements.



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**Disposal instructions:** Discharge, treatment, or disposal may be subject to national, state, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

**Contaminated Packaging:** No data available.

#### 14. Transport information

**DOTUN Number:** Not regulated.  
**UN Proper Shipping Name:** Not regulated.  
**Transport Hazard Class(es)**  
  **Class:** Not regulated.  
  **Label(s):** Not regulated.  
**Packing Group:** Not regulated.  
**Marine Pollutant:** Not regulated.  
**Limited quantity** Not regulated.  
**Excepted quantity** Not regulated.

**Special precautions for user:** Not regulated.

#### IMDG

**UN Number:** Not regulated.  
**UN Proper Shipping Name:** Not regulated.  
**Transport Hazard Class(es)**  
  **Class:** Not regulated.  
  **Subsidiary risk:** Not regulated.  
  **EmS No.:** Not regulated.  
**Packing Group:** Not regulated.  
**Environmental Hazards**  
  **Marine Pollutant:** Not regulated.

**Special precautions for user:** Not regulated.

#### IATA

**UN Number:** Not regulated.  
**Proper Shipping Name:** Not regulated.  
**Transport Hazard Class(es):**  
  **Class:** Not regulated.  
  **Subsidiary risk:** Not regulated.  
**Packing Group:** Not regulated.  
**Environmental Hazards**  
  **Marine pollutant:** Not regulated.

**Special precautions for user:** Not regulated.

#### 15. Regulatory information

##### US Federal Regulations



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**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**  
None present or none present in regulated quantities.

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

<u>Chemical Identity</u>	<u>OSHA hazard(s)</u>
Formaldehyde	respiratory tract irritation Cancer Flammability Skin irritation Skin sensitization Eye irritation Acute toxicity Respiratory sensitization

**CERCLA Hazardous Substance List (40 CFR 302.4):**

<u>Chemical Identity</u>	<u>Reportable quantity</u>
Formaldehyde	100 lbs.
Phosphoric acid, sodium salt (1:2)	5000 lbs.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**  
Immediate (Acute) Health Hazards  
Delayed (Chronic) Health Hazard  
Respiratory or Skin Sensitization  
Germ Cell Mutagenicity  
Carcinogenicity

**SARA 302 Extremely Hazardous Substance**

<u>Chemical Identity</u>	<u>Reportable quantity</u>	<u>Threshold Planning Quantity</u>
Formaldehyde	100 lbs.	500 lbs.

**SARA 304 Emergency Release Notification**

<u>Chemical Identity</u>	<u>Reportable quantity</u>
Formaldehyde	100 lbs.
Phosphoric acid, sodium salt (1:2)	5000 lbs.

**SARA 311/312 Hazardous Chemical**

<u>Chemical Identity</u>	<u>Threshold Planning Quantity</u>
Formaldehyde	500lbs

**SARA 313 (TRI Reporting)**

<u>Chemical Identity</u>	<u>Reporting threshold for other users</u>	<u>Reporting threshold for manufacturing and processing</u>
Formaldehyde	10000 lbs	25000 lbs.



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**Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)**

<u>Chemical Identity</u>	<u>Reportable quantity</u>
Formaldehyde	Reportable quantity: 100 lbs.
Phosphoric acid, sodium salt (1:2)	Reportable quantity: 5000 lbs.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):**

<u>Chemical Identity</u>	<u>Reportable quantity</u>
Formaldehyde	15000 lbs

**US State Regulations**

**US. California Proposition 65**

**US. New Jersey Worker and Community Right-to-Know Act**

<u>Chemical Identity</u>
Formaldehyde

**US. Massachusetts RTK - Substance List**

<u>Chemical Identity</u>
Formaldehyde

**US. Pennsylvania RTK - Hazardous Substances**

<u>Chemical Identity</u>
Formaldehyde

**US. Rhode Island RTK**

<u>Chemical Identity</u>
Formaldehyde

**16. Other information, including date of preparation or last revision**

**Issue Date:** 10/02/2018

**Version #:** 1.1

**Revision Information:**

**Further Information:** No data available.



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