# Kit Components

<table>
<thead>
<tr>
<th>Kit Product No.</th>
<th>Kit Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>554714</td>
<td>BD Cytofix/Cytoperm™ Fixation/Permeabilization Solution Kit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kit Component(s)</th>
<th>Kit Component(s) Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-2091KZ</td>
<td>PERM WASH BUF 100ML</td>
</tr>
<tr>
<td>51-2090KZ</td>
<td>FIXATION AND PERMEABILIZATION SOLN 125ML</td>
</tr>
</tbody>
</table>

**IMDG**

Special precautions for user: Not regulated.

**IATA**

Special precautions for user: Not regulated.

Please note: If a listed component does not have a corresponding document included, this means that the product is not hazardous and does not require a Safety Data Sheet.
SAFETY DATA SHEET

1. Identification

Product identifier

Product name: Perm/Wash Buffer

Product No.: 51-2091KZ

Other means of identification

SDS number: 088100012091

Recommended use and restriction on use

Recommended use: Reserved for industrial and professional use.
Restrictions on use: None known.

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

Not classified

Label Elements

Hazard Symbol: No symbol
Signal Word: No signal word.
Hazard Statement: not applicable
Precautionary Statements
not applicable

Other hazards which do not result in GHS classification:
None.

3. Composition/information on ingredients
Mixtures

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>Content in percent (%)&lt;sup&gt;*&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3))</td>
<td></td>
<td>26628-22-8</td>
<td>0.083%</td>
</tr>
</tbody>
</table>

<sup>*</sup> 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 medical attention if symptoms occur.

**Ingestion:** Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person.

**Inhalation:** Provide fresh air, warmth and rest, preferably in comfortable upright sitting position.

**Skin Contact:** Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

**Eye contact:** Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses.

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

**Symptoms:** No data available.

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

**Treatment:** No data available.

5. Fire-fighting measures

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

**Suitable (and unsuitable) extinguishing media**

**Suitable extinguishing media:** Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable extinguishing media:** not applicable

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

**Special protective equipment and precautions for firefighters**
6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures:**
Contact local authorities in case of spillage to drain/aquatic environment. Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area.

**Methods and material for containment and cleaning up:**
Absorb spillage with suitable absorbent material. 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:**
Avoid release to the environment.

7. Handling and storage

**Precautions for safe handling:**
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 a cool, dry place. Keep container tightly closed.

8. Exposure controls/personal protection

**Control Parameters**

**Occupational Exposure Limits**

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3)) - as HN3</td>
<td>Ceiling</td>
<td>0.1 ppm</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3)) - as NaN3</td>
<td>Ceiling</td>
<td>0.3 mg/m3</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)</td>
</tr>
<tr>
<td></td>
<td>Ceiling</td>
<td>0.3 mg/m3</td>
<td>US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3)) - as HN3</td>
<td>Ceiling</td>
<td>0.1 ppm</td>
<td>US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>AN ESL</td>
<td>0.07 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td></td>
<td>ST ESL</td>
<td>0.7 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td></td>
<td>AN ESL</td>
<td>0.2 µg/m3</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
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<tr>
<td></td>
<td>ST ESL</td>
<td>2 µg/m3</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
</tbody>
</table>
Ceiling 0.1 ppm 0.3 mg/m³ 2010) US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)

Sodium azide (Na(N3)) - as NaN₃ Ceiling 0.29 mg/m³ US. ACGIH Threshold Limit Values (12 2010)

Sodium azide (Na(N3)) - as hydrazoic acid vapor Ceiling 0.11 ppm US. ACGIH Threshold Limit Values (12 2010)

Sodium azide (Na(N3)) - as HN₃ Cell_Time 0.1 ppm US. NIOSH: Pocket Guide to Chemical Hazards (2005)

Sodium azide (Na(N3)) - as NaN₃ Cell_Time 0.3 mg/m³ US. NIOSH: Pocket Guide to Chemical Hazards (2005)

**Appropriate Engineering Controls**

No special requirements under ordinary conditions of use and with adequate ventilation.

**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.

**Eye/face protection:** Wear safety glasses with side shields (or goggles).

**Skin Protection**

**Hand Protection:** Chemical resistant gloves Suitable gloves can be recommended by the glove supplier. Wash hands after contact.

**Other:** Wear a lab coat or similar protective clothing.

**Respiratory Protection:** 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.

**Hygiene measures:** Observe good industrial hygiene practices.

### 9. Physical and chemical properties

#### Appearance

<table>
<thead>
<tr>
<th>Physical state:</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form:</td>
<td>liquid</td>
</tr>
<tr>
<td>Color:</td>
<td>Various</td>
</tr>
<tr>
<td>Odor:</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold:</td>
<td>No data available.</td>
</tr>
<tr>
<td>pH:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Melting point/freezing point:</td>
<td>The physical-chemical properties of this material have not been fully investigated.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flash Point:</td>
<td>The physical-chemical properties of this material have not been fully investigated.</td>
</tr>
</tbody>
</table>
Evaporation rate: No data available.

Flammability (solid, gas): No data available.

Upper/lower limit on flammability or explosive limits
- Flammability limit - upper (%): No data available.
- Flammability limit - lower (%): No data available.
- Explosive limit - upper (%): No data available.
- Explosive limit - lower (%): No data available.

Vapor pressure: No data available.

Vapor density: No data available.

Relative density: No data available.

Solubility(ies)
- Solubility in water: Soluble
- Solubility (other): The physical-chemical properties of this material have not been fully investigated.

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

Auto-ignition temperature: No data available.

Decomposition temperature: No data available.

Viscosity: Not determined.

10. Stability and reactivity

Reactivity: Stable under normal temperature conditions and recommended use.

Chemical Stability: Material is stable under normal conditions.

Possibility of hazardous reactions: Not determined.

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

Incompatible Materials: Metals. Water reactive material.

Hazardous Decomposition Products: Stable; however, may decompose if heated.

11. Toxicological information

General information: No data on possible toxicity effects have been found.

Information on likely routes of exposure
- Ingestion: No harmful effects expected in amounts likely to be ingested by accident.
- Inhalation: Limited inhalation hazard at normal work temperatures.
- Skin Contact: Negligible irritation to skin at ambient temperatures.
Eye contact: Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.

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.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: No data available.

Dermal
Product: No data available.

Inhalation
Product: No data available.

Repeated dose toxicity
Product: not applicable

Skin Corrosion/Irritation
Product: Based on available data, the classification criteria are not met.

Serious Eye Damage/Eye Irritation
Product: No data available.

Respiratory or Skin Sensitization
Product: Not a skin sensitizer.

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

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens: No carcinogenic components identified

Germ Cell Mutagenicity

In vitro
Product: not applicable

In vivo
Product: not applicable

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

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: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No negative effects on the aquatic environment are known.

Aquatic Invertebrates
Product: No negative effects on the aquatic environment are known.

Chronic hazards to the aquatic environment:

Fish
Product: No negative effects on the aquatic environment are known.

Aquatic Invertebrates
Product: No negative effects on the aquatic environment are known.

Toxicity to Aquatic Plants
Product: No negative effects on the aquatic environment are known.

Persistence and Degradability

Biodegradation
Product: Expected to be readily biodegradable.

BOD/COD Ratio
Product: No data available.

Bioaccumulative potential
Bioconcentration Factor (BCF)
Product: No data available.

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
Sodium azide (Na(N3)) No data available.

Other adverse effects: The product is not expected to be hazardous to the environment.

13. Disposal considerations

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

Disposal instructions: Dispose of waste at an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

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

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)
None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>1000 lbs.</td>
</tr>
</tbody>
</table>

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Not listed.
SARA 302 Extremely Hazardous Substance

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>1000 lbs.</td>
<td>500 lbs.</td>
</tr>
</tbody>
</table>

SARA 304 Emergency Release Notification

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>salt (1:2)</td>
<td></td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>1000 lbs.</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazardous Chemical

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>500 lbs</td>
</tr>
</tbody>
</table>

SARA 313 (TRI Reporting)

None present or none present in regulated quantities.

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium</td>
<td>Reportable quantity: 5000 lbs.</td>
</tr>
<tr>
<td>salt (1:2)</td>
<td></td>
</tr>
</tbody>
</table>

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65
No ingredient regulated by CA Prop 65 present.

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium</td>
</tr>
<tr>
<td>salt (1:2)</td>
</tr>
</tbody>
</table>

US. Massachusetts RTK - Substance List

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium</td>
</tr>
<tr>
<td>salt (1:2)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
</tr>
</tbody>
</table>

US. Pennsylvania RTK - Hazardous Substances

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium</td>
</tr>
<tr>
<td>salt (1:2)</td>
</tr>
</tbody>
</table>

US. Rhode Island RTK

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium</td>
</tr>
<tr>
<td>salt (1:2)</td>
</tr>
</tbody>
</table>
16. Other information, including date of preparation or last revision

<table>
<thead>
<tr>
<th>Issue Date:</th>
<th>09/18/2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version #:</td>
<td>1.0</td>
</tr>
<tr>
<td>Revision Information:</td>
<td></td>
</tr>
<tr>
<td>Further Information:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Disclaimer:</td>
<td>Disclaimer:</td>
</tr>
<tr>
<td></td>
<td>The information contained herein has been obtained from various sources and is believed to be correct as of the date issued. However, neither BD nor any of its subsidiaries assumes any liabilities whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability for a particular use of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. BD provides SDS in electronic form so the information may be more easily accessed. Due to the possibility of errors during transmission, BD makes no representations as to the completeness or accuracy of the information.</td>
</tr>
</tbody>
</table>
# SAFETY DATA SHEET

## 1. Identification

### Product identifier

**Product name:** Fixation and Permeabilization Solution  
**Product No.:** 51-2090KZ

### Other means of identification

**SDS number:** 088100012089

### 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, CAUSA  
**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 Corrosion/Irritation**  
  Category 2  
- **Serious Eye Damage/Eye Irritation**  
  Category 1  
- **Skin sensitizer**  
  Category 1  
- **Germ Cell Mutagenicity**  
  Category 2  
- **Carcinogenicity**  
  Category 1A

#### Environmental Hazards

- **Acute hazards to the aquatic environment**  
  Category 3

### Label Elements

**Hazard Symbol:**
Signal Word: Danger

Hazard Statement: Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. Suspected of causing genetic defects. May cause cancer. Harmful to aquatic life.

Precautionary Statements

Prevention: Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapors/spray. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Avoid release to the environment.

Response: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Immediately call a POISON CENTER/doctor. Specific treatment (see this label). Wash contaminated clothing before reuse.

Storage: Store locked up.

Disposal: 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.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>Content in percent (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td></td>
<td>50-00-0</td>
<td>4.203%</td>
</tr>
</tbody>
</table>

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

4. First-aid measures
General information: Causes serious eye damage. Causes skin irritation. Suspected of causing genetic defects. May cause cancer. May cause an allergic skin reaction. 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.

Hazards: Causes serious eye damage. Causes skin irritation. May cause an allergic skin reaction. May cause genetic defects. May cause cancer.

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, CO2, dry chemical, or alcohol resistant foam.

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

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA</td>
<td>0.75 ppm</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)</td>
</tr>
<tr>
<td></td>
<td>ST ESL</td>
<td>24 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (2010)</td>
</tr>
<tr>
<td></td>
<td>AN ESL</td>
<td>2.7 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (2010)</td>
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<tr>
<td>ST ESL</td>
<td>12 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12/2010)</td>
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<tr>
<td>--------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>AN ESL</td>
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<td>ST ESL</td>
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<td>AN ESL</td>
<td>3.3 µg/m³</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12/2010)</td>
<td></td>
</tr>
<tr>
<td>AN ESL</td>
<td>6.6 µg/m³</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12/2010)</td>
<td></td>
</tr>
<tr>
<td>ST ESL</td>
<td>15 µg/m³</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12/2010)</td>
<td></td>
</tr>
<tr>
<td>STEL</td>
<td>2 ppm</td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08/2010)</td>
<td></td>
</tr>
<tr>
<td>TWA PEL</td>
<td>0.75 ppm</td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08/2010)</td>
<td></td>
</tr>
<tr>
<td>TWA A LV</td>
<td>0.5 ppm</td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08/2010)</td>
<td></td>
</tr>
<tr>
<td>OSHA_AC_T</td>
<td>0.5 ppm</td>
<td>US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (02/2006)</td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td>0.75 ppm</td>
<td>US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (02/2006)</td>
<td></td>
</tr>
<tr>
<td>STEL</td>
<td>0.3 ppm</td>
<td>US. ACGIH Threshold Limit Values (03/2017)</td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td>0.1 ppm</td>
<td>US. ACGIH Threshold Limit Values (03/2017)</td>
<td></td>
</tr>
<tr>
<td>Ceil_Time</td>
<td>0.1 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
<td></td>
</tr>
<tr>
<td>Formaldehyde - as formaldehyde</td>
<td>Ceil_Time</td>
<td>0.1 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>REL</td>
<td>0.016 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Formaldehyde - as formaldehyde</td>
<td>REL</td>
<td>0.016 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
</tbody>
</table>

**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.

**Eye/face protection:**
Chemical goggles and face shield are recommended.

**Skin Protection**

**Hand Protection:**
Chemical resistant gloves
Other: Wear a lab coat or similar protective clothing. Wear appropriate clothing to prevent repeated or prolonged skin contact.

Respiratory Protection: 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.

Hygiene measures: 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
- Physical state: liquid
- Form: liquid
- Color: Clear
- Odor: Odorless
- Odor threshold: No data available.
- pH: not applicable
- Melting point/freezing point: The physical-chemical properties of this material have not been fully investigated.
- Initial boiling point and boiling range: No data available.
- Flash Point: The physical-chemical properties of this material have not been fully investigated.
- Evaporation rate: No data available.
- Flammability (solid, gas): No data available.

Upper/lower limit on flammability or explosive limits
- Flammability limit - upper (%): No data available.
- Flammability limit - lower (%): No data available.
- Explosive limit - upper (%): No data available.
- Explosive limit - lower (%): No data available.

Vapor pressure: No data available.
Vapor density: No data available.
Relative density: No data available.

Solubility(ies)
- Solubility in water: Soluble
- Solubility (other): The physical-chemical properties of this material have not been fully investigated.

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

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral Product: ATEmix: 6,186.06 mg/kg

Dermal
Product:
ATEmix: 6,423.98 mg/kg

Inhalation Product:
ATEmix: 71.38 mg/l

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.

Formaldehyde Cancer

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

General information: Harmful to aquatic life.

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 (Black bullhead (Ameiurus melas), 96 h): 20.4 - 30.3 mg/l Mortality
LC 50 (Striped bass (Morone saxatilis), 6 h): 809 - 1,092 mg/l Mortality
LC 50 (Bluegill (Lepomis macrochirus), 3 h): 721.6 - 1,160 mg/l Mortality

Aquatic Invertebrates
Product: No data available.

Specified substance(s):
Formaldehyde
EC 50 (Water flea (Daphnia magna), 48 h): 29 mg/l Intoxication
EC 50 (Water flea (Daphnia pulex), 48 h): 5.8 mg/l Intoxication
EC 50 (Water flea (Daphnia pulex), 48 h): 4.3 - 7.8 mg/l Intoxication

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic Invertebrates
Product: No data available.
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
90 % (28 d) Detected in water. Experimental result, Key study
55 - 60 % (40 d) Detected in water. Experimental result, Not specified
91 % (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.

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.

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

**DOT**
- UN 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**

**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)

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>OSHA hazard(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>respiratory tract irritation</td>
</tr>
<tr>
<td></td>
<td>Cancer</td>
</tr>
<tr>
<td></td>
<td>Flammability</td>
</tr>
<tr>
<td></td>
<td>Skin irritation</td>
</tr>
<tr>
<td></td>
<td>Skin sensitization</td>
</tr>
<tr>
<td></td>
<td>Eye irritation</td>
</tr>
<tr>
<td></td>
<td>Acute toxicity</td>
</tr>
<tr>
<td></td>
<td>Respiratory sensitization</td>
</tr>
</tbody>
</table>

CERCLA Hazardous Substance List (40 CFR 302.4):

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>100 lbs.</td>
</tr>
<tr>
<td>Phosphoric acid, sodium</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>salt (1:2)</td>
<td></td>
</tr>
</tbody>
</table>

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
- Immediate (Acute) Health Hazards
- Delayed (Chronic) Health Hazard
- Skin Corrosion/Irritation
- Serious Eye Damage/Eye Irritation
- Skin sensitizer
- Germ Cell Mutagenicity
- Carcinogenicity

SARA 302 Extremely Hazardous Substance

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>100 lbs.</td>
<td>500 lbs.</td>
</tr>
</tbody>
</table>

SARA 304 Emergency Release Notification

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>100 lbs.</td>
</tr>
<tr>
<td>Phosphoric acid, sodium</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>salt (1:2)</td>
<td></td>
</tr>
</tbody>
</table>

SARA 311/312 Hazardous Chemical

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>500lbs</td>
</tr>
</tbody>
</table>

SARA 313 (TRI Reporting)

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reporting threshold for other users</th>
<th>Reporting threshold for manufacturing and processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>10000 lbs</td>
<td>25000 lbs.</td>
</tr>
</tbody>
</table>
Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Reportable quantity: 100 lbs.</td>
</tr>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
<td>Reportable quantity: 5000 lbs.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>15000 lbs</td>
</tr>
</tbody>
</table>

US State Regulations

US. California Proposition 65
This product contains chemical(s) known to the State of California to cause cancer and/or to cause birth defects or other reproductive harm.

Formaldehyde Carcinogenic.

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
</tr>
</tbody>
</table>

US. Massachusetts RTK - Substance List

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
</tr>
</tbody>
</table>

US. Pennsylvania RTK - Hazardous Substances

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
</tr>
</tbody>
</table>

US. Rhode Island RTK

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
</tr>
</tbody>
</table>

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

Issue Date: 10/23/2017

Version #: 1.0

Revision Information:

Further Information: No data available.
Disclaimer:
The information contained herein has been obtained from various sources and is believed to be correct as of the date issued. However, neither BD nor any of its subsidiaries assumes any liabilities whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability for a particular use of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. BD provides SDS in electronic form so the information may be more easily accessed. Due to the possibility of errors during transmission, BD makes no representations as to the completeness or accuracy of the information.
SAFETY DATA SHEET

1. Identification

Product identifier

Product name: Perm/Wash Buffer
Product No.: 51-2091KZ

Other means of identification
SDS number: 088100012091

Recommended use and restriction on use
Recommended use: Reserved for industrial and professional use.
Restrictions on use: None known.

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
Not classified

Label Elements

Hazard Symbol: No symbol
Signal Word: No signal word.
Hazard Statement: not applicable
Precautionary Statements: not applicable

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients
Mixtures

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>Content in percent (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3))</td>
<td></td>
<td>26628-22-8</td>
<td>0.083%</td>
</tr>
</tbody>
</table>

* 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 medical attention if symptoms occur.

Ingestion: Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: Provide fresh air, warmth and rest, preferably in comfortable upright sitting position.

Skin Contact: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses.

Most important symptoms/effects, acute and delayed

Symptoms: No data available.

Indication of immediate medical attention and special treatment needed

Treatment: No data available.

5. Fire-fighting measures

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

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media: not applicable

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:  Contact local authorities in case of spillage to drain/aquatic environment. Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area.

Methods and material for containment and cleaning up:  Absorb spillage with suitable absorbent material. 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:  Avoid release to the environment.

7. Handling and storage

Precautions for safe handling:  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 a cool, dry place. Keep container tightly closed.

8. Exposure controls/personal protection

Control Parameters

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3)) - as HN3</td>
<td>Ceiling</td>
<td>0.1 ppm</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3)) - as NaN3</td>
<td>Ceiling</td>
<td>0.3 mg/m3</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)</td>
</tr>
<tr>
<td></td>
<td>Ceiling</td>
<td>0.3 mg/m3</td>
<td>US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3)) - as HN3</td>
<td>Ceiling</td>
<td>0.1 ppm</td>
<td>US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>AN ESL</td>
<td>0.07 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td></td>
<td>ST ESL</td>
<td>0.7 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td></td>
<td>AN ESL</td>
<td>0.2 µg/m3</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td></td>
<td>ST ESL</td>
<td>2 µg/m3</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
</tbody>
</table>
**Sodium azide (Na(N₃)) as NaN₃**

- **Ceiling**: 0.1 ppm
- **Ceil_Time**: 0.3 mg/m³
- **Last revised date**: 09/18/2017

**US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)**

**US. ACGIH Threshold Limit Values (12 2010)**

**US. NIOSH: Pocket Guide to Chemical Hazards (2005)**

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### Appropriate Engineering Controls

No special requirements under ordinary conditions of use and with adequate ventilation.

### 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.

**Eye/face protection:**
Wear safety glasses with side shields (or goggles).

**Skin Protection**

**Hand Protection:**
Chemical resistant gloves Suitable gloves can be recommended by the glove supplier. Wash hands after contact.

**Other:**
Wear a lab coat or similar protective clothing.

**Respiratory Protection:**
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.

**Hygiene measures:**
Observe good industrial hygiene practices.

---

### 9. Physical and chemical properties

**Appearance**

| Physical state: | liquid |
| Form:           | liquid |
| Color:          | Various |

**Odor:** Odorless

**Odor threshold:** No data available.

**pH:** No data available.

**Melting point/freezing point:**
The physical-chemical properties of this material have not been fully investigated.

**Initial boiling point and boiling range:**
No data available.

**Flash Point:**
The physical-chemical properties of this material have not been fully investigated.
Evaporation rate: No data available.
Flammability (solid, gas): No data available.
Upper/lower limit on flammability or explosive limits
  Flammability limit - upper (%): No data available.
  Flammability limit - lower (%): No data available.
  Explosive limit - upper (%): No data available.
  Explosive limit - lower (%): No data available.
Vapor pressure: No data available.
Vapor density: No data available.
Relative density: No data available.
Solubility(ies)
  Solubility in water: Soluble
  Solubility (other): The physical-chemical properties of this material have not been fully investigated.
Partition coefficient (n-octanol/water): No data available.
Auto-ignition temperature: No data available.
Decomposition temperature: No data available.
Viscosity: Not determined.

10. Stability and reactivity

Reactivity: Stable under normal temperature conditions and recommended use.
Chemical Stability: Material is stable under normal conditions.
Possibility of hazardous reactions: Not determined.
Conditions to avoid: Avoid exposure to high temperatures or direct sunlight.
Incompatible Materials: Metals. Water reactive material.
Hazardous Decomposition Products: Stable; however, may decompose if heated.

11. Toxicological information

General information: No data on possible toxicity effects have been found.
Information on likely routes of exposure
  Ingestion: No harmful effects expected in amounts likely to be ingested by accident.
  Inhalation: Limited inhalation hazard at normal work temperatures.
  Skin Contact: Negligible irritation to skin at ambient temperatures.
Eye contact: Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.

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.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: No data available.

Dermal
Product: No data available.

Inhalation
Product: No data available.

Repeated dose toxicity
Product: not applicable

Skin Corrosion/Irritation
Product: Based on available data, the classification criteria are not met.

Serious Eye Damage/Eye Irritation
Product: No data available.

Respiratory or Skin Sensitization
Product: Not a skin sensitizer.

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

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens: No carcinogenic components identified

Germ Cell Mutagenicity

**In vitro**
Product: not applicable

**In vivo**
Product: not applicable

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

**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:** None known.

### 12. Ecological information

**Ecotoxicity:**

**Acute hazards to the aquatic environment:**

**Fish**
Product: No negative effects on the aquatic environment are known.

**Aquatic Invertebrates**
Product: No negative effects on the aquatic environment are known.

**Chronic hazards to the aquatic environment:**

**Fish**
Product: No negative effects on the aquatic environment are known.

**Aquatic Invertebrates**
Product: No negative effects on the aquatic environment are known.

**Toxicity to Aquatic Plants**
Product: No negative effects on the aquatic environment are known.

** Persistence and Degradability**

**Biodegradation**
Product: Expected to be readily biodegradable.

**BOD/COD Ratio**
SDS_US - 51-2091KZ
Product: No data available.

Bioaccumulative potential
   Bioconcentration Factor (BCF)
   Product: No data available.

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
   Sodium azide (Na(N3)) No data available.

Other adverse effects: The product is not expected to be hazardous to the environment.

13. Disposal considerations

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

Disposal instructions: Dispose of waste at an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Contaminated Packaging: No data available.

14. Transport information

DOTUN Number: Not regulated.
UN Proper Shipping Name: Not regulated.
Transport Hazard Class(es): Not regulated.
   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
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)
  None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>1000 lbs.</td>
</tr>
</tbody>
</table>

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories
  Not listed.
### SARA 302 Extremely Hazardous Substance

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>1000 lbs.</td>
<td>500 lbs.</td>
</tr>
</tbody>
</table>

### SARA 304 Emergency Release Notification

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>1000 lbs.</td>
</tr>
</tbody>
</table>

### SARA 311/312 Hazardous Chemical

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium azide (Na(N3))</td>
<td>500 lbs</td>
</tr>
</tbody>
</table>

### SARA 313 (TRI Reporting)

None present or none present in regulated quantities.

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
<td>Reportable quantity: 5000 lbs.</td>
</tr>
</tbody>
</table>

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

None present or none present in regulated quantities.

### US State Regulations

**US. California Proposition 65**

No ingredient regulated by CA Prop 65 present.

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
</tr>
</tbody>
</table>

**US. Massachusetts RTK - Substance List**

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
</tr>
<tr>
<td>Sodium azide (Na(N3))</td>
</tr>
</tbody>
</table>

**US. Pennsylvania RTK - Hazardous Substances**

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
</tr>
</tbody>
</table>

**US. Rhode Island RTK**

<table>
<thead>
<tr>
<th>Chemical Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
</tr>
</tbody>
</table>
### 16. Other information, including date of preparation or last revision

<table>
<thead>
<tr>
<th>Issue Date</th>
<th>09/18/2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version #</td>
<td>1.0</td>
</tr>
<tr>
<td>Revision Information</td>
<td></td>
</tr>
<tr>
<td>Further Information</td>
<td>No data available.</td>
</tr>
<tr>
<td>Disclaimer:</td>
<td>Disclaimer: The information contained herein has been obtained from various sources and is believed to be correct as of the date issued. However, neither BD nor any of its subsidiaries assumes any liabilities whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability for a particular use of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. BD provides SDS in electronic form so the information may be more easily accessed. Due to the possibility of errors during transmission, BD makes no representations as to the completeness or accuracy of the information.</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

1. Identification

Product identifier
Product name: Fixation and Permeabilization Solution
Product No.: 51-2090KZ

Other means of identification
SDS number: 088100012089

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 Corrosion/Irritation Category 2
- Serious Eye Damage/Eye Irritation Category 1
- Skin sensitizer Category 1
- Germ Cell Mutagenicity Category 2
- Carcinogenicity Category 1A

Environmental Hazards
- Acute hazards to the aquatic environment Category 3

Label Elements

Hazard Symbol:
Signal Word: Danger

Hazard Statement: Causes skin irritation.
Causes serious eye damage.
May cause an allergic skin reaction.
Suspected of causing genetic defects.
May cause cancer.
Harmful to aquatic life.

Precautionary Statements

Prevention: Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapors/spray. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Avoid release to the environment.

Response: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Immediately call a POISON CENTER/doctor. Specific treatment (see this label). Wash contaminated clothing before reuse.

Storage: Store locked up.

Disposal: 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.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>Content in percent (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td></td>
<td>50-00-0</td>
<td>4.203%</td>
</tr>
</tbody>
</table>

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

4. First-aid measures
General information: Causes serious eye damage. Causes skin irritation. Suspected of causing genetic defects. May cause cancer. May cause an allergic skin reaction. 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.

Hazards: Causes serious eye damage. Causes skin irritation. May cause an allergic skin reaction. May cause genetic defects. May cause cancer.

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, CO2, dry chemical, or alcohol resistant foam.

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

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA</td>
<td>0.75 ppm</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)</td>
</tr>
<tr>
<td></td>
<td>ST ESL</td>
<td>24 ppb</td>
<td>US. Texas, Effects Screening Levels (Texas Commission on Environmental Quality) (2010)</td>
</tr>
<tr>
<td></td>
<td>AN ESL</td>
<td>2.7 ppb</td>
<td>US. Texas, Effects Screening Levels (Texas Commission on Environmental Quality) (2010)</td>
</tr>
</tbody>
</table>
## 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.

### Eye/face protection:
Chemical goggles and face shield are recommended.

### Skin Protection
- **Hand Protection:** Chemical resistant gloves

### Table: Exposure limits and related standards

<table>
<thead>
<tr>
<th>Exposure Level</th>
<th>Limit Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST ESL</td>
<td>12 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td>AN ESL</td>
<td>5.4 ppb</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td>ST ESL</td>
<td>30 µg/m³</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td>AN ESL</td>
<td>3.3 µg/m³</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td>AN ESL</td>
<td>6.6 µg/m³</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td>ST ESL</td>
<td>15 µg/m³</td>
<td>US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)</td>
</tr>
<tr>
<td>STEL</td>
<td>2 ppm</td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)</td>
</tr>
<tr>
<td>TWA PEL</td>
<td>0.75 ppm</td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)</td>
</tr>
<tr>
<td>TWA A LV</td>
<td>0.5 ppm</td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)</td>
</tr>
<tr>
<td>OSHA_AC_T</td>
<td>0.5 ppm</td>
<td>US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (02 2006)</td>
</tr>
<tr>
<td>TWA</td>
<td>0.75 ppm</td>
<td>US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053) (02 2006)</td>
</tr>
<tr>
<td>STEL</td>
<td>0.3 ppm</td>
<td>US. ACGIH Threshold Limit Values (03 2017)</td>
</tr>
<tr>
<td>TWA</td>
<td>0.1 ppm</td>
<td>US. ACGIH Threshold Limit Values (03 2017)</td>
</tr>
<tr>
<td>Ceil_Time</td>
<td>0.1 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Formaldehyde - as formaldehyde</td>
<td>0.1 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>0.016 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
<tr>
<td>Formaldehyde - as formaldehyde</td>
<td>0.016 ppm</td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards (2005)</td>
</tr>
</tbody>
</table>
Other: Wear a lab coat or similar protective clothing. Wear appropriate clothing to prevent repeated or prolonged skin contact.

Respiratory Protection: 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.

Hygiene measures: 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
- Physical state: liquid
- Form: liquid
- Color: Clear
- Odor: Odorless
- Odor threshold: No data available.
- pH: not applicable

Melting point/freezing point: The physical-chemical properties of this material have not been fully investigated.

Initial boiling point and boiling range: No data available.

Flash Point: The physical-chemical properties of this material have not been fully investigated.

Evaporation rate: No data available.

Flammability (solid, gas): No data available.

Upper/lower limit on flammability or explosive limits
- Flammability limit - upper (%): No data available.
- Flammability limit - lower (%): No data available.
- Explosive limit - upper (%): No data available.
- Explosive limit - lower (%): No data available.

Vapor pressure: No data available.

Vapor density: No data available.

Relative density: No data available.

Solubility(ies)
- Solubility in water: Soluble
- Solubility (other): The physical-chemical properties of this material have not been fully investigated.

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

Auto-ignition temperature: No data available.

Decomposition temperature: No data available.
10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity:</td>
<td>Product is not reactive under normal conditions and recommended use.</td>
</tr>
<tr>
<td></td>
<td>Stable</td>
</tr>
<tr>
<td>Chemical Stability:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions:</td>
<td>Stable; however, may decompose if heated. None under normal conditions.</td>
</tr>
<tr>
<td>Conditions to avoid:</td>
<td>Avoid exposure to high temperatures or direct sunlight.</td>
</tr>
<tr>
<td>Incompatible Materials:</td>
<td>Strong oxidizing agents.</td>
</tr>
<tr>
<td>Hazardous Decomposition Products:</td>
<td>By heating and fire, harmful vapors/gases may be formed.</td>
</tr>
</tbody>
</table>

11. Toxicological information

Information on likely routes of exposure

<table>
<thead>
<tr>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion:</td>
<td>Ingestion may cause severe irritation of the mouth, the esophagus and the</td>
</tr>
<tr>
<td></td>
<td>gastrointestinal tract.</td>
</tr>
<tr>
<td>Inhalation:</td>
<td>May cause irritation to the respiratory system.</td>
</tr>
<tr>
<td>Skin Contact:</td>
<td>Causes skin irritation. Prolonged or repeated contact may cause skin</td>
</tr>
<tr>
<td></td>
<td>sensitization in susceptible individuals.</td>
</tr>
<tr>
<td>Eye contact:</td>
<td>May cause chemical eye burns. Avoid contact with eyes.</td>
</tr>
</tbody>
</table>

Symptoms related to the physical, chemical and toxicological characteristics

<table>
<thead>
<tr>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Inhalation:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Skin Contact:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Eye contact:</td>
<td>No data available.</td>
</tr>
</tbody>
</table>

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

<table>
<thead>
<tr>
<th>Route</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Product:</td>
<td></td>
<td>ATEmix: 6,186.06 mg/kg</td>
</tr>
</tbody>
</table>
Product: ATEmix: 6,423.98 mg/kg

Inhalation Product:
ATEmix: 71.38 mg/l

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.

Formaldehyde Cancer

Germ Cell Mutagenicity

In vitro Product: No data available.

In vivo Product: not applicable

Reproductive toxicity
12. Ecological information

General information: Harmful to aquatic life.

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 (Black bullhead (Ameiurus melas), 96 h): 20.4 - 30.3 mg/l Mortality
LC 50 (Striped bass (Morone saxatilis), 6 h): 809 - 1,092 mg/l Mortality
LC 50 (Bluegill (Lepomis macrochirus), 3 h): 721.6 - 1,160 mg/l Mortality

Aquatic Invertebrates

Product: No data available.

Specified substance(s):
Formaldehyde
EC 50 (Water flea (Daphnia magna), 48 h): 29 mg/l Intoxication
EC 50 (Water flea (Daphnia pulex), 48 h): 5.8 mg/l Intoxication
EC 50 (Water flea (Daphnia pulex), 48 h): 4.3 - 7.8 mg/l Intoxication

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic Invertebrates

Product: No data available.
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
90 % (28 d) Detected in water. Experimental result, Key study
55 - 60 % (40 d) Detected in water. Experimental result, Not specified
91 % (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.

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.

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

**DOT**

- UN Number: Not regulated.
- UN Proper Shipping Name: Not regulated.
- 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.
- Class: Not regulated.
- Subsidiary risk: Not regulated.
- EmS No.: Not regulated.
- Packing Group: Not regulated.
- Environmental Hazards: Not regulated.
- Marine Pollutant: Not regulated.
- Special precautions for user: Not regulated.

**IATA**

- UN Number: Not regulated.
- Proper Shipping Name: Not regulated.
- Class: Not regulated.
- Subsidiary risk: Not regulated.
- Packing Group: Not regulated.
- Environmental Hazards: Not regulated.
- Marine pollutant: Not regulated.
- Special precautions for user: Not regulated.

15. Regulatory information

**US Federal Regulations**

**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)

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>OSHA hazard(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>respiratory tract irritation</td>
</tr>
<tr>
<td></td>
<td>Cancer</td>
</tr>
<tr>
<td></td>
<td>Flammability</td>
</tr>
<tr>
<td></td>
<td>Skin irritation</td>
</tr>
<tr>
<td></td>
<td>Skin sensitization</td>
</tr>
<tr>
<td></td>
<td>Eye irritation</td>
</tr>
<tr>
<td></td>
<td>Acute toxicity</td>
</tr>
<tr>
<td></td>
<td>Respiratory sensitization</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>100 lbs.</td>
</tr>
<tr>
<td>Phosphoric acid, sodium</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>salt (1:2)</td>
<td></td>
</tr>
</tbody>
</table>

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

**Hazard categories**
- Immediate (Acute) Health Hazards
- Delayed (Chronic) Health Hazard
- Skin Corrosion/Irritation
- Serious Eye Damage/Eye Irritation
- Skin sensitizer
- Germ Cell Mutagenicity
- Carcinogenicity

### SARA 302 Extremely Hazardous Substance

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>100 lbs.</td>
<td>500 lbs.</td>
</tr>
</tbody>
</table>

### SARA 304 Emergency Release Notification

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>100 lbs.</td>
</tr>
<tr>
<td>Phosphoric acid, sodium</td>
<td>5000 lbs.</td>
</tr>
<tr>
<td>salt (1:2)</td>
<td></td>
</tr>
</tbody>
</table>

### SARA 311/312 Hazardous Chemical

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Threshold Planning Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>500 lbs</td>
</tr>
</tbody>
</table>

### SARA 313 (TRI Reporting)

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reporting threshold for other users</th>
<th>Reporting threshold for manufacturing and processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>10000 lbs</td>
<td>25000 lbs.</td>
</tr>
</tbody>
</table>
Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Reportable quantity: 100 lbs.</td>
</tr>
<tr>
<td>Phosphoric acid, sodium salt (1:2)</td>
<td>Reportable quantity: 5000 lbs.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Chemical Identity</th>
<th>Reportable quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>15000 lbs</td>
</tr>
</tbody>
</table>

US State Regulations

US. California Proposition 65
This product contains chemical(s) known to the State of California to cause cancer and/or to cause birth defects or other reproductive harm.

Formaldehyde Carcinogenic.

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

Chemical Identity
Formaldehyde

US. Massachusetts RTK - Substance List

Chemical Identity
Formaldehyde

US. Pennsylvania RTK - Hazardous Substances

Chemical Identity
Formaldehyde

US. Rhode Island RTK

Chemical Identity
Formaldehyde

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

Issue Date: 10/23/2017

Version #: 1.0

Revision Information:

Further Information: No data available.
Disclaimer:

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