Safety Data Sheet

Cat. # 786-067

HOOK™ Peptide Coupling Kit (Amine Reactive)

Size: 5 Reactions
1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 03/25/2016
Revision date: 05/11/2017
Version: 7.1

SECTION 1: Identification

1.1. Identification

Product form: Substance
Substance name: 1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride
Chemical name: EDC
CAS-No.: 25952-53-8
Product code: 009E
Formula: C8H17N3.HCl
Synonyms:

-BIG No: 26531

1.2. Recommended use and restrictions on use

No additional information available

1.3. Supplier

Geno Technology, Inc./ G-Biosciences
9800 Page Avenue
Saint Louis, 63132 - United States
T 800-628-7730 - F 314-991-1504
technical@GBiosciences.com - www.GBiosciences.com

1.4. Emergency telephone number

Emergency number: Chemtrec 1-800-424-9300 (USA/Canada), +1-703-527-3887 (Intl)

SECTION 2: Hazard(s) Identification

2.1. Classification of the substance or mixture

GHS US classification

Acute toxicity (oral) Category 4: H302 Harmful if swallowed
Acute toxicity (dermal) Category 3: H311 Toxic in contact with skin
Skin corrosion/irritation Category 2: H315 Causes skin irritation
Serious eye damage/eye irritation Category 2: H319 Causes serious eye irritation
Skin sensitization, Category 1: H317 May cause an allergic skin reaction
Specific target organ toxicity (repeated exposure) Category 2: H373 May cause damage to organs through prolonged or repeated exposure
Hazardous to the aquatic environment - Acute Hazard Category 1: H400 Very toxic to aquatic life
Hazardous to the aquatic environment - Chronic Hazard Category 1: H410 Very toxic to aquatic life with long lasting effects

Full text of H statements: see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US): ☠️ ⚠️ ☢️ 🌧️

Signal word (GHS US): Danger

Hazard statements (GHS US):
- H302 - Harmful if swallowed
- H311 - Toxic in contact with skin
- H315 - Causes skin irritation
- H317 - May cause an allergic skin reaction
- H319 - Causes serious eye irritation
- H373 - May cause damage to organs through prolonged or repeated exposure
- H400 - Very toxic to aquatic life

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Precautionary statements (GHS US):

- H410 - Very toxic to aquatic life with long lasting effects
- P260 - Do not breathe dust/fume/gas/mist/vapors/spray.
- P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.
- P264 - Wash hands, forearms and face thoroughly after handling.
- P270 - Do not eat, drink or smoke when using this product.
- P272 - Contaminated work clothing must not be allowed out of the workplace
- P273 - Avoid release to the environment.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P301+P312 - If swallowed: Call a poison center or doctor if you feel unwell
- P302+P352 - If on skin: Wash with plenty of water
- P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P312 - Call a poison center or doctor if you feel unwell
- P314 - Get medical advice/attention if you feel unwell
- P321 - Specific treatment (see supplemental first aid instruction on this label)
- P322 - Specific treatment (see supplemental first aid instruction on this label)
- P330 - Rinse mouth.
- P332+P313 - If skin irritation occurs: Get medical advice/attention.
- P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
- P337+P313 - If eye irritation persists: Get medical advice/attention.
- P361+P364 - Take off immediately all contaminated clothing and wash it before reuse.
- P362+P364 - Take off contaminated clothing and wash it before reuse.
- P363 - Wash contaminated clothing before reuse.
- P391 - Collect spillage.
- P405 - Store locked up.
- P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type: Mono-constituent

<table>
<thead>
<tr>
<th>Name</th>
<th>Common Name (Synonyms)</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride (Main constituent)</td>
<td>(3-dimethylaminopropyl)ethylcarbodiimide monohydrochloride / 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride / 1,3-Propanediamine, N', (ethylcarbimidoyl)-N,N-dimethyl, monohydrochloride / EDAC (=1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride) / EDC (=1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride) / EDCI (=1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride) / N'-ethylcarbodiimide hydrochloride / N'- (ethylcarbimidoyl)-N,N-dimethylethane-1,3-diamine monohydrochloride / N-ethyl-N'-(3-diethylaminopropyl)carbodiimide hydrochloride / WSC (=1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride)</td>
<td>(CAS-No.) 25952-53-8</td>
<td>100</td>
<td>Acute Tox. 4 (Oral), H302 Acute Tox. 3 (Dermal), H311 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements: see section 16

3.2. Mixtures

Not applicable
1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride

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**SECTION 4: First-aid measures**

**4.1. Description of first aid measures**


First-aid measures after inhalation: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact: Wash immediately with lots of water. Do not apply (chemical) neutralizing agents without medical advice. Consult a doctor/medical service.

First-aid measures after eye contact: Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Do not apply (chemical) neutralizing agents without medical advice. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion: Rinse mouth with water. Do not apply (chemical) neutralizing agents without medical advice. Call Poison Information Centre (www.big.be/antigif.htm). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital. Take the container/vomit to the doctor/hospital.

**4.2. Most important symptoms and effects (acute and delayed)**

Potential Adverse human health effects and symptoms: Harmful if swallowed. Toxic in contact with skin. Causes skin irritation. Causes serious eye irritation.

Symptoms/effects after inhalation: Irritation of the respiratory tract. Irritation of the nasal mucous membranes.

Symptoms/effects after skin contact: Tingling/irritation of the skin.

Symptoms/effects after eye contact: Irritation of the eye tissue.

Symptoms/effects after ingestion: Gastrointestinal complaints.

Chronic symptoms: Irritation of the gastric/intestinal mucosa. Respiratory difficulties.

**4.3. Immediate medical attention and special treatment, if necessary**

Treat symptomatically.

**SECTION 5: Fire-fighting measures**

**5.1. Suitable (and unsuitable) extinguishing media**


**5.2. Specific hazards arising from the chemical**

Fire hazard: DIRECT FIRE HAZARD: Non-flammable. Most organic solids may burn if strongly heated. INDIRECT FIRE HAZARD: Heating increases the fire hazard.

Explosion hazard: DIRECT EXPLOSION HAZARD: Most organic solids are liable to dust explosion hazard. INDIRECT EXPLOSION HAZARD: Dust cloud can be ignited by a spark.

**5.3. Special protective equipment and precautions for fire-fighters**

Precautionary measures fire: Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions: Dilute toxic gases with water spray. Take account of toxic/corrosive precipitation water. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.


**SECTION 6: Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

**6.1.1. For non-emergency personnel**


Emergency procedures: Mark the danger area. Prevent dust cloud formation. No naked flames. Wash contaminated clothes.

Measures in case of dust release: In case of dust production: keep upwind. Dust production: have neighbourhood close doors and windows.
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6.1.2. For emergency responders
Protective equipment: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions
Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
For containment: Contain released product, pump into suitable containers. Plug the leak, cut off the supply. Knock down/dilute dust cloud with water spray. Take account of toxic/corrosive precipitation water.

Methods for cleaning up: Stop dust cloud by covering with sand/earth. Scoop solid spill into closing containers. Carefully collect the spill/leftovers. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

Other information: Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections
For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Hygiene measures: Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Contaminated work clothing should not be allowed out of the workplace.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions: Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool.

Heat-ignition: KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.

Information on mixed storage: KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) acids. water/moisture.

Storage area: Store in a cool area. Store in a dry area. Keep container in a well-ventilated place. Keep locked up. Unauthorized persons are not admitted. Meet the legal requirements.

Special rules on packaging: SPECIAL REQUIREMENTS: closing. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride (25952-53-8)  
No additional information available

8.2. Appropriate engineering controls
Appropriate engineering controls: Ensure good ventilation of the work station.

Environmental exposure controls: Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:
Protective gloves against chemicals (EN374)

Eye protection:
Face shield. In case of dust production: protective goggles

Skin and body protection:
Protective clothing. In case of dust production: head/neck protection. In case of dust production: dustproof clothing

Respiratory protection:
Dust production: dust mask with filter type P3. High dust production: self-contained breathing apparatus
### 1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride

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**SECTION 9: Physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Solid.</td>
</tr>
<tr>
<td>Color</td>
<td>White to off-white</td>
</tr>
<tr>
<td>Odor</td>
<td>Odourless</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</td>
<td>120 °C (1013 hPa, Equivalent or similar to OECD 102)</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Not applicable (decomposes)</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>&lt; 0.00002 hPa (20 °C, EU Method A.4: Vapour Pressure)</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific gravity / density</td>
<td>1044 kg/m³ (20 °C, OECD 109: Density of Liquids and Solids)</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>191.71 g/mol</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water.</td>
</tr>
<tr>
<td>Water</td>
<td>&gt; 100 g/100ml (20 °C, OECD 105: Water Solubility)</td>
</tr>
<tr>
<td>Log Pow</td>
<td>-2.98 (Experimental value, OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method, 20 °C)</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt;= 125 °C (Equivalent or similar to OECD 102, 1013 hPa)</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
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<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

**SECTION 10: Stability and reactivity**

10.1. **Reactivity**

The product is non-reactive under normal conditions of use, storage and transport.

10.2. **Chemical stability**

Stable under normal conditions.

10.3. **Possibility of hazardous reactions**

No dangerous reactions known under normal conditions of use.

10.4. **Conditions to avoid**

None under recommended storage and handling conditions (see section 7).

10.5. **Incompatible materials**

No additional information available.

10.6. **Hazardous decomposition products**

Hazardous decomposition products.

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**SECTION 11: Toxicological information**

11.1. **Information on toxicological effects**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (oral)</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>Acute toxicity (dermal)</td>
<td>Toxic in contact with skin.</td>
</tr>
</tbody>
</table>

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1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride  
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<table>
<thead>
<tr>
<th>Acute toxicity (inhalation)</th>
<th>Not classified</th>
</tr>
</thead>
</table>

### 1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride (25952-53-8)

<table>
<thead>
<tr>
<th>LD50 oral rat</th>
<th>500 mg/kg body weight (OECD 423: Acute Oral Toxicity – Acute Toxic Class Method, Rat, Female, Experimental value, Oral, 14 day(s))</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 dermal rat</td>
<td>200 - 1000 mg/kg body weight (OECD 402: Acute Dermal Toxicity, 24 h, Rat, Male / female, Experimental value, Dermal)</td>
</tr>
<tr>
<td>ATE US (oral)</td>
<td>500 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (dermal)</td>
<td>200 mg/kg body weight</td>
</tr>
</tbody>
</table>

**Skin corrosion/irritation**: Causes skin irritation.

**Serious eye damage/irritation**: Causes serious eye irritation.

**Respiratory or skin sensitization**: May cause an allergic skin reaction.

**Germ cell mutagenicity**: Not classified

**Carcinogenicity**: Not classified

**Reproductive toxicity**: Not classified

**Specific target organ toxicity – single exposure**: Not classified

**Specific target organ toxicity – repeated exposure**: May cause damage to organs through prolonged or repeated exposure.

**Aspiration hazard**: Not classified

**Viscosity, kinematic**: No data available

**Potential Adverse human health effects and symptoms**: Harmful if swallowed. Toxic in contact with skin. Causes skin irritation. Causes serious eye irritation.

**Symptoms/effects after inhalation**: Irritation of the respiratory tract. Irritation of the nasal mucous membranes.

**Symptoms/effects after skin contact**: Tingling/irritation of the skin.

**Symptoms/effects after eye contact**: Irritation of the eye tissue.

**Symptoms/effects after ingestion**: Gastrointestinal complaints.

**Chronic symptoms**: Irritation of the gastric/intestinal mucosa. Respiratory difficulties.

### SECTION 12: Ecological Information

#### 12.1. Toxicity

**Ecology - general**: The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment. Very toxic to aquatic life with long lasting effects.

**Ecology - air**: Not included in the list of substances which may contribute to the greenhouse effect (IPCC). Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014). Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).

**Ecology - water**: Very toxic to crustacea. Toxic to fishes. Toxic to algae. Photolysis in water.

#### 1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride (25952-53-8)

<table>
<thead>
<tr>
<th>LC50 fish 1</th>
<th>4.6 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Cyprinus carpio, Static system, Experimental value, GLP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC50 Daphnia 1</td>
<td>0.41 mg/l (ISO 6341 15 Water quality - Determination of the Inhibition of the Mobility of Daphnia magna Straus (Cladocera, Crustacea), 48 h, Daphnia magna, Experimental value)</td>
</tr>
</tbody>
</table>

#### 12.2. Persistence and degradability

**Persistence and degradability**: Not readily biodegradable in water.

#### 12.3. Bioaccumulative potential

**Bioaccumulative potential**: Not bioaccumulative.

#### 12.4. Mobility in soil

**Ecology - soil**: No (test)data on mobility of the substance available.
12.5. Other adverse effects
No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods
Product/Packaging disposal recommendations : Do not discharge into drains or the environment. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Refer to manufacturer/supplier for information on recovery/ recycling. Remove to an incinerator for chlorinated waste materials with energy recovery. Dissolve or mix with a combustible solvent.

SECTION 14: Transport information

Department of Transportation (DOT)
In accordance with DOT
Dangerous for the environment : Yes
Marine pollutant : Yes

Other information : No supplementary information available.

Transportation of Dangerous Goods

Transport by sea
Transport document description (IMDG) : UN 2811 toxic solid, organic, n.o.s., 6.1, III, MARINE POLLUTANT
UN-No. (IMDG) : 2811
Proper Shipping Name (IMDG) : toxic solid, organic, n.o.s.
Class (IMDG) : 6.1 - Toxic substances
Packing group (IMDG) : III - substances presenting low danger
EmS-No. (1) : F-A
EmS-No. (2) : S-A
Marine pollutant : Yes

Air transport
Transport document description (IATA) : UN 2811 Toxic solid, organic, n.o.s., 6.1, III
UN-No. (IATA) : 2811
Proper Shipping Name (IATA) : Toxic solid, organic, n.o.s.
Class (IATA) : 6.1 - Toxic Substances
Packing group (IATA) : III - Minor Danger
1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride
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SECTION 15: Regulatory information

15.1. US Federal regulations

1-ethyl-3-(3-dimethylamino)propyl carbodiimide, hydrochloride (25952-53-8)
Not listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

EU-Regulations

National regulations
No additional information available

15.3. US State regulations

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 05/11/2017

Full text of H-phrases:

<table>
<thead>
<tr>
<th>H-phrase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H302</td>
<td>Harmful if swallowed</td>
</tr>
<tr>
<td>H311</td>
<td>Toxic in contact with skin</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation</td>
</tr>
<tr>
<td>H317</td>
<td>May cause an allergic skin reaction</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
<tr>
<td>H373</td>
<td>May cause damage to organs through prolonged or repeated exposure</td>
</tr>
<tr>
<td>H400</td>
<td>Very toxic to aquatic life</td>
</tr>
<tr>
<td>H410</td>
<td>Very toxic to aquatic life with long lasting effects</td>
</tr>
</tbody>
</table>

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.
**Optimizer Buffer IV [5X]**

**Safety Data Sheet**

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 10/25/2016  
Revision date: 05/11/2017  
Version: 7.1

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### SECTION 1: Identification

#### 1.1. Identification

- **Product form**: Mixture
- **Product name**: Optimizer Buffer IV [5X]
- **Product code**: 264O

#### 1.2. Recommended use and restrictions on use

No additional information available

#### 1.3. Supplier

Geno Technology, Inc./ G-Biosciences  
9800 Page Avenue  
Saint Louis, 63132-1429 - United States  
T 800-628-7730 - F 314-991-1504  
technical@GBiosciences.com, www.GBiosciences.com

#### 1.4. Emergency telephone number

- **Emergency number**: Chemtrec 1-800-424-9300 (USA/Canada), +1-703-527-3887 (Intl)

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

**GHS US classification**  
Not classified

#### 2.2. GHS Label elements, including precautionary statements

**GHS US labelling**  
No labeling applicable

#### 2.3. Other hazards which do not result in classification

No additional information available

#### 2.4. Unknown acute toxicity (GHS US)

Not applicable

### SECTION 3: Composition/Information on ingredients

#### 3.1. Substances

Not applicable

#### 3.2. Mixtures

This mixture does not contain any substances to be mentioned according to the criteria of section 3.2 of HazCom 2012

### SECTION 4: First-aid measures

#### 4.1. Description of first aid measures

- **First-aid measures after inhalation**: Remove person to fresh air and keep comfortable for breathing.  
- **First-aid measures after skin contact**: Wash skin with plenty of water.  
- **First-aid measures after eye contact**: Rinse eyes with water as a precaution.  
- **First-aid measures after ingestion**: Call a poison center/doctor/physician if you feel unwell.

#### 4.2. Most important symptoms and effects (acute and delayed)

No additional information available

#### 4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

### SECTION 5: Fire-fighting measures

#### 5.1. Suitable (and unsuitable) extinguishing media

- **Suitable extinguishing media**: Water spray. Dry powder. Foam. Carbon dioxide.

#### 5.2. Specific hazards arising from the chemical

No additional information available
5.3. Special protective equipment and precautions for fire-fighters

Protection during firefighting: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures: Ventilate spillage area.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Take up liquid spill into absorbent material.

Other information: Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Ensure good ventilation of the work station. Wear personal protective equipment.

Hygiene measures: Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a well-ventilated place. Keep cool.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Optimizer Buffer IV [5X]</th>
</tr>
</thead>
<tbody>
<tr>
<td>No additional information available</td>
</tr>
</tbody>
</table>

8.2. Appropriate engineering controls

Appropriate engineering controls: Ensure good ventilation of the work station.

Environmental exposure controls: Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

**Hand protection:**
Protective gloves

**Eye protection:**
Safety glasses

**Skin and body protection:**
Wear suitable protective clothing

**Respiratory protection:**
In case of insufficient ventilation, wear suitable respiratory equipment

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state: Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color: No data available</td>
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</table>
### Optimizer Buffer IV [5X]

#### Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>No data available</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</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

No additional information available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

#### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

#### 10.5. Incompatible materials

No additional information available

#### 10.6. Hazardous decomposition products

Hazardous decomposition products.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Effect</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (oral)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Acute toxicity (dermal)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Acute toxicity (inhalation)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Not classified</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>Not classified</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Not classified</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Specific target organ toxicity – single exposure</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### Specific target organ toxicity – repeated exposure
- Not classified

### Aspiration hazard
- Not classified

### Viscosity, kinematic
- No data available

### SECTION 12: Ecological information

#### 12.1. Toxicity
- Ecology - general
  - The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

#### 12.2. Persistence and degradability
- No additional information available

#### 12.3. Bioaccumulative potential
- No additional information available

#### 12.4. Mobility in soil
- No additional information available

#### 12.5. Other adverse effects
- No additional information available

### SECTION 13: Disposal considerations

#### 13.1. Disposal methods
- Waste treatment methods
  - Waste treatment methods.

### SECTION 14: Transport information

#### Department of Transportation (DOT)
- In accordance with DOT
  - Not applicable

#### Transportation of Dangerous Goods
- Not applicable

#### Transport by sea
- Not applicable

#### Air transport
- Not applicable

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

- **Optimizer Buffer IV [5X]**
  - Not listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 15.2. International regulations

- CANADA

- EU-Regulations

- National regulations
  - No additional information available
Optizer Buffer IV [5X]

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

15.3. US State regulations

**SECTION 16: Other information**

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 05/11/2017

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.
SECTION 1: Identification

1.1. Identification

Product form: Mixture
Product name: Tube-O-DIALYZER Storage Solution
Product code: Tube-O

1.2. Recommended use and restrictions on use

No additional information available

1.3. Supplier

Geno Technology, Inc./G-Biosciences
9800 Page Avenue
Saint Louis, 63132-1429 - United States
T 800-628-7730 - F 314-991-1504
technical@GBiosciences.com - www.GBiosciences.com

1.4. Emergency telephone number

Emergency number: Chemtrec 1-800-424-9300 (USA/Canada), +1-703-527-3887 (Intl)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification
Flammable liquids Category 4 H227 Combustible liquid
Full text of H statements: see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling
Signal word (GHS US): Warning
Hazard statements (GHS US): H227 - Combustible liquid
Precautionary statements (GHS US): P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P370+P378 - In case of fire: Use media other than water to extinguish.
P403+P235 - Store in a well-ventilated place. Keep cool.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

<table>
<thead>
<tr>
<th>Name</th>
<th>Common Name (Synonyms)</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ethanol</td>
<td>ethanol (ethanol alcohol) / ethanol, anhydrous, undenatured / ethyl alcohol</td>
<td>(CAS-No.) 64-17-5</td>
<td>10 - 50</td>
<td>Flam. Liq. 2, H225</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements: see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact: Wash skin with plenty of water.
First-aid measures after eye contact: Rinse eyes with water as a precaution.
First-aid measures after ingestion: Call a poison center/doctor/physician if you feel unwell.
Section 4: Most important symptoms and effects (acute and delayed)

No additional information available.

Section 4.3: Immediate medical attention and special treatment, if necessary

Treat symptomatically.

Section 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media


5.2. Specific hazards arising from the chemical

Fire hazard: Combustible liquid.

5.3. Special protective equipment and precautions for fire-fighters

Protection during firefighting: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures: Ventilate spillage area. No open flames, no sparks, and no smoking.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: “Exposure controls/personal protection”.

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters.

Other information: Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

Section 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Ensure good ventilation of the work station. Wear personal protective equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Hygiene measures: Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a well-ventilated place. Keep cool.

Section 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube-O-DIALYZER Storage Solution</td>
<td>No additional information available</td>
</tr>
<tr>
<td>ethanol (64-17-5)</td>
<td>USA - ACGIH - Occupational Exposure Limits</td>
</tr>
<tr>
<td>ACGIH STEL (ppm)</td>
<td>1000 ppm</td>
</tr>
</tbody>
</table>

8.2. Appropriate engineering controls

Appropriate engineering controls: Ensure good ventilation of the work station.

Environmental exposure controls: Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment
Hand protection:
Protective gloves

Eye protection:
Safety glasses

Skin and body protection:
Wear suitable protective clothing

Respiratory protection:
In case of insufficient ventilation, wear suitable respiratory equipment

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor</td>
<td>No data available</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</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>65 °C</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
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<td>Viscosity, kinematic</td>
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<tr>
<td>Explosion limits</td>
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<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid
Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

10.5. Incompatible materials
No additional information available
10.6. **Hazardous decomposition products**

Hazardous decomposition products.

**SECTION 11: Toxicological information**

11.1. **Information on toxicological effects**

<table>
<thead>
<tr>
<th>Acute toxicity (oral)</th>
<th>Not classified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (dermal)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Acute toxicity (inhalation)</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

**ethanol (64-17-5)**

| LD50 oral rat | 10740 mg/kg body weight (Rat; OECD 401: Acute Oral Toxicity; Experimental value) |
| LD50 dermal rabbit | > 16000 mg/kg (Rabbit; Literature study) |
| LC50 inhalation rat (mg/l) | > 20 mg/l (4 h, Rat, Inhalation) |

Skin corrosion/irritation : Not classified

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

**IARC group**

1 - Carcinogenic to humans

Reproductive toxicity : Not classified

Specific target organ toxicity – single exposure : Not classified

Specific target organ toxicity – repeated exposure : Not classified

Aspiration hazard : Not classified

Viscosity, kinematic : No data available

**SECTION 12: Ecological information**

12.1. **Toxicity**

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

**ethanol (64-17-5)**

| LC50 fish 1 | 14200 mg/l (US EPA, 96 h, Pimephales promelas, Flow-through system, Fresh water, Experimental value) |
| EC50 Daphnia 1 | 9300 mg/l (48 h, Daphnia magna, Pure substance) |

12.2. **Persistence and degradability**

**ethanol (64-17-5)**

| Persistence and degradability | Readily biodegradable in water. Biodegradable in the soil. No (test)data on mobility of the substance available. |
| Biochemical oxygen demand (BOD) | 0.8 - 0.967 g O₂/g substance |
| Chemical oxygen demand (COD) | 1.7 g O₂/g substance |
| ThOD | 2.1 g O₂/g substance |
| BOD (% of ThOD) | 0.43 |

12.3. **Bioaccumulative potential**

**ethanol (64-17-5)**

| BCF fish 1 | 1 (Other, 72 h, Cyprinus carpio, Static system, Fresh water, Read-across) |
| Log Pow | -0.35 (Experimental value; OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method; 24 °C) |

Bioaccumulative potential : Low potential for bioaccumulation (Log Kow < 4).

12.4. **Mobility in soil**
ethanol (64-17-5)
Surface tension 0.0245 N/m (20 °C)
Ecology - soil Highly mobile in soil.

12.5. Other adverse effects
No additional information available

SECTION 13: Disposal considerations
13.1. Disposal methods

SECTION 14: Transport information
Department of Transportation (DOT)
In accordance with DOT
Not regulated

Transportation of Dangerous Goods
Not applicable

Transport by sea
Not regulated

Air transport
Not regulated

SECTION 15: Regulatory information
15.1. US Federal regulations
ethanol (64-17-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations
CANADA
ethanol (64-17-5)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations
National regulations
ethanol (64-17-5)
Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

SECTION 16: Other information
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
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Full text of H-phrases:

<table>
<thead>
<tr>
<th>H225</th>
<th>Highly flammable liquid and vapour</th>
</tr>
</thead>
<tbody>
<tr>
<td>H227</td>
<td>Combustible liquid</td>
</tr>
</tbody>
</table>

SDS US (GHS HazCom 2012)

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