27 October 2017 **Kit Components**

Product Code	Description
CCFOS059	CopyControl™ HTP Fosmid Library Production Kit

Components
CCFOS059-1

End-It™ Enzyme Mix	E0025-D1
GELase™ Enzyme Preparation	E0032-1D
Fast-Link™ DNA Ligase	E0077-2D1
dNTP Mix, 2.5 mM each	SS000055-D1
GELase™ 50X Buffer	SS000087-D1
Fast-Link™ 10X Ligation Buffer	SS000272-D2
End-It™ 10X Buffer	SS000272-D1
ATP	SS000391-D1
MaxPlax DNA Packaging Extract	SS000437-D
Fosmid Control DNA	SS000485-D
Ligated Lambda Control DNA	SS000602-D
pCC2FOS™ Fosmid Vector	SS000700-D
CopyControl™ Fosmid Autoinduction Solution	SS000728-D2
LE392MP Control Plating Strain Glycerol Stock	SS001000-D
Phage T1 Resistant EPI300 T1R Glycerol Stock	SS001002-D

Components
MP5110

MaxPlax DNA Packaging Extract	SS000437-D
Ligated Lambda Control DNA	SS000602-D
LE392MP Control Plating Strain Glycerol Stock	SS001000-D

End-IT™ Enzyme Mix.

Safety Data Sheet

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

Revision date: 07/09/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : End-IT™ Enzyme Mix

Product form : Mixture

Product code : E0025-D1, E0025-D2

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified.

2.2. Label elements

GHS-US labelling

No labelling applicable.

2.3. Other hazards

Irritant to eyes and skin. Target organs are kidneys.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.2. Mixture

Name	Product identifier	%
Glycerol, CAS # 56-85-1 EC# 200-289-5 Chemical Formula: $C_3H_8O_3$ Molecular Weight: 92.09 g/mol Synonyms: Glycerin, 1,2,3-Propanetril	Ingredient in product.	50%

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions.

Explosion hazard : Emits toxic fumes under fire conditions.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -20°C in a freezer without a defrost cycle.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Glycerol	56-81-5	TWA	10 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	10 mg/3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation		
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.

Eye protection : Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid, viscous and colorless

Color : Colorless

Odor : No data available

Odor Threshold : No data available

pH : No data available

Melting point : No data available

Freezing point (50% aquesous solution) : No data available

Boiling point : No data available

Flash point : No data available

Relative evaporation rate : No data available

Flammability (solid, gas) : No data available

Vapour pressure : No data available

Relative vapour density at 20°C : No data available

Relative density : No data available

Solubility in Water : No data available

Log Pow : No data available

Log Kow : No data available

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity, kinematic : No data available

Viscosity, dynamic : No data available

Explosive properties : No data available

Oxidising properties : No data available

Explosive limits : No data available

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous polymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents, strong bases.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: MA8050000. Prolonged exposure may cause nausea, vomitting, and headache. Kidneys may be affected.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

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. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

DOT

Not hazardous for transport

IMDG

No additional information available

IATA

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Chronic Health Hazard

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This materials does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

European Union Directive 67/548/EEC: Irritant R36/38, irritant to eyes and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36, wear appropriate personal protective equipment.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components
Glycercol, CAS 56-81-5

New Jersey Right to Know Hazardous Substance List
Glycerol, CAS 56-81-5

Pennsylvania Right to Know List
Glycercol, CAS 56-81-5

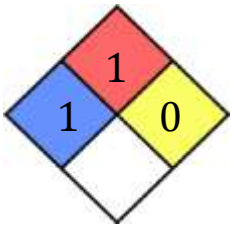
SECTION 16: Other information

Indication of changes : Revision A: Updated format.

Revision date : 07/09/2017

Other information : Author: Lucigen Corporation

NFPA health hazard	:	1 – Exposure will cause irriation.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	1
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

GELase™ Enzyme Preparation.

Safety Data Sheet

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

Revision date: 10/23/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : GELase™ Enzyme Preparation

Product form : Mixture

Product code : E0032-1D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Used to recover nucleic acids from agarose gels, laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2. Label elements

Not a hazardous substance or mixture.

2.3. Other hazards

No data available.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Glycerol CAS# 56-81-5 EC# 200-289-5 Chemical Formula $C_3H_8O_3$ Molecular Weight 92.09 g/mol Synonyms: Glycerin, 1,2,3-Propanetriol	Ingredient in product.	50

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : Can cause upper respiratory irratation.

Symptoms/injuries after skin contact : Can cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes most likely will irritating.

Symptoms/injuries after ingestion : Can cause gastrointestinal irritation and inflammatory reactions in the gastrointestinal tract.

4.3. Indication of any immediate medical attention and special treatment needed

In the event of an exposure, this product may cause nausea, headache, vomiting, central nervous system depression, diarrhea, dehydration, kidney irregularities, and liver irregularities. Consult a physician right away in the event of an exposure.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, alcohol-resistant foam, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions (carbon monoxide and carbon dioxide).

Explosion hazard : Emits toxic fumes under fire conditions (carbon monoxide and carbon dioxide).

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8). Avoid breathing in dust, vapour, or mist.

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters drains, sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into drains, sewers, or streams. Avoid creating and breathing in dust.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -20°C freezer without a defrost cycle. Keep container tightly closed and isolated.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Glycerol	56-81-5	TWA	10 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	10 mg/3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation		
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
Polyethylene glycol, avg MW 8,000	25322-68-3	TWA	10.000000 mg/m3	USA. Workplace Environmental Exposure Levels (WEEL)

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are Nitrile.

Eye protection : Tight fitting safety goggles and or a faceshield (8-inch minimum) should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid, viscous

Color : Colorless

Odor : No data available

Odor Threshold : No data available

pH : No data available

Melting point : No data available

Freezing point : No data available

Boiling point : No data available

Flash point : No data available

Relative evaporation rate : No data available

Flammability (solid, gas) : No data available

Vapour pressure : No data available

Relative vapour density at 20 °C : No data available

Relative density : No data available

Solubility in Water : No data available

Log Pow : No data available

Log Kow : No data available

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity, kinematic : No data available

Viscosity, dynamic : No data available

Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No other information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents, strong bases, reducing agents, and alkali metals.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide, hydrogen chloride gas, nitrogen oxides, and sulphur oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: No data available
Skin corrosion/irritation	: No data available
Serious eye damage/irritation	: No data available
Respiratory or skin sensitisation	: No data available
Germ cell mutagenicity	: No data available
Carcinogenicity	: IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	: No data available
Specific target organ toxicity (single exposure)	: No data available
Specific target organ toxicity (repeated exposure)	: No data available
Aspiration hazard	: No data available
Symptoms/injuries after inhalation	: May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	: May cause skin irritation.
Symptoms/injuries after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	: May cause gastrointestinal irritation.
Additional Information	: RTECS: MA8050000. Prolonged exposure may cause nausea, vomitting, and headache. Kidneys may be affected.

SECTION 12: Ecological information

12.1. Toxicity

No data available.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

No data available.

12.4. Mobility in soil

No data available.

12.5. Other adverse effects

No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit. Contact a licensed professional waste disposal service to dispose of this mixture.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid releasing to the environment.

SECTION 14: Transport information

In accordance with DOT

Not a dangerous good.

For IMGD

Not a dangerous good.

For IATA

Not a dangerous good.

SECTION 15: Regulatory information

Glycerol

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Chronic Health Hazard (Glycerol)

SARA 313

This materials does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

Glycerol: European Union Directive 67/548/EEC: Irritant R36/38, irritant to eyes and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36, wear appropriate personal protective equipment.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components
Glycercol, CAS 56-81-5

New Jersey Right to Know Hazardous Substance List
Glycerol, CAS 56-81-5

Pennsylvania Right to Know List
Glycercol, CAS 56-81-5

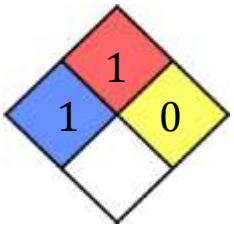
SECTION 16: Other information

Indication of changes : Revision A: New SDS Created.

Revision date : 10/23/2017

Other information : Author: Lucigen Corporation

NFPA health hazard	:	1 – Exposure would cause irritation with only minor residual injury.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposures conditions, and is not reactive with water.



HMIS III Rating

Health	:	1
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Fast-Link™ DNA Ligase

Safety Data Sheet

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

Revision date: 10/23/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Fast-Link™ DNA Ligase

Product form : Mixture

Product code : E0077-2D1, E0077-2D2

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2. Label elements

Not a hazardous substance or mixture.

2.3. Other hazards

None.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.2. Mixture

Name	Product identifier	%
Glycerol, CAS # 56-85-1 EC# 200-289-5 Chemical Formula: $C_3H_8O_3$ Molecular Weight: 92.09 g/mol Synonyms: Glycerin, 1,2,3-Propanetril	Ingredient in product.	50%

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions.

Explosion hazard : Emits toxic fumes under fire conditions.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection". Avoid contact with skin and eyes.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Avoid breathing dust, vapour, mist, or gas. Avoid contact with eyes, skin, and clothing. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a -20°C freezer without a defrost cycle.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Glycerol	56-81-5	TWA	10 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	10 mg/3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation		
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.

Eye protection : Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure as necessary.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator if exposure symptoms develop. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid, viscous and colorless

Color : Colorless

Odor : No data available

Odor Threshold : No data available

pH : No data available

Melting point : No data available

Freezing point : No data available

Boiling point : No data available

Flash point : No data available

Relative evaporation rate : No data available

Flammability (solid, gas) : No data available

Vapour pressure : No data available

Relative vapour density at 20°C : No data available

Relative density : No data available

Solubility in Water : No data available

Log Pow : No data available

Log Kow : No data available

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity, kinematic : No data available

Viscosity, dynamic : No data available

Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous polymerization does not occur.

10.4. Conditions to avoid

No additional information available

10.5. Incompatible materials

Strong oxidizing agents, strong bases.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: No data available
Skin corrosion/irritation	: No data available
Serious eye damage/irritation	: No data available
Respiratory or skin sensitisation	: No data available
Germ cell mutagenicity	: No data available
Carcinogenicity	: IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	: No data available
Specific target organ toxicity (single exposure)	: No data available
Specific target organ toxicity (repeated exposure)	: No data available
Aspiration hazard	: No data available
Symptoms/injuries after inhalation	: May cause respiratory irratation.
Symptoms/injuries after skin contact	: May cause skin irritation.
Symptoms/injuries after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	: May cause gastrointestinal irritation.
Additional Information	: RTECS: MA8050000. Prolonged exposure may cause nausea, vomitting, and headache. Kidneys may be affected.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

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. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

DOT

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Chronic Health Hazard

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations.

European Union Directive 67/548/EEC: Irritant R36/38, irritant to eyes and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36, wear appropriate personal protective equipment.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

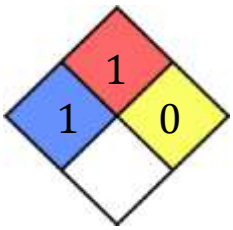
Massachusetts Right To Know Components
Glycercol, CAS 56-81-5

New Jersey Right to Know Hazardous Substance List
Glycercol, CAS 56-81-5

Pennsylvania Right to Know List
Glycercol, CAS 56-81-5

SECTION 16: Other information

Indication of changes	:	Revision A: Updated format.
Revision date	:	10/23/2017
Other information	:	Author: Lucigen Corporation
NFPA health hazard	:	1 – Poses no health hazard, no precautions necessary, and would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and is not reactive with water.



HMIS III Rating

Health	:	1
Flammability	:	0
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

dNTP Mix, 2.5 mM each.

Safety Data Sheet

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

Revision date: 10/23/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : dNTP Mix, 2.5 mM erach

Product form : Mixture

Product code : SS000055-D1, SS000055-D2

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory Chemicals.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

No additional information available.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Mixture may contain one or more of the following substances:

Name	Product identifier	%
dATP, CAS# N/A	Ingredient in product.	4.6-5.1
dCTP, CAS# N/A	Ingredient in product.	4.6-5.1
dGTP, CAS# N/A	Ingredient in product.	4.6-5.1
dTTP, CAS# N/A	Ingredient in product.	4.6-5.1

Mixture contains no other hazardous ingredients at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with tepid water for at least 15 minutes. If symptoms continue, consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with tepid water for at least 15 minutes. Remove contact lenses if present and can easy to do so. Continue rinsing. If symptoms continue, consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly. Do not induce vomiting. Consult a physician if symptoms persist. Do not give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use water, dry chemical, chemical foam, or alcohol-resistance foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Product is not flammable.

Explosion hazard : Product is not explosive.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. In the event of fire and/or explosion, do not breathe fumes. Do not dispose of fire-fighting water in the environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8). If liquid evaporates, avoid dusty conditions. Avoid direct contact with skin or eyes.

6.1.1. For non-emergency personnel

Protective equipment : Wear Protective equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as vermiculite and sand. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after working with mixture, before leaving the laboratory, before eating, drinking or smoking and when leaving work. Avoid ingestion and inhalation. Keep container tightly closed.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a -20°C freezer without a defrost cycle.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Contains no substances with occupational expsoure limits.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash should be available.

Personal protective equipment : Gloves. Protective goggles.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier.

Eye protection : Use eye protection suitable to the environment. Avoid direct contact with eyes.

Skin and body protection : Wear long sleeves, and chemically impervious PPE to minimize bodily exposure as needed.

Respiratory protection : Use NIOSH-approved dust/particulate respirator as needed. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid containing dissolved material
Color	: Colorless
Odor	: No data available
Odor Threshold	: No data available
pH	: 7.0
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: Not available
Skin corrosion/irritation	: Not available
Serious eye damage/irritation	: Not available
Respiratory or skin sensitisation	: Not available
Germ cell mutagenicity	: Not available
Carcinogenicity	: Not available
Reproductive toxicity	: Not available
Specific target organ toxicity (single exposure)	: Not available
Specific target organ toxicity (repeated exposure)	: Not available
Aspiration hazard	: Not classified
Symptoms/injuries after inhalation	: May cause upper respiratory irratation.
Symptoms/injuries after skin contact	: May cause skin irritation.
Symptoms/injuries after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	: May cause gastrointestinal irritation.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods	: Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.
Waste disposal recommendations	: Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

DOT

Not hazardous for transport

IMDG

No additional information available

IATA

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

OSHA Hazards

No OSHA Hazards

CERCLA Reportable Quantity

This product does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

No SARA Hazards

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

No additional information available.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

Massachusetts Right to Know Components

No components are subject to the Massachusetts Right to Know Act.

New Jersey Right to Know Components

Adenosine 5'-(tetrahydrogen triphosphate), disodium salt, trihydrate CAS 51963-61-2

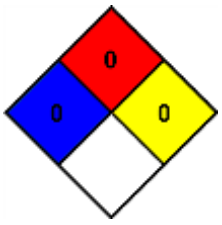
Pennsylvania Right to Know Components

Adenosine 5'-(tetrahydrogen triphosphate), disodium salt, trihydrate CAS 51963-61-2

SECTION 16: Other information

Indication of changes	:	Revision A: SDS updated.
Revision date	:	10/23/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	:	0 - Materials that will not burn.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	0
Flammability	:	0
Physical	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

50X GELase™ Buffer.

Safety Data Sheet

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

Revision date: 05/25/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : 50X GELase™ Buffer

Product form : Mixture

Product code : SS000087-D1

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Reducing agent used in molecular biology reactions, laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazadous substance or mixture.

2.2. Label elements

GHS-US labelling elements, including precautionary statements

Not a hazardous substance or mixture.

2.3. Other hazards not otherwise classeified or not covered by GHS

None.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Bis-Tris, CAS # 6976-37-0 EC # 230-237-4 Chemical Formula: $C_8H_{19}NO_5$ Molecular Weight: 209.24 g/mol Synonyms: 2,2-Bis(Hydroxymethyl)-2,2',2"-Nitrilotriethanol, 2-Bis(2-hydroxyethyl)amino-2-(hydroxymethyl)-1,3-propanediol, Bis(2-hydroxyethyl)amino-tris(hydroxymethyl)methane, 2-[Bis(2-hydroxyethyl)amino]-2-(hydroxymethyl)propane-1,3-diol	Ingredient in product.	41.9
Sodium Chloride, CAS 7647-14-5 EC# 231-598-3 Chemical Formula: NaCl Molecular Weight: 58.44	Ingredient in product.	11.7

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Discard contaminated clothing. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use carbon dioxide, dry chemical, alcohol-resistant foam, or other appropriate foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Produt is not flammable, however, irritating and toxic fumes may form under fire conditions.

Explosion hazard : Product is not explosive.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, rubber gloves, rubber boots, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to drains, sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams. Do not allow product to enter drains.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment and ensure working in an area with good ventilation. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work. Do not breathe in vapour, mist, or dust. Avoid creating dust or aerosols. Avoid prolonged or repeated exposure.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -20°C in a freezer without a defrost cycle. Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limits.

8.2. Exposure controls

Appropriate engineering controls : Exercise caution when handling. Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Gloves should compatible with solvent if dissolved.

Eye protection : Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : As needed, wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state	: Liquid, contains dissolved powder
Color	: Clear solution at room temperature
Odor	: No data available
Odor Threshold	: No data available
pH	: 6.2
Melting point	: 103-104°C (un-dissolved solid)
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility in Water	: No data available
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous plymerization does not occur.

10.4. Conditions to avoid

Excess heat.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide, nitrogen oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	
IARC	:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP	:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
OSHA	:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS# VZ4725000. Vomiting, dehydration, diarrhea, and congestion of the internal organs may occur if Sodium Chloride is ingested.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312

No SARA Hazards

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

Not a hazard.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

New Jersey Right to Know Hazardous Substance List

2-[Bis(2-hydroxyethyl)amino]-2-(hydroxymethyl)propane-1,3-diol, CAS 6976-37-0
Sodium Chloride, CAS 7647-14-5

Pennsylvania Right to Know List

2-[Bis(2-hydroxyethyl)amino]-2-(hydroxymethyl)propane-1,3-diol, CAS 6976-37-0
Sodium Chloride, CAS 7647-14-5

SECTION 16: Other information

Indication of changes : Revision A: New SDS Created.

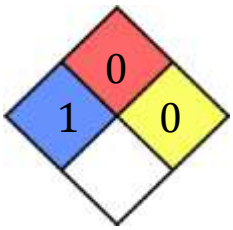
Revision date : 05/22/2017

Other information : Author: Lucigen Corporation

NFPA health hazard : 1 – Exposure would cause irritation with only minor residual injuy.

NFPA fire hazard : 0 – Material that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 0 – Normally stable, even under fire exposure conditions, and is not reactive with water.



HMIS III Rating

Health : 1

Flammability : 0

Physical Hazard : 0

Personal Protection :

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Fast-Link™ 10X Ligation Buffer.

Safety Data Sheet

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

Revision date: 10/24/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Fast-Link™ 10X Ligation Buffer

Product form : Mixture

Product code : SS000272-D2, SS000272-D5, SS000272-D6

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory chemical, used in molecular biology experiments.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Acute toxicity, Oral (Category 4), H302

Skin irritation (Category 2), H315

Eye irritation (Category 2A), H319

2.2. Label elements

GHS-US labelling elements, including precautionary statements

Pictogram :

Signal Word(s) : Warning

Hazard statement(s)

H302 : Harmful if swallowed.

H315 : Causes skin irritation.

H319 : Causes serious eye irritation.

Precautionary statement(s)

P264 : Wash skin thoroughy after handling.

P270 : Do not eat, drink, or smoke when using this product.

P280 : Wear protective gloves/eye protection/face protection.

P301+P312+P330 : IF SWALLOWED: Call a POISION CONTROL CENTER or physician. Rinse mouth.

P302+P352 : IF ON SKIN: Wash with soap and tepid water.

P305+P351+P338+P310 : IF IN EYES: Rinse with tepid water for 15 minutes. Remove contacts if present and it is easy to do so. Continue rinsing. Immediately call a POISION CONTROL CENTER or physician

P332+P313 : If skin irritation occurs: Wash with soap and tepid water. Contact a physician if irriation occurs.

P337+P313 : If eye irritation occurs: Rinse with tepid water for 15 minutes. Contact a physician if irriation occurs.

P362 : Remove contaminated clothing and wash before reusing.

P501 : Dispose of contents/container to an approved/licensed waste disposal plant/facility.

2.3. Other hazards

Irritant to eyes and skin. May cause stomach irregularities. May effect liver.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Tris Acetate, CAS # 6850-28-8 EC# 229-939-6 Chemical Formula: $C_6H_{15}NO_5$ Molecular Weight: 181.19 g/mol Synonyms: [2-Hydroy-1,1-bis(hydroxymethyl)ethyl]ammonium acetate, Tris(hydroxylmethyl)aminomethaneacetate salt	Ingredient in product.	5.9
Potassium Acetate CAS# 127-08-2 EC# 204-822-2 Chemical Formula $C_2H_3O_2K$ Molecular Weight 98.14 g/mol Synonyms: Potassium Salt, Diuretic Salt,	Ingredient in product.	6.5
Magnesium acetate, CAS# 142-72-3 EC# 205-554-9 Chemical Formula C4H6MgO4 Molecular Weight 142.39 g/mol	Ingredient in product.	1.4
DTT, CAS # 3483-12-3 EC # 222-468-7 Chemical Formula: $C_4H_{10}O_2S_2$ Molecular Weight: 154.25 g/mol Synonyms: DL-Dithiothreitol, *threo*-1,4-Dimercapto-2,3-butanediol, Cleland's reagent, (R*,R*)-1,4-Dimercaptobutane-2,3-diol Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A,; H302, H315, H319	Ingredient in product	0.08

No ingredients are hazardous according to OSHA criteria.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : Can cause upper respiratory irratation.

Symptoms/injuries after skin contact : Can cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes most likely will be irritating.

Symptoms/injuries after ingestion : Can cause gastrointestinal irritation and inflammatory reactions in the gastrointestinal tract.

4.3. Indication of any immediate medical attention and special treatment needed

.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, alcohol-resistant foam, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions (carbon oxides, magensium oxide, nitrogen oxides, potassium oxides).

Explosion hazard : Emits toxic fumes under fire conditions (carbon oxides, magensium oxide, nitrogen oxides, potassium oxides).

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8). Avoid breathing in dust, vapour, or mist.

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters drains, sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into drains, sewers, or streams. Avoid creating and breathing in dust.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -20°C freezer without a defrost cycle. Keep container tightly closed and isolated.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat as needed.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are Nitrile.

Eye protection : Tight fitting safety goggles and or a faceshield (8-inch minimum) should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Chemically impervious PPE/coveralls to minimize bodily exposure as needed.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state : Liquid

Color	:	Colorless to cloudy white
Odor	:	Some odor
Odor Threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No other information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

Exposure to moisture and heat.

10.5. Incompatible materials

Oxidizing agents, acids, strong bases, reducing agents, and alkali metals.

10.6. Hazardous decomposition products

Carbon oxides, magnesium oxide, nitrogen oxides, and potassium oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	LD50 Oral – Rat – 400 mg/kg (DTT)
	:	LD50 Oral – Rat – 3,250 mg/kg (Potassium Acetate)
Skin corrosion/irritation	:	Rat – No irritation (Potassium Acetate), OECD Test Guideline 404
Serious eye damage/irritation	:	Rabbit – No irritation (Potassium Acetate), OECD Test Guideline 405
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available

Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: EK1610000. Exposure may cause nausea, headache, vomiting, and central nervous system depression. Liver may be affected. (DTT)
	:	Magnesium Acetate may cause stomach irrgularities.

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish	:	LC50 – *Danio rerio* (zebra fisher) – 992 mg/L, 96 hours (Potassium Acetate)
Toxicity to daphnia and other aquatic invertebrates	:	EC50 – *Daphnia* (water flea) - > 919 mg/L, 48 hours (Potassium Acetate)
	:	LC50 – *Daphnia magna*(water flea) – 27 mg/L, 48 hours (DTT)
Toxicity to algae	:	EC50 – *Skeletonema costatum* - > 1,000 mg/L, 72 hours (Potassium Acetate)

12.2. Persistence and degradability

Potassium Acetete is readily biodegradable.

12.3. Bioaccumulative potential

Potassium Acetate does not accumulate in organisms.

12.4. Mobility in soil

No additional information available.

12.5. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	:	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit. Contact a licensed professional waste disposal service to dispose of this mixture.
Waste disposal recommendations	:	Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid releasing to the environment.

SECTION 14: Transport information

In accordance with DOT

For DTT: UN number 3335. Class 9. Proper shipping name: A Aviation regulated solid, n.o.s. ((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol)
Posion Inhalation Hazard: No

For IMGD

Not dangerous good

For IATA

For DTT: UN number 3335. Class 9. Packing group: III. Proper shipping name: A Aviation regulated solid, n.o.s. ((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol)

Additional information

Other information : No supplementary information available.

SECTION 15: Regulatory information

Glycerol

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Acute Health Hazard (DTT)

Chronic Health Hazard (DTT)

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

DTT: European Union Directive 67/548/EEC: Toxic R23/24/25. Toxic by inhalation, in contact with skin, and if swallowed. Irritant R36/37/38, irritant to eyes, respiratory system and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36/37/38, wear appropriate protective clothing, gloves, and face protection.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

No components are subjext to the Massachusetts Right to Know Act

New Jersey Right to Know Hazardous Substance List

Water, CAS 7732-18-5

((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol), (DTT), CAS 3488-12-3

Magnesium Acetate, CAS 142-72-3

Potassium acetate, CAS 127-08-2

[2-Hydroy-1,1-bis(hydroxymethyl)ethyl]ammonium acetate (Tris Acetate), CAS 6850-28-8

Pennsylvania Right to Know List

Water, 7732-18-5

((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol), (DTT), CAS 3488-12-3

Magnesium Acetate, CAS 142-72-3

Potassium acetate, CAS 127-08-2

2-Hydroy-1,1-bis(hydroxymethyl)ethyl]ammonium acetate (Tris Acetate), CAS 6850-28-8

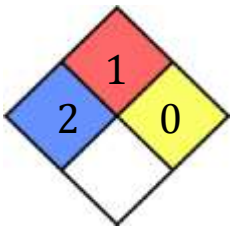
SECTION 16: Other information

Indication of changes	: Revision A: New SDS Created.
Revision date	: 10/24/2017
Other information	: Author: Lucigen Corporation

H-Statements in section 2.

Acute Tox.	: Acute toxicity.
Eye Irri.	: Eye irritation.
H302	: Harmful if swallowed.
H315	: Causes skin irritation.
H319	: Causes serious eye irritation.
Skin Irrit.	: Skin Irritation.

NFPA health hazard	:	2 – Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0- Normally stable, even under fire exposure conditions, and is not reactive with water.



HMIS III Rating

Health	:	2
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

End-It™ 10X Buffer.

Safety Data Sheet

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

Revision date: 10/24/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : End-It™ 10X Buffer

Product form : Mixture

Product code : SS000272-D1, SS000272-D4

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory chemical, used in molecular biology experiments.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Acute toxicity, Oral (Category 4), H302

Skin irritation (Category 2), H315

Eye irritation (Category 2A), H319

2.2. Label elements

GHS-US labelling elements, including precautionary statements

Pictogram :

Signal Word(s) : Warning

Hazard statement(s)

H302 : Harmful if swallowed.

H315 : Causes skin irritation.

H319 : Causes serious eye irritation.

Precautionary statement(s)

P264 : Wash skin thoroughy after handling.

P270 : Do not eat, drink, or smoke when using this product.

P280 : Wear protective gloves/eye protection/face protection.

P301+P312+P330 : IF SWALLOWED: Call a POISION CONTROL CENTER or physician. Rinse mouth.

P302+P352 : IF ON SKIN: Wash with soap and tepid water.

P305+P351+P338+P310 : IF IN EYES: Rinse with tepid water for 15 minutes. Remove contacts if present and it is easy to do so. Continue rinsing. Immediately call a POISION CONTROL CENTER or physician

P332+P313 : If skin irritation occurs: Wash with soap and tepid water. Contact a physician if irriation occurs.

P337+P313 : If eye irritation occurs: Rinse with tepid water for 15 minutes. Contact a physician if irriation occurs.

P362 : Remove contaminated clothing and wash before reusing.

P501 : Dispose of contents/container to an approved/licensed waste disposal plant/facility.

2.3. Other hazards

Irritant to eyes and skin. May cause stomach irregularities. May effect liver.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Tris Acetate, CAS # 6850-28-8 EC# 229-939-6 Chemical Formula: $C_6H_{15}NO_5$ Molecular Weight: 181.19 g/mol Synonyms: [2-Hydroy-1,1-bis(hydroxymethyl)ethyl]ammonium acetate, Tris(hydroxylmethyl)aminomethaneacetate salt	Ingredient in product.	5.9
Potassium Acetate CAS# 127-08-2 EC# 204-822-2 Chemical Formula $C_2H_3O_2K$ Molecular Weight 98.14 g/mol Synonyms: Potassium Salt, Diuretic Salt,	Ingredient in product.	6.5
Magnesium acetate, CAS# 142-72-3 EC# 205-554-9 Chemical Formula C4H6MgO4 Molecular Weight 142.39 g/mol	Ingredient in product.	1.4
DTT, CAS # 3483-12-3 EC # 222-468-7 Chemical Formula: $C_4H_{10}O_2S_2$ Molecular Weight: 154.25 g/mol Synonyms: DL-Dithiothreitol, *threo*-1,4-Dimercapto-2,3-butanediol, Cleland's reagent, (R*,R*)-1,4-Dimercaptobutane-2,3-diol Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A,; H302, H315, H319	Ingredient in product	0.08

No ingredients are hazardous according to OSHA criteria.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : Can cause upper respiratory irratation.

Symptoms/injuries after skin contact : Can cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes most likely will be irritating.

Symptoms/injuries after ingestion : Can cause gastrointestinal irritation and inflammatory reactions in the gastrointestinal tract.

4.3. Indication of any immediate medical attention and special treatment needed

.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, alcohol-resistant foam, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions (carbon oxides, magensium oxide, nitrogen oxides, potassium oxides).

Explosion hazard : Emits toxic fumes under fire conditions (carbon oxides, magensium oxide, nitrogen oxides, potassium oxides).

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8). Avoid breathing in dust, vapour, or mist.

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters drains, sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into drains, sewers, or streams. Avoid creating and breathing in dust.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -20°C freezer without a defrost cycle. Keep container tightly closed and isolated.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat as needed.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are Nitrile.

Eye protection : Tight fitting safety goggles and or a faceshield (8-inch minimum) should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Chemically impervious PPE/coveralls to minimize bodily exposure as needed.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state : Liquid

Color	:	Colorless to cloudy white
Odor	:	Some odor
Odor Threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No other information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

Exposure to moisture and heat.

10.5. Incompatible materials

Oxidizing agents, acids, strong bases, reducing agents, and alkali metals.

10.6. Hazardous decomposition products

Carbon oxides, magnesium oxide, nitrogen oxides, and potassium oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	LD50 Oral – Rat – 400 mg/kg (DTT)
	:	LD50 Oral – Rat – 3,250 mg/kg (Potassium Acetate)
Skin corrosion/irritation	:	Rat – No irritation (Potassium Acetate), OECD Test Guideline 404
Serious eye damage/irritation	:	Rabbit – No irritation (Potassium Acetate), OECD Test Guideline 405
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available

Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: EK1610000. Exposure may cause nausea, headache, vomiting, and central nervous system depression. Liver may be affected. (DTT)
	:	Magnesium Acetate may cause stomach irrgularities.

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish	:	LC50 – *Danio rerio* (zebra fisher) – 992 mg/L, 96 hours (Potassium Acetate)
Toxicity to daphnia and other aquatic invertebrates	:	EC50 – *Daphnia* (water flea) - > 919 mg/L, 48 hours (Potassium Acetate)
	:	LC50 – *Daphnia magna*(water flea) – 27 mg/L, 48 hours (DTT)
Toxicity to algae	:	EC50 – *Skeletonema costatum* - > 1,000 mg/L, 72 hours (Potassium Acetate)

12.2. Persistence and degradability

Potassium Acetete is readily biodegradable.

12.3. Bioaccumulative potential

Potassium Acetate does not accumulate in organisms.

12.4. Mobility in soil

No additional information available.

12.5. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	:	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit. Contact a licensed professional waste disposal service to dispose of this mixture.
Waste disposal recommendations	:	Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid releasing to the environment.

SECTION 14: Transport information

In accordance with DOT

For DTT: UN number 3335. Class 9. Proper shipping name: A Aviation regulated solid, n.o.s. ((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol)
Posion Inhalation Hazard: No

For IMGD

Not dangerous good

For IATA

For DTT: UN number 3335. Class 9. Packing group: III. Proper shipping name: A Aviation regulated solid, n.o.s. ((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol)

Additional information

Other information : No supplementary information available.

SECTION 15: Regulatory information

Glycerol

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Acute Health Hazard (DTT)

Chronic Health Hazard (DTT)

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

DTT: European Union Directive 67/548/EEC: Toxic R23/24/25. Toxic by inhalation, in contact with skin, and if swallowed. Irritant R36/37/38, irritant to eyes, respiratory system and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36/37/38, wear appropriate protective clothing, gloves, and face protection.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

No components are subjext to the Massachusetts Right to Know Act

New Jersey Right to Know Hazardous Substance List

Water, CAS 7732-18-5

((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol), (DTT), CAS 3488-12-3

Magnesium Acetate, CAS 142-72-3

Potassium acetate, CAS 127-08-2

[2-Hydroy-1,1-bis(hydroxymethyl)ethyl]ammonium acetate (Tris Acetate), CAS 6850-28-8

Pennsylvania Right to Know List

Water, 7732-18-5

((R*, R*)- 1,4- Dimercaptobutane – 2, 3 – diol), (DTT), CAS 3488-12-3

Magnesium Acetate, CAS 142-72-3

Potassium acetate, CAS 127-08-2

2-Hydroy-1,1-bis(hydroxymethyl)ethyl]ammonium acetate (Tris Acetate), CAS 6850-28-8

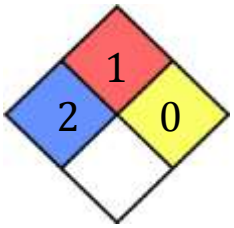
SECTION 16: Other information

Indication of changes	: Revision A: New SDS Created.
Revision date	: 10/24/2017
Other information	: Author: Lucigen Corporation

H-Statements in section 2.

Acute Tox.	: Acute toxicity.
Eye Irri.	: Eye irritation.
H302	: Harmful if swallowed.
H315	: Causes skin irritation.
H319	: Causes serious eye irritation.
Skin Irrit.	: Skin Irritation.

NFPA health hazard	:	2 – Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0- Normally stable, even under fire exposure conditions, and is not reactive with water.



HMIS III Rating

Health	:	2
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

ATP, 10 mM.

Safety Data Sheet

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

Revision date: 11/02/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : ATP, 10 mM

Product form : Mixture

Product code : SS000391-D1. SS000391-D2, SS000391-D3

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory Chemicals.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

No additional information available.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Mixture contains the following substance:

Name	Product identifier	%
ATP, CAS # 51963-61-2 Chemical formula: $C_{10}H_{20}N_5Na_2O_{16}P_3$ Molecular weight: 605.19 g/mol Synonyms: Adenosine 5'-(tetrahydrogen triphosphate), disodium salt, trihydrate	Ingredient in product.	0.01

Mixture contains no other hazardous ingredients at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with tepid water for at least 15 minutes. If symptoms continue, consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with tepid water for at least 15 minutes. Remove contact lenses if present and can easy to do so. Continue rinsing. If symptoms continue, consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly. Do not induce vomiting. Consult a physician if symptoms persist. Do not give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use water, dry chemical, chemical foam, or alcohol-resistance foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Product is not flammable.

Explosion hazard : Product is not explosive.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. In the event of fire and/or explosion, do not breathe fumes. Do not dispose of fire-fighting water in the environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8). If liquid evaporates, avoid dusty conditions. Avoid direct contact with skin or eyes.

6.1.1. For non-emergency personnel

Protective equipment : Wear Protective equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as vermiculite and sand. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after working with mixture, before leaving the laboratory, before eating, drinking or smoking and when leaving work. Avoid ingestion and inhalation. Keep container tightly closed.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a -20°C freezer without a defrost cycle.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Contains no substances with occupational expsoure limits.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash should be available.

Personal protective equipment : Gloves. Protective goggles.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier.

Eye protection : Use eye protection suitable to the environment. Avoid direct contact with eyes.

Skin and body protection : Wear long sleeves, and chemically impervious PPE to minimize bodily exposure as needed.

Respiratory protection : Use NIOSH-approved dust/particulate respirator as needed. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid containing dissolved material
Color	: Colorless
Odor	: No data available
Odor Threshold	: No data available
pH	: 7.0
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: Not available
Skin corrosion/irritation	: Not available
Serious eye damage/irritation	: Not available
Respiratory or skin sensitisation	: Not available
Germ cell mutagenicity	: Not available
Carcinogenicity	: Not available
Reproductive toxicity	: Not available
Specific target organ toxicity (single exposure)	: Not available
Specific target organ toxicity (repeated exposure)	: Not available
Aspiration hazard	: Not classified
Symptoms/injuries after inhalation	: May cause upper respiratory irratation.
Symptoms/injuries after skin contact	: May cause skin irritation.
Symptoms/injuries after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	: May cause gastrointestinal irritation.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods	: Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.
Waste disposal recommendations	: Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

DOT

Not hazardous for transport

IMDG

No additional information available

IATA

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

OSHA Hazards

No OSHA Hazards

CERCLA Reportable Quantity

This product does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

No SARA Hazards

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

No additional information available.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

Massachusetts Right to Know Components

No components are subject to the Massachusetts Right to Know Act.

New Jersey Right to Know Components

Adenosine 5'-(tetrahydrogen triphosphate), disodium salt, trihydrate CAS 51963-61-2

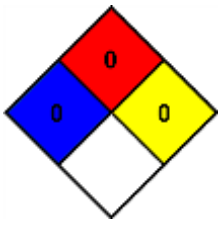
Pennsylvania Right to Know Components

Adenosine 5'-(tetrahydrogen triphosphate), disodium salt, trihydrate CAS 51963-61-2

SECTION 16: Other information

Indication of changes	:	Revision A: SDS updated.
Revision date	:	11/02/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	:	0 - Materials that will not burn.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	0
Flammability	:	0
Physical	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

MaxPlax™ DNA Packing Extracts.

Safety Data Sheet

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

Revision date: 11/03/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : MaxPlax™ DNA Packing Extracts

Product form : Mixture

Product code : SS000437-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Extract from bacteria, laboratory buffer.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture (on concentrated 2-mercaptoethanol).

GHS-US classification

Flammable liquids, (Category 4), H227

Acute toxicity, Oral (Category 3), H301

Acute toxicity, Inhalation (Category 3), H331

Acute toxicity, Dermal (Category 2), H310

Skin irritation (Category 2), H315

Serious Eye Damage (Category 1), H318

Skin sensitisation (Category 1), H317

Specific target organ toxicity – repreated exposure, Oral (Category 2), Liver, Heart, H373

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

2.2. Label elements

GHS-US labelling

Pictogram :

Signal Word : Danger

Hazard statement(s)

H227 : Combustible liquid.

H301+H331 : Toxic if swallowed or if inhaled.

H310 : Fatal in contact with skin

H315 : Causes skin irritation.

H317 : May cause an allergic skin reaction.

H373 : May cause damage to organs (Liver, Heart) through prolonged or repeated exposure if swallowed.

H410 : Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210 : Keep aways from heat, sparks, open flames, and hot surfaces.

P260 : Do not breathe dust, fumes, fas, mist, vapours, or spray.

P262 : Do not get in eyes, on skin, or on clothing.

P264 : Wash skin thoroughy after handling.

P270 : Do not eat, drink, or smoke when using this product.

P271 : Use onlin in a well-ventilated area.

P272	:	Do not remove contaminated clothing from the workplace.
P273	:	Avoid release in to the environment.
P280	:	Wear protective gloves/eye protection/face protection.
P301+P312+P330	:	IF SWALLOWED: Call a POISION CONTROL CENTER or physician. Rinse mouth.
P302+P352+P310	:	IF ON SKIN: Wash with soap and tepid water. Call a POISION CONTROL CENTER or physician.
P302+P353	:	IF ON SKIN: Wash with soap and tepid water.
P305+P351+P338+P310	:	IF IN EYES: Rinse with tepid water for 15 minutes. Remove contacts if present and it is easy to do so. Continue rinsing. Call a POISION CONTROL CENTER or physician.
P314	:	Get medial advice/attention if you do not feel well.
P333+P378	:	If skin or rash occurs, immediately get medical advice or medical attention.
P362	:	Remove contaminated clothing and wash before reusing.
P370+P378	:	In case of fire, use dry sand, dry chemical, or alcohol-resistant foam to extinguish.
P391	:	Collect spillage.
P403+P233	:	Store in a well-ventialed place. Keep container tightly closed.
P403+P235	:	Store in a well-ventialed place. Keep cool.
P405	:	Store securely.
P501	:	Dispose of contents/container to an approved/licensed waste disposal plant/facility.

2.3. Other hazards

Has a stench. May rapidly absorb through skin.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
2-Mercaptoethanol, CAS# 60-24-2 EC# 200-464-6 Formula: C_2H_6OS Molecular Weight: 78.13 g/mol Synonyms: BME, Thioethylene glycol, 2-Hydroxyethylmercaptan, β-Mercaptoethanol Additional Information: Flam. Liq. 3.; Acute Tox. 3; Aucte Tox. 2; Skin Irrit. 2; Eye Dam. 1; Skin Sens. 1; STOT RE 2; Aquatic Acute 1; Aquaic Chronic 1; H227, H301, H331, H310, H315, H327, H318, H373, H410	Ingredient in product.	0.1 – 2.0

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	:	If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.
First-aid measures after inhalation	:	IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Seek immediate medical attention.
First-aid measures after skin contact	:	IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Seek immediate medical attention.
First-aid measures after eye contact	:	IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Seek immediate medical attention.
First-aid measures after ingestion	:	IF SWALLOWED: Rinse mouth thoroughly and seek immediate medical attention. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries	:	Not expected to present a significant acute hazard under anticipated conditions of normal use.
Symptoms/injuries after inhalation	:	Can be harmful if inhaled.
Symptoms/injuries after skin contact	:	Can cause skin burns. May be fatal if large amounts are absorbed through skin.
Symptoms/injuries after eye contact	:	Can burn eyes. Seek immediate medical attention.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use water, dry chemical, chemical foam, or alcohol-resistance foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Product is not flammable, however carbon oxides and sulphur oxides may be produced in the event of a fire.

Explosion hazard : Product is not explosive, however carbon oxides and sulphur oxides may be produced in the event of a fire.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -70°C freezer. Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
2-Mercaptoethanol	60-24-2	TWA	0.200000 ppm	USA. Workplace Environmental Exposure Levels. (WEEL)
	Remarks	Skin		

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment	:	Gloves. Protective goggles. Laboratory Coat.

Hand protection	:	Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: natural latex, butyl-rubber.
Eye protection	:	Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.
Skin and body protection	:	Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.
Respiratory protection	:	Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state	:	Liquid, contains dissolved protein
Color	:	Clear to yellowish solution
Odor	:	May have some odor
Odor Threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous plymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Oxidizing agents.

10.6. Hazardous decomposition products

Carbon oxides, sulphur oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects (based on 2-mercapoethanol)

Acute toxicity	:	LD50 – Rat – 98-162 mg/kg (OEDC Test Guideline 401)
	:	LC50 Inhalation – Rat – 2 mg/mL, 4 hr
	:	LC50 Inhalation – Rat – 625 ppm, 4 hr
	:	LD50 Dermal – Rabbit – 112 mg/kg
Skin corrosion/irritation	:	Rabbit, irritating to skin (Draize Test)
Serious eye damage/irritation	:	Rabbit, risk or serious damage to eyes.
Respiratory or skin sensitisation	:	Guinea pig, may cuase sensitisation by skin contact. (Maximisation Test, OEDC Test Guideline 406).
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC.
	:	ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
	:	NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP
	:	OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	Ingestion – May cuase damage to organs through prolonged or repeated exposure – Liver, Heart.
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause respiratory irratation.
Symptoms/injuries after skin contact	:	Can cause skin burns.
Symptoms/injuries after eye contact	:	Direct contact with the eyes can cause burns.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: KL5600000. 2-Mercaptoethanol may cause a burning sensation, cough, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting, weakness, unconsciousness. 2-Mercaptoethanol is very distructive to mucous membranes (including eyes), skin, and upper respiratory tract.

SECTION 12: Ecological information

12.1. Toxicity (based on 2-mercapoethanol)

Toxic to fish	:	LC50 – *Leuciscus idus* (Golden orfe) – 46-100 mg/L, 96 hr
Toxic to daphnia and other aquatic invertebrates	:	EC50 – *Daphnia* (water flea) – 0.89 mg/L, 48 hr (OEDC Test Guideline 202)
Toxic to algae	:	EC50 – *Desmodesmus subspicatus* (green algae) – 12 mg/L, 72 hr
Toxic to bacteria	:	LC50 – Bacteria – 125 mg/L, 17 hr

12.2. Persistence and degradability

Biodegradabiligy	:	Result: < 30.0% - Not readily biodegradable.
	:	Result: 6% - Not readily biodegradable.
	:	Aerobic conditions – Exposure time is 28 days
	:	Result: < 10% - Not readily biodegradable.

12.3. Bioaccumulative potential

Does not accumulate in organisms.

12.4. Mobility in soil

No additional information available.

12.5. Other adverse effects

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Do not allow product to enter drains. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT (based on 2-mercapoethanol)

UN number: 2966. Class: 6.1. Packing group: II.

Proper shipping name: Thioglycol.

Poison Inhalation Hazard: No

IMDG

UN number: 2966. Class: 6.1. Packing group: II.

EMS-No: F-A, S-A

Proper shipping name: Thioglycol.

Marine pollutant: Yes

IATA

UN number: 2966. Class: 6.1. Packing group: II.

Proper shipping name: Thioglycol.

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

No additional information available.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

2-Mercaptoethanol, CAS 60-24-2

New Jersey Right to Know Hazardous Substance List

2-Mercaptoethanol, CAS 60-24-2

Pennsylvania Right to Know List

2-Mercaptoethanol, CAS 60-24-2

SECTION 16: Other information

Indication of changes : Revision A: New SDS Created.

Revision date : 11/03/2017

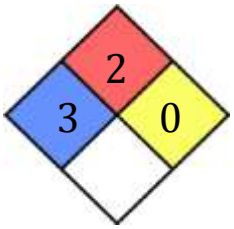
Other information : Author: Lucigen Corporation

Acute Tox. : Acute toxicity

Aquatic Acute Acute aquatic toxicity

Aquatic Chronic		Chronic aquatic toxicity
Eye Dam.		Serious Eye Damage
Flam. Liq.		Flammable liquids
H227	:	Combustible liquid.
H301	:	Toxic if swallowed.
H301+H331	:	Toxic if swallowed or if inhaled.
H310	:	Fatal in contact with skin
H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction
H318	:	Causes serious eye damage.
H331	:	Toxic if inhaled.
H373	:	May cause damage to organs through prolonged or repeated exposure if swallowed.
H400	:	Very toxic to aquatic life.

NFPA health hazard	:	3 – Short exposure could cause serious, temporary, or moderate residual injury.
NFPA fire hazard	:	2 – Must be moderately heated or exposed to relatively high ambient temperature before ignition and combustion can occur and multiple finely divided suspended solids that do not require heating before ignition can occur. Flash point between 37.8 and 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	3
Flammability	:	2
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Fosmid Control DNA.

Safety Data Sheet

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

Revision date: 10/23/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Fosmid Control DNA

Product form : Mixture

Product code : SS000485-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory Chemicals.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

No additional information available.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

No ingredients are hazardous according to OSHA criteria. No components need to be disclosed according to the applicable regulations.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with tepid water for at least 15 minutes. If symptoms continue, consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with tepid water for at least 15 minutes. Remove contact lenses if present and can easy to do so. Continue rinsing. If symptoms continue, consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly. Do not induce vomiting. Consult a physician if symptoms persist. Do not give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use water, dry chemical, chemical foam, or alcohol-resistance foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Product is not flammable.

Explosion hazard : Product is not explosive.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. In the event of fire and/or explosion, do not breathe fumes. Do not dispose of fire-fighting water in the environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Protective equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as vermiculite and sand. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after working with mixture, before leaving the laboratory, before eating, drinking or smoking and when leaving work. Avoid ingestion and inhalation. Keep container tightly closed.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in at either -20°C or -70°C . Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash should be available.

Personal protective equipment	:	Gloves. Protective goggles.

Hand protection	:	Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier.
Eye protection	:	Use eye protection suitable to the environment. Avoid direct contact with eyes.
Skin and body protection	:	Wear long sleeves, and chemically impervious PPE to minimize bodily exposure.
Respiratory protection	:	Use NIOSH-approved dust/particulate respirator as needed. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid containing dissolved material
Color	:	Colorless
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	~ 7
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	Not available
Skin corrosion/irritation	:	Not available
Serious eye damage/irritation	:	Not available
Respiratory or skin sensitisation	:	Not available
Germ cell mutagenicity	:	Not available
Carcinogenicity	:	Not available
Reproductive toxicity	:	Not available
Specific target organ toxicity (single exposure)	:	Not available
Specific target organ toxicity (repeated exposure)	:	Not available
Aspiration hazard	:	Not classified
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods	:	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.
Waste disposal recommendations	:	Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

OSHA Hazards

No OSHA Hazards

CERCLA Reportable Quantity

This product does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

No SARA Hazards

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

No additional information available.

15.3. US State regulations

California Proposition 65

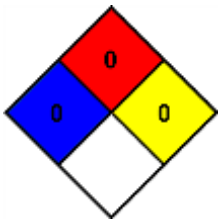
This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

This mixture not listed on the following:
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Indication of changes	:	Revision A: New SDS Created.
Revision date	:	10/23/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	:	0 - Materials that will not burn.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	0
Flammability	:	0
Physical	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Ligated Lambda Control DNA.

Safety Data Sheet

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

Revision date: 11/02/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Ligated Lambda Control DNA

Product form : Mixture

Product code : SS000602-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified.

2.2. Label elements

GHS-US labelling

No labeling applicable.

2.3. Other hazards

None.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.2. Mixture

Synonyms : Control Lambda DNA Template/Primer

No components need to be disclosed according to the applicable regulations.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, alcohol resistant foam, dry chemical, carbon dioxide, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : No data available.

Explosion hazard : No data available.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a -20°C freezer without a defrost cycle.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Contains no substances with occupational exposure limit values.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment	:	Gloves. Protective goggles. Laboratory Coat.

Hand protection	:	Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.
Eye protection	:	Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.
Skin and body protection	:	Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.
Respiratory protection	:	Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Color	:	No data available
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

Specific gravity is 1.261.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous polymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Hazardous decomposition products may form under fire conditions. The nature of the decomposition products is not known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	None.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

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. Waste treatment methods

Waste treatment methods	:	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.
Waste disposal recommendations	:	Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302 Components

No chemicals in this solution are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

No SARA Hazards

SARA 313

This materials does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

None.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

New Jersey Right to Know Hazardous Substance List

Water, CAS 7732-18-5

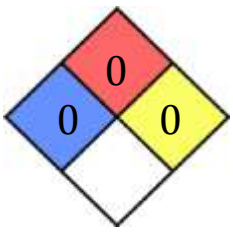
Pennsylvania Right to Know List

Water, CAS 7732-18-5

SECTION 16: Other information

Indication of changes	: Revision A: Updated format.
Revision date	: 11/02/2017
Other information	: Author: Lucigen Corporation

NFPA health hazard	: 0 – Poses no health hazard, no precautions necessary and would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	: 0 – Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.
NFPA reactivity	: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	: 0
Flammability	: 0
Physical Hazard	: 0
Personal Protection	:

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

pCC2FOS™ Fosmid Vector.

Safety Data Sheet

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

Revision date: 10/23/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : pCC2FOS™ Fosmid Vector

Product form : Mixture

Product code : SS000700-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory Chemicals.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

No additional information available.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

No ingredients are hazardous according to OSHA criteria. No components need to be disclosed according to the applicable regulations.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with tepid water for at least 15 minutes. If symptoms continue, consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with tepid water for at least 15 minutes. Remove contact lenses if present and can easy to do so. Continue rinsing. If symptoms continue, consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly. Do not induce vomiting. Consult a physician if symptoms persist. Do not give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use water, dry chemical, chemical foam, or alcohol-resistance foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Product is not flammable.

Explosion hazard : Product is not explosive.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. In the event of fire and/or explosion, do not breathe fumes. Do not dispose of fire-fighting water in the environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Protective equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as vermiculite and sand. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after working with mixture, before leaving the laboratory, before eating, drinking or smoking and when leaving work. Avoid ingestion and inhalation. Keep container tightly closed.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in at either -20°C or -70°C . Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash should be available.

Personal protective equipment	:	Gloves. Protective goggles.

Hand protection	:	Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier.
Eye protection	:	Use eye protection suitable to the environment. Avoid direct contact with eyes.
Skin and body protection	:	Wear long sleeves, and chemically impervious PPE to minimize bodily exposure.
Respiratory protection	:	Use NIOSH-approved dust/particulate respirator as needed. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid containing dissolved material
Color	:	Colorless
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	~ 7
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	Not available
Skin corrosion/irritation	:	Not available
Serious eye damage/irritation	:	Not available
Respiratory or skin sensitisation	:	Not available
Germ cell mutagenicity	:	Not available
Carcinogenicity	:	Not available
Reproductive toxicity	:	Not available
Specific target organ toxicity (single exposure)	:	Not available
Specific target organ toxicity (repeated exposure)	:	Not available
Aspiration hazard	:	Not classified
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods	:	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.
Waste disposal recommendations	:	Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

OSHA Hazards

No OSHA Hazards

CERCLA Reportable Quantity

This product does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

No SARA Hazards

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

No additional information available.

15.3. US State regulations

California Proposition 65

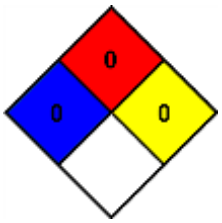
This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

This mixture not listed on the following:
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Indication of changes	:	Revision A: New SDS Created.
Revision date	:	10/23/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	:	0 - Materials that will not burn.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	0
Flammability	:	0
Physical	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

CopyControl™ Fosmid Autoinduction Solution.

Safety Data Sheet

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

Revision date: 11/02/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : CopyControl™ Fosmid Autoinduction Solution

Product form : Mixture

Product code : SS000728-D1, SS000728-D2

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Solution used in molecular biology experiments, laboratory buffer.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

No data available.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Proprietary Ingredient Not a hazardous ingredient at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	Ingredient in product.	10-20

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause respiratory irratation.

Symptoms/injuries after skin contact : No data available.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : No data available.

4.3. Indication of any immediate medical attention and special treatment needed

Persons with impaired kidney function may be more susceptible to susceptible to the mixture's effects. This mixture may also affect the heart.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use water, dry chemical, chemical foam, or alcohol-resistance foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Product is not flammable, however carbon monoxide and carbon dioxide may be produced in the event of a fire.

Explosion hazard : May be combustible at high temperature. Combustion products include carbon monoxide and carbon dioxide.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work. Avoid breathing dust, vapour, mist, or gas. Avoid contact with eyes, skin, and clothing.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -20°C freezer without a defrost cycle. Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limits.

8.2. Exposure controls

Appropriate engineering controls	:	Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.
Personal protective equipment	:	Gloves. Protective goggles. Laboratory Coat.

Hand protection	:	Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.
Eye protection	:	Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.
Skin and body protection	:	Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure as needed.
Respiratory protection	:	Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state	:	Liquid, contains dissolved powder
Color	:	Clear solution
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous plymerization does not occur. Non-corrosive to glass.

10.4. Conditions to avoid

No data available

10.5. Incompatible materials

No data available

10.6. Hazardous decomposition products

Carbon monoxide, and carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	No data available
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause respiratory irratation.
Symptoms/injuries after skin contact	:	No data available
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	No data available.
Additional Information	:	Possible hazardous long term degradation may occur. Degraded products are more toxic than the solution. Persons with impaired kidney function may be more susceptible to susceptible to the mixture's effects. This mixture may also affect the heart.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

12.2. Persistence and degradability

Degraded products are more toxic than solution.

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. Waste treatment methods

Waste treatment methods	:	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.
Waste disposal recommendations	:	Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

OSHA Hazards

No OSHA Hazards

CERCLA Reportable Quantity

This product does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

No SARA Hazards

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

No additional information available.

15.3. US State regulations

California Proposition 65

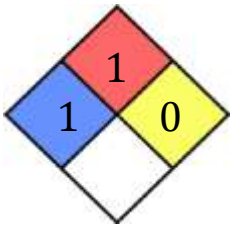
This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

This mixture not listed on the following:
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Indication of changes	:	Revision A: New SDS Created.
Revision date	:	11/02/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	1 – Exposure would cause irritation with only minor residual injury.
NFPA fire hazard	:	1 – Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	1
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

LE392MP Control Plating Strain Glycerol Stock.

Safety Data Sheet

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

Revision date: 10/20/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : LE392MP Control Plating Strain Glycerol Stock

Product form : Mixture

Product code : SS001000-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : *E. coli* in glycerol solution, laboratory materials.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

Irritant to eyes and skin. Target organs are kidneys.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
E. coli, CAS# N/A Not a hazardous ingredient at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	Ingredient in product.	0.1-10
Glycerol EC# 200-289-5 Chemical Formula: $C_3H_8O_3$ Molecular Weight: 92.09 g/mol Synonyms for Glycerol: Glycerin, 1,2,3-Propanetriol	Ingredient in product.	50

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions.

Explosion hazard : Emits toxic fumes under fire conditions.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -70°C. Keep container tightly closed. Do not store with sodium hydride, phosphorous trioxide, perchloric acid, chlorine, calcium hypochlorite, nitric acid, sulphuric acid, sodium peroxide, hydrogen peroxide, or potassium permanganate, as these substances may cause a violent or explosive reaction if they come in to direct contact. Mixture is hygroscopic.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Glycerol	56-81-5	TWA	10 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	10 mg/3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation		
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.

Eye protection : Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state : Liquid, viscous and colorless

Color : Colorless

Odor : Odorless

Odor Threshold : No data available

pH : No data available

Melting point : No data available

Freezing point (50% aquesous solution) : No data available

Boiling point : No data available

Flash point : No data available

Relative evaporation rate : No data available

Flammability (solid, gas) : No data available

Vapour pressure : No data available

Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous plymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents, strong bases.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: MA8050000. Prolonged exposure may cause nausea, vomitting, and headache. Kidneys may be affected.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

Glycerol

15.1. US Federal regulations

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Chronic Health Hazard

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

European Union Directive 67/548/EEC: Irritant R36/38, irritant to eyes and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36, wear appropriate personal protective equipment.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

Glycercol, CAS 56-81-5

New Jersey Right to Know Hazardous Substance List

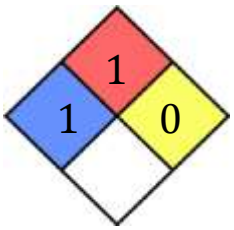
Glycerol, CAS 56-81-5

Pennsylvania Right to Know List
Glycercol, CAS 56-81-5

SECTION 16: Other information

Indication of changes	:	Revision A: New SDS Created.
Revision date	:	10/20/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	1 – Exposure will cause irriation.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	1
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Phage T1 Resistant EPI300 T1R Glycerol Stock.

Safety Data Sheet

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

Revision date: 10/20/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Phage T1 Resistant EPI300 T1R Glycerol Stock

Product form : Mixture

Product code : SS001002-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : *E. coli* in glycerol solution, laboratory materials.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

Irritant to eyes and skin. Target organs are kidneys.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
E. coli, CAS# N/A Not a hazardous ingredient at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	Ingredient in product.	0.1-10
Glycerol EC# 200-289-5 Chemical Formula: $C_3H_8O_3$ Molecular Weight: 92.09 g/mol Synonyms for Glycerol: Glycerin, 1,2,3-Propanetriol	Ingredient in product.	50

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions.

Explosion hazard : Emits toxic fumes under fire conditions.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -70°C. Keep container tightly closed. Do not store with sodium hydride, phosphorous trioxide, perchloric acid, chlorine, calcium hypochlorite, nitric acid, sulphuric acid, sodium peroxide, hydrogen peroxide, or potassium permanganate, as these substances may cause a violent or explosive reaction if they come in to direct contact. Mixture is hygroscopic.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Glycerol	56-81-5	TWA	10 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	10 mg/3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation		
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.

Eye protection : Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state : Liquid, viscous and colorless

Color : Colorless

Odor : Odorless

Odor Threshold : No data available

pH : No data available

Melting point : No data available

Freezing point (50% aquesous solution) : No data available

Boiling point : No data available

Flash point : No data available

Relative evaporation rate : No data available

Flammability (solid, gas) : No data available

Vapour pressure : No data available

Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous plymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents, strong bases.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: MA8050000. Prolonged exposure may cause nausea, vomitting, and headache. Kidneys may be affected.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

Glycerol

15.1. US Federal regulations

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Chronic Health Hazard

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

European Union Directive 67/548/EEC: Irritant R36/38, irritant to eyes and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36, wear appropriate personal protective equipment.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

Glycercol, CAS 56-81-5

New Jersey Right to Know Hazardous Substance List

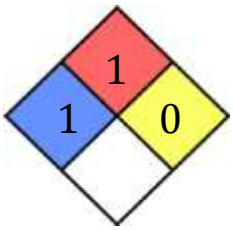
Glycerol, CAS 56-81-5

Pennsylvania Right to Know List
Glycercol, CAS 56-81-5

SECTION 16: Other information

Indication of changes	:	Revision A: New SDS Created.
Revision date	:	10/20/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	1 – Exposure will cause irriation.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	1
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

MaxPlax™ DNA Packing Extracts.

Safety Data Sheet

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

Revision date: 11/03/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : MaxPlax™ DNA Packing Extracts

Product form : Mixture

Product code : SS000437-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Extract from bacteria, laboratory buffer.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture (on concentrated 2-mercaptoethanol).

GHS-US classification

Flammable liquids, (Category 4), H227

Acute toxicity, Oral (Category 3), H301

Acute toxicity, Inhalation (Category 3), H331

Acute toxicity, Dermal (Category 2), H310

Skin irritation (Category 2), H315

Serious Eye Damage (Category 1), H318

Skin sensitisation (Category 1), H317

Specific target organ toxicity – repreated exposure, Oral (Category 2), Liver, Heart, H373

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

2.2. Label elements

GHS-US labelling

Pictogram :

Signal Word : Danger

Hazard statement(s)

H227 : Combustible liquid.

H301+H331 : Toxic if swallowed or if inhaled.

H310 : Fatal in contact with skin

H315 : Causes skin irritation.

H317 : May cause an allergic skin reaction.

H373 : May cause damage to organs (Liver, Heart) through prolonged or repeated exposure if swallowed.

H410 : Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210 : Keep aways from heat, sparks, open flames, and hot surfaces.

P260 : Do not breathe dust, fumes, fas, mist, vapours, or spray.

P262 : Do not get in eyes, on skin, or on clothing.

P264 : Wash skin thoroughy after handling.

P270 : Do not eat, drink, or smoke when using this product.

P271 : Use onlin in a well-ventilated area.

P272	:	Do not remove contaminated clothing from the workplace.
P273	:	Avoid release in to the environment.
P280	:	Wear protective gloves/eye protection/face protection.
P301+P312+P330	:	IF SWALLOWED: Call a POISION CONTROL CENTER or physician. Rinse mouth.
P302+P352+P310	:	IF ON SKIN: Wash with soap and tepid water. Call a POISION CONTROL CENTER or physician.
P302+P353	:	IF ON SKIN: Wash with soap and tepid water.
P305+P351+P338+P310	:	IF IN EYES: Rinse with tepid water for 15 minutes. Remove contacts if present and it is easy to do so. Continue rinsing. Call a POISION CONTROL CENTER or physician.
P314	:	Get medial advice/attention if you do not feel well.
P333+P378	:	If skin or rash occurs, immediately get medical advice or medical attention.
P362	:	Remove contaminated clothing and wash before reusing.
P370+P378	:	In case of fire, use dry sand, dry chemical, or alcohol-resistant foam to extinguish.
P391	:	Collect spillage.
P403+P233	:	Store in a well-ventialed place. Keep container tightly closed.
P403+P235	:	Store in a well-ventialed place. Keep cool.
P405	:	Store securely.
P501	:	Dispose of contents/container to an approved/licensed waste disposal plant/facility.

2.3. Other hazards

Has a stench. May rapidly absorb through skin.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
2-Mercaptoethanol, CAS# 60-24-2 EC# 200-464-6 Formula: C_2H_6OS Molecular Weight: 78.13 g/mol Synonyms: BME, Thioethylene glycol, 2-Hydroxyethylmercaptan, β-Mercaptoethanol Additional Information: Flam. Liq. 3.; Acute Tox. 3; Aucte Tox. 2; Skin Irrit. 2; Eye Dam. 1; Skin Sens. 1; STOT RE 2; Aquatic Acute 1; Aquaic Chronic 1; H227, H301, H331, H310, H315, H327, H318, H373, H410	Ingredient in product.	0.1 – 2.0

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	:	If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.
First-aid measures after inhalation	:	IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Seek immediate medical attention.
First-aid measures after skin contact	:	IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Seek immediate medical attention.
First-aid measures after eye contact	:	IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Seek immediate medical attention.
First-aid measures after ingestion	:	IF SWALLOWED: Rinse mouth thoroughly and seek immediate medical attention. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries	:	Not expected to present a significant acute hazard under anticipated conditions of normal use.
Symptoms/injuries after inhalation	:	Can be harmful if inhaled.
Symptoms/injuries after skin contact	:	Can cause skin burns. May be fatal if large amounts are absorbed through skin.
Symptoms/injuries after eye contact	:	Can burn eyes. Seek immediate medical attention.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Incase of fire, use water, dry chemical, chemical foam, or alcohol-resistance foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Product is not flammable, however carbon oxides and sulphur oxides may be produced in the event of a fire.

Explosion hazard : Product is not explosive, however carbon oxides and sulphur oxides may be produced in the event of a fire.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -70°C freezer. Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
2-Mercaptoethanol	60-24-2	TWA	0.200000 ppm	USA. Workplace Environmental Exposure Levels. (WEEL)
	Remarks	Skin		

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment	:	Gloves. Protective goggles. Laboratory Coat.

Hand protection	:	Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: natural latex, butyl-rubber.
Eye protection	:	Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.
Skin and body protection	:	Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.
Respiratory protection	:	Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state	:	Liquid, contains dissolved protein
Color	:	Clear to yellowish solution
Odor	:	May have some odor
Odor Threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous plymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Oxidizing agents.

10.6. Hazardous decomposition products

Carbon oxides, sulphur oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects (based on 2-mercapoethanol)

Acute toxicity	:	LD50 – Rat – 98-162 mg/kg (OEDC Test Guideline 401)
	:	LC50 Inhalation – Rat – 2 mg/mL, 4 hr
	:	LC50 Inhalation – Rat – 625 ppm, 4 hr
	:	LD50 Dermal – Rabbit – 112 mg/kg
Skin corrosion/irritation	:	Rabbit, irritating to skin (Draize Test)
Serious eye damage/irritation	:	Rabbit, risk or serious damage to eyes.
Respiratory or skin sensitisation	:	Guinea pig, may cuase sensitisation by skin contact. (Maximisation Test, OEDC Test Guideline 406).
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC.
	:	ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
	:	NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP
	:	OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	Ingestion – May cuase damage to organs through prolonged or repeated exposure – Liver, Heart.
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause respiratory irratation.
Symptoms/injuries after skin contact	:	Can cause skin burns.
Symptoms/injuries after eye contact	:	Direct contact with the eyes can cause burns.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: KL5600000. 2-Mercaptoethanol may cause a burning sensation, cough, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting, weakness, unconsciousness. 2-Mercaptoethanol is very distructive to mucous membranes (including eyes), skin, and upper respiratory tract.

SECTION 12: Ecological information

12.1. Toxicity (based on 2-mercapoethanol)

Toxic to fish	:	LC50 – *Leuciscus idus* (Golden orfe) – 46-100 mg/L, 96 hr
Toxic to daphnia and other aquatic invertebrates	:	EC50 – *Daphnia* (water flea) – 0.89 mg/L, 48 hr (OEDC Test Guideline 202)
Toxic to algae	:	EC50 – *Desmodesmus subspicatus* (green algae) – 12 mg/L, 72 hr
Toxic to bacteria	:	LC50 – Bacteria – 125 mg/L, 17 hr

12.2. Persistence and degradability

Biodegradabiligy	:	Result: < 30.0% - Not readily biodegradable.
	:	Result: 6% - Not readily biodegradable.
	:	Aerobic conditions – Exposure time is 28 days
	:	Result: < 10% - Not readily biodegradable.

12.3. Bioaccumulative potential

Does not accumulate in organisms.

12.4. Mobility in soil

No additional information available.

12.5. Other adverse effects

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Do not allow product to enter drains. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT (based on 2-mercapoethanol)

UN number: 2966. Class: 6.1. Packing group: II.

Proper shipping name: Thioglycol.

Poison Inhalation Hazard: No

IMDG

UN number: 2966. Class: 6.1. Packing group: II.

EMS-No: F-A, S-A

Proper shipping name: Thioglycol.

Marine pollutant: Yes

IATA

UN number: 2966. Class: 6.1. Packing group: II.

Proper shipping name: Thioglycol.

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

No additional information available.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

2-Mercaptoethanol, CAS 60-24-2

New Jersey Right to Know Hazardous Substance List

2-Mercaptoethanol, CAS 60-24-2

Pennsylvania Right to Know List

2-Mercaptoethanol, CAS 60-24-2

SECTION 16: Other information

Indication of changes : Revision A: New SDS Created.

Revision date : 11/03/2017

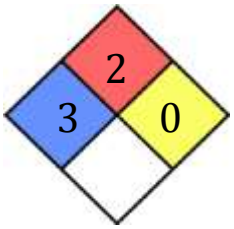
Other information : Author: Lucigen Corporation

Acute Tox. : Acute toxicity

Aquatic Acute Acute aquatic toxicity

Aquatic Chronic		Chronic aquatic toxicity
Eye Dam.		Serious Eye Damage
Flam. Liq.		Flammable liquids
H227	:	Combustible liquid.
H301	:	Toxic if swallowed.
H301+H331	:	Toxic if swallowed or if inhaled.
H310	:	Fatal in contact with skin
H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction
H318	:	Causes serious eye damage.
H331	:	Toxic if inhaled.
H373	:	May cause damage to organs through prolonged or repeated exposure if swallowed.
H400	:	Very toxic to aquatic life.

NFPA health hazard	:	3 – Short exposure could cause serious, temporary, or moderate residual injury.
NFPA fire hazard	:	2 – Must be moderately heated or exposed to relatively high ambient temperature before ignition and combustion can occur and multiple finely divided suspended solids that do not require heating before ignition can occur. Flash point between 37.8 and 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	3
Flammability	:	2
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Ligated Lambda Control DNA.

Safety Data Sheet

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

Revision date: 11/02/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Ligated Lambda Control DNA

Product form : Mixture

Product code : SS000602-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified.

2.2. Label elements

GHS-US labelling

No labeling applicable.

2.3. Other hazards

None.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.2. Mixture

Synonyms : Control Lambda DNA Template/Primer

No components need to be disclosed according to the applicable regulations.

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, alcohol resistant foam, dry chemical, carbon dioxide, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : No data available.

Explosion hazard : No data available.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a -20°C freezer without a defrost cycle.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Contains no substances with occupational exposure limit values.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment	:	Gloves. Protective goggles. Laboratory Coat.

Hand protection	:	Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.
Eye protection	:	Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.
Skin and body protection	:	Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.
Respiratory protection	:	Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Color	:	No data available
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

Specific gravity is 1.261.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous polymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Hazardous decomposition products may form under fire conditions. The nature of the decomposition products is not known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	None.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

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. Waste treatment methods

Waste treatment methods	:	Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.
Waste disposal recommendations	:	Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302 Components

No chemicals in this solution are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

No SARA Hazards

SARA 313

This materials does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

None.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

New Jersey Right to Know Hazardous Substance List

Water, CAS 7732-18-5

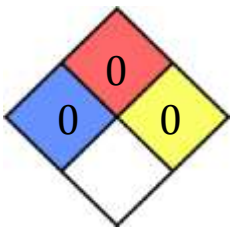
Pennsylvania Right to Know List

Water, CAS 7732-18-5

SECTION 16: Other information

Indication of changes	: Revision A: Updated format.
Revision date	: 11/02/2017
Other information	: Author: Lucigen Corporation

NFPA health hazard	: 0 – Poses no health hazard, no precautions necessary and would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	: 0 – Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.
NFPA reactivity	: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	: 0
Flammability	: 0
Physical Hazard	: 0
Personal Protection	:

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

LE392MP Control Plating Strain Glycerol Stock.

Safety Data Sheet

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

Revision date: 10/20/2017 Version: A

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : LE392MP Control Plating Strain Glycerol Stock

Product form : Mixture

Product code : SS001000-D

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : *E. coli* in glycerol solution, laboratory materials.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling

Not a hazardous substance or mixture.

2.3. Other hazards

Irritant to eyes and skin. Target organs are kidneys.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
E. coli, CAS# N/A Not a hazardous ingredient at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).	Ingredient in product.	0.1-10
Glycerol EC# 200-289-5 Chemical Formula: $C_3H_8O_3$ Molecular Weight: 92.09 g/mol Synonyms for Glycerol: Glycerin, 1,2,3-Propanetriol	Ingredient in product.	50

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : May cause upper respiratory irratation.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Emits toxic fumes under fire conditions.

Explosion hazard : Emits toxic fumes under fire conditions.

Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.

Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store at -70°C. Keep container tightly closed. Do not store with sodium hydride, phosphorous trioxide, perchloric acid, chlorine, calcium hypochlorite, nitric acid, sulphuric acid, sodium peroxide, hydrogen peroxide, or potassium permanganate, as these substances may cause a violent or explosive reaction if they come in to direct contact. Mixture is hygroscopic.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Glycerol	56-81-5	TWA	10 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	10 mg/3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation		
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.

Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.

Eye protection : Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state : Liquid, viscous and colorless

Color : Colorless

Odor : Odorless

Odor Threshold : No data available

pH : No data available

Melting point : No data available

Freezing point (50% aquesous solution) : No data available

Boiling point : No data available

Flash point : No data available

Relative evaporation rate : No data available

Flammability (solid, gas) : No data available

Vapour pressure : No data available

Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility in Water	:	No data available
Log Pow	:	No data available
Log Kow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous plymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents, strong bases.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	IARC – No component of this product present at levels greater than or equal to 0.1% is dientified as probablye, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.
Reproductive toxicity	:	No data available
Specific target organ toxicity (single exposure)	:	No data available
Specific target organ toxicity (repeated exposure)	:	No data available
Aspiration hazard	:	No data available
Symptoms/injuries after inhalation	:	May cause upper respiratory irratation. May cause headaches.
Symptoms/injuries after skin contact	:	May cause skin irritation.
Symptoms/injuries after eye contact	:	Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	:	May cause gastrointestinal irritation.
Additional Information	:	RTECS: MA8050000. Prolonged exposure may cause nausea, vomitting, and headache. Kidneys may be affected.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

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. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

Glycerol

15.1. US Federal regulations

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Chronic Health Hazard

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

European Union Directive 67/548/EEC: Irritant R36/38, irritant to eyes and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36, wear appropriate personal protective equipment.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

Glycercol, CAS 56-81-5

New Jersey Right to Know Hazardous Substance List

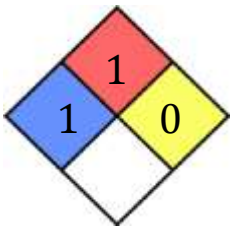
Glycerol, CAS 56-81-5

Pennsylvania Right to Know List
Glycercol, CAS 56-81-5

SECTION 16: Other information

Indication of changes	:	Revision A: New SDS Created.
Revision date	:	10/20/2017
Other information	:	Author: Lucigen Corporation

NFPA health hazard	:	1 – Exposure will cause irriation.
NFPA fire hazard	:	1 – Flash point is at or above 93.3°C.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	1
Flammability	:	1
Physical Hazard	:	0
Personal Protection	:	

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.