<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60448-1, 60448-2</td>
<td>OverExpress™ C43 (DE3) pLysS Chemically Competent Cells</td>
</tr>
</tbody>
</table>

**Components**

<table>
<thead>
<tr>
<th>OverExpress C43(DE3) pLysS Chemically Competent Cells</th>
<th>F96414</th>
</tr>
</thead>
<tbody>
<tr>
<td>pUC 19 Transformation Control</td>
<td>F92078-1</td>
</tr>
<tr>
<td>pAVD 10 DNA</td>
<td>F92706-1</td>
</tr>
<tr>
<td>Expression Recovery Media</td>
<td>F98405-1</td>
</tr>
</tbody>
</table>
OverExpress™C43(DE3) pLysS Chemically Competent Cells.

Safety Data Sheet

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

Revision date: 05/16/2018  Version: A

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

1.1. Product identifier

Product name : OverExpress™C43(DE3) pLysS Chemically Competent Cells.
Product form : Mixture
Product code : F96414

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. coli</em>, CAS# N/A</td>
<td>Ingredient in product.</td>
<td>0.1-10</td>
</tr>
<tr>
<td>Glycerol</td>
<td>Ingredient in product.</td>
<td>15</td>
</tr>
<tr>
<td>EC# 200-289-5 Chemical Formula: C₃H₈O₃ Molecular Weight: 92.09 g/mol Synonyms for Glycerol: Glycerin, 1,2,3-Propanetriol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 irritation.
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 absorbents, 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

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>56-81-5</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>USA, OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>10 mg/3</td>
<td>USA, ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>USA, Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>15 mg/m³</td>
<td>USA, Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants</td>
</tr>
</tbody>
</table>

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% aqueous 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
OverExpress™ C43(DE3) pLysS Chemically Competent Cells.

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

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 identified as probably, 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 anticipated carcinogen by NTP.
OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen 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 irritation. 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, vomiting, 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

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
Glycerol, CAS 56-81-5

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

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

SECTION 16: Other information

Indication of changes: Revision A: New SDS Created.
Revision date: 05/16/2018
Other information: Author: Lucigen Corporation.
OverExpress™ C43(DE3) pLysS Chemically Competent Cells.

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

NFPA health hazard : 1 – Exposure will cause irritation.
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.
SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name: pUC19 Transformation Control
Product form: Mixture
Product code: F92078-1

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
Non-hazardous mixture

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 irritation.
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 firefighting 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.
pUC19 Transformation Control.
Safety Data Sheet
Prepared according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**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
- **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.
pUC19 Transformation Control

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

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 irritation.
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

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

<table>
<thead>
<tr>
<th>This mixture not listed on the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
</tbody>
</table>

SECTION 16: Other information
Indication of changes : Revision A: New SDS Created.
Revision date : 05/14/2018
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.
SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name: pAVD 10 DNA Transformation Control
Product form: Mixture
Product code: F92706-1

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
Non-hazardous mixture

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 irritation.
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.
pAVD 10 DNA Transformation Control.
Safety Data Sheet
Prepared according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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.
pAVD 10 DNA Transformation Control.
Safety Data Sheet
Prepared according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

| 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 irritation.
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
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 : 05/14/2018
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.
SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name: Expression Recovery Media
Product form: Mixture
Product code: F98405-1

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture: Laboratory reagent for in vitro research use only.

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

2.2. Label elements

GHS-US labelling
No labeling applicable

2.3. Other hazards
Other hazards not contributing to the classification None under normal conditions.

2.4. Unknown acute toxicity (GHS-US)
No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance
Salts and non-animal origin media components for use in the growth of bacterial cultures.

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous ingredients at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).</td>
<td>Not applicable.</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

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 irritation.

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.
Expression Recovery Media.
Safety Data Sheet
Prepared according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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

8.2. Exposure controls
Appropriate engineering controls: Ensure adequate ventilation, especially in confined areas.
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. Suggested glove materials are: Natural rubber ("latex"), Neoprene, Nitrile/butadiene rubber, Polyethylene, Ethyl vinyl alcohol laminate, PVC or vinyl.

Eye protection: Chemical goggles or safety glasses.

Skin and body protection: Wear suitable protective clothing. Wear long sleeves.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state: No data available
Color: No data available
Odor: No data available
Odor Threshold: No data available
pH: No data available
Melting point: No data available
Freezing point (50% aqueous 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
Thermal decomposition generates: Not known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified
Skin corrosion/irritation: Not classified
**Expression Recovery Media.**

**Safety Data Sheet**

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

<table>
<thead>
<tr>
<th>Condition</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious eye damage/irritation</td>
<td>Not classified</td>
</tr>
<tr>
<td>Respiratory or skin sensitisation</td>
<td>Not classified</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Specific target organ toxicity (repeated exposure)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>Not classified</td>
</tr>
<tr>
<td>Symptoms/injuries after inhalation</td>
<td>May cause irritation. May cause headaches.</td>
</tr>
<tr>
<td>Symptoms/injuries after skin contact</td>
<td>May cause irritation.</td>
</tr>
<tr>
<td>Symptoms/injuries after eye contact</td>
<td>Direct contact with the eyes is likely to be irritating.</td>
</tr>
<tr>
<td>Symptoms/injuries after ingestion</td>
<td>May cause gastrointestinal irritation.</td>
</tr>
<tr>
<td>Chronic symptoms</td>
<td>No data available</td>
</tr>
</tbody>
</table>

**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 304 Extremely Hazardous Substances Reportable Quantity
This product does not contain any components with a section 304 EHS RQ.

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

SARA 313
Expression Recovery Media.
Safety Data Sheet
Prepared according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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

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
Not Listed

New Jersey Right to Know Hazardous Substance List
Not Listed

Pennsylvania Right to Know List
Not Listed

SECTION 16: Other information

Indication of changes : Revision A: New SDS Created.
Revision date : 05/16/2018
Other information : Author: Lucigen Corporation.

NFPA health hazard : 1 – Exposure will cause irritation.
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.