SAFETY DATA SHEET

RNA Ladder - Lyophilized

Section 1. Identification

Product Identifier: **RNA Ladder - Lyophilized**

Product code: **15002L, 15003L**

Product Type: **Solid - Powder**

Supplier's details:

Norgen Biotek Corporation
3430 Schmon Parkway
Thorold, ON
Canada L2V 4Y6
Tel: (905) 227-8848
Fax: (905) 227-1061
Toll Free: 1-866-667-4362
E-mail: techsupport@norgenbiotek.com

Emergency telephone number (with hours of operation):

CHEMTREC
U.S. & Canada: 1-800-424-9300

Section 2. Hazard Identification

Classification of the Substance or mixture: Not a Hazardous Substance or Mixture

GHS label elements

Hazard Pictograms: No hazard pictogram required.
Signal Word: No signal word required.
Hazard Statements: No hazard statement(s) required

Precautionary statements: No precautionary statement(s) required)
Prevention:
Response:

Section 2. Hazard Identification

Storage: Not applicable.
Disposal: Not applicable.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture
Other means of identification: Not Applicable

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye Contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact: Flush contaminated skin with plenty of water. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Section 4. First-aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact:	In case of contact with eyes, rinse out with water. Remove contact lenses.
Inhalation:	If inhaled, move patient to fresh air.
Skin contact:	In case of skin contact, rinse skin with water. Remove contaminated clothing.
Ingestion:	In case of ingestion, do not induce vomiting. Drink water. Consult a doctor if feeling unwell.

Over-exposure signs/symptoms

Eye contact:	Possible irritation
Inhalation:	Possible cough, possible irritation
Skin contact:	Possible irritation
Ingestion:	Possible stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician:	Not applicable
Specific treatments:	No data available
Protection of first-aiders:	No data available

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media:	For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards arising from the chemical:	Not combustible. Ambient fire may liberate hazardous vapours
Hazardous thermal decomposition products:	None
Special protective actions for fire-fighters:	In the event of fire, wear self-contained breathing apparatus.
Special protective	

equipment for

Section 6. Accidental release measures

fire-fighters: In the event of fire, wear self-contained breathing apparatus.

Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel: Advice for non-emergency personnel: Do not breathe vapors, aerosols. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

For emergency responders: Advice for emergency responders: Do not breathe vapors, aerosols. Evacuate the danger area, observe emergency procedures. For personal protection see section 8.

Environmental precautions: No special precautionary measures necessary

Methods and materials for containment and cleaning up

Small spill: Dilute with water. Wipe up with absorbent pad.

Large spill: Observe possible material restrictions (see sections 7 and 10). Take up with liquid absorbent material. Dispose of properly. Clean up affected area.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: For precautions see section 2.

Advice on general occupational hygiene: Wear appropriate PPE (if any) when handling.

Conditions for safe storage, including incompatibilities: No special storage conditions required. Keep tightly closed.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Contains no substances with occupational exposure limit values

Appropriate engineering controls: Not required.

Environmental exposure controls: Not required.

Individual protection measures

Hygiene measures: No data available
Eye/face protection:

Skin protection

Hand protection: Not required
Body protection: Not required
Other skin protection: Not required
Respiratory protection: Not required

Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance:

Physical State: Solid - Powder
Color: White
Odor: Not available.
Odor threshold: Not available.
pH: Not available.
Melting point/ freezing point: Not applicable.
Boiling point, initial boiling point, and boiling range: Not available.
Flash point: Not applicable.
Evaporation rate: Not available.
Flammability: Not available.
Lower and upper explosion limit/ flammability limit: Not available.
Vapor pressure: Not available.
Relative vapor density: Not available.
Relative density: Not available.
Solubility: Miscible in water.
Partition coefficient: n-octanol/water Not applicable.

Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Viscosity: Not available.
Flow time (ISO 2431): Not available.
Particle characteristics
Median particle size: Not applicable.

Section 10. Stability and reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability: The product is stable.
Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid: No specific data.
Incompatible materials: Reactive or incompatible with the following materials; oxidizing materials, acids and alkalis.
Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicology information

Information on toxicology effects
Acute toxicity
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Irritation/Corrosion
To the best of our knowledge, this mixture is not considered an irritant or corrosive.
Sensitization
There is no data available.
Mutagenicity
There is no data available.
Carcinogenicity
There is no data available.
Reproductive toxicity
There is no data available.
Teratogenicity

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There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure: Most likely routes of exposure are: Inhalation, Ingestion, skin contact. No hazards known for listed routes of exposure

Potential acute health effects

Eye contact: No data available

Inhalation: No data available

Skin contact: No data available

Ingestion: No data available

Symptoms related to the physical, chemical, and toxicological characteristics

Eye contact: No data available

Inhalation: No data available

Skin contact: No data available

Ingestion: No data available

Delayed and immediate effects and chronic effects from short- and long-term exposure

Short term exposure

Potential immediate effects: No data available

Potential delayed effects: No data available

Long term exposure

Potential immediate effects: No data available

Potential delayed effects: No data available

Potential chronic health effects

General: No data available

Carcinogenicity: No data available

Mutagenicity: No data available

Reproductive toxicity: No data available

Numerical measures of toxicity

Acute toxicity estimates

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12. Ecological information

Toxicity

There is no data available.

Persistence and degradability

There is no data available.

Mobility in soil

Soil/water partition coefficient (K_{OC}): Not available.

Other adverse effects: No known significant effect or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	TGD Classification	DOT Classification (US)	IMGD	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.

AERG: Not applicable.

Special precautions for user: **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments: Not available.

Section 15. Regulatory information

Canadian lists

Canadian NPRI: The following components are listed: No listed components

CEPA Toxic substances: None of the components are listed.

International regulations

Chemical Weapon Convention List Schedules I, II, & III Chemicals

Not listed

Montreal Protocol

Not listed

Stockholm Convention on Persistent Organic Pollutants

Not listed

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed

UNECE Aarhus Protocol on POPs and Heavy Metals

Not Listed

Inventory list

Canada: All components are listed or exempted.

Section 16. Other information

History

Date of issue/Date of revision: 09/13/2024

Date of previous issue: 12/15/2021

Version: 03

Prepared by: Norgen Biotek Corp.

Key to abbreviations: ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
HPR = Hazardous Products Regulations
IATA = International Ait Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
$LogP_{OW}$ = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 (Marpol = marine pollution)
SGG = Segregation Group
UN = United Nations

Procedure used to derive the classification

Classification	Justification
Non-Hazardous	This substance/mixture does not contain hazardous components

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

RNA Ladder Loading Buffer

Section 1. Identification

Product Identifier: **RNA Ladder Loading Buffer**
Product code: **15906, 15907**
Product Type: **Liquid**
Supplier's details: Norgen Biotek Corporation
3430 Schmon Parkway
Thorold, ON
Canada L2V 4Y6
Tel: (905) 227-8848
Fax: (905) 227-1061
Toll Free: 1-866-667-4362
E-mail: techsupport@norgenbiotek.com

Emergency telephone number (with hours of operation): CHEMTREC
U.S. & Canada: 1-800-424-9300

Section 2. Hazard Identification

Classification of the Substance or mixture:
ACUTE TOXICITY (oral) - Category 4
ACUTE TOXICITY (dermal) - Category 4
ACUTE TOXICITY (inhalation) - Category 3
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SKIN SENSITIZATION - Category 1
GERM CELL MUTAGENICITY - Category 2
CARCINOGENICITY - Category 1
TOXIC TO REPRODUCTION (Unborn child) - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

GHS label elements
Hazard Pictograms:

Signal Word:	Danger
Hazard Statements:	H302 + H312 - Harmful if swallowed or in contact with skin. H315 - Causes skin irritation. H317 - May cause an allergic skin reaction. H318 - Causes serious eye damage. H331 - Toxic if inhaled. H335 - May cause respiratory irritation. H341 - Suspected of causing genetic defects. H350 - May cause cancer. H360D - May damage the unborn child.
Precautionary statements:	
Prevention:	P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P280 - Wear protective gloves, protective clothing and eye or face protection. P271 - Use only outdoors or in a well-ventilated area. P261 - Avoid breathing vapor. P270 - Do not eat, drink or smoke when using this product. P264 - Wash thoroughly after handling. P272 - Contaminated work clothing should not be allowed out of the workplace.
Response:	P308 + P313 - IF exposed or concerned: Get medical advice or attention. P304 + P340, P311 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor. P301 + P312, P330 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth. P362 + P364 - Take off contaminated clothing and wash it before reuse. P302 + P312, P352 - IF ON SKIN: Call a POISON CENTER or doctor if you feel unwell. Wash with plenty of water. P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention. P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
Storage:	P405 - Store locked up. P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.
Disposal:	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations..

Section 3. Composition/information on ingredients

Substance/mixture: Mixture
Other means of identification: N/A

Ingredient name	% (w/w)	CAS number
Formamide	60-80	75-12-7
Formaldehyde	10-30	50-00-0

Ranges id listed above for hazardous ingredient(s) are prescribed ranges. The actual concentration(s) or actual concentration range(s) are being withheld as a trade secret.
There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye Contact: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician.

Inhalation: Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact: Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion: Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: Causes serious eye damage.

Inhalation: Toxic if inhaled. May cause respiratory irritation.

Skin contact: Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

Ingestion: Harmful if swallowed.

Over-exposure signs/symptoms

Eye contact: Adverse symptoms may include the following:
Pain
Watering
Redness

Inhalation: Adverse symptoms may include the following:
Respiratory tract irritation
Coughing
Reduced fetal weight
Increase in fetal deaths
Skeletal malformations

Skin contact: Adverse symptoms may include the following:
Pain or Irritation
Redness
Blistering may occur
Reduced fetal weight
Increase in fetal deaths
Skeletal malformations

Ingestion: Adverse symptoms may include the following:
Stomach pains
Reduced fetal weight
Increase in fetal deaths
Skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments: No specific treatment.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: None known.

Specific hazards arising from the chemical: No specific fire or explosion hazard.

Hazardous thermal decomposition products: Decomposition products may include the following materials:
Carbon dioxide, Carbon monoxide, Nitrogen oxides (NOx)

Special protective actions for fire-fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage, including incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Formamide	**CA Alberta Provincial (Canada, 6/2018).** Absorbed through skin. 8 hrs OEL: 10 ppm 8 hours. 8 hrs OEL: 18 mg/m³ 8 hours. **CA British Columbia Provincial (Canada,1/2020).** Absorbed through skin. TWA: 10 ppm 8 hours. **CA Ontario Provincial (Canada, 6/2019).** Absorbed through skin. TWA: 10 ppm 8 hours. **CA Quebec Provincial (Canada, 7/2019).** Absorbed through skin. TWAEV: 10 ppm 8 hours. TWAEV: 18 mg/m³ 8 hours. **CA Saskatchewan Provincial (Canada,7/2013).** Absorbed through skin. STEL: 15 ppm 15 minutes. TWA: 10 ppm 8 hours.

Formaldehyde	**CA Alberta Provincial (Canada, 6/2018).** C: 1.3 mg/m³ 8 hrs OEL: 0.75 ppm 8 hours. 8 hrs OEL: 0.9 mg/m³ 8 hours. C: 1 ppm **CA British Columbia Provincial (Canada,1/2020).** Skin sensitizer. Inhalation sensitizer. TWA: 0.1 ppm 8 hours. STEL: 0.3 ppm 15 minutes. **CA Ontario Provincial (Canada, 6/2019).** Ceiling Limit: 1.5 ppm STEL: 1 ppm 15 minutes. **CA Quebec Provincial (Canada, 7/2019).** STEV: 2 ppm 15 minutes. STEV: 3 mg/m³ 15 minutes. **CA Saskatchewan Provincial (Canada,7/2013).** Skin sensitizer. CEIL: 0.3 ppm

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance:

Physical State: Liquid
Color: Blue
Odor: Not available.
Odor threshold: Not available.
pH: Not available.
Melting point/ freezing point: Not applicable.
Boiling point, initial boiling point, and boiling range: Not available.
Flash point: Not applicable.
Evaporation rate: Not available.
Flammability: Not available.

Lower and upper explosion limit/ flammability limit:	Not available.
Vapor pressure:	Not available.
Relative vapor density:	Not available.
Relative density:	Not available.
Solubility:	Miscible in water.
Partition coefficient: n-octanol/water	Not applicable.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
Viscosity:	Not available.
Flow time (ISO 2431):	Not available.

Particle characteristics

Median particle size: Not applicable.

Section 10. Stability and reactivity

Reactivity:	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability:	The product is stable.
Possibility of hazardous reactions:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid:	No specific data.
Incompatible materials:	Reactive or incompatible with the following materials; oxidizing materials, acids and alkalis.
Hazardous decomposition products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicology information

Information on toxicology effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Formamide	LD50 Dermal	Rabbit	17 g/kg	-
	LD50 Oral	Rat	4000 mg/kg	-
Formaldehyde	LD50 Inhalation Gas	Rat	250 ppm	4 hours
	LD50 Dermal	Rabbit	270 mg/kg	-
	LD50 Oral	Rat	100 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Formaldehyde	Eyes – Severe Irritant	Rabbit	-	24 hours 750 µg	-
	Eyes – Severe Irritant	Rabbit	-	750 µg	-
	Skin – Mild Irritant	Rabbit	-	540mg	-
	Skin – Moderate Irritant	Rabbit	-	24 hours 50 mg	-
	Skin – Severe Irritant	Rabbit	-	24 hours 2 mg	-

Sensitization

There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

Product/Ingredient Name	IARC	NTP	ACGIH
Formamide	-	-	A3
Formaldehyde	1	Known to be a human carcinogen	A1

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

Product/Ingredient Name	Category	Route of Exposure	Target Organs
Formaldehyde	Category 3	-	Respiratory Tract irritation

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure: Routes of entry anticipated: Oral, Dermal, Inhalation

Potential acute health effects

Eye contact: Causes serious eye damage.

Inhalation: Toxic if inhaled. May cause respiratory irritation.

Skin contact: Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

Ingestion: Harmful if swallowed.

Symptoms related to the physical, chemical, and toxicological characteristics

Eye contact: Adverse symptoms may include the following:
Pain
Watering
Redness

Inhalation: Adverse symptoms may include the following:
Respiratory tract irritation
Coughing
Reduced fetal weight
Increase in fetal deaths
Skeletal malformations

Skin contact: Adverse symptoms may include the following:
Pain or Irritation
Redness
Blistering may occur
Reduced fetal weight
Increase in fetal deaths
Skeletal malformations

Ingestion: Adverse symptoms may include the following:
Stomach pains
Reduced fetal weight
Increase in fetal deaths
Skeletal malformations

Delayed and immediate effects and chronic effects from short- and long-term exposure

Short term exposure

Potential immediate effects: No known significant effects or critical hazards.

Potential delayed effects: No known significant effects or critical hazards.

Long term exposure

Potential immediate effects: No known significant effects or critical hazards.

Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects

General: Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity: Suspected of causing genetic defects

Reproductive toxicity: May damage the unborn child.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
RNA Ladder	429.2	1158.8	1073	N/A	N/A
Formamide	4000	17000	N/A	N/A	N/A
Formaldehyde	100	270	250	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Formaldehyde	Acute EC50 0.442 mg/L Marine Water	Algae – Ulva pertusa	96 Hours
	Acute EC50 3.26 mg/L Fresh Water	Daphnia – Daphnia magna (embryo)	48 Hours
	Acute LC50 1170 ul/L Marine Water	Crustaceans – Artemia sp.	48 Hours
	Chronic NOEC 3000 ppm Fresh Water	Crustaceans – Astacus astacus (egg)	21 Days
	Chronic NOEC 1.56 mg/L Fresh Water	Fish – Oreochromis niloticus (fingerling)	12 Weeks

Persistence and degradability

There is no data available.

Bioaccumulative Potential

Product/ingredient name	$LogP_{OW}$	BCF	Potential
Formamide	-0.82	-	Low

Mobility in soil

Soil/water partition coefficient (K_{OC}): Not available.

Other adverse effects: No known significant effect or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	TDG Classification	DOT Classification (US)	IMDG	IATA
UN number	UN2810	UN2810	UN2810	UN2810
UN proper shipping name	TOXIC LIQUID, ORGANIC, N.O.S. (Formaldehyde)	TOXIC LIQUID, ORGANIC, N.O.S. (Formaldehyde)	TOXIC LIQUID, ORGANIC, N.O.S. (Formaldehyde)	TOXIC LIQUID, ORGANIC, N.O.S. (Formaldehyde)
Transport hazard class(es)	6.1 	6.1 	6.1 	6.1 
Packing group	II	II	II	II
Environmental hazards	No.	No.	No.	No.

AERG: 153

DOT (RQ) Details: Formaldehyde 100 lbs / 45.4 kg [14.77 gal / 55.911 L]

Additional Information

TDG Classification: Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.26-2.36 (Class 6).

DOT Classification: **Reportable quantity** 429.18 lbs / 194.85 kg. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.

IMDG: **Emergency schedules** F-A, S-A

Special precautions for user: **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments: Not available.

Section 15. Regulatory information

Canadian lists

Canadian NPRI: The following components are listed: formaldehyde

CEPA Toxic substances: The following components are listed: formaldehyde

International regulations

Chemical Weapon Convention List Schedules I, II, & III Chemicals

Not listed

Montreal Protocol

Not listed

Stockholm Convention on Persistent Organic Pollutants

Not listed

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed

Inventory list

Canada: Not Determined

Section 16. Other information

History

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Prepared by: Norgen Biotek Corp.

Key to abbreviations: ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
HPR = Hazardous Products Regulations
IATA = International Ait Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
$LogP_{OW}$ = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 (Marpol = marine pollution)
SGG = Segregation Group
UN = United Nations

Procedure used to derive the classification

Classification	Justification
ACUTE TOXICITY (oral) - Category 4	Calculation Method
ACUTE TOXICITY (dermal) - Category 4	Calculation Method
ACUTE TOXICITY (inhalation) - Category 3	Calculation Method
SKIN CORROSION/IRRITATION - Category 2	Calculation Method
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1	Calculation Method
SKIN SENSITIZATION - Category 1	Calculation Method
GERM CELL MUTAGENICITY - Category 2	Calculation Method
CARCINOGENICITY - Category 1	Calculation Method
TOXIC TO REPRODUCTION (Unborn child) - Category 1	Calculation Method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Calculation Method

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.