

MSDS #9008 COVER SHEET

20164	Magnetic RNA Pull-Down Kit
Component #	Description
0020163	RNA 3' End Desthiobiotinylation Kit
0020164Y	RBP Enrichment Module
0020164Z	RNA Controls



MSDS #9007 COVER SHEET

20163	Pierce RNA 3' End Desthiobiotinylation Kit
Component #	Description
1862288	RNA Ligase Reaction Buffer 10X
1862289	T4 RNA Ligase
1862290	Control RNA
1862176	Biotinylated IRE Control RNA
1862150	RNase Inhibitor
1862154	Nuclease-Free Water
1862294	DMSO
1862295	30% PEG
1862772	Cytidine Bisphosphate Desthiobiotin
1862297	Glycogen



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Material Safety Data Sheet

T4 RNA Ligase 1 Reaction Buffer 10X

1. Product and company identification

: T4 RNA Ligase 1 Reaction Buffer 10X **Product name**

: Thermo Fisher Scientific Supplier Manufacturer

Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

: Thermo Fisher Scientific

Code : 1862288 MSDS# 8423 Validation date : 8/17/2012. **Print date** : 8/17/2012. Responsible name MSDS Specialist

> CHEMTREC: 800.424.9300 **OUTSIDE US:** 703.527.3887

Material uses Refer to the instruction booklet for proper and

intended use. Otherwise, contact supplier for specific

1/

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid.

Color : Clear. Colorless. Odor : Odorless Signal word : WARNING!

Hazard statements : HARMFUL IF SWALLOWED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Precautionary measures : Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing.

Keep container tightly closed. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Irritating to respiratory system. Exposure to decomposition products may cause a health

hazard. Serious effects may be delayed following exposure.

Ingestion : Toxic if swallowed. Skin : Irritating to skin.

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T4 RNA Ligase 1 Reaction Buffer 10X

2. Hazards identification

Eyes : Irritating to eyes.

Potential chronic health effects

Chronic effects : Contains material that can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

: Contains material which causes damage to the following organs: mucous membranes, **Target organs**

upper respiratory tract, skin, eyes, central nervous system (CNS).

Contains material which may cause damage to the following organs: kidneys, liver.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

irritation

Eyes : Adverse symptoms may include the following:

pain or irritation watering redness

Medical conditions

: Pre-existing disorders involving any target organs mentioned in this MSDS as being at

aggravated by overrisk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
	77-86-1 3483-12-3	7 - 10 1 - 3

Canada

Name	CAS number	%
trometamol (R*,R*)-1,4-dimercaptobutane-2,3-diol	77-86-1 3483-12-3	7 - 10 1 - 3

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

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4. First aid measures

Eye contact

Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower evelids. Get medical

attention immediately

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention immediately.

: No action shall be taken involving any personal risk or without suitable training. If it is Protection of first-aiders 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. 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.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Inhalation

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

Not suitable : None known

Special exposure hazards : 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

decomposition products

Hazardous thermal : Decomposition products may include the following materials:

carbon dioxide carbon monoxide

nitrogen oxides sulfur oxides

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.

6. Accidental release measures

: No action shall be taken involving any personal risk or without suitable training. Personal precautions

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 (see Section 8)

: 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 for cleaning up

Environmental precautions

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.

8/17/2012. 3/ 8/17/2012.

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6. Accidental release measures

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.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. 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.

Storage

: Do not store above the following temperature: -20°C (-4°F). 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. 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.

8. Exposure controls/personal protection

<u>Canada</u>

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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.

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8. Exposure controls/personal 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 or

dusts

Skin

: 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

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be

necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state

Color : Clear. Colorless. Odor : Odorless

Dispersibility properties Solubility

: Dispersible in the following materials: cold water and hot water. : Soluble in the following materials: cold water and hot water

10. Stability and reactivity

Chemical stability Conditions to avoid : The product is stable. : No specific data.

Incompatible materials Hazardous decomposition : No specific data.

products Possibility of hazardous : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
(R*,R*)-1,4- dimercaptobutane-2,3-diol	LD50 Oral	Rat	400 mg/kg	-

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
trometamol	Skin - Severe irritant	Rabbit Rabbit Woman	-	25 Percent 500 milligrams 1 Percent	-

Conclusion/Summary

: Not available

Sensitizer

8/17/2012.

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T4 RNA Ligase 1 Reaction Buffer 10X

11. Toxicological information

Conclusion/Summary

: Not available

Carcinogenicity

: Not available. Conclusion/Summary

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
trometamol (R*,R*)-1,4-	-	-	-	None. None.	-	None. None.
dimercaptobutane-2,3-diol						

Mutagenicity

Conclusion/Summary

: Not available.

Teratogenicity

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
(R*,R*)-1,4- dimercaptobutane-2,3-diol	LD50 Oral	Rat	400 mg/kg	-

Conclusion/Summary

To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
trometamol	Skin - Moderate irritant Skin - Severe irritant	Rabbit Rabbit	-	25 Percent 500	-
	Skin - Moderate irritant	Woman	-	milligrams 1 Percent	-

Conclusion/Summary

Sensitizer

Conclusion/Summary : Not available

Carcinogenicity

Conclusion/Summary : Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
trometamol (R*,R*)-1,4-	-	-	-	None. None.		None. None.
dimercaptobutane-2,3-diol						

Mutagenicity

Conclusion/Summary

: Not available

: Not available

Teratogenicity

8/17/2012.

5/

Conclusion/Summary : Not available

Reproductive toxicity

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11. Toxicological information

Conclusion/Summary : Not available.

: Not available.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
	Acute LC50 27000 to 30000 ug/L Fresh water	Daphnia - Daphnia magna - <24 hours	48 hours

Conclusion/Summary

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
	Acute LC50 27000 to 30000 ug/L Fresh water	Daphnia - Daphnia magna - <24 hours	48 hours

Conclusion/Summary

Persistence/degradability

Conclusion/Summary : Not available

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

: Not available.

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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 emptied 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

Disposal should be in accordance with applicable regional, national and local laws and regulations. Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

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14. Transport information

PG* : Packing group

15. Regulatory information

United States

HCS Classification

: Toxic material Irritating material

Target organ effects

U.S. Federal regulations

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined United States inventory (TSCA 8b): Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: trometamol

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

trometamol: Immediate (acute) health hazard

Clean Air Act Section : Not listed

112(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals

(Essential Chemicals)

State regulations Massachusetts

New York

New Jersey

Pennsylvania

: None of the components are listed. : None of the components are listed. : None of the components are listed. : None of the components are listed.

: Not determined.

United States inventory

(TSCA 8b) Canada

7/

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic)

Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed.

: Not listed

Canada inventory

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

8/17/2012.

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15. Regulatory information

International lists

: Australia inventory (AICS): Not determined. China inventory (IECSC): Not determined. Japan inventory: Not determined.

Korea inventory: Not determined.

New Zealand Inventory of Chemicals (NZIoC): Not determined.

Philippines inventory (PICCS): Not determined.

16. Other information

Label requirements

HARMFUL IF SWALLOWED. CAUSES RESPIRATORY TRACT, EYE AND SKIN

IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



 Date of printing
 : 8/17/2012.

 Date of issue
 : 8/17/2012.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

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.

8/17/2012.

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Material Safety Data Sheet

T4 RNA Ligase 1

1. Product and company identification

: T4 RNA Ligase 1 **Product name** Synonym : ssRNA Ligase

Supplier : Thermo Fisher Scientific Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Manufacturer

Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Code : 1862289 MSDS# 8422 Validation date : 8/17/2012. **Print date** : 8/17/2012. Responsible name MSDS Specialist

CHEMTREC: 800.424.9300 **OUTSIDE US:** 703.527.3887

Material uses

Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid. Signal word : CAUTION!

: MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE Hazard statements

TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

: Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or Precautionary measures

smoke when using this product. Avoid contact with eyes, skin and clothing. Keep

container tightly closed. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Moderately irritating to the respiratory system. : No known significant effects or critical hazards. Ingestion

Skin : Moderately irritating to the skin. : Moderately irritating to eyes. Eyes

Potential chronic health effects

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T4 RNA Ligase 1

2. Hazards identification

Chronic effects : May cause target organ damage, based on animal data.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Target organs : May cause damage to the following organs: kidneys.

Contains material which may cause damage to the following organs: liver,

gastrointestinal tract, upper respiratory tract, skin, eyes.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

: No specific data. Ingestion

Skin : Adverse symptoms may include the following:

irritation redness

: Adverse symptoms may include the following: Eves

> irritation watering redness

Medical conditions aggravated by over: Pre-existing disorders involving any target organs mentioned in this MSDS as being at

risk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
glycerol	56-81-5	45 - 65
Canada		
Name	CAS number	%
glycerol	56-81-5	45 - 65

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

4. First aid measures

Eye contact

Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower evelids. Get medical

attention immediately.

Skin contact

8/17/2012.

1/1

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

2/1

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4. First aid measures

Inhalation

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

Ingestion

: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately

Protection of first-aiders

: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician

: No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable

: Use an extinguishing agent suitable for the surrounding fire.

Not suitable

Special exposure hazards

: 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

: None known

Hazardous thermal decomposition products : Decomposition products may include the following materials:

carbon dioxide carbon monoxide

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.

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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.

8/17/2012. 3/1

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T4 RNA Ligase 1

7. Handling and storage

Handling

Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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

Storage

: Do not store above the following temperature: -20°C (-4°F). 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. 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

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
glycerol	ACGIH TLV (United States, 3/2012). TWA: 10 mg/m³ 8 hour(s). Form: Inhalable fraction OSHA PEL (United States, 6/2010). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 15 mg/m³ 8 hour(s). Form: Total dust OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 10 mg/m³ 8 hour(s). Form: Total dust OSHA PEL (United States). TWA: 15 mg/m³ 8 hour(s). Form: Total dust
	ACGIH TLV (United States). TWA: 10 mg/m³ 8 hour(s). Form: Total particulates ACGIH (United States). TWA: 10 mg/m³ OSHA PEL (United States). Notes: Respirable TWA: 15 mg/m³ 8 hour(s).

Canada

8/17/2012.

Occupational exposure limits		TWA (8 hours)		STEL (15 mins)		Ceiling					
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
	US ACGIH 3/2012 US ACGIH AB 4/2009 BC 9/2011 ON 7/2010 QC 9/2011		10 10 10 10 3 10	-		-	 	- - - - - -			[a] [b] [3] [c] [c] [d] [a] [e]

[3]Skin sensitization

Form: [a]Inhalable fraction [b]Total particulates [c]Mist [d]Respirable mist [e]mist

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

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8. Exposure controls/personal protection

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

Skin

: 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

Eyes

: 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 or

: 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

Environmental exposure

controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state

Dispersibility properties Solubility

: Dispersible in the following materials: cold water and hot water. : Soluble in the following materials: cold water and hot water

10. Stability and reactivity

Chemical stability : The product is stable. Conditions to avoid : No specific data. Incompatible materials : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
	LD50 Dermal LD50 Oral		>21900 mg/kg 12600 mg/kg	-

8/17/2012. 5/1

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T4 RNA Ligase 1

11. Toxicological information

Conclusion/Summary

: Not available

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	Sub-chronic TD50 Oral	Rat	3. 3	28 days Continuous
	Sub-chronic TD50 Oral	Rat		30 days Intermittent

Conclusion/Summary : Not available

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
glycerol	Eyes - Mild irritant	Rabbit		24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit		24 hours 500 milligrams	-

Conclusion/Summary

: Not available

Sensitizer

Conclusion/Summary : Not available

Carcinogenicity

Conclusion/Summary : Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
glycerol	-	-	-	-	-	None.

Mutagenicity

Conclusion/Summary

: Not available

Teratogenicity

Conclusion/Summary

: Not available

Reproductive toxicity

Conclusion/Summary : Not available

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	LD50 Dermal LD50 Oral	Rat Rat	>21900 mg/kg 12600 mg/kg	-

Conclusion/Summary : Not available

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	Sub-chronic TD50 Oral	Rat		28 days Continuous
	Sub-chronic TD50 Oral	Rat		30 days Intermittent

Conclusion/Summary Irritation/Corrosion

: Not available

8/17/2012.

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6/1

11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
3,744	Eyes - Mild irritant Skin - Mild irritant	Rabbit Rabbit	-	24 hours 500 milligrams 24 hours 500 milligrams	-

Conclusion/Summary

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
glycerol	-	-	-	-	-	None.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

Ecotoxicity: No known significant effects or critical hazards.

: Not available.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
glycerol	Acute LC50 51 to 57 ml/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

<u>Canada</u>

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
glycerol	Acute LC50 51 to 57 ml/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

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

8/17/2012. 7/1

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T4 RNA Ligase 1

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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 emptied 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.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Irritating material

Target organ effects

U.S. Federal regulations

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: glycerol

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: glycerol: Immediate (acute) health hazard, Delayed (chronic) health hazard

8/1

Clean Water Act (CWA) 311: edetic acid

Clean Air Act Section : Not listed

112(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

8/17/2012.

DEA List I Chemicals : Not listed

(Precursor Chemicals)

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15. Regulatory information

DEA List II Chemicals (Essential Chemicals) : Not listed

State regulations

Massachusetts : The following components are listed: GLYCERINE MIST

New York : None of the components are listed.

New Jersey : The following components are listed: Glycerin

: The following components are listed: 1,2,3-PROPANETRIOL Pennsylvania

United States inventory

: All components are listed or exempted.

(TSCA 8b) Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: Not determined. Korea inventory: Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

16. Other information

MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE Label requirements

TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material

Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : 8/17/2012. : 8/17/2012. Date of issue

Date of previous issue : No previous validation.

8/17/2012.

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T4 RNA Ligase 1

16. Other information

Version

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

Notice to reader

9/1

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.

8/17/2012. 10/1

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Material Safety Data Sheet

Non-labeled RNA Control

1. Product and company identification

Product name : Non-labeled RNA Control

: Thermo Fisher Scientific Supplier Pierce Biotechnology P O Box 117 Rockford, IL 61105 United States

815.968.0747 or 800.874.3723

Code : 1862290 MSDS# 8452 Validation date : 10/5/2012. Print date : 10/5/2012. Responsible name MSDS Specialist

> CHEMTREC: 800.424.9300 **OUTSIDE US:**

703.527.3887

Manufacturer

Material uses

: Thermo Fisher Scientific Pierce Biotechnology P O Box 117 Rockford, IL 61105 United States 815.968.0747 or 800 874 3723

Refer to the instruction booklet for proper and

intended use. Otherwise. contact supplier for specific

1/

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid.

: NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN **Hazard statements**

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication

Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and

available for employees and other users of this product.

: Dermal contact, Eve contact, Inhalation, Ingestion, Routes of entry

Potential acute health effects

Inhalation : No known significant effects or critical hazards. : No known significant effects or critical hazards. Ingestion Skin : No known significant effects or critical hazards. : No known significant effects or critical hazards. Eves

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards.

10/5/2012.

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Non-labeled RNA Control

2. Hazards identification

Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Developmental effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data. Ingestion : No specific data. Skin : No specific data. Eyes : No specific data. Medical conditions : None known.

aggravated by over-

exposure

Inhalation

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Check for and remove any contact lenses. Immediately flush eyes with plenty of water Eye contact for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur.

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes Skin contact

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention if symptoms occur.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable : None known.

Special exposure hazards : 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

2/

: No specific data. Hazardous thermal

decomposition products

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5. Fire-fighting measures

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.

6. Accidental release measures

Personal precautions

: 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. Put on appropriate personal protective equipment (see Section 8).

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 for 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. 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Handling

Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: Do not store above the following temperature: -20°C (-4°F). 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. 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

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

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Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Non-labeled RNA Control

8. Exposure controls/personal protection

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory

Hygiene measures

: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the layatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that evewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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

Eyes

: 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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin

: 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.

Environmental exposure

controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels

9. Physical and chemical properties

Physical state

: Liquid.

Dispersibility properties

: Dispersible in the following materials: cold water and hot water.

Solubility

: Soluble in the following materials: cold water and hot water

10. Stability and reactivity

Chemical stability

: The product is stable.

Conditions to avoid

: No specific data.

Incompatible materials

: No specific data.

Hazardous decomposition

: Under normal conditions of storage and use, hazardous decomposition products should

products

not be produced.

Possibility of hazardous reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

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4/

Non-labeled RNA Control

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary : Not available

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

Ecotoxicity: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available

Canada 10/5/2012.

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12. Ecological information

Aquatic ecotoxicity

Conclusion/Summary

Persistence/degradability

Conclusion/Summary : Not available

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

: Not available.

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

6/

products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

10/5/2012.

5/

Clean Air Act Section 602 : Not listed

Class I Substances

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Non-labeled RNA Control

15. Regulatory information

Clean Air Act Section 602 : Not listed

Class II Substances

.

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

 Massachusetts
 : None of the components are listed.

 New York
 : None of the components are listed.

 New Jersey
 : None of the components are listed.

 Pennsylvania
 : None of the components are listed.

United States inventory

(TSCA 8b) Canada : Not determined.

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : Not determined.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): Not determined.

China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.

Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): Not determined.

Philippines inventory (PICCS): Not determined. Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

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10/5/2012.

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Non-labeled RNA Control

16. Other information



 Date of printing
 : 10/5/2012.

 Date of issue
 : 10/5/2012.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

Notice to reader

7/

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.

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8/

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Material Safety Data Sheet

Biotinylated IRE RNA

1. Product and company identification

Product name : Biotinylated IRE RNA

: Thermo Fisher Scientific Supplier Pierce Biotechnology P.O. Box 117

Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105

United States 815.968.0747 or 800.874.3723

Code : 1862176 1892990 1901784

MSDS# 8270 Validation date : 3/23/2012. **Print date** : 3/23/2012. MSDS Specialist Responsible name

> CHEMTREC: 800.424.9300

OUTSIDE US: 703.527.3887

Material uses Refer to the instruction booklet for proper and

intended use. Otherwise. contact supplier for specific

1/7

applications.

Product type : Solid

2. Hazards identification

Emergency overview

Physical state : Solid.

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the

safe handling and proper use of the product. This MSDS should be retained and

Manufacturer

available for employees and other users of this product.

Routes of entry

: Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

: No known significant effects or critical hazards. Inhalation : No known significant effects or critical hazards. Ingestion Skin : No known significant effects or critical hazards. : No known significant effects or critical hazards. Eves

Potential chronic health effects

3/23/2012.

Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. **Developmental effects** : No known significant effects or critical hazards.

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2. Hazards identification

Fertility effects : No known significant effects or critical hazards

Over-exposure signs/symptoms

Inhalation : No specific data. Ingestion : No specific data. Skin : No specific data. Eyes : No specific data. Medical conditions : None known.

aggravated by over-

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water Eve contact

for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur.

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes Skin contact while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention if symptoms occur.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if Inhalation respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Extinguishing media

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

Not suitable

Special exposure hazards : 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.

Hazardous thermal : No specific data.

decomposition products

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.

3/23/2012. 2/7

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6. Accidental release measures

Personal precautions

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. Put on appropriate personal protective equipment (see Section 8).

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 for cleaning up

Small spill

: Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal

contractor.

Large spill

: Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: Do not store above the following temperature: -70°C (-94°F). 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. 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

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limit value known

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

3/23/2012.

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8. Exposure controls/personal protection

Hands

Eyes

: 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.

: 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 or

Skin

: 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.

Environmental exposure

controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be

necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state

Dispersibility properties

: Dispersible in the following materials: cold water and hot water.

: Soluble in the following materials: cold water and hot water

10. Stability and reactivity

Chemical stability

: The product is stable

Conditions to avoid

: No specific data. : No specific data.

Incompatible materials Hazardous decomposition

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

products

Solubility

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this substance have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary

Irritation/Corrosion

: Not available

Conclusion/Summary

Sensitizer

Conclusion/Summary

: Not available Not available

Carcinogenicity

Conclusion/Summary : Not available

Mutagenicity

Conclusion/Summary

: Not available

Teratogenicity

Conclusion/Summary

: Not available

Reproductive toxicity

Conclusion/Summary : Not available

Canada 3/23/2012.

3/7

Acute toxicity

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4/7

Biotinylated IRE RNA

11. Toxicological information

Conclusion/Summary : To the best of our knowledge, the toxicological properties of this substance have not

been thoroughly investigated

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

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

13. Disposal considerations

Waste disposal

3/23/2012.

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Biotinylated IRE RNA

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Not regulated.

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined U.S. Federal regulations

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: No products were found

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

: Not listed

Clean Air Act Section

112(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Clean Air Act Section 602 : Not listed

Class I Substances Class II Substances

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed. **United States inventory** : All components are listed or exempted.

(TSCA 8b)

5/7

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

3/23/2012. 6/7

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15. Regulatory information

International lists

: Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: All components are listed or exempted.

Korea inventory: All components are listed or exempted.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

16. Other information

Label requirements

: NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material Information System (U.S.A.)

Health 0
Flammability 0
Physical hazards 0

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



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 Version
 : 1.01

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

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.

3/23/2012. 7/7

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Material Safety Data Sheet

RNase Inhibitor

1. Product and company identification

Product name : RNase Inhibitor

Supplier : Thermo Fisher Scientific Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723 Manufacturer : Thermo Fisher Scientific Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Code : 1862150 1862151 1862151B

 MSDS #
 8288

 Validation date
 : 1/7/2011.

 Print date
 : 1/7/2011.

Responsible name MSDS Specialist

CHEMTREC: 800.424.9300 OUTSIDE US: 202.483.7616 Material uses Refer to the instruction

booklet for proper and intended use. Otherwise, contact supplier for specific

1/10

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid.

Color : Colorless.

Odor : Odorless.

Signal word : CAUTION!

Hazard statements : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Precautionary measures : Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or

smoke when using this product. Avoid contact with eyes, skin and clothing. Keep

container tightly closed. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

Routes of entry : Dermal contact. Inhalation. Ingestion.

Potential acute health effects

 Inhalation
 : Moderately irritating to the respiratory system.

 Ingestion
 : No known significant effects or critical hazards.

Skin : Moderately irritating to the skin.

Eyes : Moderately irritating to eyes.

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2. Hazards identification

Potential chronic health effects

Chronic effects : Contains material that can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: kidneys, liver,

gastrointestinal tract, upper respiratory tract, skin, eyes.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

irritation redness

Eyes : Adverse symptoms may include the following:

irritation watering redness

Medical conditions : Pre-existing disorders involving any target organs mentioned in this MSDS as being at

aggravated by over- risk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
glycerol	56-81-5	45 - 65

Canada

<u>Canada</u>		
Name	CAS number	%
glycerol	56-81-5	45 - 65

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

4. First aid measures

Eye contact

Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

1/7/2011. 2/10

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4. First aid measures

Inhalation

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately

Ingestion

: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical

attention immediately.

Protection of first-aiders

: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire. : None known

Not suitable Special exposure hazards

: 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

Hazardous thermal decomposition products : Decomposition products may include the following materials:

carbon dioxide

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.

Special remarks on fire : Emits toxic fumes under fire conditions.

hazards

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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.

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RNase Inhibitor

7. Handling and storage

Handling

Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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

Storage

Do not store above the following temperature: -20°C (-4°F). 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. 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

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
glycerol	ACGIH (United States). TWA: 10 mg/m³ ACGIH TLV (United States, 2/2010). TWA: 10 mg/m³ 8 hour(s). Form: Inhalable fraction. See Appendix C, paragraph A. Inhalable Particulate Mass TLVs (IPM-TLVs) for those materials that are hazardous when deposited anywhere in the respiratory tract. OSHA PEL (United States, 6/2010). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 15 mg/m³ 8 hour(s). Form: Total dust OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hour(s). Form: Total dust OSHA PEL (United States). TWA: 15 mg/m³ 8 hour(s). Form: Total dust ACGIH TLV (United States). TWA: 15 mg/m³ 8 hour(s). Form: Total particulates OSHA PEL (United States). TWA: 15 mg/m³ 8 hour(s). Form: Total particulates OSHA PEL (United States). Notes: Respirable TWA: 15 mg/m³ 8 hour(s).

Canada

3/10

Occupational exposure limits		TWA (TWA (8 hours)		STEL (15 mins)		Ceiling				
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
glycerol	US ACGIH 2/2010 US ACGIH AB 4/2009 BC 10/2009 ON 7/2010 QC 6/2008	- - - - -	10 10 10 10 3 10	- - - - -	- - - - -	- - - - -	- - - - -				(a) (b) (3) (c) (c) (d) (a) (e)

[3]Skin sensitization

Form: [a]Inhalable fraction. See Appendix C, paragraph A. Inhalable Particulate Mass TLVs (IPM-TLVs) for those materials that are hazardous when deposited anywhere in the respiratory tract. [b]Total particulates [c]Mist [d]Respirable mist [e]mist

1/7/2011. 4/10

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RNase Inhibitor

8. Exposure controls/personal protection

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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

Eyes

Skin

: 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 or

: 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

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid. Color : Colorless. : Odorless Odor

Dispersibility properties Solubility

: Dispersible in the following materials: cold water and hot water. : Easily soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable : No specific data. Conditions to avoid Incompatible materials : No specific data.

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Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous

reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

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11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	LD50 Dermal	Rat	>21900 mg/kg	-
	LD50 Oral	Rat	12600 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	Sub-chronic TD50 Oral	Rat	16800 mg/kg	28 days Continuous
	Sub-chronic TD50 Oral	Rat	96 g/kg	30 days Intermittent

Conclusion/Summary

: Not available

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
glycerol		Rabbit	-	-	-
	Skin - Mild irritant	Rabbit	-	-	-

Conclusion/Summary

: Not available.

Sensitizer

Conclusion/Summary

: Not available.

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	Equivocal - Oral - TDLo	Mouse		25 weeks Intermittent

: Not available. Conclusion/Summary

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
glycerol	-	-	-	-	-	None.

<u>Mutagenicity</u>

Product/ingredient name	Test	Experiment	Result
glycerol	.,	Subject: Mammalian-Animal Subject: Mammalian-Human	Positive Positive

Conclusion/Summary

Teratogenicity

5/10

Conclusion/Summary

: Not available

: Not available.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure

6/10

1/7/2011.

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RNase Inhibitor 11. Toxicological information glycerol Rat - Male Unreported: 2 days 280 mg/kg Rat - Male Oral: 100 Positive 1 days mg/kg Unreported: 1 days Rat - Male 862 mg/kg Mammal - species Unreported: 1 days unspecified - Male 119 mg/kg Positive Rat - Male Unreported: 1 days 1600 mg/kg

Conclusion/Summary

: Not available.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
			>21900 mg/kg 12600 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	Sub-chronic TD50 Oral	Rat		28 days Continuous
	Sub-chronic TD50 Oral	Rat		30 days Intermittent

Conclusion/Summary

: Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
glycerol	Eyes - Mild irritant	Rabbit	-	-	-
	Skin - Mild irritant	Rabbit	-	-	-

Conclusion/Summary

Sensitizer

: Not available.

Conclusion/Summary

: Not available.

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	Equivocal - Oral - TDLo	Mouse		25 weeks Intermittent

Conclusion/Summary

: Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
glycerol	-	-	-	-	-	None.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
3,11	.,,	Subject: Mammalian-Animal Subject: Mammalian-Human	Positive Positive

Conclusion/Summary

: Not available.

Teratogenicity

1/7/2011.

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11. Toxicological information

Conclusion/Summary

: Not available.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
glycerol	-	Positive	-	Rat - Male	Oral: 100 mg/kg	1 days
	-	-	-	Rat - Male	Unreported: 280 mg/kg	
	-	-	-	Rat - Male	Unreported: 862 mg/kg	1 days
	-	Positive	-	Rat - Male	Unreported: 1600 mg/kg	1 days
	-	-	-	Mammal - species unspecified - Male	Unreported: 119 mg/kg	1 days

Conclusion/Summary

: Not available.

: Not available

: Not available.

12. Ecological information

Ecotoxicity

: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
glycerol	Acute LC50 51 to 57 ml/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary

Persistence/degradability

Conclusion/Summary : Not available

Canada

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
glycerol	Acute LC50 51 to 57 ml/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary

Persistence/degradability

Conclusion/Summary : Not available.

Other adverse effects

: No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal

7/10

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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 emptied 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.

1/7/2011. 8/10

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RNase Inhibitor

13. Disposal considerations

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Irritating material

Target organ effects

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: glycerol

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

glycerol: Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Air Act Section : Not listed

112(b) Hazardous Air

Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

Jiass II Substances

DEA List I Chemicals (Precursor Chemicals)

(i recursor orienticula)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

Massachusetts : The following components are listed: GLYCERINE MIST

New York : None of the components are listed.

: Not listed

New Jersey : The following components are listed: Glycerin

Pennsylvania: The following components are listed: 1,2,3-PROPANETRIOL

United States inventory

(TSCA 8b)

: All components are listed or exempted.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

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RNase Inhibitor

15. Regulatory information

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: Not determined.

Korea inventory: Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): Not determined.

16. Other information

Label requirements : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material

Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection

Association (U.S.A.)



 Date of printing
 : 1/7/2011.

 Date of issue
 : 1/7/2011.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

Notice to reader

9/10

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.

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Material Safety Data Sheet

Nuclease-Free Water

1. Product and company identification

Product name : Nuclease-Free Water

Synonym : AQUA Chemical formula : H2-O

Supplier : Thermo Fisher Scientific

Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723 : Thermo Fisher Scientific Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Code : 1862154 1862547 1862548 1889672 1896452 1896638C

MSDS # : 8268
Validation date : 9/7/2012.
Print date : 9/11/2012.

Responsible name : MSDS (Regulatory Specialist)

In case of emergency : CHEMTREC:

800.424.9300 OUTSIDE US: 703.527.3887 Material uses : Refer to the instruction

booklet for proper and intended use. Otherwise, contact supplier for specific

1/

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid.
Color : Clear

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication

Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and

Manufacturer

available for employees and other users of this product.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

 Inhalation
 : No known significant effects or critical hazards.

 Ingestion
 : No known significant effects or critical hazards.

 Skin
 : No known significant effects or critical hazards.

 Eyes
 : No known significant effects or critical hazards.

Potential chronic health effects

9/11/2012.

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Nuclease-Free Water

2. Hazards identification

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data.
Ingestion : No specific data.
Skin : No specific data.
Eyes : No specific data.
Medical conditions : None known.

aggravated by over-

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water

for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.

Skin contact In case of contact immediately flush s

 In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable : None know

Special exposure hazards : 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

2/

training.

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Nuclease-Free Water

5. Fire-fighting measures

Hazardous thermal decomposition products : No specific data.

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.

6. Accidental release measures

Personal precautions

: 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. Put on appropriate personal protective equipment (see Section 8).

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 for 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 spil

: Stop leak if without risk. Move containers from spill area. 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. Note: see section 1 for emergency contact information and section 13 for waste disposal

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: 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. 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.

8. Exposure controls/personal protection

Consult local authorities for acceptable exposure limits.

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Canada

Occupational exposure limits

No exposure limit value known

Recommended monitoring

procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

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61105

Nuclease-Free Water

8. Exposure controls/personal protection

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe

working limits of the selected respirator.

Hands

: 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

Eves

: 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 or

Skin

: 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.

Environmental exposure

controls

: Emissions from ventilation or work process equipment should be checked to ensure the comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state

: Liquid. Flash point : [Product does not sustain combustion.]

Color : Clear Molecular weight : 18.02 g/mole

Molecular formula : H2-O

Boiling/condensation point : 100°C (212°F) Meltina/freezina point : 0°C (32°F)

Relative density

Vapor pressure : 2.3 kPa (17.535 mm Hg) [20°C]

Vapor density : 0.62 [Air = 1]

Evaporation rate : 0.36 (Butvl acetate. = 1)

Solubility : Easily soluble in the following materials: cold water.

9/11/2012. 9/11/2012. 3/

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Nuclease-Free Water

10. Stability and reactivity

Chemical stability : The product is stable.
Conditions to avoid : No specific data.
Incompatible materials : No specific data.

Hazardous decomposition : Under normal conditions of storage and use, hazardous decomposition products should

products not be produced.

Possibility of hazardous reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Passes through the placental barrier in human.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Passes through the placental barrier in human.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

9/11/2012. 5/4

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Nuclease-Free Water

12. Ecological information

Ecotoxicity: This product shows a low bioaccumulation potential.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

<u>Canada</u>

Aquatic ecotoxicity

Conclusion/Summary : Not available

Persistence/degradability

Conclusion/Summary : Not available.

Partition coefficient: n- : -1.38

Bioconcentration factor : Not available.

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

13. Disposal considerations

Waste disposal

octanol/water

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

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15. Regulatory information

United States

HCS Classification : Not regulated.

: TSCA 8(a) IUR Exempt/Partial exemption: This material is listed or exempted. U.S. Federal regulations

United States inventory (TSCA 8b): This material is listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

Clean Air Act Section

112(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals

(Precursor Chemicals)

DEA List II Chemicals (Essential Chemicals)

: Not listed

: Not listed

: Not listed

State regulations

Massachusetts : This material is not listed **New York** : This material is not listed. **New Jersey** : This material is not listed. Pennsylvania : This material is not listed.

United States inventory

(TSCA 8b)

: This material is listed or exempted.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : This material is not listed. **CEPA Toxic substances** : This material is not listed.

Pierce Biotechnology Inc.

Canada inventory : This material is listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): This material is listed or exempted.

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China inventory (IECSC): This material is listed or exempted. Japan inventory: This material is listed or exempted. Korea inventory: This material is listed or exempted.

61105

New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted.

Philippines inventory (PICCS): This material is listed or exempted.

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16. Other information

Label requirements

NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : 9/11/2012. : 9/7/2012. Date of issue Date of previous issue : 5/7/2012. Version : 1.03

: MSDS (Regulatory Specialist) Prepared by

▼Indicates information that has changed from previously issued version.

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.

9/11/2012. 7/ 9/11/2012.

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: Thermo Fisher Scientific

Pierce Biotechnology

Rockford, IL 61105

P.O. Box 117

United States

800.874.3723

815.968.0747 or

Refer to the instruction

The world leader in serving science

Material Safety Data Sheet

Dimethyl Sulfoxide (DMSO)

1. Product and company identification

: Dimethyl Sulfoxide (DMSO)

: Methyl sulfoxide; Methane, 1,1'-sulfinylbis-; Methane, sulfinylbis-; Dimethyl sulphoxide Synonym

Chemical formula

Supplier : Thermo Fisher Scientific

Manufacturer Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

: TS-20684 0020684B 0020688 1859614 1862294 1871050 1871070 1891939 1896112

NCI1050

MSDS# : 1977 Validation date : 11/10/2011. : 11/10/2011. Print date

Responsible name : MSDS (Regulatory Specialist)

: CHEMTREC: In case of emergency

Material uses 800.424.9300 booklet for proper and **OUTSIDE US:** intended use. Otherwise, 703.527.3887 contact supplier for specific

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Code

Physical state : Liquid. [Hygroscopic.] Color : Colorless. Clear.

: ALMOST ODORLESS [Slight] Odor

Signal word : WARNING!

Hazard statements : COMBUSTIBLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND

SKIN IRRITATION. CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE

REPRODUCTIVE HAZARD - MAY CAUSE ADVERSE REPRODUCTIVE EFFECTS IN

FEMALES, BASED ON ANIMAL DATA

: Do not handle until all safety precautions have been read and understood. Obtain Precautionary measures special instructions before use. Do not breathe vapor or mist. Use only with adequate

ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep away from heat and flame. Keep container tightly closed. Use personal protective equipment as required. Wash thoroughly after handling.

: This material is considered hazardous by the OSHA Hazard Communication Standard **OSHA/HCS** status

(29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

11/10/2011.

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3747 N. Meridian Road (815) 968-7316 Fax Dimethyl Sulfoxide (DMSO)

Ingestion

2. Hazards identification

Inhalation : Irritating to respiratory system.

Skin : Irritating to skin. : Irritating to eyes. Eyes

Potential chronic health effects

Chronic effects : Can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards. : No known significant effects or critical hazards. Mutagenicity

Teratogenicity : No known significant effects or critical hazards. : No known significant effects or critical hazards. **Developmental effects** Fertility effects : May impair female fertility, based on animal data.

Target organs : Causes damage to the following organs: central nervous system (CNS).

: No known significant effects or critical hazards.

May cause damage to the following organs: skin, eyes.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

reduced fetal weight increase in fetal deaths skeletal malformations

Ingestion : Adverse symptoms may include the following:

reduced fetal weight increase in fetal deaths skeletal malformations

Skin : Adverse symptoms may include the following:

> irritation redness

reduced fetal weight increase in fetal deaths skeletal malformations

: Adverse symptoms may include the following: Eyes pain or irritation

watering redness reduced fetal weight increase in fetal deaths skeletal malformations

Medical conditions

: Pre-existing disorders involving any target organs mentioned in this MSDS as being at

aggravated by overrisk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
dimethyl sulfoxide	67-68-5	98 - 100

Canada

1/12

Name	CAS number	%
dimethyl sulfoxide	67-68-5	98 - 100

2/12

11/10/2011.

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3. Composition/information on ingredients

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

4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention immediately.

: 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.

: No specific treatment. Treat symptomatically. Contact poison treatment specialist Notes to physician

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Protection of first-aiders

Flammability of the product : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

Extinguishing media

Suitable : Use dry chemical, CO2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards

: 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. Move containers from fire area if this can be done without risk. Use water

spray to keep fire-exposed containers cool.

Hazardous thermal decomposition products : Decomposition products may include the following materials:

carbon dioxide carbon monoxide

sulfur oxides

Special protective equipment for fire-fighters

Special remarks on fire hazards

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

: Combustible when exposed to heat or flame. Upon heating above 100°C (212°F), sulfur dioxide is emitted. When DMSO undergoes hazardous thermo-oxidative degradation it may produce formaldehyde, methyl mercaptan, and sulfur dioxide. The vapour is heavier

than air and may travel along the ground; distant ignition possible.

Special remarks on explosion hazards

: Vapors may form explosive mixtures with air.

Dimethyl Sulfoxide (DMSO)

6. Accidental release measures

Personal precautions

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. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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. Use spark-proof tools and explosionproof equipment. 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). Use spark-proof tools and explosion-proof equipment. 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.

7. Handling and storage

Handling

Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

: Store between the following temperatures: 20 to 25°C (68 to 77°F). Store in accordance with local regulations. Store in a segregated and approved area. 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. Eliminate all ignition sources. Separate from oxidizing materials. 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.

11/10/2011. 3/12 11/10/2011. 4/12

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8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
dimethyl sulfoxide	AIHA WEEL (United States, 5/2010). TWA: 250 ppm 8 hour(s).

Canada

Occupational exposure limit	<u>s</u>	TWA (8 hours)		STEL (15 mins	;)	Ceilin	g		
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
dimethyl sulfoxide	US AIHA 5/2010	250	-	-	-	-	-	-	-		

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

: 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. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

Skin

11/10/2011.

: 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

Eyes

: 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 or

: Personal protective equipment for the body should be selected based on the task being

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be

performed and the risks involved and should be approved by a specialist before handling

necessary to reduce emissions to acceptable levels. Other protection : Nitrile gloves have been found to dissolve rapidly when in contact with DMSO.

9. Physical and chemical properties

Physical state : Liquid. [Hygroscopic.]

Flash point : Closed cup: 87°C (188.6°F) [Setaflash.]

Auto-ignition temperature : 215°C (419°F) Flammable limits : Lower: 2.6% Upper: 42% Color : Colorless. Clear.

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Dimethyl Sulfoxide (DMSO)

9. Physical and chemical properties

: ALMOST ODORLESS [Slight] Odor : Bitter. Sweetish. [Slight] Taste

Molecular weight : 78.14 g/mole Molecular formula : C2-H6-O-S Boiling/condensation point : 189°C (372.2°F) Melting/freezing point : 18.5°C (65.3°F)

Relative density : 11

Vapor pressure : 0.059 kPa (0.4455 mm Hg) [20°C]

Vapor density : 2.7 [Air = 1] Volatility : 100% (v/v)

: 0.026 (butyl acetate = 1) **Evaporation rate** Viscosity : Dynamic: 2.47 mPa·s (2.47 cP)

Solubility : Easily soluble in the following materials: cold water and hot water. Soluble in the following materials: diethyl ether and acetone

10. Stability and reactivity

Chemical stability : The product is stable

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld,

braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials:

oxidizing materials

Hazardous decomposition : Under normal conditions of storage and use, hazardous decomposition products should

not be produced.

Possibility of hazardous : Under normal conditions of storage and use, hazardous reactions will not occur.

products reactions

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
dimethyl sulfoxide	LD50 Dermal LD50 Dermal LD50 Oral		>5000 mg/kg 40000 mg/kg 14500 mg/kg	- - -

Conclusion/Summary Not available

Chronic toxicity

Conclusion/Summary : Exposure can cause stomach pains, vomiting and diarrhea. Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and

blood, resulting in impaired functions and lesions of blood cells.

Irritation/Corrosion

5/12

Product/ingredient name	Result	Species	Score	Exposure	Observation
dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-

11/10/2011. 6/12

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11. Toxicological information

Conclusion/Summary

: Not available.

<u>Sensitizer</u>

: Not available.

Conclusion/Summary Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
dimethyl sulfoxide	Equivocal - Subcutaneous - TDLo	Rat	220 g/kg	82 weeks Intermittent
	Equivocal - Subcutaneous - TDLo	Mouse	66 g/kg	66 weeks Intermittent
	Equivocal - Oral - TDLo	Rat	59 g/kg	81 weeks Intermittent
	Equivocal - Oral - TDLo	Mouse	65340 mg/kg	66 weeks Intermittent

Conclusion/Summary

: Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
dimethyl sulfoxide	-	-	-	None.	-	None.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
dimethyl sulfoxide	Cytogenetic Analysis	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic	Positive
	Cytogenetic Analysis	Experiment: In vivo Subject: Mammalian-Animal	Positive
	Mutation in Microorganisms	Subject: Bacteria	Positive

Conclusion/Summary

Teratogenicity

: Not available.

Conclusion/Summary

: Not available. Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
dimethyl sulfoxide	-	-	Positive	Mouse - Female	Intraperitoneal: 5500 mg/kg	-
	-	Positive	-	Rat	Intraperitoneal: 6600	-
	-	Positive	-	Rat	mg/kg Subcutaneous: 30750 mg/kg	-
	-	Positive	Positive	Mouse	Oral: 16	-
	-	-	Positive	Mammal - species unspecified - Female	mg/kg Intraperitoneal: 5500 mg/kg	-
	-	Positive	-	Rat	Intraperitoneal: 56 g/kg	-

Conclusion/Summary

: Not available.

Canada

Acute toxicity

11/10/2011.

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Dimethyl Sulfoxide (DMSO)

11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
			>5000 mg/kg 40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary

: Exposure can cause stomach pains, vomiting and diarrhea. Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and blood, resulting in impaired functions and lesions of blood cells.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-

Conclusion/Summary

: Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
dimethyl sulfoxide	Equivocal - Subcutaneous - TDLo	Rat		82 weeks Intermittent
	Equivocal - Subcutaneous - TDLo	Mouse		66 weeks Intermittent
	Equivocal - Oral - TDLo	Rat		81 weeks Intermittent
	Equivocal - Oral - TDLo	Mouse	65340 mg/kg	66 weeks Intermittent

Conclusion/Summary : Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
dimethyl sulfoxide	-	-	-	None.	-	None.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
dimethyl sulfoxide	Cytogenetic Analysis	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic	Positive
	Cytogenetic Analysis	Experiment: In vivo Subject: Mammalian-Animal	Positive
	Mutation in Microorganisms	Subject: Bacteria	Positive

Conclusion/Summary

Teratogenicity Conclusion/Summary : Not available.

Reproductive toxicity

7/12

11/10/2011.

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: Not available.

8/12

11. Toxicological information

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
dimethyl sulfoxide	-	-	Positive	Mouse - Female	Intraperitoneal: 5500	-
	-	Positive	-	Rat	mg/kg Intraperitoneal: 6600	-
	-	Positive	Positive	Mouse	mg/kg Oral: 16	-
	-	Positive	-	Rat	mg/kg Subcutaneous: 30750 mg/kg	-
	-	-	Positive	Mammal - species unspecified - Female	Intraperitoneal: 5500 mg/kg	-
	-	Positive	-	Rat	Intraperitoneal: 56 g/kg	-

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity : Not readily biodegradable. This product shows a low bioaccumulation potential.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
	Acute EC50 12350 to 25500 mg/L Acute EC50 7000 mg/L Acute LC50 25000 ppm Fresh water	Algae Daphnia Daphnia - Daphnia magna - Neonate - <24 hours	96 hours 24 hours 48 hours
	Acute LC50 33500 mg/L Acute LC50 34000 mg/L Acute LC50 35000 mg/L Chronic NOEC <0.1 g/L Fresh water	Fish Fish Fish - Danio rerio - Embryo - 4 to 6 hours	96 hours 96 hours 96 hours 30 days

Conclusion/Summary : Not available.

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
dimethyl sulfoxide	Japanese MITI Test	3 % - 14 days		30 mg/l Activated sludge

Conclusion/Summary : Not available

<u>Canada</u>

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
dimethyl sulfoxide	Acute EC50 12350 to 25500 mg/L Acute EC50 7000 mg/L Acute LC50 25000 ppm Fresh water	Algae Daphnia Daphnia - Daphnia magna - Neonate - <24 hours	96 hours 24 hours 48 hours
	Acute LC50 33500 mg/L Acute LC50 34000 mg/L Acute LC50 35000 mg/L Chronic NOEC <0.1 g/L Fresh water	Fish Fish Fish - Danio rerio - Embryo - 4 to 6 hours	96 hours 96 hours 96 hours 30 days

11/10/2011. 9/12

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Dimethyl Sulfoxide (DMSO)

12. Ecological information

Conclusion/Summary : Not available

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
dimethyl sulfoxide	Japanese MITI Test	3 % - 14 days	0	30 mg/l Activated sludge

Conclusion/Summary : Not available
Partition coefficient: n- : -1.35

octanol/water

.

Bioconcentration factor

actor : <1

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

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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 emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	NA1993	Combustible liquid, n.o.s. (Dimethyl Sulfoxide)	Combustible liquid.	III
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Combustible liquid Irritating material

Target organ effects

U.S. Federal regulations : T

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): This material is listed or exempted.

11/10/2011. 10/12

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15. Regulatory information

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: dimethyl sulfoxide

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: dimethyl sulfoxide: Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Air Act Section

112(b) Hazardous Air Pollutants (HAPs)

: Not listed

: Not listed

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed Class II Substances

DEA List I Chemicals (Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

Massachusetts : This material is not listed **New York** : This material is not listed : This material is listed **New Jersey** Pennsylvania : This material is listed

United States inventory

(TSCA 8b)

Canada

WHMIS (Canada) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C

: This material is listed or exempted.

Canadian lists

Canadian NPRI : This material is not listed **CEPA Toxic substances** : This material is not listed

Canada inventory : This material is listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): This material is listed or exempted.

China inventory (IECSC): This material is listed or exempted. Japan inventory: This material is listed or exempted. Korea inventory: This material is listed or exempted.

New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted.

Philippines inventory (PICCS): This material is listed or exempted.

16. Other information

Label requirements COMBUSTIBLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE

REPRODUCTIVE HAZARD - MAY CAUSE ADVERSE REPRODUCTIVE EFFECTS IN

FEMALES, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.)

11/10/2011.

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11/12

Dimethyl Sulfoxide (DMSO)

16. Other information Flammability 0 Physical hazards

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : 11/10/2011. Date of issue : 11/10/2011. Date of previous issue : 3/21/2011. Version : 1.02

Prepared by : MSDS (Regulatory Specialist)

▼Indicates information that has changed from previously issued version.

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.

11/10/2011. 12/12

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Material Safety Data Sheet

30% PEG

1. Product and company identification

Product name : 30% PEG

: Thermo Fisher Scientific Supplier Pierce Biotechnology P O Box 117

> Rockford, IL 61105 United States 815.968.0747 or

800.874.3723

Code : 1862295 MSDS# 8446 Validation date : 10/4/2012. Print date : 10/4/2012. Responsible name

MSDS Specialist CHEMTREC:

800.424.9300 **OUTSIDE US:** 703.527.3887

Material uses

Manufacturer

Refer to the instruction booklet for proper and intended use. Otherwise. contact supplier for specific

: Thermo Fisher Scientific

Pierce Biotechnology

Rockford, IL 61105

P O Box 117

United States

800.874.3723

815.968.0747 or

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid. [Viscous liquid.]

Color : Clear. Odor : Odorless

Hazard statements : CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE. BASED ON

ANIMAL DATA.

: Do not breathe vapor or mist. Do not eat, drink or smoke when using this product. **Precautionary measures**

Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : No known significant effects or critical hazards. Ingestion : No known significant effects or critical hazards. Skin : No known significant effects or critical hazards. Eves : No known significant effects or critical hazards.

Potential chronic health effects

10/4/2012.

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30% PEG

2. Hazards identification

Chronic effects : Contains material that may cause target organ damage, based on animal data.

: No known significant effects or critical hazards. Carcinogenicity Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: kidneys, bladder.

Over-exposure signs/symptoms

Inhalation : No specific data. Ingestion : No specific data. Skin : No specific data. Eyes : No specific data.

Medical conditions

: Pre-existing disorders involving any target organs mentioned in this MSDS as being at

CAS number

2/

aggravated by overrisk may be aggravated by over-exposure to this product.

exposure

Name

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Poly(ethylene glycol)	25322-68-3	25 - 45
Canada		
Name	CAS number	%
Poly(ethylene glycol)	25322-68-3	25 - 45

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section

4. First aid measures

Protection of first-aiders

10/4/2012.

1/

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water Eye contact

for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention immediately

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if Inhalation

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical

attention immediately.

: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

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4. First aid measures

Notes to physician

: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable : None known.

Special exposure hazards

: 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

Hazardous thermal decomposition products : Decomposition products may include the following materials:

carbon dioxide

carbon monoxide

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

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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.

7. Handling and storage

Handling

10/4/2012.

: Put on appropriate personal protective equipment (see Section 8). 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, Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.

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30% PEG

7. Handling and storage

Storage

: Do not store above the following temperature: -20°C (-4°F). 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. 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

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
Poly(ethylene glycol)	AIHA WEEL (United States, 5/2010).
	TWA: 10 mg/m ³ 8 hours. Form: Aerosol

Canada

Occupational exposure limits		TWA (8 hours)		STEL (15 mins)		Ceiling					
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
Poly(ethylene glycol)	US AIHA 5/2010	-	10	-	-	-	-	-	-	-	[a]

Form: [a]Aerosol

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of

hazardous substances will also be required.

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

3/

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.

4/

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8. Exposure controls/personal protection

Eyes

: 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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin

: 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.

Environmental exposure

controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

: Liquid. [Viscous liquid.] Physical state

Color : Clear. Odor : Odorless.

Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable Conditions to avoid : No specific data. Incompatible materials : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should

not be produced.

Possibility of hazardous reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

Acute toxicity

Г	Product/ingredient name	Result	Species	Dose	Exposure
Ī	Poly(ethylene glycol)	LD50 Oral	Rat	50000 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Poly(ethylene glycol)	-	-	-	None.	-	None.

10/4/2012. 5/

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30% PEG

11. Toxicological information

Mutagenicity

Conclusion/Summary

Teratogenicity

: Not available. : Not available.

Conclusion/Summary Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Poly(ethylene glycol)	LD50 Oral	Rat	50000 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Poly(ethylene glycol)	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary

: Not available.

Teratogenicity

Conclusion/Summary

: Not available.

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

Ecotoxicity

: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Poly(ethylene glycol)	Acute LC50 >1000000 μg/l Fresh water	Fish - Salmo salar - Parr	96 hours

Conclusion/Summary

: Not available. Persistence/degradability

Conclusion/Summary : Not available.

Canada

10/4/2012.

Aquatic ecotoxicity

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6/

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12. Ecological information

Product/ingredient name	Result	Species	Exposure
Poly(ethylene glycol)	Acute LC50 >1000000 μg/l Fresh water	Fish - Salmo salar - Parr	96 hours

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available

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

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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 emptied 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

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Target organ effects

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found. SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

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15. Regulatory information

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals (Precursor Chemicals)

: Not listed

DEA List II Chemicals (Essential Chemicals)

: Not listed

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed. **United States inventory** : All components are listed or exempted.

(TSCA 8b)

Canada

WHMIS (Canada)

: Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists

: Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted. Japan inventory: All components are listed or exempted. Korea inventory: All components are listed or exempted. Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

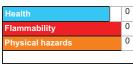
Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements

: CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

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10/4/2012.

7/

16. Other information



 Date of printing
 : 10/4/2012.

 Date of issue
 : 10/4/2012.

Date of previous issue : No previous validation.

Version :

Prepared by : MSDS Specialist

VIndicates information that has changed from previously issued version.

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.

10/4/2012.

9/



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: Thermo Fisher Scientific

Pierce Biotechnology

Rockford, IL 61105

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United States

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815.968.0747 or

The world leader in serving science

Material Safety Data Sheet

Cytidine (bis)phosphate Desthiobiotin

1. Product and company identification

Product name : Cytidine (bis)phosphate Desthiobiotin

Supplier : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117

Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

800.874.3723 : 1862772 8997 : 10/16/2012.

Print date : 10/16/2012.

Responsible name MSDS (Regulatory Specialist)

CHEMTREC: 800.424.9300 OUTSIDE US: 703.527.3887

Material uses

Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific

1/

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Code

MSDS#

Validation date

Physical state : Liquid.

Color : Colorless.
Odor : Odorless.

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the

standard (29 CFR 1910.1200), this MSDS contains valuable information critical to treated and proper use of the product. This MSDS should be retained and

Manufacturer

available for employees and other users of this product.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

 Inhalation
 : No known significant effects or critical hazards.

 Ingestion
 : No known significant effects or critical hazards.

 Skin
 : No known significant effects or critical hazards.

 Eyes
 : No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

10/16/2012.

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Cytidine (bis)phosphate Desthiobiotin

2. Hazards identification

 Carcinogenicity
 : No known significant effects or critical hazards.

 Mutagenicity
 : No known significant effects or critical hazards.

 Teratogenicity
 : No known significant effects or critical hazards.

 Developmental effects
 : No known significant effects or critical hazards.

 Fertility effects
 : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data.
Ingestion : No specific data.
Skin : No specific data.
Eyes : No specific data.
Wedical conditions : None known.

aggravated by overexposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water

for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

2/

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable : None known

Special exposure hazards : 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.

Hazardous thermal : No specific data.

decomposition products

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Cytidine (bis)phosphate Desthiobiotin

5. Fire-fighting measures

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.

6. Accidental release measures

Personal precautions

: 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. Put on appropriate personal protective equipment (see Section 8).

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 for 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. 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: 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. 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.

8. Exposure controls/personal protection

Canada

Occupational exposure limits

No exposure limit value known

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

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8. Exposure controls/personal protection

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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

necessa

Eyes

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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin

: 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.

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid.

Color : Colorless.
Odor : Odorless.
pH : 6 to 8

Dispersibility properties : Dispersible in the following materials: methanol

Not dispersible in the following materials: diethyl ether and acetone.

Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable
Conditions to avoid : No specific data.
Incompatible materials : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

3/

10/16/2012. 4/4

Cytidine (bis)phosphate Desthiobiotin

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary : To the best of our knowledge, the toxicological properties of this product have not been

thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary : To the best of our knowledge, the toxicological properties of this product have not been

thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available

Mutagenicity

Conclusion/Summary : Not available

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

10/16/2012.

Aquatic ecotoxicity

Conclusion/Summary : Not available

Persistence/degradability

Conclusion/Summary : Not available.

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Cytidine (bis)phosphate Desthiobiotin

12. Ecological information

Canad

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined United States inventory (TSCA 8b): Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

6/

products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

5/

10/16/2012.

Cytidine (bis)phosphate Desthiobiotin

15. Regulatory information

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals

: Not listed : Not listed

(Precursor Chemicals)

DEA List II Chemicals

(Essential Chemicals)

State regulations

 Massachusetts
 : None of the components are listed.

 New York
 : None of the components are listed.

 New Jersey
 : None of the components are listed.

 Pennsylvania
 : None of the components are listed.

United States inventory

(TSCA 8b)

: Not determined.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : Not determined.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): Not determined.

China inventory (IECSC): Not determined.

Japan inventory: Not determined. Korea inventory: Not determined.

Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): Not determined.

Philippines inventory (PICCS): Not determined.

Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements

NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

10/16/2012.

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Cytidine (bis)phosphate Desthiobiotin

16. Other information



 Date of printing
 : 10/16/2012.

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 : 10/16/2012.

 Date of previous issue
 : 10/16/2012.

 Version
 : 1.01

Prepared by : MSDS (Regulatory Specialist)

▼Indicates information that has changed from previously issued version.

Notice to reader

7/

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.

10/16/2012.



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Material Safety Data Sheet

Glycogen

1. Product and company identification

Product name : Glycogen

Supplier Pierce Biotechnology P O Box 117 Rockford, IL 61105

United States 815.968.0747 or 800.874.3723

: Thermo Fisher Scientific

Code : 1862297 1896122

MSDS# 8447 Validation date : 10/4/2012. Print date : 10/4/2012.

Responsible name MSDS Specialist

CHEMTREC: 800.424.9300

OUTSIDE US: 703.527.3887

Material uses

Manufacturer

Refer to the instruction booklet for proper and intended use. Otherwise. contact supplier for specific applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid. Color : Colorless. Odor : Odorless

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

: While this material is not considered hazardous by the OSHA Hazard Communication OSHA/HCS status

> Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and

available for employees and other users of this product.

: Dermal contact, Eve contact, Ingestion. Routes of entry

Potential acute health effects

Inhalation : No known significant effects or critical hazards. Ingestion : No known significant effects or critical hazards. Skin : No known significant effects or critical hazards. : No known significant effects or critical hazards. Eves

Potential chronic health effects

10/4/2012.

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(815) 968-7316 Fax Pierce Biotechnology Inc.

Glycogen

2. Hazards identification

Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data. Ingestion : No specific data. Skin : No specific data. Eves : No specific data. **Medical conditions** : None known.

aggravated by over-

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water Eye contact

for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if Inhalation

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

10/4/2012.

1/

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

Not suitable : None known

Special exposure hazards : 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

2/

training.

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Glycogen

5. Fire-fighting measures

Hazardous thermal decomposition products : Decomposition products may include the following materials: carbon dioxide

carbon monoxide

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.

6. Accidental release measures

Personal precautions

: 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. Put on appropriate personal protective equipment (see Section 8).

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 for 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. 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: Do not store above the following temperature: -20°C (-4°F). 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. 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.

8. Exposure controls/personal protection

Canada

10/4/2012.

Occupational exposure limits

No exposure limit value known

Consult local authorities for acceptable exposure limits.

Glycogen

8. Exposure controls/personal protection

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: No special ventilation requirements, Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

Eves

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

: 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 or dusts. If contact is possible, the following protection should be worn, unless the

Skin

Odor

assessment indicates a higher degree of protection: safety glasses with side-shields. : 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.

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

: Odorless

Physical state : Liquid. Color : Colorless.

Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

: The product is stable. Chemical stability Conditions to avoid : No specific data. Incompatible materials : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous

4/

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions 10/4/2012.

3/

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Glycogen

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary

: Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary

: Not available.

Mutagenicity

Conclusion/Summary

: Not available.

: Not available.

Teratogenicity

: Not available. Conclusion/Summary

Reproductive toxicity

Conclusion/Summary : Not available

Canada

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

(815) 968-7316 Fax

Chronic toxicity

Conclusion/Summary

Irritation/Corrosion

Conclusion/Summary : Not available

Sensitizer : Not available.

Conclusion/Summary

Carcinogenicity : Not available.

Conclusion/Summary

Mutagenicity : Not available.

Conclusion/Summary Teratogenicity

10/4/2012.

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Pierce Biotechnology Inc.

Glycogen

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

: Not available. Conclusion/Summary

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

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

10/4/2012.

HCS Classification : Not regulated

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined U.S. Federal regulations

United States inventory (TSCA 8b): All components are listed or exempted.

6/

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15. Regulatory information

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: No products were found. SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals

(Precursor Chemicals)

DEA List II Chemicals : Not listed

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(Essential Chemicals)

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed. United States inventory : All components are listed or exempted.

: Not listed

(TSCA 8b)

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: Not determined.

PO Box 117

Korea inventory: All components are listed or exempted. Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

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Taiwan inventory (CSNN): Not determined.

16. Other information

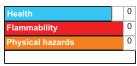
Label requirements

Glycogen

: NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material

Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



: 10/4/2012. Date of printing : 10/4/2012. Date of issue

Date of previous issue : No previous validation.

Version

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

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 quarantee that these are the only hazards that exist.

10/4/2012. 10/4/2012. 7/

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8/



MSDS #9001 COVER SHEET

20164Y	RBP Enrichment Module
Component #	Description
1862766	Streptavidin Magnetic Beads
1862767	1X RNA Capture Buffer
1862183	50% Glycerol
1862768	20mM Tris (pH 7.5)
1862769	10X Protein-RNA Binding Buffer
1862770	1X Wash Buffer
1862771	Biotin Elution Buffer
1862775	Anti-HuR MAb



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Material Safety Data Sheet

Pierce® Streptavidin Magnetic Beads

1. Product and company identification

Product name : Pierce® Streptavidin Magnetic Beads

Supplier : Thermo Fisher Scientific
Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

300.874.3723

: 0088816 0088817 1862766 1896489

MSDS # 8037
Validation date : 10/17/2012.
Print date : 10/17/2012.

Responsible name MSDS Specialist

CHEMTREC: 800.424.9300 OUTSIDE US: 703.527.3887 Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.

1/

: Thermo Fisher Scientific

Pierce Biotechnology

Rockford, IL 61105

P O Box 117

United States

800.874.3723

815.968.0747 or

Product type : Liquid.

2. Hazards identification

Emergency overview

Code

Physical state : Liquid. [Suspension.]

Color : Brown.

Hazard statements : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

Precautionary measures : Avoid breathing vapor or mist. Use only with adequate ventilation. Avoid contact with

eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after handling.

While this material is not considered hazardous by the OSHA Hazard Communication

Manufacturer

Material uses

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and

available for employees and other users of this product.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

 Inhalation
 : Slightly irritating to the respiratory system.

 Ingestion
 : No known significant effects or critical hazards.

Skin : Slightly irritating to the skin.

Eyes : Slightly irritating to the eyes.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

10/17/2012.

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2. Hazards identification

 Carcinogenicity
 : No known significant effects or critical hazards.

 Mutagenicity
 : No known significant effects or critical hazards.

 Teratogenicity
 : No known significant effects or critical hazards.

 Developmental effects
 : No known significant effects or critical hazards.

 Fertility effects
 : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

irritation redness

Eves : Adverse symptoms may include the following:

irritation watering redness : None known.

Medical conditions aggravated by over-

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical

attention immediately.

Protection of first-aiders

: No action shall be taken involving any personal risk or without suitable training. It may

2/

be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

10/17/2012.

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5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable

: Use an extinguishing agent suitable for the surrounding fire.

Not suitable

Special exposure hazards

: 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

Hazardous thermal decomposition products

Special protective equipment for fire-fighters : No specific data.

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

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.

Storage

: Store between the following temperatures: 2 to 8°C (35.6 to 46.4°F). 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. 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.

10/17/2012.

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Pierce® Streptavidin Magnetic Beads

8. Exposure controls/personal protection

Occupational exposure limits No exposure limit value known

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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

Eyes

: 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 or

Skin

: 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.

Environmental exposure

controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

4/

9. Physical and chemical properties

Physical state : Liquid. [Suspension.]

Color : Brown. : 7

Dispersibility properties : Partially dispersible in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability

: The product is stable.

Conditions to avoid Incompatible materials : No specific data. : No specific data.

Hazardous decomposition products

3/

: Under normal conditions of storage and use, hazardous decomposition products should

not be produced.

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10. Stability and reactivity

Possibility of hazardous reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been

thoroughly investigated.

Chronic toxicity

Conclusion/Summary

: Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary

: Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been

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thoroughly investigated.

PO Box 117

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available

Life Science Research

Pierce® Streptavidin Magnetic Beads

12. Ecological information

Ecotoxicity

: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

- - - -

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary

: Not expected to bioaccumulate.

012 BCF = 35

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not expected to bioaccumulate.

012 BCF = 35

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

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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 emptied 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.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information			Classes	PG*				
DOT Classification	Not regulated.	-	-	-				
IATA-DGR Class	Not regulated.	-	-	-				

PG* : Packing group

10/17/2012. 5/4 10/17/2012. 6/4

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15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): Not determined.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found. SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed.

United States inventory

: Not determined. (TSCA 8b)

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed.

Canada inventory : Not determined.

Life Science Research

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): Not determined.

PO Box 117

China inventory (IECSC): All components are listed or exempted.

Japan inventory: Not determined.

Korea inventory: Not determined.

New Zealand Inventory of Chemicals (NZIoC): Not determined.

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Philippines inventory (PICCS): Not determined.

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16. Other information

Label requirements

: MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION

Hazardous Material

Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : 10/17/2012. Date of issue : 10/17/2012. Date of previous issue : 10/16/2012. Version : 1.02

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

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.

10/17/2012. 10/17/2012. 7/ 8/

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Material Safety Data Sheet

1X RNA Capture Buffer

1. Product and company identification

Product name : 1X RNA Capture Buffer

Supplier : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117

Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Code : 1862767 MSDS # 9006 Validation date : 10/17/2012.

Print date : 10/17/2012.

Responsible name MSDS Specialist

CHEMTREC: 800.424.9300

800.424.9300 OUTSIDE US: 703.527.3887 Manufacturer

: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Material uses Refer to the instruction

booklet for proper and intended use. Otherwise, contact supplier for specific

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid.
Odor : Odorless.
Signal word : WARNING!

Hazard statements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL

DATA

Precautionary measures : Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or

smoke when using this product. Avoid contact with eves, skin and clothing. Keep

container tightly closed. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Irritating to respiratory system.

Ingestion : No known significant effects or critical hazards.

Skin : Irritating to skin.

Eyes : Irritating to eyes.

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1X RNA Capture Buffer

2. Hazards identification

Potential chronic health effects

Chronic effects : Contains material that may cause target organ damage, based on animal data.

 Carcinogenicity
 : No known significant effects or critical hazards.

 Mutagenicity
 : No known significant effects or critical hazards.

 Teratogenicity
 : No known significant effects or critical hazards.

 Developmental effects
 : No known significant effects or critical hazards.

 Fertility effects
 : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: skin, eyes,

stomach.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

irritation

Eyes : Adverse symptoms may include the following:

pain or irritation watering

Medical conditions : Pre-existing disorders involving any target organs mentioned in this MSDS as being at

aggravated by overrisk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name		CAS number %					
	sodium chloride	7647-14-5	5 - 7				

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

4. First aid measures

Eye contact

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention immediately.

Skin contact

10/17/2012.

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed pers

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical

personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

2/

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4. First aid measures

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.

Notes to physician

: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable

: Use an extinguishing agent suitable for the surrounding fire.

Not suitable

Special exposure hazards

: 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

Hazardous thermal decomposition products : Decomposition products may include the following materials:

halogenated compounds

metal oxide/oxides

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.

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8)

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 for 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.

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7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.

Storage

: 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. 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.

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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.

Eyes

10/17/2012.

: 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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

4/

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8. Exposure controls/personal 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.

Environmental exposure

controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid. Odor : Odorless. рΗ : 6 to 8

Dispersibility properties : Dispersible in the following materials: cold water and hot water. Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable Conditions to avoid : No specific data. Incompatible materials : No specific data.

Hazardous decomposition

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous

products reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sodium chloride	LD50 Dermal	Rabbit	10000 mg/kg	-
	LD50 Oral	Rat	3000 mg/kg	-
	LDLo Intra-arterial	Guinea pig	300 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary : Not available

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
sodium chloride	Eyes - Moderate irritant	Rabbit		24 hours 100 milligrams	-
	Eyes - Moderate irritant Skin - Mild irritant	Rabbit Rabbit	-	10 milligrams 24 hours 500 milligrams	-

Conclusion/Summary

Sensitizer

: Not available.

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary : Not available.

10/17/2012.

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11. Toxicological information

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sodium chloride	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary

: Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary

: Not available.

Irritation/Corrosion

Conclusion/Summary

: Not available.

Sensitizer

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sodium chloride	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity United States

5/

: No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
sodium chloride	Acute EC50 2430000 µg/l Fresh water Acute LC50 1042 mg/l Fresh water	Algae - Navicula seminulum Crustaceans - Ceriodaphnia dubia	96 hours 48 hours
	Acute LC50 1661 mg/l Fresh water Acute LC50 1000000 µg/l Fresh water Chronic NOEC 0.314 g/L Fresh water Chronic NOEC 100 mg/l Fresh water	Daphnia - Daphnia magna Fish - Morone saxatilis - Larvae Daphnia - Daphnia pulex Fish - Gambusia holbrooki - Adult	48 hours 96 hours 21 days 8 weeks

Conclusion/Summary : Not available

10/17/2012.

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12. Ecological information

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary

: Not available.

Persistence/degradability

Conclusion/Summary : Not available

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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 emptied 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.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*				
DOT Classification	Not regulated.	-	-	-				
IATA-DGR Class	Not regulated.	-	-	-				

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Irritating material

Target organ effects

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined U.S. Federal regulations

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: sodium chloride

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: sodium chloride: Immediate (acute) health hazard, Delayed (chronic) health hazard 1X RNA Capture Buffer

15. Regulatory information

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed. **United States inventory** : All components are listed or exempted.

(TSCA 8b) Canada

WHMIS (Canada)

: Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists

: Australia inventory (AICS): All components are listed or exempted. China inventory (IECSC): All components are listed or exempted.

Japan inventory: All components are listed or exempted. Korea inventory: All components are listed or exempted. Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

8/

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

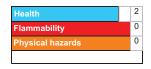
16. Other information

Label requirements

CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material

Information System (U.S.A.)



10/17/2012. 10/17/2012. 7/

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16. Other information

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



 Date of printing
 : 10/17/2012.

 Date of issue
 : 10/17/2012.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

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.

10/17/2012. 9/:



Part of Thermo Fisher Scientific

: Thermo Fisher Scientific

Pierce Biotechnology

The world leader in serving science

Material Safety Data Sheet

50% Glycerol

1. Product and company identification

Product name : 50% Glycerol

: Thermo Fisher Scientific Supplier Pierce Biotechnology P.O. Box 117 Rockford, IL 61105

United States 815.968.0747 or 800.874.3723

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Manufacturer

Code : 1862183 MSDS# 8266 Validation date : 3/22/2012. **Print date** : 3/22/2012. MSDS Specialist Responsible name

> CHEMTREC: 800.424.9300 **OUTSIDE US:** 703.527.3887

Material uses Refer to the instruction booklet for proper and

intended use. Otherwise. contact supplier for specific

applications.

Product type : Liquid

2. Hazards identification

Emergency overview

Physical state : Liquid. Color : Clear. : Agreeable. Odor Signal word : CAUTION!

Hazard statements : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Precautionary measures : Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or

smoke when using this product. Avoid contact with eyes, skin and clothing. Keep

container tightly closed. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

: Dermal contact. Eye contact. Inhalation. Ingestion. Routes of entry

Potential acute health effects

Inhalation : Moderately irritating to the respiratory system. Ingestion : No known significant effects or critical hazards.

: Moderately irritating to the skin. Skin Eyes : Moderately irritating to eyes.

Potential chronic health effects

3/22/2012.

Chronic effects : Contains material that can cause target organ damage

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2. Hazards identification

Carcinogenicity : No known significant effects or critical hazards. : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: kidneys, liver,

gastrointestinal tract, upper respiratory tract, skin, eyes

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

> irritation redness

Eyes : Adverse symptoms may include the following:

irritation watering

Medical conditions

: Pre-existing disorders involving any target organs mentioned in this MSDS as being at aggravated by overrisk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
glycerol	56-81-5	45 - 65

<u>Canada</u>								
	Name	CAS number	%					
	glycerol	56-81-5	45 - 65					

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

4. First aid measures

Eve contact

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

Skin contact

Ingestion

1/9

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

2/9

immediately.

: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical

attention immediately.

3/22/2012.

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4. First aid measures

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation

Notes to physician

: No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable

: Use an extinguishing agent suitable for the surrounding fire.

Not suitable

None known

Special exposure hazards

: 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

Hazardous thermal decomposition products : Decomposition products may include the following materials:

carbon dioxide

carbon monoxide

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.

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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.

7. Handling and storage

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3747 N. Meridian Road

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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

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50% Glycerol

7. Handling and storage

: Do not store above the following temperature: -20°C (-4°F). 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. 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

8. Exposure controls/personal protection

Ingredient	Exposure limits
glycerol	ACGIH TLV (United States, 2/2010). TWA: 10 mg/m³ 8 hour(s). Form: Inhalable fraction ACGIH (United States). TWA: 10 mg/m³ OSHA PEL (United States, 6/2010). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 15 mg/m³ 8 hour(s). Form: Total dust
	OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 10 mg/m³ 8 hour(s). Form: Total dust OSHA PEL (United States). TWA: 15 mg/m³ 8 hour(s). Form: Total dust ACGIH TLV (United States). TWA: 10 mg/m³ 8 hour(s). Form: Total particulates OSHA PEL (United States). Notes: Respirable TWA: 15 mg/m³ 8 hour(s).

Canada

Occupational exposure limits		TWA	TWA (8 hours)		STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
glycerol	US ACGIH 2/2010 US ACGIH AB 4/2009 BC 9/2010 ON 7/2010 QC 6/2008	-	10 10 10 10 3 10	-	- - - - -	-	- - - - -	- - - - -	- - - - -	-	[a] [b] [3] [c] [c] [d] [a] [e]

[3]Skin sensitization

Form: [a]Inhalable fraction [b]Total particulates [c]Mist [d]Respirable mist [e]mist

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

3/22/2012. 3/22/2012. 3/9 4/9 Rockford II (815) 968-0747

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8. Exposure controls/personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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

Eyes

: 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 or

Skin

: 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

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid. Color : Clear Odor : Agreeable.

Dispersibility properties Solubility

: Partially dispersible in the following materials: cold water and hot water. : Partially soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability Conditions to avoid Incompatible materials : The product is stable : No specific data. : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
	LD50 Dermal LD50 Oral		>21900 mg/kg 12600 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
	Sub-chronic TD50 Oral Sub-chronic TD50 Oral	Rat Rat	96 g/kg	28 days Continuous 30 days Intermittent

Conclusion/Summary

: Not available.

Irritation/Corrosion

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50% Glycerol

11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
glycerol	Eyes - Mild irritant	Rabbit		24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit		24 hours 500 milligrams	-

Conclusion/Summary

: Not available

Sensitizer

Conclusion/Summary : Not available

Carcinogenicity

Conclusion/Summary : Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
glycerol	-	-	-	-	-	None.

Mutagenicity

Conclusion/Summary

: Not available

Teratogenicity

Conclusion/Summary

: Not available

Reproductive toxicity

Conclusion/Summary : Not available

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	LD50 Dermal	Rat	>21900 mg/kg	-
	LD50 Oral	Rat	12600 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
glycerol	Sub-chronic TD50 Oral	Rat		28 days Continuous
	Sub-chronic TD50 Oral	Rat		30 days Intermittent

Conclusion/Summary

: Not available

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
glycerol	Eyes - Mild irritant	Rabbit		24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit		24 hours 500 milligrams	-

Conclusion/Summary Sensitizer

: Not available

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary

: Not available.

Classification

5/9

3/22/2012. 6/9

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11. Toxicological information

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
glycerol	-	-	-	-	-	None.

Mutagenicity

Conclusion/Summary : Not available

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
glycerol	Acute LC50 51 to 57 ml/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary

: Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
glycerol	Acute LC50 51 to 57 ml/L Fresh water	Fish - Oncorhynchus mykiss	96 hours

Conclusion/Summary

Persistence/degradability

Conclusion/Summary : Not available.

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

: Not available

13. Disposal considerations

Waste disposal

3/22/2012.

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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 emptied 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.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

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50% Glycerol

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

HCS Classification : Irritating material

Target organ effects

U.S. Federal regulations TSCA 8(a) IUR Exempt/Partial exemption: All components are listed or exempted.

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: glycerol

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

glycerol: Immediate (acute) health hazard. Delayed (chronic) health hazard

Clean Air Act Section 112(b) Hazardous Air

Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals

(Precursor Chemicals)

DEA List II Chemicals

(Essential Chemicals)

State regulations

Massachusetts : The following components are listed: GLYCERINE MIST

New York : None of the components are listed.

Not listed

: Not listed

: Not listed

New Jersey : The following components are listed: Glycerin

Pennsylvania : The following components are listed: 1,2,3-PROPANETRIOL

United States inventory : All components are listed or exempted. (TSCA 8b)

Canada

7/9

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

3/22/2012.

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8/9

15. Regulatory information

International lists

: Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.

Korea inventory: All components are listed or exempted.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

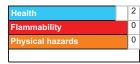
16. Other information

Label requirements

: MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : 3/22/2012.

Date of issue : 3/22/2012.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

▼Indicates information that has changed from previously issued version.

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.

3/22/2012. 9/9



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Material Safety Data Sheet

20 mM Tris (pH 7.5)

1. Product and company identification

Product name : 20 mM Tris (pH 7.5)

Supplier : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117

Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Code : 1862768 MSDS # 9005 Validation date : 10/17/2012. Print date : 10/17/2012.

Responsible name MSDS Specialist

CHEMTREC: 800.424.9300

OUTSIDE US: 703.527.3887

Material uses

Manufacturer

Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.

: Thermo Fisher Scientific

Pierce Biotechnology

Rockford, IL 61105

P O Box 117

United States

800.874.3723

815.968.0747 or

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid.
Odor : Odorless.

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication
Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the

standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and

available for employees and other users of this product.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

 Inhalation
 : No known significant effects or critical hazards.

 Ingestion
 : No known significant effects or critical hazards.

 Skin
 : No known significant effects or critical hazards.

 Eyes
 : No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects: No known significant effects or critical hazards.

Carcinogenicity: No known significant effects or critical hazards.

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20 mM Tris (pH 7.5)

2. Hazards identification

 Mutagenicity
 : No known significant effects or critical hazards.

 Teratogenicity
 : No known significant effects or critical hazards.

 Developmental effects
 : No known significant effects or critical hazards.

 Fertility effects
 : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data.
Ingestion : No specific data.
Skin : No specific data.
Eyes : No specific data.
Wedical conditions : None known.

aggravated by overexposure

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur.

attention if symptoms occur

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air. If not breathing is fregular or if

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

oosen light cioth

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable : None known

Special exposure hazards : 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.

Hazardous thermal : No specific data.

decomposition products

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.

2/

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6. Accidental release measures

Personal precautions

: 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. Put on appropriate personal protective equipment (see Section 8).

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 for 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. 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: 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. 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.

8. Exposure controls/personal protection

Canada

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits

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20 mM Tris (pH 7.5)

8. Exposure controls/personal protection

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

Eves

Skin

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

necess

: 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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

: F

 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.

Environmental exposure : Emis

controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid.
Odor : Odorless.
pH : 6 to 8

Dispersibility properties
Solubility

Dispersible in the following materials: cold water and hot water.Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable
Conditions to avoid : No specific data.
Incompatible materials : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been the roughly investigated

thoroughly investigated.

Chronic toxicity

10/17/2012.

3/

Conclusion/Summary

: Not available.

Irritation/Corrosion

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4/

20 mM Tris (pH 7.5)

11. Toxicological information

Conclusion/Summary

: Not available

Sensitizer

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary : N

: Not available.

Mutagenicity

Conclusion/Summary

: Not available.

Teratogenicity

Conclusion/Summary

: Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary

: Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

Ecotoxicity: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

10/17/2012. 5/4

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20 mM Tris (pH 7.5)

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: No products were found. SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

6/

products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Act Section 602 . Not liste

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals

: Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

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20 mM Tris (pH 7.5)

15. Regulatory information

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

United States inventory : All components are listed or exempted.

(TSCA 8b) Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: All components are listed or exempted.

Korea inventory: All components are listed or exempted.

Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material

Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : **10/17/2012**. **Date of issue** : 10/17/2012.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

10/17/2012.

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20 mM Tris (pH 7.5)

16. Other information

Indicates information that has changed from previously issued version.

Notice to reader

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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.

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Material Safety Data Sheet

10X Protein-RNA Binding Buffer

1. Product and company identification

Product name : 10X Protein-RNA Binding Buffer

: Thermo Fisher Scientific Supplier Pierce Biotechnology

> P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Code : 1862769 9004 MSDS# Validation date : 10/17/2012. **Print date** : 10/17/2012.

Responsible name MSDS Specialist

> CHEMTREC: 800.424.9300

OUTSIDE US: 703.527.3887

Manufacturer

: Thermo Fisher Scientific Pierce Biotechnology P O Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Material uses Refer to the instruction

booklet for proper and intended use. Otherwise, contact supplier for specific

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid. Odor : Odorless. : WARNING! Signal word

: CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION, CONTAINS Hazard statements

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Precautionary measures

: Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep

container tightly closed. Wash thoroughly after handling.

: This material is considered hazardous by the OSHA Hazard Communication Standard OSHA/HCS status

(29 CFR 1910.1200).

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation ; Irritating to respiratory system. Exposure to decomposition products may cause a

health hazard. Serious effects may be delayed following exposure.

Ingestion : No known significant effects or critical hazards.

Skin : Irritating to skin. : Irritating to eyes. Eyes

10/17/2012. 1/

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10X Protein-RNA Binding Buffer

2. Hazards identification

Potential chronic health effects

Chronic effects : Contains material that can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards. : No known significant effects or critical hazards. Mutagenicity Teratogenicity : No known significant effects or critical hazards. **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

: Contains material which causes damage to the following organs: mucous membranes, Target organs

Contains material which may cause damage to the following organs: kidneys, liver,

stomach.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

irritation

: Adverse symptoms may include the following: Eyes

pain or irritation watering redness

: Pre-existing disorders involving any target organs mentioned in this MSDS as being at Medical conditions

risk may be aggravated by over-exposure to this product. aggravated by over-

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
trometamol	7647-14-5 77-86-1 9005-64-5	1 - 3 1 - 3 0.1 - 1

Canada

Name	CAS number	%
trometamol	77-86-1	1 - 3

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

10/17/2012. 2/

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4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if Inhalation

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention

immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention immediately

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.

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.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable : None known

Special exposure hazards : 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

Hazardous thermal decomposition products : Decomposition products may include the following materials:

carbon dioxide carbon monoxide nitrogen oxides

halogenated compounds

metal oxide/oxides

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.

6. Accidental release measures

Personal precautions : 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8)

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 for 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.

10/17/2012. 3/

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10X Protein-RNA Binding Buffer

6. Accidental release measures

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.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.

Storage

: 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. 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.

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring

procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

10/17/2012. 4/

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8. Exposure controls/personal protection

Hands

: 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.

Eyes

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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin

: 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.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid. Odor : Odorless.

: 6 to 8

Dispersibility properties : Dispersible in the following materials: cold water and hot water Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable Conditions to avoid : No specific data. Incompatible materials : No specific data.

Hazardous decomposition

products

Possibility of hazardous

reactions

: Under normal conditions of storage and use, hazardous decomposition products should

: Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sodium chloride	LD50 Dermal LD50 Oral LDLo Intra-arterial	Rat	10000 mg/kg 3000 mg/kg 300 mg/kg	-

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary

Irritation/Corrosion

: Not available.

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11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
Sorbitan monolaurate, ethoxylated	Skin - Mild irritant	Human	-	72 hours 15 milligrams Intermittent	-
sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
trometamol	Skin - Moderate irritant	Rabbit	-	25 Percent	-
	Skin - Severe irritant	Rabbit	-	500 milligrams	-
	Skin - Moderate irritant	Woman	-	1 Percent	-

Conclusion/Summary

: Not available.

Sensitizer

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary

: Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sodium chloride	-	-	-	None.	-	None.
trometamol	-	-	-	None.	-	None.
Sorbitan monolaurate,	-	-	-	None.	-	None.
ethoxylated						

Mutagenicity

Conclusion/Summary

Teratogenicity

Conclusion/Summary

: Not available.

: Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary

: Not available.

: Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
trometamol	Skin - Moderate irritant	Rabbit	-	25 Percent	-
	Skin - Severe irritant	Rabbit	-	500 milligrams	-
	Skin - Moderate irritant	Woman	-	1 Percent	-

6/

Conclusion/Summary

Sensitizer

5/

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available

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11. Toxicological information

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
sodium chloride trometamol	-	-	-	None. None.		None. None.
Sorbitan monolaurate, ethoxylated	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

Ecotoxicity

: No known significant effects or critical hazards

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
sodium chloride	Acute EC50 2430000 µg/l Fresh water Acute LC50 1042 mg/l Fresh water	Algae - Navicula seminulum Crustaceans - Ceriodaphnia dubia	96 hours 48 hours
	Acute LC50 1661 mg/l Fresh water Acute LC50 1000000 µg/l Fresh water Chronic NOEC 0.314 g/L Fresh water Chronic NOEC 100 mg/l Fresh water	Daphnia - Daphnia magna Fish - Morone saxatilis - Larvae Daphnia - Daphnia pulex Fish - Gambusia holbrooki - Adult	48 hours 96 hours 21 days 8 weeks

Conclusion/Summary : Not available

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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 emptied 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

Disposal should be in accordance with applicable regional, national and local laws and regulations. 10/17/2012.

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13. Disposal considerations

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Irritating material

Target organ effects

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption; Not determined

United States inventory (TSCA 8b): All components are listed or exempted. SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: trometamol; sodium chloride SARA 311/312 MSDS distribution - chemical inventory - hazard identification: trometamol: Immediate (acute) health hazard; sodium chloride: Immediate (acute)

8/

health hazard, Delayed (chronic) health hazard

Clean Air Act Section 112 : Not listed

(b) Hazardous Air

Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed. **United States inventory** : All components are listed or exempted.

: Not listed

(TSCA 8b)

Canada

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists

10/17/2012.

7/

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15. Regulatory information

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : A

: Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.

Korea inventory: All components are listed or exempted.

Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements

: CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : **10/17/2012**. **Date of issue** : 10/17/2012.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

VIndicates information that has changed from previously issued version.

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.

10/17/2012. 9/



Part of Thermo Fisher Scientifi

The world leader in serving science

Material Safety Data Sheet

1X Wash Buffer

1. Product and company identification

Product name : 1X Wash Buffer

: Thermo Fisher Scientific Supplier Pierce Biotechnology P.O. Box 117 Rockford, IL 61105

> United States 815.968.0747 or 800.874.3723

: 1862770

9003 MSDS# Validation date : 10/17/2012. **Print date** : 10/17/2012.

Responsible name MSDS Specialist

CHEMTREC: 800.424.9300 OUTSIDE US: 703.527.3887

Material uses

Manufacturer

Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.

1/

: Thermo Fisher Scientific

Pierce Biotechnology

Rockford, IL 61105

P O Box 117

United States

800.874.3723

815.968.0747 or

Product type : Liquid.

2. Hazards identification

Emergency overview

Code

Physical state : Liquid. Odor : Odorless.

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the

safe handling and proper use of the product. This MSDS should be retained and

available for employees and other users of this product.

: Dermal contact. Eye contact. Inhalation. Ingestion. Routes of entry

Potential acute health effects

Inhalation : No known significant effects or critical hazards. Ingestion : No known significant effects or critical hazards. Skin : No known significant effects or critical hazards. Eyes : No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards.

10/17/2012.

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1X Wash Buffer

2. Hazards identification

: No known significant effects or critical hazards. Mutagenicity Teratogenicity : No known significant effects or critical hazards. **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data. Ingestion : No specific data. Skin : No specific data. Eves : No specific data. Medical conditions : None known.

aggravated by overexposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical Ingestion

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable

5. Fire-fighting measures

Special exposure hazards : 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.

Hazardous thermal : No specific data.

decomposition products 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.

2/

10/17/2012.

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6. Accidental release measures

Personal precautions

: 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. Put on appropriate personal protective equipment (see Section 8).

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 for 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. 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: 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. 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.

8. Exposure controls/personal protection

Canada

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits

10/17/2012.

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8. Exposure controls/personal protection

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

Eves

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

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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin

: 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.

Environmental exposure

controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid Odor : Odorless рН : 6 to 8

Dispersibility properties Solubility

: Dispersible in the following materials: cold water and hot water. : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable Conditions to avoid : No specific data. Incompatible materials : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

3/

11. Toxicological information

United States

10/17/2012.

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary

: Not available

Irritation/Corrosion

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11. Toxicological information

Conclusion/Summary Sensitizer

: Not available

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary

: Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

: No known significant effects or critical hazards. **Ecotoxicity**

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

10/17/2012. 5/

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1X Wash Buffer

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: No products were found

6/

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals

: Not listed

(Essential Chemicals)

State regulations

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15. Regulatory information

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed. United States inventory : All components are listed or exempted.

(TSCA 8b) Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted. Japan inventory: All components are listed or exempted. Korea inventory: All components are listed or exempted. Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

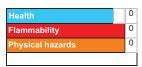
Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material

Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : 10/17/2012. : 10/17/2012. Date of issue

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

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16. Other information

▼Indicates information that has changed from previously issued version.

Notice to reader

7/

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.

10/17/2012. 8/

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Material Safety Data Sheet

Biotin Elution Buffer

1. Product and company identification

Product name : Biotin Elution Buffer

: Thermo Fisher Scientific Supplier Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

: 1862771

9002

MSDS# Validation date : 10/17/2012. **Print date** : 10/17/2012. Responsible name MSDS Specialist

CHEMTREC:

800.424.9300 OUTSIDE US: 703.527.3887

Manufacturer

: Thermo Fisher Scientific Pierce Biotechnology P O Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Material uses

Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific

1/

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Code

Physical state : Liquid. Odor : Odorless.

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the

safe handling and proper use of the product. This MSDS should be retained and

available for employees and other users of this product.

Potential acute health effects

Inhalation : No known significant effects or critical hazards. : No known significant effects or critical hazards. Ingestion Skin : No known significant effects or critical hazards. Eves : No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards. Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards.

10/17/2012.

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Biotin Elution Buffer

2. Hazards identification

: No known significant effects or critical hazards. Teratogenicity **Developmental effects** : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data. Ingestion : No specific data. Skin : No specific data. Eves : No specific data. Medical conditions : None known.

aggravated by overexposure

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Check for and remove any contact lenses. Immediately flush eyes with plenty of water Eye contact for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur. Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders

: No action shall be taken involving any personal risk or without suitable training.

: No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Notes to physician

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

Not suitable : None known

Special exposure hazards : 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

: No specific data.

Hazardous thermal decomposition products

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.

2/

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Biotin Elution Buffer

6. Accidental release measures

Personal precautions

: 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. Put on appropriate personal protective equipment (see Section 8).

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 for 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. 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. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: 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. 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.

8. Exposure controls/personal protection

Canada

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits

10/17/2012.

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Biotin Elution Buffer

8. Exposure controls/personal protection

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

Eves

Skin

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

necess

 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 or dusts. If contact is possible the following protection should be worn unless the

dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

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.

Environmental exposure

controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid.

Odor : Odorless

pH : 6 to 8

Dispersibility properties : Solubility :

Dispersible in the following materials: cold water and hot water.Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable
Conditions to avoid : No specific data.
Incompatible materials : No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been

thoroughly investigated.

Chronic toxicity

3/

Conclusion/Summary

: Not available.

Irritation/Corrosion

10/17/2012.

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4/

Biotin Elution Buffer

11. Toxicological information

Conclusion/Summary Sensitizer

: Not available

Conclusion/Summary

: Not available.

: Not available.

: Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary

Teratogenicity

Conclusion/Summary Reproductive toxicity

Conclusion/Summary

: Not available. Canada

Acute toxicity

Conclusion/Summary

: To the best of our knowledge, the toxicological properties of this product have not been thoroughly investigated.

Chronic toxicity

Conclusion/Summary

: Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer Conclusion/Summary

: Not available. Carcinogenicity

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

: No known significant effects or critical hazards. **Ecotoxicity**

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available. Biotin Elution Buffer

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations

: TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: No products were found

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals

: Not listed

(Essential Chemicals)

State regulations

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5/

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15. Regulatory information

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

United States inventory : All components are listed or exempted.

(TSCA 8b) Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: All components are listed or exempted.

Korea inventory: All components are listed or exempted.

Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material

Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : **10/17/2012. Date of issue** : 10/17/2012.

Date of previous issue : No previous validation.

Version : 1

Prepared by : MSDS Specialist

10/17/2012.

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16. Other information

Indicates information that has changed from previously issued version.

Notice to reader

7/

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.

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Material Safety Data Sheet

Antibodies in PBS and Gelatin with Sodium Azide

1. Product and company identification

Product name

: Antibodies in PBS and Gelatin with Sodium Azide

Supplier

: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105

Rockford, IL 61105 United States 815.968.0747 or 800.874.3723 Manufacturer

: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Code

: 1861773 1862243 1862775 1892954 1896098 1896486 1896623 1896624 MA1113 MA141027 MA141032 MA141043 MA141093 MA141094 MA141108 MA141126 MA141136 MA141143 MA141172 MA141173 MA141180 MA141181 MA141204 MA141212 MA141219 MA141244 MA141247 MA141315 MA141338 MA141380 MA141484 MA141515 MA181797 MA190710 MA516197 OPA110080 OPA110100 OPA110110 OPA110980 PA15769 PA15770 PA125435 PA141006 PA141037

PA141062 PA141066 PA141068 PA141078 PA141080 PA141086 PA141090 PA141118 PA141119 PA1411124 PA1411127 PA1411128 PA1411131 PA1411142 PA1411145 PA1411154 PA1411157 PA1411158 PA1411159 PA141159 PA141159 PA141159 PA141159 PA141159 PA141159 PA1411199 PA1411209 PA1411214 PA1411216 PA1411238 PA1411234 PA1411236 PA1411237 PA1411236 PA1411237 PA1411247 PA1412479 PA141259 PA141269 PA141270 PA141271 PA141272 PA141274 PA141276 PA141292 PA141301 PA141302 PA141307 PA1413101 PA141312 PA141317 PA141318

PA141320 PA141321 PA141324 PA141327 PA141328 PA141332 PA141333 PA141338 PA141341 PA141342 PA141357 PA141363 PA141364 PA141373 PA141375 PA141376 PA141381 PA141382 PA141383 PA141385 PA141386 PA141386 PA141399 PA141399 PA141395 PA141396 PA141397 PA141398 PA141399 PA141400 PA141401 PA141402 PA141406 PA141407 PA141407 PA141409 PA141410 PA141411 PA141412 PA141413 PA141414 PA141425 PA141426 PA141427 PA141430 PA141432 PA141433 PA141434 PA141435 PA141441 PA141441449 PA141445 PA141445 PA141457 PA141458 PA141446 PA141465 PA141467 PA141469 PA141469 PA141474 PA141487 PA141488 PA141489 PA141490 PA141490 PA141499 PA141501 PA141502 PA141502 PA141513 PA141514 PA141514 PA141516 PA141517 PA141516 PA141520 PA141522 PA141532 PA141568 PA141544 PA141545 PA141548 PA141562 PA141566 PA141566 PA141566 PA141568 PA141568 PA141578 PA141573 PA141574 PA141575 PA141576 PA141578 PA141581 PA141585 PA141588 PA141588 PA141588 PA141578 PA141578 PA141581 PA141585 PA141588 PA141588 PA141578 PA141578 PA141581 PA141578 PA141578 PA141578 PA141585 PA141588 PA141588

PA141590 PA141596 PA141598 PA141599 PA141600 PA141601 PA141608 PA141609 PA141613 PA141621 PA141622 PA141633 PA141634 PA141642 PA141643 PA141657 PA141665 PA141663 PA141667 PA141679 PA141679 PA141680 PA141683 PA1416484 PA141685 PA141690 PA141697 PA141698 PA141701 PA141703 PA141704

PA141705 PA186412 PA186415 PA186416

MSDS # 2946

 Validation date
 : 10/15/2012.

 Print date
 : 10/16/2012.

 Responsible name
 MSDS Specialist

10/16/2012.

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Antibodies in PBS and Gelatin with Sodium Azide

1. Product and company identification

CHEMTREC: 800.424.9300 OUTSIDE US: 703.527.3887 Material uses

Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.

2/

Product type : Liquid

2. Hazards identification

Emergency overview

Physical state : Liquid.

Hazard statements : NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the

Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and

available for employees and other users of this product.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

 Inhalation
 : No known significant effects or critical hazards.

 Ingestion
 : No known significant effects or critical hazards.

 Skin
 : No known significant effects or critical hazards.

 Eyes
 : No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data.
Ingestion : No specific data.
Skin : No specific data.
Eyes : No specific data.
Wedical conditions : None known.

aggravated by over-

exposure

1/

See toxicological information (Section 11)

3. Composition/information on ingredients

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

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Antibodies in PBS and Gelatin with Sodium Azide

4. First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention if symptoms occur.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if Inhalation

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if

symptoms occur.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical

personnel. Never give anything by mouth to an unconscious person. Get medical

attention if symptoms occur.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist

immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

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

Not suitable : None known

Special exposure hazards

: 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.

: No specific data.

Hazardous thermal decomposition products

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.

6. Accidental release measures

Personal precautions : 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. Put on appropriate personal

protective equipment (see Section 8).

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

pollution (sewers, waterways, soil or air).

Methods for 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.

: Stop leak if without risk. Move containers from spill area. Prevent entry into sewers. Large spill 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. Note: see Section 1 for emergency contact

information and Section 13 for waste disposal.

10/16/2012.

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Antibodies in PBS and Gelatin with Sodium Azide

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas.

Storage

: 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. 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.

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limit value known

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

Hygiene measures

: No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory

: 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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

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

Eves

3/

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 or

Skin

: 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

4/

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

10/16/2012.

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Antibodies in PBS and Gelatin with Sodium Azide

9. Physical and chemical properties

Physical state : Liquid.

Dispersibility properties : Dispersible in the following materials: cold water and hot water.

Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable
Conditions to avoid : No specific data.
Incompatible materials : No specific data.

Hazardous decomposition : Under normal conditions of storage and use, hazardous decomposition products should

products not be produced.

Possibility of hazardous : Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary : To the best of our knowledge, the toxicological properties of this product have not been

thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary : To the best of our knowledge, the toxicological properties of this product have not been

thoroughly investigated.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

10/16/2012.

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Antibodies in PBS and Gelatin with Sodium Azide

11. Toxicological information

Mutagenicity

Conclusion/Summary

: Not available.

Teratogenicity

Conclusion/Summary

: Not available.

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

Ecotoxicity: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

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

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*		
DOT Classification	Not regulated.	-	-	-		
IATA-DGR Class	Not regulated.	-	-	-		

PG* : Packing group

5/

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Antibodies in PBS and Gelatin with Sodium Azide

15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No

products were found.

Clean Water Act (CWA) 311: disodium hydrogenorthophosphate

Clean Air Act Section 112 : Not listed

(b) Hazardous Air

Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals

: Not listed (Precursor Chemicals)

DEA List II Chemicals (Essential Chemicals)

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. **New Jersey** : None of the components are listed. Pennsylvania : None of the components are listed. : All components are listed or exempted.

: Not listed

United States inventory (TSCA 8b)

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted. Japan inventory: All components are listed or exempted.

Korea inventory: All components are listed or exempted.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

10/16/2012.

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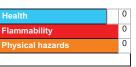
Antibodies in PBS and Gelatin with Sodium Azide

16. Other information

: NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN Label requirements

THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



: 10/16/2012. Date of printing : 10/15/2012. Date of issue Date of previous issue : 7/18/2012. Version : 1.11

Prepared by : MSDS Specialist

Indicates information that has changed from previously issued version.

Notice to reader

7/

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.

10/16/2012. 8/

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MSDS #9000 COVER SHEET

20164Z	RNA Controls
Component #	Description
1862776 Positive Control RNA	
1862777	Negative Control RNA



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The world leader in serving science

Material Safety Data Sheet

Positive Control RNA (AR RNA)

1. Product and company identification

Product name : Positive Control RNA (AR RNA)

: Thermo Fisher Scientific Supplier Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

: 1862776 1896484

MSDS# 8998 Validation date : 10/17/2012. **Print date** : 10/17/2012. Responsible name MSDS Specialist

> CHEMTREC: 800.424.9300 OUTSIDE US:

703.527.3887

Manufacturer

: Thermo Fisher Scientific Pierce Biotechnology P O Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

Material uses Refer to the instruction

booklet for proper and intended use. Otherwise, contact supplier for specific

applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Code

Physical state : Liquid. Signal word : WARNING!

Hazard statements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Precautionary measures : Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or

smoke when using this product. Avoid contact with eyes, skin and clothing. Keep

container tightly closed. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

: Dermal contact. Eye contact. Inhalation. Ingestion. Routes of entry

Potential acute health effects

: Irritating to respiratory system. Exposure to decomposition products may cause a Inhalation

health hazard. Serious effects may be delayed following exposure.

Ingestion : No known significant effects or critical hazards.

Skin : Irritating to skin. : Irritating to eyes.

Potential chronic health effects

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Positive Control RNA (AR RNA)

2. Hazards identification

Chronic effects : Contains material that can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Developmental effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: kidneys, liver, skin.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

irritation

Eyes : Adverse symptoms may include the following:

> pain or irritation watering

Medical conditions aggravated by over: Pre-existing disorders involving any target organs mentioned in this MSDS as being at

CAC mumban

2/

risk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS Hulliber	/0
trometamol	77-86-1	1 - 3
Canada		

Namo

Name	CAS number	%
trometamol	77-86-1	1 - 3

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

4. First aid measures

Eye contact

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention immediately.

Skin contact

10/17/2012.

1/

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

Inhalation

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

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4. First aid measures

Ingestion

: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

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.

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.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable

: Use an extinguishing agent suitable for the surrounding fire.

Not suitable

Special exposure hazards

: 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

Hazardous thermal decomposition products : Decomposition products may include the following materials:

carbon dioxide carbon monoxide nitrogen oxides

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.

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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.

Positive Control RNA (AR RNA)

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.

Storage

: 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. 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.

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of

hazardous substances will also be required.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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.

Eyes

: 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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

4/

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PO Box 117

8. Exposure controls/personal protection

Skin

: 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.

Environmental exposure

controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state : Liquid.
pH : 6 to 8

Dispersibility properties : Dispersible in the following materials: cold water and hot water.

Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability : The product is stable
Conditions to avoid : No specific data.
Incompatible materials : No specific data.

Hazardous decomposition : Under normal conditions of storage and use, hazardous decomposition products should

products not be produced.

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
trometamol	Skin - Moderate irritant Skin - Severe irritant	Rabbit Rabbit	-	25 Percent 500 milligrams	-
	Skin - Moderate irritant	Woman	-	1 Percent	-

Conclusion/Summary

ry : Not available.

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
trometamol	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary : Not available.

10/17/2012. 5/4

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Positive Control RNA (AR RNA)

11. Toxicological information

Teratogenicity

Conclusion/Summary

: Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary

: Not available.

: Not available.

: Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
trometamol	Skin - Moderate irritant Skin - Severe irritant	Rabbit Rabbit	-	25 Percent 500	-
	Skin - Moderate irritant	Woman	-	milligrams 1 Percent	-

Conclusion/Summary

Sensitizer

Conclusion/Summary

: Not available.

Carcinogenicity

Conclusion/Summary

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
trometamol	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary

: Not available.

Teratogenicity

Conclusion/Summary

: Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12. Ecological information

Ecotoxicity: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

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6/

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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 emptied 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.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Irritating material

Target organ effects

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: trometamol

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

trometamol: Immediate (acute) health hazard

Clean Air Act Section 112 : Not listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

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Positive Control RNA (AR RNA)

15. Regulatory information

State regulations

Massachusetts : None of the components are listed. **New York** : None of the components are listed. : None of the components are listed. **New Jersey** Pennsylvania : None of the components are listed. **United States inventory** : All components are listed or exempted.

(TSCA 8b)

Canada

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists Canadian NPRI : None of the components are listed. **CEPA Toxic substances** : None of the components are listed. Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

> China inventory (IECSC): All components are listed or exempted. Japan inventory: All components are listed or exempted. Korea inventory: All components are listed or exempted. Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

8/

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

16. Other information

CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS Label requirements

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



: 10/17/2012. Date of printing Date of issue : 10/17/2012.

Date of previous issue : No previous validation.

Version

10/17/2012.

7/

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16. Other information

Prepared by

: MSDS Specialist

VIndicates information that has changed from previously issued version.

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.

10/17/2012. 9/:

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Pierce Biotechnology

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P O Box 117

United States

800.874.3723

815.968.0747 or

The world leader in serving science

Material Safety Data Sheet

Negative Control RNA (poly(A) RNA)

1. Product and company identification

Product name : Negative Control RNA (poly(A) RNA)

: Thermo Fisher Scientific Supplier Pierce Biotechnology

P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723

: 1862777 1896485

MSDS# 8999 Validation date : 10/17/2012. **Print date** : 10/17/2012. Responsible name MSDS Specialist

> CHEMTREC: 800.424.9300 OUTSIDE US: 703.527.3887

Material uses

Manufacturer

Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.

Product type : Liquid.

2. Hazards identification

Emergency overview

Code

Physical state : Liquid. Signal word : WARNING!

Hazard statements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Precautionary measures : Do not breathe vapor or mist. Use only with adequate ventilation. Do not eat, drink or

smoke when using this product. Avoid contact with eyes, skin and clothing. Keep

container tightly closed. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard

(29 CFR 1910.1200).

: Dermal contact. Eye contact. Inhalation. Ingestion. Routes of entry

Potential acute health effects

: Irritating to respiratory system. Exposure to decomposition products may cause a Inhalation

health hazard. Serious effects may be delayed following exposure.

Ingestion : No known significant effects or critical hazards

Skin : Irritating to skin. : Irritating to eyes.

Potential chronic health effects

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Negative Control RNA (poly(A) RNA)

2. Hazards identification

Chronic effects : Contains material that can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards. Mutagenicity : No known significant effects or critical hazards. Teratogenicity : No known significant effects or critical hazards. Developmental effects : No known significant effects or critical hazards. Fertility effects : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: kidneys, liver, skin.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:

respiratory tract irritation

coughing

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:

irritation

Eyes : Adverse symptoms may include the following:

> pain or irritation watering

Medical conditions aggravated by over: Pre-existing disorders involving any target organs mentioned in this MSDS as being at

risk may be aggravated by over-exposure to this product.

exposure

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
trometamol	77-86-1	1 - 3

Canada

Name	CAS number	%
trometamol	77-86-1	1 - 3

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

4. First aid measures

Eye contact

: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical

attention immediately.

Skin contact

10/17/2012.

1/

: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean

shoes thoroughly before reuse. Get medical attention immediately.

: Move exposed person to fresh air. If not breathing, if breathing is irregular or if Inhalation

respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

2/

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4. First aid measures

Ingestion

: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

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.

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.

5. Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable

: Use an extinguishing agent suitable for the surrounding fire.

Not suitable

Special exposure hazards

: 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

Hazardous thermal decomposition products : Decomposition products may include the following materials: carbon dioxide

carbon monoxide nitrogen oxides

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.

6. Accidental release measures

Personal precautions

: 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. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

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 for 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.

Negative Control RNA (poly(A) RNA)

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). 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. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.

Storage

: 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. 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.

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

procedures

Recommended monitoring : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands

: 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.

Eyes

: 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 or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

4/

10/17/2012. 10/17/2012. 3/

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8. Exposure controls/personal 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.

Environmental exposure

controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Physical state

: Liquid.

Dispersibility properties

: Dispersible in the following materials: cold water and hot water.

Solubility : Soluble in the following materials: cold water and hot water.

10. Stability and reactivity

Chemical stability Conditions to avoid : The product is stable : No specific data.

Incompatible materials

: No specific data.

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should

not be produced.

Possibility of hazardous

: Under normal conditions of storage and use, hazardous reactions will not occur.

reactions

11. Toxicological information

United States

Acute toxicity

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
trometamol	Skin - Moderate irritant Skin - Severe irritant	Rabbit Rabbit	1	25 Percent 500	-
	Skin - Moderate irritant	Woman	-	milligrams 1 Percent	-

Conclusion/Summary

: Not available

Sensitizer

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary

: Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
trometamol	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

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Negative Control RNA (poly(A) RNA)

11. Toxicological information

Conclusion/Summary

: Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Conclusion/Summary

: Not available.

Chronic toxicity

Conclusion/Summary

: Not available

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
trometamol	Skin - Moderate irritant	Rabbit	-	25 Percent	-
	Skin - Severe irritant	Rabbit	-	500	-
				milligrams	
	Skin - Moderate irritant	Woman	-	1 Percent	-

Conclusion/Summary

Sensitizer

Conclusion/Summary

: Not available.

: Not available.

Carcinogenicity

Conclusion/Summary

: Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
trometamol	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary

: Not available.

: Not available

Teratogenicity

Conclusion/Summary

Reproductive toxicity

Conclusion/Summary : Not available

12. Ecological information

Ecotoxicity

: No known significant effects or critical hazards.

United States

Aquatic ecotoxicity Conclusion/Summary

: Not available.

: Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

5/

Aquatic ecotoxicity

Conclusion/Summary

Persistence/degradability

Conclusion/Summary : Not available.

10/17/2012.

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6/

13. Disposal considerations

Waste disposal

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times 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 disposed 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 emptied 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.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	Not regulated.	-	-	-
IATA-DGR Class	Not regulated.	-	-	-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Irritating material

Target organ effects

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: trometamol

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

trometamol: Immediate (acute) health hazard

Clean Air Act Section 112 : Not listed

(b) Hazardous Air

Pollutants (HAPs)

Clean Air Act Section 602 : Not listed

Class I Substances

Clean Air Act Section 602 : Not listed

Class II Substances

DEA List I Chemicals : Not listed

(Precursor Chemicals)

DEA List II Chemicals : Not listed

(Essential Chemicals)

10/17/2012.

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Negative Control RNA (poly(A) RNA)

15. Regulatory information

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

United States inventory : All components are listed or exempted.

(TSCA 8b)

Canada

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists
Canadian NPRI : None of the components are listed.
CEPA Toxic substances : None of the components are listed.
Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted. Japan inventory: All components are listed or exempted. Korea inventory: All components are listed or exempted. Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

8/

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

16. Other information

Label requirements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS

MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.)



The customer is responsible for determining the PPE code for this material.

National Fire Protection
Association (U.S.A.)



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7/

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16. Other information

Prepared by

: MSDS Specialist

VIndicates information that has changed from previously issued version.

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.

10/17/2012. 9/:

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