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MSDS# 1355 COVER SHEET

17908	Phenol: Chloroform Isoamyl Alcohol Kit
Component #	Description
N/A	Phenol: Chloroform Isoamyl
1856207	Tris Buffer

17909	Phenol: Chloroform Kit
Component #	Description
N/A	Phenol: Chloroform
1856206	Tris Buffer

Life Science Research
Pierce Biotechnology, Inc.
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Material Safety Data Sheet

Phenol : Chloroform Isoamyl Alcohol Kit

1. Product and company identification

Product name : Phenol : Chloroform Isoamyl Alcohol Kit

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 : 0017908 0017909

MSDS # : 1355

Validation date : 12/17/2012.

Print date : 12/17/2012.

Responsible name : MSDS 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 applications.**

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid. [Two-layer liquid.]

Color : Colorless.

Signal word : DANGER!

Hazard statements : CAUSES EYE AND SKIN BURNS. HARMFUL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED. CAUSES RESPIRATORY TRACT IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. CONTAINS MATERIAL WHICH MAY CAUSE HERITABLE GENETIC EFFECTS.

Precautionary measures : Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Do not get in eyes. Do not get on skin. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Use personal protective equipment as required. 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

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2. Hazards identification

Inhalation : Toxic by 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. May cause burns to mouth, throat and stomach.

Skin : Corrosive to the skin. Causes burns. Toxic in contact with skin.

Eyes : Corrosive to eyes. Causes burns.

Potential chronic health effects

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

Carcinogenicity : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : Contains material which may cause heritable genetic effects.

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: blood, kidneys, lungs, the nervous system, the reproductive system, liver, heart, spleen, gastrointestinal tract, cardiovascular system, upper respiratory tract, immune system, skin, central nervous system (CNS), eye, lens or cornea, pancreas.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Ingestion : Adverse symptoms may include the following:
stomach pains

Skin : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Eyes : Adverse symptoms may include the following:
pain
watering
redness

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
phenol	108-95-2	45 - 65
trichloromethane	67-66-3	45 - 65
3-methylbutan-1-ol	123-51-3	1 - 3

Canada

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3. Composition/information on ingredients

Name	CAS number	%
phenol	108-95-2	45 - 65
trichloromethane	67-66-3	45 - 65
3-methylbutan-1-ol	123-51-3	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 : 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. 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.

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 decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds
carbonyl halides

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.

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Phenol : Chloroform Isoamyl Alcohol Kit

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. 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).

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. Avoid exposure - obtain special instructions before use. 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 : 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.

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
phenol	**ACGIH (United States, 0/1996). Absorbed through skin.** TWA: 19 mg/m³ **OSHA (United States, 0/1996). Absorbed through skin.** TWA: 5 ppm **NIOSH (United States, 0/1994). Absorbed through skin.** TWA: 5 ppm CEIL: 15.6 ppm TWA: 19 mg/m³ CEIL: 60 mg/m³

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8. Exposure controls/personal protection

	OSHA (United States, 0/1989). Absorbed through skin. TWA: 19 mg/m³ **ACGIH TLV (United States, 3/2012). Absorbed through skin.** TWA: 5 ppm 8 hours. TWA: 19 mg/m³ 8 hours. **OSHA PEL 1989 (United States, 3/1989). Absorbed through skin.** TWA: 5 ppm 8 hours. TWA: 19 mg/m³ 8 hours. **NIOSH REL (United States, 6/2009). Absorbed through skin.** TWA: 5 ppm 10 hours. TWA: 19 mg/m³ 10 hours. CEIL: 15.6 ppm 15 minutes. CEIL: 60 mg/m³ 15 minutes. **OSHA PEL (United States, 6/2010). Absorbed through skin.** TWA: 5 ppm 8 hours. TWA: 19 mg/m³ 8 hours.
trichloromethane	**ACGIH TLV (United States, 3/2012).** TWA: 49 mg/m³ 8 hours. TWA: 10 ppm 8 hours. **NIOSH REL (United States, 6/2009).** STEL: 9.78 mg/m³ 60 minutes. STEL: 2 ppm 60 minutes. **OSHA PEL (United States, 6/2010).** CEIL: 240 mg/m³ CEIL: 50 ppm **OSHA PEL 1989 (United States, 3/1989).** TWA: 9.78 mg/m³ 8 hours. TWA: 2 ppm 8 hours.
3-methylbutan-1-ol	**ACGIH (United States, 0/1994).** TWA: 361 mg/m³ STEL: 452 mg/m³ **OSHA (United States, 0/1989).** TWA: 361 mg/m³ STEL: 452 mg/m³ **ACGIH TLV (United States, 3/2012).** STEL: 452 mg/m³ 15 minutes. STEL: 125 ppm 15 minutes. TWA: 361 mg/m³ 8 hours. TWA: 100 ppm 8 hours. **NIOSH REL (United States, 6/2009).** STEL: 450 mg/m³ 15 minutes. STEL: 125 ppm 15 minutes. TWA: 360 mg/m³ 10 hours. TWA: 100 ppm 10 hours. **OSHA PEL (United States, 6/2010).** TWA: 360 mg/m³ 8 hours. TWA: 100 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** STEL: 450 mg/m³ 15 minutes. STEL: 125 ppm 15 minutes. TWA: 360 mg/m³ 8 hours. TWA: 100 ppm 8 hours.

Canada

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Phenol : Chloroform Isoamyl Alcohol Kit

8. Exposure controls/personal protection

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
phenol	US ACGIH 3/2012	5	19	-	-	-	-	-	-	-	[1]
	AB 4/2009	5	19	-	-	-	-	-	-	-	[1]
	BC 4/2012	5	-	-	-	-	-	-	-	-	[1]
	ON 7/2010	5	19	-	-	-	-	-	-	-	[1]
	QC 9/2011	5	19	-	-	-	-	-	-	-	[1]
trichloromethane	US ACGIH 3/2012	10	49	-	-	-	-	-	-	-	
	AB 4/2009	10	49	-	-	-	-	-	-	-	
	BC 4/2012	2	-	-	-	-	-	-	-	-	
	ON 7/2010	10	49	-	-	-	-	-	-	-	
	QC 9/2011	5	24.4	-	-	-	-	-	-	-	
3-methylbutan-1-ol	US ACGIH 3/2012	100	361	-	125	452	-	-	-	-	
	AB 4/2009	100	361	-	125	451	-	-	-	-	[3]
	BC 4/2012	100	-	-	125	-	-	-	-	-	
	ON 7/2010	100	361	-	125	452	-	-	-	-	
	QC 9/2011	100	361	-	125	452	-	-	-	-	

[1]Absorbed through skin. [3]Skin sensitization

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. 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.

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 and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

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.

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8. Exposure controls/personal protection

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. [Two-layer liquid.]

Color : Colorless.

pH : 6.5 to 6.9

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

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
phenol	LC50 Inhalation Vapor	Rat	316 mg/m³	4 hours
	LD50 Dermal	Rabbit	630 mg/kg	-
	LD50 Dermal	Rat	525 mg/kg	-
	LD50 Oral	Rat	300 mg/kg	-
trichloromethane	LC50 Inhalation Vapor	Rat	47702 mg/m³	4 hours
	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	300 mg/kg	-
3-methylbutan-1-ol	LD50 Oral	Rat	1300 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
phenol	Eyes - Mild irritant	Rabbit	-	0.5 minutes 5 milligrams	-
	Eyes - Severe irritant	Rabbit	-	5 milligrams	-
	Skin - Severe irritant	Pig	-	0.5 minutes 400 microliters	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Severe irritant	Rabbit	-	535 milligrams	-
trichloromethane	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500	-

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11. Toxicological information

				milligrams	
3-methylbutan-1-ol	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 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
phenol	A4	3	D	-	-	-
trichloromethane	A3	2B	B	+	Possible	+
3-methylbutan-1-ol	-	-	-	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
phenol	LC50 Inhalation Vapor	Rat	316 mg/m³	4 hours
	LD50 Dermal	Rabbit	630 mg/kg	-
	LD50 Dermal	Rat	525 mg/kg	-
	LD50 Oral	Rat	300 mg/kg	-
trichloromethane	LC50 Inhalation Vapor	Rat	47702 mg/m³	4 hours
	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	300 mg/kg	-
3-methylbutan-1-ol	LD50 Oral	Rat	1300 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
phenol	Eyes - Mild irritant	Rabbit	-	0.5 minutes 5 milligrams	-
	Eyes - Severe irritant	Rabbit	-	5 milligrams	-
	Skin - Severe irritant	Pig	-	0.5 minutes 400 microliters	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Severe irritant	Rabbit	-	535 milligrams	-
trichloromethane	Eyes - Moderate irritant	Rabbit	-	24 hours 20	-

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11. Toxicological information

	Skin - Mild irritant	Rabbit	-	milligrams 24 hours 500 milligrams	-
3-methylbutan-1-ol	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 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
phenol	A4	3	D	-	-	-
trichloromethane	A3	2B	B	+	Possible	+
3-methylbutan-1-ol	-	-	-	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
phenol	Acute EC50 61.1 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 36 mg/l Marine water	Algae - Hormosira banksii - Gamete	72 hours
	Acute EC50 12000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 4200 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 3100 µg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Neonate	48 hours
	Acute LC50 1.75 µg/l Fresh water	Fish - Cyprinus carpio - Larvae	96 hours
	Chronic EC10 969 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata - Exponential growth phase	72 hours
	Chronic IC10 2.38 ng/L Fresh water	Daphnia - Daphnia magna - Neonate	21 days
	Chronic NOEC 118 µg/l Fresh water	Fish - Oncorhynchus mykiss	90 days
trichloromethane	Acute EC50 13.3 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Acute LC50 81.5 to 106 mg/l Marine water	Crustaceans - Penaeus duorarum	48 hours
	Acute LC50 65.7 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 13.3 ppm Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic EC10 3.61 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Chronic NOEC 6300 µg/l Fresh water	Daphnia - Daphnia magna	21 days

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

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Phenol : Chloroform Isoamyl Alcohol Kit

12. Ecological information

Canada

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
phenol	Acute EC50 61.1 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 36 mg/l Marine water	Algae - Hormosira banksii - Gamete	72 hours
	Acute EC50 12000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 4200 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 3100 µg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Neonate	48 hours
	Acute LC50 1.75 µg/l Fresh water	Fish - Cyprinus carpio - Larvae	96 hours
	Chronic EC10 969 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata - Exponential growth phase	72 hours
	Chronic IC10 2.38 ng/L Fresh water	Daphnia - Daphnia magna - Neonate	21 days
	Chronic NOEC 118 µg/l Fresh water	Fish - Oncorhynchus mykiss	90 days
trichloromethane	Acute EC50 13.3 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Acute LC50 81.5 to 106 mg/l Marine water	Crustaceans - Penaeus duorarum	48 hours
	Acute LC50 65.7 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 13.3 ppm Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic EC10 3.61 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Chronic NOEC 6300 µg/l Fresh water	Daphnia - Daphnia magna	21 days

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

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13. Disposal considerations

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	UN2810	Toxic liquid, organic, n.o.s. (phenol, trichloromethane) RQ (Chloroform, Phenol (Ultra Pure))	6.1	II
IATA-DGR Class	UN2810	Toxic liquid, organic, n.o.s. (phenol, trichloromethane)	6.1	II

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Toxic material
Corrosive material
Carcinogen
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: phenol; trichloromethane
SARA 302/304 emergency planning and notification: phenol; trichloromethane
SARA 302/304/311/312 hazardous chemicals: phenol; trichloromethane; 3-methylbutan-1-ol
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: phenol: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; trichloromethane: Immediate (acute) health hazard, Delayed (chronic) health hazard; 3-methylbutan-1-ol: Fire hazard, Immediate (acute) health hazard

Clean Water Act (CWA) 307: phenol; trichloromethane

Clean Water Act (CWA) 311: phenol; trichloromethane

Clean Air Act (CAA) 112 regulated toxic substances: trichloromethane

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

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15. Regulatory information

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	phenol trichloromethane	108-95-2 67-66-3	45 - 65 45 - 65
Supplier notification	phenol trichloromethane	108-95-2 67-66-3	45 - 65 45 - 65

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: PHENOL; CHLOROFORM; ISOAMYL ALCOHOL

New York : The following components are listed: Phenol; Carbolic acid; Chloroform; Methane, trichloro-

New Jersey : The following components are listed: PHENOL; CARBOLIC ACID; CHLOROFORM; METHANE, TRICHLORO-; Isoamyl Alcohol; 1-BUTANOL, 3-METHYL-

Pennsylvania : The following components are listed: PHENOL; METHANE, TRICHLORO-; 1-BUTANOL, 3-METHYL-

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
trichloromethane	Yes.	Yes.	20 µg/day (ingestion) 40 µg/day (inhalation)	No.

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

Canada

WHMIS (Canada) : Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class D-2A: Material causing other toxic effects (Very toxic).
Class E: Corrosive material

Canadian lists

Canadian NPRI : The following components are listed: Phenol (and its salts); Chloroform

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

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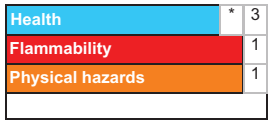
15. Regulatory information

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.
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 EYE AND SKIN BURNS. HARMFUL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED. CAUSES RESPIRATORY TRACT IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. CONTAINS MATERIAL WHICH MAY CAUSE HERITABLE GENETIC EFFECTS.

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 : **12/17/2012.**
Date of issue : 12/17/2012.
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.

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Thermo SCIENTIFIC

Part of Thermo Fisher Scientific

Material Safety Data Sheet

Tris Buffer for 17908, 17909, and 17914

1. Product and company identification

Product name : Tris Buffer for 17908, 17909, and 17914

Supplier : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117
Rockford, IL 61105
United States
815.968.0747 or
800.874.3723
7 AM - 5 PM Central Time
(GMT -06:00)

Manufacturer : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117
Rockford, IL 61105
United States
815.968.0747 or
800.874.3723
7 AM - 5 PM Central Time
(GMT -06:00)

Code : 1856201 1856206 1856207

MSDS # 9081

Validation date : 5/30/2013.

Print date : 5/30/2013.

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 applications.**

Product type : Liquid.

2. Hazards identification

Emergency overview

Physical state : Liquid.

Color : Clear. Colorless.

Signal word : DANGER!

Hazard statements : CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY BE HARMFUL IF SWALLOWED. 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 get in eyes. Do not get on skin. Do not eat, drink or smoke when using this product. 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 : Severely corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

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2. Hazards identification

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Skin : Severely corrosive to the skin. Causes severe burns.

Eyes : Severely corrosive to the eyes. Causes severe burns.

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 causes damage to the following organs: mucous membranes, eye, lens or cornea, nose/sinuses, trachea.
Contains material which may cause damage to the following organs: kidneys, liver, gastrointestinal tract, upper respiratory tract, skin, teeth.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Ingestion : Adverse symptoms may include the following:
stomach pains

Skin : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Eyes : Adverse symptoms may include the following:
pain
watering
redness

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
trometamol	77-86-1	10 - 20
Hydrogen chloride	7647-01-0	5 - 7

Canada

Name	CAS number	%
trometamol	77-86-1	10 - 20
Hydrogen chloride	7647-01-0	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.

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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.

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. 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.

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 training.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
halogenated compounds

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. 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).

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.

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Tris Buffer for 17908, 17909, and 17914

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 : 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
Hydrogen chloride	**ACGIH (United States).** CEIL: 2 ppm **MSHA (United States).** CEIL: 7 mg/m³ **NIOSH (United States).** CEIL: 7 mg/m³ **ACGIH TLV (United States, 3/2012).** C: 2 ppm **NIOSH REL (United States, 1/2013).** CEIL: 7 mg/m³ CEIL: 5 ppm **OSHA PEL (United States, 6/2010).** CEIL: 7 mg/m³ CEIL: 5 ppm **OSHA PEL 1989 (United States, 3/1989).** CEIL: 7 mg/m³ CEIL: 5 ppm

Canada

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8. Exposure controls/personal protection

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
Hydrogen chloride	US ACGIH 3/2012 AB 4/2009 BC 4/2012 ON 1/2013 QC 12/2012	- - - - -	- - - - -	- - - - -	- - - - 5	- - - - 7.5	- - - - -	2 2 2 2 -	- 3 - - -	- - - - -	 [3]

[3]Skin sensitization

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.

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 and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

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.

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Tris Buffer for 17908, 17909, and 17914

9. Physical and chemical properties

Physical state : Liquid.

Color : Clear. Colorless.

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

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Hydrogen chloride	LC50 Inhalation Vapor LD50 Dermal LD50 Oral	Rat Rabbit Rat	3124 ppm >5010 mg/kg 700 mg/kg	1 hours - -

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 milligrams	- -
Hydrogen chloride	Skin - Moderate irritant Eyes - Mild irritant Skin - Mild irritant	Woman Rabbit Human	- - -	1 Percent 0.5 minutes 5 milligrams 24 hours 4 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.
Hydrogen chloride	A4	3	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

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11. Toxicological information

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Hydrogen chloride	LC50 Inhalation Vapor LD50 Dermal LD50 Oral	Rat Rabbit Rat	3124 ppm >5010 mg/kg 700 mg/kg	1 hours - -

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 Skin - Moderate irritant	Rabbit Rabbit Woman	- - -	25 Percent 500 milligrams 1 Percent	- - -
Hydrogen chloride	Eyes - Mild irritant Skin - Mild irritant	Rabbit Human	- -	0.5 minutes 5 milligrams 24 hours 4 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 Hydrogen chloride	- A4	- 3	- -	None. -	- -	None. -

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

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Tris Buffer for 17908, 17909, and 17914

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Hydrogen chloride	Acute LC50 240000 µg/l Marine water Acute LC50 282 ppm Fresh water	Crustaceans - Carcinus maenas - Adult Fish - Gambusia affinis - Adult	48 hours 96 hours

Conclusion/Summary : Not available.

Persistence/degradability

Conclusion/Summary : Not available.

Canada

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Hydrogen chloride	Acute LC50 240000 µg/l Marine water Acute LC50 282 ppm Fresh water	Crustaceans - Carcinus maenas - Adult Fish - Gambusia affinis - Adult	48 hours 96 hours

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	UN1789	Hydrochloric acid Solution	8	III
IATA-DGR Class	UN1789	Hydrochloric acid Solution	8	III

PG* : Packing group

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15. Regulatory information

United States

HCS Classification : Corrosive material
Target organ effects

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.
SARA 302/304: Hydrogen chloride
SARA 311/312 Hazards identification: Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 311: Hydrogen chloride
Clean Air Act (CAA) 112 regulated flammable substances: Hydrogen chloride
Clean Air Act (CAA) 112 regulated toxic substances: Hydrogen chloride

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Listed

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	Hydrogen chloride	7647-01-0	5 - 7
Supplier notification	Hydrogen chloride	7647-01-0	5 - 7

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: HYDROGEN CHLORIDE

New York : The following components are listed: Hydrochloric acid

New Jersey : The following components are listed: HYDROGEN CHLORIDE; HYDROCHLORIC ACID

Pennsylvania : The following components are listed: HYDROCHLORIC ACID

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

Canada

WHMIS (Canada) : Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).
Class E: Corrosive material

Canadian lists

Canadian NPRI : The following components are listed: Hydrochloric acid

CEPA Toxic substances : None of the components are listed.

Canada inventory : All components are listed or exempted.

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Tris Buffer for 17908, 17909, and 17914

15. Regulatory information

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.

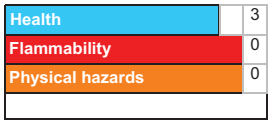
International regulations

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 : CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY BE HARMFUL IF SWALLOWED. 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 : **5/30/2013.**

Date of issue : 5/30/2013.

Date of previous issue : 5/30/2013.

Version : 1.01

Prepared by : MSDS (Regulatory 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.

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