

# Material Safety Data Sheet

Halt™ Protease Phosphatase Inhibitor Cocktail

## 1. Product and company identification

<b>Product name</b>	: Halt™ Protease Phosphatase Inhibitor Cocktail		
<b>Supplier</b>	: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723	<b>Manufacturer</b>	: Thermo Fisher Scientific Pierce Biotechnology P.O. Box 117 Rockford, IL 61105 United States 815.968.0747 or 800.874.3723
<b>Code</b>	: 0078441 0078441B 0078443 0078443S 0078445 0078447 1861280 1861281 1861282 1861284 1901696		
<b>MSDS #</b>	7864		
<b>Validation date</b>	: 7/25/2011.		
<b>Print date</b>	: 7/26/2011.		
<b>Responsible name</b>	MSDS Specialist	<b>Material uses</b>	<b>Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.</b>
	<b>CHEMTREC:</b> 800.424.9300 <b>OUTSIDE US:</b> 703.527.3887		
<b>Product type</b>	: Liquid.		

## 2. Hazards identification

### Emergency overview

<b>Physical state</b>	: Liquid.
<b>Odor</b>	: Odorless.
<b>Signal word</b>	: WARNING!
<b>Hazard statements</b>	: HARMFUL IF INHALED OR SWALLOWED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.
<b>Precautionary measures</b>	: 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 eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Avoid prolonged contact with eyes, skin and clothing. Keep container tightly closed. Use personal protective equipment as required. Wash thoroughly after handling.
<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Routes of entry</b>	: Dermal contact. Eye contact. Inhalation. Ingestion.
<b>Potential acute health effects</b>	

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## 2. Hazards identification

<b>Inhalation</b>	: Toxic by inhalation. Irritating to respiratory system.
<b>Ingestion</b>	: Toxic if swallowed.
<b>Skin</b>	: Harmful in contact with skin. Irritating to skin.
<b>Eyes</b>	: Irritating to eyes.
<b>Potential chronic health effects</b>	
<b>Chronic effects</b>	: Contains material that can cause target organ damage.
<b>Carcinogenicity</b>	: Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure.
<b>Mutagenicity</b>	: No known significant effects or critical hazards.
<b>Teratogenicity</b>	: No known significant effects or critical hazards.
<b>Developmental effects</b>	: No known significant effects or critical hazards.
<b>Fertility effects</b>	: No known significant effects or critical hazards.
<b>Target organs</b>	: Contains material which causes damage to the following organs: heart, teeth. Contains material which may cause damage to the following organs: kidneys, gastrointestinal tract, upper respiratory tract, skin, bones, central nervous system (CNS), eye, lens or cornea.
<b>Over-exposure signs/symptoms</b>	
<b>Inhalation</b>	: Adverse symptoms may include the following: respiratory tract irritation coughing
<b>Ingestion</b>	: No specific data.
<b>Skin</b>	: Adverse symptoms may include the following: irritation redness
<b>Eyes</b>	: Adverse symptoms may include the following: pain or irritation watering redness
<b>Medical conditions aggravated by over-exposure</b>	: 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	%
disodium β-glycerophosphate	819-83-0	3 - 5
disodium dihydrogenpyrophosphate	7758-16-9	1 - 3
Sodium fluoride	7681-49-4	1 - 3
trisodium tetraoxovanadate	13721-39-6	1 - 3

### Canada

Name	CAS number	%
disodium dihydrogenpyrophosphate	7758-16-9	1 - 3
Sodium fluoride	7681-49-4	1 - 3
trisodium tetraoxovanadate	13721-39-6	1 - 3
Trypsin inhibitor, pancreatic basic	9087-70-1	0.1 - 1

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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 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  
phosphorus 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. 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).

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### **6. Accidental release measures**

- 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**

<b>Ingredient</b>	<b>Exposure limits</b>
Sodium fluoride	<b>OSHA PEL Z2 (United States, 11/2006).</b> TWA: 2.5 mg/m <sup>3</sup> 8 hour(s). Form: Dust <b>MSHA Standard Air (United States).</b> TWA: 2.5 mg/m <sup>3</sup> 8 hour(s). <b>ACGIH TLV (United States, 2/2010). Notes: as F</b> TWA: 2.5 mg/m <sup>3</sup> , (as F) 8 hour(s). <b>NIOSH REL (United States, 6/2009). Notes: as F</b> TWA: 2.5 mg/m <sup>3</sup> , (as F) 10 hour(s). <b>OSHA PEL (United States, 6/2010). Notes: as F</b> TWA: 2.5 mg/m <sup>3</sup> , (as F) 8 hour(s). <b>OSHA PEL 1989 (United States, 3/1989). Notes: as F</b> TWA: 2.5 mg/m <sup>3</sup> , (as F) 8 hour(s).

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### 8. Exposure controls/personal protection

#### Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	Notations
Sodium fluoride, as F	US ACGIH 2/2010	-	2.5	-	-	-	-	-	-	-	[A]
	AB 4/2009	-	2.5	-	-	-	-	-	-	-	
	BC 9/2010	-	2.5	-	-	-	-	-	-	-	
	ON 7/2010	-	2.5	-	-	-	-	-	-	-	
	QC 6/2008	-	2.5	-	-	-	-	-	-	-	

Notes: [A]as F

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.

**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.

**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.

**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.

**Solubility** : Soluble in the following materials: cold water.

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### 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
disodium dihydrogenpyrophosphate	LC50 Inhalation Dusts and mists	Rat	>0.58 mg/L	4 hours
Sodium fluoride	LD50 Oral	Rat	1800 mg/kg	-
trisodium tetraoxovanadate	LD50 Oral	Rat	31 mg/kg	-
	LD50 Oral	Rat	330 mg/kg	-

**Conclusion/Summary** : Not available.

##### Chronic toxicity

**Conclusion/Summary** : Not available.

##### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Sodium fluoride	Eyes - Moderate irritant	Rabbit	-	-	-

**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 fluoride	A4	3	C	-	Possible	-
trisodium tetraoxovanadate	-	-	-	None.	-	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
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**11. Toxicological information**

disodium dihydrogenpyrophosphate	LC50 Inhalation Dusts and mists LD50 Oral	Rat	>0.58 mg/L	4 hours
Sodium fluoride	LD50 Oral	Rat	1800 mg/kg	-
trisodium tetraoxovanadate	LD50 Oral	Rat	31 mg/kg	-
	LD50 Oral	Rat	330 mg/kg	-

**Conclusion/Summary** : Not available.

**Chronic toxicity**

**Conclusion/Summary** : Not available.

**Irritation/Corrosion**

Product/ingredient name	Result	Species	Score	Exposure	Observation
Sodium fluoride	Eyes - Moderate irritant	Rabbit	-	-	-

**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 fluoride	A4	3	C	-	Possible	-
trisodium tetraoxovanadate	-	-	-	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 fluoride	Acute EC50 272 mg/L	Algae	96 hours
	Acute EC50 850000 ug/L Fresh water	Algae - Scenedesmus subspicatus - Exponential growth phase	72 hours
	Acute EC50 98000 ug/L Fresh water	Daphnia - Daphnia magna - Neonate - 6 to 24 hours	48 hours
	Acute LC50 >300000 ug/L Marine water	Crustaceans - Crangon crangon - Adult	48 hours
	Acute LC50 51000 to 68000 ug/L Fresh water	Fish - Oncorhynchus mykiss - 58.7 mm - 1.8 g	96 hours
trisodium tetraoxovanadate	Chronic NOEC 110000 ug/L Fresh water	Daphnia - Daphnia magna - <=24 hours	48 hours
	Acute LC50 16500 to 19500 ug/L Fresh water	Fish - Oncorhynchus tshawytscha - Fry - 0.5 g	96 hours

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**12. Ecological information**

**Conclusion/Summary** : Not available.

**Persistence/degradability**

**Conclusion/Summary** : Not available.

**Canada**

**Aquatic ecotoxicity**

Product/ingredient name	Result	Species	Exposure
Sodium fluoride	Acute EC50 272 mg/L	Algae	96 hours
	Acute EC50 850000 ug/L Fresh water	Algae - Scenedesmus subspicatus - Exponential growth phase	72 hours
	Acute EC50 98000 ug/L Fresh water	Daphnia - Daphnia magna - Neonate - 6 to 24 hours	48 hours
	Acute LC50 >300000 ug/L Marine water	Crustaceans - Crangon crangon - Adult	48 hours
	Acute LC50 51000 to 68000 ug/L Fresh water	Fish - Oncorhynchus mykiss - 58.7 mm - 1.8 g	96 hours
trisodium tetraoxovanadate	Chronic NOEC 110000 ug/L Fresh water	Daphnia - Daphnia magna - <=24 hours	48 hours
	Acute LC50 16500 to 19500 ug/L Fresh water	Fish - Oncorhynchus tshawytscha - Fry - 0.5 g	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. 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*
<b>DOT Classification</b>	Not regulated.	-	-	-
<b>IATA-DGR Class</b>	Not regulated.	-	-	-

**14. Transport information**

PG\* : Packing group

**15. Regulatory information**United States

**HCS Classification** : Toxic material  
Irritating material  
Carcinogen  
Target organ effects

**U.S. Federal regulations** : **TSCA 8(a) PAIR**: trisodium tetraoxovanadate  
**TSCA 8(a) IUR Exempt/Partial exemption**: Not determined  
**United States inventory (TSCA 8b)**: At least one component is not listed.  
**Commerce control list precursor**: Sodium fluoride

**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 fluoride; trisodium tetraoxovanadate

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**:  
Sodium fluoride: Immediate (acute) health hazard, Delayed (chronic) health hazard;  
trisodium tetraoxovanadate: Delayed (chronic) health hazard

**Clean Water Act (CWA) 311**: Sodium fluoride

**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** : Not 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)** : Not listed

State regulations

**Massachusetts** : The following components are listed: SODIUM FLUORIDE

**New York** : The following components are listed: Sodium fluoride

**New Jersey** : The following components are listed: SODIUM FLUORIDE

**Pennsylvania** : The following components are listed: SODIUM FLUORIDE (NAF)

**United States inventory (TSCA 8b)** : At least one component is not listed.

Canada

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

Canadian lists

**Canadian NPRI** : The following components are listed: Sodium fluoride; Vanadium

**CEPA Toxic substances** : The following components are listed: Inorganic fluorides

**Canada inventory** : At least one component is not listed.

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**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)**: 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 INHALED OR SWALLOWED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.

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

Health	3
Flammability	0
Physical hazards	0

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

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



**Date of printing** : 7/26/2011.

**Date of issue** : 7/25/2011.

**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

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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