

Material Safety Data Sheet

Halt™ Protease Inhibitor Cocktail

1. Product and company identification

Product name : Halt™ Protease Inhibitor Cocktail
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 : 0078425 0078437 0078439 0078439B 0087785 0087785B 0087785X2 1860932
 1861278 1861279 1861748 1862209 1901695
MSDS # : 7607
Validation date : 4/19/2011.
Print date : 4/19/2011.
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. [Clear sparkling liquid.]
Odor : Odorless.
Signal word : DANGER!
Hazard statements : CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE REPRODUCTIVE HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE ADVERSE REPRODUCTIVE EFFECTS IN FEMALES, BASED ON ANIMAL DATA.
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 prolonged 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 : Eye contact. Inhalation. Ingestion.
Potential acute health effects
Inhalation : 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 : Corrosive to the skin. Causes burns. Harmful 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 : 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 : Contains material which may impair female fertility, based on animal data.
Target organs : Contains material which causes damage to the following organs: mucous membranes, skin, eyes, central nervous system (CNS).
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:
 stomach pains
 reduced fetal weight
 increase in fetal deaths
 skeletal malformations
Skin : Adverse symptoms may include the following:
 pain or irritation
 redness
 blistering may occur
 reduced fetal weight
 increase in fetal deaths
 skeletal malformations
Eyes : Adverse symptoms may include the following:
 pain
 watering
 redness
 reduced fetal weight
 increase in fetal deaths
 skeletal malformations
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	%
Dimethyl sulfoxide	67-68-5	80 - 95
Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride	30827-99-7	1 - 3

Canada

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3. Composition/information on ingredients

Name	CAS number	%
Dimethyl sulfoxide	67-68-5	80 - 95
Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride	30827-99-7	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** : 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
sulfur 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.

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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. 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. Avoid exposure during pregnancy. 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
Dimethyl sulfoxide	AIHA WEEL (United States, 5/2010). TWA: 250 ppm 8 hour(s).

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other	Notations
Dimethyl sulfoxide	US AIHA 5/2010	250	-	-	-	-	-	-	-	-	

Consult local authorities for acceptable exposure limits.

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Halt™ Protease Inhibitor Cocktail**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.
- 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.
- 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. [Clear sparkling liquid.]
- Flash point** : Closed cup: >100°C (>212°F) [Product does not sustain combustion.]
- Odor** : Odorless.
- Solubility** : Easily 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.

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Halt™ Protease Inhibitor Cocktail**11. Toxicological information**United StatesAcute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Dimethyl sulfoxide	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride	LD50 Oral	Mouse	2834 mg/kg	-

Conclusion/Summary : Not available.Chronic toxicity**Conclusion/Summary** : Not available.Irritation/Corrosion

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

Conclusion/Summary : Not available.Sensitizer**Conclusion/Summary** : Not available.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.
Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride	-	-	-	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 : Not available.Teratogenicity**Conclusion/Summary** : Not available.Reproductive toxicity

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11. Toxicological information

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

Conclusion/Summary : Not available.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Dimethyl sulfoxide	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride	LD50 Oral	Mouse	2834 mg/kg	-

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

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

Conclusion/Summary : Not available.

Sensitizer

Conclusion/Summary : Not available.

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

Halt™ Protease Inhibitor Cocktail

11. Toxicological information

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Dimethyl sulfoxide	-	-	-	None.	-	None.
Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride	-	-	-	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 : Not available.

Teratogenicity

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 mg/kg	-
	-	Positive	-	Rat	Subcutaneous: 30750 mg/kg	-
	-	Positive	Positive	Mouse	Oral: 16 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 : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Dimethyl sulfoxide	Acute EC50 12350 to 25500 mg/L	Algae	96 hours
	Acute EC50 7000 mg/L	Daphnia	24 hours
	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate - <24 hours	48 hours
	Acute LC50 33500 mg/L	Fish	96 hours
	Acute LC50 34000 mg/L	Fish	96 hours
	Acute LC50 35000 mg/L	Fish	96 hours

Conclusion/Summary : Not available.

Persistence/degradability

Halt™ Protease Inhibitor Cocktail**12. Ecological information**

Product/ingredient name	Test	Result	Dose	Inoculum
Dimethyl sulfoxide	Japanese MITI Test	3 % - 14 days	100 mg/l	30 mg/l Activated sludge

Conclusion/Summary : Not available.

Canada**Aquatic ecotoxicity**

Product/ingredient name	Result	Species	Exposure
Dimethyl sulfoxide	Acute EC50 12350 to 25500 mg/L	Algae	96 hours
	Acute EC50 7000 mg/L	Daphnia	24 hours
	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate - <24 hours	48 hours
	Acute LC50 33500 mg/L	Fish	96 hours
	Acute LC50 34000 mg/L	Fish	96 hours
	Acute LC50 35000 mg/L	Fish	96 hours

Conclusion/Summary : Not available.

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Dimethyl sulfoxide	Japanese MITI Test	3 % - 14 days	100 mg/l	30 mg/l Activated sludge

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.

Dispose 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 available.	Not available.	Not available.	-

PG* : Packing group

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Halt™ Protease Inhibitor Cocktail**15. Regulatory information****United States**

HCS Classification : Corrosive 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: Dimethyl sulfoxide; Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Dimethyl sulfoxide: Immediate (acute) health hazard, Delayed (chronic) health hazard; Benzenesulfonyl fluoride, 4-(2-aminoethyl)-, hydrochloride: Immediate (acute) health hazard

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 : None of the components are listed.

New York : None of the components are listed.

New Jersey : The following components are listed: Dimethyl sulfoxide

Pennsylvania : None of the components are listed.

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

Canada

WHMIS (Canada) : Class E: Corrosive material

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.

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

Philippines inventory (PICCS): Not determined.

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16. Other information

Label requirements : CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE REPRODUCTIVE HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE ADVERSE REPRODUCTIVE EFFECTS IN FEMALES, BASED ON ANIMAL DATA.

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

Health	3
Flammability	1
Physical hazards	1

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

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



Date of printing : 4/19/2011.
Date of issue : 4/19/2011.
Date of previous issue : No previous validation.
Version : 1
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.