



## MATERIAL SAFETY DATA SHEET

**Material Name: NIPENT<sup>®</sup> (pentostatin for injection)**

### 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

<b>Manufacturer Name And Address</b>	Hospira, Inc. 275 North Field Drive Lake Forest, Illinois 60045 USA	Hospira Australia Pty Ltd 1 Lexia Place Mulgrave VIC 3170 AUSTRALIA
<b>Emergency Telephone #'s</b>	CHEMTREC: North America: 800-424-9300; International 1-703-527-3887; Australia (02) 8014 4880	
<b>Hospira, Inc., Non-Emergency</b>	224 212-2055	
<b>Material Name</b>	NIPENT <sup>®</sup> (pentostatin for injection)	
<b>Synonyms</b>	(R)-3-(2-deoxy-β-D-erythro-pentofuranosyl)-3,6,7,8-tetrahydroimidazo[4,5-d][1,3]diazepin-8-ol.	

### 2. HAZARD INFORMATION / CLASSIFICATION

<b>Emergency Overview</b>	NIPENT <sup>®</sup> (pentostatin for injection) is provided as a lyophilized powder for reconstitution in single dose vials. NIPENT <sup>®</sup> (pentostatin for injection) contains pentostatin, an anti-neoplastic agent that disrupts normal purine metabolism and DNA synthesis. It is a cytotoxic agent, and should be considered a potential occupational reproductive hazard, harmful to the fetus, and a potential human carcinogen. Following an accidental over-exposure, possible target organs may include the bone marrow, central nervous system, cardiovascular system, gastrointestinal tract, liver, kidneys, lungs, skin, and the fetus.		
<b>Occupational Exposure Potential</b>	There are scientific studies that suggest that personnel (e.g. nurses, pharmacists, etc.) who prepare and administer parenteral antineoplastics (e.g. in hospitals) may be at some risk due to potential mutagenicity, teratogenicity, and/or carcinogenicity of these materials if workplace exposures are not properly controlled. The actual risk in the workplace is not known.		
<b>Signs and Symptoms</b>	During occupational use, this product should be considered irritating to the eyes and respiratory tract. In clinical use, adverse effects have included myelosuppression, headache, diarrhea, nausea and vomiting, hepatotoxicity, central nervous system toxicity, impaired renal function, pulmonary toxicity (cough, dyspnea, and pneumonia), rashes, conjunctivitis, hair loss, joint and muscle pain, and cardiovascular disorders including arrhythmias, angina pectoris, and heart failure. Occasionally, hypersensitivity reactions have also been reported.		
<b>Medical Conditions Aggravated by Exposure</b>	Pre-existing hypersensitivity to pentostatin. Pre-existing bone marrow, blood, gastrointestinal, cardiovascular, liver, kidney, skin, and lung ailments; or pregnancy.		
<b>Carcinogen Lists:</b>	<b>IARC:</b> Not listed	<b>NTP:</b> Not listed	<b>OSHA:</b> Not listed

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<b>Ingredient Name</b>	Pentostatin
<b>Chemical Formula</b>	C <sub>11</sub> H <sub>16</sub> N <sub>4</sub> O <sub>4</sub>

Component	Approximate Percent by Weight	CAS Number	RTECS Number
Pentostatin	17 (0.2 after reconstitution)	53910-25-1	NI2931000

Non-hazardous ingredients include: 50 mg of mannitol (1% after reconstitution). Hazardous ingredients present at less than 1% are: sodium hydroxide and/or hydrochloric acid, which are added to adjust the pH.

#### 4. FIRST AID MEASURES

<b>Eye Contact</b>	Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
<b>Skin Contact</b>	Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
<b>Inhalation</b>	Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
<b>Ingestion</b>	Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

#### 5. FIRE FIGHTING MEASURES

<b>Flammability</b>	None anticipated for this product.
<b>Fire &amp; Explosion Hazard</b>	None anticipated for this product.
<b>Extinguishing Media</b>	As with any fire, use extinguishing media appropriate for primary cause of fire.
<b>Special Fire Fighting Procedures</b>	Firefighters should wear self-contained breathing apparatus. Protective equipment and clothing should be worn to minimize contact with the respiratory tract, skin and eyes.

#### 6. ACCIDENTAL RELEASE MEASURES

<b>Spill Cleanup and Disposal</b>	<p>Put on suitable protective clothing and equipment as specified by site spill procedures. For spilled powder, isolate the area around spill. Collect the spilled powder using techniques that minimize powder migration. Clean affected area with soap and water. Alternatively, a 10% solution of household bleach in water can be used to clean the affected spill areas. Dispose of materials according to the applicable federal, state, or local regulations.</p> <p>If a spill occurs after reconstitution, absorb liquid with suitable material and clean affected area with soap and water. A 10% solution of household bleach can be used to further clean the affected spill areas. Dispose of materials according to the applicable federal, state, or local regulations.</p>
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#### 7. HANDLING AND STORAGE

<b>Handling</b>	<p>Pentostatin, the active ingredient in NIPENT<sup>®</sup> (pentostatin for injection), is a cytotoxic agent. Appropriate procedures should be implemented during the handling and disposal of cytotoxic antineoplastics agents to minimize potential exposures. Several guidelines on handling cytotoxic antineoplastic agents have been published. There is no general agreement that all of the procedures recommended in the guidelines are necessary or appropriate. Consult your hygienist or safety professional for your site requirements.</p> <p>Avoid ingestion, inhalation, skin contact, and eye contact. When handling the powder, precautions may include the use of a containment cabinet during the weighing, reconstitution and/or solubilization of this antineoplastic agent. The use of disposable gloves and respiratory protection is recommended. Proper disposal of contaminated vials, syringes, or other materials is required when working with this material.</p>
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**7. HANDLING AND STORAGE: continued**

**Storage** No special storage is required for hazard control. However, employees should be trained on the proper storage procedures for antineoplastic agents. To maintain the integrity of the material, vials should be stored refrigerated between 2°C and 8°C (36°F to 46°F). After reconstitution, vials may be stored at room temperature and ambient light, but should be used within eight hours because the product does not contain a preservative.

**Special Precautions** Persons with known hypersensitivities to pentostatin, women who are pregnant, or women who want to become pregnant, should consult a health and/or safety professional prior to handling this material.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Exposure Guidelines**

Component	Exposure limits			
	OSHA-PEL	ACGIH-TLV	Hospira EEL	Other Limits
Pentostatin	8-hr TWA: Not established	8-hr TWA: Not established	8-hr TWA: Not Established	NA

Notes: OSHA PEL: US Occupational Safety and Health Administration – Permissible Exposure Limit  
 ACGIH TLV: American Conference of Governmental Industrial Hygienists – Threshold Limit Value.  
 EEL: Employee Exposure Limit.  
 TWA: 8-hour Time Weighted Average.  
 STEL: 15-minute Short Term Exposure Limit.

**Respiratory Protection** Respiratory protection is normally not needed during intended product use. However, if the generation of dusts or aerosols is likely, and engineering controls are not considered adequate to control potential airborne exposures, the use of an approved air-purifying respirator with a HEPA cartridge (N99 or equivalent) is recommended under conditions where airborne dust or aerosol concentrations are not expected to be excessive. For uncontrolled release events, or if exposure levels are not known, provide respirators that offer a high protection factor such as a powered air purifying respirator or supplied air. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions require respirator use. Personnel who wear respirators should be fit tested and approved for respirator use as required.

**Skin Protection** When handling this product, disposable gloves should be worn at all times. Further, the use of double gloves is recommended. Disposable gloves made from nitrile, neoprene, polyurethane or natural latex generally have low permeability to this material. Persons known to be allergic to latex rubber should select a non-latex glove. Gloves should be changed regularly, and removed immediately after known contamination. Care should be taken to minimize inadvertent contamination when removing and/or disposing of gloves.

**Eye Protection** As a minimum, the use of chemical safety goggles is recommended when handling this product.

**Engineering Controls** When handling the dry powder, local exhaust ventilation is recommended to minimize employee exposure. The use of an enclosure, such as an approved ventilated cabinet designed to minimize airborne exposures, is recommended during reconstitution.

**9. PHYSICAL/CHEMICAL PROPERTIES**

<b>Appearance/Physical State</b>	White to off-white solid
<b>Odor</b>	Odorless
<b>Odor Threshold:</b>	NA
<b>pH:</b>	After reconstitution, the pH of the final product is between 7.0 and 8.5.
<b>Melting point/Freezing point:</b>	220-225°C
<b>Initial Boiling Point/Boiling Point Range</b>	NA
<b>Evaporation Rate:</b>	NA
<b>Flash Point:</b>	NA
<b>Flammability (solid, gas):</b>	NA
<b>Upper/Lower Flammability or Explosive Limits:</b>	NA
<b>Vapor Pressure</b>	NA
<b>Vapor Density (Air =1)</b>	NA
<b>Evaporation Rate</b>	NA
<b>Specific Gravity</b>	NA
<b>Solubility</b>	Freely soluble in water.
<b>Partition coefficient: n-octanol/water:</b>	NA
<b>Auto-ignition temperature</b>	NA
<b>Decomposition temperature</b>	NA

**10. STABILITY AND REACTIVITY**

<b>Reactivity</b>	Not determined.
<b>Chemical Stability</b>	Stable under standard use and storage conditions.
<b>Hazardous Reactions</b>	Not determined
<b>Conditions to avoid</b>	Not determined
<b>Incompatibilities</b>	Not determined
<b>Hazardous Decomposition Products</b>	Not determined. During thermal decomposition, it may be possible to generate irritating vapors and/or toxic fumes of carbon oxides and nitrogen oxides (NO <sub>x</sub> ).
<b>Hazardous Polymerization</b>	Not anticipated to occur with this product.

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

Not determined for the product mixture. Information for the active ingredient, pentostatin, is as follows:

Ingredient(s)	Percent	Test Type	Route of Administration	Value	Units	Species
Pentostatin	100	LD50	Oral	227	mg/kg	Mouse
Pentostatin	100	LD50	Intravenous	122	mg/kg	Mouse
Pentostatin	100	LD50	Intraperitoneal	72	mg/kg	Mouse

LD50 is the dosage producing 50% mortality.

### Aspiration Hazard

None anticipated from normal handling of this product.

### Dermal Irritation/Corrosion

None anticipated from normal handling of this material. However, inadvertent skin contact may produce irritation with redness.

### Ocular Irritation/Corrosion

None anticipated from normal handling of this material. However, inadvertent eye contact may produce irritation with redness, tearing, and discomfort.

### Dermal or Respiratory Sensitization

None anticipated from normal handling of this material. Occasionally, hypersensitivity reactions have been reported during clinical use of this product.

### Reproductive Effects

\*Fertility studies have not been conducted in animals; however, in a 5-day intravenous toxicity study in dogs, mild seminiferous tubular degeneration was reported at dosages of 1 and 4 mg/kg. Pentostatin was administered intravenously to pregnant rats at dosages of 0, 0.01, 0.1, or 0.75 mg/kg/day on days 6 through 15 of gestation. Maternal toxicity occurred at dosages of 0.1 and 0.75 mg/kg/day. Teratogenic effects (primarily increased incidences of various skeletal malformations) occurred at dosages of 0.75 mg/kg/day. Pentostatin was also teratogenic in mice when given as a single 2 mg/kg intraperitoneal injection on day 7 of gestation. Pentostatin was not teratogenic in rabbits when given intravenously at dosages of 0, 0.005, 0.01, or 0.02 mg/kg/day on days 6 through 18 of gestation; however, maternal toxicity, abortions, early deliveries, and deaths occurred in all drug-treated groups.

### Mutagenicity

\*Pentostatin was nonmutagenic when tested in *Salmonella typhimurium* strains TA-98, TA-1535, TA-1537, and TA-1538, but exhibited a positive response trend in the TA-100 strain, with and without metabolic activation. Formulated pentostatin was clastogenic in an *in vivo* mouse bone marrow micronucleus assay at dosages of 20 mg/kg and above. Pentostatin was not mutagenic to V79 Chinese hamster lung cells, with or without metabolic activation. Pentostatin did not significantly increase chromosomal aberrations in V79 Chinese hamster lung cells, either in the presence or absence of metabolic activation.

### Carcinogenicity

\*The carcinogenic potential of pentostatin has not been fully evaluated in long-term animal studies.

### Target Organ Effects

This material should be considered irritating to the eyes and respiratory tract. Following an accidental over-exposure, possible target organs may include the bone marrow, central nervous system, cardiovascular system, gastrointestinal tract, liver, kidneys, skin, lungs, and the fetus.

\*Abstracted from the Nipent® Package Insert

## 12. ECOLOGICAL INFORMATION

<b>Aquatic Toxicity</b>	Not available for product.
<b>Persistence/ Biodegradability</b>	Not determined
<b>Bioaccumulation</b>	Not determined
<b>Mobility in Soil</b>	Not determined

Notes:

1. EC50: Concentration in water that produces 50% mortality in Daphnia sp.
2. LC50: Concentration in water that produces 50% mortality in fish.
3. EC50: Concentration in water that produces 50% inhibition of growth in algae.
4. LD50 = Time to 50% mortality of organisms

## 13. DISPOSAL CONSIDERATIONS

<b>Waste Disposal</b>	All waste materials must be properly characterized. Disposal should be performed in accordance with the federal, state or local regulatory requirements.
<b>Container Handling and Disposal</b>	Dispose of containers and unused contents in accordance with federal, state and local regulations.

## 14. TRANSPORTATION INFORMATION

**DOT STATUS:** Not Regulated

**Proper Shipping Name:** NA  
**Hazard Class:** NA  
**UN Number:** NA  
**Packing Group:** NA  
**Reportable Quantity:** NA

**ICAO/IATA STATUS** Not Regulated

**Proper Shipping Name:** NA  
**Hazard Class:** NA  
**UN Number:** NA  
**Packing Group:** NA  
**Reportable Quantity:** NA

**IMDG STATUS** Not Regulated

**Proper Shipping Name:** NA  
**Hazard Class:** NA  
**UN Number:** NA  
**Packing Group:** NA  
**Reportable Quantity:** NA

**15. REGULATORY INFORMATION**





<b>U.S. TSCA Status</b>	Exempt
<b>U.S. CERCLA Status</b>	Not listed
<b>U.S. SARA 302 Status</b>	Not listed
<b>U.S. SARA 313 Status</b>	Not listed
<b>U.S. RCRA Status</b>	Not listed
<b>U.S. PROP 65 (Calif.)</b>	This product is, or contains chemical(s) known to the State of California to cause developmental toxicity.

Notes: TSCA, Toxic Substance Control Act; CERCLA, US EPA law, Comprehensive Environmental Response, Compensation, and Liability Act; SARA, Superfund Amendments and Reauthorization Act; RCRA, US EPA, Resource Conservation and Recovery Act; Prop 65, California Proposition 65

**U.S. OSHA Classification**

Possible Irritant
Reproductive Toxin
Possible Carcinogen
Target Organ Toxin

**GHS Classification** \*Where medicinal products are not exempt, the recommended GHS workplace classification for this product is as follows:

<b>Hazard Class</b>	Acute Oral Toxicity	Eye Irritation	Toxic to Reproduction	Mutagenicity	Carcinogenicity	Target Organ Toxicity
<b>Hazard Category</b>	Not Classified	2B	2	2	2	2
<b>Hazard Symbol</b>	NA	NA				
<b>Signal Word</b>	NA	Warning	Warning	Warning	Warning	Warning
<b>Hazard Statement</b>	NA	Causes eye irritation	Suspected of damaging fertility or the unborn child	Suspected of causing genetic defects if ingested.	Suspected of causing cancer if ingested.	May cause damage to the bone marrow, central nervous system, cardiovascular system, gastrointestinal tract, liver, kidneys, skin, and lungs through prolonged or repeated exposure.

**GHS Precautionary Statements:**

- Prevention:** Obtain special instructions before use.  
 Do not handle until all safety precautions have been read and understood.  
 Use personal protective equipment as required.  
 Avoid breathing dust or aerosols.  
 Wear protective gloves. Contaminated work clothing should not be allowed out of the workplace.  
 Do not eat, drink or smoke when using this product.  
 Wash hands thoroughly after handling.
- Response:** IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth.  
 IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs, seek medical attention. Take off contaminated clothing and wash before reuse.  
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. If eye irritation persists, get medical attention.  
 If exposed or concerned, get medical attention.

**15. REGULATORY INFORMATION: continued**

**EU Classification\***

\*Medicinal products are exempt from the requirements of the EU Dangerous Preparations Directive. Information provided below is for the pure drug substance pentostatin.

**Classification(s):**

	Harmful	Irritant	Toxic to Reproduction Category 2	Carcinogen Category 2	Mutagen Category 2
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**Symbol:**



**Indication of Danger:**

Xn	Xi	T	T	T
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**Risk Phrases:**

R22 - Harmful if swallowed  
 R36/37 - Irritating to eyes and respiratory system  
 R45 - May cause cancer  
 R46 - May cause heritable genetic damage  
 R60 - May impair fertility  
 R61 - May cause harm to the unborn child  
 R64 - May cause harm to breastfed babies

**Safety Phrases:**

S22: Do not breathe dust  
 S24: Avoid contact with the skin  
 S25: Avoid contact with eyes  
 S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

**16. OTHER INFORMATION**

Notes:

ACGIH TLV	American Conference of Governmental Industrial Hygienists – Threshold Limit Value
CAS	Chemical Abstracts Service Number
CERCLA	US EPA law, Comprehensive Environmental Response, Compensation, and Liability Act
DOT	US Department of Transportation Regulations
EEL	Employee Exposure Limit
IATA	International Air Transport Association
LD <sub>50</sub>	Dosage producing 50% mortality
NA	Not applicable/Not available
NE	Not established
NIOSH	National Institute for Occupational Safety and Health
OSHA PEL	US Occupational Safety and Health Administration – Permissible Exposure Limit
Prop 65	California Proposition 65
RCRA	US EPA, Resource Conservation and Recovery Act
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act
STEL	15-minute Short Term Exposure Limit
TSCA	Toxic Substance Control Act
TWA	8-hour Time Weighted Average

**16. OTHER INFORMATION: continued**

MSDS Coordinator: Hospira GEHS  
Date Prepared: July 16, 2007  
Revision Date: February 26, 2008  
Revision Date: February 23, 2010

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