



MATERIAL SAFETY DATA SHEET

Material Name: Paclitaxel Injection, USP

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer Name And Address	Hospira, Inc. 275 North Field Drive Lake Forest, Illinois 60045 USA	Hospira Australia Pty Ltd 1 Lexia Place Mulgrave VIC 3170 AUSTRALIA
Emergency Telephone #'s	CHEMTREC: North America: 800-424-9300; International 1-703-527-3887; Australia (02) 8014 4880	
Hospira, Inc., Non-Emergency	224 212-2055	
Material Name	Paclitaxel Injection, USP	
Synonyms	(2 <i>aR</i> ,4 <i>S</i> ,4 <i>aS</i> ,6 <i>R</i> ,9 <i>S</i> ,11 <i>S</i> ,12 <i>S</i> ,12 <i>aR</i> ,12 <i>bS</i>)-1,2 <i>a</i> ,3,4,4 <i>a</i> ,6,9,10,11,12,12 <i>a</i> ,12 <i>b</i> -Dodecahydro-4,6,9,11,12,12 <i>b</i> -hexahydroxy-4 <i>a</i> ,8,13,13-tetramethyl-7,11-methano-5 <i>H</i> -cyclodeca[3,4]-benz[1,2- <i>b</i>]oxet-5-one 6,12 <i>b</i> -diacetate,12-benzoate,9-ester with (2 <i>R</i> ,3 <i>S</i>)- <i>N</i> -benzoyl-3-phenylisoserine; 5β,20-Epoxy-1,2 <i>α</i> ,4,7β,10β,13 <i>α</i> -hexahydroxytax-11-en-9-one 4,10-diacetate 2-benzoate 13-ester with (2 <i>R</i> ,3 <i>S</i>)- <i>N</i> -benzoyl-3-phenylisoserine; Taxol®	

2. HAZARD INFORMATION / CLASSIFICATION

Emergency Overview	Paclitaxel Injection, USP, contains paclitaxel, a taxane prepared semi-synthetically from a precursor derived from the needles of the European yew. Paclitaxel induces microtubule formation and stabilization of microtubules, thereby disrupting normal cell division. Clinically, paclitaxel is used to treat some types of cancers. In the workplace, this material should be considered a flammable liquid, cytotoxic, neurotoxic, a potential occupational reproductive hazard, harmful to the fetus, a potential human carcinogen, and potentially irritating to the skin, eyes, and respiratory tract. Following an accidental over-exposure, possible target organs may include the bone marrow, gastrointestinal system, peripheral nervous system, cardiovascular systems, liver, skin and the fetus.
Occupational Exposure Potential	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.
Signs and Symptoms	During occupational use, this material should be considered irritating to the skin, eyes and respiratory tract. In clinical use, adverse effects have included myelosuppression, nausea, vomiting and diarrhea, fatigue, hair loss, bradycardia and abnormal ECG, hepatotoxicity, peripheral neuropathy, hair loss, joint and muscle pain, and hypersensitivity reactions.
Medical Conditions Aggravated by Exposure	Pre-existing hypersensitivity to paclitaxel. Pre-existing bone marrow, blood, gastrointestinal, cardiovascular, peripheral nervous system, liver, or skin ailments; or pregnancy.
Carcinogen Lists:	IARC: Not listed NTP: Not listed OSHA: Not listed

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name	Paclitaxel
Chemical Formula	C ₄₇ H ₅₁ NO ₁₄

Component	Approximate Percent by Weight	CAS Number	RTECS Number
Paclitaxel	~ 0.65	33069-62-4	DA8340700
Ethyl Alcohol	~ 42	64-17-5	KQ6300000
Cremophor EL	~ 57	61791-12-6	GO5661000

Hazardous ingredients present at less than 1% include citric acid.

4. FIRST AID MEASURES

Eye Contact	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.
Skin Contact	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.
Inhalation	Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
Ingestion	Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

5. FIRE FIGHTING MEASURES

Flammability	Flashpoint: 13.6°C (56.4°F).
Fire & Explosion Hazard	Flammable liquid. Keep away from flames, sparks, and other sources of ignition.
Extinguishing Media	As with any fire, use extinguishing media appropriate for primary cause of fire. For small fires, use water fog or fire extinguishing media suitable for Class B fires (e.g. dry chemical, carbon dioxide or foam). For large fires, apply water from as far away as possible; use very large quantities of water applied as a mist or spray.
Special Fire Fighting Procedures	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

Spill Cleanup and Disposal	Isolate area around spill and remove all sources of ignition. Put on suitable protective clothing and equipment as specified by site spill procedures. Absorb liquid with suitable material and clean affected area with soap and water. An undiluted solution of household bleach may be applied to the spill for ten minutes to inactivate paclitaxel. Absorb the liquid with an inert absorbent material (e.g. absorbent pad). Dispose of materials according to the applicable federal, state, or local regulations.
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7. HANDLING AND STORAGE

Handling	Paclitaxel 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.
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7. HANDLING AND STORAGE: continued

- Handling: continued** Avoid ingestion, inhalation, skin contact, and eye contact. If handling a 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 may be required when working with this material.
- Storage** No special storage is required for hazard control. However, employees should be trained on the proper storage procedures for antineoplastic agents. For product protection, follow USP controlled room temperature storage recommendations noted on the product case label, the primary container label, or the product insert.
- Special Precautions** Persons with known hypersensitivities to paclitaxel, 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
Paclitaxel	8-hr TWA: Not established	8-hr TWA: Not established	8-hr TWA: 5 mcg/m ³	NA
Ethyl Alcohol	8 hr TWA: 1000 ppm; 1900 mg/m ³	8 hr TWA: 1000 ppm	8-hr TWA: Not Established	NA
Cremophor EL	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 aerosols or vapors 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 (P100 or equivalent) with an organic vapor cartridge is recommended under conditions where airborne aerosol or vapor 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 material, 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 material.
- Engineering Controls** When handling, 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.

9. PHYSICAL/CHEMICAL PROPERTIES

Appearance/Physical State	Clear colorless to slightly yellow viscous non-aqueous solution
Odor	Alcohol
Odor Threshold:	NA
pH:	NA
Melting point/Freezing point:	NA
Initial Boiling Point/Boiling Point Range	NA
Flash Point:	NA
Evaporation Rate:	NA
Flammability (solid, gas):	NA
Upper/Lower Flammability or Explosive Limits:	LEL: 3.3% based on ethanol UEL: 19% based on ethanol
Vapor Pressure	NA
Vapor Density (Air =1)	NA
Evaporation Rate	NA
Specific Gravity	NA
Solubility	The active ingredient, paclitaxel, has low solubility in water
Partition coefficient: n-octanol/water:	NA
Auto-ignition temperature	NA
Decomposition temperature	NA

10. STABILITY AND REACTIVITY

Reactivity	NA
Chemical Stability	This product is stable.
Hazardous Reactions	NA
Conditions to avoid	Heat, flames, sparks or other sources of ignition.
Incompatibilities	Oxidizing agents, acids, and bases. Do not use with PVC materials.
Hazardous Decomposition Products	Not determined. During thermal decomposition, it may be possible to generate irritating vapors and/or toxic fumes of carbon oxides (COx) and nitrogen oxides (NOx).
Hazardous Polymerization	Not anticipated to occur with this material.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Not determined for the product. Information for ingredients is provided below.

Ingredient(s)	Percent	Route	Test Type	Value	Units	Species
Paclitaxel	100	Intravenous	LD50	85	mg/kg	Rat
Paclitaxel	100	Intravenous	LD50	12	mg/kg	Mouse
Paclitaxel	100	Intraperitoneal	LD50	32.5	mg/kg	Rat
Paclitaxel	100	Intraperitoneal	LD50	128	mg/kg	Mouse
Ethyl Alcohol	100	Oral	LD50	3450 – 11,500	mg/kg	Guinea Pig, Rat, Mouse, Dog
Ethyl Alcohol	100	Intravenous	LD50	1973	mg/kg	Mouse
Ethyl Alcohol	100	Inhalation	LC50 (10h)	20,000	ppm	Rat
Ethyl Alcohol	100	Inhalation	LD50 (4h)	39,000	mg/m3	Mouse
Cremophor EL	100	Oral	LD50	> 6400	mg/kg	Rat
Cremophor EL	100	Dermal	LD50	> 5000	mg/kg	Rat

LD50 is the dosage producing 50% mortality.

LC50 is the concentration in air that produces 50% mortality when inhaled.

- Aspiration Hazard** None anticipated from normal handling of this product. However, inadvertent inhalation of the product aerosol may produce respiratory irritation.

- Dermal Irritation/Corrosion** None anticipated from normal handling of this product. Following inadvertent skin contact, this product may produce irritation with itching and redness. Cremophor EL was non-irritating in a skin irritation study in rabbits. Ethanol may produce mild skin irritation with redness and dryness.

- Ocular Irritation/Corrosion** None anticipated from normal handling of this product. Following inadvertent eye contact, this product may produce irritation, redness and discomfort. Exposure to ethanol or Cremophor EL may produce eye irritation. Exposure to ethanol has produced severe eye irritation in studies in animals.

- Dermal or Respiratory Sensitization** No data found. In clinical use, anaphylaxis and severe hypersensitivity reactions including dyspnea, hypotension requiring treatment, angioedema, and generalized urticaria have occurred in 2-4% of patients receiving paclitaxel. Cremophor EL was non-sensitizing in a sensitization study in guinea pigs.

- Reproductive Effects** Administration of paclitaxel prior to and during mating impaired fertility in male and female rats at dosages ≥ 1 mg/kg/day. At this dosage, paclitaxel caused reduced fertility and reproductive indices, and increased embryo- and fetotoxicity. Administration of paclitaxel during the period of organogenesis to rabbits at a dosage of 3.0 mg/kg/day caused embryo- and fetotoxicity, as indicated by intrauterine mortality, increased resorptions, and increased fetal deaths. Maternal toxicity was also observed at this dose. No teratogenic effects were noted at a dosage of 1.0 mg/kg/day; the teratogenic potential could not be assessed at higher doses due to extensive fetal mortality. Ethanol has been shown to produce fetotoxicity in the embryo or fetus of laboratory animals. Chronic prenatal exposure to ethanol has been associated with a distinct pattern of congenital malformations that have collectively been termed the "fetal alcohol syndrome". No adverse effects on fertility or fetal development were noted in studies in animals given Cremophor EL.

11. TOXICOLOGICAL INFORMATION:continued

Mutagenicity	Paclitaxel was clastogenic in vitro (producing chromosome aberrations in human lymphocytes) and in vivo (micronucleus test in mice). Paclitaxel was not mutagenic in the Ames test or in the CHO/HGPRT gene mutation assay. No mutagenic effect was found in various tests with bacteria and mammalian cell culture with Cremophor EL; it was not mutagenic in studies with mammals.
Carcinogenicity	The carcinogenic potential of paclitaxel has not been fully evaluated in long-term studies in animals. Cremophor EL was not carcinogenic in chronic dietary studies in animals.
Target Organ Effects	This material should be considered irritating to the skin, eyes and respiratory tract. Following an accidental over-exposure, possible target organs may include the bone marrow, peripheral nervous system, cardiovascular system, gastrointestinal system, liver, skin and the fetus.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity	<p>Not determined for the product. Information for ingredients is provided below:</p> <p>LC50 > 0.74 mg/L in daphnia for paclitaxel IC50 > 1000 mg/L for inhibition of respiration in activated sludge for paclitaxel.</p> <p>LC50(24 hr) = 12,900 - 15,300 mg/L in rainbow trout for ethanol LC50 (24 hr) = 11,200 mg/L in fingerling trout for ethanol LC50(48 hr) = 9,268 - 14,221 mg/L in Daphnia magna for ethanol EC50 = 9310 mg/L in Chlorella pyrenoidosa (green algae) for ethanol</p>
Persistence/Biodegradability	<p>Not determined for the product. Information for ingredients is provided below:</p> <p>Paclitaxel undergoes anaerobic degradation.</p> <p>Ethanol was reported to be degraded between 45% and 74% in five days in two aqueous biodegradation assays.</p>
Bioaccumulation	<p>Not determined for the product. Information for ingredients is provided below:</p> <p>Because of its low octanol:water partition coefficient, ethanol is not anticipated to bioaccumulate.</p>
General Notes	None

LC50: Concentration in water that produces 50% mortality in Daphnia sp.
 IC: inhibitory concentration

13. DISPOSAL CONSIDERATIONS

Waste Disposal	Disposal should be performed in accordance with the federal, state or local regulatory requirements. Product is classified as hazardous waste (D001) based on flashpoint testing.
Container Handling and Disposal	Dispose of containers and unused contents in accordance with federal, state and local regulations.

14. TRANSPORTATION INFORMATION

DOT STATUS: Regulated
Proper Shipping Name: Ethanol Solution
Hazard Class: 3
UN Number: 1170
Packing Group: II
Reportable Quantity: NA

ICAO/IATA STATUS Regulated
Proper Shipping Name: Ethanol Solution
Hazard Class: 3
UN Number: 1170
Packing Group: II
Reportable Quantity: NA

IMDG STATUS Regulated
Proper Shipping Name: Ethanol Solution
Hazard Class: 3
UN Number: 1170
Packing Group: II
Reportable Quantity: NA

Notes: DOT – US Department of Transportation Regulations

15. REGULATORY INFORMATION








TSCA Status Exempt
CERCLA Status Not listed
SARA 302 Status Not listed
SARA 313 Status Not listed
RCRA Status Classified as D001 hazardous waste based on ignitability.
PROP 65 (Calif.) 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
 Flammable Liquid

15. REGULATORY INFORMATION: continued

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

Hazard Class	Hazard Category	Symbol	Signal Word	Hazard Statement
Flammable Liquid	2		Danger	Highly flammable liquid and vapor
Acute Oral Toxicity	Unknown	NA	NA	NA
Eye Irritation	2A		Warning	Causes serious eye irritation
Skin Irritation	2		Warning	Causes skin irritation
Toxic to Reproduction	2		Warning	Suspected of damaging fertility or the unborn child
Mutagenicity	2		Warning	Suspected of causing genetic defects
Carcinogenicity	2		Warning	Suspected of causing cancer
Target Organ Toxicity	2		Warning	May cause damage to the bone marrow, peripheral nervous system, cardiovascular system, gastrointestinal system, liver, and skin 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 vapors.
 In case of inadequate ventilation wear respiratory protection.
 Wear eye/face protection as specified by the manufacturer/supplier or the competent authority.
 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 INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms call a POISON CENTER or a doctor.
 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 paclitaxel.

Classification(s):	Irritant	Toxic to Reproduction Category 2	Carcinogen Category 2	Mutagen Category 2
Symbol:				
Indication of Danger:	Xi	T	T	T

Risk Phrases:
 R36/37/38 - Irritating to eyes, respiratory system, and skin
 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:
 S23: Do not breathe vapors/sprays
 S24: Avoid contact with the skin
 S25: Avoid contact with eyes
 S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
 S60: This material and its container must be disposed of as hazardous waste

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 ₅₀	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: Global Occupational Toxicology
Date Prepared: May 5, 2008
Date Revised: August 21, 2008
Date Revised: November 9, 2009

Disclaimer:

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