



## MATERIAL SAFETY DATA SHEET

While we believe the information provided herein is accurate and current, JHP Pharmaceuticals makes no representation or warranties, either explained or implied, and assume no responsibility for any damage or injuries of any kind, which may result from use or reliance upon this information

SECTION 1	MATERIAL IDENTIFICATION
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**PRODUCT NAME:** Delestrogen®  
(estradiol valerate injection, USP) **DATE OF ISSUE:** 3/6/08

**FORMULA:** C23H32O3 **SUPERCEDES:** 2/5/08 **REVISION:** 2.0

**SYNONYMS:** Estradiol valerate injection, USP

**NDC:** 42023-110-01 Delestrogen® (estradiol valerate injection, USP), 10mg/mL, 5mL MDV  
 42023-111-01 Delestrogen® (estradiol valerate injection, USP), 20mg/mL, 5mL MDV  
 42023-112-01 Delestrogen® (estradiol valerate injection, USP), 40mg/mL, 5mL MDV

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SECTION 2	INGREDIENT (S)
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**EXPOSURE LIMITS/GUIDELINES**

CAS #	INGREDIENT NAME	OSHA PEL	ACGIH TLV	OTHER	LISTED AS CARCINOGEN
979-32-8	Estradiol valerate	N/D	N/D	N/D	Yes
8001-79-4	Castor Oil	N/D	N/D	N/D	N/D
120-51-4	Benzyl Benzoate, USP	N/D	N/D	N/D	N/D
100-51-6	Benzyl Alcohol	N/D	N/D	N/D	N/D
N/D	Chlorobutanol	N/D	N/D	N/D	N/D
N/D	Sesame Oil	N/D	N/D	N/D	N/D

SECTION 3	HAZARD IDENTIFICATION
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**ROUTES OF ENTRY:**

1. **Inhalation:** Under normal conditions exposure to this material by inhalation is not expected to occur
2. **Skin Contact:** Exposure may occur via skin contact if gloves and protective clothing are not worn. Absorption may occur, although the extent of dermal absorption is unknown. Acute –a. Toxic: If there is sufficient skin contact with this material, the following symptoms are possible: nausea, vomiting, cholestatic jaundice, skin changes, edema, headache, dizziness, depression, corneal changes, and intolerance to contact lenses. Women may experience menstrual irregularities and breast tenderness. This formulation also contains irritants. –b. Irritation: The material contains benzyl alcohol and benzyl benzoate which can irritate the skin. The irritant potential of estradiol valerate has not been evaluated. However, based on irritation studies performed with other steroids, estradiol valerate is not expected to be irritating to the skin. –c. Sensitization: The potential of this material to act as a sensitizer (allergen) has not been evaluated. However, based on clinical experience with this material, it is not expected to be a sensitizer.
3. **Ingestion:** Ingestion of large quantities of this material in an occupational setting would not be expected to occur. Ingestion of trace amounts of the material might occur if material contacts hands and if hands are not washed prior to eating, drinking, or smoking. Estradiol valerate is absorbed through the gastrointestinal tract, although the extent of absorption is unknown. Acute: -This material contains a highly potent estrogen. Acute overdosing may cause nausea and vomiting. Women may experience menstrual irregularities, specifically withdrawal bleeding. If sufficient ingestion of castor oil occurs, laxative effects including abdominal cramps, diarrhea, nausea, and vomiting may result. Chronic: Repeated ingestion of large doses of estradiol valerate over a prolonged period may cause nausea, vomiting, cardiovascular effects, cholestatic jaundice, skin changes, edema, headache, dizziness, depression, corneal changes, and intolerance to contact lenses and hematologic effects. Women may experience menstrual irregularities and breast tenderness. Gynecomastia, testicular atrophy and loss libido and potency has also been reported in men after treatment with estrogen or overexposure to estrogen in an occupational setting.

**HEALTH HAZARD:**

Estradiol valerate, a derivative of 17 beta-estradiol, acts on male and female reproductive systems. An exposure guideline of 0.0001 mg/m<sup>3</sup> of air (expressed as estradiol equivalents) has been established for work place exposure to estradiol valerate. Provided that ingestion and skin contact are avoided, adherence to the exposure guideline will ensure that a worker is not exposed to more than 2% of the lowest recommended therapeutic dose of this drug and should protect employees from experiencing pharmacological effects of these substances. It is also expected that exposure below the exposure guideline would not be associated with a significantly elevated incidence of endometrial cancer. It is recommended that pregnant women avoid exposure to 17 beta-estradiol and its derivatives.

**Carcinogen Lists**

**IARC:** Yes

**NTP:** Yes

**OSHA:** No

Estradiol valerate is a potent estrogenic compound. It is an ester of 17 beta-estradiol which has been classified as a potential human carcinogen by IARC based on information from animal studies. NTP has classified 17 beta-estradiol as "reasonably anticipated to be carcinogenic." Chronic exposure to high therapeutic doses of conjugated estrogens has been associated with an increased incidence of endometrial cancer in humans. Exposure to high doses of estrogens has been associated with induction of cancer in laboratory animals.

**Target Organs:** Male and female reproductive systems, central nervous system, liver, eyes, gallbladder, and blood.

**Medical Condition Aggravated by Exposure:** Repeated exposure to therapeutic doses of estrogen may aggravate cancer, cardiac disease, renal disease, metabolic bone disease, abnormal clotting, high blood pressure, toxic reactions to tricyclic anti-depressants.

**Medical Surveillance Recommendation:** Estradiol valerate is a potent estrogenic hormone. Estrogens have been reported to increase the risk of endometrial cancer in women. They can also cause, among other effects, increased blood clotting, liver tumors, and abnormal glucose tolerance. Gynecomastia has also been reported in men after treatment with estrogens or overexposure to estrogens in an occupational setting. Estrogens can cause fetal harm if taken during pregnancy. Women who are pregnant should avoid exposure to these compounds. If exposure exceeds the exposure guideline, personnel should be monitored with glucose and liver function tests.

**SECTION 4**

**FIRST AID INFORMATION**

**EYES:** Hold eyelids apart and flush with plenty of water for 15 minutes. Get medical attention if signs of irritation develop.

**SKIN:** Remove contaminated clothing. Flush with plenty of water

**INHALATION:** Remove exposed person to fresh air. If person is not breathing, give artificial respiration. If breathing is difficult, administer oxygen. Get medical attention.

**INGESTION:** Seek medical attention immediately. Do NOT induce vomiting.

**REGULATED EXPOSURE LIMITS :** See **Health Hazard Information**.

**SECTION 5**

**FIRE AND EXPLOSION DATA**

**FLASH POINT AND METHOD:** N/D

**EXTINGUISHING MEDIUM:** In case of fire, use carbon dioxide, foam, or dry chemical

**SPECIAL FIRE PROCEDURES:** Firefighters should wear self-contained breathing apparatus (SCBA), flame and chemical resistant clothing, boots and gloves. Evacuate personnel to upwind direction, remove unneeded material. Cool container(s) with water from maximum distance. Fight fire from a maximum distance or use an unmanned monitor. Divert fire run-off to a safe area. Keep unnecessary people away; isolate hazard area and deny entry. Move container from the fire area, if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks.

**HAZARDOUS DECOMPOSITION OR COMBUSTION PRODUCTS:** CO and CO<sub>2</sub>

**FIRE HAZARDS:** ND

**EXPLOSION HAZARDS:** ND

**SECTION 6**

**ACCIDENTAL RELEASE MEASURES**

**ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Isolate area and wear protective clothing (disposable gown and latex gloves, shoe covers). A respirator with a high efficiency particulate air (HEPA) cartridge or self contained breathing apparatus should also be used if there is a potential for aerosols to be present. Small spills, wipe up with wet absorbent gauze pads. Wash area with detergent/ water solution. For large spills, cover with absorbent material and sweep up. A HEPA vacuum may also be used to clean up small or large spills. Product and contaminated materials are hazardous, place a suitable container for disposal. Incineration is recommended.

**SECTION 7****HANDLING AND STORAGE**

**STORE AS STATED IN PRODUCT LABELING:** This material should be handled and stored per label instructions to ensure product integrity. Store at room temperature, protect from air and light.

**OTHER PRECAUTIONS:** Therapeutic agents are intended for use under direction of a physician and/or under the conditions of use described on the label. As a general precaution, personnel who handle drug substances should avoid contact (ingestion, inhalation, skin and eye contact) with these substances.

**SECTION 8****SPECIAL PROTECTION**

**RESPIRATORY PROTECTION:** When engineering controls are not sufficient to control exposure, or if BSC (biological safety cabinet) is not available, wear NIOSH approved respirator with HEPA filters; self-contained breathing apparatus should be available for handling large quantities and for emergency use.

**PROTECTIVE GLOVES:** Disposable surgical latex or nitrile gloves.

**VENTILATION:** Local mechanical exhaust ventilation, includes chemical fume hoods and biological safety cabinets (BSC), recommended to minimize employee exposure. Control exposure by enclosure of processes whenever possible.

**EYE PROTECTION:** Safety glasses.

**OTHER PROTECTIVE CLOTHING OR EQUIPMENT:** Wear impervious disposable coveralls with closed front, if involved in manufacture of Delestrogen. Remove disposable clothing prior to leaving work area.

**SECTION 9****PHYSICAL AND CHEMICAL DATA**

**THERAPEUTIC CLASS:** Hormone    **PHYSICAL STATE:** Solution

**APPEARANCE:** Clear, colorless to pale

**CHARACTERISTIC ODOR:** Slightly fatty at room temperature

**SPECIFIC GRAVITY:** N/D

**SOLUBILITY:** Insoluble

**pH:** N/D

**WATER:** N/A

**OTHER:**

**SECTION 10****STABILITY AND REACTIVITY**

**STABILITY:** Stable under normal conditions.

**INCOMPATIBILITY:** N/D

**HAZARDOUS POLYMERIZATION:** Will not occur.

**HAZARDOUS DECOMPOSITION OF BYPRODUCTS:** CO and CO<sub>2</sub>

**CONDITIONS TO AVOID:** None known.

**SECTION 11****TOXICOLOGY****TOXICITY INFORMATION:**

**Acute:** LD50: Not Available  
LC50: Not Available

**Chronic:**

**Carcinogenicity:** Estrogens have been shown to induce cancer in many animal species and in many different organ systems. See HEALTH HAZARD, Carcinogen Lists.

**Mutagenicity:** Estradiol valerate has been extensively tested in a battery of genetic toxicity tests. Based on the results of the majority of these studies, it is generally thought that estrogen and conjugated estrogens exert their carcinogenic action via non-mutagenic mechanisms. In general, these compounds are considered to be tumor promoters rather than initiators. There are, however, a few recent studies which propose a genotoxic mechanism for estradiol and other estrogens.

**Teratogenicity:** Estrogens can cause serious fetal toxicity when administered to pregnant women.

**Reproductive Effects:** In women, estrogens (used in combination with progestins) are used for ovulation control in the prevention of conception. Subacute and chronic overexposure may result in menstrual irregularities and infertility. In men, exposure to estrogens has been associated with testicular atrophy, gynecomastia, and loss of libido and potency.

**Toxicological Synergistic Productivity:** Estrogens have been reported to enhance the anti-inflammatory effect of hydrocortisone in patients with chronic inflammatory disease.

(Refer to package insert for further information)

<b>SECTION 12</b>	<b>ECOLOGICAL INFORMATION</b>
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<b>SECTION 13</b>	<b>DISPOSAL</b>
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**WASTE DISPOSAL METHOD:** Dispose of in accordance with local, state and federal regulations or the authority having jurisdiction. It is recommended this formulation be treated as a hazardous material.

<b>SECTION 14</b>	<b>TRANSPORTATION INFORMATION</b>
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**DOT:** Not a DOT controlled material (United States).

**Identification:** NA

**Special Provisions for Transport:** NA

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NA – NOT APPLICABLE

ND – NO DATA FOUND

The information provided in this Material Safety Data Sheet has been compiled from our experience and the data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for the adoption of safety precautions as may be necessary. We reserve the right to revise the Material Safety Data Sheets from time to time as new information becomes available. The user has the responsibility to contact the company to make sure the sheet is the latest one issued.