SAFETY DATA SHEET

1. Identification

Product identifier: Poulvac MD-Vac (HVT CA)

Other means of identification:
- Synonyms: Marek’s disease vaccine, HVT serotype 3 * Live Turkey Herpesvirus (HVT) Serotype 3 * Cell Associated Frozen vaccine

Recommended use of the chemical and restrictions on use:
- Recommended use: Veterinary vaccine
- Restrictions on use: Not for human use

Details of manufacturer or importer:
- Company Name (AU): Zoetis Australia Pty Ltd
  ABN: 94 156 476 425
  Level 6, 5 Rider Boulevard
  Rhodes NSW 2138 AUSTRALIA
- Tel: 1800 814 883
- Fax: (02) 8876 0444
- Email: australia.animalhealth@zoetis.com
- Emergency Phone: 1800 814 883 (all hours)
- Police and Fire Brigade: Dial 000
- If ineffective: Dial Poisons Information Centre (13 1126 from anywhere in Australia)

2. Hazard(s) identification

Classification of the hazardous chemical:
- Physical hazards: Not classified.
- Health hazards: Not classified.
- Environmental hazards: Not classified.

Label elements, including precautionary statements:
- Hazard symbol(s): None.
- Signal word: None.
- Hazard Statement(s): The mixture does not meet the criteria for classification.
- Precautionary Statement(s):
  - Prevention: Observe good industrial hygiene practices.
  - Response: Wash hands after handling.
  - Storage: Store away from incompatible materials.
  - Disposal: Dispose of waste and residues in accordance with local authority requirements.
- Other hazards which do not result in classification: None known.
- Supplemental information: In the event of accidental injection, an allergic reaction may occur. Stored under liquid nitrogen. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

3. Composition/information on ingredients

Mixture

<table>
<thead>
<tr>
<th>Identity of chemical ingredients</th>
<th>CAS number and other unique identifiers</th>
<th>Concentration of ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>67-68-5</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>1403-66-3</td>
<td>##</td>
</tr>
<tr>
<td>Live Turkey Herpesvirus (HVT) Serotype 3</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>
4. First-aid measures

**Description of necessary first aid measures**

**Inhalation**
Move to fresh air. Call a physician if symptoms develop or persist.

**Skin contact**
Wash off with soap and water. Get medical attention if irritation develops and persists. In case of contact with liquefied gas, thaw frosted parts with lukewarm water. Do not rub affected area. Call a physician or poison control centre immediately.

**Eye contact**
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

**Ingestion**
For personal protection, see section 8 of the SDS. You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this SDS with you when you call. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

**Personal protection for first-aid responders**
Direct contact with eyes may cause temporary irritation. Exposure may cause temporary irritation, redness, or discomfort. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

**Symptoms caused by exposure**
Treat symptomatically. Self Injection: In all instances of accidental self injection contact a doctor as soon as possible. Further information on treatment is available from Poisons Information Centre - Phone 131 126. Accidental self injection may lead to an inflammatory response. Medical advice should be sought on the management of deep injections, particularly those near a joint or associated with bruising. Check your tetanus immunisation status.

The recommendations following self inoculation for medical management or surgical intervention are as follows: Category 1 injury (superficial skin exposure) Simply wash the contaminated area in warm soapy water. If vaccine material is splashed onto mucosal surfaces (e.g. eyes) there is greater risk and topical corticosteroids should be considered here. Category 2 injury (simple needle-stick injuries without injection) Allow the wound to bleed freely and do not squeeze or interfere with the injection site. Clean the wound thoroughly with soap and water, and keep it clean and dry. Treat symptomatically (e.g. ensure appropriate tetanus cover; prescribe topical corticosteroids and oral antibiotics to prevent opportunistic infection). If unsure whether or not product has been injected, monitor for 24 hours. If pain and swelling subside, injection is unlikely to have occurred. If pain and swelling persist after 24 hours, treatment should be as per Category 3. Category 3 injury (injection of vaccine material) Acute pain and inflammation is usually evident within 24 hours. Perform early surgery and drainage to remove the oil based vaccine material before it spreads or elicits a severe granulomatous reaction. Category 4 injury (lesion that has progressed to necrosis or granulomatous ulceration) Perform surgical debridement to remove any residual vaccine material. Skin grafting may ultimately be required.

5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

**Unsuitable extinguishing media**
Do not use water jet as an extinguisher, as this will spread the fire.

**Specific hazards arising from the chemical**
During fire, gases hazardous to health may be formed.

**Special protective equipment and precautions for fire fighters**
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions**
Move containers from fire area if you can do so without risk.

**Hazchem Code**
None.

**General fire hazards**
No unusual fire or explosion hazards noted. The product is not flammable.

**Specific methods**
Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
For non-emergency personnel
Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained.
1. Avoid discharge into drains, water courses or onto the ground.

2. Environmental precautions

3. Methods and materials for containment and cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

7. Handling and storage

Precautions for safe handling

Use care in handling/storage. Contact with liquefied gas might cause frostbites, in some cases with tissue damage. Wear appropriate personal protective equipment. Avoid contact with eyes, skin, and clothing. Avoid breathing mist or vapour. Avoid accidental injection. When using, do not eat, drink or smoke. Wash thoroughly after handling. Do not use in areas without adequate ventilation. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Avoid release to the environment. Observe good industrial hygiene practices.

Take all precautionary measures, including the use of gloves and face shield or goggles, to avoid potential hazards of handling liquid nitrogen and the possibility of explosion of glass vials as they are taken from the liquid-nitrogen refrigerator or canister or holding cane, or as they are placed in the thawing container. When removing the vial from the cane, hold palm of the gloved hand away from face and body.

Conditions for safe storage, including any incompatibilities

Keep refrigerated with a nitrogen blanket (atmosphere). Keep away from heat, sparks and open flame. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls and personal protection

Control parameters

Follow standard monitoring procedures.

Occupational exposure limits

Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide (CAS 67-68-5)</td>
<td>TWA</td>
<td>160 mg/m3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 ppm</td>
</tr>
</tbody>
</table>

Biological limit values

No biological exposure limits noted for the ingredient(s).

Exposure guidelines

No exposure standards allocated.

Control banding approach

Gentamicin - Zoetis OEB 2 (control exposure to the range of 100ug/m3 to < 1000ug/m3)

Appropriate engineering controls

Ensure adequate ventilation, especially in confined areas. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. General ventilation normally adequate.

Individual protection measures, for example personal protective equipment (PPE)

Eye/face protection

Wear tight-fitting goggles or face shield.

Skin protection

Hand protection

Wear protective gloves.

Other

Wear suitable protective clothing. Use protective clothing (uniforms, lab coats, disposable coveralls, etc.) in both production and laboratory areas. Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Respiratory protection

No personal respiratory protective equipment normally required. In case of insufficient ventilation, wear suitable respiratory equipment. If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.
Thermal hazards: Wear appropriate thermal protective clothing, when necessary. Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Hygiene measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties:

Appearance: Frozen Suspension

Physical state: Solid.

Form: Solid.

Colour: Not available.

Odour: Not available.

Odour threshold: Not available.

pH: Not available.

Melting point/freezing point: Not available.

Initial boiling point and boiling range: Not available.

Flash point: Not available.

Evaporation rate: Not available.

Flammability (solid, gas): Not available.

Upper/lower flammability or explosive limits:

Flammability limit - lower (%): Not available.

Flammability limit - upper (%): Not available.

Explosive limit - lower (%): Not available.

Explosive limit – upper (%): Not available.

Vapour pressure: Not available.

Vapour density: Not available.

Relative density: Not available.

Solubility(ies):

Solubility (water): Not available.

Partition coefficient (n-octanol/water): Not available.

Auto-ignition temperature: Not available.

Decomposition temperature: Not available.

Viscosity: Not available.

Other physical and chemical parameters:

Explosive properties: Not explosive.

Oxidising properties: Not oxidising.

10. Stability and reactivity:

Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability: Material is stable under normal conditions.

Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.

Conditions to avoid: Heat, flames and sparks. Sunlight. Contact with incompatible materials.


Hazardous decomposition products: No hazardous decomposition products are known.
11. Toxicological information

Information on possible routes of exposure

Inhalation
No adverse effects due to inhalation are expected.

Skin contact
Prolonged skin contact may cause temporary irritation. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

- **Dimethyl sulfoxide**
  - Species: Rabbit
  - Severity: Mild

Eye contact
Direct contact with eyes may cause temporary irritation.

- **Dimethyl sulfoxide**
  - Species: Rabbit
  - Severity: Mild

- **Gentamicin**
  - Species: Rabbit
  - Severity: Non-irritating

Ingestion
Expected to be a low ingestion hazard.

Symptoms related to exposure
Direct contact with eyes may cause temporary irritation. Exposure may cause temporary irritation, redness, or discomfort. In the event of accidental injection, an allergic reaction may occur. Signs and symptoms might include skin rash, itching, redness or swelling. Respiratory reactions may be characterized by rhinitis, sneezing, scratchy throat, oral mucosal edema, laryngeal mucosal edema, coughing, shortness of breath, wheezing, and chest pain. Asthma like reactions occur with acute exposures in sensitized patients. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

Acute toxicity

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide (CAS 67-68-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td>Rat</td>
<td>40000 mg/kg</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>Rat</td>
<td>&gt; 2000 mg/m3</td>
</tr>
<tr>
<td>Oral</td>
<td>Rat</td>
<td>14500 mg/kg</td>
</tr>
<tr>
<td><strong>Chronic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td>Rat</td>
<td>2.783 mg/l, 13 weeks Respiratory system</td>
</tr>
<tr>
<td>Gentamicin (CAS 1403-66-3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intramuscular</td>
<td>Mouse</td>
<td>167 mg/kg</td>
</tr>
<tr>
<td>Oral</td>
<td>Rat</td>
<td>463 mg/kg</td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>6600 mg/kg</td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>710 mg/kg</td>
</tr>
<tr>
<td><strong>Skin corrosion/irritation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Serious eye damage/irritation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye contact</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Dimethyl sulfoxide          | Species: Rabbit
  - Severity: Mild |
| Gentamicin                  | Species: Rabbit
  - Severity: Non-irritating |
Respiratory or skin sensitisation

**Respiratory sensitisation**
Not a respiratory sensitizer.

**Skin sensitisation**
This product is not expected to cause skin sensitisation.

**Skin sensitisation**
Dimethyl sulfoxide
Species: Guinea Pig
Severity: negative

Germ cell mutagenicity
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Mutagenicity**
Dimethyl sulfoxide
- In Vitro Bacterial Mutagenicity (Ames)
  Result: negative
  Species: Salmonella
- In Vitro Cytogenetics
  Result: negative
  Species: Chinese Hamster Ovary (CHO) cells
- In Vivo Cytogenetics
  Result: positive
  Species: Rat
- In Vivo Micronucleus
  Result: negative
  Species: Mouse
- In Vivo Sex-Linked Recessive Lethal Test
  Result: negative
  Species: Drosophila

Carcinogenicity
Due to partial or complete lack of data the classification is not possible.

Reproductive toxicity
This product is not expected to cause reproductive or developmental effects.

**Developmental effects**
Dimethyl sulfoxide
- 1000 mg/kg/day Embryo / Fetal Development, Maternal toxicity
  Result: NOAEL
  Species: Rat
  Organ: Oral
- 200 mg/kg/day Embryo / Fetal Development, Fetotoxicity
  Result: LOAEL
  Species: Rat
  Organ: Oral
- Gentamicin
  75 mg/kg/day Embryo / Fetal Development, Developmental toxicity
  Result: LOAEL
  Species: Rat
  Organ: Intramuscular

Specific target organ toxicity - single exposure
Not classified.

Specific target organ toxicity - repeated exposure
Not classified.

Aspiration hazard
Not an aspiration hazard.

Chronic effects
None known. Health injuries are not known or expected under normal use.

Other information
The antigens included in this product are non-infectious. All have been prepared from attenuated preparations of microorganisms.

12. Ecological information

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Avoid release to the environment.
<table>
<thead>
<tr>
<th>Components Test results</th>
<th>Species</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide (CAS 67-68-5)</td>
<td>EC50</td>
<td>Daphnia Magna (Water Flea)</td>
</tr>
<tr>
<td></td>
<td>LC50</td>
<td>Lepomis macrochirus (Bluegill Sunfish)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oncorhynchus mykiss (Rainbow Trout)</td>
</tr>
</tbody>
</table>

**Aquatic**

**Fish**

| | LC50 | Rainbow trout, donaldson trout (Oncorhynchus mykiss) | 33000 - 37000 mg/l, 96 hours |

**Persistence and degradability**

**Bioaccumulative potential**

No data available for this product.

**Mobility in soil**

No data available for this product.

**Other adverse effects**

No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

**13. Disposal considerations**

**Disposal methods**

Refer to product label and/or product insert for specific instructions. Avoid release to the environment. Do not allow this material to drain into sewers/water supplies. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Residual waste**

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging**

Since emptied containers may retain product residue, follow label warnings even after container is emptied.

**14. Transport information**

**ADG**

Not regulated as dangerous goods.

**RID**

Not regulated as dangerous goods.

**IATA**

Not regulated as dangerous goods.

**IMDG**

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable.

**15. Regulatory information**

**Safety, health and environmental regulations**

This Safety Data Sheet was prepared in accordance with Australia Model Code of Practice for the preparation of Safety Data Sheets for Hazardous Chemicals (23/12/2011).

APVMA No. 53224

This SDS replaces version: Issued November, 2015

**Australia Medicines & Poisons Appendix E**

Dimethyl sulfoxide (CAS 67-68-5)

**Australia Medicines & Poisons Appendix F**

Dimethyl sulfoxide (CAS 67-68-5)

**Australia Medicines & Poisons Schedule 4**

DIMETHYL SULFOXIDE (EXCLUDING DIMETHYL SULFONE) (CAS 67-68-5)

Gentamicin (CAS 1403-66-3)

**Australia Medicines & Poisons Schedule 6**

DIMETHYL SULFOXIDE (EXCLUDING DIMETHYL SULFONE) (CONC<=2%) (CAS 67-68-5)

**High Volume Industrial Chemicals (HVIC)**

Not listed.
Importation of Ozone Deleting Substances (Customs(Prohibited imports) Regulations 1956, Schedule 10)
Not listed.

National Pollutant Inventory (NPI) substance reporting list
Not listed.

Prohibited Carcinogenic Substances
Not regulated.

Prohibited Substances (National Model Regulation for the control of Workplace Hazardous Substances, Schedule 2 NOHSC:1005 (1994) as amended)
Not listed.

Restricted Importation of Organochlorine Chemicals (Customs(Prohibited Imports) Regulations 1956, Schedule 9)
Not listed.

Restricted Carcinogenic Substances
Not regulated.

International regulations

Stockholm Convention
Not applicable.

Rotterdam Convention
Not applicable.

Kyoto protocol
Not applicable.

Montreal Protocol
Not applicable.

Basel Convention
Not applicable.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>No</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>No</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>No</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>No</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>No</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>No</td>
</tr>
</tbody>
</table>

* A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s). A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date
20-December-2016

Disclaimer
Zoetis Inc. believes that the information contained in this Safety Data Sheet is accurate, and while it is provided in good faith, it is without warranty of any kind, expressed or implied. If data for a hazard are not included in this document there is no known information at this time. The information in the sheet was written based on the best knowledge and experience currently available.

Revision information
Product and Company Identification: Synonyms
Composition / Information on Ingredients: Ingredients