SAFETY DATA SHEET

PHESGOTM(pertuzumab,trastuzumab&hyaluronidase-zzxf)Injection(60/60mg/ml)

Version 1.0  Revision Date: 06-16-2020  Date of last issue: -
Date of first issue: 06-16-2020

SECTION 1. IDENTIFICATION

Product name : PHESGOTM(pertuzumab,trastuzumab&hyaluronidase-zzxf)Injection(60/60mg/ml)
Product code : RO719-8574/F04
Common name(s), synonym(s) of the substance :
HERCEPTIN® (Trastuzumab), PERJETA® (Pertuzumab) Trastuzumab, Pertuzumab Fixed Dose Combination (60mg/ml, 60mg/ml) Maintenance Dose

Manufacturer or supplier’s details
Company name of supplier : Genentech, Inc.
Address : DNA Way 1 94080 South San Francisco CA USA
Telephone : 001-(650) 225-1000
E-mail address : info.sds@roche.com
Emergency telephone : US Chemtrec phone (800)-424-9300

Recommended use of the chemical and restrictions on use
Recommended use : Formulated pharmaceutical active substance
Restrictions on use : For professional users only.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200
Not a hazardous substance or mixture.

GHS label elements
Not a hazardous substance or mixture.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trastuzumab</td>
<td>180288-69-1</td>
<td>6.0</td>
</tr>
<tr>
<td>Pertuzumab</td>
<td>380610-27-5</td>
<td>6.0</td>
</tr>
<tr>
<td>Trehalose (D+)-, 2H2O</td>
<td>6138-23-4</td>
<td>3.97</td>
</tr>
<tr>
<td>.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl</td>
<td>57-50-1</td>
<td>3.42</td>
</tr>
</tbody>
</table>
SECTION 4. FIRST AID MEASURES

General advice : Do not leave the victim unattended.

If inhaled : Move to fresh air.
If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : If on skin, rinse well with water.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Rinse mouth with water.

Most important symptoms and effects, both acute and delayed : None known.

Notes to physician : The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards during fire fighting : No information available.

Hazardous combustion products : In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Nitrogen oxides (NOx)

Further information : Standard procedure for chemical fires.
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Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Refer to protective measures listed in sections 7 and 8.

Environmental precautions: Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up: Wipe up with absorbent material (e.g. cloth, fleece). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion: Normal measures for preventive fire protection.

Advice on safe handling: For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area.

Conditions for safe storage: Electrical installations / working materials must comply with the technological safety standards.

Further information on storage conditions: See label, package insert or internal guidelines

Materials to avoid: No materials to be especially mentioned.

Storage temperature: Protected from heat and light

Further information on storage stability: No decomposition if stored and applied as directed.

Packaging material: Suitable material: Stainless steel, glass, Vials

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trastuzumab</td>
<td>180288-69-1</td>
<td>IOEL</td>
<td>0.1 mg/m3</td>
<td>Roche Industrial Hygiene Com-</td>
</tr>
</tbody>
</table>
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**PHESGOTM (pertuzumab, trastuzumab & hyaluronidase-zzxf) Injection (60/60mg/ml)**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pertuzumab</strong></td>
<td>380610-27-5</td>
<td>IOEL</td>
<td>0.04 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Roche Industrial Hygiene Committee (RIHC)</td>
</tr>
<tr>
<td>.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl</td>
<td>57-50-1</td>
<td>TWA</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Respirable)</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (total)</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (total dust)</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable fraction)</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Total dust)</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (respirable dust fraction)</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td><strong>Hyaluronidase</strong></td>
<td>757971-58-7</td>
<td>IOEL</td>
<td>0.00006 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Roche Industrial Hygiene Committee (RIHC)</td>
</tr>
</tbody>
</table>

**Engineering measures**: No data available

**Personal protective equipment**

**Respiratory protection**: No personal respiratory protective equipment normally required.

**Hand protection**

- **Material**: Protective gloves

- **Remarks**: Wear appropriate protective gloves to prevent skin contact. Replace torn or punctured gloves promptly.

**Eye protection**: Safety glasses

**Skin and body protection**: Protective suit

**Hygiene measures**: Handle in accordance with good industrial hygiene and safety practice.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**: Sterile liquid, Clear liquid
## SECTION 10. STABILITY AND REACTIVITY

### Reactivity
No dangerous reaction known under conditions of normal use.

### Chemical stability
Stable under normal conditions. Proteins are temperature-sensitive; the thermal denaturation has an impact on quality but does not affect Plant and Process Safety; during decomposition no flammable gas, no organic peroxide and no oxidising substances are created.
Does not contain any antimicrobial preservative; therefore, care must be taken to ensure the sterility of the prepared solution.

**Possibility of hazardous reactions**
- Stable under recommended storage conditions.
- No hazards to be specially mentioned.

**Conditions to avoid**
- No data available.

**Incompatible materials**
- No data available.

**Hazardous decomposition products**
- No data available.

### SECTION 11. TOXICOLOGICAL INFORMATION

#### Acute toxicity
Not classified based on available information.

**Components:**

**Trastuzumab:**
- **Acute oral toxicity**
  - Remarks: Not bioavailable by oral administration.

**Acute toxicity (other routes of administration)**
- Maximum tolerated dose (Mouse): > 94 mg/kg
- Application Route: i.v.

**Pertuzumab:**
- **Acute oral toxicity**
  - Remarks: Not bioavailable by oral administration.

**.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:**
- **Acute oral toxicity**
  - LD50 Oral (Rat): 29,700 mg/kg
  - LD50 Oral (Mouse): 14,000 mg/kg

- **Acute inhalation toxicity**
  - Acute toxicity estimate: > 30 mg/l
  - Test atmosphere: dust/mist
  - Method: Expert judgment

- **Acute dermal toxicity**
  - Acute toxicity estimate: > 5,001 mg/kg
  - Method: Expert judgment

**Hyaluronidase:**
- **Acute oral toxicity**
  - Remarks: Not bioavailable by oral administration.

#### Skin corrosion/irritation
Not classified based on available information.

**Components:**

**Hyaluronidase:**
- Remarks: This information is not available.
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Serious eye damage/eye irritation
Not classified based on available information.

Components:
Hyaluronidase:
Remarks: This information is not available.

Respiratory or skin sensitization
Skin sensitization
Not classified based on available information.

Respiratory sensitization
Not classified based on available information.

Components:
Hyaluronidase:
Remarks: May cause sensitization of susceptible persons by skin contact or by inhalation of dust.

Germ cell mutagenicity
Not classified based on available information.

Carcinogenicity
Not classified based on available information.

Components:
.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:
Remarks: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity
Not classified based on available information.

Components:
Trastuzumab:
Effects on fetal development: Result: Parenteral administration to pregnant women can cause fetal harm
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STOT-single exposure
Not classified based on available information.

Components:

.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:
Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

Hyaluronidase:
Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT-repeated exposure
Not classified based on available information.

Components:

.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:
Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Hyaluronidase:
Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

Pertuzumab:
Species : cynomolgus monkey
NOAEL : mg/kg/w, 250
Application Route : s.c.
Exposure time : 4 Weeks
GLP : yes
Remarks : Subacute toxicity

Species : cynomolgus monkey
NOAEL : 50 mg/kg/w
Application Route : i.v.
Exposure time : 26 Weeks
GLP : yes
Remarks : Subchronic toxicity

Hyaluronidase:
Species : cynomolgus monkey
NOAEL : mg/kg/w, 2
Application Route : s.c.
Exposure time : 39 weeks
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Aspiration toxicity
Not classified based on available information.

Components:
.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:
No data available

Hyaluronidase:
No data available

Further information

Components:
Trastuzumab:
Remarks : anaphylactic reactions may occur following the intravenous application of proteins; rare cases of hypersensitivity have been described with other monoclonal antibodies

Pertuzumab:
Remarks : anaphylactic reactions may occur following the intravenous application of proteins; rare cases of hypersensitivity have been described with other monoclonal antibodies

.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:
Remarks : Health injuries are not known or expected under normal use.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:
.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:
Toxicity to fish : LC50: > 100 mg/l
Exposure time: 96 h

Ecotoxicology Assessment
Acute aquatic toxicity : This product has no known ecotoxicological effects.
Chronic aquatic toxicity : This product has no known ecotoxicological effects.
Toxicity Data on Soil : Not expected to adsorb on soil.
Other organisms relevant to the environment : No data available
Hyaluronidase:

Ecotoxicology Assessment
Toxicity Data on Soil : Not expected to adsorb on soil.
Other organisms relevant to the environment : No data available

Persistence and degradability
Components:
Trastuzumab:
Biodegradability : Result: Readily biodegradable.
Biodegradation: 65 %
Exposure time: 14 d
Method: OECD Test Guideline 301F
GLP: yes
Result: Globular proteins are generally well biodegradable

Pertuzumab:
Biodegradability : Result: Globular proteins are generally well biodegradable

Hyaluronidase:
Biodegradability : Result: Globular proteins are generally well biodegradable

Bioaccumulative potential
Components:
Trastuzumab:
Partition coefficient: n-octanol/water : Remarks: No data available

Pertuzumab:
Partition coefficient: n-octanol/water : Remarks: No data available

.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl:
Partition coefficient: n-octanol/water : log Pow: -3.67

Hyaluronidase:
Partition coefficient: n-octanol/water : Remarks: No data available

Mobility in soil
No data available
Other adverse effects

Product:
Ozone-Depletion Potential: Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:
Trastuzumab:
Additional ecological information: Monoclonal antibodies are proteins with highly specific affinity to a certain antigen; therefore, no appreciable ecotoxic potential is to be expected

Pertuzumab:
Additional ecological information: Monoclonal antibodies are proteins with highly specific affinity to a certain antigen; therefore, no appreciable ecotoxic potential is to be expected

Hyaluronidase:
Additional ecological information: No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues: Can be disposed as waste water, when in compliance with local regulations.
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations
UNRTDG: Not regulated as a dangerous good
IATA-DGR: Not regulated as a dangerous good
IMDG-Code: Not regulated as a dangerous good
TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE
Not applicable

DOMESTIC REGULATION

49 CFR
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Component TPQ (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA 311/312 Hazards</td>
<td></td>
<td>No SARA Hazards</td>
</tr>
</tbody>
</table>

Clean Air Act
This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App. A + B). This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61). This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F). This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMR Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act
This product does not contain any Hazardous Substances listed under the U.S. Clean Water Act, Section 311, Table 116.4A. This product does not contain any Hazardous Chemicals listed under the U.S. Clean Water Act, Section 311, Table 117.3. This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307.

US State Regulations

Massachusetts Right To Know
.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl 57-50-1

Pennsylvania Right To Know
Water 7732-18-5
Trastuzumab 180288-69-1
Pertuzumab 380610-27-5
Trehalose (D+)-, 2H2O 6138-23-4
.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl 57-50-1
Maine Chemicals of High Concern
Vermont Chemicals of High Concern
Washington Chemicals of High Concern

California Permissible Exposure Limits for Chemical Contaminants

\[.alpha.-D-Glucopyranoside, .beta.-D-fructofuranosyl \quad 57-50-1\]

The ingredients of this product are reported in the following inventories:

**DSL**: This product contains the following components that are not on the Canadian DSL nor NDSL.
- Trastuzumab
- Pertuzumab
- L-Histidine monohydrochloride monohydrate
- Hyaluronidase

**AICS**: Not in compliance with the inventory

**NZIoC**: On the inventory, or in compliance with the inventory

**ENCS**: Not in compliance with the inventory

**ISHL**: Not in compliance with the inventory

**KECI**: Not in compliance with the inventory

**PICCS**: Not in compliance with the inventory

**IECSC**: Not in compliance with the inventory

**TCSI**: Not in compliance with the inventory

**TSCA**: Substance(s) not listed on TSCA inventory

**TSCA list**
No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

**SECTION 16. OTHER INFORMATION**
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NFPA:

HMIS® IV:

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FLAMMABILITY</th>
<th>PHYSICAL HAZARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>/</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH: USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL: USA. NIOSH Recommended Exposure Limits
OSHA P0: USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA: 8-hour, time-weighted average
NIOSH REL / TWA: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA P0 / TWA: 8-hour time weighted average
OSHA Z-1 / TWA: 8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic sub-
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The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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US / Z8 / 1810