Section 1. Product and Company Identification

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Pullulan</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS Number</td>
<td>9057-02-7</td>
</tr>
</tbody>
</table>

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parchem.com info@parchem.com

Section 2. Hazards Identification

Classification of the substance or mixture
GHS Classification: Not hazardous

GHS Label Elements
Pictograms: N/A
Signal word: N/A

Hazard and precautionary statements
GHS Precautionary Statements
Prevention: No precautionary phrases.
Response: No precautionary phrases.
Storage: No precautionary phrases.
Disposal: No precautionary phrases.

Other Hazards which do not result in Classification: Not classified as flammable but will burn.

Emergency Overview: The product is regarded as a safe material produced from starch by cultivating a non-pathogenic and non-toxigenic microorganism, Aureobasidium pullulans.

Section 3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Pullulan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym(s)</td>
<td>Poly(6)-a-D-glucopyranosyl(1→4)-a-D-glucopyranosyl(1→4)-a-D-glucopyranosyl(1→)</td>
</tr>
<tr>
<td>Formula</td>
<td>(C_{18}H_{30}O_{12})n</td>
</tr>
<tr>
<td>CAS Number</td>
<td>9057-02-7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS NUMBER</th>
<th>CONCENTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pullulan</td>
<td>9057-02-7</td>
<td>≥ 90%</td>
</tr>
</tbody>
</table>
Section 4. First Aid Measures

**General Information:** Not expected to be a health hazard when used under normal conditions.  
**Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing.  
**Skin Contact:** Immediately take off all contaminated clothing. Wash areas thoroughly with water.  
**Eye Contact:** Immediately flush eyes with a sufficient amount of water. Remove contact lenses if easy to do so. Continue rinsing.  
**Ingestion:** If material is swallowed in large amounts, get medical attention. Consult a doctor, if symptoms develop or persist after taking the measures above.

Section 5. Firefighting Measures

Clear fire area of all non-emergency personnel.  
**Extinguish Media:** Dry chemical, foam, carbon dioxide, water fog  
**Unsuitable Extinguishing Media:** No information available.  
**Special Fire Fighting:** Position upwind. Keep unnecessary personnel away. Move containers out of hazard area if safe to do so. Keep the containers cool by spraying water if exposed to heat or fire. Cool containers with flooding quantities of water until well after until well after the fire is out.  
**Protection for Firefighter:** Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Section 6. Accidental Release Measures

Avoid contact with spilled or released material. See Chapter 13 for information on disposal. Observe the relevant local and international regulations.  
**Personal Precautions:** Use personal protection recommended in Chapter 8. Avoid breathing mist and contact with skin and eyes.  
**Environment Procedures:** Prevent entry into ditches, sewers and waterways.  
**Containment and Cleanup:** Sweep up the spill and dispose of in general trash. Wash residual with water. Spill area can be washed with water for approved disposal. Follow all regulatory requirements for non-hazardous waste disposal.

Section 7. Handling and Storage

**Handling:** Use in a well-ventilated place. If necessary, use personal protection recommended in Section 8. Wash thoroughly after handling. When handling, do not eat, drink, or smoke. Coloration and decomposition may occur by moisture absorption.  
**Storage:** Keep container tightly closed. Keep in a cool, dark and dry place in order to maintain the quality. Keep securely closed when not in use. Keep away from food, drink and animal feeding stuffs.
Section 8. Exposure Controls / Personal Protection

**Exposure Limit Value:** Not set.  
**Exposure Controls:** No specific controls are needed. If necessary, the following personal protective equipment and materials are applied.

**Personal Protective Equipment and Materials**  
**Respiratory Protection:** If ventilation is not sufficient to effectively remove and prevent buildup of dusts, appropriate respiratory protection should be provided.  
**Hand Protection:** Wear impervious gloves for prolonged contact.  
**Eye/face Protection:** Wear appropriate eye protection.  
**Skin Protection:** Wear impervious apron and/or boots for skin protection in case scattering.

Section 9. Physical and Chemical Properties

**Appearance:** White to light yellowish white powder  
**Odor:** Odorless or slight characteristic odor  
**pH (10% Water Solution):** 5.0 - 7.0  
**Aqueous Dissolution:** Soluble  
**Specific Gravity:** 0.35 (Bulk specific gravity)  
**Melting Point:** 250°C  
**Flash Point:** Ca. 280°C

Section 10. Stability and Reactivity

**Chemical Stability:** Stable under ordinary storage conditions.  
**Possibility of Hazardous Reactions:** Not likely to occur.  
**Conditions to Avoid:** Avoid accumulation of airborne dusts. Avoid hot and humid storage.  
**Materials to Avoid:** Avoid contacting strong oxidizing agents, which may react with the product.  
**Hazardous Decomposition Products:** In case of fire, the product emits carbon monoxide, carbon dioxide and/or low molecule weight hydrocarbons.

Section 11. Toxicological Information

**Acute Oral Toxicity:** LD50 ≥ 14,280 mg/kg and ≥ 24,134 mg/kg in male dd mice and male RF mice by oral administration, respectively.  
**Sub-Acute Oral Toxicity:** NOAEL > 7,914 mg/kg/day and > 9,674 mg/kg/day in male and female rats by oral (feeding) administration, respectively (90 days)  
**Chronic Toxicity:** NOAEL > 4,450 mg/kg/day and > 5,080 mg/kg/day in male and female rats by oral (feeding) administration, respectively (62 weeks)  
**Skin Irritation/Sensitization:** No dermal irritation (25%, RIPT, Human).  
**Eye Damage/Irritation:** Not cause any negative effect (30%, Bovine cornel opacity and permeability test), Practically no irritation (100%, Hen’s egg test).
Germ Cell Mutagenicity: No data available [Not mutagenicity (standardized AMES assay, and mouse micronucleus and chromosome aberration assays)]

Carcinogenicity: No data available

Reproductive Toxicity: No data available

Specific Target Organ Toxicity/Single Exposure: No data available

Specific Target Organ Toxicity/Repeated Exposure: No data available

Aspiration Hazard: No data available

Section 12. Ecological Information

Hazardous to the Aquatic Environment: No data available

Hazardous to the Ozone Layer: Not data available

Section 13. Disposal Considerations

Waste Treatment Methods: Dispose of product and contaminated packaging in accordance with all local, state, and federal environmental control regulations.

Section 14. Transport Information

International Transportation Regulations
Sea: Not applicable
Air: Not applicable

United Nations Number: None
The product to be kept in sealed container. Keep away from moisture, high temperatures, and direct sunlight. Container should be protected from breakage. Additional care should be taken to comply with the conditions listed under Section 7.

Section 15. Regulatory Information

The product is not subject to classification according to the sources of literature known to us. Please refer to national measures that may be relevant.

Section 16. Other Information

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

REVISION DATE: 9/22/2015