1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>VINYLCYCLOHEXENE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviation</td>
<td>VCH</td>
</tr>
<tr>
<td>Company</td>
<td>DAICEL-EVONIK Ltd.</td>
</tr>
<tr>
<td>Head Office</td>
<td>〒163-0912 2-3-1 Nishi-shinjuku, Shinjuku-ku, Tokyo, Japan</td>
</tr>
<tr>
<td>Dealing Department</td>
<td>Tokyo Office Sales department Tel.03-5324-6331 Fax.03-5324-6336</td>
</tr>
<tr>
<td>Osaka Office Sales department Tel.06-6342-6712 Fax.06-6342-6718</td>
<td></td>
</tr>
<tr>
<td>Emergency address and tel.No.</td>
<td>Tokyo Office Sales department Tel.03-5324-6331</td>
</tr>
<tr>
<td>Aboshi Plant Quality Assurance Dept. Tel.079-273-3872</td>
<td></td>
</tr>
<tr>
<td>Preparation of MSDS</td>
<td>Aboshi Plant Quality Assurance Dept.</td>
</tr>
<tr>
<td>Prepar.</td>
<td>〒671-1281 1239 shinzaikai,Aboshi-ku,Himeji,hyogo,Japan</td>
</tr>
<tr>
<td>Tel.079-273-3872 Fax.079-274-3927</td>
<td></td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION

**GHS Classification**

| Physical hazards | Flammable liquid | Category 2 |
| Health hazards | Skin corrosion/irritation | Category 2 |
| | Carcinogenicity | Category 2 |
| | Reproductive toxicity | Category 2 |
| | Aspiration hazard | Category 1 |
| Environmental Hazards | Hazardous to the aquatic environment (long-term hazard) | Category 3 |

**Pictogram**

![Pictogram]

**Signal word**

Danger

**Hazard statement (code)**

- H225 Highly flammable liquid and vapour
- H315 Causes skin irritation
- H351 Suspected to causing cancer
- H361 Suspected to damaging fertility or the unborn child
- H304 May be fatal if swallowed and enters airways
- H412 Harmful to aquatic life with long lasting effects

**Precautionary Statement**

**Prevention**

- P201 Obtain special instructions before use.
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P243 Take precautionary measures against static discharge.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

**Reaction**

- P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P308+P313 IF exposed or concerned: Get medical advice/attention.

**Storage**

- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance /Nature</th>
<th>Substance</th>
<th>Chemical Nature</th>
<th>4-VINYLCYCLOHEXENE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>REACH No.</th>
<th>METI</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-VINYLCYCLOHEXENE</td>
<td>100-40-3</td>
<td>01-211994539-23</td>
<td>3-2229</td>
</tr>
</tbody>
</table>

Other information

4. FIRST AID MEASURES

**Description of first aid measures**
- Pay attention to self-protection.
- Remove victims from hazardous area.
- Take off immediately all contaminated clothing.
- Keep warm, position comfortably, and cover well.
- Do not leave affected persons unattended.

**Inhalation**
- Move victims into fresh air.
- If the casualty is not breathing: Perform mouth-to-mouth resuscitation, notify emergency physician immediately.

**Skin contact**
- Wash off with plenty of water and soap.
- Continue decontamination with polyethylene glycol400 after initial rinsing with water and then wash with water and soap.
- If symptoms persist, consult a physician for treatment.

**Eye contact**
- With eye held open, thoroughly rinse immediately with plenty of water at least 10 minutes.
- Consult an ophthalmologist immediately if the symptoms persist.

**Ingestion:**
- Rinse out mouth.
- Do not induce vomiting and seek medical advice immediately.
- If the product has been swallowed or vomited danger of penetration into the lung (danger of aspiration).

**Most important symptoms and effects, both acute and delayed**

**Indication of any immediate medical attention and special treatment needed**
- After accidental absorption in the body, the pathology and clinical findings are dependent on the kinetics of the noxious substance (quantity of absorbed substance, the absorption time, and the effectiveness of early elimination measures (first aid)/excretion -metabolism).
- Continue with first aid measures.
- Depending on the pathology and clinical findings, patient monitoring and symptomatic treatment are necessary.

5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**
- Water spray, foam, dry chemical powder or carbon dioxide.

**Unsuitable extinguishing media/methods**
- High volume water jet

**Special hazards arising from the substance or mixture**
- May be released in case of fire: carbon monoxide, carbon dioxide, organic product of decomposition.
- Under certain fire conditions, traces of other toxic product may occur.
- Cool closed containers exposed to fire with water spray.
- Closed container may rupture if strongly heated.

**Special protective equipment for fire fighters**
- Wear a self contained respiratory apparatus
6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Keep away from sources of ignition - No smoking.
Ensure adequate ventilation.
Do not allow to enter drains (danger of explosion).
Wear personal protective equipment; see section 8.

Environmental precautions

Should not be released into the environment.

Methods and material for containment and cleaning up

Take up mechanically or with an absorbent material.
Fill into marked, sealable containers.
Suitable binder: sand, diatomaceous earth, universal absorbent, sawdust.
To be disposed of in compliance with existing regulations.

Reference to other sections

Wear personal protective equipment

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin and eyes.
If possible, use material transfer/filling, metering and blending plants that are closed, or provide for local suction devices.
Priority should be given to close-system units.

Advice on protection against fire and explosion

Take precautionary measures against static charges, keep away from sources of ignition.
Explosion protection equipment required.

Storage

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place.
Under inert gas (nitrogen).
Product is supplied in stabilised form.

Advice on common storage

Observe prohibition against storing together!

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure controls

Engineering measures
If possible, use material transfer/filling, metering and blending plants that are closed, or provide for local suction devices.
Priority should be given to closed-system units.

Personal protective equipment

Respiratory protection
In case of dusts/vapours/aerosols being formed or if the limit values like TLV are exceeded:
use respiratory equipment with suitable filter (filter type A) or wear a self-contained respiratory apparatus

Hand protection

Glove material: Polychloroprene (PCP)
Material thickness: 0.5 mm
Break-through time: 25 min
Method: Source: GloSaDa (Glove Safety Database)

Glove material: nitrile rubber
Material thickness: 0.35 mm
Break-through time: > 480 min
Method: Source: GloSaDa (Glove Safety Database)

Eye protection

Safety glasses with side-shields

Hygiene measures
Do not inhale vapours/aerosols.
Avoid contact with skin and eyes.
Do not wear contaminated clothing.
When using, do not eat, drink or smoke. Wash face and/or hands before break and end of work.
9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
- Form: liquid
- Color: colourless
- Physical state: liquid
- Odour: sharp
- Odour threshold: 0.0083 ppm

Information on basic physical and chemical properties
- pH: neutral
- Melting point/range: ca. -101°C
- Boiling point/range: 129°C
- Flash point: 14°C
- Ignition temperature: 280°C
- Thermal decomposition: Distills without decomposition at atmospheric pressure.
- Explosiveness: Vapours can form explosive mixtures with air.
  - not explosive
- Vapor pressure: 15 hPa (20°C)
- Density: 0.831 (20°C)
- Water solubility: 0.05 g/l (20°C)

Further information
- formation of flammable gases: The substance or mixture does not emit flammable gases in contact with water.
- peroxides: The substance or mixture is not classified as organic peroxide.
- Metal corrosion: The substance or mixture is not classified as organic peroxide.
- Viscosity, dynamic: 0.7 mPa.s (200°C)
- Viscosity, kinematic: < 20 mm²/s (400°C)
- Vapour density: no data available

10. STABILITY AND REACTIVITY

Stability
- Stable under recommended storage conditions.
- Possibility of hazardous reactions: Product is supplied in stabilised form.
  - The stabilizer has a pronounced suppressant effect on potential peroxide formation.

Conditions to avoid
- Keep away from heat and sources of ignition.

Incompatible materials
- halogens, oxidizing agents

Hazardous decomposition products
- Decomposition products in combustion and thermal decomposition
  - Carbon monoxide
  - Carbon monoxide organic products of decomposition

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity
- LD50 rat: 6300 mg/kg

Acute inhalation toxicity
- No data available

Acute dermal toxicity
- LD50 Rabbit: > 16640 mg/kg

Skin irritation
- Rabbit: Irritating to skin.

Eye irritation
- Rabbit: No eye irritation

Sensitization
- no data available

Assessment of STOT single exposure
- The substance or mixture is not classified as specific target organ toxicant, single exposure.

Assessment of STOT repeated exposure
- The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Risk of aspiration toxicity
- The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes human aspiration toxicity hazards.

Carcinogenicity
- Limited evidence of acute carcinogenic effect.

Mutagenicity
- Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
  - Animal testing did not show any mutagenic effects.

Teratogenicity
- No effects on or via lactation
  - no evidence of teratogenic properties

Toxicity to reproduction
- Suspected human reproductive toxicant.
12. ECOLOGICAL INFORMATION

Toxicity to fish
  LC₅₀ Orzias latipes: 17 mg/L/48 h

Toxicity in aquatic invertebrates
  EC₅₀ Daphnia magna: >100 mg/L/48 h

Toxicity to bacteria
  In the range of water solubility not toxic under test conditions.

Persistence and degradability
  Not readily biodegradable.

Bioaccumulation
  Bioconcentration factor (BCF): 110 - 208 Improbable due to volatility.

Mobility in soil
  Due to the high octanol-water coefficient, adhesion to soil components, and thus a low mobility level in the soil, is to be expected.

Further Information
  No further information available

13. DISPOSAL CONSIDERATIONS

With respect to local regulations, e.g. dispose of to suitable waste incineration plant.

14. TRANSPORT INFORMATION

Land transport (ADR/RID):
  UN: 1993
  UN Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. (4-vinylcyclohexene)
  Class: 3
  Packing Group: II

Sea transport (IMDG):
  UN: 1993
  UN Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. (4-vinylcyclohexene)
  Class: 3
  Packing Group: II

Air transport (ICAO/IATA):
  UN: 1993
  UN Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. (4-vinylcyclohexene)
  Class: 3
  Packing Group: II

15. REGULATORY INFORMATION

National legislation

  Europe (EINECS/ELINCS) listed/registered
  USA (TSCA) listed/registered
  Canada (DSL) listed/registered
  Australia (AICS) listed/registered
  Japan (MITI) listed/registered
  Korea (KEC) listed/registered
  Philippines (PICCS) listed/registered
  China listed/registered
  New Zealand listed/registered

16. OTHER INFORMATION

Further information

The information provided in the Safety Data Sheet is corrected to the best of our knowledge, information and belief at the data of 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.