

SAFETY DATA SHEET

Date Printed: January 20, 2020

Version: 7

Regulation: According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

1. Identification

1.1 Product identifier

1.1.1 Product name: eco-DEHCH

1.1.2 Other means of identification: -

1.2 Recommended use of the chemical and restrictions on use

1.2.1 Recommended use: Chemical additive of PVC, plastic, rubber, ink, glue, paint, lubricant

1.2.2. Restrictions on use: Do not use for purposes other than those recommended

1.3 Details of the supplier of the safety data sheet

1.3.1 Manufacturer

Company name: Hanwha Solutions Co, Ltd.

Address: Ulsan plant, Hanwha Solutions Co, Ltd., 22, Yongyeon-ro 230beon-gil, Nam-gu, Ulsan, Korea

Prepared by: Production of plasticizer team(3rd Ulsan plant)

Contact Telephone: +82-52-279-1024

1.3.2 Supplier&Distributor

Company name: Hanwha Solutions Co, Ltd.

Address: Hanwha Bldg., Janggyo-dong, Jung-gu, Seoul, Korea

Prepared by: Sales of plasticizer team

Contact Telephone: +82-2-729-2990

1.4 Emergency phone number

Emergency phone : : +82-2-729-2990 (Sales) / +82-52-279-1024 (Plant)

2. Hazard(s) identification

2.1 Classification of the substance or mixture

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Physical / Chemical Hazards:

Not available

Health Hazards:

Not classified

Environmental Hazards:

Not available

2.2 Label elements, including precautionary statements

○ **Pictogram and symbol:** Not applicable

○ **Signal word:** Not applicable

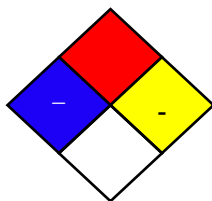
○ **Hazard statements:** Not applicable

○ **Precautionary statements:** Not applicable

○ **Treatment statements:** Not applicable

○ **Storage statements:** Not applicable

○ **Waste statements:** Not applicable

2.3 Other hazard information not included in hazard classification (NFPA)


- Health: -
- Flammability: -
- Reactivity: -
- Specific hazard: -

3. Composition/information on ingredients

| Component | Common name and synonyms | CAS No. | Conc. / % |
|---|--------------------------|------------|-----------|
| Bis(2-ethylhexyl) cyclohexane-1,4-dicarboxylate | Not available | 84731-70-4 | > 99 |

4. First-aid measures
4.1 Description of first aid measures
Eye contact

- In case of contact with substance, immediately flush eyes with running water at least 20 minutes.

Skin contact

- In case of contact with substance, immediately flush skin with running water at least 20 minutes.
- Remove and isolate contaminated clothing and shoes.
- Get immediate medical advice/attention.

Inhalation

- Specific medical treatment is urgent.
- Move victim to fresh air.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.

Ingestion

- Do not let him/her eat anything, if unconscious.
- Get immediate medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

- None known

4.3 Indication of immediate medical attention and notes for physician

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. Fire-fighting measures
5.1 Extinguishing media

- **Suitable extinguishing media:** Use dry sand, dry fire extinguisher, water spray, normal foam, Carbon Dioxide, when fighting fires involving this material.
- **Unsuitable extinguishing media:** High Pressure Water Jet

5.2 Specific hazards arising from the chemical

- May be ignited by heat, sparks or flames.
- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.

- Fire will produce irritating and/or toxic gases.
- If inhaled, may be harmful.

5.3 Special protective equipment and precautions for fire-fighters

- Move containers from fire area if you can do it without risk.
- Some may be transported hot.
- Runoff from fire control may cause pollution.
- Contact with substance may cause severe burns to skin and eyes.
- Dike fire-control water for later disposal; do not scatter the material.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- Eliminate all ignition sources.
- Stop leak if you can do it without risk.
- Ventilate the area.
- Do not touch or walk through spilled material.

6.2 Environmental precautions

- Prevent entry into waterways, sewers, basements of confined areas.

6.3 Methods and materials for containment and cleaning up

- Small Spill; Flush area with flooding quantities of water. And take up with sand or other non-combustible absorbent material and place into containers for later disposal.
- Large Spill; Dike far ahead of liquid spill for later disposal.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

7. Handling and storage

7.1 Precautions for safe handling

- Wash your hands thoroughly after handling.
- Please work with reference to engineering controls and personal protective equipment.
- Be careful to high temperature.

7.2 Conditions for safe storage, including any incompatibilities

- Store in a closed container.
- Store in cool and dry place.

8. Exposure controls/personal protection

8.1 Occupational Exposure limits

- o **ACGIH regulation:** Not available
- o **Biological exposure index:** Not available
- o **OSHA regulation:** Not available
- o **NIOSH regulation:** Not available
- o **EU regulation:** Not available
- o **Other:** Not available

8.2 Exposure controls

Appropriate engineering controls

- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Individual protection measures, such as personal protective equipment

Respiratory protection

- Use respirators and components tested and approved under appropriate government standards such as NIOSH

Eye protection

- Wear safety goggles as follow if eye irritation or other disorder occur.
 - ; In case of gaseous state organic material: enclosed safety goggles
 - ; In case of vapour state organic material: safety goggles or breathable safety goggles
 - ; In case of particulate material: breathable safety goggles
- An eye wash unit and safety shower station should be available nearby work place.

Hand protection

- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Body protection

- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

| | |
|--|-----------------------------|
| Description: | Liquid |
| Color: | Colorless |
| Odor: | Odorless |
| Odor threshold: | Not available |
| pH: | 6.19 (CIPAC MT 75.3) |
| Melting point/freezing point: | -40.7 °C |
| Initial boiling point and boiling range: | 406.4 °C |
| Flash point: | 212 °C (Cleveland open cup) |
| Evaporation rate: | Not available |
| Flammability (solid, gas): | Not applicable |
| Upper/lower flammability or explosive limits: | Not available |
| Vapor pressure: | < 1.5mmHg (50 °C) |
| Vapor density: | Not available |
| Relative density | 0.956 (20 °C) |
| Solubility: | Insoluble |
| Partition coefficient: n-octanol/water: | logKow ≥ 6.2 |
| Auto-ignition temperature: | Not available |
| Decomposition temperature | Not available |
| Dynamic viscosity: | 30-45 mPa.s (20 °C) |

“NOTE: The physical data presented above are typical values and should not be construed as a specification”

10. Stability and reactivity

10.1 Reactivity/Chemical stability/Possibility of hazardous reactions:

- Fire may produce irritating and/or toxic gases.
- If inhaled, may be harmful.

10.2 Conditions to avoid:

- Keep away from heat/sparks/open flames/hot surfaces. – No smoking

10.3 Incompatible materials:

- Combustion materials

10.4 Hazardous decomposition products: Irritating, Toxic gases

11. Toxicological information

| Information on toxicological effects | |
|--|---|
| (a) Acute toxicity | Not classified |
| Oral | Not classified |
| | Rat(female), LD ₅₀ >2,000 mg/kg bw (OECD TG 403, GLP) |
| Dermal | Not classified |
| | Rat(female), LD ₅₀ >2,000 mg/kg bw (OECD TG 402, GLP) |
| Inhalation | Not available |
| (b) Skin Corrosion/ Irritation | Not classified |
| | The test substance induced no dermal irritation when applied to male New Zealand white rabbits and was therefore considered a non-irritant. In addition, there was no mortality and no treatment-related clinical signs were observed. (erythema score=0, edema score=0) (OECD TG 404, GLP) |
| (c) Serious Eye Damage/ Irritation | Not classified |
| | The test item was considered to be non-irritating to eyes in three New Zealand white rabbits. (cornea score=0, iris score=0, conjunctivae score=0, chemosis score=0) (OECD TG 405, GLP) |
| (d) Respiratory sensitization | Not available |
| (e) Skin Sensitization | Not classified |
| | The highest concentration of the test item (100 %) induced no skin irritation was used in the patch exposure for second induction and challenge. (OECD TG 406, GLP) |
| (f) Carcinogenicity | Not classified |
| | - IARC, ACGIH, NTP, OSHA, EU CLP 1272/2008: Not listed |
| (g) Mutagenicity | Not classified |
| | <i>in vitro</i> : Mammalian Chromosome Aberration Test(OECD TG 473, GLP), Bacterial Reverse Mutation Test(OECD TG 471, GLP): with/without metabolic activation : Negative <i>in vivo</i> : Mouse, Mammalian Erythrocyte Micronucleus Test(OECD TG 474, GLP): Negative |
| (h) Reproductive toxicity | Not classified |
| | - Rats dosed by oral gavage during organogenesis at dose levels of 100, 300 and 1000 mg/kg bw/day did not result in any toxicologically significant effects at any dose level. (OECD TG 414, GLP) - No treatment-related clinical signs and death of SD rats in two generations was found at |

| | |
|--|---|
| | dose level of 0, 40, 200 and 1,000mg/kg.day by gavage. NOAEL is considered to be 1,000 mg/kg.day (OECD TG 416, GLP) |
| (i) Specific target organ toxicity (single exposure) | Not available |
| (j) Specific target organ toxicity (repeat exposure) | Not available |
| (k) Aspiration Hazard | Not available |

| 12. Ecological information | |
|------------------------------------|---|
| 12.1 Toxicity | |
| Acute toxicity | Not classified |
| | Fish: <i>Oryzias latipes</i> , LC ₅₀ (96h) >100 mg/L semi-static (OECD TG 203, GLP) Invertebrate: <i>Daphnia magna</i> , EC ₅₀ (48h) >0.17 mg/L (OECD TG 202, GLP) Algae: <i>Pseudokirchneriella subcapitata</i> , EC ₅₀ (72h) >0.27 mg/L static (OECD TG 201, GLP) |
| Chronic toxicity | Fish: <i>Danio rerio</i> (previous name: <i>Brachydanio rerio</i>), 28days NOEC > 10 mg/L (OECD TG 215, GLP) <i>Oryzias latipes</i> , NOEC > 0.0657mg/L (OECD TG 210, GLP) |
| 12.2 Persistence and degradability | Persistence: - High persistency (log Kow is more than 4 estimated.) (LogKow ≥ 6.2) Degradability: - Bis(2-ethylhexyl) cyclohexane-1,4-dicarboxylate: 0.487day |
| 12.3 Bio-accumulative potential | Bioaccumulation: Bioaccumulation is expected to be low according to the BCF <500 (BCF = 9) (OECD TG 305, GLP) Biodegradation: As not well-biodegraded, it is expected to have high accumulation potential in living organisms (54.1% biodegradation was observed after 28 days) (OECD TG 301 C, GLP) |
| 12.4 Mobility in soil | High potency of mobility to soil. (logKoc ≥ 5.63 (Estimated), 40°C) (OECD TG 121, GLP) |
| 12.5 Hazardous to the ozone layer | Not classified |
| 12.6 Other adverse effects | Not available |

13. Disposal considerations

13.1 Disposal method

Waste must be disposed of in accordance with federal, state and local environmental control regulation.

13.2 Disposal precaution

Consider the required attentions in accordance with waste treatment management regulation.

14. Transport information

14.1 UN No.: Not applicable

14.2 UN Proper shipping name: Not applicable

14.3 Transport Hazard classes:

ADR: Not applicable

IMDG: Not applicable

ICAO/IATA: Not applicable

RID: Not applicable

14.4 Packing group: Not applicable

14.5 Environmental hazards: Not applicable

14.6 Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code): Not established

14.7 Special precautions for user

in case of fire: Not applicable

in case of leakage: Not applicable

15. Regulatory information

15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture

USA Regulatory Information

TSCA (Toxic Substances Control Act): Not regulated

Proposition 65: Not regulated

OSHA Regulation: Not regulated

CERCLA Regulation: Not regulated

SARA 302 Regulation: Not regulated

SARA 304 Regulation: Not regulated

SARA 313 Regulation: Not regulated

Foreign Regulatory Information

Substance of Rotterdam] Protocol: Not regulated

Substance of Stockholm Protocol: Not regulated

Substance of Montreal Protocol: Not regulated

Foreign Inventory Status

- Korea management information: Existing Chemical Substance (2013-3-5632)
- Japan management information: Existing and New Chemical Substances (ENCS): Not listed
- China management information: Inventory of Existing Chemical Substances (IECSC): Not listed
- Australia management information: Australian Inventory Inventory of Chemical Substances (AICS): Not listed
- Canada management information: Domestic Substances List (DSL): Not listed
- New Zealand management information: New Zealand Inventory of Chemicals (NZIoC): Not listed
- Philippines management information: Philippine Inventory of Chemicals and Chemical Substances (PICCS):

Not listed 16. Other information, including date of preparation or last revision**16.1 Indication of changes:**

Preparation date: October 24, 2016
Version: 7
Revision date: January 20, 2020

16.2 Key literature reference and sources for data:

- National chemicals information systems; <http://ncis.nier.go.kr>
- Pubchem; <http://pubchem.ncbi.nlm.nih.gov/>
- AKRON; <http://ull.chemistry.uakron.edu/erd/>
- IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; <http://monographs.iarc.fr>
- ECHA; <http://echa.europa.eu/web/guest>
- NIOSH(The National Institute for Occupational Safety and Health)
- ACGIH(American Conference of Governmental Industrial Hygienists)
- TOMES-LOLI®; <http://www.rightanswerknowledge.com/loginRA.asp>
- National Emergency Management Agency-Korea dangerous material inventory management system; <http://hazmat.mpss.kfi.or.kr/index.do>
- Waste Control Act enforcement regulation attached [1]
- EPISUITE Program ver.4.1

16.3 Abbreviations

ACGIH: American Conference of Governmental Industrial hygienists
NIOSH: The National Institute for Occupational Safety and Health
OSHA: Occupational Safety & Health Administration
IARC: International Agency for Research on Cancer
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Dangerous Goods
ICAO/IATA: International Civil Aviation Organization/ International Air Transport Association
RID: Regulations Concerning the International Transport of Dangerous Goods by Rail

16.4 Other

- Product should be handled, stored, and used in accordance with the generally accepted industrial hygiene practices and in conformity with all the applicable legal regulations.
- The information provided herein is based on the knowledge possessed at this present time from the view point of safety requirements.
- It should, therefore, not be construed as guaranteeing specific properties.