Hanwha Solutions

# SAFETY DATA SHEET

**Date Printed:** June 23, 2023
**Version:** 6
**Revision date:** June 23, 2023
**Regulation:** In accordance with Commission Regulation (EU) 2020/878

## 1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

### 1.1 Product identifier

**Product name:** SP-390
**EC No.**: 229-176-9
**REACH Registration No.:** Refer to chapter 3.
**CAS No.**: 6422-86-2

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

#### 1.2.1 Identified Uses

- Ind. Manufacturing, Formulation, Distribution and storage, Adhesives and sealants (FEICA) industrial manufacturing, Coatings and inks (CEPE) industrial manufacturing, Plasticizer (plastisol) formulation, Plasticizer(plastisol) industrial manufacture, Plasticizer (pvc articles) formulation, Plasticizer (pvc articles) industrial manufacturing.

#### 1.2.2 Recommended use

- It is also used for PVC, plastic, rubber, ink, glue, paint and additives such as lubricant.

#### 1.2.3 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(Hwangseong-dong), Nam-gu, Ulsan, Korea
Prepared by: Plasticizers Production Team
Contact Telephone: (Ulsan plant) +82-52-279-1024

#### 1.3.2 Supplier & Distributor

Company name: Hanwha Solutions Co, Ltd.
Address: Hanwha Building, 86, Cheonggyecheon-ro, Jongno-gu, Seoul, Korea
Prepared by: PSR/PlasticizerSales Team
Contact Telephone: +82-2-729-5051, Fax: +82-2-729-5057
Email Address: minho.baek@hanwha.com

### 1.4 Emergency telephone number

**Emergency Telephone**: +82-2-729-5051

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 (CLP)

**Physical / Chemical Hazards:** Not classified

**Health Hazards:** Not classified

**Environmental Hazards:** Not classified

### 2.2 Label elements

**o Hazard pictograms:** Not applicable

o **Signal word:** Not applicable
o **Hazard statement:** Not applicable
o **Precautionary statements :**
- **Precaution**: Not applicable
- **Response**: Not applicable
- **Storage**: Not applicable
- **Disposal**: Not applicable

**2.3 Other hazards**
- **Additional precautionary statements:** Not available
- **National Fire Protection Association (NFPA):**
  **Health:** Not available
  **Flammability:** Not available
  **Reactivity:** Not available

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS No. | EC No. | Conc. / % | Classification according to 1272/2008/EC | SCL/ M-factor/ ATE | Registration No. |
|---|---|---|---|---|---|---|
| Dioctyl terephthalate | 6422-86-2 | 229-176-9 | 100 | Not applicable | - | 01-2119446265-39-0000 |

## 4. FIRST AID MEASURES

**4.1 Description of first aid measures**

**4.1.1 General information:**
Remove soiled or soaked clothing immediately, do not allow to dry.
Adhere to personal protective measures when giving first aid.
Clean body thoroughly (Bad, shower).

**4.1.2 Following 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.

**4.1.3 Following skin contact:**
In case of contact with substance, immediately flush skin with running water for at least 20 minutes.
Remove and isolate contaminated clothing and shoes.
Wash contaminated clothing and shoes before reuse.
Get immediate medical advice/attention.

**4.1.4 Following eye contact:**
In case of contact with substance, immediately flush eyes with running water at least 20 minutes.

**4.1.5 Following ingestion:**
Do not let him/her eat anything, if unconscious.
Get immediate medical advice/attention.

**4.1.6 Self-protection of the first aider:**
First aider: Pay attention to self-protection!

**4.2 Most important symptoms and effects, both acute and delay Acute effects:**
- Symptoms and effects: 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: Dry sand, Dry chemical powder, alcohol-resistant foam, water spray, regular foam, carbon oxides (CO, $CO_2$)
- Unsuitable extinguishing media: High pressure water streams

### 5.2 Specific hazards arising from the substance or mixture
- Thermal decomposition products: Irritating, corrosive or toxic gases
- May be ignited by heat, sparks or flames.
- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.
- If inhaled, may be harmful.

### 5.3 Advice for firefighters
- Wear full protective firefighting gear including self-contained breathing apparatus (SCBA) for protection against possible exposure.
- The fire suppression is not fully protectable from the hazard.
- Dike fire-control water for later disposal; do not scatter the material.
- Move containers from fire area if you can do it without risk.
- Fire involving Tanks; Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks; Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Fire involving Tanks; Always stay away from tanks engulfed in fire.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures
### 6.1.1 For non-emergency personnel
- Stop leak if you can do it without risk.
- Do not touch or walk through spilled material.

### 6.1.2 For emergency responders
- Eliminate all ignition sources.
- Ventilate the area.
- Prevent dust cloud.
- For further information refer to section 8.2.

### 6.2 Environmental precautions
- Prevent entry into water ways, sewers, basements or confined areas.

### 6.3 The methods of purification and removal
- 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.

### 6.4 Reference to other sections
- If appropriate, Section 8 and 13 shall be referred to.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling
- Wash 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

- Keep container tightly closed.
- Keep in a dry, cool place.
- Away from open flame and oxidizing agents.
- Protect from heat and direct sunlight.
- Never cut, drill, weld or grind on or near this container.

**7.3 Specific end use(s)**

- Recommendations shall relate to the identified use(s) referred to in subsection 1.2 and be detailed and operational.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**8.1 Control parameters**

**Occupational Exposure limits**

- **o EU regulation:** Not available
- **o U.S regulation:** Not available
- **o ACGIH:** Not available
- **o Biological exposure index:** Not available
- **o Others:** Not available
- **o DNELs, PNECs:**

| **Exposure route of relevance** | **DNELs, DMELs, PNECs** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Workers | | | | General population | | | |
| | Long term, Local effects | Long term, Systemic effects | Short term, Local effects | Short term, Systemic effect | Long term, Local effects | Long term, Systemic effects | Short term, Local effects | Short term, Systemic effect |
| Human: oral (mg/kg bw/day) | Not available | Not available | Not available | Not available | Not available | 3.95 (repeated dose toxicity) | Not available | No hazard identified |
| Human: inhalation ($mg/m^3$) | No hazard identified | 23.2 (repeated dose toxicity) | No hazard identified | No hazard identified | No hazard identified | 6.86 (repeated dose toxicity) | No hazard identified | No hazard identified |
| Human: dermal (mg/kg bw/day)* | No hazard identified | 6.58 (repeated dose toxicity) | No hazard identified | No hazard identified | No hazard identified | 3.95 (repeated dose toxicity) | No hazard identified | No hazard identified |
| Environment: water | 0.08 µg/L (freshwater), 0.008 µg/L (marine water), 0.014 µg/L (intermittent releases) | | | | | | | |
| Environment: air | No hazard identified | | | | | | | |
| Environment: soil | 15 µg/kg | | | | | | | |
| Environment: sediment | 8.28 mg/kg (sediment freshwater), 0.828 mg/kg (sediment marine water) | | | | | | | |
| Environment: STP | 1 mg/L | | | | | | | |
| Environment: Predators | Not available | | | | | | | |

**8.2 Exposure controls**

**Appropriate engineering controls:**

- Provide good general ventilation (typically 10 ventilations per hour).
- Adjust the ventilation speed to suit the conditions.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
- If no exposure limits have been established, keep the air level at an acceptable level.

**Individual protection mea3sures, such as personal protective equipment:**

**Respiratory protection:**

- Wear European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary.

**Eye protection:**
- Wear breathable safety goggles to protect from particulate material causing eye irritation or other disorder.
- 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.

**Thermal hazards:**
- If appropriate, Section 5.3 shall be referred to.

**Environmental exposure controls:** Not available

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**9.1 Information on basic physical and chemical properties**

| | |
|---|---|
| **Appearance** | |
| **Description:** | Liquid |
| **Color:** | Colourless |
| **Odor:** | Mild |
| **Odor threshold:** | Not available |
| **pH:** | 6~7 |
| **Melting point/freezing point:** | < -48 ℃ |
| **Initial boiling point and boiling range:** | 400 ℃ |
| **Flash point:** | 222 ℃<br>(Cleveland open cup, ASTM 92-18) |
| **Evaporation rate:** | Not available |
| **Flammability (solid, gas):** | Not applicable |
| **Upper/lower flammability or explosive limits:** | Not available |
| **Vapor pressure:** | $2.14X10^{-5}$ mmHg (25 ℃) |
| **Vapor density:** | 13.5 (Air = 1) |
| **Relative density:** | 0.984 ± 0.003 at 20 ℃/68 °F<br>(JIS K 6751) |
| **Solubility(ies):** | 0.0004 mg/l (22.5 ℃) |
| **Partition coefficient: n-octanol/water:** | log Kow = 8.39 |
| **Auto-ignition temperature:** | 387 ℃ (98 kPa) |
| **Decomposition temperature:** | Not available |
| **Viscosity:** | 70-100 mPa.s at 20 ℃<br>(HSC internal method) |
| **Explosive properties:** | Not available |
| **Oxidizing properties:** | Not available |
| **Molecular weight:** | 390.557 |
| **Specific gravity:** | Not available |
| **Particle Size (Polymer compound)** | Not applicable |
| **Self-accelerated decomposition temperature (Polymer compound)** | Not applicable |

**9.2 Other information:** Not available

## 10. STABILITY AND REACTIVITY

**10.1 Reactivity**

- Not available

**10.2 Chemical stability**
- Stable at normal temperature and pressure.
- If inhaled, may be harmful.

**10.3 Possibility of hazardous reactions**
- Fire may produce irritating and/or toxic gases.

**10.4 Conditions to avoid**
- Heat, sparks or flames, other sources of ignition

**10.5 Incompatible materials**
- Combustibles, oxidizing solids, oxidizing liquid, oxidant

**10.6 Hazardous decomposition products**
- Irritating and/or toxic gases, carbon oxides (CO, $CO_2$)

## 11. TOXICOLOGICAL INFORMATION

| 11.1 Information on toxicological effects | |
|---|---|
| (a) Acute toxicity | |
| Oral | Not classified |
| | · Rat, $LD_{50}$ > 5,000 mg/kg (TSCA FHSA Regulations, GLP) |
| Dermal | Not classified |
| | · Guinea pig, $LD_{50}$ = 19,680 mg/kg bw, no deaths. |
| Inhalation | Not available |
| (b) Skin Corrosion/ Irritation | Not classified |
| | · In a skin irritation/corrosion study using rabbits, skin irritation was not observed. (erythema score=0, edema score=0) (OECD TG 404, GLP) |
| (c) Serious Eye Damage/ Irritation | Not classified |
| | · In an acute ocular irritation study, DOTP may cause slight transient ocular irritation. The effects were fully reversible within 72hours. (OECD TG 405, GLP) |
| (d) Respiratory sensitization | Not available |
| (e) Skin Sensitization | Not classified |
| | · In a dermal sensitization study, DOTP was found to be non-irritating. Only slight erythema was observed for one to seven subjects at any given time during the induction phase of the study and for only one subject during the challenge phase of the study. DOTP did not elicit contact dermal sensitization in any individual completing the study. (GLP) |
| (f) Carcinogenicity | Not classified |
| | · Under conditions of this study, there was no evidence of a treatment-related effect on the incidence of any tumor type for any group of rats. Di (2-ethylhexyl) terephthalate is unlikely to pose a significant carcinogenic risk to humans exposed to low levels of this chemical (EPA OPPTS 870.4200, GLP)<br>· IARC, NTP, OSHA, ACGIH, EU CLP 1272/2008: not listed |
| (g) Mutagenicity | Not classified |

| | |
|---|---|
| | · *In vitro:* In an Ames reverse gene mutation assay in bacteria (S. typhimurium TA) : negative with and without Metabolic activation (OECD TG 471, GLP)<br>· *In vitro:* In a mammalian cell cytogenetics assay (Chinese hamster Ovary (CHO)) : negative with and without Metabolic activation (OECD TG 473, GLP) |
| (h) Reproductive toxicity | Not classified |
| | · There were no adverse effects on mating performance, fertility, or reproductive organs in a 2-generation study in which 30 rats/sex/group/generation were exposed to DOTP at dose concentrations of 0, 3,000, 6,000, and 10,000 ppm. (reproductive toxicity: 10,000 ppm / parental toxicity: 3,000 ppm / neonatal toxicity: 3,000 ppm) (OECD TG 416, GLP)<br>· In a teratology study in which groups of pregnant CD-1 mice were exposed to 0, 1,000, 3,000, and 7,000 ppm di (2-ethylhexyl) terephthalate ad libitum via the diet from gestation days 0-18, intrauterine growth and survival was unaffected at all dose levels and there was no evidence of teratogenicity or fetotoxicity, even at maternally toxic doses. (OECD TG 414, GLP) |
| (i) Specific target organ toxicity (single exposure) | Not classified |
| | · In an acute oral toxicity study, clinical abnormalities were limited to oily, unkempt inguinal hair for all animals on Days 1 and 2 of the study, and yellow discolored inguinal hair for two female rats on Day 1. No other clinical abnormalities were noted throughout the study. All rats gained weight over the 14-day observation period. ($LD_{50}$ > 5,000 mg/kg bw) (TSCA FHSA Regulations, GLP) |
| (j) Specific target organ toxicity (repeat exposure) | Not classified |
| | · In a subchronic dietary toxicity study, di (2-ethylhexyl) terephthalate was administered to 20 rats/sex/group at target concentrations of 0, 0.1, 0.5, and 1.0% continuously for 90 days. Toxicity related to the administration of di (2-ethylhexyl) terephthalate was limited to minor effects on red blood cell formation, and enlargement of the liver in both sexes at a dose concentration of 1.0%. There were no corresponding functional changes in the liver, no gross or microscopic liver changes, and no adverse effects on any clinical chemistry parameters that would indicate liver damage. (NOEL=0.5%, male: 277 mg/kg bw/day, female: 309 mg/kg bw/day) (GLP) |
| (k) Aspiration Hazard | Not available |
| 11.2 Information on other hazards | |
| 11.2.1 Endocrine disrupting properties | Not available |
| 11.2.2 Other information | Not available |

## 12. ECOLOGICAL INFORMATION

| 12.1 Toxicity | |
|---|---|
| Acute toxicity | Not classified |
| | · Fish: 96h-$LC_{50}$ (*Pimephales promelas*) > 984 mg/L (OECD TG 203)<br>· Invertebrate: 48h-$EC_{50}$ (*Daphnia magna*) > 0.0014 mg/L (OECD TG 202, GLP) |

| | |
|---|---|
| | · Algae: 72h-$EC_{50}$ (*Selenastrum capricornutum*) > 0.86 mg/L (OECD TG 201, GLP) |
| Chronic toxicity | Not classified |
| | · Fish: 60d-NOEC (*Oncorhynchus mykiss*) ≥ 0.28 mg/L (US EPA) (GLP)<br>· Invertebrate: 21d-NOEC (*Daphnia magna*) ≥ 0.00076 mg/L (OECD TG 211, GLP)<br>· Algae: 72h-NOEC(*Selenastrum capricornutum)* ≥ 0.86 mg/L (OECD TG 201, GLP) |
| 12.2 Persistence and degradability | · The atmospheric photodegradation half-life is 0.487days. (5.84 daylight hours)<br>· 73.05% biodegradation was observed after 28 day. (OECD TG 301B, GLP) |
| 12.3 Bioaccumulative potential | · log Kow = 8.39 (Estimated)<br>· BCF = 393 (EPA OPPTS 850.1710, GLP) |
| 12.4 Mobility in soil | · Koc = 5.43 |
| 12.5 Results of PBT and vPvB assessment | The substance is not PBT / vPvB. |
| 12.6 Endocrine disrupting properties | Not available |
| 12.7 Other adverse effects | Not available |
| 12.8 Additional information | Not available |

## 13. DISPOSAL CONSIDERATIONS

**13.1 Waste treatment methods**

- Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.

**13.1.1 Product/Packaging disposal**

- No waste key number as per the European Waste Types List can be assigned to this product, since such classification is based on the (as yet undetermined) use to which the product is put by the consumer.
- The waste key number must be determined as per the European Waste Types List (decision on EU Waste Types List 2000/532/EC) in cooperation with the disposal firm/producing firm/official authority.

**13.1.2 Waste treatment-relevant information**

- Waste must be disposed of in accordance with directive 2008/98/EC.

**13.1.3 Sewage disposal-relevant information:**

- Release to the environment or sewage system is prohibited. Must be treated as hazardous waste.

**13.1.4 Other disposal recommendations:** Not available

## 14. TRANSPORT INFORMATION

**14.1 UN No.:** Not applicable

**14.2 UN Proper shipping name:** Not applicable

**14.3 Transport Hazard class:**

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 Special precautions for user**
**in case of fire:** Not applicable
**in case of leakage:** Not applicable

**14.7 Transport in bulk according to Annex II of Marpol and the IBC Code:** Not applicable

## 15. REGULATORY INFORMATION

**15.1 Safety, health and environmental regulation/legislation specific for mixture**
**EU Regulatory Information**
**EU classification**
**EU 1272/2008(CLP)**
**Classification:** Not applicable
**Risk phrases:** Not applicable
**Safety phrases:** Not applicable
**EU SVHC list**: Not regulated
**EU Authorization list**: Not regulated
**EU Restriction list**: Not regulated

**Foreign Inventory Status**
- Korea management information: Existing Chemical Substance (KE-02197)
- U.S.A management information: Section 8(b) Inventory (TSCA): Present (ACTIVE)
- Canada management information: Domestic Substances List (DSL): Present
- Australia management information: Inventory of Industrial Chemicals (AIIC): Present
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (01783)
- Japan management information: Existing and New Chemical Substances (ENCS): Present ((3)-4053)
- New Zealand management information: Inventory of Chemicals (NZIoC): May be used as a single component chemical under an appropriate group standard.
- Philippines management information: Inventory of Chemicals and Chemical Substances (PICCS): Present
- Taiwan management information: Taiwan Chemical Substance Inventory (TCSI): Present

**15.2 Chemical safety assessment:** Not available

## 16. OTHER INFORMATION

**Product safety data sheet for prepared in accordance with Commission Regulation (EU) 2020/878**

**16.1 Indication of changes:**
Preparation date: June 20, 2016
Version: 6
Revision date: June 23, 2023

**16.2 Key literature reference and sources for data:**
TSCA; http://iaspub.epa.gov/sor_internet/registry/substreg/searchandretrieve/searchbylist/search.do
EU Regulation 1272/2008
TOMES-LOLI; http://csi.micromedex.com/fraMain.asp?Mnu=0
UN Recommendations on the transport of dangerous goods 17th
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; http://monographs.iarc.fr
ECHA CHEM; http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances
OECD SIDS; http://webnet.oecd.org/
HSDB; https://pubchem.ncbi.nlm.nih.gov/
EPA; http://www.epa.gov/iris
EPISUITE Program ver.4.1

NIOSH(The National Institute for Occupational Safety and Health)
ACGIH(American Conference of Governmental Industrial Hygienists)
National chemicals information systems; http://ncis.nier.go.kr
Management Agency-Korea dangerous material inventory management system;
http://hazmat.mpss.kfi.or.kr/material.do

**16.3 Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008(CLP):**

| Classification according to Regulation (EC) 1272/2008 (CLP) | Classification procedure |
|---|---|
| Not applicable | Not applicable |

**16.4 Abbreviations**

$EC_{50}$: median effective concentration
$LC_{50}$: median lethal concentration
$LD_{50}$: median lethal dose
OEL: Occupational exposure limit
PBT: Persistent, bioaccumulative, toxic chemical
STEL: short-term exposure limit
TWA: time weighted average
vPvB: very persistent, very bioaccumulative chemical
EWC: the European Waste Code
SCL: Specific concentration limit
M-factor: Multiplication factor
ATE: Acute toxicity estimate

**16.5 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.