Hanwha Solutions

SAFETY DATA SHEET

Date Printed: March 15, 2023
Version: 5
Regulation: According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

1. Identification

1.1 Product identifier
1.1.1 Product of name: SP-390
1.1.2 Other means of identification: Not available

1.2 Recommended use of the chemical and restrictions on use
1.2.1 Recommended use: It is used for PVC, plastic, rubber, ink, glue, paint and additives such as 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(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

1.4 Emergency phone number
Emergency phone: +82-2-729-5051

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 classified
Health Hazards: Not classified
Environmental Hazards: Not classified

2.2 Label elements, including precautionary statements
- **o Pictogram and symbol**: Not applicable
- **o Signal word**: Not applicable
- **o Hazard statements**: Not applicable
- **o Precautionary statements:**
  - **Prevention:** Not applicable
  - **Treatment:** Not applicable
  - **Storage:** Not applicable
  - **Disposal:** Not applicable

2.3 Other hazard information not included in hazard classification
(National Fire Protection Association; NFPA)

- **o Health:** Not available
- **o Flammability:** Not available
- **o Reactivity:** Not available

3. Composition/information on ingredients

Component	Common name and synonyms	CAS No.	Conc. / %
Dioctyl terephthalate	Bis(2-ethylhexyl) terephthalate	6422-86-2	100

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 for at least 20 minutes.
- Remove and isolate contaminated clothing and shoes.
- Wash contaminated clothing and shoes before reuse.
- 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 acute effects

- Not 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 chemical

- 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 ignites readily.
- If inhaled, may be harmful.

5.3 Special protective equipment and precautions for fire-fighters

- 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

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

6.2 Environmental precautions

- Prevent entry into waterways, sewers, basements or 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 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.

8. Exposure controls/personal protection

8.1 Occupational Exposure limits

- **ACGIH regulation**: Not available
- **OSHA regulation**: Not available
- **NIOSH regulation**: Not available
- **Biological exposure index**: Not available
- **EU regulation**: Not available
- **Other**: 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 measures, such as personal protective equipment

Respiratory protection

- Wear NIOSH 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.

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 ℃ (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 °C)
Vapor density:	13.5 (Air = 1)
Relative density	0.984 ± 0.003 at 20 ℃/68 °F (JIS K 6751)
Solubility:	0.0004 mg/l (22.5 ℃)
Solubility in organic solvents:	Not available
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 ℃ (HSC internal method)
Molecular weight:	390.557
Particle Size (Polymer compound)	Not applicable
Self-accelerated decomposition temperature (Polymer compound)	Not applicable

"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:

- Stable at normal temperature and pressure.
- Fire may produce irritating and/or toxic gases.
- If inhaled, may be harmful.

10.2 Conditions to avoid:

- Heat, sparks or flames, other sources of ignition

10.3 Incompatible materials:

- Combustibles, oxidizing solids, oxidizing liquid, oxidant

10.4 Hazardous decomposition products:

- Irritating and/or toxic gases, carbon oxides (CO, CO_2)

11. Toxicological information

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) · 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) · *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) · 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

12. Ecological information

12.1 Toxicity	
Acute toxicity	Not classified
	· Fish: 96h-LC_{50} (*Pimephales promelas*) > 984 mg/L (OECD TG 203) · 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) · Invertebrate: 21d-NOEC (*Daphnia magna*) ≥ 0.00076 mg/L (OECD TG 211, GLP) · 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) · 73.05% biodegradation was observed after 28 day. (OECD TG 301B, GLP)
12.3 Bio-accumulative potential	· log Kow = 8.39 (Estimated) · 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 Hazardous to the ozone layer	Not classified

12.7 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 regulations.

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

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): Section8 (b) inventory: Present (ACTIVE)
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 (KE-02197)
- European Inventory of Existing Commercial chemical Substances (EINECS): Present (229-176-9)

- 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

16. OTHER INFORMATION

16.1 Indication of changes:

Preparation date: June 20, 2016
Version: 5
Revision date: March 15, 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
- National Emergency Management Agency-Korea dangerous material inventory management system; http://hazmat.mpss.kfi.or.kr/material.do

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.