Hanwha Solutions

SAFETY DATA SHEET

Date Printed: June 23, 2023
Version: 2
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: DINP
EC No.: 271-090-9
REACH Registration No.: Refer to chapter 3.
CAS No.: 68515-48-0

1.2 Relevant identified uses of the substance or mixture and uses advised against
1.2.1 Identified Uses
- Polymer materials

1.2.2 Recommended use
- Polymer materials

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, 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 Corporation
Address: 86, Cheonggyecheon-ro, Jung-gu, Seoul, Republic of Korea
Prepared by: PSR/Plasticizer Sales Team
Contact Telephone: +82-2-729-5051, Fax: +82-2-729-5057

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
- **Hazard pictograms:** Not classified
- **Signal word:** Not applicable
- **Hazard statement:** Not applicable
- **Precautionary statements:** 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.
1,2-Benzenedicarboxylic acid, di-C8-10-branched alkyl esters, C9-rich	68515-48-0	271-090-9	100	Not classified	-	01-2119432682-41-0006

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.
Get immediate medical advice/attention.

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, alcohol-resistant foam, water spray, regular foam, CO_2
- Unsuitable extinguishing media: High pressure water streams

5.2 Specific hazards arising from the substance or mixture

- May explode from heat, sparks, or flames.
- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.
- Fire will produce irritating, corrosive and/or toxic gases.
- If inhaled, may be harmful.

5.3 Advice for firefighters

- 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.
- Please note that materials and conditions to avoid.
- Do not touch or walk through spilled material.

6.1.2 For emergency responders

- Eliminate all ignition sources.
- Ventilate the contaminated 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

- Please note that materials and conditions to avoid.
- 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

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

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)	-	-	-	-	-	0.085	-	-
Human: inhalation (mg/m^3)	-	0.60	-	-	-	0.196	-	-
Human: dermal (mg/kg bw/day)	-	0.17	-	-	-	0.085	-	-
Environment: water	$PNEC_{freshwater}$: 6.80E-04 mg/L							
Environment: air	Not available							
Environment: soil	$PNEC_{soil}$: > 8.90E-05 mg/L							
Environment: sediment	$PNEC_{sediment}$: 4.56 mg/kg							
Environment: STP	Not available							
Environment: Predators	No potential for bioaccumulation							

8.2 Exposure controls

Appropriate engineering controls:

- Provide local exhaust ventilation system or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

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:	Slight
Odor threshold:	Not available
pH:	6~7
Melting point/freezing point:	-48 ℃
Initial boiling point and boiling range:	244~252 ℃ (6.6 hPa)
Flash point:	224 ℃ (Cleveland open cup, ASTM 92-18)
Evaporation rate:	Not available
Flammability (solid, gas):	Not available
Upper/lower flammability or explosive limits:	Not available
Vapor pressure:	0.0001 kPa (<0.001 hPa; 38℃)
Vapor density:	10 (>10 (air=1))
Relative density:	Not available
Solubility(ies):	<.1 vol% (20 ℃)
Partition coefficient: n-octanol/water:	Log K_{ow} = 8.8
Auto-ignition temperature:	260 ℃ (about 260 ℃; 1013.25 hPa)
Decomposition temperature:	Not available
Viscosity:	90 mPa.s (20 ℃) (HSC internal method)
Explosive properties:	Not applicable
Oxidizing properties:	Not available
Molecular weight:	418.6 g/mol
Specific gravity:	0.975±0.003 (20 ℃)(JIS K 6751)
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
- If inhaled, may be harmful.

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

10.4 Conditions to avoid
- Ignition sources of Heat, sparks or flames etc.

10.5 Incompatible materials
- Combustibles

10.6 Hazardous decomposition products
- Irritating and/or toxic gases

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects	
(a) Acute toxicity	
Oral	Not classified
	· LD_{50}(Rat, female/male) > 40,000 mg/kg bw, no deaths (read-across : CAS No. 28553-12-0)
Dermal	Not classified
	· LD_{50} (Rabbit, female/male) > 3,160 mg/kg bw, no deaths
Inhalation	Not classified
	· LC_{50} (Rabbit, female/male) > 4.4 mg/L air(nominal), no deaths (read-across : CAS No. 28553-12-0)
(b) Skin Corrosion/ Irritation	Not classified
	· In a skin Corrosion/irritation study with rabbits, not irritating (primary dermal irritation index (PDII)=0) (read-across : CAS No. 28553-12-0)(OECD TG 404)
(c) Serious Eye Damage/ Irritation	Not classified
	· In a Serious Eye Damage/Irritation study with rabbits, not irritating. (read-across : CAS No. 28553-12-0) (OECD TG 405)
(d) Respiratory sensitization	Not available (Insufficient data)
	· There have been reports of hypersensitivity reactions in 10-year-old children exposed to toys containing DINP, which may provide indirect evidence that DINP may cause hypersensitivity reactions. Since the confirmed results did not show any positive reaction, direct evidence was insufficient to regard DINP as a sensitizer, so it was not applied to classification.
(e) Skin Sensitization	Not classified
	· The human body was observed as a target (10-year-old white child exposed to DINP contained in toys), and small erythema and palpitations appeared in the exposed area after exposure, but recovered after 5 days and did not recur when the drug was applied twice a day.There is a possibility of causing dermatitis, but the symptoms are very weak. (read-across : CAS No. 28553-12-0)
(f) Carcinogenicity	Not classified
	· IARC, NTP, OSHA, ACGIH, EU CLP 1272/2008: not listed · In a repeated oral toxicity study with rats(male/female) for 2 years, no direct evidence of carcinogenicity was observed in test animals. NOAEL = 17 mg/kg bw/day(OECD TG 453)
(g) Mutagenicity	Not classified
	· In vitro Bacteri reverse mutation assay : negative with and without metabolic activation (OECD TG 471, GLP) (read-across : CAS No. 28553-12-0) · In vitro Ovary mutation assay with hamster : negative with and without Metabolic activation (OECD TG 473, GLP) (read-across : CAS No. 28553-12-0) · In vivo micronucleus test : negatve (OECD TG 474, GLP)

	(read-across : CAS No. 68515-48-0)
(h) Reproductive toxicity	Not classified
	· As a result of the second-generation reproductive toxicity test in rats, it did not affect fertility or male reproductive development at a dose concentration of up to 500 mg/kg/day. (EC Dangerous Substances Directiov(67/548/EEC) · As a result of teratogenicity studies in rats (females), increased skeletal mutations, decreased dietary intake, weight loss, increased liver weight, soft tissue mutations and increased skeletal mutations were observed, but no malformations were observed in the fetus. NOAEL = 200 mg/kg bw/day (OECD TG 414, GLP)
(i) Specific target organ toxicity (single exposure)	Not classified
	· It was not classified as result of the acute oral toxicity test, and the autopsy and observation findings were also not specific.
(j) Specific target organ toxicity (repeat exposure)	Not classified
	· Based on the results of subchronic oral administration test results for 13 weeks at concentration of 0, 100, 500, 2,500 mg/kg bw/day to monkey(female/male), NOAEL = 500 mg/kg bw/day. (OECD TG 408)(read-across : CAS No. 28553-12-0)
(k) Aspiration Hazard	Not classified
	· product viscosity : 90 mPa.s (20 °C)(HSC internal method)
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
Chronic toxicity	Not classified
	- fish : · 96h- LD_{50} (*Rainbow trout O.mykiss*) > 0.16 mg/L(Static, freshwater)(US EPA) · 284d-NOEC(*Oryzias latipes*) ≥ 18.5, ≤ 24.5 μg/g (freshwater)(OECD TG 210) - Invertebrate : · 48h-EC_{50} (*Daphnia magna*) > 0.06 mg/L (Static, freshwater)(US EPA) · 21d-NOEC(*Daphnia magna*) = 0.034 mg/L (freshwater)(US EPA) - Algae : · 5d-EC_{50} (*Selenastrum capricornutum*) > 1.8 mg/L (Static, freshwater)(US EPA) * Since the water solubility is 0.6 μg/L (0.0006 mg/L), it is judged that there is no toxic effect to the limit even if it is accepted.
12.2 Persistence and degradability	· It decomposed 67.8±7.2% in 14 days; readily biodegrable (read-across : CAS No. 28553-12-0)(EPA OPPTS 835.5045)
12.3 Bioaccumulative potential	· log K_{ow} = 8.8 · The FWMF(Food Web Magnification Factor) of DINP is 0.46, and it is biologically

	diluted in the food chain, and it is easily metabolized in the body, so the possibility of bioaccumulation is low.
12.4 Mobility in soil	· K_{oc} = 309,029
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 available

Risk phrases: Not available

Safety phrases: Not available

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-02208)
- 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
- New Zealand management information: Inventory of Chemicals (NZIoC): HSNO Approval : HSR 003687
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (22214)
- Japan management information: Existing and New Chemical Substances (ENCS): Present ((3)-1307)
- 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: January 26, 2022
Version: 2
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
ACT ON REGISTRATION, EVALUATION, ETC. OF CHEMICALS : Registration Dossier :
DINP(CAS No. 68515-48-0)

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.