SAFETY DATA SHEET

Date Printed: January 5, 2024
Version: 2
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: CLNA-TR8142EC
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 wires.
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: Yeosu plant, Hanwha Solutions Co, Ltd., 117, Yeosusandan 3-ro, Yeosu-si, Jeollanam-do, Korea
Prepared by: W&C Production team
Contact Telephone: +82-61-688-1582, Fax: +82-61-688-1585

1.3.2 Supplier & Distributor
Company name: Hanwha Solutions Co, Ltd.
Address: 21F, Hanwha Bldg., Janggyo-dong, Jung-gu, Seoul, Korea
Prepared by: W&C Sales Team
Contact Telephone: +82-2-729-2689, Fax : 02-729-2563, e-mail : raehyun.yu@hanwha.com

1.4 Emergency phone number

Emergency phone: +82-2-729-2689

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

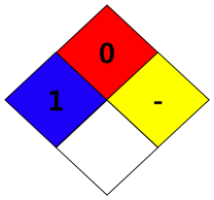
Health Hazards: Not classified

Environmental Hazards: Not classified

2.2 Label elements, including precautionary statements

- **Pictogram and symbol**: Not applicable
- **Signal word**: Not applicable
- **Hazard statements**: Not applicable
- **Precautionary statements:** Not applicable
  - **Prevention:** Not applicable
  - **Treatment:** Not applicable
  - **Storage:** Not applicable
  - **Disposal:** Not applicable

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



o Health: 1
o Flammability: 0
o Reactivity: -

3. Composition/information on ingredients

Component	Common name and synonyms	CAS No.	Conc. / %
Polyethylene	Ethylene polymers	9002-88-4	> 96
Dicumyl Peroxide	Bis(1-metyl-1-phenylethyl)peroxide	80-43-3	< 3

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 for at least 20 minutes.
- Get immediate medical advice/attention.

Skin contact

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

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:** Dry chemical powder, alcohol resistant foam, water spray, Carbon dioxide, regular foam

- **Unsuitable extinguishing media**: Not available

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 may 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 melting.
- 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.
- Powder Spill; Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
- Prevent dust cloud.

6.2 Environmental precautions

- Prevent entry into water ways, 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

- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- 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.
- Please note that there are materials and conditions to avoid.

8. Exposure controls/personal protection

8.1 Occupational Exposure limits

< Polyethylene>

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:

- Slovak Republic: TWA=5mg/m^3 (total solid aerosol)
- Latvia: TWA= 5mg/m^3 (dust, listed under Polymers dust)
- China: TWA= 5mg/m^3 (total dust), STEL= 10mg/m^3 (total dust)

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 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:	Solid
Color:	Not available
Odor:	Not available
Odor threshold:	Not available
pH:	Not available
Melting point/freezing point:	100~130℃
Initial boiling point and boiling range:	Not available
Flash point:	Not available
Evaporation rate:	Not available
Flammability (solid, gas):	Not available
Upper/lower flammability or explosive limits:	Not available
Vapor pressure:	Not available
Vapor density:	Not available
Relative density	0.910 ~ 0.925
Solubility:	Not soluble
Partition coefficient: n-octanol/water:	Not available

Auto-ignition temperature:	Not available
Decomposition temperature	Not available
Viscosity:	Not available

"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:

- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.
- Fire may produce irritating and/or toxic gases.

10.2 Conditions to avoid:

- Keep away from heat/sparks/open flames/hot surfaces.

10.3 Incompatible materials:

- Strong oxidizing agent

10.4 Hazardous decomposition products:

- Irritating, toxic gas

11. Toxicological information

Information on toxicological effects	
(a) Acute toxicity	
Oral	Not classified (ATE_{mix}>2,000mg/kg bw)
	Polyethylene: Rat, LD_{50} >2,000 mg/kg bw Dicumyl Peroxide: Rat, LD_{50} ≥2,000 mg/kg bw (OECD TG 401, GLP)
Dermal	Not classified (ATE_{mix}>2,000mg/kg bw)
	Dicumyl Peroxide: Rat, LD_{50} >2,000 mg/kg bw (OECD TG 402, GLP)
Inhalation	Not available
(b) Skin Corrosion/ Irritation	Not classified
	- Polyethylene: In test on skin irritation with rabbits, mild skin irritations was observed (irritating index: 0.2) - Dicumyl Peroxide: In test on skin irritation with rabbits, very slight erythema was observed (OECD TG 404, GLP)
(c) Serious Eye Damage/ Irritation	Not classified

	- Polyethylene: At the 24 hour observation, one and two treated eyes suffered from moderate and minimal conjunctival irritation, respectively. Polyethylene produced a maximum group mean score of 11.7 and was classified as a mild irritant to the rabbit eye, All treated eyes appeared normal at the 72 hour and 7 day observations. - Dicumyl Peroxide: In test on serious eye damage/irritation with rabbits, slightly eye irritations was observed The effects were fully reversible after 72h. (cornea opacity=1, conjunctivae redness=1) (OECD TG 405, GLP)
(d) Respiratory sensitization	Not available
(e) Skin Sensitization	Not classified
	- Polyethylene: In skin sensitization test with guinea pigs, skin sensitizations were not observed. - Dicumyl Peroxide: The result of the LLNA test perfomed with dicumyl peroxide revealed that dicumyl peroxide is not senstizing to skin. (OECD TG 429, GLP)
(f) Carcinogenicity	Not classified
	- Polyethylene: · IARC: Group 3(Not classifiable as to its carcinogenicity to humans)
(g) Mutagenicity	Not classified
	- Polyethylene: · *In vitro*: Reverse mutation test (*S. typhimurium*) with/ without metabolic activation: Negative · *In vivo*: Not available - Dicumyl Peroxide: · *In vitro*: Mammalian Chromosome Aberration Test (*Chinese hamster lung (CHL/IU) cells*) with/ without metabolic activation: Negative (OECD TG 473, GLP) · *In vitro*: Mammalian Cell Gene Mutation Test(*Chinese hamster lung fibroblasts (V79)*) with/ without metabolic activation: Negative (OECD TG 476, GLP) · *In vitro*: Bacterial Reverse Mutation Assay(*S. typhimurium* TA 1535, TA 1537, TA 98 and TA 100) with/ without metabolic activation: Negative (OECD TG 471, GLP) · *In vivo*: Not available
(h) Reproductive toxicity	Not classified
	- Dicumyl Peroxide: In a developmental toxicity study according to OECD 414, dicumyl peroxide was administered to 24 pregnant female Hsd. Brl. Han: WISTAR rats per dose by oral gavage at dose levels of 0, 50, 150 and 450 mg/kg bw/day from day 5 through 19 of gestation. The highest administered dose elicited pronounced maternal toxicity, including death, piloerection, reduced activity, coldness, paleness, vaginal bleeding and hypotonicity, enlarged adrenals and spleen and blood in the uterus, markedly reduced food consumption, lower body weight, markedly reduced body weight gain and weight loss as well as markedly reduced corrected body weight and body weight gain.

	Effects of the highest dose on embryos included increased post implantation loss (and lower number of viable foetuses), a decreased foetal weight, an increased percentage of foetuses with body weight retardation, malrotated fore- and hindlimbs as well as skeletal malformations of the pectoral girdle and extremities, increase of skeletal variations and placentas with dark brownish discoloration or fibrinoid degeneration possibly due to the marked maternal toxicity. ($NOAEL_{maternal\ toxicity}$=150mg/kg bw/day, $NOAEL_{developmental\ toxicity}$=150mg/kg bw/day, $LOAEL_{maternal\ toxicity}$=450mg/kg bw/day, $LOAEL_{developmental\ toxicity}$=450mg/kg bw/day, $NOEL_{maternal\ toxicity}$=50mg/kg bw/day)(OECD TG 414, GLP)
(i) Specific target organ toxicity (single exposure)	Not available
(j) Specific target organ toxicity (repeat exposure)	Not classified
	- Polyethylene: Subchronic or Prechronic Exposure/ In a 90-day study, liver changes (fat droplets, cloudy swelling, and increased liver weight) that were considered reversible in all cases. (NOAEC=Rat: 2700, 540ppm, dog: 2700ppm) - Dicumyl Peroxide: · Dicumyl Peroxide (CAS number 80-43-3) caused salivation, changes in body weight and body weight gain, in feed efficiency, clinical chemistry parameters (ALT, GGT, total bilirubin, blood urea nitrogen, bile acid or inorganic phosphorous) and organ weights (liver and kidneys) after repeated dose oral administration to male and female Hsd.Brl.Han: Wistar rats. (NOAEL=80mg/kg bw/day, LOAEL=320mg/kg bw/day)(OECD TG 408, GLP) · In 90day subchronic oral study with rat, there were observed in both sexes and body weight gain, salivation. Histopathologically, hypertrophy, degeneration of hepatocytes was observed in both sexes. (NOAEL=60mg/kg bw/day(nominal), LOAEL=200mg/kg bw/day(nominal))(OECD TG 407, GLP)
(k) Aspiration Hazard	Not available

12. Ecological information

12.1 Toxicity	
Acute toxicity	Not classified (ATE_{mix}=1,000mg/L)
	- Dicumyl Peroxide: Invertebrate: 48 hr EC_{50}(*Daphnia magna*) > 1.74 mg/L (OECD TG 202, GLP) Algae: 72 hr ErC_{50}(*Selenastrum capricornutum*) > 1,000 mg/L (OECD TG 201, GLP)
Chronic toxicity	Category 3
	- Dicumyl Peroxide: Invertebrate: 21d $NOEC_{reproduction}$ (*Daphnia magna*) = 0.177 mg/L (OECD TG 211, GLP) Algae: 72 hr NOEC (*Selenastrum capricornutum*) = 3.2 mg/L (OECD TG 201, GLP)
12.2Persistence and degradability	- Dicumyl Peroxide: Persistence: High persistency (log Kow is more than 4 estimated.)

	(Log Kow = 5.6, 25 °C) (OECD TG 117) Degradability: The half life of dicumyl peroxide is 23.8 d (pH 4), 29.2 d (pH 7), 29.9 d(pH 9) at 25 °C. (OECD TG 111, GLP)
12.3Bioaccumulative potential	- Dicumyl Peroxide: Bioaccumulation: Bioaccumulation is expected to be high according to the BCF ≥ 500(BCF = 1977) (Estimated) Biodegradation: As not well-biodegraded, it is expected to have high accumulation potential in living organisms (18% biodegradation was observed after 28 day) (OECD TG 301 D, GLP)
12.4 Mobility in soil	- Dicumyl Peroxide: High potency of mobility to soil. (Koc = $5.93x10^4$) (Predicted)
12.5 Hazardous to the ozone layer	Not classified
12.6 Other adverse effects	Not available

13. Disposal considerations

Disposal method

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

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

< Polyethylene >

USA Regulatory Information

TSCA (Toxic Substances Control Act): Section8 (b) inventory(Present) [XU]

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-28877)
- Japan management information: Existing and New Chemical Substances (ENCS): Present ((6)-1))
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (05721)
- Australia management information: Inventory of Chemical Substances (AICS): Present
- Canada management information: Domestic Substances List (DSL): Present
- 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

< Dicumyl peroxide >

USA Regulatory Information

TSCA (Toxic Substances Control Act): Section8 (b) inventory(Present)

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-03299)
- European Inventory of Existing Commercial chemical Substances(EINECS): Present (201-279-3)
- Japan management information: Existing and New Chemical Substances (ENCS): Present ((3)-1086)
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (14132)
- Australia management information: Australia Inventory of Chemical Substances (AICS): Present
- Canada management information: Domestic Substances List (DSL): Present

- New Zealand management information: New Zealand Inventory of Chemicals (NZIoC): HSNO Approval: HSR001374
- Philippines management information: Philippines Inventory of Chemicals and Chemical Substances (PICCS): Present

16. Other information, including date of preparation or last revision

16.1 Indication of changes:

Preparation date: Jun. 20, 2016
Version: 2
Revision date: January 5, 2024

16.2 Key literature reference and sources for data:

- ○ National chemicals information systems; http://ncis.nier.go.kr
- ○ IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; http://monographs.iarc.fr
- ○ ECHA; http://echa.europa.eu/web/guest
- ○ HSDB; http://toxnet.nlm.nih.gov/
- ○ OECD SIDS; http://webnet.oecd.org/
- ○ 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.