

SAFETY DATA SHEET

Date Printed:

Version: 4

Revision date: October 2, 2024

Regulation: In accordance with Commission Regulation (EU) 2020/878

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

1.1.1 Product name: CCBA-8725BK

1.1.2. EC No.: Not applicable

1.1.3. REACH Registration No.: Refer to chapter 3.

1.1.4. CAS No.: Not applicable

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

1.2.1 Identified Uses:

- It is used for outer semiconductor layer.

1.2.2 Recommended use:

- It is used for outer semiconductor layer.

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: Yeosu plant, Hanwha Solutions Co, Ltd., 117, Yeosusandan 3-ro, Yeosu-si, Jeollanam-do, Korea

Prepared by: W&C Production team

Contact Telephone: +82-61-688-1550, Fax: +82-61-688-1585

1.3.2 Supplier & Distributor

Company name: Hanwha Solutions Co, Ltd.

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

Prepared by: W&C Sales team

Contact Telephone: +82-2-729-5315, Fax: +82-2-729-3000

1.4 Emergency telephone number

1.4.1. Emergency Telephone: +82-2-729-2689, +49-6196-5016

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: Not applicable

- **Prevention:** Not applicable

- **Response:** Not applicable

- **Storage:** Not applicable
- **Disposal:** Not applicable

2.3 Other hazards

- This mixture is not carried out to assess PBT and vPvB according to EU REACH 1907/2006. There is no any ingredient classified as PBT and vPvB.
- **Additional precautionary statements:** Not applicable
- **National Fire Protection Association (NFPA):**
Health: 0
Flammability: Not available
Reactivity: Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances: Not applicable

3.2 Mixtures:

Component	CAS No.	EC No.	Conc. / %	Classification according to 1272/2008/EEC	SCL/ M-factor/ ATE	Registration No.
Acetic acid ethenyl ester, polymer with ethene; EVA; Ethylenevinylacetate copolymer	24937-78-8	429-840-1	> 50	Not classified	-	01-2119462827-27-0116 01-2119471301-50-0017
Carbon black	1333-86-4	215-609-9	< 47	Not classified	ATE(oral) >8,000 mg/kg bw	01-2119384822-32-0000
Poly(2,2,4-trimethyl-1,2-dihydroquinoline); Polymer of 2,2,4-trimethyl-1,2-dihydroquinoline	26780-96-1	500-051-3	< 2	Not classified	ATE(oral) =3,190 mg/kg bw ATE(dermal) > 5,190 mg/kg bw	Not registered
[1,3(or 1,4)-Phenylenebis (1-methylethylidene)] bis[[1,1-dimethylethyl] peroxide; Bis(tert-butylperoxy-isopropyl) benzene	25155-25-3	246-678-3	< 1	Not classified	ATE(oral) >2,000 mg/kg bw ATE(dermal) > 2,000 mg/kg bw	Not registered

*Under EU REACH regulation, monomers in polymer is registered.

4. FIRST AID MEASURES

4.1 Description of first aid measures

4.1.1. General information:

- If exposed or concerned: Get medical advice/attention.

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 thoroughly clothes 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 delayed:

- Not known

4.3 Indication of any immediate medical attention and special treatment needed:

- 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, carbon dioxide
- Unsuitable extinguishing media: high pressure water streams

5.2 Specific hazards arising from the substance or mixture

- 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 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.
- Do not touch or walk through spilled material.

6.1.2 For emergency responders

- Eliminate all ignition sources.
- Please note that materials and conditions to avoid.
- 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 Methods and material 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.

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

< Carbon black >

o **EU regulation:** Not available

o **U.S regulation:**

- NIOSH: TWA=3.5 mg/m³; 0.1 mg/m³ (Carbon black in presence of Polycyclic aromatic hydrocarbons, as PAH)

- OSHA: TWA=3.5 mg/m³

o **ACGIH:** TWA=3 mg/m³ (inhalable particulate matter)

o **Biological exposure index:** Not available

o **Others:**

- Belgium: TWA= 3.5 mg/m³

- Denmark: TWA=3.5 mg/m³

- Finland: TWA= 3.5 mg/m³, STEL= 7 mg/m³

- China: TWA=4 mg/m³ (total dust), STEL= 8 mg/m³ (total dust)

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	No hazard identified	Not available	No hazard identified
Human: inhalation	500* (repeated)	1 (repeated)	No hazard identified		No hazard	60* (repeated)	No hazard identified	

(mg/m ³) or (µg/m ³)*	dose toxicity)	dose toxicity)		identified	dose toxicity)	
Human: dermal	No hazard identified			No hazard identified		
Environment water	1 - 50 mg/L (Freshwater), 10 mg/L (Intermittent releases (freshwater)), 100 µg/L (Marine water), 1 mg/L (Intermittent releases (marine water))					
Environment soil	No hazard identified					
Environment sediment	No hazard identified (freshwater, marine water)					
Environment STP	No data: aquatic toxicity unlikely					
Environment Air	No hazard identified					
Environment Predators	No potential for bioaccumulation					

< Poly(2,2,4-trimethyl-1,2- dihydroquinoline) >

o **EU regulation:** Not available

o **U.S regulation:**

- NIOSH: Not available

- OSHA: 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 (µg/kg bw/day)	Not available				Not available	600 (repeated dose toxicity)	Not available	
Human: inhalation (mg/m ³)	Not available	7 (repeated dose toxicity)	Not available		Not available	1.8 (repeated dose toxicity)	Not available	
Human: dermal (mg/kg bw/day) or (µg/kg bw/day)*	Not available	1 (repeated dose toxicity)	Not available		Not available	600* (repeated dose toxicity)	Not available	
Environment water	56 µg/L (Freshwater), 560 µg/L (Intermittent releases (freshwater)), 5.6 µg/L (Marine water)							
Environment soil	4.2 mg/kg soil dw							
Environment sediment	21 mg/kg sediment dw (freshwater water), 2.1 mg/kg sediment dw (marine water)							
Environment STP	100 mg/L							
Environment Air	Not available							
Environment Predators	8 mg/kg food (Secondary poisoning)							

< [1,3(or 1,4)-Phenylenebis (1-methylethylidene)] bis[(1,1-dimethylethyl) peroxide]>

o **EU regulation:** Not available

o **U.S regulation:**

- NIOSH: Not available

- OSHA: 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	1 (repeated dose toxicity)	No hazard identified	
Human: inhalation (mg/m ³)	Hazard unknown	19.7 (repeated dose toxicity)	Hazard unknown (no further information necessary as no exposure expected)		Hazard unknown	3.47 (repeated dose toxicity)	Hazard unknown (no further information necessary as no exposure expected)	
Human: dermal (mg/kg bw/day)	Hazard unknown	28 (repeated dose toxicity)	No hazard identified		Hazard unknown	10 (repeated dose toxicity)	No hazard identified	
Environment water	No hazard identified							
Environment soil	No exposure of soil expected							
Environment sediment	8.9 mg/kg sediment dw (freshwater water), 892 mg/kg sediment dw (marine water)							
Environment STP	100 mg/L							
Environment Air	No hazard identified							
Environment Predators	44.4 mg/kg food (Secondary poisoning)							

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

Eye protection:

- Wear facepiece with goggles to protect.
- An eye wash unit and safety shower station should be available nearby work place.
- 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 chemical resistant gloves.
- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Body protection:

- Wear appropriate protective chemical resistant clothing.
- 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

Physical state:	Solid, Pellet
Color:	Black
Odor:	Not available
Odor threshold:	Not available
pH:	Not available
Melting point/freezing point:	80~110°C
Boiling point or initial boiling point and boiling range:	Decompose on heating
Flash point:	Not available
Evaporation rate:	Not available
Flammability (solid, gas):	Not flammable
Upper/lower flammability or explosive limits:	Not available
Vapour pressure:	Not available
Vapour density:	Not available
Density and/or relative density:	1.15±0.05 (23°C)
Solubility(ies):	Insoluble
Partition coefficient: n-octanol/water:	Not available
Auto-ignition temperature:	Not available
Decomposition temperature:	Not available
Viscosity:	Not available
Kinematic viscosity:	Not available
Explosive properties:	Not available
Oxidizing properties:	Not available
Molecular weight:	Not available
Specific gravity:	Not available
Particle characteristics (solid):	Not available
Particle Size (Polymer compound):	Not available
Self-accelerated decomposition temperature (Polymer compound):	Not available

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 (heat, sparks or flames)

10.5 Incompatible materials

- Combustibles

10.6 Hazardous decomposition products

- Irritating and/or toxic gases

11. TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008	
(a) Acute toxicity	
Oral	Not classified (ATE _{mix} =79,750 mg/kg bw)
	<ul style="list-style-type: none"> - Carbon black: Rat, LD₅₀ > 8,000 mg/kg - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): Rat(male/female), LD₅₀=3,190 mg/kg bw - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide]: Rat(male/female), LD₅₀>2,000 mg/kg bw (OECD TG 401, 423, GLP)
Dermal	Not classified (ATE _{mix} >3,388 mg/kg bw)
	<ul style="list-style-type: none"> - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): Rabbit(male/female), LD₅₀>5,190 mg/kg bw - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide]: Rat(male/female), LD₅₀>2,000 mg/kg bw (OECD TG 402, GLP)
Inhalation	Not available
(b) Skin Corrosion/ Irritation	Not classified
	<ul style="list-style-type: none"> - Carbon black: In test on skin irritation with rabbits, skin irritation was not observed. (OECD TG 404) - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): It was not irritating to the skin in a study equivalent to OECD TG 404 with 6 rabbits dosed with 500 mg TMQ. - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide]: It is not considered as a primary dermal irritant.(OECD TG 404, GLP)
(c) Serious Eye Damage/ Irritation	Not classified
	<ul style="list-style-type: none"> - Carbon black: In test on eye irritation with rabbits, eye irritations were not observed. (OECD TG 405) - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): The test compound was not irritating to the eyes in a study equivalent to

	<p>OECD TG 405 with 6 rabbits dosed with 100 mg TMQ.</p> <p>- [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide: The test material was not an eye irritant.(OECD TG 405, GLP)</p>
(d) Respiratory sensitization	Not classified
	- Carbon black: In test on respiratory sensitization with mouse, respiratory sensitization was not observed.
(e) Skin Sensitization	Not classified
	<p>- Carbon black: In skin sensitization test with guinea pigs, skin sensitizations were not observed. (OECD TG 406, GLP)</p> <p>- Poly(2,2,4-trimethyl-1,2-dihydroquinoline): A Guinea Pig Maximization Test (GPMT) according to OECD TG 406 was performed on female guinea pigs. The challenge led to no skin effects in the animals of the treatment group or of the control group. In summary, under the conditions of the maximization test and with respect to the evaluation criteria the test item therefore exhibits no skin-sensitization potential. (OECD TG 406, GLP)</p> <p>- [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide: Under the experimental conditions of this study, the test item did not induce delayed contact hypersensitivity in the murine Local Lymph Node Assay. (OECD TG 429, GLP)</p>
(f) Carcinogenicity	Not classified
	<p>- Acetic acid ethenyl ester, polymer with ethene: · IARC, IRIS, OSHA, ACGIH, NTP, EU CLP 1272/2008: not listed</p> <p>- Carbon black: · IARC: Group 2B(Possibly carcinogenic to humans) · ACGIH: A3(Confirmed animal carcinogen with unknown relevance to humans)</p> <p>- Poly(2,2,4-trimethyl-1,2-dihydroquinoline): · IARC, IRIS, OSHA, ACGIH, NTP, EU CLP 1272/2008: not listed</p> <p>- [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide: · IARC, IRIS, OSHA, ACGIH, NTP, EU CLP 1272/2008: not listed</p>
(g) Germ cell mutagenicity	Not classified
	<p>- Carbon black: · In vitro: Bacterial reverse mutation assay, ambiguous without metabolic activation/negative with metabolic activation (OECD TG 471, GLP) · In vivo: Sex-linked Recessive Lethal Test in Drosophila melanogaster: negative (OECD TG 477)</p> <p>- Poly(2,2,4-trimethyl-1,2-dihydroquinoline): · In vitro: Gene mutation study in bacteria: Metabolic activation: with and without; negative (OECD TG 471) Mammalian Chromosome Aberration Test: Metabolic activation: with and without; negative (OECD TG 473, GLP) Gene mutation study in mammalian cells: Metabolic activation: with and without; negative (OECD TG 476, GLP) · In vivo: Not available</p> <p>- [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl)</p>

	<p>peroxide</p> <ul style="list-style-type: none"> · In vitro: Gene mutation study in bacteria: Metabolic activation: with and without; negative (OECD TG 471, GLP) Mammalian Chromosome Aberration Test: Metabolic activation: with and without; negative (OECD TG 473, GLP) Gene mutation study in mammalian cells: Metabolic activation: with and without; negative (OECD TG 476, GLP) · In vivo: Not available
(h) Reproductive toxicity	<p>Not classified</p> <ul style="list-style-type: none"> - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): A dose of 20 mg/kg was considered a NOEL for maternal toxicity and a dose of 120 was considered a NOEL for developmental toxicity. (GLP) - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl)peroxide]: The NOAEL for the systemic toxicity in the parental generation is considered to be 300 mg/kg bw/day, based on decreased body weight gain and food consumption in males and females and microscopic changes in kidneys of females observed at 1,000 mg/kg bw/day. The NOAEL for the fertility was 1000 mg/kg bw/day in males and 300 mg/kg bw/day in females. The NOAEL for the fetal development was 100 mg/kg body weight/day based a lower body weight gain at 300 and 1,000 mg/kg bw/day. (OECD TG 422, GLP)
(i) Specific target organ toxicity (single exposure)	<p>Not classified</p> <ul style="list-style-type: none"> - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): In an acute dermal toxicity study with rabbits(male/female), clinical signs were noted for all animals and gross autopsy of the survivors indicated hemorrhagic areas of the lung, discoloration of liver, spleen and kidney and inflammation of the gastrointestinal tract. LD₅₀>5,190 mg/kg bw. - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl)peroxide]: In acute oral/and dermal study, clinical signs of toxicity were not observed.
(j) Specific target organ toxicity (repeat exposure)	<p>Not classified</p> <ul style="list-style-type: none"> - Carbon black: In 90 days subchronic inhalation study with rat, there were no significant adverse effects. (NOAEC = 1.1 mg/m³ air)(OECD TG 413) - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): The following effects were considered to be test material related: effects on body weight of females in the high dose group; histopathologic effects on adrenals in the high dose males; effects on liver weight and liver histopathology in the high dose males and in the mid and high dose females. The increased incidence of thyroid follicular adenoma/cystadenomas in the high level males and females was considered to have resulted from compound administration, but may have resulted from compensatory mechanisms as a result of the hepatic changes. The NOAEL for systemic toxicity was considered to be 250 ppm in males and 50 ppm in females. (OECD TG 453, GLP) - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl)peroxide]: The NOAEL is considered to be 300 mg/kg bw/day, based on decreased body weight gain and food consumption in males and females and microscopic changes in kidneys of females observed at 1000 mg/kg bw/day. The NOEL is considered to be 100 mg/kg bw/day based on kidney multifocal tubular

	degeneration / regeneration and increase in kidney/body weight ratio in males at 300 mg/kg. This NOEL is considered as secure, since effects on male kidneys are related to a species specific alpha 2- μglobuline accumulation as demonstrated in a subsequent 90-day oral study. (OECD TG 422, 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 (ATEmix=37.525 mg/L)
Acute toxicity	<ul style="list-style-type: none"> - Carbon black: <ul style="list-style-type: none"> · Fish: 96hr LC₀(Danio rerio)=1,000mg/L (OECD TG 203, GLP) 96hr LC₀(Danio rerio)=10,000mg/L (OECD TG 203, GLP) · Crustacean: 24hr EC₅₀(<i>Daphnia magna</i>)>5,600mg/L (OECD TG 202, GLP) 48hr EC₅₀(<i>Daphnia magna</i>)=33.08-41.97mg/L 48hr LC₅₀(<i>Daphnia magna</i>)=54.55-68.23mg/L · Algae: 72hr EC₅₀(<i>Desmodesmus subspicatus</i>)>10,000mg/L (OECD TG 201, GLP) - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): <ul style="list-style-type: none"> · water solubility: <2.5 mg/L(23 °C, pH:5) · As all L(E)C₅₀s are over water solubility value, acute toxicity is not classified. - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide <ul style="list-style-type: none"> · water solubility: 0.04 mg/L · As all L(E)C₅₀s are over water solubility value, acute toxicity is not classified.
Chronic toxicity	Not classified
12.2 Persistence and degradability	<ul style="list-style-type: none"> - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): <ul style="list-style-type: none"> · Persistence: High persistency (log K_{ow} is more than 4 estimated) (Log K_{ow} = 1.2 - 7.7)(25 °C, pH: 6.3)\ · Degradability: Atmospheric half-life of about 1.5-2.0 hours (estimated) - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide <ul style="list-style-type: none"> · Persistence: High persistency (log K_{ow} is more than 4 estimated) (Log K_{ow}=7.3)(20 °C, pH: 5 - 9)\ · Degradability: Atmospheric half-life of 1.6 days

12.3 Bioaccumulative potential	<ul style="list-style-type: none"> - Poly(2,2,4-trimethyl-1,2-dihydroquinoline): <ul style="list-style-type: none"> · Bioaccumulation: Bioaccumulation is expected to be high according to the BCF \geq 500 (BCF=108-1,300) (OECD TG 305C) · Biodegradation: As not well-biodegraded, it is expected to have high accumulation potential in living organisms (0% biodegradation was observed after 28 days; not readily biodegradable) (EU Method C.4-E, GLP) - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide]: <ul style="list-style-type: none"> · Bioaccumulation: Bioaccumulation is expected to be high according to the BCF \geq 500 (BCF=536 kg/day) (GLP) · Biodegradation: As not well-biodegraded, it is expected to have high accumulation potential in living organisms (0% biodegradation was observed after 28 days; not readily biodegradable) (OECD TG 301 D, GLP)
12.4 Mobility in soil	<ul style="list-style-type: none"> - [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide]: <ul style="list-style-type: none"> · High potency of mobility to soil. (K_{oc} =2,344,000; estimated)
12.5 Results of PBT and vPvB assessment	This mixture is not carried out to assess PBT and vPvB according to EU REACH 1907/2006. There is no any ingredient classified as PBT and vPvB.
12.6 Endocrine disrupting properties	Not available
12.7 Other adverse effects	<ul style="list-style-type: none"> - Hazardous to the ozone layer: Not classified; Any ingredients are not under the Montreal Protocol list.
12.8 Additional information	Not available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

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

13.1.1 Product/Packaging disposal:

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

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 Maritime transport in bulk according to IMO instruments: Not applicable

15. REGULATORY INFORMATION

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

< Acetic acid ethenyl ester, polymer with ethene >

EU Regulatory Information

European management information: European Inventory of Existing Commercial chemical Substances (EINECS): Present (Pre-registered Substances, EC No. 429-840-1)

EU classification

EU 1272/2008(CLP)

Classification: Not classified

Risk phrases: Not applicable

Safety phrases: Not applicable

EU SVHC list: Not regulated

EU Authorization list: Not regulated

EU Restriction list: Not regulated

Waste Framework Directive 2008/98/EC: Non-hazardous waste

Foreign Inventory Status

- Korea management information: Existing Chemical Substance (KE-00037)
- TSCA (Toxic Substances Control Act): Section 8 (b) inventory: Present [XU] (ACTIVE)
- Japan management information: Existing and New Chemical Substances (ENCS): Present ((6)-6))
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (39322)
- 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
- Taiwan management information: Taiwan Chemical Substance Inventory (TCSI): Present

< Carbon black >

EU Regulatory Information

European management information: European Inventory of Existing Commercial chemical Substances (EINECS): Present (215-609-9)

EU classification

EU 1272/2008(CLP)

Classification: Not classified

Risk phrases: Not applicable

Safety phrases: Not applicable

EU SVHC list: Not regulated

EU Authorization list: Not regulated
EU Restriction list: Not regulated
Waste Framework Directive 2008/98/EC: Non-hazardous waste

Foreign Inventory Status

- Korea management information: Existing Chemical Substance (KE-04682)
- U.S.A management information: Section 8(b) Inventory (TSCA): Present
- Japan management information: Existing and New Chemical Substances (ENCS): Present
(5)-5222, (5)-3328)
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (34022)
- 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): Approval: HSR002801
- Philippines management information: Inventory of Chemicals and Chemical Substances (PICCS): Present
- Taiwan management information: Taiwan Chemical Substance Inventory (TCSI): Present

< Poly(2,2,4-trimethyl-1,2-dihydroquinoline) >

EU Regulatory Information

European management information: European Inventory of Existing Commercial chemical Substances (EINECS): Present (500-051-3)

EU classification

EU 1272/2008(CLP)

Classification: Not classified
Risk phrases: Not applicable
Safety phrases: Not applicable

EU SVHC list: Not regulated

EU Authorization list: Not regulated

EU Restriction list: Not regulated

Waste Framework Directive 2008/98/EC: Non-hazardous waste

Foreign Inventory Status

- Korea management information: Existing Chemical Substance (KE-29056)
- U.S.A management information: Section 8(b) Inventory (TSCA): Present [XU](ACTIVE)
- Japan management information: Existing and New Chemical Substances (ENCS): Present
(6)-1023, (7)-2019)
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (10693)
- 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
- Taiwan management information: Taiwan Chemical Substance Inventory (TCSI): Present

< [1,3(or 1,4)-Phenylenebis(1-methylethylidene)]bis[(1,1-dimethylethyl) peroxide] >

EU Regulatory Information

European management information: European Inventory of Existing Commercial chemical Substances (EINECS): Present (246-678-3)

EU classification

EU 1272/2008(CLP)

Classification: Not classified
Risk phrases: Not applicable
Safety phrases: Not applicable

EU SVHC list: Not regulated
EU Authorization list: Not regulated
EU Restriction list: Not regulated
Waste Framework Directive 2008/98/EC: Non-hazardous waste

Foreign Inventory Status

- Korea management information: Existing Chemical Substance (KE-28332)
- U.S.A management information: Section 8(b) Inventory (TSCA): Present (ACTIVE)
- Japan management information: Existing and New Chemical Substances (ENCS): Present ((3)-1067)
- China management information: Inventory of Existing Chemical Substances (IECSC): Present (11007)
- 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
- 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: Sep. 27, 2018
 Version: 4
 Revision date: October 2, 2024

16.2 Key literature reference and sources for data:

- Pubchem; <http://pubchem.ncbi.nlm.nih.gov/>
- AKRON; <http://ull.chemistry.uakron.edu/erd/>
- IARC Monographs on the Identification of Carcinogenic hazard to Humans; <http://monographs.iarc.who.int>
- ECHA; <http://echa.europa.eu/web/guest>
- HSDB; <http://toxnet.nlm.nih.gov/>
- OECD SIDS; <https://www.oecd.org/>
- NIOSH(The National Institute for Occupational Safety and Health)
- ACGIH(American Conference of Governmental Industrial Hygienists)
- 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
- CHEMICAL SAFETY REPORT; ethylene

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 classified	Not classified

16.4 Abbreviations

EC₅₀: median effective concentration
 LC₅₀: median lethal concentration
 LD₅₀: 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
DNEL: The derived no-effect level
PNEC: Predicted No Effect Concentration
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.

ANNEX TO THE SDS**1. Exposure Assessment of monomer(ethylene) in Acetic acid ethenyl ester, polymer with ethene**

- Ethylene is not required exposure assessment.