

1. Identification

- A. Product name : HIQ TRIPLE CLEARCOAT HC-5310
 B. Recommended Use and Restriction on Use
 1) General use : AUTOMOTIVE REFINISHES
 2) Restriction on use : Recommendations for purposes other use restrictions.
 C. Manufacturer / Supplier / distributor information
 1) Company name : NOROO Paint & Coatings Co., Ltd.
 2) Address : 351, Bakdal-ro, Manan-gu, Anyang-si, Gyeonggi-do, Korea
 3) Emergency telephone number : +82-31-467-6114

2. Hazard identification

A. GHS Classification : Acute toxicity (inhalation: vapor) Category 3 ▷Carcinogenicity Category 1B ▷Chronic aquatic toxicity Category 2 ▷Specific target organ toxicity(Single exposure) Category 1 ▷Specific target organ toxicity(Single exposure) Category 2 ▷Specific target organ toxicity(Single exposure) Category 3

B. GHS label elements

1) Hazard symbols :



2) Signal words : DANGER

3) Hazard statements : Toxic if inhaled ▷Suspected of causing cancer ▷Toxic to aquatic life with long lasting effects ▷Causes damage to organs ▷May cause damage to organs ▷May cause respiratory irritation, May cause drowsiness and dizziness.

4) Precautionary statements

- Avoid breathing dust/fume/gas/mist/vapours/spray. ▷Use only outdoors or in a well-ventilated area. ▷Obtain special instructions before use. ▷Do not handle until all safety precautions have been read and understood. ▷Use personal protective equipment as required. ▷Avoid release to the environment. ▷Do not breathe dust/fume/gas/mist/vapours/spray. ▷Wash hands thoroughly after handling. ▷Do not eat, drink or smoke when using this product.
- Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. ▷Immediately call a POISON CENTER or doctor/physician ▷Specific treatment ▷If exposed or concerned: Get medical advice/attention. ▷Collect spillage. ▷If exposed: Call a POISON CENTER or doctor/physician. ▷If exposed or if you feel unwell: Call a POISON CENTER or doctor/physician. ▷Call a POISON CENTER or doctor/physician if you feel unwell.
- Storage : Store in a well-ventilated place. Keep container tightly closed. ▷Store locked up.
- Disposal :Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification : (NFPA Classification)

Chemical Name	NFPA grade		
	Health	Flammability	Reactivity
Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene	NO DATA	NO DATA	NO DATA
Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene	NO DATA	NO DATA	NO DATA
n-Butyl acetate	2	3	0

3-Ethoxypropanoic acid ethyl ester	3	2	0
Dimethyl carbonate	1	3	1
2-Heptanone	1	2	0
Solvent naphtha (petroleum), light arom.	1	2	0
Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro	NO DATA	NO DATA	NO DATA

3. Composition/information on ingredients

Chemical Name	Trade names and Synonyms	CAS-NO	Content(%)
S1(Trade secrets)	-	-	19~29
S2(Trade secrets)	-	-	22~32
n-Butyl acetate	n-Butyl acetate	123-86-4	18~28
3-Ethoxypropanoic acid ethyl ester	3-Ethoxypropanoic acid ethyl ester	763-69-9	10~20
Dimethyl carbonate	Dimethyl carbonate	616-38-6	4~14
2-Heptanone	2-Heptanone	110-43-0	3~13
Solvent naphtha (petroleum), light arom.	Solvent naphtha (petroleum), light arom.	64742-95-6	1~10
Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro	Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro	127519-17-9	1~10

4. First-aid measures

- A. Eye Contact : If irritation, pain, swelling, and tears or glaring may occur, immediately take a doctor's treatment
Rinse exposed eyes with plenty of water for at least 15minutes.
- B. Skin Contact : Immediately wash off with soap and water for at least 15 minutes. If irritation or pain may occur, take a doctor's examination on exposed area. Discard clothing, and then wash off exposed area with soap and water.
- C. Inhalation : Discard contaminated clothing and shoes, and keep personal away. If breathing is difficult, administer oxygen If inhaled or swallowed, do not perform the inhalation phase of breathing Take an emergency medical examination by a doctor Perform the artificial respiration using the pocket mask installed the one way valves, or other inhaled medical devices. If the cessation of breathing may occur, perform the artificial respiration Avoid from source of exposure, and then moved into an area with fresh air
- D. Ingestion Contact : It is need to be considered that early removal of some ingested material by cautious gastric lavage must be weighed against potential complications of bleeding or perforation Get a doctor's attention immediately if ingestion of large amounts of materials. Take an appropriate medical treatment depending on the symptoms. Do not induce vomiting, and then if vomiting occurs, keep head below hips to prevent aspiration into lungs. Induce vomiting
- E. Notes to Physician : There is no specific antidote and take an appropriate medical treatment.

5. Fire-fighting measures

- A. Suitable (Unsuitable) extinguishing media
- 1) Suitable extinguishing media : Extinguished agent as powder foam or carbon dioxide, and regular foam
 - 2) (Unsuitable) extinguishing media : Water is not an appropriate extinguished agent
 - 3) Case of bic fire : Use an appropriate protect device depend on the fire scenario Evacuate more than 800m if an explosion hazard may occur. Spread a large amount of the extinguished agent as a mist form with staying upwind
- B. Specific hazards arising from the chemical
- 1) Pyrolysate : Carbon dioxide, toxic carbon compounds/Nitrogen compounds/sulfur compounds

2) Fire and Explosion danger : Intermediate levels of fire hazard. Explosive vapor/air mixture can be made at a temperature of 100°C.

C. Special protective actions for fire-fighters

- 1) Personal Precautions, protective equipment : Respirator or air respirator, heat resistant clothing, heat resistant hat, heat resistant gloves, heat resistant boots
- 2) Emergency procedures : Keep unauthorized personnel out except the fire-suppression personnel Cool containers with water until well after fire is out. If there is no risk, move to move containers from fire area. Perform a fire fighting using an appropriate extinguished agent.

6. Accidental release measures

A. Personal Precautions, protective equipment and emergency procedures

- 1) Personal Precautions, protective equipment : Respirator for organic gases other appropriate protective equipment / protection / protective gloves
- 2) Emergency procedures : Do not contact with the skin Do work with the personal protected devices such as respirator for organic gases other appropriate protective equipment / protection / protective gloves Spread water for reducing the suppression of generated steam Take an action if there is no risk

B. Environmental precautions

- 1) Atmosphere : Stay upwind and keep out of low areas. Spread water for reducing the suppression of generated steam
- 2) Soil : Use absorbent to collect the appropriate container. Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers.
- 3) Under water : Collect spilled material with mechanic devices Use absorbent to collect the appropriate container.

C. Methods and materials for containment and cleaning up

- 1) Small spill : Appropriate container for disposal of spilled material collected. Absorb for use sand or other non-combustible material.
- 2) Large spill : Notification to central government, local government. When emissions at least of the standard amount Keep unnecessary people away, isolate hazard area and deny entry.

7. Handling and storage

A. Precautions for safe handling : Use local ventilations and a full ventilation system when handling Close the container for minimizing the petroleum steam Ground for preventing the static discharge Keep or handle followed by Dangerous goods Safety Management Act

B. Conditions for safe storage, including any incompatibilities : Stored in an isolated place, Freezing note, Hot body care Do not contact to strong oxidizer or acid Keep proper temperature : 5~35°C Outdoor Storage is to avoid direct sunlight. Because of evaporation and contamination concerns, The vessel is fully enclosed and kept in ventilated indoor

8. Exposure controls/personal protection

A. Exposure Limits

- 1) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 - 1-1. ACGIH : NO DATA
 - 1-2. Biological exposure indices : NO DATA
- 2) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 - 2-1. ACGIH : NO DATA
 - 2-2. Biological exposure indices : NO DATA
- 3) n-Butyl acetate
 - 3-1. ACGIH : NO DATA
 - 3-2. Biological exposure indices : NO DATA
- 4) 3-Ethoxypropanoic acid ethyl ester
 - 4-1. ACGIH : NO DATA
 - 4-2. Biological exposure indices : NO DATA

- 5)Dimethyl carbonate
5-1.ACGIH : NO DATA
5-2.Biological exposure indices : NO DATA
- 6)2-Heptanone
6-1.ACGIH : NO DATA
6-2.Biological exposure indices : NO DATA
- 7)Solvent naphtha (petroleum), light arom.
7-1.ACGIH : NO DATA
7-2.Biological exposure indices : NO DATA
- 8)Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro
8-1.ACGIH : NO DATA
8-2.Biological exposure indices : NO DATA
- B.Engineering Controls : ▷ Spread water for reducing the suppression of generated steam ▷ Stay upwind and keep out of low areas.. ▷ NO DATA. ▷ NO DATA.
- C.Personal Protective Equipment
- 1)Respiratory protection : Respiratory protection is ranked in order from minimum to maximum Under conditions of frequent use or heavy exposure, respiratory protection may be needed Consider warning properties before use will be Use the personal protect respirator for organic solvent or higher level of capacity when workers are supposed to be exposed under unsuitable respiratory working condition, or longer period exposure than standard level. Wear respirator should be authorized by Korea Occupational Safety and Health Agency
 - 2)Eye protection : Let workers do wear the safety glasses in case hazard caused by mist may be expected. Cleansing Organization (saline) or install washing facilities and an emergency washing facilities in the place close to workplace. Use the protect respirator for organic solvent or higher level of capacity.
 - 3)Hand protection : Wear appropriate protective gloves Wear the chemical protection of gloves Do the workers wear the impermeable protective gloves made from rubber/PVC due to skin irritation may be supposed by chronicle/long period exposure.
 - 4)Skin protection : Wear appropriate protective clothing to prevent contamination. Wear appropriate chemical protective clothing. Work after wearing the impermeable protective apron made by rubber/PVC in case hazard caused by exposure or spill, if needed wear the impermeable whole body protective clothing.

9.Physical and chemical properties

- A.Appearance : transparent liquid
B.Odor : solvent odor
C.Odor threshold : NO DATA
D.PH : NO DATA
E.Melting point/Freezing point : NO DATA
F.Initial Boiling Point/Boiling Ranges : 127-210 °C
G.Flash point : 34.87
H.Evaporating Rate : NO DATA
I.Flammability(solid, gas) : NO DATA
J.Upper/Lower Flammability or explosive limits : NO DATA
K.Vapour pressure : NO DATA
L.Solubility : NO DATA
M.Vapour density : higher than air
N.Specific gravity : NO DATA
O.Partition coefficient of n-octanol/water : NO DATA
P.Autoignition temperature : 425
Q.Decomposition temperature : NO DATA
R.Viscosity : NO DATA
S.Molecular weight : NO DATA

10.Stability and reactivity

- A.Chemical stability : NO DATA

B.Possibility of hazardous reactions : Avoid contaminants and friction Do not contact with heat, spark, flame or other flammable sources

C.Conditions to avoid : Oxidation agent, metal and combustable materials

D.Hazardous decomposition products : Thermal decomposition products (carbon etc..)

11.Toxicological information

A.Information on the likely routes of exposure

- 1)Respiratory tracts : Adverse lung effects, Dyspnoea, Hypothermia, Vomitting
- 2)Oral : Vomitting, Diarrhea, Stomach pain, Irregular heartbeat
- 3)Skin : Irritation, Burn, Adverse nerve effects
- 4)Eye : Irritation, eye damage

B.Delayed and immediate effects and also chronic effects from short and long term exposure

1)Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene

1-1. Acute toxicity

- a. Oral : NO DATA
- b. Dermal : NO DATA
- c. Inhalation : NO DATA

1-2. Skin corrosion/irritation : NO DATA

1-3. Serious eye damage/irritation : NO DATA

1-4. Respiratory sensitization : NO DATA

1-5. Skin sensitization : NO DATA

1-6. Carcinogenicity

- 6-1. IARC : NO DATA
- 6-2. OSHA : NO DATA
- 6-3. ACGIH : NO DATA
- 6-4. NTP : NO DATA
- 6-5. EU CLP : NO DATA

1-7. Germ cell mutagenicity : NO DATA

1-8. Reproductive toxicity : NO DATA

1-9. STOT-single exposure : NO DATA

1-10. STOT-repeated exposure : NO DATA

1-11. Aspiration hazard : NO DATA

2)Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene

2-1. Acute toxicity

- a. Oral : NO DATA
- b. Dermal : NO DATA
- c. Inhalation : NO DATA

2-2. Skin corrosion/irritation : NO DATA

2-3. Serious eye damage/irritation : NO DATA

2-4. Respiratory sensitization : NO DATA

2-5. Skin sensitization : NO DATA

2-6. Carcinogenicity

- 6-1. IARC : NO DATA
- 6-2. OSHA : NO DATA
- 6-3. ACGIH : NO DATA
- 6-4. NTP : NO DATA
- 6-5. EU CLP : NO DATA

2-7. Germ cell mutagenicity : NO DATA

2-8. Reproductive toxicity : NO DATA

2-9. STOT-single exposure : NO DATA

2-10. STOT-repeated exposure : NO DATA

2-11. Aspiration hazard : NO DATA

3)n-Butyl acetate

- 3-1. Acute toxicity
 - a. Oral : LD50 = 14130 mg/kg Rat
 - b. Dermal : LD50 = 17600 mg/kg Rabbit
 - c. Inhalation : Steam LC50 = 2000 ppm Rat
- 3-2. Skin corrosion/irritation : Causes a weak stimulus person.
- 3-3. Serious eye damage/irritation : Non-irritating to rabbit eye irritation
- 3-4. Respiratory sensitization : NO DATA
- 3-5. Skin sensitization : Not a skin sensitizer
- 3-6. Carcinogenicity
 - 6-1. IARC : NO DATA
 - 6-2. OSHA : NO DATA
 - 6-3. ACGIH : NO DATA
 - 6-4. NTP : NO DATA
 - 6-5. EU CLP : NO DATA
- 3-7. Germ cell mutagenicity : NO DATA
- 3-8. Reproductive toxicity : Reported that there is no reproductive toxicity.
- 3-9. STOT-single exposure : Central nervous system disorders who, pulmonary edema, respiratory irritation.
- 3-10. STOT-repeated exposure : NO DATA
- 3-11. Aspiration hazard : NO DATA

4)3-Ethoxypropanoic acid ethyl ester

- 4-1. Acute toxicity
 - a. Oral : LD50 = 3200 mg/kg Rat
 - b. Dermal : LD50 = 10000 mg/kg rabbit
 - c. Inhalation : NO DATA
- 4-2. Skin corrosion/irritation : Causes weak stimulus in guinea pigs
- 4-3. Serious eye damage/irritation : Mild irritation in rabbits
- 4-4. Respiratory sensitization : NO DATA
- 4-5. Skin sensitization : Reported no skin sensitization guinea pig
- 4-6. Carcinogenicity
 - 6-1. IARC : NO DATA
 - 6-2. OSHA : NO DATA
 - 6-3. ACGIH : NO DATA
 - 6-4. NTP : NO DATA
 - 6-5. EU CLP : NO DATA
- 4-7. Germ cell mutagenicity : In vitro Ames microbialtest : Negative
- 4-8. Reproductive toxicity : NO DATA
- 4-9. STOT-single exposure : NO DATA
- 4-10. STOT-repeated exposure : NO DATA
- 4-11. Aspiration hazard : NO DATA

5)Dimethyl carbonate

- 5-1. Acute toxicity
 - a. Oral : LD50 = 13000 mg/kg Rat
 - b. Dermal : LD50 = 5000 mg/kg Rabbit
 - c. Inhalation : LC50 = 140 mg/ℓ 4 hr Rat
- 5-2. Skin corrosion/irritation : non-irritating(rabbit)
- 5-3. Serious eye damage/irritation : Mild irritant(rabbit)
- 5-4. Respiratory sensitization : NO DATA
- 5-5. Skin sensitization : NO DATA
- 5-6. Carcinogenicity
 - 6-1. IARC : NO DATA
 - 6-2. OSHA : NO DATA
 - 6-3. ACGIH : NO DATA
 - 6-4. NTP : NO DATA
 - 6-5. EU CLP : NO DATA
- 5-7. Germ cell mutagenicity : NO DATA

- 5-8. Reproductive toxicity : NO DATA
- 5-9. STOT-single exposure : NO DATA
- 5-10. STOT-repeated exposure : NO DATA
- 5-11. Aspiration hazard : NO DATA

6)2-Heptanone

- 6-1. Acute toxicity
 - a. Oral : LD50 = 1670 mg/kg Rat
 - b. Dermal : LD50 = 10300 mg/kg Rabbit
 - c. Inhalation : NO DATA
- 6-2. Skin corrosion/irritation : (using rabbit) skin Irritation test result - middle Irritation
- 6-3. Serious eye damage/irritation : Using the rabbit eye irritation test results - Mild irritant
- 6-4. Respiratory sensitization : NO DATA
- 6-5. Skin sensitization : NO DATA
- 6-6. Carcinogenicity
 - 6-1. IARC : NO DATA
 - 6-2. OSHA : NO DATA
 - 6-3. ACGIH : NO DATA
 - 6-4. NTP : NO DATA
 - 6-5. EU CLP : NO DATA
- 6-7. Germ cell mutagenicity : NO DATA
- 6-8. Reproductive toxicity : NO DATA
- 6-9. STOT-single exposure : NO DATA
- 6-10. STOT-repeated exposure : Repeated exposure tests using rats divided in two, check the reference range is not toxic.
- 6-11. Aspiration hazard : Ketones less than 13 carbon atoms

7)Solvent naphtha (petroleum), light arom.

- 7-1. Acute toxicity
 - a. Oral : LD50 = 8400 mg/kg Rat
 - b. Dermal : LD50 > 2000 mg/kg Rabbit
 - c. Inhalation : Mist LC50 = 3400 ppm 4 hr Rat
- 7-2. Skin corrosion/irritation : weakstimulus(rabbit)
- 7-3. Serious eye damage/irritation : Mild irritant(rabbit)
- 7-4. Respiratory sensitization : NO DATA
- 7-5. Skin sensitization : Non-sensitizer (Guinea pig)
- 7-6. Carcinogenicity
 - 6-1. IARC : NO DATA
 - 6-2. OSHA : NO DATA
 - 6-3. ACGIH : NO DATA
 - 6-4. NTP : NO DATA
 - 6-5. EU CLP : Carc. 1B
- 7-7. Germ cell mutagenicity : NO DATA
- 7-8. Reproductive toxicity : NO DATA
- 7-9. STOT-single exposure : NO DATA
- 7-10. STOT-repeated exposure : NO DATA
- 7-11. Aspiration hazard : Harmful aspiration concerns

8)Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro

- 8-1. Acute toxicity
 - a. Oral : NO DATA
 - b. Dermal : NO DATA
 - c. Inhalation : NO DATA
- 8-2. Skin corrosion/irritation : NO DATA
- 8-3. Serious eye damage/irritation : NO DATA
- 8-4. Respiratory sensitization : NO DATA
- 8-5. Skin sensitization : NO DATA
- 8-6. Carcinogenicity

- 6-1. IARC : NO DATA
- 6-2. OSHA : NO DATA
- 6-3. ACGIH : NO DATA
- 6-4. NTP : NO DATA
- 6-5. EU CLP : NO DATA
- 8-7. Germ cell mutagenicity : NO DATA
- 8-8. Reproductive toxicity : NO DATA
- 8-9. STOT-single exposure : NO DATA
- 8-10. STOT-repeated exposure : NO DATA
- 8-11. Aspiration hazard : NO DATA

12. Ecological information

A. Ecotoxicity

- 1) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 - 1-1. Fish : NO DATA
 - 1-2. Crustaceans : NO DATA
 - 1-3. Algae : NO DATA
- 2) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 - 2-1. Fish : NO DATA
 - 2-2. Crustaceans : NO DATA
 - 2-3. Algae : NO DATA
- 3) n-Butyl acetate
 - 3-1. Fish : LC50 = 62 mg/ℓ 96 hr
 - 3-2. Crustaceans : LC50 = 32 mg/ℓ 48 hr
 - 3-3. Algae : NO DATA
- 4) 3-Ethoxypropanoic acid ethyl ester
 - 4-1. Fish : LC50 = 88 mg/ℓ 96 hr Pimephales promelas
 - 4-2. Crustaceans : LC50 = 970 mg/ℓ 48 hr Daphnia magna
 - 4-3. Algae : NO DATA
- 5) Dimethyl carbonate
 - 5-1. Fish : NO DATA
 - 5-2. Crustaceans : NO DATA
 - 5-3. Algae : NO DATA
- 6) 2-Heptanone
 - 6-1. Fish : LC50 = 131 mg/ℓ 96 hr
 - 6-2. Crustaceans : NO DATA
 - 6-3. Algae : NO DATA
- 7) Solvent naphtha (petroleum), light arom.
 - 7-1. Fish : LC50 = 9.22 mg/ℓ 96 hr Oncorhynchus mykiss
 - 7-2. Crustaceans : EC50 = 6.14 mg/ℓ 48 hr Daphnia magna
 - 7-3. Algae : EC50 = 19 mg/ℓ 72 hr Selenastrum capricornutum
- 8) Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro
 - 8-1. Fish : NO DATA
 - 8-2. Crustaceans : NO DATA
 - 8-3. Algae : NO DATA

B. Persistence and degradability

- 1) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 - 1-1. Persistence : NO DATA
 - 1-2. Degradability : NO DATA

2) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene

2-1. Persistence : NO DATA

2-2. Degradability : NO DATA

3) n-Butyl acetate

3-1. Persistence : log Kow = 1.78

3-2. Degradability : NO DATA

4) 3-Ethoxypropanoic acid ethyl ester

4-1. Persistence : log Kow = 1.35

4-2. Degradability : BOD5/COD = 0.17

5) Dimethyl carbonate

5-1. Persistence : NO DATA

5-2. Degradability : NO DATA

6) 2-Heptanone

6-1. Persistence : NO DATA

6-2. Degradability : NO DATA

7) Solvent naphtha (petroleum), light arom.

7-1. Persistence : log Kow = 2.1 ~ 6 (Estimates)

7-2. Degradability : BOD5/COD = 0.43

8) Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro

8-1. Persistence : log Kow = 7.81 (Recalcitrant)

8-2. Degradability : NO DATA

C. Bioaccumulative potential

1) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene

1-1. Bioaccumulative potential : NO DATA

1-2. Biodegradation : NO DATA

2) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene

2-1. Bioaccumulative potential : NO DATA

2-2. Biodegradation : NO DATA

3) n-Butyl acetate

3-1. Bioaccumulative potential : NO DATA

3-2. Biodegradation : Biodegradability = 98 (%)

4) 3-Ethoxypropanoic acid ethyl ester

4-1. Bioaccumulative potential : BCF = 3

4-2. Biodegradation : Biodegradability = 43 (%) 28 day (GLP data)

5) Dimethyl carbonate

5-1. Bioaccumulative potential : NO DATA

5-2. Biodegradation : NO DATA

6) 2-Heptanone

6-1. Bioaccumulative potential : NO DATA

6-2. Biodegradation : NO DATA

7) Solvent naphtha (petroleum), light arom.

7-1. Bioaccumulative potential : NO DATA

7-2. Biodegradation : NO DATA

8) Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro

8-1. Bioaccumulative potential : NO DATA

8-2. Biodegradation : Biodegradability = 6 (%) 28 day (GLP, OECD TG 301B)

D. Mobility in soil

1) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-

- furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 ▷ NO DATA
- 2) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 ▷ NO DATA
- 3) n-Butyl acetate
 ▷ NO DATA
- 4) 3-Ethoxypropanoic acid ethyl ester
 ▷ NO DATA
- 5) Dimethyl carbonate
 ▷ NO DATA
- 6) 2-Heptanone
 ▷ NO DATA
- 7) Solvent naphtha (petroleum), light arom.
 ▷ NO DATA
- 8) Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro
 ▷ Koc = 262500 (Can be adsorbed in the soil)
- E. Other adverse effects
- 1) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 ▷ NO DATA
- 2) Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
 ▷ NO DATA
- 3) n-Butyl acetate
 ▷ NO DATA
- 4) 3-Ethoxypropanoic acid ethyl ester
 ▷ Shellfish - NOEC : 9.5 mg/ℓ /48hours
- 5) Dimethyl carbonate
 ▷ NO DATA
- 6) 2-Heptanone
 ▷ NO DATA
- 7) Solvent naphtha (petroleum), light arom.
 ▷ NO DATA
- 8) Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro
 ▷ NO DATA

13. Disposal considerations

- A. Disposal methods : Spilled material should keep in the airtight container, and consign according to Waste Material Management Act
- B. Special precautions for disposal : Discard it followed by appropriate regulations Prohibit the unauthorized disposal and incineration due to adversely affect natural ecosystems

14. Transport information

- A. UN number : 1263
- B. Proper shipping name : PAINT (including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid

- filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning or reducing compound)
- C.Hazard class : 3
- D.Packing group : III
- E.Marine pollutant : be applicable
- F.Special precautions for user related to transport or transportation measures
- 1)EmS FIRE SCHEDULE : F-E
- 2)EmS SPILLAGE SCHEDULE : S-E

15. Regulatory information

- 1)Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2-methyl-2-propenoic acid butyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
- 1-1. Information of EU Classification
- ▷ Classification : NO DATA
 - ▷ Risk Phrases : NO DATA
 - ▷ Safety Phrase : NO DATA
- 1-2. U.S. Federal regulations
- ▷ OSHA PROCESS SAFETY (29CFR1910.119) : NO DATA
 - ▷ CERCLA Section 103 (40CFR302.4) : NO DATA
 - ▷ EPCRA Section 302 (40CFR355.30) : NO DATA
 - ▷ EPCRA Section 304 (40CFR355.40) : NO DATA
 - ▷ EPCRA Section 313 (40CFR372.65) : NO DATA
- 1-3. Rotterdam Convention listed ingredients : NO DATA
- 1-4. Stockholm Convention listed ingredients : NO DATA
- 1-5. Montreal Protocol listed ingredients : NO DATA
- 2)Vinylbenzene polymer with 2-methyl-2-propenoic acid methyl ester, 2,5-furandione, 2-methyl-1,3-propanediol, neodecanoic acid 2,3-epoxypropyl ester, 2-hydroxyethyl methacrylate and 1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl)bisbenzene
- 2-1. Information of EU Classification
- ▷ Classification : NO DATA
 - ▷ Risk Phrases : NO DATA
 - ▷ Safety Phrase : NO DATA
- 2-2. U.S. Federal regulations
- ▷ OSHA PROCESS SAFETY (29CFR1910.119) : NO DATA
 - ▷ CERCLA Section 103 (40CFR302.4) : NO DATA
 - ▷ EPCRA Section 302 (40CFR355.30) : NO DATA
 - ▷ EPCRA Section 304 (40CFR355.40) : NO DATA
 - ▷ EPCRA Section 313 (40CFR372.65) : NO DATA
- 2-3. Rotterdam Convention listed ingredients : NO DATA
- 2-4. Stockholm Convention listed ingredients : NO DATA
- 2-5. Montreal Protocol listed ingredients : NO DATA
- 3)n-Butyl acetate
- 3-1. Information of EU Classification
- ▷ Classification : R10R66R67
 - ▷ Risk Phrases : R: 10-66-67
 - ▷ Safety Phrase : S: (2-)-25
- 3-2. U.S. Federal regulations
- ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
 - ▷ CERCLA Section 103 (40CFR302.4) : 2267.995 kg 5000 lb
 - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
 - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
 - ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
- 3-3. Rotterdam Convention listed ingredients : NO DATA

- 3-4. Stockholm Convention listed ingredients : NO DATA
- 3-5. Montreal Protocol listed ingredients : NO DATA
- 4)3-Ethoxypropanoic acid ethyl ester
 - 4-1. Information of EU Classification
 - ▷ Classification : NO DATA
 - ▷ Risk Phrases : NO DATA
 - ▷ Safety Phrase : NO DATA
 - 4-2. U.S. Federal regulations
 - ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
 - ▷ CERCLA Section 103 (40CFR302.4) : notapplicable
 - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
 - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
 - ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
 - 4-3. Rotterdam Convention listed ingredients : NO DATA
 - 4-4. Stockholm Convention listed ingredients : NO DATA
 - 4-5. Montreal Protocol listed ingredients : NO DATA
- 5)Dimethyl carbonate
 - 5-1. Information of EU Classification
 - ▷ Classification : F; R11
 - ▷ Risk Phrases : R: 11
 - ▷ Safety Phrase : S: (2-)9-16
 - 5-2. U.S. Federal regulations
 - ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
 - ▷ CERCLA Section 103 (40CFR302.4) : notapplicable
 - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
 - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
 - ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
 - 5-3. Rotterdam Convention listed ingredients : NO DATA
 - 5-4. Stockholm Convention listed ingredients : NO DATA
 - 5-5. Montreal Protocol listed ingredients : NO DATA
- 6)2-Heptanone
 - 6-1. Information of EU Classification
 - ▷ Classification : R10Xn; R20/22
 - ▷ Risk Phrases : R: 10-20/22
 - ▷ Safety Phrase : S: (2-)24/25
 - 6-2. U.S. Federal regulations
 - ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
 - ▷ CERCLA Section 103 (40CFR302.4) : notapplicable
 - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
 - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
 - ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
 - 6-3. Rotterdam Convention listed ingredients : NO DATA
 - 6-4. Stockholm Convention listed ingredients : NO DATA
 - 6-5. Montreal Protocol listed ingredients : NO DATA
- 7)Solvent naphtha (petroleum), light arom.
 - 7-1. Information of EU Classification
 - ▷ Classification : Carc. Cat. 2; R45Muta. Cat. 2; R46Xn; R65
 - ▷ Risk Phrases : R: 45-46-65
 - ▷ Safety Phrase : S: 53-45
 - 7-2. U.S. Federal regulations
 - ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
 - ▷ CERCLA Section 103 (40CFR302.4) : notapplicable
 - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
 - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
 - ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
 - 7-3. Rotterdam Convention listed ingredients : NO DATA

- 7-4. Stockholm Convention listed ingredients : NO DATA
7-5. Montreal Protocol listed ingredients : NO DATA
- 8) Mixture of branched and linear alkyl(C=7-9) ester of [3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]pro
- 8-1. Information of EU Classification
- ▷ Classification : N; R51-53
 - ▷ Risk Phrases : R: 51/53
 - ▷ Safety Phrase : R: 51/53S: 61
- 8-2. U.S. Federal regulations
- ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
 - ▷ CERCLA Section 103 (40CFR302.4) : notapplicable
 - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
 - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
 - ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
- 8-3. Rotterdam Convention listed ingredients : NO DATA
8-4. Stockholm Convention listed ingredients : NO DATA
8-5. Montreal Protocol listed ingredients : NO DATA

16. Other information

- A. Reference : Occupational Health and Safety Act
Korea Industrial Safety Corporation Preparation of Material Safety Data Sheet
KOSHA CODE W-05-2007 【The guideline for MSDS , 2012.】
- B. Issue date : 2015-05-11 오전 11:08:58
- C. Revision number and Last date revised : 2.(2015-05-14 오후 3:32:25)
- D. Other : " WWW.NOR00.CO.KR"