

## 1. Identification

- A. Product name : BU-5500
- B. Recommended Use and Restriction on Use
- General use : automotive refinsh
  - Restriction on use : Restricted to use other than recommended use
- C. Manufacturer / Supplier / distributor information
- Company name : NOROO Paint & Coatings Co., Ltd.
  - Address : 351, Bakdal-ro, Manan-gu, Anyang-si, Gyeonggi-do, Korea
  - Emergency telephone number : +82-31-467-6114

## 2. Hazard identification

- A. GHS Classification
- Flammable liquids Category 3
  - Acute toxicity (inhalation: gas) Category 4
  - Carcinogenicity Category 2
  - Germ cell mutagenicity Category 1B
  - Chronic aquatic toxicity Category 3
  - Serious eye damage/irritation Category 2A
  - Specific target organ toxicity(Single exposure) Category 2
  - Specific target organ toxicity(Single exposure) Category 3
  - Specific target organ toxicity(Repeated exposure) Category 1
  - Skin corrosion/irritation Category 2
  - Aspiration hazard Category 1
  - Ozone layer hazard

- B. GHS label elements
- Hazard symbols



- Signal words : DANGER
- Hazard statements :
  - H226 Flammable liquid and vapour
  - H332 Harmful if inhaled
  - H351 Suspected of causing cancer
  - H340 May cause genetic defects
  - H412 Harmful to aquatic life with long lasting effects
  - H319 Causes serious eye irritation
  - H371 Causes damage to the immune system and kidneys in the body. (Refer Section SDS 11)
  - H335+H336 May cause respiratory irritation, May cause drowsiness and dizziness.
  - H372 Prolonged or repeated exposure may cause lung damage to the body (Refer Section SDS 11)
  - H315 Causes skin irritation
  - H304 May be fatal if swallowed and enters airways
  - H420 It destroys the upper layer of the ozone layer and is harmful to public health and environment.
- Precautionary statements
  - Prevention
    - P210 Keep away from heat/sparks/open flames/hot surfaces. ? No smoking.
    - P242 Use only non-sparking tools. Flammable liquids (chapter 2.6) 1, 2, 3
    - P261 Do not breathe dust/fume/gas/mist/vapours/spray.
    - P271 Use only outdoors or in a well-ventilated area.
    - P270 Do not eat, drink or smoke when using this product.
    - P233 Keep container tightly closed.
    - P240 Ground/bond container and receiving equipment.
    - P201 Obtain special instructions before use.
    - P202 Do not handle until all safety precautions have been read and understood.
    - P281 Use personal protective equipment as required.
    - P241 Use explosion-proof electrical/ventilating/lighting/equipment.
    - P273 Avoid release to the environment.
    - P243 Take precautionary measures against static discharge.
    - P280 Wear protective gloves/protective clothing/eye protection/face protection.
    - P264 Wash hands thoroughly after handling.
    - P260 Do not breathe dust/fume/gas/mist/vapours/spray.
    - P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
  - Response
    - P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
    - P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
    - P312 Call a POISON CENTER or doctor/physician if you feel unwell.
    - P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).
    - P308+P313 If exposed or concerned: Get medical advice/attention.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P337+P313 If eye irritation persists: Get medical advice/attention.  
P309+P311 If exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.  
P314 Get medical advice/attention if you feel unwell.  
P302+P352 IF ON SKIN: Wash with plenty of soap and water.  
P321 Specific treatment  
P332+P313 If skin irritation occurs: Get medical advice/attention.  
P362 Take off contaminated clothing and wash before reuse.  
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
P331 Do NOT induce vomiting.

- Storage

P403+P235 Store in a well-ventilated place. Keep cool.  
P405 Store locked up.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

- Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulation  
P502 Please refer to the information provided by the manufacturer / supplier on recycling and recycling examples.

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

Chemical Name	NFPA grade	Health	Flammability	Reactivity
S1(Trade secrets)		NO DATA	NO DATA	NO DATA
Propylene glycol methyl ether acetate		1	2	0
Xylene		NO DATA	NO DATA	NO DATA
S2(Trade secrets)		NO DATA	NO DATA	NO DATA
Dimethyl carbonate		1	3	1
Trade secret		NO DATA	NO DATA	NO DATA
S3(Trade secrets)		NO DATA	NO DATA	NO DATA
n-Butyl acetate		2	3	0
Solvent naphtha (petroleum), light arom.		1	2	0
S4(Trade secrets)		NO DATA	NO DATA	NO DATA
Toluene		2	3	0
Copper, phthalocyanine		1	1	0
Ethylbenzene		2	3	0

### 3. Composition/information on ingredients

Chemical Name	Trade names and Synonyms	CAS-NO	Content(%)
S1(Trade secrets)	-	-	17~27
Propylene glycol methyl ether acetate	Propylene glycol methyl ether acetate	108-65-6	14~24
Xylene	Xylene	1330-20-7	10~20
S2(Trade secrets)	-	-	11~21
Dimethyl carbonate	Dimethyl carbonate	616-38-6	2~12
Trade secret	-	-	3~13
S3(Trade secrets)	-	-	4~14
n-Butyl acetate	n-Butyl acetate	123-86-4	2~12
Solvent naphtha (petroleum), light arom.	Solvent naphtha (petroleum), light arom.	64742-95-6	1~10
S4(Trade secrets)	-	-	1~10
Toluene	Toluene	108-88-3	1~10
Copper, phthalocyanine	Copper, phthalocyanine	147-14-8	1~10
Ethylbenzene	Ethylbenzene	100-41-4	0.1~4

### 4. First-aid measures

A. Eye Contact : Do not rub your eyes. If you wear a contact lenses, remove them first. If irritation, pain, swelling, tears or glaring happens, take medical assistant immediately Flush exposed eyes with plenty of water for more than 15minutes.

B. Skin Contact : Wear gloves while washing the patient and avoid contact with exposed clothes. Wash carefully after handling. If symptoms like redness or irritation occurs, take medical assistant immediately. Wash off with soap and water for more than 15 minutes. And take medical assistant immediately. If symptoms like irritation or pain occurs, take medical assistant immediately. Remove exposed clothing, and wash off exposed area with soap and water.

C. Inhalation : Take a medical assistant immediately. Remove contaminated clothing and shoes, and isolate it. If hard to breathe, administering oxygen Perform the artificial respiration, using the pocket mask with one way valves or other respiratory medical devices. If inhaled or swallowed, do not perform the inhalation phase of breathing If not breathing, perform the artificial respiration. Avoid from exposure, and move into an area with fresh air.

D. Ingestion Contact : Flush mouth with water immediately. It is need to be considered that early removal of some ingested material by gastric lavage must be weighed against potential complications of bleeding or perforation Take proper medical assistant by symptoms. If ingested large quantity, take medical assistant. Do not try to induce vomiting, if occurs, keep head below hips to prevent swallow into lungs. Inducing vomit.

E. Notes to Physician : There is no specific antidote and take an appropriate medical treatment.

### 5. Fire-fighting measures

A. Suitable (Unsuitable) extinguishing media

- Suitable extinguishing media : Powder extinguishing agent, gaseous Extinguishing Agent, and regular foam.
- (Unsuitable) extinguishing media : Avoid extinguishing fire with halogenating agent. Avoid use waterjet as fire extinguishing agent. Water is not appropriate extinguishing agent
- Case of big fire : Use appropriate protective device depend on the situation. Stay away more than 800m to avoid tank explosion. Spread large amount of the extinguishing agent as a mist form with staying against wind.

B. Specific hazards arising from the chemical

- Pyrolysate : Irritating and highly toxic gases may produced during the combustion by pyrolysis or combustion itself. Carbon dioxide, toxic carbon compounds/Nitrogen compounds/sulfur compounds
- Fire and Explosion danger : Vapor may be released to the ignition source and ignited. Aqueous (Exclude water-soluble one) products does not have risk of fire or explosion hazard by itself. Vapors may explode indoors, outdoors, and in drains Leakages may fire / explosion hazard and could be easily ignited by heat, sparks or flames. Container may explode when heating May form explosive mixture at or above ignition point Risk of medium-sized fire.

C. Special protective actions for fire-fighters

- Personal Precautions, protective equipment : Gas mask or air respirator, heat resistant clothing, heat resistant helmet, heat resistant gloves, heat resistant boots
- Emergency procedures : Do not approach if the tank is on fire. Avoid inhalation of the substance or combustion products. Use an unmanned fire extinguishing device, in case of large-sized fire. If not, leave it to burn. Tell the fire department, location of the fire and the hazardous features. Protect others from access and prohibit access to dangerous areas. Block the area except for the fire-suppression personnel. Cooling containers with water long time after extinguish fire. If there is no risk, moving containers away from fire. Use appropriate extinguishing agents to catch fire.

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## 6. Accidental release measures

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A. Personal Precautions, protective equipment and emergency procedures

- Personal Precautions, protective equipment : Gas mask for organic gases, other appropriate protective device / clothing / gloves.
- Emergency procedures : Do not contact on the bare skin Do work with the personal protected devices such as gas mask for organic gases other appropriate protective devices / clothing / gloves. Spray water to reduce amount of steam. Take an action to block the leakage if there is no risk.

B. Environmental precautions

- Atmosphere : Using local ventilation to Minimize the exposure to worker. Do install the local ventilations and full ventilation system
- 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.
- Under water : Collect spilled material with mechanic devices Use absorbent to collect the appropriate container.

C. Methods and materials for containment and cleaning up

- Small spill : Move to appropriate container for disposal of spilled material collected. Absorb for use sand or other non-combustible material.
- Large spill : Notify to central and local government, when emissions are above regulation. Prohibit access of unnecessary people, isolate hazard area to secure.

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## 7. Handling and storage

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A. Precautions for safe handling : Storing with combustible substances such as stained clothes or paper may cause fire by spontaneous ignition. Thus do not stack it, and keep it in a non-flammable container with cap filled with water and dispose it. Do not take contaminated clothings away from the work area. Avoid contact with heat, sparks, flames or other sources of ignition. Do not inhale vapor for long-term or repeatedly. Do not handle until read and understood all safety precautions. Avoid contact with prohibited materials in mixture. Wash carefully after handling. Use local ventilations and a full ventilation system when handling Seal 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 : Storage temperature: 25 ~ 35 °C Storage temperature: 15 ~ 25 °C Storage temperature: 5 ~ 15 °C Store away from waterworks and sewers. Collect in an airtight container to dispose. Prevent static electricity and do not store near heat sources. Store in original container only. Store in accordance with all current law and regulations. Check periodically for leaks Store in a cool, dry, well-ventilated area. Stored in an isolated place, freezing caution, high temperature body caution. Avoid strong oxidizing agents, acid. Storage temperature: 5 ~ 35 °C Avoid direct sunlight while storing outdoor. Because of evaporation and contamination concerns, airtight the container and store in a well-ventilated building.

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## 8. Exposure controls/personal protection

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A. Exposure Limits

- S1 (Trade secrets)
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- Propylene glycol methyl ether acetate
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- Xylene
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- S2 (Trade secrets)
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- Dimethyl carbonate

- ACGIH : NO DATA
- Biological exposure indices : NO DATA
- Trade secret
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- S3 (Trade secrets)
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- n-Butyl acetate
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- Solvent naphtha (petroleum), light arom.
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- S4 (Trade secrets)
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- Toluene
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- Copper, phthalocyanine
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA
- Ethylbenzene
  - ACGIH : NO DATA
  - Biological exposure indices : NO DATA

B. Engineering Controls :

- ▷ Do install the local ventilations and full ventilation system
- ▷ Using local ventilation to Minimize the exposure to worker .
- ▷ NO DATA
- ▷ NO DATA

C. Personal Protective Equipment

- Respiratory protection : Respiratory protection is ranked in order from minimum to maximum Respiratory protection may be needed, while frequent use or heavy exposure. Consider warning properties before use. If there is possibility of direct contact or exposure to these substances should wear a authorized dust-proof mask or respirator for organic compounds 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. Respirators should be authorized by Korea Occupational Safety and Health Agency
- Eye protection : If there is possibility of direct contact or exposure to these substances should wear authorized safty glasses or mask. Let workers do wear the safety glasses in case hazard caused by mist may be expected. Install washing facilities and an emergency washing facilities close to workplace. Use the respirator for organic solvent or higher level.
- Hand protection : Wear appropriate protective gloves If there is possibility of direct contact or exposure to these substances should wear authorized safety gloves for chemicals. Wear the chemical protective gloves Do the workers wear the impermeable protective gloves made from rubber/PVC due to skin irritation may be supposed by chronicle and long period exposure.
- Skin protection : Wear cleanroom garment or appropriate protective clothing to prevent contamination If there is a possibility of direct contact or exposure to the substance Wear protective clothing for chemical substances Wear appropriate chemical protective clothing. Work after wearing the impermeable protective apron made by rubber/PVC in case hazard caused by exposure or spill, wear the impermeable whole body protective clothing if needed.

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## 9. Physical and chemical properties

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- A. Appearance : liquid
- B. Odor : solvent odor
- C. Odor threshold : NO DATA
- D. PH : NO DATA
- E. Melting point/Freezing point(°C) : NO DATA
- F. Initial Boiling Point/Boiling Ranges(°C) : 80.8~172.8
- G. Flash point(°C) : 33.5
- H. Evaporating Rate : NO DATA
- I. Flammability(solid, gas)(°C) : NON Flammable
- 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 : 0.9~1.1
- O. Partition coefficient of n-octanol/water : NO DATA

- P. Autoignition temperature(°C) : 354  
Q. Decomposition temperature(°C) : NO DATA  
R. Viscosity : 67~73ku  
S. Molecular weight : NO DATA

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## 10. Stability and reactivity

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- 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..)

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## 11. Toxicological information

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- A. Information on the likely routes of exposure  
 Respiratory tracts : Adverse lung effects, Dyspnoea, Hypothermia, Vomitting  
 Oral : Vomitting, Diarrhea, Stomach pain, Irregular heartbeat  
 Skin : Irritation, Burn, Adverse nerve effects  
 Eye : Irritation, eye damage
- B. Delayed and immediate effects and also chronic effects from short and long term exposure  
 S1 (Trade secrets)  
- Acute toxicity  
  Oral : NO DATA  
  Dermal : NO DATA  
  Inhalation : NO DATA  
- Skin corrosion/irritation : NO DATA  
- Serious eye damage/irritation : NO DATA  
- Respiratory sensitization : NO DATA  
- Skin sensitization : NO DATA  
- Carcinogenicity  
  IARC : NO DATA  
  OSHA : NO DATA  
  ACGIH : NO DATA  
  NTP : NO DATA  
  EU CLP : NO DATA  
- Germ cell mutagenicity : NO DATA  
- Reproductive toxicity : NO DATA  
- STOT-single exposure : NO DATA  
- STOT-repeated exposure : NO DATA  
- Aspiration hazard : NO DATA  
 Propylene glycol methyl ether acetate  
- Acute toxicity  
  Oral : LD50 = 8532 mg/kg Rat  
  Dermal : LD50 > 5000 mg/kg Rabbit  
  Inhalation : LD50 > 5000 mg/kg Rabbit  
- Skin corrosion/irritation : rabbit: non-Irritation  
- Serious eye damage/irritation : Rabbit: mild irritant  
- Respiratory sensitization : NO DATA  
- Skin sensitization : Guinea pig / maximization test (GLP): No sensitization  
- Carcinogenicity  
  IARC : NO DATA  
  OSHA : NO DATA  
  ACGIH : NO DATA  
  NTP : NO DATA  
  EU CLP : NO DATA  
- Germ cell mutagenicity : In vitro - Salmonella typhimurium/TA98, TA100, TA1535, TA1537 (ames test, GLP): With and without metabolic activation system- Negative, CHL Cells/Chromosomal abnormalitiestest (GLP):With and without metabolic activation system- Negative, rat Hepatocyte/UDStest (GLP)  
- Reproductive toxicity : In vitro - Salmonella typhimurium/TA98, TA100, TA1535, TA1537 (Return mutation test, GLP): Negative (negative), CHL Cells / Chromosome aberration test (GLP): Negative (negative), rat hepatocyte / UDS test (GLP) : Negative in the absence of metabolic activation system  
- STOT-single exposure : Reported liver effects in humans. Rat Causes affect the spleen. In mice causes an effect on the central nervous system, and lung. That the anesthetic effect on the animal. Irritating to the prayers of people. (ACGIH, etc.)  
- STOT-repeated exposure : Reported affect the kidneys, liver, central nervous system in humans. (PATTY 5th)  
- Aspiration hazard : NO DATA  
 Xylene  
- Acute toxicity  
  Oral : LD50=3550 mg/kg rat  
  Dermal : LD50 4350 mg/kg Rabbit  
  Inhalation : LD50 4350 mg/kg Rabbit  
- Skin corrosion/irritation : Skin irritation test in rabbits Causes moderate irritation.  
- Serious eye damage/irritation : Skin irritation test in rabbits Causes moderate irritation.  
- Respiratory sensitization : NO DATA  
- Skin sensitization : NO DATA  
- Carcinogenicity

- IARC : Group 3
- OSHA : NO DATA
- ACGIH : A4
- NTP : NO DATA
- EU CLP : NO DATA
- Germ cell mutagenicity : If three people a voice dynamics, somatic cell mutagenicity tests in vivo (micronucleus test, chromosome test) Voice
- Reproductive toxicity : If three people a voice dynamics, somatic cell mutagenicity tests in vivo (micronucleus test, chromosome test) Voice
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : In the liquid can cause chemical pneumonia if swallowed.
- S2 (Trade secrets)
  - Acute toxicity
    - Oral : NO DATA
    - Dermal : NO DATA
    - Inhalation : NO DATA
  - Skin corrosion/irritation : NO DATA
  - Serious eye damage/irritation : NO DATA
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    - IARC : NO DATA
    - OSHA : NO DATA
    - ACGIH : NO DATA
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- Dimethyl carbonate
  - Acute toxicity
    - Oral : LD50 = 13000 mg/kg Rat
    - Dermal : LD50 = 5000 mg/kg Rabbit
    - Inhalation : LD50 = 5000 mg/kg Rabbit
  - Skin corrosion/irritation : non-irritating(rabbit)
  - Serious eye damage/irritation : Mild irritant(rabbit)
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    - IARC : NO DATA
    - OSHA : NO DATA
    - ACGIH : NO DATA
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- Trade secret
  - Acute toxicity
    - Oral : NO DATA
    - Dermal : NO DATA
    - Inhalation : NO DATA
  - Skin corrosion/irritation : NO DATA
  - Serious eye damage/irritation : NO DATA
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    - IARC : NO DATA
    - OSHA : NO DATA
    - ACGIH : NO DATA
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- S3 (Trade secrets)
  - Acute toxicity
    - Oral : NO DATA
    - Dermal : NO DATA
    - Inhalation : NO DATA
  - Skin corrosion/irritation : NO DATA
  - Serious eye damage/irritation : NO DATA
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity

- IARC : NO DATA
- OSHA : NO DATA
- ACGIH : NO DATA
- NTP : NO DATA
- EU CLP : NO DATA
- Germ cell mutagenicity : NO DATA
- Reproductive toxicity : NO DATA
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : NO DATA
- n-Butyl acetate
  - Acute toxicity
    - Oral : LD50 = 14130 mg/kg Rat
    - Dermal : LD50 = 17600 mg/kg Rabbit
    - Inhalation : LD50 = 17600 mg/kg Rabbit
  - Skin corrosion/irritation : Causes a weak stimulus person.
  - Serious eye damage/irritation : Non-irritating to rabbit eye irritation
  - Respiratory sensitization : NO DATA
  - Skin sensitization : Not a skin sensitizer
  - Carcinogenicity
    - IARC : NO DATA
    - OSHA : NO DATA
    - ACGIH : NO DATA
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : Central nervous system disorders who. pulmonary edema, respiratory irritation.
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- Solvent naphtha (petroleum), light arom.
  - Acute toxicity
    - Oral : LD50 = 8400 mg/kg Rat
    - Dermal : LD50 > 2000 mg/kg Rabbit
    - Inhalation : LD50 > 2000 mg/kg Rabbit
  - Skin corrosion/irritation : weakstimulus(rabbit)
  - Serious eye damage/irritation : Mild irritant(rabbit)
  - Respiratory sensitization : NO DATA
  - Skin sensitization : Non-sensitizer (Guinea pig)
  - Carcinogenicity
    - IARC : NO DATA
    - OSHA : NO DATA
    - ACGIH : NO DATA
    - NTP : NO DATA
    - EU CLP : Carc. 1B
  - Germ cell mutagenicity : EU CLP: 1B (case containing less than 0.1% of the benzene in a weight ratio of the material not applied to the present classification)
  - Reproductive toxicity : EU CLP: 1B (case containing less than 0.1% of the benzene in a weight ratio of the material not applied to the present classification)
  - STOT-single exposure : Affecting the central nervous system. Inhalation of high concentrations vapors may cause loss of consciousness.
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : Harmful aspiration concerns
- S4 (Trade secrets)
  - Acute toxicity
    - Oral : NO DATA
    - Dermal : NO DATA
    - Inhalation : NO DATA
  - Skin corrosion/irritation : NO DATA
  - Serious eye damage/irritation : NO DATA
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    - IARC : NO DATA
    - OSHA : NO DATA
    - ACGIH : NO DATA
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- Toluene
  - Acute toxicity
    - Oral : rat LD50=2600 mg/kg
    - Dermal : rabbit LD50=12,000 mg/kg
    - Inhalation : rabbit LD50=12,000 mg/kg
  - Skin corrosion/irritation : Rabbit skin irritation test using the results of the Causes moderate irritation.
  - Serious eye damage/irritation : Eyes irritant test using a rabbit raised for 6 days reversible irritation.
  - Respiratory sensitization : NO DATA

- Skin sensitization : Tests with negative results Guinea
- Carcinogenicity
  - IARC : Group 3
  - OSHA : NO DATA
  - ACGIH : A4
  - NTP : NO DATA
  - EU CLP : NO DATA
- Germ cell mutagenicity : Dominant lethal test negative, positive micronucleus test, chromosome aberration test positive
- Reproductive toxicity : Dominant lethal test negative, positive micronucleus test, chromosome aberration test positive
- STOT-single exposure : Causes acts on the central nervous system in humans, fatigue, drowsiness, dizziness, respiratory irritation, agitation, vomiting, central nervous system depression, confusion, gait abnormalities. Eyes, nose, causing irritation of the throat. In experimental animals
- STOT-repeated exposure : Headaches accompanied by people from hearing loss or visual field constriction, or nystagmus, tremor, ataxia, loss of memory, such as chronic central nervous system disorder that appears. Noewichuk is observed. It appears kidney dysfunction such as hematuria or pro
- Aspiration hazard : NO DATA
- Copper, phthalocyanine
  - Acute toxicity
    - Oral : LD50 > 6400 mg/kg Rat
    - Dermal : NO DATA
    - Inhalation : NO DATA
  - Skin corrosion/irritation : non-stimulus
  - Serious eye damage/irritation : No stimulation
  - Respiratory sensitization : NO DATA
  - Skin sensitization : Patch test results for the people no hypersensitivity reactions
  - Carcinogenicity
    - IARC : NO DATA
    - OSHA : NO DATA
    - ACGIH : NO DATA
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : ames test: Negative, Salmonella breeding, strains: TA98, TA100, TA102, TA97, Chromosomal abnormalitiestest: Negative trials species: Chinese hamster
  - Reproductive toxicity : Reverse mutation test: negative, salmonella breeding, strains: TA98, TA100, TA102, TA97, chromosome aberration test: negative test Species: Chinese hamster
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : Rat: 28days NOAEL 200mg/kg/day, Weight of lung, spleen, adrenal glands, Chimuseku increase in male 1000mg / kg
  - Aspiration hazard : NO DATA
- Ethylbenzene
  - Acute toxicity
    - Oral : LD50 = 3500 mg/kg Rat
    - Dermal : LD50 = 15400 mg/kg Rabbit
    - Inhalation : Steam LC50 = 4000 ppm 4 hr Rat (Equivalents : 17.4 mg/L)
  - Skin corrosion/irritation : skin Irritation test result weak Irritation
  - Serious eye damage/irritation : Rabbit eye irritation test results in a slight conjunctival irritation, recoverable damage.
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    - IARC : Group 2B
    - OSHA : NO DATA
    - ACGIH : A3
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : Micronucleustest Negative (7)
  - Reproductive toxicity : Micronucleustest Negative (7)
  - STOT-single exposure : It causes central nervous system effects in laboratory animals and airway irritation.
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : Hydrocarbons. Swallowing the liquid by aspiration may cause chemical pneumonia. Ties seongryul 0.74 mm2 / s (25 °C)

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## 12. Ecological information

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### A. Ecotoxicity

- S1 (Trade secrets)
  - Fish : NO DATA
  - Crustaceans : NO DATA
  - Algae : NO DATA
- Propylene glycol methyl ether acetate
  - Fish : LC50 ≥ 100 mg/ℓ 96 hr Oryzias latipes
  - Crustaceans : EC50 = 373 mg/ℓ 48 hr Daphnia magna
  - Algae : EC50 ≥ 1000 mg/ℓ 72 hr Selenastrum capricornutum
- Xylene
  - Fish : NO DATA
  - Crustaceans : NO DATA
  - Algae : NO DATA
- S2 (Trade secrets)
  - Fish : NO DATA
  - Crustaceans : NO DATA



- Algae : NO DATA
  - Dimethyl carbonate
    - Fish : NO DATA
    - Crustaceans : NO DATA
    - Algae : NO DATA
  - Trade secret
    - Fish : NO DATA
    - Crustaceans : NO DATA
    - Algae : NO DATA
  - S3 (Trade secrets)
    - Fish : NO DATA
    - Crustaceans : NO DATA
    - Algae : NO DATA
  - n-Butyl acetate
    - Fish : LC50 = 62 mg/ℓ 96 hr
    - Crustaceans : LC50 = 32 mg/ℓ 48 hr
    - Algae : NO DATA
  - Solvent naphtha (petroleum), light arom.
    - Fish : LC50 = 9.22 mg/ℓ 96 hr Oncorhynchus mykiss
    - Crustaceans : EC50 = 6.14 mg/ℓ 48 hr Daphnia magna
    - Algae : EC50 = 19 mg/ℓ 72 hr Selenastrum capricornutum
  - S4 (Trade secrets)
    - Fish : NO DATA
    - Crustaceans : NO DATA
    - Algae : NO DATA
  - Toluene
    - Fish : LC50 24 mg/ℓ 96 hr Oncorhynchus mykiss
    - Crustaceans : EC50 11.5 mg/ℓ 48 hr Daphnia magna
    - Algae : NO DATA
  - Copper, phthalocyanine
    - Fish : LC50 ≥ 100 mg/ℓ 48 hr
    - Crustaceans : NO DATA
    - Algae : NO DATA
  - Ethylbenzene
    - Fish : LC50 = 9.09 mg/ℓ 96 hr
    - Crustaceans : LC50 = 0.4 mg/ℓ 96 hr
    - Algae : NO DATA
- B. Persistence and degradability
- S1 (Trade secrets)
    - Persistence : NO DATA
    - Degradability : NO DATA
  - Propylene glycol methyl ether acetate
    - Persistence : log Kow = 0.43
    - Degradability : NO DATA
  - Xylene
    - Persistence : NO DATA
    - Degradability : NO DATA
  - S2 (Trade secrets)
    - Persistence : NO DATA
    - Degradability : NO DATA
  - Dimethyl carbonate
    - Persistence : NO DATA
    - Degradability : NO DATA
  - Trade secret
    - Persistence : NO DATA
    - Degradability : NO DATA
  - S3 (Trade secrets)
    - Persistence : NO DATA
    - Degradability : NO DATA
  - n-Butyl acetate
    - Persistence : log Kow = 1.78
    - Degradability : NO DATA
  - Solvent naphtha (petroleum), light arom.
    - Persistence : log Kow = 2.1 ~ 6 (Estimates)
    - Degradability : BOD5/COD = 0.43
  - S4 (Trade secrets)
    - Persistence : NO DATA
    - Degradability : NO DATA
  - Toluene
    - Persistence : log Kow 2.73
    - Degradability : NO DATA
  - Copper, phthalocyanine
    - Persistence : log Kow = 6.60 (Estimated)
    - Degradability : NO DATA
  - Ethylbenzene
    - Persistence : NO DATA
    - Degradability : NO DATA
- C. Bioaccumulative potential
- S1 (Trade secrets)
    - Bioaccumulative potential : NO DATA

- Biodegradation : NO DATA
  - Propylene glycol methyl ether acetate
    - Bioaccumulative potential : NO DATA
    - Biodegradation : Biodegradability > 60 (%) 28 day
  - Xylene
    - Bioaccumulative potential : NO DATA
    - Biodegradation : 39 (%)
  - S2 (Trade secrets)
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - Dimethyl carbonate
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - Trade secret
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - S3 (Trade secrets)
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - n-Butyl acetate
    - Bioaccumulative potential : NO DATA
    - Biodegradation : Biodegradability = 98 (%)
  - Solvent naphtha (petroleum), light arom.
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - S4 (Trade secrets)
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - Toluene
    - Bioaccumulative potential : NO DATA
    - Biodegradation : 86 (%) 20 day
  - Copper, phthalocyanine
    - Bioaccumulative potential : BCF = 0.33 ~ 11
    - Biodegradation : Biodegradability < 1 (%) 28 day
  - Ethylbenzene
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
- D. Mobility in soil
- S1 (Trade secrets)
    - ▷ NO DATA
  - Propylene glycol methyl ether acetate
    - ▷ NO DATA
  - Xylene
    - ▷ log Kow = 3.12 (measured) (ortho), 3.2 (measured) (meta), 3.15 (measurements) (p) (5)
  - S2 (Trade secrets)
    - ▷ NO DATA
  - Dimethyl carbonate
    - ▷ NO DATA
  - Trade secret
    - ▷ NO DATA
  - S3 (Trade secrets)
    - ▷ NO DATA
  - n-Butyl acetate
    - ▷ NO DATA
  - Solvent naphtha (petroleum), light arom.
    - ▷ NO DATA
  - S4 (Trade secrets)
    - ▷ NO DATA
  - Toluene
    - ▷ NO DATA
  - Copper, phthalocyanine
    - ▷ NO DATA
  - Ethylbenzene
    - ▷ log Kow = 3.15 (11)
- E. Other adverse effects
- S1 (Trade secrets)
    - ▷ NO DATA
  - Propylene glycol methyl ether acetate
    - ▷ NO DATA
  - Xylene
    - ▷ NO DATA
  - S2 (Trade secrets)
    - ▷ NO DATA
  - Dimethyl carbonate
    - ▷ NO DATA
  - Trade secret
    - ▷ NO DATA
  - S3 (Trade secrets)
    - ▷ NO DATA
  - n-Butyl acetate

- NO DATA
- Solvent naphtha (petroleum), light arom.
  - ▷ NO DATA
- S4 (Trade secrets)
  - ▷ NO DATA
- Toluene
  - ▷ NO DATA
- Copper, phthalocyanine
  - ▷ NO DATA
- Ethylbenzene
  - ▷ NO DATA

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### 13. Disposal considerations

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A. Disposal methods : To prevent environmental pollution, dispose it to a licensed waste disposal company. Recycle the recycleable materials, such as organic solvents, and then incinerate the residue at high temperature. Pre-treat with oil-water separation method when it is available. Disposal 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

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### 14. Transport information

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A. UN number : 1263

B. Proper shipping name : Paint (including paint, lacquer, enamel, colorants, shellac solutions, varnish, polish, liquid filler and liquid lacquer sealer) or related materials (including paint diluent and reductant).

C. Hazard class : 3

D. Packing group : III

E. Marine pollutant : N/A

F. Special precautions for user related to transport or transportation measures

- EmS FIRE SCHEDULE : F-E
  - EmS SPILLAGE SCHEDULE : S-E
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### 15. Regulatory information

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- S1 (Trade secrets)
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- Propylene glycol methyl ether acetate
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- Xylene
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - U.S. Federal regulations
    - ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
    - ▷ CERCLA Section 103 (40CFR302.4) : 45.3599 kg 100 lb
    - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
    - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
    - ▷ EPCRA Section 313 (40CFR372.65) : pertinent
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- S2 (Trade secrets)

- Information of EU Classification
  - ▷ Classification : NO DATA
  - ▷ Risk Phrases : NO DATA
  - ▷ Safety Phrase : NO DATA
- 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
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA
- Dimethyl carbonate
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- Trade secret
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- S3 (Trade secrets)
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- n-Butyl acetate
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- Solvent naphtha (petroleum), light arom.
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA

- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA
- S4 (Trade secrets)
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- Toluene
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - U.S. Federal regulations
    - ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
    - ▷ CERCLA Section 103 (40CFR302.4) : 453.599 kg 1000 lb
    - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
    - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
    - ▷ EPCRA Section 313 (40CFR372.65) : pertinent
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- Copper, phthalocyanine
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - 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
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- Ethylbenzene
  - Information of EU Classification
    - ▷ Classification : NO DATA
    - ▷ Risk Phrases : NO DATA
    - ▷ Safety Phrase : NO DATA
  - U.S. Federal regulations
    - ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
    - ▷ CERCLA Section 103 (40CFR302.4) : 453.599 kg 1000 lb
    - ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
    - ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
    - ▷ EPCRA Section 313 (40CFR372.65) : pertinent
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA

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## 16. Other information

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### A. Reference

This MSDS is based on 'Industrial safety and health' Act paragraph 41 and Proclamation of Ministry of Labor and Employment 2016-19, and considered domestic regulations.

This MSDS is based on KOSHA, NITE, ESIS, NLM, SIDS, IPCS, NCIS.

B. Issue date : 2010-06-10

C. Revision number and Last date revised : 4.(2019-09-06 오후 3:04:00)

D. Other : " [WWW.NOROO.CO.KR](http://WWW.NOROO.CO.KR) "