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**1. Identification**

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- A. Product name : 1K ACRYLIC LACQUER CLEAR LC-1000  
 Usage category : No Data
- B. Recommended Use and Restriction on Use  
 General use : automotive refinish  
 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
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**2. Hazard identification**

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- A. GHS Classification  
Acute toxicity (inhalation: vapor) Category 4  
Carcinogenicity Category 2  
Reproductive toxicity Category 2  
Serious eye damage/irritation Category 2A  
Specific target organ toxicity(Single exposure) Category 1  
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  
Aspiration hazard Category 2  
Ozone Layer Hazards

- B. GHS label elements  
 Hazard symbols



- Signal words : DANGER
- Hazard statements :
- H332 Harmful if inhaled
  - H351 Suspected of causing cancer
  - H361 Suspected of damaging fertility or the unborn child
  - H319 Causes serious eye irritation
  - H370 Causes damage to organs: central nervous system (CNS), gastrointestinal tract(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
  - H305 May be harmful 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
    - P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
    - P271 Use only outdoors or in a well-ventilated area.
    - P201 Obtain special instructions before use.
    - P202 Do not handle until all safety precautions have been read and understood.
    - P280 Wear protective gloves/protective clothing/eye protection/face protection.
    - P264 Wash hands and contact areas thoroughly after handling.
    - P260 Do not breathe dust/fume/gas/mist/vapours/spray.
    - P270 Do not eat, drink or smoke when using this product.
  - Response
    - 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.
    - 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 attention / attention.
    - P308+P311 If exposed or concerned: Get medical advice / attention.
    - P321 Specific treatment
    - P314 Get medical advice/attention if you feel unwell.
    - P302+P352 IF ON SKIN: Wash with plenty of soap and water.
    - P332+P313 If skin irritation occurs: Get medical advice/attention.
    - P362+P364 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  
P405 Store by locking.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed
- Disposal  
P501 Dispose of the contents and containers in accordance with waste-related laws.  
P502 Please refer to the information on (recycling/recycling) provided by (manufacturer/supplier).

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

Chemical Name	NFPA grade	Health	Flammability	Reactivity
Toluene		2	3	0
S1(Trade secrets)		NO DATA	NO DATA	NO DATA
2-Propanol		2	3	0
4-Methyl-2-pentanone		1	3	0
Xylene		NO DATA	NO DATA	NO DATA
Oxybispropanol dibenzoate		0	1	0
n-Butyl acetate		2	3	0
Cellulose acetate butylate		1	1	0
2-Butoxyethanol		3	2	0
Ethylbenzene		2	3	0
Methyl Ethyl Ketone		1	3	0

### 3. Composition/information on ingredients

Chemical Name	Trade names and Synonyms	CAS-NO	Content (%)
Toluene	Toluene	108-88-3	32~42
S1(Trade secrets)	-	-	22~32
2-Propanol	2-Propanol	67-63-0	7~17
4-Methyl-2-pentanone	4-Methyl-2-pentanone	108-10-1	6~16
Xylene	Xylene	1330-20-7	3~13
Oxybispropanol dibenzoate	Oxybispropanol dibenzoate	27138-31-4	1~10
n-Butyl acetate	n-Butyl acetate	123-86-4	1~10
2-Butoxyethanol	2-Butoxyethanol	111-76-2	1~10
Cellulose acetate butylate	Cellulose acetate butylate	9004-36-8	1~10
Ethylbenzene	Ethylbenzene	100-41-4	1~10
Methyl Ethyl Ketone	Methyl Ethyl Ketone	78-93-3	1~10

### 4. First-aid measures

- A. Eye Contact : If you wear a contact lenses, remove them first. Do not rub your eyes. 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. If unconscious, do not induce vomiting. In case of vomiting, keep head down under hip to prevent lung inhalation. 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 halogenting 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 : 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 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. 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 : 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. Storage temperature: 25 ~ 35 °C Storage temperature: 15 ~ 25 °C Storage temperature: 5 ~ 15 °C 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
- Toluene
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA
  - S1 (Trade secrets)
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA
  - 2-Propanol
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA
  - 4-Methyl-2-pentanone
    - ACGIH : TWA, 20 ppm (82 mg/m<sup>3</sup>) STEL 75 ppm (307 mg/m<sup>3</sup>)
    - Biological exposure indices : While urinating - Methyl isobutyl ketone : 1 mg/L (After work)
  - Xylene
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA
  - Oxybispropanol dibenzoate
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA
  - n-Butyl acetate
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA
  - Cellulose acetate butylate
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA
  - 2-Butoxyethanol
    - ACGIH : TWA, 20 ppm (97 mg/m<sup>3</sup>)
    - Biological exposure indices : While urinating - Butoxyacetic acid (BAA)(with hydrolysis) : 200 mg/g (After work)
  - Ethylbenzene
    - ACGIH : NO DATA
    - Biological exposure indices : NO DATA

- Methyl Ethyl Ketone
  - 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 : If there is possibility of direct contact or exposure to these substances should wear a authorized dust-proof mask or respirator for organic compounds 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. 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 : If there is possibility of direct contact or exposure to these substances should wear authorized safety gloves for chemicals. Wear appropriate protective gloves 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 : If there is a possibility of direct contact or exposure to the substance Wear protective clothing for chemical substances Wear cleanroom garment or 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, wear the impermeable whole body protective clothing if needed.

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## 9. Physical and chemical properties

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- A. Appearance : transparent 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) : 79.6~172.5
- G. Flash point(°C) : 14.5
- 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 : 0.8~1.0
- O. Partition coefficient of n-octanol/water : NO DATA
- P. Autoignition temperature(°C) : 238
- Q. Decomposition temperature(°C) : NO DATA
- R. Viscosity : NO DATA
- 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

- 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
- 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
- 2-Propanol
  - Acute toxicity
    - Oral : LD50 = 4710mg/kg Rat
    - Dermal : LD50 = 12870 mg/kg rabbit
    - Inhalation : LD50 = 12870 mg/kg rabbit
  - Skin corrosion/irritation : (using rabbit) skin Irritation test result weak Irritation and in people non-irritating
  - Serious eye damage/irritation : The rabbit eye irritation test results of weak or too irritating impartial
  - Respiratory sensitization : NO DATA
  - Skin sensitization : Guinea pig test results negative
  - Carcinogenicity
    - IARC : Group 3
    - OSHA : NO DATA
    - ACGIH : A4
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : (Using mouse bone marrow cells)Micronucleus test - Negative
  - Reproductive toxicity : (Using mouse bone marrow cells)Micronucleus test - Negative
  - STOT-single exposure : By inhalation exposure in rats decreased the activity is displayed. Stimulation of the digestive tract in humans during acute intoxication, blood pressure, body temperature, such as depression, central nervous system symptoms, renal failure appears.
  - STOT-repeated exposure : In mice it was 4 gaewol inhalation exposure experiment reported that the effect on the blood vessels, liver, spleen, kidneys and may impact on the anesthetic action is recognized
  - Aspiration hazard : Test mice when administered within 24 hours of the spectacle of death from cardiopulmonary arrest is recognized, an
- 4-Methyl-2-pentanone
  - Acute toxicity
    - Oral : LD50 2080 mg/kg Rat (NITE, ECHA)
    - Dermal : LD50 >16,000 mg/kg rabbit (NITE)
    - Inhalation : vapor LC50 8.2 ~ 16.4 mg/ℓ 4h Rat (ECHA)
  - Skin corrosion/irritation : Skin corrosion/irritation test results in rabbits, no irritation observed OECD TG 404 (ECHA)
  - Serious eye damage/irritation : As a result of severe eye damage/irritation test using rabbits, a weak irritation corneal index of 0.08, iris of 0, and congestion of 0.8 were observed OECD TG 405 (ECHA)
  - Respiratory sensitization : NO DATA

- Skin sensitization : Skin sensitization test on guinea pigs, did not cause sensitization (ECHA)
- Carcinogenicity
  - IARC : Group 2B
  - OSHA : NO DATA
  - ACGIH : A3
  - NTP : NO DATA
  - EU CLP : NO DATA
- Germ cell mutagenicity : Bacterial reversion mutation test results using in vitro microorganisms OECD TG 476, mammalian chromosome abnormality test results OECD TG 473, negative in the absence of metabolic activity system, micronucleus test results using mammalian red blood cells in vivo, negative OECD TG 474, GLP (ECHA)
- Reproductive toxicity : As a result of developmental toxicity/teratogenicity test using rats, kidney weight increase, fetal weight loss, and ossification delay were observed, but no evidence of anomaly was observed (NOAEL 1 000 ppm) (ECHA)
- STOT-single exposure : salam-eseo gido · jeommag jageugseong, dutong · hyeongijeung · guto deung-ui machwi jag-yong-eul subanhaneun jungchu singyeong jeungsang-i natanam. dongmul silheom-eseo machwi jag-yong-i natanam. (NITE)82/5000In humans, symptoms of central nervous system accompanied by anesthetic action such as airway/mucosal irritation, headache, dizziness, and vomiting appear. Anesthesia is shown in animal experiments. (NITE)
- STOT-repeated exposure : 90-day oral repeat toxicity test OECD TG408 results NOAEL 250 mg/kg bw/day (ECHA) due to increase in kidney weight
- 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.
- Oxybispropanol dibenzoate
  - Acute toxicity
    - Oral : LD50 4673 mg/kg Rat (Van Waters and Rogers)
    - 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
- Cellulose acetate butylate
  - 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
- 2-Butoxyethanol
  - Acute toxicity
    - Oral : LD50 1414 mg/kg Guinea pig (OECD TG 401, GLP)
    - Dermal : LD50 >2000 mg/kg Rat (ECHA)
    - Inhalation : Vapor LC50 >7.4 mg/ℓ 7 hr Rat (ECHA)
  - Skin corrosion/irritation : As a result of skin irritation test using rabbits, it is erythema irritation 2, which is not applicable under the GHS standard, but it is sufficient to determine that it is irritating EU Method B.4 (ECHA)
  - Serious eye damage/irritation : Eye irritation test results showed conjunctival irritation index 2.6, iritis 0.56, conjunctival edema 1.8, indicating irritation OECD TG405, GLP (ECHA)
  - Respiratory sensitization : NO DATA
  - Skin sensitization : Skin sensitization test results using guinea pigs non-sensitization (OECD TG 406, ECHA)
  - Carcinogenicity
    - IARC : Group 3
    - OSHA : NO DATA
    - ACGIH : A3
    - NTP : NO DATA
    - EU CLP : NO DATA
  - Germ cell mutagenicity : Reverse mutation test using in vitro microorganisms OECD TG471, chromosomal abnormality test using mammalian cells OECD TG473 result negative, micronucleus test using mammalian bone marrow cells in vivo OECD TG474 result negative (ECHA)
  - Reproductive toxicity : 2nd generation reproductive toxicity test (NTP) results, NOAEL (parental toxicity) = 720 mg/kg bw/day due to weight loss, fertility, etc., NOAEL (F1, F2) = 720 mg/kg bw/ due to weight loss of offspring day, no effect on reproductive toxicity was observed, developmental toxicity and teratogenic effects were not observed as a result of developmental toxicity test using rats (OECD TG414) NOAEL (development) = 100 mg/kg bw/day, NOAEL (teratogenicity) > 200 mg/kg bw/day (ECHA)
  - STOT-single exposure : As a result of respiratory irritation test using mice, RD50 2818 ppm showed minimal or no sensory stimulation (ECHA)
  - STOT-repeated exposure : As a result of a 90-day repeated oral toxicity test in rats, OECD TG408 showed some abnormalities in liver and cytoplasm in histopathological findings, but no adverse effects were observed. NOAEL male <69 mg/kg bw/day, NOAEL female <82 mg/kg bw/day 90-day inhalation repeat toxicity test using mice OECD TG413, GLP Results NOAEC <31ppm (ECHA)
  - 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 mm<sup>2</sup> / s (25 °C)
- Methyl Ethyl Ketone
  - Acute toxicity
    - Oral : LD50 2737 mg/kg Rat
    - Dermal : LD50 6480 mg/kg rabbit
    - Inhalation : LD50 6480 mg/kg rabbit

- Skin corrosion/irritation : Moderate irritation (Rabbit)
- Serious eye damage/irritation : It appears not to be irritating by vapor exposure in humans.
- 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 : Mammalian erythrocyte micronucleus test using Voice
- Reproductive toxicity : Mammalian erythrocyte micronucleus test using Voice
- STOT-single exposure : In the rat or mouse inhalation exposure test results appear in the relatively low concentration the effect on the central nervous system. It appears also affect the kidneys at concentrations in the rat courtyard. This prayer appears irritant by inhalation exposure
- STOT-repeated exposure : NO DATA
- Aspiration hazard : Ketones less than 13 carbon atoms

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## 12. Ecological information

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### A. Ecotoxicity

- Toluene
  - Fish : LC50 24 mg/ℓ 96 hr *Oncorhynchus mykiss*
  - Crustaceans : EC50 11.5 mg/ℓ 48 hr *Daphnia magna*
  - Algae : NO DATA
- S1 (Trade secrets)
  - Fish : NO DATA
  - Crustaceans : NO DATA
  - Algae : NO DATA
- 2-Propanol
  - Fish : LC50 > 100 mg/ℓ 96 hr
  - Crustaceans : NO DATA
  - Algae : EC50 = 2.2 mg/ℓ 96 hr
- 4-Methyl-2-pentanone
  - Fish : ECHA LD50 >179 mg/ℓ 96 hr *Brachydanio rerio* (ECHA)
  - Crustaceans : ECHA EC50 >200 mg/ℓ 48 hr *Daphnia magna* (ECHA)
  - Algae : NO DATA
- Xylene
  - Fish : NO DATA
  - Crustaceans : NO DATA
  - Algae : NO DATA
- Oxybispropanol dibenzoate
  - Fish : LC50 5.114 mg/ℓ 96 hr Other
  - Crustaceans : LC50 5.239 mg/ℓ 48 hr Other
  - Algae : EC50 1.436 mg/ℓ 96 hr Other
- n-Butyl acetate
  - Fish : LC50 = 62 mg/ℓ 96 hr
  - Crustaceans : LC50 = 32 mg/ℓ 48 hr
  - Algae : NO DATA
- Cellulose acetate butylate
  - Fish : NO DATA
  - Crustaceans : NO DATA
  - Algae : NO DATA
- 2-Butoxyethanol
  - Fish : LC50 1474 mg/ℓ 96 hr *Oncorhynchus mykiss*(OECD Guideline 203)
  - Crustaceans : EC50 1800 mg/ℓ 48 hr *Daphnia magna*(OECD TG 202)
  - Algae : EC50 911 mg/ℓ 72 hr *Selenastrum capricornutum*(OECD TG 201)
- Ethylbenzene
  - Fish : LC50 = 9.09 mg/ℓ 96 hr
  - Crustaceans : LC50 = 0.4 mg/ℓ 96 hr
  - Algae : NO DATA
- Methyl Ethyl Ketone
  - Fish : LC50 3220 mg/ℓ 96 hr *Pimephales promelas*
  - Crustaceans : EC50 5091 mg/ℓ 48 hr *Daphnia magna*
  - Algae : EC50 > 500 mg/ℓ 96 hr *Skeletonema costatum*

### B. Persistence and degradability

- Toluene
  - Persistence : log Kow 2.73
  - Degradability : NO DATA
- S1 (Trade secrets)
  - Persistence : NO DATA
  - Degradability : NO DATA
- 2-Propanol
  - Persistence : NO DATA
  - Degradability : NO DATA
- 4-Methyl-2-pentanone
  - Persistence : log Kow 1.9 (ECHA)
  - Degradability : NO DATA
- Xylene
  - Persistence : NO DATA
  - Degradability : NO DATA



- Oxybispropanol dibenzoate
    - Persistence : log Kow 3.88 (Estimates)
    - Degradability : NO DATA
  - n-Butyl acetate
    - Persistence : log Kow = 1.78
    - Degradability : NO DATA
  - Cellulose acetate butylate
    - Persistence : NO DATA
    - Degradability : NO DATA
  - 2-Butoxyethanol
    - Persistence : 0.81 log Kow (25 ° C, pH=7, BASF standard method)
    - Degradability : NO DATA
  - Ethylbenzene
    - Persistence : NO DATA
    - Degradability : NO DATA
  - Methyl Ethyl Ketone
    - Persistence : log Kow 0.29
    - Degradability : NO DATA
- C. Bioaccumulative potential
- Toluene
    - Bioaccumulative potential : NO DATA
    - Biodegradation : 86 (%) 20 day
  - S1 (Trade secrets)
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - 2-Propanol
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - 4-Methyl-2-pentanone
    - Bioaccumulative potential : NO DATA
    - Biodegradation : 83% 28 day (ECHA)
  - Xylene
    - Bioaccumulative potential : NO DATA
    - Biodegradation : 39 (%)
  - Oxybispropanol dibenzoate
    - Bioaccumulative potential : BCF 192.5
    - Biodegradation : NO DATA
  - n-Butyl acetate
    - Bioaccumulative potential : NO DATA
    - Biodegradation : Biodegradability = 98 (%)
  - Cellulose acetate butylate
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - 2-Butoxyethanol
    - Bioaccumulative potential : NO DATA
    - Biodegradation : 90.4 % 28 day (OECD TG 301G)
  - Ethylbenzene
    - Bioaccumulative potential : NO DATA
    - Biodegradation : NO DATA
  - Methyl Ethyl Ketone
    - Bioaccumulative potential : NO DATA
    - Biodegradation : 89 (%) 20 day
- D. Mobility in soil
- Toluene
    - ▷ NO DATA
  - S1 (Trade secrets)
    - ▷ NO DATA
  - 2-Propanol
    - ▷ NO DATA
  - 4-Methyl-2-pentanone
    - ▷ Koc 101.85 (Estimate)
  - Xylene
    - ▷ log Kow = 3.12 (measured) (ortho), 3.2 (measured) (meta), 3.15 (measurements) (p) (5)
  - Oxybispropanol dibenzoate
    - ▷ NO DATA
  - n-Butyl acetate
    - ▷ NO DATA
  - Cellulose acetate butylate
    - ▷ NO DATA
  - 2-Butoxyethanol
    - ▷ NO DATA
  - Ethylbenzene
    - ▷ log Kow = 3.15 (11)
  - Methyl Ethyl Ketone
    - ▷ NO DATA
- E. Other adverse effects
- Toluene
    - ▷ NO DATA
  - S1 (Trade secrets)
    - ▷ NO DATA

- 2-Propanol
  - ▷ NO DATA
- 4-Methyl-2-pentanone
  - ▷ crustaceans(Daphnia magna) : NOEC 21 d=78 mg/L (ECHA)
- Xylene
  - ▷ NO DATA
- Oxybispropanol dibenzoate
  - ▷ NO DATA
- n-Butyl acetate
  - ▷ NO DATA
- Cellulose acetate butylate
  - ▷ NO DATA
- 2-Butoxyethanol
  - ▷ Fish Danio rerio: NOEC14d>100 mg/L OECD TG 204, Crustacean Daphnia magna: NOEC21d=100 mg/L OECD TG 211 (ECHA)
- Ethylbenzene
  - ▷ NO DATA
- Methyl Ethyl Ketone
  - ▷ 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 : II
- 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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- 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
- 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) : 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
- 2-Propanol
  - 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) : pertinent
  - Rotterdam Convention listed ingredients : NO DATA
  - Stockholm Convention listed ingredients : NO DATA
  - Montreal Protocol listed ingredients : NO DATA
- 4-Methyl-2-pentanone
  - 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) : 2267.995 kg 5000 lb
    - ▷ EPCRA Section 302 (40CFR355.30) : NO DATA
    - ▷ EPCRA Section 304 (40CFR355.40) : NO DATA
    - ▷ EPCRA Section 313 (40CFR372.65) : Applicable
  - 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
- Oxybispropanol dibenzoate
  - 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
- 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
- Cellulose acetate butylate
  - 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
- 2-Butoxyethanol
  - 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
- Methyl Ethyl Ketone
  - 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

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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 : 2020-12-09

C. Revision number and Last date revised : 1.(2021-01-08)

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