

Material Safety Data (MSDS)

1. Information on chemical products and companies

A. Product name

- [IS-2001~2032] ILSIN Lacquer-5Y7/1

B. Recommendations for the product and restrictions on use

- Purpose(Use) : Commercial use of wood and Steel
- Restrictions on use : No data

C. Provider Information

- Company name : Ilshin Chemical Co., Ltd
- Address : 2, Sincheoksandan 1-ro, Deoksan-eup, Jincheon-gun, Chungcheongbuk-do (Sincheok-ri 851)
- Emergency phone number : TEL : 043)536-0161, FAX : 043)536-0162

2. Hazards and risks

A. Classification of hazards and risks

- Acute toxicity (percutaneous): Category 4
- Acute toxicity (inhalation: vapour): Category 4
- Chronic aquatic environment hazards: Category 4
- Carcinogenicity: Category 2
- Reproductive toxicity: Category 2
- Severe eye damage/eye irritation: Category 2
- High pressure gas: liquefied gas
- Flammable gases : category 1
- Flammable liquids: Category 2
- Specific target organ toxicity (one exposure): Category 2
- Skin Corrosion/Skin Irritation: Category 2
- Inhalation hazard: Category 2

B. Items with warning signs including precautionary measures

○ Picture characters



○ Signal word

- Dangerous

○ Hazardous and dangerous statements

- H220 Extremely flammable gas
- H225 Highly flammable liquids and vapors
- H305 Swallowing into the airways can be harmful
- H312 Harmful in contact with skin.
- H315 irritation to the skin
- H319 Causes serious eye irritation.
- H332 Harmful when inhaled
- H351 Suspected of causing cancer.
- H361 Suspected to cause damage to fetal or reproductive capacity
- H371 May cause damage to the eyes and skin in the body (see paragraph 11 (MSDS)).

○ Preventive action statement

1) Prevention

- P201 Secure the manual before use.
- P202 Do not handle all safety precautions until you have read and understood them.
- P210 Keep away from heat, spark, flame and high heat - no smoking
- P233 Seal the container tightly.
- P240 Bond or ground the vessel and receiver.
- P241 Use explosion-proof electricity, ventilation, lighting, and equipment.

- P242 Use only spark-free tools.
- P243 Take antistatic measures.
- P260 (Do not inhale (dust, fume, gas, mist, steam, spray).
- P261 (dust, fume, gas, mist, vapours, spray) Avoid breathing.
- P264 Wash the handling area thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P271 Handle only outdoors or in well ventilated areas.
- P273 Do not discharge into environment.
- P280 (protective gloves, protective clothing, eye protection, face protection).
- P281 Wear appropriate personal protective gear

2) Correspondence

- P301+P310 If swallowed, consult a medical institution (doctor) immediately.
- P302+P352 Wash with plenty of soap and water if it gets on your skin.
- P303+P361+P353 On Skin (or Hair): Take off all contaminated clothing immediately. Wash your skin with water.
- P304+P340 When inhaled, move to a place with fresh air and rest in an easy-to-breathe position.
- P305+P351+P338 Wash carefully with water for a few minutes if it gets on your eyes. Remove contact lenses if possible. Keep washing.
- P308+P313 If you are exposed or concerned about exposure, seek medical measures and advice.
- P309+P311 If you feel exposed or uncomfortable, see a medical institution.
- P312 If you feel uncomfortable, consult a medical institution.
- P321 Take the necessary measures.
- P322 Take the necessary steps.
- P331 Don't make me vomit.
- P332+P313 Seek medical advice if skin irritation occurs.
- P337+P313 Seek medical advice if eye irritation persists.
- P362 Remove contaminated clothing and wash it before using it again.
- P363 Wash contaminated clothing before use again.
- P370+P378 Use fire extinguisher to extinguish fire.

3) Storage

- P401 Keep appropriately (according to relevant laws and regulations).
- P403 Store in a well ventilated place.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- P403+P235 Store in a well-ventilated place. Keep cool.
- P405 Store locked up.
- P410+P403 Avoid direct sunlight and store in a well ventilated place.

4) Disposal

- P501 Refer to "13. Disposal Precautions" in MSDS and dispose of contents and containers.

C. Other hazards and risks that are not included in the classification criteria for hazards and risks

○ NFPA rating (Steps 0 Through 4)

- Health: 2, Fire: 4, Reactivity: 1

3. Name and content of components

Chemical substance name	Tolerant name and tinnitus	CAS number or identification number	content(%)
Oxybismethane	Dimethyl ether	115-10-6	30 ~ 40
Titanium dioxide	Titanium oxide (TiO ₂)	13463-67-7	10 ~ 15
Carbon Black	-	1333-86-4	0.1 ~ 1.5
Alkyd resin	-	68526-21-6	10 ~ 15
Acetone	Dimethyl ketone	67-64-1	10 ~ 15
Propane	Dimethylmethane	74-98-6	1 ~ 5
Methyl acetate	Acetic acid methyl ester	79-20-9	1 ~ 5
Toluene	Methylbenzene	108-88-3	1 ~ 5
C.I. pigment yellow 083	Butanamide, 2,2'-[(3,3'-dichloro[1,1'-biphenyl]-4,4'-diyl)bis(2,1-diazenediyl)]bis[N-(4-chloro-2,5-dimethoxyphenyl)-3-oxo-	5567-15-7	0.1 ~ 1.5
Nitrocellulose	Pyroxylin	9004-70-0	1 ~ 3

n-Butyl acetate	Acetic acid, butyl ester	123-86-4	1 ~ 3
2-Butoxyethanol	Ethylene glycol monobutyl ether	111-76-2	1 ~ 2

4. Tips for emergency measures

A. When it goes into your eyes

- Immediately wash snow under running water for at least 20 minutes when contacting with substances
- Get urgent medical attention
- Seek immediate medical attention.
- Immediately wash skin and eyes with running water for at least 20 minutes when contacting with substances
- Wash carefully with water for a few minutes if it gets on your eyes. Remove contact lenses if possible. Keep washing up.
- Seek medical advice if eye irritation persists.

B. When it comes into contact with the skin

- For hot substances, soak or wash affected areas in large amounts of cold water to remove heat
- Wash clothes and shoes thoroughly before reuse
- Take immediate medical attention
- Get urgent medical attention
- Remove contaminated clothing and shoes and isolate contaminated areas
- Immediately wash skin and eyes with running water for at least 20 minutes when contacting with substances
- Prevent the spread of contamination in case of minor skin contact
- Freeze clothes that are frozen on your skin before removing them
- In case of burns, immediately cool the area with cold water for as long as possible, and do not remove clothing that sticks to the skin
- Wash your skin with soap and water
- Get medical help when the molten material is stuck to the skin and removed.
- In case of contact with liquefied gas, melt the area with lukewarm water
- Contact with gas or liquefied gas can cause burns, serious injury and frostbite
- Wash with plenty of soap and water if it gets on your skin.
- Remove all contaminated clothing from the skin (or hair). Wash/shower your skin with water.
- Seek medical advice if skin irritation occurs.
- If skin irritation or erythema appears, seek medical advice.
- Remove contaminated clothing and wash it before using it again.
- Take off your dirty clothes.
- Wash contaminated clothing before use again.

C. When you inhale it

- If exposed to excess dust or fume, remove it with clean air and take medical measures if you have coughs or other symptoms.
- Transfer to a place with fresh air
- Get emergency medical attention
- If you are not breathing, perform artificial respiration.
- When eating or inhaling substances, do not breathe through mouth-to-mouth method and use appropriate respiratory equipment
- If breathing is difficult, provide oxygen.
- Keep warm and steady
- Seek medical advice if you are exposed or concerned about exposure.
- Seek medical attention (doctor).
- If you feel uncomfortable, consult a medical institution.
- Don't make me throw up.

D. When you eat it

- Don't feed an unconscious person anything with your mouth.
- Get urgent medical attention
- Seek immediate medical attention.
- When eating or inhaling substances, do not breathe through mouth-to-mouth method and use appropriate respiratory equipment
- If you swallowed it, see a medical institution immediately.
- Seek medical advice if you are exposed or concerned about exposure.
- If you feel unwell, seek medical advice/attention.
- Rinse your mouth with water immediately.
- Don't make me throw up.

E. Other doctor's precautions

- Make sure the medical personnel know about the substance and take protective measures.
- Contact the medical staff in case of exposure and take special emergency measures such as follow-up.
- Symptoms caused by contact and inhalation may be delayed.
- Ensure that medical personnel are aware of the substance and take protective measures.

5. How to cope with an explosion or fire

A. Appropriate (and inappropriate) digestive medicine

- Small fire: Dry sand, Dry chemical, alcohol resistant foam, water spray, normal foam, CO2 (suitable extinguishing agent)
- Large Fire: Water Spray/Fog, General Foam (Appropriate Fire Extinguishing Agent)
- High pressure injection (inappropriate extinguishing agent)
- Use alcohol foam, carbon dioxide or water spray to extinguish fire related to this substance
- Use dry sand or soil to extinguish suffocation

B. Specific hazards arising from chemicals

- Can decompose at high temperatures to produce toxic gases
- Unstable at room temperature
- Intense polymerization can cause fires and explosions
- Steam can be transferred to the ignition source to ignite
- May produce irritating and highly toxic gases by pyrolysis or combustion during burning
- Containers may explode when heated
- High flammability: easily ignited by heat, spark, flame
- Forming an explosive mixture with air
- Polar flammability
- Leakage is at risk of fire/explosion
- May be ignited by friction, heat, spark, or flame
- Can be re-ignited after digestion
- Risk of steam explosion in indoor, outdoor, and sewers
- Can be ignited by heat, sparks, or flames
- Flammable/Combustible substances
- Some materials can burn quickly with a flash
- Some can ride but do not ignite easily
- Vapor can form an explosive mixture with air
- Steam can backfire (flash back) to travel to the sources of ignition.
- Cylinders exposed to fire may emit flammable gases
- Some may produce flammable hydrogen gas when in contact with metals
- Non-flammable, the substance itself does not burn, but may decompose when heated, resulting in corrosive/toxic fume
- Toxicity: Inhalation, ingestion and skin contact can cause serious injury and death
- Contact with molten material can cause serious burns to the skin and eyes
- Irritates or burns skin and eyes on inhalation and contact
- Steam may cause dizziness or suffocation without awareness
- Irritating and toxic gases can be generated in the event of a fire
- Irritates or burns skin and eyes on inhalation and contact
- May be toxic in inhalation and skin absorption
- Highly flammable gas
- Highly flammable liquids and vapors
- Flammable liquid and vapor
- Includes high pressure gas; may explode when heated

C. Protective equipment and preventive measures to be worn in the event of a fire suppression

- In the event of a leaking gas fire, do not attempt to extinguish the fire unless the leak can be safely prevented.
- If it is possible to dispose of it safely, remove all ignition sources.
- Rescuers should wear appropriate protective equipment.
- Keep a safe distance away from the area.
- Please note that some may be transported at high temperatures.

- Please note that it may be melted and transported.
- Dig a ditch for the disposal of fire extinguishing water and trap it so that the material does not scatter.
- If it is not dangerous, remove the container from the fire area.
- Note that liquefied vapors are heavier than air, so they diffuse along the ground.
- Be careful that broken cylinders may fly up.
- If the leak is not stopped, do not extinguish the leaking gas fire.
- Most of them are lighter than water, so be careful.
- Since most vapors are heavier than air, they can diffuse along the ground and accumulate in lowlands or enclosed spaces
- Be careful because it may melt and be transported above the flash point.
- Do not spray directly into exposure sources or safety devices as it may freeze in the event of a tank fire.
- In the event of a tank fire, extinguish it at maximum distance or use unmanned fire extinguishing equipment.
- In the event of a tank fire, cool the container with plenty of water even after the extinguishing has been extinguished.
- In the event of a tank fire, withdraw immediately if there is a high-pitched sound from the pressure release device or if the tank discolores.
- In the event of a tank fire, step away from the tank engulfed in flames.
- In the event of a tank fire, use unmanned fire extinguishing equipment in case of a large-scale fire, and if it is not possible, step back and let it burn.

6. How to deal with leakage accidents

A. Measures and protective equipment necessary to protect the human body

- Remove all ignition sources as very fine particles can cause fire or explosion.
- Wipe off spills immediately and follow protective equipment precautions
- If possible, turn the leak container so that it is released as a gas rather than a liquid.
- Isolate the contaminated area until the gas is completely diffused and diluted.
- Contact material with frozen liquid can break easily
- Do not touch or walk around exposed objects
- Do not pour directly into the source of leakage
- Remove all ignition sources
- Use water spray to reduce steam or disperse vapor to prevent water from coming into contact with leaks
- Be sure to ground all equipment when handling materials.
- If not dangerous, stop leaking
- Do not touch broken containers or leaks without wearing appropriate protective clothing
- Steam suppression foam can be used to reduce steam generation.
- Keep water out of the container.
- Cover with plastic sheet to prevent diffusion
- Prevent the formation of dust formation
- Be aware of substances and conditions to avoid
- Do not inhale (dust, fume, gas, mist, vapor, spray)
- Do not attempt to extinguish the fire if leakage cannot be prevented safely in the event of a leaky gas fire.

B. Measures necessary to protect the environment

- Leakage may cause contamination
- Prevent inflow into waterways, sewers, cellar, and enclosed spaces in case of large leakage.
- Prevent inflow into waterways, sewers, cellars and enclosed spaces
- Do not allow vapor to spread through sewers, ventilation systems and enclosed spaces
- Do not discharge into the environment.

C. Purification or removal method

- In the event of a small leak, rinse the contaminated area with a large amount of water
- In the event of a small leak, absorb sand and non-combustible materials and place in a container
- Build levees and collect water for digestion.
- Absorb spills with inert substances (e.g. dry sand or soil) and place them in chemical waste containers.
- Remove airy dust and wet with water to prevent scattering.
- Absorb the liquid and rinse the contaminated area with detergent and water.
- Use a clean explosion proof tool to collect the absorbed material
- In case of a large leak, wet it with water and dig a ditch to deal with it later
- Using a clean explosion proof tool, collect leakage and place in a loosely covered plastic container
- In the event of a large leak, make a ditch away from the liquid leak

- Cover with plastic sheet to prevent diffusion and keep dry in case of powder leakage
- In the event of a small leak, absorb sand and non-combustible materials and place in a container
- Collect the leaks.

7. Handling and storage methods

A. Safety handling tips

- Do not apply, cut, or weld, solder, join, pierce, grind or expose to heat, flame, flame, static or other sources of ignition.
- Follow all MSDS, label precautions as product residue (vapors, liquids, solids) may remain after the container is emptied.
- Use with care when handling/storing.
- Carefully open the cap before opening.
- Avoid prolonged or continuous skin contact.
- Do not breathe steam from heated substances.
- Do not enter the storage area without adequate ventilation.
- Be sure to ground all equipment when handling substances
- Pay attention to substances and conditions to be avoided
- Work with reference to engineering care and personal protective equipment
- Watch out for high temperatures
- Be careful as it may explode during dust generation or friction work.
- Measure and ventilate the oxygen concentration in the air during work because there is a risk of oxygen deficiency when working in a closed space in a low-lying area
- Do not handle until all safety precautions have been read and understood.
- Use only tools that do not produce sparks
- Take antistatic measures
- Do not inhale (dust, fume, gas, mist, vapor, spray)
- Wash the area thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Handle only outdoors or in well ventilated areas

B. Safe storage method

- Drain the empty drum completely, block it properly and immediately return it to the drum regulator or position it properly.
- Do not expose the container to heat, as it may increase the pressure if exposed to heat.
- Keep away from food and drinks.
- Be mindful of substances and conditions to avoid
- Keep it sealed.
- Keep away from heat, sparks, flames, and high fever - Non-smoking
- Keep container tightly closed.
- Keep low temperature and avoid direct sunlight.
- Store the container tightly sealed in a well-ventilated area.
- Store in a well ventilated place and keep at low temperature.
- Store in a storage area with a lock.
- Maintain spacing between loads.
- Avoid direct sunlight and store in a well-ventilated place.
- Store away from other substances.

8. Exposure protection and personal protective equipment

A. Exposure standards of chemical substances, biological exposure standards, etc

○ Domestic exposure standards

- [Methyl acetate] : TWA - 200ppm STEL - 250ppm
- [2-Butoxyethanol] : TWA - 20ppm
- [Acetone] : TWA - 500ppm STEL - 750ppm
- [n-Butyl acetate] : TWA - 150ppm STEL - 200ppm
- [Toluene] : TWA - 50ppm STEL - 150ppm

○ ACGIH exposure standard

- [Acetone] : STEL 500 ppm
- [Methyl acetate] : TWA 200 ppm, STEL 250 ppm
- [Toluene] : TWA 20 ppm, STEL 200 ppm
- [n-Butyl acetate] : TWA 150 ppm

- [2-Butoxyethanol] : TWA 20 ppm

○ Biological exposure criteria

- [Toluene] : 0.02 mg/L Medium: blood Time: prior to last shift of workweek Parameter: Toluene;
0.03 mg/L Medium: urine Time: end of shift Parameter: Toluene;
0.3 mg/g creatinine Medium: urine Time: end of shift Parameter: oCresol with hydrolysis (background)

B. Appropriate engineering management

- Use process isolation, local exhaust, or other engineering management to adjust air levels below exposure standards.
- If dust, fume, or mist is generated during operation, ventilate the air so that air pollution is kept below the exposure standard.
- Install eyewash and a safety shower for equipment that stores or uses this substance.

C. Personal Protective Equipment

○ Respiratory protection

- Wear a gas mask certified by the Korea Occupational Safety and Health Agency if there is a possibility of direct exposure or exposure to the substance.
- Respiratory protection is classified from minimum to maximum concentration.
- Consider the warning characteristics before use.
- Gas mask (directly small, for organic compounds)
- Air-filtered respirators (purification containers and front type for organic compounds)
- Unknown concentration or other imminent danger to life or health: air ventilation mask (complex air line mask), air respirator (front type)

○ Eye protection

- If you are concerned about direct contact or exposure to the substance, wear safety glasses certified by the Korea Occupational Safety and Health Agency.
- Workshop in close proximity Install eye washing and emergency washing facilities (shower type).

○ Hand protection

- If you are concerned about direct contact or exposure to the substance, wear chemical resistant gloves certified by the Korea Occupational Safety and Health Agency.

○ Physical protection

- If you are concerned about direct contact or exposure to the substance, wear chemical resistant protective clothing certified by the Korea Occupational Safety and Health Agency.

9. Physical and chemical properties

A. Appearance	
- an icon of nature	liquid
- Colors	grey-yellow
B. Smell	The smell of solvent
C. Smell threshold	No data
D. pH	No data
E. melting point/fishing point	No data
F. Initial boiling point and boiling point range	No data
G. a print shop	-80 °C
H. Evaporation rate	No data
I. Flammable (solid, gas)	No data
J. Upper/lower limit of range of ignition or explosion	No data
K. steam pressure	No data
L. solubility	No data
M. steam density	No data
N. specific gravity	0.9 ~ 1.1(-20 °C)
O. N-octanol/water distribution factor	No data
P. Natural ignition temperature	No data
Q. Decomposition temperature	No data
R. Viscosity	95 ~ 100 Ku
S. molecular weight	No data

10. Stability and Reactivity

A. Possibility of chemical stability and adverse reactions

- Highly flammable liquids and vapors
- Intense polymerization can cause fires and explosions

- Can form explosive mixtures at or above the flash point
- Containers may explode when heated
- High flammability: easily ignited by heat, spark, flame
- Leakage is at risk of fire/explosion
- Risk of steam explosion in indoor, outdoor, and sewers
- Vapor can form an explosive mixture with air
- Steam can backfire (flash back) to travel to the sources of ignition.
- Irritating and toxic gases can be generated in the event of a fire
- May be toxic if inhaled and absorbed through skin.
- Can decompose at high temperatures to produce toxic gases
- Unstable at room temperature
- May be ignited by friction, heat, spark, or flame
- Explosive or explosive burning by powder, dust, debris, perforation, lathe, cutting, etc.
- Can be re-ignited after digestion
- Flammable/Combustible substances
- Some materials can burn quickly with a flash
- Contact with molten material may cause serious burns to skin and eyes.
- May cause burns to skin and eyes on contact
- Non-flammable, the substance itself does not burn, but may decompose when heated, resulting in corrosive/toxic fume
- Leakage is at risk of fire/explosion
- Risk of steam explosion in indoor, outdoor, and sewers
- Vapor can form an explosive mixture with air
- Steam can backfire (flash back) to travel to the sources of ignition.
- Steam may cause dizziness or suffocation without awareness
- Irritates or burns skin and eyes if inhaled or on contact.

B. Conditions to Avoid

- Keep away from heat, sparks, flames, and high temperatures - No smoking
- Sources of ignition, such as heat, sparks, and flames

C. Substances to be avoided

- Combustible substance, Reducing substance
- metal
- Irritating, Toxic gases

D. Hazardous substances produced during decomposition

- Irritating and highly toxic gases can be generated by pyrolysis or combustion during burning
- Corrosive/Toxic fume
- Irritating, Corrosive, Toxic gases

11. Information on toxicity

A. Information on likely exposure routes

- [2-Butoxyethanol] : Substances that can cause systemic effects by being absorbed into mucous membranes, eyes, and skin (Ministry of Employment and Labor Notice No. 2018-24; skin)
- [Propane] : Nausea, vomiting, irregular heartbeat, headache, drowsiness, dizziness, disorientation, mood swings, loss of coordination (function), suffocation, convulsions, unconsciousness, coma, difficulty breathing, central nervous system depression, frostbite.

B. Health Hazard Information

○ Acute toxicity

* Oral toxicity

- [Titanium dioxide] : LD50 > 10000 mg/kg Rat (HSDB)
- [Carbon Black] : LD50 = 15400 mg/kg Rat
- [Acetone] : LD50 = 5280 mg/kg Rat (EHC(1990), SIDS(1997))
- [Methyl acetate] : LD50 > 5000 mg/kg Rat
- [Toluene] : rat LD50=2600 mg/kg
- [C.I. pigment yellow 083] : LD50 > 5000 mg/kg Rat (IUCLID; THOMSON)
- [Nitrocellulose] : LD50 > 5000 mg/kg Rat (NITE(2006))

- [n-Butyl acetate] : LD50 = 14130 mg/kg Rat (HSDB)
- [2-Butoxyethanol] : LD50 = 1746 mg/kg Rat (SIDS (1997))

*** Percutaneous toxicity**

- [Carbon Black] : LD50 = 3000 mg/kg Rabbit
- [Titanium dioxide] : LD50 > 10000 mg/kg Rabbit (IUCLID)
- [Acetone] : LD50 = 12870 mg/kg rabbit (EHC(1990), PATTY(1994), SIDS(1997))
- [Methyl acetate] : LD50 > 5000 mg/kg Rat
- [Toluene] : rabbit LD50=12,000 mg/kg
- [n-Butyl acetate] : LD50 = 17600 mg/kg Rabbit (NITE(2006))
- [2-Butoxyethanol] : LD50 = 99 mg/kg Rabbit (SIDS (1997))

*** Inhalation toxicity**

- [Oxybismethane] : gas LC50 163619 ppm/4 hr Rat (308.5 mg/L/4H)
- [Titanium dioxide] : LC50 > 6.82 mg/l 4 hr Rat (NITE(2006))
- [Acetone] : Steam LC50 = 76 mg/L/4hr Rat
- [Propane] : LC50 142500 ppm/4hr Rat (570000 ppm/15min)
- [Methyl acetate] : Steam LCLo = 32000 ppm 4 hr Rat
- [Toluene] : rat LC50=28.1 mg/L/4hr
- [n-Butyl acetate] : LC50 >21 mg/L/4hr (GLP)(ECHA)
- [2-Butoxyethanol] : LC50 = 2.2 mg/l 4 hr Rat (SIDS (1997))

○ Corrosive or irritating skin

- [Oxybismethane] : Vapors and liquids irritate the skin
- [Titanium dioxide] : Skin irritability tests in rabbits show mild irritability or non-irritability (NITE(2006))
- [Acetone] : Non-irritating skin irritation test results using rabbits
- [Propane] : No data (EU Directive 67/548). rabbit /irritating (IUCLID)
- [Methyl acetate] : Non-polarity in humans and rabbits
- [Toluene] : Skin irritation, rabbit, Irritation, OECD Guide line 404 People, Skin irritability, guinea pig, Skin irritability
- [C.I. pigment yellow 083] : OECD Guide-404 Rabbit Slightly irritating (IUCLID)
- [n-Butyl acetate] : a weak stimulus in a person. (NITE(2006))
- [2-Butoxyethanol] : Skin irritability test results indicate irritability (SIDS)

○ Severe eye damage or irritation

- [Oxybismethane] : Steam and liquids irritate the eyes
- [Titanium dioxide] : Eye irritation test results show mild irritability in rabbits (NITE(2006))
- [Acetone] : Steam stimulates the human eye, but stimulation does not last when exposure stops. Corneal epidermal destruction recovered on 4-6 days.
- [Propane] : Rabbit/not irritating (IUCLID)
- [Methyl acetate] : Eye irritability test results in rabbits show severe irritability (cornea, iris irritation, conjunctiva redness, edema, bleeding), but it can be recovered within 7 days, so it is not classified (nite).
- [Toluene] : An eye irritation test using rabbits causes recoverable irritation for 6 days.
- [C.I. pigment yellow 083] : OECD Guide-405 Rabbit: not irritating (IUCLID)
- [n-Butyl acetate] : No irritation to rabbit eyes~ It's light irritation, so not classified (nite).
- [2-Butoxyethanol] : Test results in rabbits show strong irritability, pain-related irritation in humans, and corneal opacity, but the symptoms recover within a few days. (NITE)

○ Respiratory irritability

- No data

○ Skin irritability

- [Titanium dioxide] : Person to voice patch test results (NITE(2006))
- [Acetone] : Mouse test result negative, guinea pig test result negative
- [Methyl acetate] : Negative on guinea pig test
- [Toluene] : Test result negative using guinea pig
- [n-Butyl acetate] : Skin irritable negative (NITE(2006))
- [2-Butoxyethanol] : Guinea pig test results negative, Human Patch Test Results negative (NITE(2006))

○ Carcinogenicity

*** Ministry of Environment Chemicals Control Act**

- No data

*** IARC**

- [Carbon Black] : Group 2B
- [2-Butoxyethanol] : Group 3
- [Titanium dioxide] : Group 2B

- [Toluene] : Group 3
- * **OSHA**
 - No data
- * **ACGIH**
 - [Carbon Black] : A3
 - [2-Butoxyethanol] : A3
 - [Acetone] : A4
 - [Titanium dioxide] : A4
 - [Toluene] : A4
- * **NTP**
 - No data
- * **EU CLP**
 - No data
- **Germ cell mutagenicity**
 - [Oxybismethane] : Microbial return mutation test results negative
 - [Titanium dioxide] : Mouse nuclear test negative, mouse chromosome aberration test negative (NITE(2006))
 - [Acetone] : Nuclear test negative
 - [C.I. pigment yellow 083] : IN VITRO - AMES TEST - negative (IUCALID)
 - [Methyl acetate] : Results of micro-nuclear test using white mice negative
 - [2-Butoxyethanol] : Negative micronuclear test using mouse and white mouse bone marrow cells, epidemiological investigations on humans also showed no increase in micronuclear and sister chromatid exchange. (NITE(2006))
- **Reproductive toxicity**
 - [Oxybismethane] : There are reports of fetal and embryonic effects in experimental animals
 - [Acetone] : Mild developmental toxicity at high concentration exposure (11000 ppm (20 mg/L)) in rats, fetal weight loss, Fetal weight loss at high concentration exposure (6600 ppm (15.6 mg/L)) in mice, Increased late fetal absorption (EHC, 207 (1998))
 - [Toluene] : Increased miscarriage, neonatal developmental abnormalities, deformities, and decreased concentration of female hormones in human epidemiological studies, In animal testing, toxicity that did not appear in the first generation showed fetal death and deformed child symptoms in the second generation
 - [n-Butyl acetate] : Reported non-reproductive toxicity. (NITE)
 - [2-Butoxyethanol] : When exposed to tracheostomal stage during pregnancy, adverse effects on occurrence such as a decrease in the number of frostbite and an increase in absorption times appear in white mice and rabbits. (NITE(2006))
- **Specific target organ toxicity (1 exposure)**
 - [Acetone] : In humans, nasal, airway, bronchial irritation, headache, dizziness, leg exhaustion, and fainting when exposed to high concentrations.
 - [Methyl acetate] : In humans, airway and pharyngeal stimulation, dizziness, headache, unstable walking and loss of vision in both eyes, optic nerve atrophy, enlargement of the left spot, visual stenosis of the right neck, and anesthesia.
 - [Toluene] : The central nervous system is considered a target organ, indicating airway irritation, anesthesia
 - [Nitrocellulose] : Stimulates a person's throat and is likely to cause dizziness, shortness of breath, and loss of consciousness at high concentrations (NITE(2006))
 - [n-Butyl acetate] : Animal inhalation experiments have shown to cause respiratory system damage. (NITE, 2009)
 - [2-Butoxyethanol] : Stimulation of the throat is observed in a person. Neurotoxicity test results in decreased activity and decreased reflex response in white mice. Inhalation exposure test results in central nervous system inhibition in white mice and rabbits. (NITE)
- **Specific target organ toxicity (repeated exposure)**
 - [Oxybismethane] : Inhalation of rats did not reveal any significant differences in behavior, health status, food intake and food rate during repeated exposure for 13 weeks.
 - [Carbon Black] : Effects on the lungs (epidermal hyperplasia, growth, pulmonary fibrosis, proliferation of alveolar cells, etc.) within the standard value range of Category 1 in human pneumoconiosis and rat inhalation tests.
 - [Toluene] : It causes headaches, memory loss, chronic central nervous system disorders, kidney failure such as hematuria and proteinuria, brain atrophy, fattyization of liver cells, and hepatotoxicity in the human body
 - [Propane] : (EU Directive 67/548/EEC). Central nervous system: the effects of the nervous system(TOMES)
 - [2-Butoxyethanol] : Animal testing shows toxic effects on blood (red blood cells) by inhalation exposure. (NITE(2006))
- **The harmful effects of aspiration**
 - [Acetone] : kinematic viscosity 0.426 mm²/s (calculation)
 - [Toluene] : It is a hydrocarbon with a kinematic viscosity of 0.65 mm²/s (25 °C).

12. Environmental Impact

A. Ecotoxicity

- **Fish**
 - [Acetone] : LC50 > 100 mg/ℓ 96 hr

- [Propane] : LC50 > 100 mg/ℓ 96 hr Other ((Species : Fish TLm))
- [Methyl acetate] : LC50 = 320 mg/ℓ 96 hr
- [C.I. pigment yellow 083] : LC50 = 45 mg/ℓ 48 hr Oncorhynchus mykiss
- [Nitrocellulose] : LC50 = 1000 mg/ℓ 96 hr
- [n-Butyl acetate] : LC50 = 62 mg/ℓ 96 hr
- [2-Butoxyethanol] : LC50 = 1250 mg/ℓ 96 hr

○ **Crustaceans**

- [Titanium dioxide] : EC50 > 1000 mg/ℓ 48 hr
- [Carbon Black] : EC50 = 5600 mg/ℓ 24 hr
- [Propane] : LC50 52.157 mg/ℓ 48 hr
- [n-Butyl acetate] : LC50 = 32 mg/ℓ 48 hr
- [2-Butoxyethanol] : LC50 = 5.4 mg/ℓ 96 hr

○ **The current**

- [Propane] : LC50 32.252 mg/ℓ 96 hr
- [Methyl acetate] : EC50 > 120 mg/ℓ 72 hr
- [Nitrocellulose] : EC50 = 579 mg/ℓ 96 hr

B. Residue and Decomposition

○ **Residuity**

- [Oxybismethane] : log Kow 0.1
- [Propane] : log Kow 2.36
- [C.I. pigment yellow 083] : log Kow = 7.54
- [n-Butyl acetate] : log Kow = 1.78
- [2-Butoxyethanol] : log Kow = 0.83

○ **Decomposibility**

- No data

C. Biological Concentration

○ **Bioconcentrality**

- [Propane] : BCF 13
- [C.I. pigment yellow 083] : BCF = 10

○ **Biodegradable**

- [Oxybismethane] : 5 (%) 28 day
- [Propane] : 65.7 (%) 35 day
- [C.I. pigment yellow 083] : Biodegradability = 6 (%) 28 day (Non-biodegradability)
- [n-Butyl acetate] : Biodegradability = 98 (%)
- [2-Butoxyethanol] : Biodegradability = 96 (%)

D. Soil Mobility

- [Oxybismethane] : Koc 27

E. Other harmful effects

- No data

13. Precautions for disposal

A. Disposal method

- If two or more types of designated wastes are mixed and it is difficult to separate and dispose of them, the reduction and stabilization can be performed by incineration or similar methods.
- Oil and water separation shall be performed in advance by the method of separating oil and water.
- To be incinerated.
- Burn at high temperature.
- After recovering substances to be recycled such as organic solvents, incinerate the residues at high temperature.
- Drain all remaining gas in the spray container and drain according to the procedure.

B. Precautions for disposal

- A business operator (business waste discharger) that discharges business waste shall dispose of the waste generated from the business site by itself, or delegate it to a waste disposal business operator, a person who regenerates the waste of others, or a person who installs and operates a waste disposal facility.

- Compliance with the Waste Management Act.

14. Information Required for Transport

A. United Nations number (UN No.)

- UN 1950

B. UN proper shipping name

- AEROSOLS

C. Risk rating in transportation

- 2.1

D. Container rating

- No data

E. Marine pollutants

- Not Applicable

F. Special safety measures that users need or need to know about transportation or means of transportation

- In accordance with the Dangerous Goods Safety Control Act for local transportation.
- Packaging and transportation to DOT and other regulations.
- Types of emergency measures in case of fire: F-E (non-water-reactive flammable liquids)
- Types of emergency measures in case of spillage: S-E (floating on water)

15. Legal regulatory status

A. Regulation under the Occupational Safety and Health Act

○ Material to be measured in the working environment

- [Titanium dioxide] : Measurement cycle: 6 months
- [Acetone] : Measurement cycle: 6 months
- [Methyl acetate] : Measurement cycle: 6 months
- [n-Butyl acetate] : Measurement cycle: 6 months
- [Toluene] : Measurement cycle: 6 months
- [2-Butoxyethanol] : Measurement cycle: 6 months

○ Exposure criteria setting substances

- [Carbon Black]
- [Methyl acetate]
- [2-Butoxyethanol]
- [Acetone]
- [Titanium dioxide]
- [n-Butyl acetate]
- [Toluene]

○ Ministry of Employment and Labor Notice

* Carcinogenicity

- [2-Butoxyethanol] : Carcinogenicity 2
- [Titanium dioxide] : Carcinogenicity 2

* Reproductive cell mutagenicity

- No data

* Reproductive toxicity

- [Toluene] : Reproductive toxicity 2

○ Substances subject to PSM submission

- [Toluene]
- [n-Butyl acetate]
- [Acetone]
- [Methyl acetate]
- [Oxybismethane]
- [Propane]

○ Hazardous substances to be managed

- [2-Butoxyethanol]
- [Titanium dioxide]
- [Acetone]
- [Methyl acetate]
- [n-Butyl acetate]
- [Toluene]

○ Allowable standard setting substances

- [Toluene]

○ Substances subject to special health examination

- [2-Butoxyethanol] : Diagnosis cycle: 12 months
- [Acetone] : Diagnosis cycle: 12 months
- [Toluene] : Diagnosis cycle: 12 months

B. Regulation under the Chemical Substance Control Act

○ Toxic substances

- Not applicable (85% or more of Toluene)

○ Chemicals subject to emission investigation

- Applicable (Toluene containing not less than 1%)

○ Accident preparation material

- Not applicable (85% or more of Toluene)

○ Restricted substances

- Not applicable

○ Permitted substance

- Not applicable

C. Regulation under the Dangerous Goods Safety Management Act

- Dangerous goods: Category 4 oil (Designated quantity: 200 liters (non-water-soluble liquid))

D. Regulation under the Waste Management Act

- This product falls under the designated waste (waste paint and waste locker) according to the Enforcement Decree of the Waste Management Act (Attachment 1) among wastes generated at the workplace.

E. Other regulations under domestic and foreign laws

○ Residual Organic Pollutants Control Act

- Not Applicable

*** EU classification information**

*** Result of definitive classification**

- [Oxybismethane] : F+; R12
- [Acetone] : F; R11Xi; R36R66R67
- [Propane] : F+; R12
- [Methyl acetate] : F; R11 Xi; R36 R66 R67
- [Toluene] : F; R11 Repr.Cat.3; R63 Xn; R48/20-65 Xi; R38 R67
- [n-Butyl acetate] : R10 R66 R67
- [2-Butoxyethanol] : Xn; R20/21/22 Xi; R36/38

*** Risk statement**

- [Oxybismethane] : R12
- [Acetone] : R11, R36, R66, R67
- [Propane] : R12
- [Methyl acetate] : R11, R36, R66, R67
- [Toluene] : R11, R38, R48/20, R63, R65, R67
- [n-Butyl acetate] : R10, R66, R67
- [2-Butoxyethanol] : R20/21/22, R36/38

*** Safety statement**

- [Oxybismethane] : S2, S9, S16, S33
- [Acetone] : S2, S9, S16, S26, S46
- [Propane] : S2, S9, S16
- [Methyl acetate] : S2, S16, S26, S29, S33
- [Toluene] : S2, S36/37, S46, S62

- [n-Butyl acetate] : S2, S25
- [2-Butoxyethanol] : S2, S36/37, S46

○ **About U.S. Management**

- * **OSHA Regulation (29CFR1910.119)**
 - [Nitrocellulose] : 1133.9975 kg 2500 lb
- * **CERCLA 103 Regulation (40CFR302.4)**
 - [Acetone] : 2267.995 kg 5000 lb
 - [Toluene] : 453.599 kg 1000 lb
 - [n-Butyl acetate] : 2267.995 kg 5000 lb
- * **EPCRA 302 Regulation (40CFR355.30)**
 - Not Applicable
- * **EPCRA 304 Regulation (40CFR355.40)**
 - Not Applicable
- * **EPCRA 313 Regulations (40CFR372.65)**
 - [Toluene] : Applicable

○ **Rotterdam Convention Substances**

- Not Applicable

○ **Stockholm Convention Substances**

- Not Applicable

○ **Montreal Protocol Substances**

- Not Applicable

16. Other Notes

A. Source of data

- This MSDS is referred to in Article 110 of the Occupational Safety and Health Act (the provision of material safety and health data) and Notice No. 2023-9 of the Ministry of Employment and Labor (classification and labeling of chemicals, and Based on the criteria for material safety and health data), it is prepared in consideration of the current status of related regulatory laws and regulations in Korea.
- This MSDS was prepared based on KOSHA, NITE, ESIS, NLM, SIDS, IPCS, NCIS, etc.

B. Date of initial preparation

- 2023-11-06

C. Number of revisions and the date of final revisions

- th/

D. Other

- This information was prepared based on the DB currently available to protect worker health, environment, and safety.