

Material Safety Data (MSDS)

1. Information on chemical products and companies

A. Product name

- [IS-2001~2032] ILSIN Lacquer-Heavy Equipment COLOR

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

- P403+P235 Store in a well ventilated place and keep at low temperatures.
- P405 Store in a locked storage area.

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
Alkyd resin	-	68213-49-0	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	1 ~ 2.5
Barium sulfate, natural	Sulfuric acid, barium salt (1:1)	7727-43-7	1 ~ 5
C.I. pigment Orange 34		15793-73-4	1 ~ 2.5
Nitrocellulose	Pyroxylin	9004-70-0	1 ~ 5
Titanium dioxide	Titanium oxide (Tio2)	13463-67-7	1 ~ 5
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

- Do not rub your eyes.
- Flush eyes with plenty of water for at least 15 minutes.
- Get medical attention immediately.
- If symptoms (redness, irritation, etc.) occur, go to the hospital immediately.
- If you are wearing contact lenses, remove them first.

B. When it comes into contact with the skin

- Remove contaminated clothing and shoes and immediately rinse with soap and water for at least 15 minutes.
- Wash contaminated cloth thoroughly before reuse.
- Seek immediate medical attention.
- If symptoms (redness, irritation, etc.) occur, go to the hospital immediately.
- Wash thoroughly after handling.
- Prevent skin spread.

C. When you inhale it

- If exposed to large amounts of steam or mist, move to a place with fresh air.
- Take action as necessary.
- Seek immediate medical attention.
- If breathing is irregular or stops, perform artificial respiration and oxygen.

D. When you eat it

- Get advice from your doctor as to whether vomiting should be triggered.
- Rinse your mouth with water immediately.
- If swallowed, drink plenty of water and do not induce vomiting.
- Seek immediate medical attention.

E. Other doctor's precautions

- Inform medical personnel of the contamination so that they can Take appropriate protective measures.
- Seek medical attention and advice if exposed or concerned about exposure.

5. How to cope with an explosion or fire

A. Appropriate (and inappropriate) digestive medicine

- Water, carbon dioxide, powder, dry chemical fire extinguishing agent
- Water, Foams
- Powdered fire extinguishing agent, carbon dioxide, water, alcohol-type home
- Particulate powder fire extinguishing agent, carbon dioxide, water, common foams
- Avoid fire extinguishing using waterjets.

B. Specific hazards arising from chemicals

- Highly flammable liquids and vapors
- 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
- 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.
- Steam may cause dizziness or suffocation without awareness
- Irritates or burns skin and eyes on inhalation and contact

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

- Prevent access by unauthorized persons and prohibit entry into the hazardous area.
- Evacuate immediately if you hear the sound of a safety device activating or if the tank changes color due to a fire.

- Notify the fire department and inform them of the location of the fire and its hazardous characteristics.
- Wear appropriate protective equipment if necessary.
- Steam or gas can ignite from a distant ignition source and diffuse in an instant.
- These are materials with extremely low flash points, and the main water extinguishing effect may be small when extinguishing fires.

6. How to deal with leakage accidents

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

- Workers should wear appropriate protective equipment (see section 『8. Exposure prevention and personal protection』) to avoid contact with eyes and skin and inhalation.
- Ventilate before entering confined spaces.
- Move the container to an area safe from leakage.
- Wear protective equipment and dispose of damaged containers or leaking materials.
- Do not inject directly into spilled liquid and leak area.
- Prevent access to non-related persons, isolate dangerous areas, and prohibit entry.
- Do not clean and dispose without professional supervision.
- Avoid skin contact and breathing.

B. Measures necessary to protect the environment

- Prevent leakage from entering sewage systems and water systems.
- If there is a large amount of leakage, report it to 119, the Ministry of Environment, the Regional Environmental Management Agency, or the city or province (Environmental Guidance Division).

C. Purification or removal method

- Massive leakage: Avoid low-lying areas and stay in the opposite direction from the wind. Build and manage embankments for the disposal of leakage.
- If you discharge more than the standard amount, notify the central government and local governments of the emissions.
- Disposal by the Waste Management Act (Ministry of Environment).
- Collect in a suitable container for disposal of leaking material.
- Small amount leakage: Use sand or other non-flammable materials to absorb.
- Wipe off the solvent.
- Build the embankment for further processing.
- Prevent wastewater from entering or spreading into waterways, sewers and underground.
- Do not Use plastic containers.

7. Handling and storage methods

A. Safety handling tips

- Wash thoroughly after handling.
- Handle only in a well-ventilated area.
- Do not handle until all safety precautions have been read and understood.
- Use work shoes that prevent static electricity.
- Do not inhale vapors for long periods of time or repeatedly.
- Avoid contact with heat, sparks, flames or other ignition sources.
- Do not take contaminated clothing out of the workplace.

B. Safe storage method

- Check periodically for leaks.
- Do not apply heat directly.
- Store in accordance with current laws and regulations.
- Be aware of substances and conditions to avoid.
- Prevent static electricity and avoid storing near heat sources such as boilers or combustibles.
- Collect in an airtight container.
- Designate and store carcinogenic substances.
- Store in a place away from water supply and sewerage.

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

- The employer shall take necessary measures, such as installing facilities to suppress the emission of gas, gas, etc. or sealing the emission source of gas, etc. so that the concentration of gas, steam, mist, fume, or dust does not exceed the harmful level in the air.

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	heavy equipment color
B. Smell	The smell of solvent
C. Smell threshold	No data
D. pH	No data
E. Melting point/Freezing point	No data
F. Initial boiling point and boiling point range	No data
G. Flash point	-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 ~ 100Ku
S. molecular weight	No data

10. Stability and Reactivity

A. Possibility of chemical stability and adverse reactions

- Stable for recommended storage and handling.
- No adverse polymerization reaction.

B. Conditions to Avoid

- Avoid non-mixing substances and conditions.
- Avoid contact with heat, flame, flame or other sources of ignition.

C. Substances to be avoided

- No data

D. Hazardous substances produced during decomposition

- No data

11. Information on toxicity

A. Information on likely exposure routes

- ☐ (respiratory)
 - Swallowing into the airways can be harmful
- ☐ (Original)
 - No data
- ☐ (Eyes and Skin)
 - Severe irritation to the eyes
 - Irritation to the skin

B. Health Hazard Information

☐ Acute toxicity

* Oral toxicity

- [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 orange 34] : LD50 > 15000 mg/kg Rat
- [C.I. pigment yellow 083] : LD50 > 5000 mg/kg Rat (IUCLID; THOMSON)
- [Barium sulfate, natural] : LD50 > 3000 mg/kg Rat (IUCLID)
- [Nitrocellulose] : LD50 > 5000 mg/kg Rat (NITE(2006))
- [Titanium dioxide] : LD50 > 10000 mg/kg Rat (HSDB)
- [n-Butyl acetate] : LD50 = 14130 mg/kg Rat (HSDB)
- [2-Butoxyethanol] : LD50 = 1746 mg/kg Rat (SIDS (1997))

* Percutaneous toxicity

- [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
- [Titanium dioxide] : LD50 > 10000 mg/kg Rabbit (IUCLID)
- [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)
- [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
- [Titanium dioxide] : LC50 > 6.82 mg/l 4 hr Rat (NITE(2006))
- [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
- [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
- [C.I. pigment yellow 083] : OECD Guide-404 Rabbit Slightly irritating (IUCLID)
- [Barium sulfate, natural] : Non-irritating to humans (KOSHA)
- [Titanium dioxide] : Skin irritability tests in rabbits show mild irritability or non-irritability (NITE(2006))
- [Toluene] : Skin irritation, rabbit, Irritation, OECD Guide line 404 People, Skin irritability, guinea pig, Skin irritability
- [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
- [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).
- [C.I. pigment yellow 083] : OECD Guide-405 Rabbit: not irritating (IUCLID)
- [Barium sulfate, natural] : Mildly irritating to humans (KOSHA)
- [Titanium dioxide] : Eye irritation test results show mild irritability in rabbits (NITE(2006))
- [Toluene] : An eye irritation test using rabbits causes recoverable irritation for 6 days.
- [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

- [Acetone] : Mouse test result negative, guinea pig test result negative
- [Methyl acetate] : Negative on guinea pig test
- [Toluene] : Test result negative using guinea pig
- [Titanium dioxide] : Person to voice patch test results (NITE(2006))
- [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

- [2-Butoxyethanol] : Group 3
- [Titanium dioxide] : Group 2B
- [Toluene] : Group 3

* OSHA

- No data

* ACGIH

- [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
- [Acetone] : Nuclear test negative
- [Methyl acetate] : Results of micro-nuclear test using white mice negative
- [C.I. pigment yellow 083] : IN VITRO - AMES TEST - negative (IUCLID)

- [Titanium dioxide] : Mouse nuclear test negative, mouse chromosome aberration test negative (NITE(2006))
- [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.
 - [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**
 - [Propane] : LC50 52.157 mg/ℓ 48 hr
 - [Barium sulfate, natural] : EC50 = 32 mg/ℓ 48 hr Daphnia magna
 - [Titanium dioxide] : EC50 > 1000 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
 - [Barium sulfate, natural] : EC50 = 1890.263 mg/ℓ 96 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 orange 34] : log Kow = 10.64 (Estimation)
- [C.I. pigment yellow 083] : log Kow = 7.54
- [Barium sulfate, natural] : log Kow = 0.63
- [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 orange 34] : BCF = 10
- [C.I. pigment yellow 083] : BCF = 10
- [Barium sulfate, natural] : BCF = 3.162

○ 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

- [Barium sulfate, natural] : Measurement cycle: 6 months
- [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

- [Methyl acetate]
- [Barium sulfate, natural]
- [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

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

○ Hazardous substances to be managed

- [Barium sulfate, natural]
- [2-Butoxyethanol]
- [Titanium dioxide]
- [Acetone]
- [Methyl acetate]
- [n-Butyl acetate]
- [Toluene]

○ Allowable standard setting substances

- [Toluene]

○ Substances subject to special health examination

- [Barium sulfate, natural] : Diagnosis cycle: 12 months
- [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%)
 - Applicable (Barium sulfate containing more than 1%, natural)
- ☐ **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

- 2020-02-13

C. Number of revisions and the date of final revisions

- 7th/2024-09-05

D. Other

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