

물질안전보건자료

(Material Safety Data Sheet)

Name of the product

KUT370(A)-RAL1023

1. Information about chemicals and companies

A. Product name KUT370(A)-RAL1023

B. Recommended use of the product and restrictions on its use
Recommended use of the product general industrial paint
Product usage restrictions Do not use anything other than the intended use.

C. Supplier information (in case of imported goods, enter information of domestic suppliers that can be contacted urgently)
Corporate name Geumgang Paint Industrial Co., Ltd.
Address 454-2 Yongjeon-ri, Gokyeong-myeon, Yeongcheon-si, Gyeongsangbuk-do
Emergency phone number 054 338 7722

2. Harmful and dangerous

A. Hazard classification and risk classification
Inflammable liquids: Classification 2
Skin Corrosive/Skin irritability: Classification 2
Severe eye damage/eye irritation: Classification 2 (2A/2B)
Carcinogenicity: Classification 2
Reproductive toxicity: Classification 2

Specific target organ toxicity (one exposure): Classification 3 (anesthesia impact)
Specific target organ toxicity (one exposure): Classification 3 (anesthesia impact)

Specific target organ toxicity (one exposure): Classification 3 (respiratory irritation)
Specific target organ toxicity (repeated exposure): Category 1
Aspiration hazard: Classification 1

B. Warning signs including preventive measures

Picture text



a sign language

Dangers

H225 High Resilient Liquid and Steam

H304 Swallowing into the airways can be fatal

H315 Causes irritation to the skin

H319 Severe irritation to the eyes

H335 May cause respiratory irritation

H336 May cause drowsiness or dizziness

Hazardous and dangerous phrases

H351 Suspected to cause cancer (Describe the path of exposure to cause cancer; only if there is conclusive evidence that it does not cause cancer by other exposure pathways)
effect) (Describe the path of exposure that causes reproductive toxicity, provided there is conclusive evidence that it does not cause reproductive toxicity by other exposure pathways)

H372 Describe the exposure route that causes damage to the organ (specify all organs known to be affected by long-term or repeated exposure); provided, however, that there is conclusive evidence that it does not cause specific target organ toxicity (repeated exposure) by other exposure routes.)

Preventive measures statement

Obtain a manual for handling P201 before use.

Prevention

P202 Do not handle all safety precautions until you have read and understood them.

Keep away from P210 heat, hot surfaces, sparks, flames, and other sources of ignition.
No smoking

Seal the P233 container tightly.

Ground P240 containers and containers.

Use P241 explosion proof type [electric/ventilation/lighting/] equipment.

Prevention	Use a P242 spark-free tool.
	P243 Take antistatic measures.
	Do not inhale P260 dust/fume/gas/mist/steam/spray.
	P261 Avoid inhalation of dust/fume/gas/mist/steam/spray.
	Wash thoroughly after handling P264.
	P270 Do not eat, drink or smoke when using this product.
	P271 Only handle outdoors or in well-ventilated areas.
	P280 Wear protective gloves/protective glasses/facial protection.
	P301+P310 If swallowed: seek medical attention immediately.
	P302+P352 On skin: Wash with plenty of water.
Prevention	P303+P361+P353 When smeared on skin (or hair): Remove all contaminated clothing immediately.Wash your skin with water.
	If you inhale P304+P340: Move to a place with fresh air and rest in an easy-to-breathe position.
	P305+P351+P338 On your eyes: Wash carefully with water for a few minutes. Remove contact lenses if possible. Continue washing.
	P308+P313 If exposed or concerned about exposure: seek medical action/advice.
	P312 If you feel uncomfortable, consult a medical institution/doctor/doctor.
	P314 Get medical action/advice if you feel uncomfortable.
	P321 first aid.
	P331 Don't make me vomit.
	P332+P313 When skin irritation appears: seek medical action/advice.
	P337+P313 If eye irritation persists: seek medical action/advice.
Storage	P362+P364 Take off contaminated clothing and wash it before use again.
	P370+P378 In case of fire: Use appropriate equipment to extinguish the fire.
	P403+P233 Store in a well-ventilated place. Seal the container tightly.
Storage	P403+P235 Store in a well-ventilated place. Keep it low.
	Save with P405 lock.
Disposal	Dispose of contents/containers in accordance with P501 waste-related laws and regulations

3. Name and content of components			
Material name	Nomenclature (tolerance)	CAS number	content (%)
titanium dioxide		13463-67-7	5-11
butyl acetate	Normal-butyl acetate	123-86-4	0.1-3
	n-butyl acetate		
xylene	Xylene (Ortho, Meta, Paraic)	1330-20-7	28-36
	Dimethylbenzene (Oso, Meta, Para-isomer)		
	Xylene, o,m,p-isomers		
	Xylene(o,m,p-isomers)		
ethylbenzene	ethyl benzene	100-41-4	2-7
	Ethyl benzene		
propylene glycol monomethyl ether acetic acid	1-methoxy-2-propanol acetic acid (1-METHOXY-2-PROPANOL ACETATE);	108-65-6	3-10
C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	butaneamide, 2,2''-(3,3''-dichloro(1,1''-biphenyl)-4,4''-dyle)bis(azo))bis	5567-15-7	5-11
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	ORGANOPHILIC CLAY;	68953-58-2	0.1-2
dyrolytic acid dibutylin	DIBUTYLBIS (1- OXODODECYL.OXY.STANNANE);	77-58-7	0-0.02
2-Ethylhexanoic acid zinc salt		136-53-8	0.01-0.2
Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer		190524-90-4	26-35

4. First aid measures	
A. When it gets into your eyes	Wash your eyes immediately under running water for at least 20 minutes upon contact with any material

Take medical action immediately

Get urgent medical attention

Wash skin and eyes immediately with running water for at least 20 minutes upon contact with substances

Wash carefully with water for a few minutes when it gets on your eyes. Remove them if possible. Keep washing.

If eye irritation persists, seek medical action and advice.

Wash your skin immediately under running water for at least 20 minutes upon contact with any substance

Remove contaminated clothes and shoes and isolate them

Wash clothes and shoes thoroughly before reuse

Take medical action immediately

If it is a hot material, soak or wash the affected area in a large amount of cold water to remove heat

Get urgent medical attention

Remove contaminated clothes and shoes and isolate contaminated areas

Wash skin and eyes immediately with running water for at least 20 minutes upon contact with substances

Prevent the spread of contaminated areas during minor skin contact

In case of burns, cool the area immediately with cold water as long as possible, and do not remove any clothing attached to the skin

Wash your skin with soap and water

Remove or remove any contaminated clothing if it gets on the skin (or hair). Wash/shower your skin with water.

Remove all contaminated clothing if it gets on your skin (or hair). Wash/shower your skin with water.

If you feel uncomfortable, see a medical doctor.

If you feel uncomfortable, seek medical attention/advice.

Seek medical measures and advice if skin irritation occurs.

Ask for medical measures and advice if skin irritation or erythema appears.

Take off your contaminated clothing.

Wash contaminated clothing before use again.

Get urgent medical attention

Move to a place with fresh air

If you are not breathing, perform ventilation

If you have difficulty breathing, supply oxygen

Remove with clean air if exposed to excess dust or fumes and take medical action if you have cough or other symptoms.

Move to a place with fresh air

Get urgent medical attention

If you are not breathing, perform ventilation

If you have difficulty breathing, supply oxygen

Please keep it warm and stable

Seek medical measures and advice if exposed or concerned about exposure.

If you are exposed or concerned about exposure: seek medical action/advice.

If you feel exposed or uncomfortable, see a medical institution (doctor).

See a medical institution.

Don't make me vomit.

Don't feed an unconscious person anything with your mouth

Take medical action immediately

Get urgent medical attention

If you eat or inhale substances, do not ventilate using mouth-to-mouth mouth exercise and use appropriate respiratory equipment

If you have swallowed, see a medical doctor immediately.

Seek medical measures and advice if exposed or concerned about exposure.

If you are exposed or concerned about exposure: seek medical action/advice.

B. When you come into contact with your skin

C. When you inhale it

D. When I ate it

D. When I ate it

If you feel exposed or uncomfortable, see a medical institution (doctor).

Don't make me vomit.

E. Other precautions of doctors

Ensure that medical personnel are aware of 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 deal with explosions and fires

a. Proper (inappropriate) digestive medicine

an appropriate (inappropriate) digestive medicine

Small fire: dry sand, dry chemical, alcohol-resistant foam, water spray, general foam, CO2 (appropriate fire extinguishing agent)

Large fire: water spray/fog, regular foam (appropriate fire extinguishing agent)

High Pressure Water (Inadequate Digestive)

Use alcohol foam, carbon dioxide or water spray for digestion related to this substance

Use dry sand or soil for asphyxiation

b. Certain hazards arising from chemicals

a specific hazard arising from a chemical substance

Can be ignited by heat, spark and flame

Containers may explode when heated

Some may burn but do not ignite easily

In case of fire, irritable and toxic gases can be generated

Inhalation of substances can be harmful

Some liquids may cause dizziness and vapor that causes suffocation

Can decompose at high temperatures to produce toxic gases

Intense polymerization can cause fire and explosion

Steam can be transferred to ignition source and ignited

During burning, irritating and very toxic gases can be generated by pyrolysis or combustion

Can form explosive mixtures at or above flashpoints

Containers may explode when heated

High Mars: easily ignited by heat, spark, and flame

Leaks are at risk of fire/explosion

Risk of steam explosion indoors, outdoors, and sewers

Some may burn but do not ignite easily

Steam can form an explosive mixture with air

Steam can travel to ignition source and flash back

Some may produce combustible hydrogen gas when in contact with metal

Non-inflammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes

Some may ignite combustible materials with oxidizing agents

Toxic: Inhalation, ingestion, and skin contact can result in serious injury and death

Contact with molten materials can cause serious burns to the skin and eyes

Steam can cause dizziness or suffocation without awareness

In case of fire, irritable and toxic gases can be generated

Fire can cause irritable, corrosive, and toxic gases

Inhalation and contact irritates or burns skin and eyes

Inhalation and skin absorption may be toxic

Highly flammable liquids and vapors

Flammable liquids and vapors

C. Protective equipment and preventive measures to be worn in case of fire extinguishing

titanium dioxide

Rescuers should wear appropriate protective gear.

Digest away from the area and keep a safe distance

Please be careful as it may melt and be transported

Dig a ditch for the disposal of the digester so that the material does not scatter

If it's not dangerous, move the container out of the fire area

In case of tank fire, extinguish fire at maximum distance or use unmanned fire extinguishing equipment

In case of tank fire, cool the container with plenty of water even after extinguishing

In case of a tank fire, immediately withdraw from the pressure release unit if there is a high pitch or the tank discoloration

In the event of a tank fire, step back from the tank engulfed in flames

In case of tank fire, use unmanned fire extinguishing equipment and, if impossible, leave to burn

Rescuers should wear appropriate protective gear.

Digest away from the area and keep a safe distance

Most of them are lighter than water, so be careful

Because most vapors are heavier than air, they can diffuse along the ground and accumulate in low-lying or confined spaces

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If it's not dangerous, move the container out of the fire area

butyl acetate

xylene

Enylbenzene

propylene glycol monomethyl ether acetic acid

	Do not directly inject into exposed sources or safeguards as they may freeze in case of tank fire In case of tank fire, extinguish fire at maximum distance or use unmanned fire extinguishing equipment In case of tank fire, cool the container with plenty of water even after extinguishing In case of a tank fire, immediately withdraw from the pressure release unit if there is a high pitch or the tank discoloration In the event of a tank fire, step back from the tank engulfed in flames In case of tank fire, use unmanned fire extinguishing equipment and, if impossible, leave to burn
C.I. 색소 황색 83(C.I. PIGMENT YELLOW 83)	Digest away from the area and keep a safe distance Some may be transported at high temperatures, so be careful Dig a ditch for the disposal of the digester so that the material does not scatter If it's not dangerous, move the container out of the fire area In case of tank fire, cool the container with plenty of water even after extinguishing In case of a tank fire, immediately withdraw from the pressure release unit if there is a high pitch or the tank discoloration In the event of a tank fire, step back from the tank engulfed in flames
4차 암모늄 화합물, 비스(수소산 수지 알킬) 다이 메틸, 벤 토나이트와의 염(QUATERNARY AMMONIUM...	Rescuers should wear appropriate protective gear. Digest away from the area and keep a safe distance Please be careful as it may melt and be transported Dig a ditch for the disposal of the digester so that the material does not scatter If it's not dangerous, move the container out of the fire area In case of tank fire, extinguish fire at maximum distance or use unmanned fire extinguishing equipment In case of tank fire, cool the container with plenty of water even after extinguishing In case of a tank fire, immediately withdraw from the pressure release unit if there is a high pitch or the tank discoloration In the event of a tank fire, step back from the tank engulfed in flames In case of tank fire, use unmanned fire extinguishing equipment and, if impossible, leave to burn
dyrolytic acid dibutylin	appropriate protective gear. Digest away from the area and keep a safe distance Dig a ditch for the disposal of the digester so that the material does not scatter If it's not dangerous, move the container out of the fire area In case of tank fire, extinguish fire at maximum distance or use unmanned fire extinguishing equipment Do not allow water to enter the container In case of tank fire, cool the container with plenty of water even after extinguishing In case of a tank fire, immediately withdraw from the pressure release unit if there is a high pitch or the tank discoloration In the event of a tank fire, step back from the tank engulfed in flames
2-Ethylhexanoic acid zinc salt	Rescuers should wear appropriate protective gear. Digest away from the area and keep a safe distance Please be careful as it may melt and be transported Some may be transported at high temperatures, so be careful Dig a ditch for the disposal of the digester so that the material does not scatter If it's not dangerous, move the container out of the fire area In case of tank fire, extinguish fire at maximum distance or use unmanned fire extinguishing equipment In case of tank fire, cool the container with plenty of water even after extinguishing In case of a tank fire, immediately withdraw from the pressure release unit if there is a high pitch or the tank discoloration In the event of a tank fire, step back from the tank engulfed in flames
2-Ethylhexanoic acid zinc salt	In case of tank fire, use unmanned fire extinguishing equipment and, if impossible, leave to burn

Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.

- ↳ If it's not dangerous, move the container out of the fire area.
- ↳ Some may be transported to high temperatures.
- ↳ Leaks may cause contamination.
- ↳ Contact can cause burns to the skin and eyes.
- ↳ Dig a ditch for the disposal of the digester so that the material does not scatter.
- ↳ If it's not dangerous, move the container out of the fire area.
- ↳ In case of tank fire, cool the container with plenty of water even after extinguishing.
- ↳ In case of a tank fire, immediately withdraw from the pressure release unit if there is a high pitch or the tank discoloration.
- ↳ In case of tank fire, step back from the tank engulfed in flames

6. How to deal with leakage accidents

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

- Remove all ignition sources
- If it is not dangerous, stop the leak
- Pay attention to substances and conditions that should be avoided
- Ventilate contaminated areas
- Do not touch or walk around exposed objects
- Avoid dust formation
- Remove all ignition sources as very fine particles can cause fire or explosion.
- Wipe off any spills immediately, and follow the precautions of the protective equipment.
- Isolate the contaminated area.
- Those who do not need to enter or are not equipped with protective equipment should not enter.
- Do not touch or walk around exposed objects
- Remove all ignition sources
- Be sure to ground all equipment when handling substances
- If it is not dangerous, stop the leak
- Do not touch damaged containers or leaks without wearing proper protective clothing
- Steam suppression foam can be used to reduce steam generation
- Do not allow water to enter the container
- Cover with plastic sheet to stop diffusion
- Avoid dust formation
- Pay attention to substances and conditions that should be avoided
- Do not inhale dust/fume/gas/mist/steam/spray.
- Avoid inhaling (dust, fume, gas, mist, steam, and spray).

B. Measures necessary to protect the environment

- Prevent inflows into waterways, sewers, cellars, and enclosed spaces
- Leaks are corrosive/toxic and may cause contamination
- Leaks may cause contamination
- Prevent inflows into waterways, sewers, cellars, and enclosed spaces
- Do not discharge into the environment.

C. Methods of purification or removal

- In case of a small leak, wash off the contaminated area with a large amount of water
- In case of small leaks, absorb with sand, non-combustible material and place in container
- In case of large leaks, make a ditch away from liquid leaks
- Place the leak in a clean, dry container with a clean shovel, close loosely, and transfer the container from the leak area
- In case of powder leakage, cover with plastic sheet to prevent diffusion and keep dry
- Build a levee for digestion and collect water.
- Absorb spills with inert substances (e.g., dry sand or soil) and place them in a chemical waste container.
- Remove airy dust and wet with water to prevent it from dispersing.
- Absorb liquid and wash off contaminated areas with detergent and water.
- In case of large leaks, make a ditch away from liquid leaks
- Use a clean explosive device to collect absorbed material

C. Methods of purification or removal	Place the leak in a clean, dry container with a clean shovel, close loosely, and transfer the container from the leak area In case of powder leakage, cover with plastic sheet to prevent diffusion and keep dry In case of small leaks, absorb with sand, non-combustible material and place in container Collect the leak.
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7. HANDLING AND STORAGE METHOD

A. Safety instructions	Pay attention to substances and conditions that should be avoided Wash thoroughly after handling Work with reference to engineering care and personal protective equipment Watch out for high temperatures Do not apply pressure, cut, weld, solder, bond, pierce, grind, or expose to heat, flame, flame, static electricity, or any other ignition source. Follow all MSDS/label precautions as product debris may remain after the container has been emptied. Use carefully when handling/storing. Open the cap carefully before opening. Avoid long-term or continuous skin contact. Do not breathe steam from heated materials. Do not enter the storage area without proper ventilation. Be sure to ground all equipment when handling substances Pay attention to substances and conditions that should be avoided Pay attention to substances and conditions that should be avoided Work with reference to engineering care and personal protective equipment Watch out for high temperatures Measure and ventilate the oxygen concentration in the air during work as there is a risk of oxygen deficiency when working in a confined space in low-lying areas Do not handle all safety precautions until you have read and understood them. Use explosion-proof electricity, ventilation, lighting, and equipment. Use only non-sparking tools. Take antistatic measures. Avoid inhaling (dust, fume, gas, mist, steam, and spray). Wash the handling area thoroughly after handling. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not eat, drink or smoke when using this product. Only handle outdoors or in well ventilated areas. Do not take contaminated clothing out of the workshop.
B. A safe way to store	Keep it airtight Store in a cool, dry place Pay attention to substances and conditions that should be avoided Drain the empty drum completely and block it properly, immediately return it to the drum controller or arrange it properly. Stay away from food and beverages. Pay attention to substances and conditions that should be avoided Stay away from heat, sparks, flames, and high fever – don't smoke Store the container tightly sealed in a well-ventilated place. Store in a well-ventilated place and keep at low temperatures. Store in a locked storage area. Lock and save.

8. Exposure Prevention and Personal Protection

A. Chemical exposure standards, biological exposure standards, etc
domestic regulations

	titanium dioxide	TWA – 10mg/m3 Carcinogenic 2
	butyl acetate	TWA – 150ppm STEL – 200ppm
	xylene	TWA – 100ppm STEL – 150ppm
	ethylbenzene	TWA – 100ppm STEL – 125ppm
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	TWA – 0.1 mg/m3 tin (organic compounds)
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	ACGIH regulations	
	titanium dioxide	TWA 10 mg/m³
	butyl acetate	TWA 50 ppm
	butyl acetate	STEL 150 ppm
	xylene	STEL 150 ppm
	xylene	TWA 100 ppm
	ethylbenzene	TWA 20 ppm
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	STEL 0.2 mg/m³
	dyrolytic acid dibutylin	TWA 0.1 mg/m³
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	biological exposure standards	
	titanium dioxide	No data
	butyl acetate	No data
	xylene	No data
	ethylbenzene	0.15 g/g creatinine Medium: urine Time: end of shift Parameter: Sum of mandelic acid and phenylglyoxylic acid (nonspecific)
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	Other exposure criteria	
	titanium dioxide	No data
	butyl acetate	No data
	xylene	No data

83)	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
B. Proper engineering management		
B. Proper engineering management		Use process isolation, local exhaust, or keep the air level below the exposure limit
B. Proper engineering management		Use process isolation, local exhaust, or other engineering management to adjust the air level below the exposure limit.
B. Proper engineering management		If dust, fumes, or mist is generated during operation, ventilate to ensure air pollution remains below the exposure limit
B. Proper engineering management		Install face wash facilities and safety showers for facilities that store or use this substance.
C. Personal protective equipment		
Respiratory protection		
titanium dioxide		Carcinogenic 2
titanium dioxide		Wear respirators certified by the Korea Occupational Safety and Health Agency that conform to the physicochemical properties of exposed particulate matter
titanium dioxide		If the exposure concentration is less than 100mg/m3, wear the appropriate type of filter while wearing the type of respirator
titanium dioxide		If the exposure concentration is less than 250 mg/m3, wear a loose-fitting hood/helmet type electric respirator or continuous flow dust mask with the appropriate type of filter
titanium dioxide		If the exposure concentration is lower than 500mg/m3, wear a front or electric or air-supplied continuous flow/pressure requirement type respirator with appropriate filter
titanium dioxide		If the exposure concentration is lower than 10000mg/m3, wear a front or helmet/hood type with appropriate filter, pressure-required air mask
titanium dioxide		If the exposure concentration is lower than 100000 mg/m3, wear a self-airing (SCBA) or pressure-required self-airing (SCBA) respirator with appropriate filters
butyl acetate		Wear respirators certified by the Korea Occupational Safety and Health Agency to suit the exposed gas/liquid physicochemical characteristics
butyl acetate		If the exposure concentration is lower than 1500 ppm, wear an appropriate filter or purifier while wearing a type of respirator
butyl acetate		If the exposure concentration is lower than 3750ppm, wear a loose-fitting hood/helmet type electric respirator or continuous flow dust mask/gas mask (the dust mask is only for liquid aerosols)
butyl acetate		If the exposure concentration is lower than 7500 ppm, wear a front or electric continuous flow/pressure requirement type respirator with appropriate filter or septic tank
butyl acetate		If the exposure concentration is lower than 1500 ppm, wear a front or helmet/hood type with appropriate filter or purification tank, pressure-required air mask
butyl acetate		If the exposure concentration is lower than 1500000 ppm, wear a self-air supply (SCBA) or pressure-required self-air supply (SCBA) respirator equipped with appropriate filters or septic tanks
xylene		Wear respirators certified by the Korea Occupational Safety and Health Agency to suit the exposed gas/liquid physicochemical characteristics
xylene		If the exposure concentration is less than 1000 ppm, wear an appropriate filter or purifier while wearing a type of respirator
xylene		If the exposure concentration is lower than 2500 ppm, wear a loose-fitting hood/helmet type electric respirator or continuous flow dust mask/gas mask (the dust mask is only for liquid aerosols)

xylylene	If the exposure concentration is lower than 5000 ppm, wear a front or electric half-flow/pressure-requiring continuous flow/pressure-requiring half-breathing device with appropriate filters or septic tanks
xylylene	If the exposure concentration is lower than 100000 ppm, wear a front or helmet/hood type, pressure-required air mask with appropriate filters or septic tanks
xylylene	If the exposure concentration is lower than 1000000ppm, wear a self-air supply (SCBA) or pressure-required self-air supply (SCBA) respirator equipped with appropriate filters or septic tanks
ethylbenzene	Wear respirators certified by the Korea Occupational Safety and Health Agency to suit the exposed gas/liquid physicochemical characteristics
ethylbenzene	If the exposure concentration is less than 1000 ppm, wear an appropriate filter or purifier while wearing a type of respirator
ethylbenzene	If the exposure concentration is lower than 2500 ppm, wear a loose-fitting hood/helmet type electric respirator or continuous flow dust mask/gas mask (the dust mask is only for liquid aerosols)
ethylbenzene	If the exposure concentration is lower than 5000 ppm, wear a front or electric half-flow/pressure-requiring continuous flow/pressure-requiring half-breathing device with appropriate filters or septic tanks
ethylbenzene	If the exposure concentration is lower than 100000 ppm, wear a front or helmet/hood type, pressure-required air mask with appropriate filters or septic tanks
ethylbenzene	If the exposure concentration is lower than 1000000ppm, wear a self-air supply (SCBA) or pressure-required self-air supply (SCBA) respirator equipped with appropriate filters or septic tanks
propylene glycol monomethyl ether acetic acid	Wear respirators certified by the Occupational Safety and Health Agency that conform to the physicochemical properties of exposed gases/liquid
propylene glycol monomethyl ether acetic acid	For gas/liquid substances, the following respirator is recommended ㉞ - Isolated front gas mask (for organic compounds (for acid gases in case of acid gases) or Isolated front gas mask (for organic compounds (for acid gases in case of acid gases) or direct front gas mask (for organic compounds (for acid gases in case of acid gases) or on the other hand gas mask (for organic compounds (for acid gases in case of acid gases) or electric gas mask
propylene glycol monomethyl ether acetic acid	If oxygen is low (<19.5%), wear a vent mask or self-contained air respirator
C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	Wear respirators certified by the Occupational Safety and Health Agency that conform to the physicochemical properties of exposed particulate matter
83) C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	For particulate matter, the following respiratory protection is recommended㉞ - Filtered face mask or air-filtered dust mask (high-efficiency particulate filter) or electric fan-attached dust mask (dust, mist, fume filter) "
83) C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	If oxygen is low (<19.6%), wear a ventilation mask or self-contained respirator
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Wear respirators certified by the Occupational Safety and Health Agency that conform to the physicochemical properties of exposed particulate matter
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	For particulate matter, the following respiratory protection is recommended㉞ - A face filter type dust mask or air filter type dust mask (high-efficiency particulate filter material) or a dust mask with an electric fan (minutes)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	If oxygen is low (<19.6%), wear a ventilation mask or self-contained respirator
dyrolytic acid dibutyltin	Tin (organic compound)
dyrolytic acid dibutyltin	Wear respirators certified by the Korea Occupational Safety and Health Agency to suit the exposed gas/liquid physicochemical characteristics
dyrolytic acid dibutyltin	If the exposure concentration is less than 1 mg/m3, wear a suitable filter or a septic while wearing a type of respirator
dyrolytic acid dibutyltin	If the exposure concentration is lower than 2.5 mg/m3, wear a loose-fitting hood/helmet type electric respirator or continuous flow dust mask (the dust mask is only for liquid aerosols)
dyrolytic acid dibutyltin	If the exposure concentration is lower than 5 mg/m3, wear a front or electric type or air-supplied continuous flow type/pressure requirement type respirator with appropriate filter or septic tank
dyrolytic acid dibutyltin	If the exposure concentration is less than 100mg/m3, wear a front or helmet/hood type with appropriate filter or purification tank, pressure-required air mask

dyrolytic acid dibutylin	If the exposure concentration is lower than 1000mg/m ³ , wear a self-air supply (SCBA) or pressure-required self-air supply (SCBA) respirator with appropriate filter or purification tank
2-Ethylhexanoic acid zinc salt	Wear respirators certified by the Occupational Safety and Health Agency that conform to the physicochemical properties of exposed gases/liquid
2-Ethylhexanoic acid zinc salt	For gas/liquid substances, the following respirator is recommended ⚡ –Isolated front gas mask (for organic compounds (for acid gases in case of acid gases) or Isolated front gas mask (for organic compounds (for acid gases in case of acid gases) or direct front gas mask (for organic compounds (for acid gases in case of acid gases) or on the other hand gas mask (for organic compounds (for acid gases in case of acid gases) or electric gas mask
2-Ethylhexanoic acid zinc salt	If oxygen is low (<19.5%), wear a vent mask or self-contained air respirator
Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Wear a respirator certified by the Occupational Safety and Health Agency to match the physicochemical properties of the exposed material
Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	–A face filter type dust mask or an air filter type dust mask (high-efficiency fine particle filter) or a dust mask with an electric fan (dust, mist, fume filter)
Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	For gas/liquid substances, the following respiratory protection is recommended ⚡ –Isolated front gas mask (for organic compounds (for acid gases in case of acid gases) or Isolated front gas mask (for organic compounds (for acid gases in case of acid gases) or direct front gas mask (for organic compounds (for acid gases in case of acid gases) or on the other hand gas mask (for organic compounds (for acid gases in case of acid gases) or electric gas mask
eye protection	Wear breathable goggles to protect your eyes against particulate matter that may irritate your eyes or cause other health problems
eye protection	Install emergency cleaning facilities (shower type) and face wash facilities in locations where workers can access them
eye protection	Wear safety glasses or breathable goggles to protect your eyes from vaporized organic substances that cause eye irritation or other health problems Install emergency cleaning facilities (shower type) and face wash facilities in locations where workers can access them
eye protection	Wear breathable safety glasses to protect your eyes against particulate matter that may irritate your eyes or cause other health problems
eye protection	Install emergency cleaning facilities (shower type) and face wash facilities in locations where workers can access them
eye protection	To protect your eyes from vaporized organic substances that cause eye irritation or other health problems, wear safety or breathable safety glasses Install emergency cleaning facilities (shower type) and face wash facilities in locations where workers can access them
eye protection	Wear the following safety glasses that may cause eye irritation or other health problems. – Closed-type safety glasses for gaseous organic matter – Air-permeable safety glasses for vapor organic matter – Air-permeable safety glasses for particulate matter Install emergency cleaning facilities (shower type) and face wash facilities in locations where workers can access them
Hand protection	Wear protective gloves of appropriate material considering the physical and chemical properties of chemicals
physical protection	Wear protective clothing of appropriate material considering the physical and chemical properties of the chemical

9. PHYSICAL CHEMICAL CHARACTERISTICS

A. Appearance

character

Liquid

Color

Colored

I. The smell

No data

C. Smell threshold

No data

D. pH

No data

E. Melting/freezing point

No data

F. Initial boiling point and boiling point range

No data

G. A flashpoint	No data
H. Evaporation rate	No data
I. Flammable (solid, gas)	No data
J. Upper/lower limits on the range of flammables or	No data
J. Steam pressure	No data
T. Solubility	No data
F. Steam density	No data
Ha. Specific gravity	0.9–1.3
G. N–octanol/water distribution coefficient (Kow)	No data
You. Natural firing temperature	No data
More. Decomposition temperature	No data
R. Viscosity	50–70
M. molecular weight	No data

10. Stability and Reactivity

a. Chemical stability and possibility of adverse reactions

titanium dioxide	Can decompose at high temperatures to produce toxic gases
titanium dioxide	Containers may explode when heated
titanium dioxide	Some may burn but do not ignite easily
titanium dioxide	Non–flammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes
butyl acetate	Flammable liquids and vapors
butyl acetate	Intense polymerization can cause fire and explosion
butyl acetate	Can form explosive mixtures at or above flashpoints
butyl acetate	Containers may explode when heated
butyl acetate	High Mars: easily ignited by heat, spark, and flame
butyl acetate	Leaks are at risk of fire/explosion
butyl acetate	Risk of steam explosion indoors, outdoors, and sewers
butyl acetate	Steam can form an explosive mixture with air
butyl acetate	Steam can travel to ignition source and flash back
butyl acetate	Fire can cause irritable, corrosive, and toxic gases
butyl acetate	Inhalation and skin absorption may be toxic
xylene	Highly flammable liquids and vapors
xylene	Intense polymerization can cause fire and explosion
xylene	Can form explosive mixtures at or above flashpoints
xylene	Containers may explode when heated
xylene	High Mars: easily ignited by heat, spark, and flame
xylene	Leaks are at risk of fire/explosion
xylene	Risk of steam explosion indoors, outdoors, and sewers
xylene	Steam can form an explosive mixture with air
xylene	Steam can travel to ignition source and flash back
xylene	Steam can cause dizziness or suffocation without awareness
xylene	Fire can cause irritable, corrosive, and toxic gases
xylene	Inhalation and contact irritates or burns skin and eyes
xylene	Inhalation and skin absorption may be toxic
ethylbenzene	Highly flammable liquids and vapors
ethylbenzene	Intense polymerization can cause fire and explosion
ethylbenzene	Can form explosive mixtures at or above flashpoints
ethylbenzene	Containers may explode when heated
ethylbenzene	High Mars: easily ignited by heat, spark, and flame
ethylbenzene	Leaks are at risk of fire/explosion
ethylbenzene	Risk of steam explosion indoors, outdoors, and sewers
ethylbenzene	Steam can form an explosive mixture with air
ethylbenzene	Steam can travel to ignition source and flash back
ethylbenzene	Inhalation and skin absorption may be toxic

	propylene glycol monomethyl ether acetic acid	Flammable liquids and vapors
	propylene glycol monomethyl ether acetic acid	Intense polymerization can cause fire and explosion
	propylene glycol monomethyl ether acetic acid	Can form explosive mixtures at or above flashpoints
	propylene glycol monomethyl ether acetic acid	Containers may explode when heated
	propylene glycol monomethyl ether acetic acid	High Mars: easily ignited by heat, spark, and flame
	propylene glycol monomethyl ether acetic acid	Leaks are at risk of fire/explosion
	propylene glycol monomethyl ether acetic acid	Risk of steam explosion indoors, outdoors, and sewers
	propylene glycol monomethyl ether acetic acid	Steam can form an explosive mixture with air
	propylene glycol monomethyl ether acetic acid	Steam can travel to ignition source and flash back
	propylene glycol monomethyl ether acetic acid	Steam can cause dizziness or suffocation without awareness
	propylene glycol monomethyl ether acetic acid	Fire can cause irritable, corrosive, and toxic gases
	propylene glycol monomethyl ether acetic acid	Inhalation and contact irritates or burns skin and eyes
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Containers may explode when heated
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Some may burn but do not ignite easily
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	In case of fire, irritable and toxic gases can be generated
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Containers may explode when heated
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Some may burn but do not ignite easily
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Non-inflammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Fire can cause irritable, corrosive, and toxic gases
	dyrolytic acid dibutylin	Can decompose at high temperatures to produce toxic gases
	dyrolytic acid dibutylin	Containers may explode when heated
	dyrolytic acid dibutylin	Some may produce combustible hydrogen gas when in contact with metal
	dyrolytic acid dibutylin	Non-inflammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes
	dyrolytic acid dibutylin	Some may ignite combustible materials with oxidizing agents
	dyrolytic acid dibutylin	Toxic: Inhalation, ingestion, and skin contact can result in serious injury and death
	dyrolytic acid dibutylin	Contact with molten materials can cause serious burns to the skin and eyes
	2-Ethylhexanoic acid zinc salt	Can decompose at high temperatures to produce toxic gases
	2-Ethylhexanoic acid zinc salt	Containers may explode when heated
	2-Ethylhexanoic acid zinc salt	Some may burn but do not ignite easily
	2-Ethylhexanoic acid zinc salt	Non-inflammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Stable at room temperature and pressure♪ Containers may explode when heated♪ Some may burn but do not ignite easily♪ In case of fire, irritable and toxic gases can be generated♪ Inhalation of substances can be harmful♪ Some liquids are giddy, and vapor that causes suffocation can occur.

B. Conditions to avoid

titanium dioxide	Ignition sources such as heat, spark, flame, etc
butyl acetate	Stay away from heat, sparks, flames, and high fever – don't smoke

83)	xylene	Stay away from heat, sparks, flames, and high fever – don't smoke
	ethylbenzene	Stay away from heat, sparks, flames, and high fever – don't smoke
	propylene glycol monomethyl ether acetic acid	Stay away from heat, sparks, flames, and high fever – don't smoke
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
	Heat	
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
	Ignition sources such as heat, spark, flame, etc	
	dyrolytic acid dibutylin	Heat
	2-Ethylhexanoic acid zinc salt	Ignition sources such as heat, spark, flame, etc
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Ignition sources such as heat, spark, flame, etc
C. Substances that should be avoided		
	titanium dioxide	combustible substances
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
C.I.	No data	
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
	combustible substances	
	dyrolytic acid dibutylin	combustible substances
	dyrolytic acid dibutylin	Metal
	2-Ethylhexanoic acid zinc salt	combustible substances
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	
	combustible substances	
	irritable, toxic gases"	
D. Hazardous substances produced during decomposition		
83)	titanium dioxide	
	titanium dioxide	Corrosive/toxic fumes
	butyl acetate	irritable, corrosive, toxic gases
	xylene	irritable, corrosive, toxic gases
	ethylbenzene	During burning, irritating and very toxic gases can be generated by pyrolysis or combustion
	propylene glycol monomethyl ether acetic acid	During burning, irritating and very toxic gases can be generated by pyrolysis or combustion
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
	irritable, corrosive, toxic gases	
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
	irritable, toxic gases	
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
	During burning, irritating and very toxic gases can be generated by pyrolysis or combustion	
	dyrolytic acid dibutylin	Corrosive/toxic fumes
	dyrolytic acid dibutylin	Corrosive/toxic fumes
	2-Ethylhexanoic acid zinc salt	irritable, corrosive, toxic gases
	2-Ethylhexanoic acid zinc salt	During burning, irritating and very toxic gases can be generated by pyrolysis or combustion
	2-Ethylhexanoic acid zinc salt	Corrosive/toxic fumes
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	
	irritable, toxic gases	
	No data	

11. Information about toxicity

A. Information on most likely exposure routes

titanium dioxide	No data
butyl acetate	No data
xylene	No data
ethylbenzene	No data
propylene glycol monomethyl ether acetic acid	No data
C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
dyrolytic acid dibutylin	No data
2-Ethylhexanoic acid zinc salt	No data
Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data

B. Health hazard information

acute toxicity	
an oral form	
titanium dioxide	LD50 > 2000 mg/kg Mouse (OECD TG 420)
butyl acetate	LD50 3200 ml/kg Rat (OECD TG 423)
xylene	LD50 3523 mg/kg Rat (EU Method B1)
ethylbenzene	LD50 3500 mg/kg Rat
propylene glycol monomethyl ether acetic acid	LD50 8532 mg/kg Rat
C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	LD50 > 5000 mg/kg Rat
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	LD50 > 5000 mg/kg Rat
dyrolytic acid dibutylin	LD50 2071 mg/kg Rat
dyrolytic acid dibutylin	No data
2-Ethylhexanoic acid zinc salt	LD50 > 2000 mg/kg Rat (no death)
Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
transdermal skin	
titanium dioxide	No data
butyl acetate	LD50 > 17600 mg/kg Rabbit (OECD TG 402)
xylene	No data
ethylbenzene	LD50 > 20000 mg/kg Rabbit (OECD Guideline 402 GLP)
propylene glycol monomethyl ether acetic acid	LD50 > 5000 mg/kg Rabbit
C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
dyrolytic acid dibutylin	LD50 > 2000 mg/kg Rat
dyrolytic acid dibutylin	No data
2-Ethylhexanoic acid zinc salt	LD50 > 2000 mg/kg Rat (No Death Similar Substance: 149-57-5 OECD TG 402, GLP)
Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data

83)	Inhale	
	titanium dioxide	Dust LC50> 6.82 mg/L Rat (OECD TG 403, No Death)
	butyl acetate	Steam LC50 1802 mg/L Rat
	xylene	Steam LC50 5922 ppm 4 hr Rat (25.713 mg/LEPA OPP 81–3, GLP;1330–20–7; EU CLP Harmonization Classification: Classification 4)
	ethylbenzene	
		Steam LC50 4000 ppm 4hr Rat (Rad LC50=4000 ppm 4hr conversion: 17.8 mg/L (ECHA, HSDB), RD50=1432 ppm 6.2 mg/L; EU CLP Harmonization Classification 4)
	propylene glycol monomethyl ether acetic acid	
		Steam LC0> 2000 ppm 3 hr Rat (no death observed at the corresponding concentration)
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
		No data
83)	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
		분진 LC50> 12.6 mg/ℓ 4 hr Rat (GLP data)
	dyrolytic acid dibutylin	Gas LD50> 2000 mg/kg Rat
	dyrolytic acid dibutylin	No data
	2–Ethylhexanoic acid zinc salt	
		Dust LC50> 5.7 mg/l 4 hr Rat (No Death Similar Substance: 1314–13–2 OECD TG 403)
	Styrene, 2–hydroxyethyl methacrylate,n–butylacrylate, n–butyl methacrylate,2–ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	Corrosive or irritable skin	
	titanium dioxide	The results of skin corrosion/stimulation test using rabbits showed no irritation, erythema index = 0, OECD TG 404
83)	butyl acetate	
		Skin Corrosion/Stimulating Test Results in Rabbits Do Not Show Stimulus OECD TG 404
	xylene	A skin irritation test using rabbits. EU Method B.4 results show that the primary skin irritation index 3 is intermediate irritation
	ethylbenzene	The results of the skin irritation test using rabbits show moderate irritation
	propylene glycol monomethyl ether acetic acid	
		Rabbit: No irritation
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
		OECD Guide–404 Lightly Irritating
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
		No irritation to the skin
83)	dyrolytic acid dibutylin	Corrosive, rat, OECD TG 402
	2–Ethylhexanoic acid zinc salt	
		As a result of skin corrosiveness/stimulation test using Rabbit, irritability observed OECD TG 404, GLP–like substance CAS No. 85203–81–2
	Styrene, 2–hydroxyethyl methacrylate,n–butylacrylate, n–butyl methacrylate,2–ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	Severe eye damage or irritation	
	titanium dioxide	Severe eye damage/stimulation test results with rabbits do not show irritation. Conjunctival redness index = 1–2, OECD TG 405, GLP
	butyl acetate	
		Severe eye damage/stimulation tests in rabbits show no eye irritation: 0.33/4, iris: 0.56/2, conjunctival index: 1/3, conjunctival edema index: 0.33/4 OECD TG 405, GLP
	xylene	
83)		Short–term Exposure Criteria Show eye and respiratory irritation effects on human bodies exposed to mixed xylene at 100 ppm STEL) o– Conjunctive redness (vessels diffuse more above normal and crimson, individual vessels are not easily identified) was observed upon xylene infusion in rabbits, . Conjunctive chemo (swelling above normal) and conjunctival secretions (above normal) were observed in 5 rabbits at 1 hour after ophthalmology) Regulations on the classification and labeling of chemicals by the Ministry of Environment: Classification 2
	ethylbenzene	
		As a result of the eye irritation test in rabbits, there was no mild irritation or corneal damage to the conjunctiva
	propylene glycol monomethyl ether acetic acid	
		Rabbit: Weak irritation
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
		OECD Guide–405 Rabbit: No Irritating

83)	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Moderate eye irritation observed in animal experiments
	dyrolytic acid dibutylin	High irritability, Rabbit, completely reversible within 21 days, OECD TG 405
	2-Ethylhexanoic acid zinc salt	Severe eye damage/stimulation test results using a rabbit showed irritability (OECD TG 405, GLP) (similar substance CAS No. 85203-81-2)
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	respiratory sensitivity	
	titanium dioxide	No data
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	skin sensitivity	
	titanium dioxide	Skin sensitivity test using guinea pigs does not cause skin sensitivity, OECD TG 403
	butyl acetate	Buehler test result with guinea pig non-hypersensitive OECD TG 406
	xylene	Mice Localized Lymph node test OECD TG 429 Non-hypersensitivity
	ethylbenzene	No data
83)	propylene glycol monomethyl ether acetic acid	Guinea pig/maximization test (GLP): No hypersensitivity
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Does not cause skin sensitivity
	dyrolytic acid dibutylin	Irritable, Guinea pig, GLP, female/male, guinea pig maximization test (GMPT): Capacity level: 0.2 g paste at 10% test substance con., Reaction: 20/20, OECD TG 406
	2-Ethylhexanoic acid zinc salt	As a result of the skin sensitivity test using guinea pigs, OECD TG 406, GLP-like substance CAS No. 1314-13-2 does not show hypersensitivity
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	carcinogenicity	
	Occupational Safety and Health Act	
	titanium dioxide	No data
	butyl acetate	No data
83)	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data

	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
Ministry of Employment and Labor Examination		
	titanium dioxide	2
	butyl acetate	No data
	xylene	No data
	ethylbenzene	2
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
IARC		
	titanium dioxide	2B
	butyl acetate	No data
	xylene	3
	ethylbenzene	2B
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	Let's.
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
OSHA		
	titanium dioxide	No data
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)		
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
ACGIH		
	titanium dioxide	A4
	butyl acetate	No data

	xylene	A4
	ethylbenzene	A3
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	NTP	
	titanium dioxide	No data
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	EU CLP	
	titanium dioxide	2 (limited to powder form containing 1% or more of particles with an aerodynamic diameter of 10 µm or less)
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	germ cell mutagenicity	
	titanium dioxide	The results of the return mutation test using microorganisms in vitro OECD TG 471, mammalian cell genetic mutation test OECD TG 476, chromosomal aberration test OECD TG 473 are negative regardless of metabolic activity, chromosomal aberration test in vivo, and color fading test are negative
	butyl acetate	As a result of the in vitro bacterial return mutation test with microorganisms, negative OECD Guideline 471 with or without metabolism In vivo mammalian erythrocyte micronuclear test results negative OECD Guideline 474
	xylene	Returned mutation test using in vitro bacteria OECD TG471 result negative, small nuclear test using mouse bone marrow cells in vivo OEF 474, GLP result negative

	ethylbenzene	Genotoxicity test using mouse lymphoma L5178Y cell negative, chromosomal aberration test using CHO cells negative, OECD TG476, GLP, OECD TG 473
	propylene glycol monomethyl ether acetic acid	Micronuclear test results using mouse bone marrow cells negative, Unscheduled DNA synthesis using mammalian hepatocytes; UDS test results negative, OECD TG474, OECD TG486, GLP"
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	In vitro – Salmonella typhimurium/TA98, TA100, TA1535, TA1537 (Retro–Mutant Test, GLP): Negative (negative), CHL Cells/Chromosomal Abnormal Test (GLP): Negative (negative), Rat hepatocyte/UDS Test (GLP): Negative (negative) in the absence of metabolic system
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	IN VITRO – AMES TEST – 음성
	dyrolytic acid dibutylin	No data
	2–Ethylhexanoic acid zinc salt	in vitro – reversible mutation test with bacteria: negative (S. typhimurium TA1535, TA1537, TA98, TA100, regardless of metabolism), OECD TG 471
	Styrene, 2–hydroxyethyl methacrylate,n–butylacrylate, n–butyl methacrylate,2–ethylhexyl acrylate,methylmethacrylate copolymer.	OECD TG 471, GLP, Mammal Chromosome Abnormalities, OECD TG 473, GLP, Mammal Chromosome Abnormalities, OECD TG 476, GLP Results, Negative Similar Substance CAS No. 149–57–57–5 with or without metabolic activity. In vivo mammalian erythrocyte micronuclear test OECD TG 474, GLP result negative similar substance CAS No. 1314–13–2"
	reproductive toxicity	No data
	titanium dioxide	
	butyl acetate	
	xylene	As a result of the reproductive development toxicity test using rats, no effects such as clinical symptoms or weight change were observed. NOAEL= 1000 mg/kg bw/day (OECD TG 210)
	ethylbenzene	
		The second generation of reproductive toxicity tests in rats showed weight, weight gain and food intake reduction at 1500 ppm to 2000 ppm (NOAELsystemic toxicity, adult rats=750 ppm (normal)) (OECD TG 416, GLP) ♪ In rats, fetal developmental toxicity tests showed weight loss, reduced baby size, and rib deformities, but maternal toxicity was found to be greater than developmental toxicity (NOAELmaternal toxicity=2.5 mg/liter (normal), NOAELateratogenicity=10 mg/liter (normal)) (GLP, OECD Guideline 414).
	propylene glycol monomethyl ether acetic acid	
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Chemical Substance Information Processing System As a result of the second generation inhaled reproductive toxicity test (OECD TG416, GLP) with rats, no adverse effects related to reproduction or development were observed up to 500 ppm. NOEL for parental systemic toxicity is NOEL=100 ppm due to weight loss and liver weight gain.♪ As a result of the inhalation development toxicity test (EOCD TG414, GLP) using rats, no deformity effect was observed up to 2000 ppm. Neonatal weight loss at 1000 or 2000 ppm was weak. Maternal toxicity decreased weight and feed consumption at 1000 and 2000 ppm. NOAEL=2000ppm and NOAEL(Maternal/Development Toxicity)=500ppm are shown.
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Rats/Expressions (0, 100, 300, 1000 mg/kg/day for 44D (M) and 41–45D(F)) (GLP): No toxic effects on reproductive variables ♪ Rat/Inhalation (500, 2000, 4000 ppm for 21D) (GLP): no malformation or other toxic effects.
	dyrolytic acid dibutylin	No data
	2–Ethylhexanoic acid zinc salt	No data
	Styrene, 2–hydroxyethyl methacrylate,n–butylacrylate, n–butyl methacrylate,2–ethylhexyl acrylate,methylmethacrylate copolymer.	Medium dose NOAEL= 30 mg/kg diet (1.9–2.3 mg/kg body weight/day), Low dose NOAEL= 5 mg/kg diet (1.9–2.3 mg/kg body weight/day), OECD TG 421, GLP♪ In an oral (observed) atypical formation study in rats, the test substance was determined to have NOAEL of 1.0 mg/kg bw/day for maternal toxicity and 5.0 mg/kg bw/day for atypical formation. rat, OECD TG 414, GLP seco
	Specific target organ toxicity (one exposure)	
	titanium dioxide	Acute oral toxicity test with rats showed no death, no weight changes and no significant lesions observed during autopsy. OECD TG 425

	butyl acetate	Causes central nervous system disorders, pulmonary edema, and respiratory irritation in humans. Target organs: central nervous system, respiratory system
	xylene	Giddiness has been reported in humans, significant arousal, progression, and anesthesia have been reported in experimental animals. Exposure to 100 ppm 442 mg/m ³ in humans causes weak irritation to the eyes and upper airways and slight effects on the central nervous system
	ethylbenzene	It causes nervous system effects and airway stimulation such as dizziness in experimental animals.
	propylene glycol monomethyl ether acetic acid	Rat (male, female)/oral (500, 1000, 2000, 4000, 6300, 100,000 mg/kg): lethargy, filoherece, watery eyes, anorexia, shallow breathing and salivations were observed.
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...		No data
	dyrolytic acid dibutylin	No data
		Experience: shortness of breath, wrinkled fur, curved body position, diarrhea observed in individuals in all dose groups; mild ocular projection reported above 2500 mg/kg; sedation reported in individuals at 5000 mg/kg. Surviving individuals recovered within 11 to 14 days. / No total long-term changes associated with the compound were observed (equivalent or similar guidelines: OECD TG 401)Percutaneous: Signs of systemic toxicity noted in human-killed females were limb posture, standing hair, dehydration, and limb paralysis. Gaiting and bending posture were noted in the other two females. No signs of systemic toxicity were observed in the remaining females or in all males. A gas expansion of the stomach was observed during the study. Autopsies of deceased animals at the end of the study showed no abnormalities (Ratt / Male / Female / OECD TG 402/GLP)
	2-Ethylhexanoic acid zinc salt	As a result of the acute inhalation toxicity test using rat water, a decrease in respiratory rate was observed. Similar substance CAS No. 1314-13-2
		No data
Specific target organ toxicity (repeated exposure)		
	titanium dioxide	NITE Classification 2
	butyl acetate	
		As a result of the 90-day repeated administration oral toxicity test on rats, central nervous system abnormalities such as ataxia and decreased activity were observed in the 600 mg/kg concentration group within 1 hour. No other special effects were observed NOAEL=level:125 mg/kg bw/day normal EPA OTS 798.2650, GLP
	xylene	90-day Inhalation Toxic trial in rats, acute, short-term symptoms of decreased activity levels at moderate and highest concentrations, decreased body weight and feed intake, upper respiratory irritation symptoms of nasal NOAEC=500 ppm GLP, EPA OTS 798.2450"
	ethylbenzene	
	propylene glycol monomethyl ether acetic acid	Chemical Substance Information Processing System The results of the 13-week repeated oral toxicity test with rats were based on hematologic changes indicating weak regenerative anemia, increased liver weight, and changes in central lobular hepatocyte hypertrophy, NOAEL=75 mg/kg bw/day OECD TG408, GLP, ECHA
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	As a result of the 13-week repeated inhalation toxicity test using mice, liver and kidney weight increased at 750 ppm 3.55 mg/L or higher, but no other histopathologic findings or harmful effects were observed. NOAEC=1000 ppm 4.74 mg/L OECD TG413, ECHA
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	rats /Exp ressi
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	Results of repeated exposure study NOAEL (12-week rate) = approx. 12,500-25,000 mg/kg-bw/day Other (phenomena): NOAEL = 10 ppm oral in piglets; anemia in diet fed 30 days in rats, very small changes at double this level, safe consumption for humans at the 0.02 mg/kg/day dose, and safe consumption for adults at the 1.2 mg/kg/day dose for adults at 60 kg, Rat, OECD TG 408
Styrene, 2-hydroxyethyl methacrylate, n-butylacrylate, n-butyl methacrylate, 2-ethylhexyl acrylate, methylmethacrylate copolymer.		As a result of the 90-day repetitive oral toxicity test using mice, growth was delayed, but no significant effect was observed. NOEL = 3000 ppm OECD TG 408-like substance CAS No. 7733-02-0
Harmful to aspiration		No data
	titanium dioxide	
	butyl acetate	No data

	xylene	No data
	ethylbenzene	
	propylene glycol monomethyl ether acetic acid	동점도: 0.86 mm ² /s @ 20degC (expolated calculation)
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Hydrocarbons. Swallowing liquids can cause chemical pneumonia by osmosis. Tie probability 0.64 mm ² /s 25℃
83)	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Viscosity 72 mPas (dynamic) 20°C molecular structure C32H64O4Sn, viscosity 72 mPas (dynamic) 20°C molecular structure C32H64O4Sn
	Other Hazardous Effects	No data
	titanium dioxide	
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
83)	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
		No data

12. Environmental impact

a. Ecotoxicity

	Fish	
	titanium dioxide	LC50 > 100 mg/ℓ 96 hr Carassius auratus (OECD Guideline 203)
	butyl acetate	LC50 18 mg/ℓ 96 hr Pimephales promelas (유수식, OECD Guideline 203)
	xylene	LC50 2.6 mg/ℓ 96 hr (OECD Guideline 203)
	ethylbenzene	LC50 5.1 mg/ℓ 96 hr
	propylene glycol monomethyl ether acetic acid	LC50 ≥ 100 mg/ℓ 96 hr Oryzias latipes
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
83)	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	LC50 45 mg/ℓ 48 hr Oncorhynchus mykiss
	dyrolytic acid dibutylin	No data
	dyrolytic acid dibutylin	LC50 262.89 mg/ℓ Lepomis cyanellus (Danio rerio, OECD Guideline 203)
	2-Ethylhexanoic acid zinc salt	LC50 100 mg/ℓ 96 hr Cyprinus carpio (유사물질 CAS No. 85203-81-2, OECD Guideline 203, GLP)
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	crustaceans	
	titanium dioxide	LC50 > 500 mg/ℓ 48 hr Daphnia magna
	butyl acetate	EC50 44 mg/ℓ 48 hr Daphnia magna

83)	xylene	LC50 3.6 mg/ℓ 24 hr (OECD TG202)
	ethylbenzene	LC50 1.8 mg/ℓ 48 hr Daphnia magna (Ceriodaphnia dubia NOEC 1.0 mg/L (0.96mg/L) 7days)
	propylene glycol monomethyl ether acetic acid	EC50 373 mg/ℓ 48 hr Daphnia magna
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	EC50 1.7 ~ 3.4 mg/ℓ 48 hr Daphnia magna
	dyrolytic acid dibutylin	(OECD TG 202, EC Guideline 92/69/EEC (2), Exponential, Freshwater)
	2-Ethylhexanoic acid zinc salt	EC50 0.131 ~ 1.06 mg/ℓ 48 hr Daphnia magna (유사물질: 7733-02-0 OECD TG 202, GLP)
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	bird	
83)	titanium dioxide	EC50 > 50 mg/ℓ 72 hr Selenastrum capricornutum
	butyl acetate	EC50 335 mg/ℓ 72 hr Selenastrum capricornutum
	xylene	EC50 1.3 mg/ℓ 48 hr (OECD TG201, GLP)
	ethylbenzene	EC50 2.6 mg/ℓ 96 hr 기타 (marine invertebrate)
	propylene glycol monomethyl ether acetic acid	
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	EC50 ≥ 1000 mg/ℓ 72 hr Selenastrum capricornutum
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	dyrolytic acid dibutylin	EC50 > 1 mg/ℓ 72 hr Desmodesmus subspicatus
	2-Ethylhexanoic acid zinc salt	(OECD TG 201, EU Method C.3 (Algal Inhibition test), 지수식, 답수)
83)	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	B. Residual and degradable	
	Residuality	
	titanium dioxide	No data
	butyl acetate	log Kow 1.78
	xylene	log Kow 3.15
	ethylbenzene	log Kow 3.15
	propylene glycol monomethyl ether acetic acid	log Kow 0.43
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	log Kow 7.54
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
83)	dyrolytic acid dibutylin	01 4.44 log Kow
	dyrolytic acid dibutylin	(log Pow, 20.8℃)
	2-Ethylhexanoic acid zinc salt	log Kow > 5.7 (OECD TG 107)
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
	Degradable	
	titanium dioxide	No data
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
		No data

	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	78% within 14 days of BOD5/COD culture
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
C. Bio-enriched		
	Concentration	
	titanium dioxide	No data
	butyl acetate	No data
	xylene	BCF 25.9 (Oncorhynchus mykiss)
	ethylbenzene	BCF 1 (BCF)
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	BCF 10
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	05 1.49 log BCF
	dyrolytic acid dibutylin	(Non-dimensional number)
	2-Ethylhexanoic acid zinc salt	BCF 38 ~ 28960
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
biodegradable		
	titanium dioxide	No data
	butyl acetate	83 % 28 day (OECD TG 301D)
	xylene	90% 28 days (Dissociable, OECD TG301F, GLP)
	ethylbenzene	70 ~ 80 % 28 day (ISO 14593 CO2 headspace시험, GLP)
	propylene glycol monomethyl ether acetic acid	> 60 (%) 28 day
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	6 (%) 28 day (Non-biodegradability)
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	23 01 39 day
	dyrolytic acid dibutylin	(O2 consumption)
	2-Ethylhexanoic acid zinc salt	60 % 28 day (OECD TG 301D, GLP)
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
D. Soil mobility		
	titanium dioxide	No data
	butyl acetate	No data
	xylene	No data
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
dyrolytic acid dibutylin	No data
2-Ethylhexanoic acid zinc salt	No data
Styrene, 2-hydroxyethyl methacrylate, n-butylacrylate, n-butyl methacrylate, 2-ethylhexyl acrylate, methylmethacrylate copolymer.	No data

E. Other harmful effects

titanium dioxide	No data
butyl acetate	No data
xylene	nic toxic
ethylbenzene	조류 Selenastrum capricornutum, NOEC96h=3.4 mg/L 지수식 EPA 1985, GLP
propylene glycol monomethyl ether acetic acid	

C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	No data
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Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
dyrolytic acid dibutylin	No data
2-Ethylhexanoic acid zinc salt	Cap sule Dap hnia mag
Styrene, 2-hydroxyethyl methacrylate, n-butylacrylate, n-butyl methacrylate, 2-ethylhexyl acrylate, methylmethacrylate copolymer.	No data

13. Precautions for disposal

A. Method of disposal

titanium dioxide	No data
butyl acetate	(1) Treat with neutralization, hydrolysis, oxidation, and reduction.
xylene	2) Burn at high temperature or melt at high temperature.
ethylbenzene	3) Solidify it."
propylene glycol monomethyl ether acetic acid	Take care of it in one of the following ways.♪ 1. Incineration.♪ 2. After treatment by evaporation and concentration, incinerate the residue.♪ 3. After purifying by separation, distillation, extraction, and filtration, incinerate the residue.♪ 4. Use neutralization, oxidation, reduction, polymerization, and condensation reactions to treat.♪ 5. Incineration of residues, or after re-treatment by means of agglomeration, sedimentation, filtration, and dehydration, incinerate residues.
C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	Take care of it in one of the following ways.♪ 1. After treatment using the reaction of neutralization, oxidation, and reduction, use the method of agglomeration, precipitation, filtration, and dehydration.♪ 2. Treat by evaporation and concentration.♪ 3. Refine by means of separation, distillation, extraction, and filtration.
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	1) Pre-treatment of oil and water separation is done with oil and water separation method.
dyrolytic acid dibutylin	Dispose of contents and containers as stipulated in the Waste Management Act.
2-Ethylhexanoic acid zinc salt	Dispose of contents and containers as stipulated in the Waste Management Act.
Styrene, 2-hydroxyethyl methacrylate, n-butylacrylate, n-butyl methacrylate, 2-ethylhexyl acrylate, methylmethacrylate copolymer.	Dispose of contents and containers as stipulated in the Waste Management Act.

83)	B. Precautions for disposal	Dispose of contents and containers as stipulated in the Waste Management Act.
	titanium dioxide	
	butyl acetate	
	xylene	
	ethylbenzene	Dispose of contents/containers in accordance with waste-related laws and regulations
	propylene glycol monomethyl ether acetic acid	Dispose of the contents containers (in accordance with the relevant laws and regulations).
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Dispose of the contents containers (in accordance with the relevant laws and regulations).
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Dispose of the contents containers (in accordance with the relevant laws and regulations).
	dyrolytic acid dibutylin	Dispose of the contents containers (in accordance with the relevant laws and regulations).
	2-Ethylhexanoic acid zinc salt	Consider the precautions specified in the regulations if specified in the Waste Management Act.
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Dispose of the contents containers (in accordance with the relevant laws and regulations).

14. Information required for transportation

A. United Nations No	1263
B. Proper shipping name	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base
D. Courage rating	II
E. Marine pollutants	No data
C. Risk rating in transportation	3
F. Special safety measures that users need or need to know about transportation or transportation	
In accordance with the Dangerous Goods Safety Control Act when transporting local areas	
Packaging and transportation in accordance with DOT and other regulations	
Types of emergency measures in case of fire	F-E
Types of emergency measures in case of spillage	S-E

15. Status of legal regulations

A. Regulations under the Occupational Safety and Health Act	
titanium dioxide	Hazardous substances subject to management
titanium dioxide	Substances subject to work environment measurement (measurement cycle: 6 months)
titanium dioxide	Exposure criteria setting substances
butyl acetate	Substances subject to process safety report (PSM) submission
butyl acetate	Hazardous substances subject to management
butyl acetate	Substances subject to work environment measurement (measurement cycle: 6 months)
butyl acetate	Exposure criteria setting substances
xylene	Substances subject to process safety report (PSM) submission
xylene	Hazardous substances subject to management
xylene	Substances subject to work environment measurement (measurement cycle: 6 months)

	xylene	Substances subject to special health examination (diagnostic cycle: 12 months)
	xylene	Exposure criteria setting substances
	ethylbenzene	Substances subject to process safety report (PSM) submission
	ethylbenzene	Hazardous substances subject to management
	ethylbenzene	Substances subject to work environment measurement (measurement cycle: 6 months)
	ethylbenzene	Substances subject to special health examination (diagnostic cycle: 12 months)
	ethylbenzene	Exposure criteria setting substances
	propylene glycol monomethyl ether acetic acid	Substances subject to process safety report (PSM) submission
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	Hazardous substances subject to management
	dyrolytic acid dibutylin	Materials subject to work environment measurement (measurement cycle: 6 months of materials subject to work environment measurement)
	dyrolytic acid dibutylin	Substances subject to special health examination (diagnostic cycle: 12 months of substances subject to special health examination)
	dyrolytic acid dibutylin	Exposure criteria setting substances
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data

B. Regulations under the Chemical Substances Control Act

	titanium dioxide	No data
	butyl acetate	No data
	xylene	toxic substances
	ethylbenzene	No data
	propylene glycol monomethyl ether acetic acid	No data
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data

C. Regulations under the Dangerous Goods Safety Management Act

	titanium dioxide	No data
	butyl acetate	4th class 2nd petroleum (non-water soluble) 1000L
	xylene	4th class 2nd petroleum (non-water soluble) 1000L
	ethylbenzene	4th class 1 petroleum (non-water soluble) 200L
	propylene glycol monomethyl ether acetic acid	4th class 2nd petroleum (non-water-soluble liquid) 1000L
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	No data
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
	dyrolytic acid dibutylin	Class 4: 6000 liters of 4 petroleum products
	2-Ethylhexanoic acid zinc salt	No data

	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	No data
D. Regulations under the Waste Management Act		
83)	titanium dioxide	No data
	butyl acetate	designated waste
	xylene	designated waste
	ethylbenzene	designated waste
	propylene glycol monomethyl ether acetic acid	No data
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	designated waste
	dyrolytic acid dibutylin	No data
	2-Ethylhexanoic acid zinc salt	No data
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	designated waste
E. Other regulations under domestic and foreign laws		
83)	domestic regulation	
	titanium dioxide	
	butyl acetate	
	xylene	
	ethylbenzene	
	propylene glycol monomethyl ether acetic acid	
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
	dyrolytic acid dibutylin	
	2-Ethylhexanoic acid zinc salt	
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	
	Other domestic regulations	
	titanium dioxide	Not applicable
	butyl acetate	Not applicable
	xylene	Not applicable
	ethylbenzene	Not applicable
	propylene glycol monomethyl ether acetic acid	Not applicable
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	Not applicable
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Not applicable
	Foreign regulations	
	US Administrative Information (OSHA Regulations)	
	titanium dioxide	Not applicable

	butyl acetate	Not applicable
	xylene	Not applicable
	ethylbenzene	Not applicable
	propylene glycol monomethyl ether acetic acid	Not applicable
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Not applicable
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Not applicable
	US Management Information (CERCLA Regulations)	
	titanium dioxide	Not applicable
	butyl acetate	2267.995kg 5000lb
	xylene	45.3599kg 100lb
	ethylbenzene	453.599kg 1000lb
	propylene glycol monomethyl ether acetic acid	Not applicable
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Not applicable
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Not applicable
	US Management Information (EPCRA 302)	
	titanium dioxide	Not applicable
	butyl acetate	Not applicable
	xylene	Not applicable
	ethylbenzene	Not applicable
	propylene glycol monomethyl ether acetic acid	Not applicable
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Not applicable
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Not applicable
	US Management Information (EPCRA 304)	
	titanium dioxide	Not applicable
	butyl acetate	Not applicable
	xylene	Not applicable
	ethylbenzene	Not applicable
	propylene glycol monomethyl ether acetic acid	Not applicable
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Not applicable

83)	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Not applicable
	US Management Information (EPCRA 313)	
	titanium dioxide	Not applicable
	butyl acetate	Not applicable
	xylene	Applicable
	ethylbenzene	Applicable
	propylene glycol monomethyl ether acetic acid	Not applicable
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Not applicable
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Not applicable
	US Management Information (Rotterdam Convention Material)	
	titanium dioxide	Not applicable
	butyl acetate	Not applicable
	xylene	Not applicable
	ethylbenzene	Not applicable
83)	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW 83)	Not applicable
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable
	Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.	Not applicable
	US Management Information (Stockholm Convention Material)	
	titanium dioxide	Not applicable
	butyl acetate	Not applicable
	xylene	Not applicable
	ethylbenzene	Not applicable
83)	propylene glycol monomethyl ether acetic acid	Not applicable
	C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Not applicable
	Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
	dyrolytic acid dibutylin	Not applicable
	2-Ethylhexanoic acid zinc salt	Not applicable

Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.

Not applicable

US Management Information (Montreal's emotional material)

titanium dioxide Not applicable

butyl acetate Not applicable

xylene Not applicable

ethylbenzene Not applicable

propylene glycol monomethyl ether acetic acid Not applicable

83) C.I. pigment yellow 83 (C.I. PIGMENT YELLOW Not applicable

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM... Not applicable

dyrolytic acid dibutylin Not applicable

2-Ethylhexanoic acid zinc salt Not applicable

Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.

Not applicable

EU classification information (final classification results)

titanium dioxide Not applicable

butyl acetate Flam. Liq. 3⤵
STOT SE 3

xylene Flam. Liq. 3⤵
Acute Tox. 4 *⤵
Acute Tox. 4 *⤵
Skin Irrit. 2

ethylbenzene Flam. Liq. 2⤵
Acute Tox. 4 *⤵
Asp. Tox. 1⤵
STOT RE 2

propylene glycol monomethyl ether acetic acid R10Xi; R36

83) C.I. pigment yellow 83 (C.I. PIGMENT YELLOW Not applicable

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM... Not applicable

dyrolytic acid dibutylin Muta. 2, Repr. 1B, STOT RE 1

2-Ethylhexanoic acid zinc salt Not applicable

Styrene, 2-hydroxyethyl methacrylate,n-butylacrylate, n-butyl methacrylate,2-ethylhexyl acrylate,methylmethacrylate copolymer.

Not applicable

EU classification information (danger phrases)

titanium dioxide Not applicable

butyl acetate H226⤵
H336

xylene H226⤵
H332⤵
H312⤵
H315

ethylbenzene H225⤵
H332⤵
H304⤵
H373 (hearing organs)

propylene glycol monomethyl ether acetic acid R10, R36

83) C.I. pigment yellow 83 (C.I. PIGMENT YELLOW Not applicable

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
dyrolytic acid dibutylin	H341, H360FD, H372 (immune system)
2-Ethylhexanoic acid zinc salt	Not applicable
Styrene, 2-hydroxyethyl methacrylate, n-butylacrylate, n-butyl methacrylate, 2-ethylhexyl acrylate, methylmethacrylate copolymer.	Not applicable
EU classification information (safety equipment)	
titanium dioxide	Not applicable
butyl acetate	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
propylene glycol monomethyl ether acetic acid	S2, S25
83) C.I. pigment yellow 83 (C.I. PIGMENT YELLOW	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
dyrolytic acid dibutylin	Not applicable
2-Ethylhexanoic acid zinc salt	Not applicable
Styrene, 2-hydroxyethyl methacrylate, n-butylacrylate, n-butyl methacrylate, 2-ethylhexyl acrylate, methylmethacrylate copolymer.	Not applicable

16. Other Notes

A. Source of data

–This MSDS is based on Article 110 of the Occupational Safety and Health Act and the Ministry of Employment and Labor Notice No. 2023-9 (Criteria for Chemical Classification* Indication and Material Safety Data)

Based on this, it is prepared in consideration of the current status of domestic regulatory laws and regulations.

–This MSDS was prepared based on KOSHA, NITE, ECHA, NLM, SIDS, LPCS, NCLS, etc.

B. Date of initial preparation

2026-07-10

C. Number of revisions and last revision date

Number of revisions

Last revision date

D. Other

○ Material safety data (MSDS) has been edited and partially modified by referring to MSDS provided by the Korea Occupational Safety and Health Agency ♪
It's data.