

물질안전보건자료

(Material Safety Data Sheet)

Name of the product

KSP G-803000

1. information about chemicals and companies

A. Product name

KSP G-803000

B. Recommended uses and restrictions on use of products

recommended use of the product

steel paint

restrictions on the use of the product

Prohibited use outside of use; prohibited youth sales

C. Supplier information (In case of imported goods, domestic supplier information available for emergency contact)

Corporate name

Geumgang Paint Industry Co., Ltd

Address

86-75 Chugok-gil, Gogyeong-myeon, Yeongcheon-si, Gyeongsangbuk-do

an emergency telephone number

054-338-7722

2. Hazardous/hazardous

A. Hazard classification and risk classification

Inflammable liquids: Classification 2

Self-heating substances and mixtures: Classification 1

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

Hazardous and dangerous phrases

H225 High Resilient Liquid and Steam

H251 Self-heating: May cause fire

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

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) (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

Prevention

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.

Response	P235 Keep it at low temperature.
	Ground P240 containers and containers.
	Use P241 explosion proof type [electric/ventilation/lighting/equipment].
	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.
	After handling P264...Wash thoroughly.
	P270 Do not eat, drink or smoke when using this product.
	P271 Only handle outdoors or in well-ventilated areas.
Storage	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.
	P303+P361+P353 If you get it on your skin (or hair): Take off all contaminated clothing immediately. Wash your skin with water (or shower).
	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 ...Take care of it.
Disposal	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.
	P362+P364 Take off contaminated clothing and wash it before use again.
	P370+P378 In case of fire: To extinguish the fire...Use B.
	P403+P233 Store in a well-ventilated place. Seal the container tightly.
	P403+P235 Store in a well-ventilated place.Keep it at a low temperature.
	Save with P405 lock.
	P407 Keep the gap between loads or pallets.
	P410 Avoid direct sunlight.
	P413 It is a highly reactive substance, so be careful when storing it.
	Keep P420 isolated.
	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 (%)
dimethyl carbonate	METHYL CARBONATE	616-38-6	1-9
carbon black		1333-86-4	0.1-2
titanium dioxide		13463-67-7	5-14
xylene	Xylene (Ortho, Meta, Paraic)	1330-20-7	15-24
	Dimethylbenzene (Oso, Meta, Para-isomer)		
	Xylene, o,m,p-isomers		
	Xylene(o,m,p-isomers)		
ethylbenzene	ethyl benzene	100-41-4	2-6
	Ethyl benzene		
CALCITE	calcite (CA(CO3))(CA(CO3))(CALCITE(CA(CO3)	13397-26-7	1-7
talc (without asbestos)	talc,	14807-96-6	10-17
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	ORGANOPHILIC CLAY;	68953-58-2	0.1-1
N,N'-1,6-hexanedylbis [12-hydroxyoctadecanamide]		55349-01-4	0.1-1
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle		N/A	30-39
4. First aid instructions			

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.
B. When you come into contact with your skin	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 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 Get medical help when the melt is stuck to the skin and removed 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.
C. When you inhale it	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 eat or inhale substances, do not ventilate using mouth-to-mouth mouth exercise and use appropriate respiratory equipment 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. Don't make me vomit.
D. When I ate it	Don't feed an unconscious person anything with your mouth Take medical action immediately
D. When I ate it	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. 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
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5. How to cope with explosions or 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 Unstable at room temperature 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 Can be ignited by friction, heat, spark, flame Powder, dust, crumbs, perforation, shelves, cutting, etc. can explode or burn explosively Can be reignited after digestion Risk of steam explosion indoors, outdoors, and sewers flammable/combustible substances Some substances can burn quickly with flashes 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 Non-inflammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes Contact with molten materials can cause serious burns to the skin and eyes Contact can cause 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
C. Protective equipment and preventive measures to be worn in case of fire extinguishing	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
C. Protective equipment and preventive measures to be worn dimethyl carbonate	Rescuers should wear appropriate protective gear. Digest away from the area and keep a safe distance

carbon black	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 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 Be careful as it may melt to a temperature above the flashpoint and be transported
titanium dioxide	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 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
xylene	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 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
ethylbenzene	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
ethylbenzene	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 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

CALCITE

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

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

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

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...

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

N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]

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

Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle

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

6. How to cope 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

Cover with plastic sheet to stop diffusion

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 may cause contamination

Avoid large leaks into waterways, sewers, cellars, and enclosed spaces

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

In case of large leaks, wet it with water and dig a ditch to deal with it later

Use a clean explosive device to collect absorbed material

Place the leak in a clean, dry container with a clean shovel, close loosely, and transfer the container from the leak area

7. Handling and storage methods

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

Be careful as it may explode during dust generation or friction work

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.

After handling...Wash thoroughly.

Do not eat, drink or smoke when using this product.

Only handle outdoors or in well ventilated areas.

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

Seal the container tightly.

Keep at low temperatures and avoid direct sunlight.

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.

Keep a gap between shipments.

Be careful when storing because it is a highly reactive substance.

Store separately from other substances.

B. A safe way to store

8. Exposure protection and personal protective gear

A. Chemical exposure standards, biological exposure standards, etc

domestic regulations

dimethyl carbonate

No data

carbon black

TWA – 3.5 mg/m³ carcinogenicity 2, inhalation (No. 2020–48)

titanium dioxide

TWA – 10mg/m³ Carcinogenic 2

xylene

TWA – 100ppm STEL – 150ppm

ethylbenzene

TWA – 100ppm STEL – 125ppm

CALCITE

No data

talc	TWA – 6 mg/m3 Cowpstone
talc	TWA – 3 mg/m3 Cowpstone (respiratory)
talc	TWA – 2 mg/m3 talc [without asbestos, less than 1% silicon oxide crystals (respiratory)] However, for asbestos-containing talc, refer to asbestos (0.1 ea/cm3)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
ACGIH regulations	
dimethyl carbonate	No data
carbon black	TWA 3 mg/m³
titanium dioxide	TWA 10 mg/m³
xylene	STEL 150 ppm
xylene	TWA 100 ppm
ethylbenzene	TWA 20 ppm
CALCITE	No data
talc	STEL
talc	TWA 2 mg/m³
talc	ETC
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
biological exposure standards	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	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)
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
Other exposure criteria	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	No data
ethylbenzene	No data
CALCITE	No data
talc	TWA : 6mg/m3 – NIOSH
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data

N,N'-1,6-hexanediybis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
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	
dimethyl carbonate	Wear respirators certified by the Occupational Safety and Health Agency that conform to the physicochemical properties of exposed gases/liquid
dimethyl carbonate	"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"
dimethyl carbonate	
carbon black	If oxygen is low (<19.5%), wear a vent mask or self-contained air respirator
carbon black	Carcinogenic 2, inhalable (No. 2020-48)
carbon black	Wear respirators certified by the Korea Occupational Safety and Health Agency that conform to the physicochemical properties of exposed particulate matter
carbon black	If the exposure concentration is lower than 35mg/m3, wear the appropriate type of filter while wearing a type of respirator
carbon black	If the exposure concentration is lower than 87.5 mg/m3, wear a loose-fitting hood/helmet electric respirator or continuous flow dust mask with the appropriate type of filter
carbon black	If the exposure concentration is lower than 175 mg/m3, wear a front or electric or air-supplied continuous flow/pressure requirement type respirator with appropriate filter
carbon black	If the exposure concentration is lower than 3500 mg/m3, wear a front or helmet/hood type with appropriate filter, pressure-required air mask
titanium dioxide	If the exposure concentration is lower than 35,000 mg/m3, wear a self-aiing (SCBA) or pressure-required self-aiing (SCBA) respirator with appropriate filters
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
xylene	If the exposure concentration is lower than 100000 mg/m3, wear a self-aiing (SCBA) or pressure-required self-aiing (SCBA) respirator with appropriate filters
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) 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
xylene	
xylene	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 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	
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 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) 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 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	
ethylbenzene	
CALCITE	Wear respirators certified by the Occupational Safety and Health Agency that conform to the physicochemical properties of exposed particulate matter
CALCITE	"For particulate matter, the following respiratory protection is recommended
talc	
talc	Sowpstone
talc	Wear respirators certified by the Korea Occupational Safety and Health Agency that conform to the physicochemical properties of the exposed material
talc	Sowpstone (breathing)
talc	
talc	Wear respirators certified by the Korea Occupational Safety and Health Agency that conform to the physicochemical properties of the exposed material
talc	talc [no asbestos, less than 1% silicon oxide crystals (respiratory)] However, for talc containing asbestos, see asbestos (0.1 ea/cm3)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Wear respirators certified by the Korea Occupational Safety and Health Agency that conform to the physicochemical properties of the exposed material
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
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	"For particulate matter, the following respiratory protection is recommended
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Wear a respirator certified by the Occupational Safety and Health Agency to match the physicochemical properties of the exposed material
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	-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)
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	"For gas/liquid substances, the following respiratory protection is recommended
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	-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" If oxygen is low (<19.6%), wear a ventilation mask or self-contained respirator Wear a respirator certified by the Occupational Safety and Health Agency to match the physicochemical properties of the exposed material

Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	-A face filter type dust mask or an air filter type dust mask (high-efficiency fine particle)
	"For gas/liquid substances, the following respiratory protection is recommended
eye protection	-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	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
eye protection	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
eye protection	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
eye protection	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 PROPERTIES

A. Appearance	
character	Liquid
Color	Colored
I. The smell	the smell of organic solvents
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)	Not applicable
J. Upper/lower limits on the range of flammables or explosions	No data
J. Steam pressure	No data
T. Solubility	No data
F. Steam density	No data
Ha. Specific gravity	1.0 ~ 1.3
G. N-octanol/water distribution coefficient (Kow)	No data
You. Natural firing temperature	No data
More. Decomposition temperature	No data
R. Viscosity	80-110
M. molecular weight	No data

10. Stability and Responsiveness

a. Chemical stability and possibility of adverse reactions

dimethyl carbonate	Highly flammable liquids and vapors
dimethyl carbonate	Intense polymerization can cause fire and explosion
dimethyl carbonate	Can form explosive mixtures at or above flashpoints
dimethyl carbonate	Containers may explode when heated
dimethyl carbonate	High Mars: easily ignited by heat, spark, and flame
dimethyl carbonate	Leaks are at risk of fire/explosion
dimethyl carbonate	Risk of steam explosion indoors, outdoors, and sewers
dimethyl carbonate	Steam can form an explosive mixture with air
dimethyl carbonate	Steam can travel to ignition source and flash back
dimethyl carbonate	Fire can cause irritable, corrosive, and toxic gases
dimethyl carbonate	Inhalation and skin absorption may be toxic
carbon black	Can decompose at high temperatures to produce toxic gases
carbon black	Unstable at room temperature
carbon black	Can be ignited by friction, heat, spark, flame
carbon black	Powder, dust, crumbs, perforation, shelves, cutting, etc. can explode or burn explosively
carbon black	Can be reignited after digestion
carbon black	flammable/combustible substances
carbon black	Some substances can burn quickly with flashes
carbon black	Contact with molten materials can cause serious burns to the skin and eyes
carbon black	Contact can cause burns to the skin and eyes
carbon black	In case of fire, irritable and toxic gases can be generated
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-inflammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes
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
CALCITE	Stable at room temperature and pressure
CALCITE	Containers may explode when heated

CALCITE	Some may burn but do not ignite easily
CALCITE	In case of fire, irritable and toxic gases can be generated
CALCITE	Inhalation of substances can be harmful
CALCITE	Some liquids may cause dizziness and vapor that causes suffocation
talc	Containers may explode when heated
talc	Some may burn but do not ignite easily
talc	Non-inflammable or material itself does not burn, but decomposes when heated to cause corrosive/toxic fumes
talc	Fire can cause irritable, corrosive, and toxic gases
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
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Stable at room temperature and pressure
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Containers may explode when heated
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Some may burn but do not ignite easily
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	In case of fire, irritable and toxic gases can be generated
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Inhalation of substances can be harmful
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Some liquids may cause dizziness and vapor that causes suffocation
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	"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	
dimethyl carbonate	In case of fire, irritable and toxic gases can be generated
carbon black	Inhalation of substances can be harmful
carbon black	Some liquids are giddy, and vapor that causes suffocation can occur."
carbon black	
titanium dioxide	
xylene	Stay away from heat, sparks, flames, and high fever – don't smoke
ethylbenzene	Friction, Heat, Spark, Flame
CALCITE	Ignition sources such as heat, spark, flame, etc
talc	Produce dust and debris such as drilling, shelving, cutting, etc
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Ignition sources such as heat, spark, flame, etc
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Stay away from heat, sparks, flames, and high fever – don't smoke
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Stay away from heat, sparks, flames, and high fever – don't smoke Ignition sources such as heat, spark, flame, etc
C. Substances that should be avoided	
dimethyl carbonate	Ignition sources such as heat, spark, flame, etc
carbon black	Ignition sources such as heat, spark, flame, etc
titanium dioxide	Ignition sources such as heat, spark, flame, etc
xylene	Ignition sources such as heat, spark, flame, etc

ethylbenzene	
CALCITE	No data
CALCITE	No data
talc	combustible substances
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	combustible material
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	irritable, toxic gases
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	combustible substances Separation group:
D. Hazardous substances produced during decomposition	combustible substances
dimethyl carbonate	combustible material
carbon black	irritable, toxic gases
titanium dioxide	"combustible substances"
titanium dioxide	irritable, toxic gases"
xylene	
ethylbenzene	
CALCITE	irritable, corrosive, toxic gases
talc	irritable, toxic gases
talc	Corrosive/toxic fumes
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	irritable, corrosive, 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
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	During burning, irritating and very toxic gases can be generated by pyrolysis or combustion
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data

11. Information on toxicity	
A. Information on most likely exposure routes	
dimethyl carbonate	"It can cause irritation (sometimes severe), laryngitis, shortness of breath, and dizziness.
carbon black	It can cause burns, laryngitis, vomiting, and gastrointestinal disturbances.
titanium dioxide	irritation (sometimes severe), which can cause absorption.
xylene	It can cause irritation (sometimes severe)."
ethylbenzene	No data
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	"Short-term exposure is a stimulus."
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Short-term exposure is a minor irritation" No data
B. Health hazard information	"Could cause irritation to the respiratory tract

	"Could cause irritation by contacting the eyes"
acute toxicity	No data
an oral form	No data
dimethyl carbonate	
carbon black	
titanium dioxide	
xylene	
ethylbenzene	
CALCITE	LD50 > 5,000 mg/kg Rat
talc	LD50 > 8000 mg/kg Rat (no deaths, OECD Guideline 401)
talc	LD50 > 2000 mg/kg Mouse (OECD TG 420)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	LD50 3523 mg/kg Rat (EU Method B1)
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	LD50 3500 mg/kg Rat
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data LD50 > 5000 mg/kg Rat
transdermal skin	No data
dimethyl carbonate	LD50 > 5000 mg/kg Rat
carbon black	No data
titanium dioxide	No data
xylene	
ethylbenzene	
CALCITE	LD50 > 2,000 mg/kg Rabbit
talc	LD50 > 8000 mg/kg Rabbit
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	LD50 > 20000 mg/kg Rabbit (OECD Guideline 402 GLP)
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data LD50 > 2000 mg/kg Rat
Inhale	No data
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	
ethylbenzene	
CALCITE	Steam LC50> 5.36mg/l 4hr Rat
talc	Dust LC50> 4.6mg/m3 4hr Rat (no animals killed up to maximum concentration)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Dust LC50> 6.82 mg/L Rat (OECD TG 403, No Death)
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Steam LC50 5922 ppm 4 hr Rat (25.713 mg/LEPA OPP 81-3, GLP;1330-20-7; EU CLP Harmonization Classification: Classification 4)
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	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) No data
Corrosive or irritable skin	Mist LC50> 2.1 mg/L 4 hr Rat ((similar material test data)
dimethyl carbonate	분진 LC50> 12.6 mg/l 4 hr Rat (GLP data)
carbon black	No data
titanium dioxide	No data

xylene	
ethylbenzene	
CALCITE	Non–polar (rabbit)
talc	No irritation occurs as a result of skin corrosiveness/stimulation test using rabbits (OECD Guideline 404)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	The results of skin corrosion/stimulation test using rabbits showed no irritation, erythema index = 0, OECD TG 404
N,N'–1,6–hexanediylbis [12–hydroxyoctadecanamide]	A skin irritation test using rabbits. EU Method B.4 results show that the primary skin irritation index 3 is intermediate irritation
Fatty acids, vegetable–oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	The results of the skin irritation test using rabbits show moderate irritation
Severe eye damage or irritation	No data
dimethyl carbonate	Relative tissue survival (%): 112.9, non–irritating, human, EU Method B.46
carbon black	No irritation to the skin
titanium dioxide	Severe eye damage/stimulation tests with rabbits resulted in no mild irritation (OECD Guideline 405)
xylene	Severe eye damage/stimulation test results with rabbits do not show irritation. Conjunctival redness index = 1–2, OECD TG 405, GLP
	"Short–term Exposure Criteria Show eye and respiratory irritation effects on human bodies exposed to mixed xylene at 100 ppm STEL
ethylbenzene	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
CALCITE	Regulations on the classification and labeling of chemicals by the Ministry of Environment: Classification 2"
talc	As a result of the eye irritation test in rabbits, there was no mild irritation or corneal damage to the conjunctiva
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No hypersensitivity, Rat, in vivo, male
N,N'–1,6–hexanediylbis [12–hydroxyoctadecanamide]	No irritation, Rabbit, Corneal Confusion (0), iris (0), conjunctival congestion (1.2), conjunctival edema (0.7), OECD TG 405
Fatty acids, vegetable–oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Moderate eye irritation observed in animal experiments
respiratory sensitivity	No data
dimethyl carbonate	
carbon black	
titanium dioxide	No data
xylene	No data
ethylbenzene	No data
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'–1,6–hexanediylbis [12–hydroxyoctadecanamide]	No data
Fatty acids, vegetable–oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
skin sensitivity	No data
dimethyl carbonate	
carbon black	
titanium dioxide	Skin, in vivo (non–LLNA) Skin irritation test, non–polar

xylene	Skin sensitivity test using guinea pigs does not result in skin sensitivity (OECD Guideline 406, GLP)
ethylbenzene	Skin sensitivity test using guinea pigs does not cause skin sensitivity, OECD TG 403
CALCITE	Mice Localized Lymph node test OECD TG 429 Non-hypersensitivity
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No hypersensitivity, guinea pig, female, OECD TG 406
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Does not cause skin sensitivity No data
carcinogenicity	No data
Occupational Safety and Health Act	
dimethyl carbonate	
carbon black	
titanium dioxide	No data
xylene	No data
ethylbenzene	No data
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data No data
Ministry of Employment and Labor Examination	No data
dimethyl carbonate	
carbon black	
titanium dioxide	No data
xylene	2
ethylbenzene	2
CALCITE	No data
talc	2
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	1A (limited to talc containing asbestos)
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data No data
IARC	No data
dimethyl carbonate	
carbon black	
titanium dioxide	No data
xylene	2B
ethylbenzene	2B
CALCITE	3
talc	2B
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data

N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	3
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
OSHA	No data
dimethyl carbonate	
carbon black	
titanium dioxide	No data
xylene	Applicable
ethylbenzene	No data
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
ACGIH	No data
dimethyl carbonate	
carbon black	
titanium dioxide	No data
xylene	A3
ethylbenzene	A4
CALCITE	A4
talc	A3
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	A4
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
NTP	No data
dimethyl carbonate	
carbon black	
titanium dioxide	No data
xylene	No data
ethylbenzene	No data
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
EU CLP	No data
dimethyl carbonate	
carbon black	

titanium dioxide	No data
xylene	No data
ethylbenzene	2 (limited to powder form containing 1% or more of particles with an aerodynamic diameter of 10 µm or less)
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
germ cell mutagenicity	No data
dimethyl carbonate	No data
carbon black	"Sister chromatid exchange assay test with mammal in vitro negative with or without metabolism (OECD Guideline 479)
titanium dioxide	The results of genetic mutation test using mammals in vitro are negative regardless of the presence or absence of metabolic activity (OECD Guideline 476)
xylene	Returned mutation test using in vitro microorganisms resulted in negative (OECD Guideline 471, GLP) with or without metabolism
ethylbenzene	"Sexlink febrile lethality test results using fruit flies in vivo (OECD Guideline 477) "
CALCITE	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
talc	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
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Genotoxicity test using mouse lymphoma L5178Y cell negative, chromosomal aberration test using CHO cells negative, OECD TG476, GLP, OECD TG 473 micronuclear test results using mouse bone marrow cells negative, unscheduled DNA synthesis using mammalian hepatocytes; UDS test results negative, OECD TG474, OECD TG486, GLP"
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	"in vivo – genetic mutation test with mammalian germ cells: negative (rat, male), OECD TG 478
reproductive toxicity	in vitro – chromosomal aberration test with mammalian cells: negative (rat pleural mesomal cells (RPMC), no metabolic system), OECD TG 473, EU Method B.10"
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	
ethylbenzene	
CALCITE	Inhalation and exposure of 300–3000 ppm to the tracheal formers of mice resulted in an increase in the proportion of loss of implantation due to suppression of weight gain in the parent animal, a decrease in feed intake, and an increase in absorption belly at a high dose of 3000 ppm, and a significant increase in the total incidence of fetal deformities such as cleft palate, dwarfism, and multiple skull deformities. In other words, the effect on reproduction and the occurrence of fetal deformities in the dose of general toxicity, such as suppression of weight gain in the parent animal, increases the incidence of fetal deformities as a particularly significant effect, so it is classified as classification 2

talc	No reproductive toxicity occurs as a result of the minimum formation/parent toxicity/developmental toxicity test using rats (OECD Guideline 414)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	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)
N,N'-1,6-hexanediyldis [12-hydroxyoctadecanamide]	Chemical Substance Information Processing System
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	"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 (EODD 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."
Specific target organ toxicity (one exposure)	No data "Daily administration of 900 mg of talc/kg body weight to pregnant rabbits on days 6 to 18 of pregnancy showed no effect on the fetus. No dose-related effects were seen in reproductive function. NOAEL is considered 900 mg/kg bw/day in reproductive toxicity studies. Guidelines: OECD TG 416, equivalent to or similar to GLP
dimethyl carbonate	NOAEL (developmental toxicity) = 1600 mg/kg bw/day, administration of 1600 mg/kg bw talc in corn oil did not affect reproductive, developmental indicators, did not affect maternal, fetal survival, rat, GLP"
carbon black	
titanium dioxide	No data
xylene	No data
ethylbenzene	No data
CALCITE	
talc	
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediyldis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Acute oral toxicity test with rats showed no death, no weight changes and no significant lesions observed during autopsy. OECD TG 425 Giddiness has been reported in humans, significant arousal, progression, and anesthesia have been reported in experimental animals. Exposure to 100 ppm442 mg/m ³ in humans causes weak irritation to the eyes and upper airways and slight effects on the central nervous system
Specific target organ toxicity (repeated exposure)	
dimethyl carbonate	"Result of 28-day (subacute) repeated inhalation toxicity test using -F344 rats: increase in AST, ALP, APTT, PT levels in blood and blood biochemical test results, target organs: liver, NOEL >600 ppm -90 days (submanent) repeated inhalation toxicity test using F344 rats: No toxic effects were observed up to 4,000 ppm exposure concentration when repeatedly exposed to full-body inhalation for 13 weeks, so NOAEL, which is a non-toxic concentration, is judged to be more than 4000 ppm.
carbon black	- Unclassified as a result of aggregating the above results"
titanium dioxide	Repeated exposure of the human body for more than 10 years leads to decreased airway resistance and expiratory flow, cough, phlegm, chronic bronchitis, lung dysfunction, pneumoconiosis, emphysema, pulmonary perfusion, obstructive gout, carcinogenic effects not applied to classification in this section
xylene	
ethylbenzene	NITE Classification 2
CALCITE	Chemical Substance Information Processing System
talc	"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/dayOECD TG408, GLP, ECHA
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	As a result of the 13-week repeated inhalation toxicity test using mice, liver and kidney weight increased at 750 ppm3.55 mg/L or higher, but no other histopathologic findings or harmful effects were observed. NOAEC=1000 ppm4.74 mg/LOECD TG413, ECHA

N,N'-1,6-hexanediyibis [12-hydroxyoctadecanamide]

Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle

To identify inhaled neurotoxicity OECD TG424 using rats, repeated inhalation exposure at a concentration of 200–800 ppm for 4 weeks–13 weeks did not recover the hearing threshold even 8 weeks after stopping exposure at a concentration of 400 ppm or more. OHC losses of 200–800 ppm during the 8-week recovery period increased severely to 4% and 100%, respectively. LOAEL=200 ppm"

No data

"Prologic (chronic): oral exposure using talc as feed for 101 days in rats (cancer/male) showed NOAEL of 100 mg/kg/day. There were no adverse events at the typical toxic terminus, and one of the animals treated with talc showed gastric smooth muscle sarcoma. However, sarcoma not associated with talc treatment was found in the uterus of both animals. No chronic pathological effect associated with oral administration in rats, Rat, OECD TG 452

Inhalation (chronic): Through rats, exposure for 7.5 hours a day and 5 days a week at a concentration of 10.8 mg talc/m³ of dust breathable for 6 to 12 months showed that the two groups with treatment periods of 6 and 12 months showed high mortality. 50% of the animals died during treatment in both groups, and exposure to the test substance resulted in distinct fibrosis. Pulmonary adenoma detected in 1 of 24 animals exposed, Rat, OECD TG 452"

Results of repeated exposure study NOAEL (12-week rate) = approx. 12,500–25,000 mg/kg-bw/day

No data

No data

Harmful to aspiration

dimethyl carbonate

carbon black

titanium dioxide

xylene

ethylbenzene

CALCITE

No data

talc

No data

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...

No data

N,N'-1,6-hexanediyibis [12-hydroxyoctadecanamide]

동점도: 0.86 mm2/s @ 20degC (expolated calculation)

Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle

Hydrocarbons. Swallowing liquids can cause chemical pneumonia by osmosis. Tie probability 0.64 mm²/s 25°C
No data

Other Hazardous Effects

No data

dimethyl carbonate

No data

carbon black

No data

titanium dioxide

No data

xylene

ethylbenzene

CALCITE

No data

talc

No data

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...

No data

N,N'-1,6-hexanediyibis [12-hydroxyoctadecanamide]

No data

Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle

No data

12. Environmental impact

a. Ecotoxicity

Fish

dimethyl carbonate

No data

carbon black

LC50 > 1000 mg/ℓ 96 hr 기타 (Tribolodon hakonensis)

titanium dioxide

LC50 > 100 mg/ℓ 96 hr Carassius auratus (OECD Guideline 203)

xylene

LC50 2.6 mg/ℓ 96 hr (OECD Guideline 203)

ethylbenzene	LC50 5.1 mg/ℓ 96 hr
CALCITE	LC50 554000 mg/ℓ 96 hr
talc	LC50 89581.016 mg/ℓ 96 hr Fishes species
talc	(QSAR, Exponential)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	LC50 0.000000137 mg/L 96 hr (QSAR predictions for substances with low water solubility are not applicable)
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
crustaceans	
dimethyl carbonate	No data
carbon black	EC50 > 5600 mg/ℓ 24 hr Daphnia magna (OECD Guideline 202, GLP)
titanium dioxide	LC50 > 500 mg/ℓ 48 hr Daphnia magna
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)
CALCITE	LC50 446000 mg/ℓ 48 hr
talc	LC50 36812.359 mg/ℓ 48 hr Daphnid species
talc	(QSAR model, QSAR model, 답수)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	LC50 0.000000000294 mg/L 48 hr (QSAR predictions for substances with low water solubility are not applicable)
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
bird	
dimethyl carbonate	No data
carbon black	ErC50 > 10000 mg/ℓ 72 hr 기타 (Desmodesmus subspicatus, OECD Guideline 201, GLP)
titanium dioxide	EC50 > 50 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)
CALCITE	EC50 220000 mg/ℓ 96 hr
talc	EC50 7202.7 mg/ℓ 96 hr Green algae
talc	(QSAR model, QSAR model, 답수)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	EC50 0.000000000352 mg/L 96 hr (QSAR predictions for substances with low water solubility are not applicable)
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
B. Residual and degradable	
Residuality	
dimethyl carbonate	log Kow 0.354 (20℃)
carbon black	No data
titanium dioxide	No data
xylene	log Kow 3.15
ethylbenzene	log Kow 3.15
CALCITE	log Kow -2.12
talc	01 -9.4 log Kow
talc	(log Pow, 25℃)

Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide] Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	log Kow 2.23 No data
Degradable	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	No data
ethylbenzene	No data
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide] Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data No data
C. Bio-enriched	
Concentration	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	BCF 25.9 (Oncorhynchus mykiss)
ethylbenzene	BCF 1 (BCF)
CALCITE	BCF 3.162
talc	01 3.162 BCF
talc	(ℓ/kg)
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide] Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	BCF 3.162 (QSAR predictions for substances with low acceptance are not applicable) No data
biodegradable	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	90% 28 days (Dissociable, OECD TG301F, GLP)
ethylbenzene	70 ~ 80 % 28 day (ISO 14593 CO2 headspace시험, GLP)
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide] Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data No data

D. Soil mobility	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	No data
ethylbenzene	No data
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
E. Other harmful effects	
dimethyl carbonate	No data
carbon black	조류:Desmodemus subspicatus: NOEC, 72h, > 10000 mg/L, OECD Guideline 201, GLP
titanium dioxide	No data
xylene	"Chronic toxicity test for fish NOEC56d>1.3 mg/L
ethylbenzene	Waterflake Chronic Toxicity Test US EPA 600/4-91-003 Results NOEC=1.17 mg/L"
CALCITE	조류 Selenastrum capricornutum, NOEC96h=3.4 mg/L 지수식 EPA 1985, GLP
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data

13. Precautions for Disposal

A. Method of disposal	
dimethyl carbonate	Dispose of contents and containers as stipulated in the Waste Management Act.
carbon black	No data
titanium dioxide	No data
xylene	"Take care of it in one of the following ways.
ethylbenzene	1. Incineration.
CALCITE	2. After treatment by evaporation and concentration, incinerate the residue.
talc	3. After purifying by separation, distillation, extraction, and filtration, incinerate the residue.
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	4. Use neutralization, oxidation, reduction, polymerization, and condensation reactions to treat.
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	5. Incineration of residues, or after re-treatment by means of agglomeration, sedimentation, filtration, and dehydration, incinerate residues."
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	"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.
B. Precautions for disposal	2. Treat by evaporation and concentration.
dimethyl carbonate	3. Refine by means of separation, distillation, extraction, and filtration."

carbon black	(1) High-temperature melting or solidification of dust, debris, or anything that is crushed by the force of an adult's grasp.
titanium dioxide	polyethylene or other similar-material bags and buried in designated waste landfill facilities."
xylene	Dispose of contents and containers as stipulated in the Waste Management Act.
ethylbenzene	Dispose of contents and containers as stipulated in the Waste Management Act.
CALCITE	Dispose of contents and containers as stipulated in the Waste Management Act.
talc	Dispose of contents and containers as stipulated in the Waste Management Act.
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide] Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Dispose of the contents containers (in accordance with the relevant laws and regulations). Dispose of the contents containers (in accordance with the relevant laws and regulations).
	Dispose of contents/containers in accordance with waste-related 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 ot	
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	
dimethyl carbonate	Substances subject to process safety report (PSM) submission
carbon black	Exposure criteria setting substances
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
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
CALCITE	No data
talc	Prohibited substances (limited to talc containing 1% or more of asbestos under the Chemical Substances Control Act)
talc	Materials subject to work environment measurement (measurement cycle: 6 months of materials subject to work environment measurement)
talc	Substances subject to special health examination (diagnostic cycle: 24 months)
talc	Exposure criteria setting substances
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
B. Regulations under the Chemical Substances Control Act	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	toxic substances
ethylbenzene	No data
CALCITE	No data
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
C. Regulations under the Dangerous Goods Safety Management Act	
dimethyl carbonate	Class 4 1 petroleum products (non-water-soluble liquid) 200 liters
carbon black	No data
titanium dioxide	No data
xylene	4th class 2nd petroleum (non-water soluble) 1000L
ethylbenzene	4th class 1 petroleum (non-water soluble) 200L
CALCITE	No data
talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	No data
D. Regulations under the Waste Management Act	
dimethyl carbonate	No data
carbon black	No data
titanium dioxide	No data
xylene	designated waste
ethylbenzene	designated waste
CALCITE	designated waste

talc	No data
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	No data
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	No data
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	designated waste
E. Other regulations under domestic and foreign laws	
domestic regulation	
dimethyl carbonate	
carbon black	
titanium dioxide	
xylene	
ethylbenzene	
CALCITE	
talc	
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	
Other domestic regulations	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
Foreign regulations	
US Administrative Information (OSHA Regulations)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable

Fatty acids, vegetable–oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
US Management Information (CERCLA Regulations)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	45.3599kg 100lb
ethylbenzene	453.599kg 1000lb
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable–oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
US Management Information (EPCRA 302)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable–oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
US Management Information (EPCRA 304)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable–oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
US Management Information (EPCRA 313)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Applicable
ethylbenzene	Applicable

CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
US Management Information (Rotterdam Convention Material)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
US Management Information (Stockholm Convention Material)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable
US Management Information (Montreal's emotional material)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	Not applicable
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Not applicable

EU classification information (final classification results)	
dimethyl carbonate	F; R11
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	"Flam. Liq. 3
ethylbenzene	Acute Tox. 4 *
CALCITE	Acute Tox. 4 *
talc	Skin Irrit. 2"
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	"Flam. Liq. 2
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Acute Tox. 4 *
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	Asp. Tox. 1 STOT RE 2"
EU classification information (danger phrases)	
dimethyl carbonate	Not applicable
carbon black	Not applicable
titanium dioxide	Not applicable
xylene	Not applicable
ethylbenzene	
CALCITE	
talc	R11
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	"H226 H332
EU classification information (safety equipment)	
dimethyl carbonate	H312
carbon black	H315"
titanium dioxide	"H225
xylene	H304
ethylbenzene	H373 (hearing organs)"
CALCITE	Not applicable
talc	Not applicable
Quaternary ammonium compounds, bis (hydrogenated resin alkyl) dimethyl, salt with bentonite (QUATERNARY AMMONIUM...	Not applicable
N,N'-1,6-hexanediylbis [12-hydroxyoctadecanamide]	Not applicable
Fatty acids, vegetable-oil, polymers with glycerol, carbomonocyclic carboxylic anhydride, furandione and ethenylcarbomonocycle	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
- C. Number of revisions and last revision date
- 2026–03–17

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."