

Date of issue 6/24/2025 (month/day/year)

Version 18

Section 1. Chemical product and company identification

- A. Product name** : SIGMA ALPHAGEN 230(HS)(EXP) BROWN
Product code : 00327444
- B. Relevant identified uses of the substance or mixture and uses advised against**
- Product use** : Professional applications, Used by spraying.
Use of the substance/ mixture : Antifouling products
Uses advised against : Product is not intended, labelled or packaged for consumer use.
- C. Supplier's or Importer's information** : PPG SSC
 (680-090)
 19, Yeocheon-ro 217beon-gil, Nam-gu,
 Ulsan, Korea
 Tel: +82-52-210-8222
Email Address : Korea.MSDS@PPG.COM
Emergency telephone number: : ☎82-52-210-8331

Section 2. Hazards identification

- A. Hazard classification** :  FLAMMABLE LIQUIDS - Category 3
 ACUTE TOXICITY (oral) - Category 4
 ACUTE TOXICITY (inhalation) - Category 4
 SKIN IRRITATION - Category 2
 EYE IRRITATION - Category 2A
 RESPIRATORY SENSITIZATION - Category 1
 SKIN SENSITIZATION - Category 1
 CARCINOGENICITY - Category 2
 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1
 AQUATIC HAZARD (ACUTE) - Category 1
 AQUATIC HAZARD (LONG-TERM) - Category 1
 This product is classified in accordance with the Industrial Safety and Health Act and the Chemical Control Act.
- B. GHS label elements, including precautionary statements**
- Symbol** :    
- Signal word** : Danger

Section 2. Hazards identification

Hazard statements :  H226 - Flammable liquid and vapor.
H302 + H332 - Harmful if swallowed or if inhaled.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H319 - Causes serious eye irritation.
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H351 - Suspected of causing cancer.
H372 - Causes damage to organs through prolonged or repeated exposure. (central nervous system (CNS), kidneys, liver)
H400 - Very toxic to aquatic life.
H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention :  P202 - Do not handle until all safety precautions have been read and understood.
P280 - Wear protective gloves, protective clothing and eye or face protection.
P284 - Wear respiratory protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P241 - Use explosion-proof electrical, ventilating or lighting equipment.
P241 - Use explosion-proof electrical, ventilating or lighting equipment.
P242 - Use non-sparking tools.
P243 - Take action to prevent static discharges.
P240 - Ground and bond container and receiving equipment.
P273 - Avoid release to the environment.
P260 - Do not breathe vapor.
P270 - Do not eat, drink or smoke when using this product.
P264 - Wash thoroughly after handling.

Response :  P391 - Collect spillage.
P370 + P378 - In case of fire: Never use water to extinguish.
P308 + P313 - IF exposed or concerned: Get medical advice or attention.
P304 + P340, P312 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor.
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 - If eye irritation persists: Get medical advice or attention.
P321 - Specific treatment (see the label).

Storage : P403 + P235 - Store in a well-ventilated place. Keep cool.

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

C. Other hazards which do not result in classification : Prolonged or repeated contact may dry skin and cause irritation.

Section 3. Composition/information on ingredients

CAS number/other identifiers

CAS number : Not applicable.

Chemical name	Common name	Identifiers	%
copper oxide	DICOPPER OXIDE / COPPER (I) OXIDE	CAS: 1317-39-1	30 - <40
Xylene	XYLENES	EC: 215-270-7 CAS: 1330-20-7	10 - <20
ROSIN	Rosin	EC: 215-535-7 CAS: 8050-09-7	10 - <20
zinc oxide	ZINC OXIDE	EC: 232-475-7 CAS: 1314-13-2	5 - <10
4-methylpentan-2-one	4-METHYLPENTAN-2-ONE / METHYL ISOBUTYL KETONE	EC: 215-222-5 CAS: 108-10-1	1 - <5
diuron (ISO)	DIURON	EC: 203-550-1 CAS: 330-54-1	1 - <5
Iron oxide	Diiron trioxide	EC: 206-354-4 CAS: 1309-37-1	1 - <5
ethylbenzene	ETHYLBENZENE	EC: 215-168-2 CAS: 100-41-4	1 - <5
Talc , not containing asbestiform fibres	Talc, non-asbestos form	EC: 202-849-4 CAS: 14807-96-6	1 - <5
copper monoxide	COPPER OXIDE	EC: 238-877-9 CAS: 1317-38-0	1 - <5
carbon black	CARBON BLACK	EC: 215-269-1 CAS: 1333-86-4	1 - <5
copper	COPPER	EC: 215-609-9 CAS: 7440-50-8 EC: 231-159-6	0.1 - <1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

- A. Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek immediate medical attention.
- B. Skin contact** : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
- C. Inhalation** : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.
- D. Ingestion** : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

Section 4. First aid measures

- E. Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

- A. Extinguishing media**
- Suitable extinguishing media** : Use dry chemical, CO₂, water spray (fog) or foam.
- Unsuitable extinguishing media** : Do not use water jet.
- B. Specific hazards arising from the chemical** : Flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon oxides
nitrogen oxides
halogenated compounds
metal oxide/oxides
oxides of lead
- C. Special equipment for fire-fighting** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Fire-fighting procedures** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Section 6. Accidental release measures

- A. Personal precautions, protective equipment and emergency procedures** :  No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- B. Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Section 6. Accidental release measures

C. Methods and materials for containment and cleaning up

Small spill

: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

A. Precautions for safe handling

: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

B. Conditions for safe storage, including any incompatibilities

: Store between the following temperatures: 0 to 35°C (32 to 95°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

A. Occupational exposure limits

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
 dicopper oxide	ISHA Article 42 (Republic of Korea, 1/2020) [copper (fume)] TWA 8 hours: 0.1 mg/m³. Form: Fume.
Xylene	ISHA Article 42 (Republic of Korea, 1/2020) [Xylene] STEL 15 minutes: 150 ppm. TWA 8 hours: 100 ppm.
ROSIN	ACGIH TLV (United States, 1/2024) [resin acids] Skin sensitizer , Inhalation sensitizer. TWA 8 hours: 0.001 mg/m³ (as total Resin acids). Form: Inhalable fraction.
zinc oxide	ISHA Article 42 (Republic of Korea, 1/2020) STEL 15 minutes: 10 mg/m³. TWA 8 hours: 5 mg/m³. TWA 8 hours: 2 mg/m³. Form: Respirable dust.
4-methylpentan-2-one	ISHA Article 42 (Republic of Korea, 1/2020) STEL 15 minutes: 75 ppm. TWA 8 hours: 50 ppm.
diuron (ISO)	ISHA Article 42 (Republic of Korea, 1/2020) TWA 8 hours: 10 mg/m³.
Iron oxide	ISHA Article 42 (Republic of Korea, 1/2020) [Iron oxide] TWA 8 hours: 5 mg/m³ (as Fe). Form: Fume. TWA 8 hours: 5 mg/m³ (as Fe).
ethylbenzene	ISHA Article 42 (Republic of Korea, 1/2020) STEL 15 minutes: 125 ppm. TWA 8 hours: 100 ppm.
Talc , not containing asbestiform fibres	ACGIH TLV (United States, 1/2024) TWA 8 hours: 2 mg/m³. Form: Respirable fraction.
copper monoxide	ISHA Article 42 (Republic of Korea, 1/2020) [copper (fume)] TWA 8 hours: 0.1 mg/m³. Form: Fume.
carbon black	ISHA Article 42 (Republic of Korea, 1/2020) TWA 8 hours: 3.5 mg/m³. Form: inhalable fraction.
copper	ISHA Article 42 (Republic of Korea, 1/2020) [copper (dust & mist)] TWA 8 hours: 1 mg/m³ (as Cu). Form: Dusts and Mists. STEL 15 minutes: 2 mg/m³ (as Cu). Form: Dusts and Mists. ISHA Article 42 (Republic of Korea, 1/2020) [copper (fume)]

Section 8. Exposure controls/personal protection

TWA 8 hours: 0.1 mg/m³. Form: Fume.

Recommended monitoring procedures : Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

B. Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

C. Personal protective equipment

Respiratory protection : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Eye protection : Chemical splash goggles and face shield.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Gloves : butyl rubber

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

A. Appearance

Physical state : Liquid.

Color : Brown.

B. Odor : Aromatic.

Section 9. Physical and chemical properties

- C. Odor threshold : Not available.
- D. pH : Not applicable.
- E. Melting/freezing point : Not available.
- F. Boiling point/boiling range : >37.78°C (>100°F)
- G. Flash point : Closed cup: 25°C (77°F)
- H. Evaporation rate : Not available.
- I. Flammability (solid, gas) : Not available.
- J. Lower and upper explosive (flammable) limits : Not available.
- K. Vapor pressure :

Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
4-methylpentan-2-one	15.75128	2.1				

- L. Solubility(ies) :

Media	Result
cold water	Not soluble

- Solubility in water : Not available.
- M. Vapor density : Not available.
- N. Relative density : 1.8
- O. Partition coefficient: n-octanol/water : Not applicable.
- P. Auto-ignition temperature :

Ingredient name	°C	°F	Method
Styron (ISO)	401	753.8	EU A.16

- Q. Decomposition temperature : Not available.
- R. Viscosity : Dynamic (room temperature): Not available.
Kinematic (room temperature): Not available.
Kinematic (40°C (104°F)): >21 mm²/s (>21 cSt)
- Flow time (ISO 2431) : Not available.
- S. Molecular weight : Not applicable.

Section 10. Stability and reactivity

- A. Chemical stability : The product is stable.
- Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.
- B. Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products.

Section 10. Stability and reactivity

C. Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

D. Hazardous decomposition products : Depending on conditions, decomposition products may include the following materials: carbon oxides nitrogen oxides halogenated compounds metal oxide/oxides

Section 11. Toxicological information

A. Information on the likely routes of exposure : Not available.

Potential acute health effects

- Inhalation** : ☒ Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- Ingestion** : ☒ Harmful if swallowed.
- Skin contact** : Causes skin irritation. Defatting to the skin. May cause an allergic skin reaction.
- Eye contact** : ☒ Causes serious eye irritation.

Over-exposure signs/symptoms

- Inhalation** : ☒ Adverse symptoms may include the following:
wheezing and breathing difficulties
asthma
- Ingestion** : ☒ No specific data.
- Skin contact** : ☒ Adverse symptoms may include the following:
irritation
redness
dryness
cracking
- Eye contact** : ☒ Adverse symptoms may include the following:
pain or irritation
watering
redness

B. Health hazards

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
☒ Copper oxide	LC50 Inhalation Dusts and mists	Rat	3.34 mg/l	4 hours
	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	500 mg/kg	-
Xylene	LD50 Dermal	Rabbit	1.7 g/kg	-
	LD50 Oral	Rat	4.3 g/kg	-
	LD50 Dermal	Rat	>2000 mg/kg	-
ROSIN	LD50 Oral	Rat	7600 mg/kg	-
	LC50 Inhalation Dusts and mists	Rat	>5700 mg/m ³	4 hours
zinc oxide	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LC50 Inhalation Vapor	Rat	11 mg/l	4 hours
4-methylpentan-2-one	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	2.08 g/kg	-

Section 11. Toxicological information

diuron (ISO)	LD50 Dermal	Rat	>5 g/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-
Iron oxide	LC50 Inhalation Dusts and mists	Rat	>5 mg/l	4 hours
	LD50 Oral	Rat	10 g/kg	-
ethylbenzene	LC50 Inhalation Vapor	Rat	17.8 mg/l	4 hours
	LD50 Dermal	Rabbit	17.8 g/kg	-
	LD50 Oral	Rat	3.5 g/kg	-
copper monoxide	LD50 Oral	Rat	>2000 mg/kg	-
carbon black	LD50 Oral	Rat	>10 g/kg	-
copper	LC50 Inhalation Dusts and mists	Rat	>5.11 mg/l	4 hours

Conclusion/Summary : There are no data available on the mixture itself.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Xylene	Skin - Moderate irritant	Rabbit	-	24 hours 500 mg	-

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Eyes : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Sensitization

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Mutagenicity

Conclusion/Summary : There are no data available on the mixture itself.

Carcinogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Reproductive toxicity

Conclusion/Summary : There are no data available on the mixture itself.

Teratogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Specific target organ toxicity (single exposure)

Name	Classification	Route of exposure	Target organs

Section 11. Toxicological information

Xylene	Category 3	-	Narcotic effects
4-methylpentan-2-one	Category 3	-	Respiratory tract irritation
-	Category 3	-	Narcotic effects
Iron oxide	Category 3	-	Respiratory tract irritation
Talc , not containing asbestiform fibres	Category 3	-	Respiratory tract irritation
copper	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Classification	Route of exposure	Target organs
Xylene	Category 1	-	central nervous system (CNS), kidneys, liver
Iron oxide	Category 1	-	-

Aspiration hazard

Name	Result
ethylbenzene	ASPIRATION HAZARD - Category 1

Potential chronic health effects

- General** : Causes damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Carcinogenicity** : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Reproductive toxicity** : No known significant effects or critical hazards.

Additional information

Prolonged or repeated contact may dry skin and cause irritation. Sanding and grinding dusts may be harmful if inhaled. Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage. Inhalation of vapor/aerosol concentrations above the recommended exposure limits causes headaches, drowsiness and nausea and may lead to unconsciousness or death. Avoid contact with skin and clothing.

Chemical name	Identifiers	GHS Classification
Copper oxide	CAS: 1317-39-1 EC: 215-270-7	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 EYE IRRITATION - Category 2A AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1
Xylene	CAS: 1330-20-7 EC: 215-535-7	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN IRRITATION - Category 2

Section 11. Toxicological information

ROSIN	CAS: 8050-09-7 EC: 232-475-7	EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 ACUTE TOXICITY (inhalation) - Category 4 RESPIRATORY SENSITIZATION - Category 1 SKIN SENSITIZATION - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 2 AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1 FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (inhalation) - Category 4
zinc oxide	CAS: 1314-13-2 EC: 215-222-5	EYE IRRITATION - Category 2A CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 CARCINOGENICITY - Category 2 AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1
4-methylpentan-2-one	CAS: 108-10-1 EC: 203-550-1	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (inhalation) - Category 4
diuron (ISO)	CAS: 330-54-1 EC: 206-354-4	EYE IRRITATION - Category 2A CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 CARCINOGENICITY - Category 2 AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1
Iron oxide	CAS: 1309-37-1	SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
ethylbenzene	EC: 215-168-2 CAS: 100-41-4 EC: 202-849-4	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (inhalation) - Category 4 CARCINOGENICITY - Category 2 ASPIRATION HAZARD - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 3
Talc , not containing asbestiform fibres	CAS: 14807-96-6	SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
copper monoxide	EC: 238-877-9 CAS: 1317-38-0 EC: 215-269-1	AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1
carbon black	CAS: 1333-86-4 EC: 215-609-9	CARCINOGENICITY - Category 2
copper	CAS: 7440-50-8 EC: 231-159-6	ACUTE TOXICITY (oral) - Category 4 SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 3

Section 12. Ecological information

A. Ecotoxicity

Product/ingredient name	Result	Species	Exposure
✓copper oxide	LC50 0.003 mg/l	Fish	96 hours
zinc oxide	Acute EC50 0.17 mg/l	Algae	72 hours
	Acute EC50 0.481 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	48 hours
4-methylpentan-2-one	Chronic NOEC 0.017 mg/l Fresh water	Algae	72 hours
diuron (ISO)	Acute LC50 >179 mg/l	Fish	96 hours
	Acute LC50 0.00788 mg/l Fresh water	Algae - <i>Synechococcus leopoliensis</i>	72 hours
	Chronic NOEC 0.000632 mg/l Fresh water	Algae - <i>Synechococcus leopoliensis</i>	72 hours
Iron oxide	Acute EC50 >100 mg/l	Daphnia	48 hours
ethylbenzene	Acute EC50 1.8 mg/l Fresh water	Daphnia	48 hours
	Chronic NOEC 1 mg/l Fresh water	Daphnia - <i>Ceriodaphnia dubia</i>	-
copper	Acute LC50 810 ppb	Fish	96 hours
	Chronic EC10 8.1 µg/l	Daphnia - <i>Daphnia magna</i> - Neonate	21 days

B. Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
✓4-methylpentan-2-one	OECD 301F	83 % - Readily - 28 days	-	-
ethylbenzene	-	79 % - Readily - 10 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
✓Xylene	-	-	Readily
4-methylpentan-2-one	-	-	Readily
ethylbenzene	-	-	Readily

C. Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
✓Xylene	3.12	7.4 to 18.5	Low
ROSIN	1.9 to 7.7	-	High
4-methylpentan-2-one	1.9	-	Low
diuron (ISO)	2.84	14.13	Low
ethylbenzene	3.6	79.43	Low

D. Mobility in soil

Soil/Water partition coefficient : Not available.

E. Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

- A. Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
- B. Disposal precautions** : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	UN	IMDG	IATA
A. UN number	UN1263	UN1263	UN1263
B. UN proper shipping name	PAINT	PAINT	PAINT
C. Transport hazard class(es)	3	3	3
D. Packing group	III	III	III
Environmental hazards	Yes. The environmentally hazardous substance mark is not required.	Yes.	Yes. The environmentally hazardous substance mark is not required.
E. Marine pollutant substances	Not applicable.	 (dicopper oxide)	Not applicable.

Additional information

UN : None identified.

IMDG : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.

F. Special precaution which a user to be aware of or needs to comply with in connection with transport or transportation

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not applicable.

Section 15. Regulatory information

A. Regulation according to ISHA

ISHA article 117 : None of the components are listed.

(Harmful substances prohibited from manufacture)

ISHA article 118 : None of the components are listed.

(Harmful substances requiring permission)

Article 2 of Youth Protection Act on Substances Hazardous to Youth : It is not allowed to sell to persons under the age of 19.

Exposure Limits of Chemical Substances and Physical Factors

The following components have an OEL:

ISHA Enforcement Regs : None of the components are listed.

Annex 19 (Exposure standards established for harmful factors)

ISHA Enforcement Regs : The following components are listed: xylene, zinc oxide, methyl isobutyl ketone, iron oxide, ethyl benzene, talc / soapstone

Annex 11-5 (Harmful factors subject to Work Environment Measurement)

ISHA Enforcement Regs : The following components are listed: Copper (dust, mist, fume), Xylene, Zinc oxide, Methyl isobutyl ketone, Iron oxide (dust, fume), Ethyl benzene

Annex 22 (Harmful Factors Subject to Special Health Check-up)

Standard of Industrial Safety and Health : The following components are listed: copper and its compounds, xylene, zinc and its compounds, methyl isobutyl ketone, iron and its compounds, ethyl benzene, copper and its compounds

Annex 12 (Hazardous substances subject to control)

B. Regulation according to Chemicals Control Act

Article 11 (TRI) : The following components are listed: Copper and its compounds, Xylene including o-,m-,p- isomer, Zinc and its compounds, Ethylbenzene, Copper and its compounds

Article 18 Prohibited (K-Reach Article 27) : None of the components are listed.

Article 19 Subject to authorization (K-Reach Article 25) : None of the components are listed.

Article 20 Restricted (K-Reach Article 27) : None of the components are listed.

Article 20 Toxic Chemicals (K-Reach Article 20) :  Toxic

Korea inventory :  All components are listed or exempted.

Article 39 (Accident Precaution Chemicals) : None of the components are listed.

Section 15. Regulatory information

- C. [Dangerous Materials Safety Management Act](#)** : **Class:** Class 4 - Flammable Liquid
Item: 4. Class 2 petroleums - Water-insoluble liquid
Threshold: 1000 L
Danger category: III
Signal word: Contact with sources of ignition prohibited
- D. [Wastes regulation](#)** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- E. [Regulation according to other foreign laws](#)**
Safety, health and environmental regulations specific for the product : No known specific national and/or regional regulations applicable to this product (including its ingredients).

Section 16. Other information

- A. [References](#)** : Korean Ministry of Environment; Chemical Control Act
Korean Ministry of Labor; Industrial Safety and Health Act
NIER Notice
Registry of Toxic Effects of Chemical Substances (RTECS)
U.S. Environmental Protection Agency, AQUIRE (Aquatic toxicity Information Retrieval) ECOTOX Database System.
- B. [First issue date](#)** : 3/26/2018
- C. [Date of issue/Date of revision](#)** : **6/24/2025**
- D. [Version](#)** : **18**
Prepared by : EHS
- E. [Other](#)**

Indicates information that has changed from previously issued version.

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