

Date of issue 1/15/2020 (month/day/year)

Version 16.01

## Section 1. Chemical product and company identification

- A. Product name** : SIGMASHIELD 905 HARDENER  
**Product code** : 00249140
- 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** : Coating. Paint. Painting-related materials.  
**Uses advised against** : Product is not intended, labelled or packaged for consumer use.
- C. Supplier's information** : PPG SSC  
(680-090)  
19, Yecheon-ro 217beon-gil, Nam-gu,  
Ulsan, Korea  
Tel: +82-52-210-8222
- Email Address** : Korea.MSDS@PPG.COM
- Emergency telephone number:** : +82-52-210-8222

## Section 2. Hazards identification

- A. Hazard classification** : FLAMMABLE LIQUIDS - Category 3  
CORROSIVE TO METALS - Category 1  
ACUTE TOXICITY (oral) - Category 4  
ACUTE TOXICITY (dermal) - Category 3  
ACUTE TOXICITY (inhalation) - Category 3  
SKIN CORROSION/IRRITATION - Category 1  
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1  
SKIN SENSITIZATION - Category 1  
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2  
ASPIRATION HAZARD - Category 2  
AQUATIC HAZARD (LONG-TERM) - Category 2

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.  
H290 - May be corrosive to metals.  
H311 + H331 - Toxic in contact with skin or if inhaled.  
H302 - Harmful if swallowed.  
H314 - Causes severe skin burns and eye damage.  
H317 - May cause an allergic skin reaction.  
H305 - May be harmful if swallowed and enters airways.  
H373 - May cause damage to organs through prolonged or repeated exposure.  
H411 - Toxic to aquatic life with long lasting effects.
- Precautionary statements**
- Prevention** : P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing.  
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P241 - Use explosion-proof electrical, ventilating, lighting and all material-handling equipment.  
P242 - Use only non-sparking tools.  
P243 - Take precautionary measures against static discharge.  
P234 - Keep only in original container.  
P233 - Keep container tightly closed.  
P271 - Use only outdoors or in a well-ventilated area.  
P273 - Avoid release to the environment.  
P260 - Do not breathe vapor.  
P270 - Do not eat, drink or smoke when using this product.  
P264 - Wash hands thoroughly after handling.  
P272 - Contaminated work clothing should not be allowed out of the workplace.  
P240 - Ground/bond container and receiving equipment.
- Response** : P391 - Collect spillage.  
P314 - Get medical attention if you feel unwell.  
P304 + P340 + P310 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician.  
P301 + P310 + P330 + P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353 + P363 + P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician.  
P302 + P361 + P364 + P352 + P312 + P362 + P364 - IF ON SKIN: Take off immediately all contaminated clothing and wash it before reuse. Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. Take off contaminated clothing and wash it before reuse.  
P333 + P313 - If skin irritation or rash occurs: Get medical attention.  
P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.
- Storage** : P405 - Store locked up.  
P403 - Store in a well-ventilated place.  
P235 - Keep cool.  
P406 - Store in a corrosion resistant container with a resistant inner liner.
- 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    | %        |
|--|---|----------------|----------|
| 2,2'-dimethyl-4,4'-methylenebis<br>(cyclohexylamine) | 3,3'-Dimethyl-4,4'-<br>diaminodicyclohexylmethane | CAS: 6864-37-5 | 70 - <80 |
| benzyl alcohol                                       | BENZYL ALCOHOL                                    | CAS: 100-51-6  | 10 - <20 |
| Methyl ethyl ketone                                  | Methyl ethyl ketone                               | CAS: 78-93-3   | 5 - <10  |
| 2,4,6-tris(dimethylaminomethyl)phenol                | 2;4;6 TRIS (DIMETHYLAMINOMETHYL)<br>PHENOL        | CAS: 90-72-2   | 1 - <5   |
| N-(3-(trimethoxysilyl)propyl)<br>ethylenediamine     | AMINOMETHOXSILANE                                 | CAS: 1760-24-3 | 1 - <5   |

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.

SUB codes represent substances without registered CAS Numbers.

## 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.
- 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, CO<sub>2</sub>, 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 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  
metal oxide/oxides  
Formaldehyde.

**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. Do not breathe 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.

### 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. Absorb spillage to prevent material damage. Dispose of via a licensed waste disposal contractor.

## Section 6. Accidental release measures

- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Absorb spillage to prevent material damage. 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). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Refer to special instructions/safety data sheet. 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 non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. 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 in a corrosion resistant container with a resistant inner liner. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep away from metals. 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

| Ingredient name     | Exposure limits  |
|---------------------|--|
| Methyl ethyl ketone | <b>Ministry of Employment and Labor (Republic of Korea, 7/2018).</b><br>STEL: 300 ppm 15 minutes.<br>TWA: 200 ppm 8 hours. |

## Section 8. Exposure controls/personal protection

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. 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** : nitrile neoprene
- 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

### A. Appearance

Physical state : Liquid.

Color : Various

B. Odor : Aromatic. [Strong]

C. Odor threshold : Not available.

D. pH : Not available.

E. Melting/freezing point : Not available.

F. Boiling point/boiling range : >37.78°C (>100°F)

G. Flash point : Closed cup: 52°C (125.6°F)

H. Evaporation rate : Not available.

I. Flammability (solid, gas) : Not available.

J. Lower and upper explosive (flammable) limits : Greatest known range: Lower: 1.3% Upper: 13% (benzyl alcohol)

K. Vapor pressure : Not available.

L. Solubility : Insoluble in the following materials: cold water.

M. Vapor density : Not available.

N. Relative density : 0.96

O. Partition coefficient: n-octanol/water : Not available.

P. Auto-ignition temperature : 426°C (798.8°F)

Q. Decomposition temperature : Not available.

R. Viscosity : Kinematic (40°C (104°F)): <0.14 cm<sup>2</sup>/s (<14 cSt)

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.

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 Formaldehyde. metal oxide/oxides



## Section 11. Toxicological information

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

### Potential acute health effects

- Inhalation** : Toxic if inhaled.
- Ingestion** : Harmful if swallowed. May be harmful if swallowed and enters airways.
- Skin contact** : Causes severe burns. Toxic in contact with skin. Defatting to the skin. May cause an allergic skin reaction.
- Eye contact** : Causes serious eye damage.

### Over-exposure signs/symptoms

- Inhalation** : No specific data.
- Ingestion** : Adverse symptoms may include the following:  
stomach pains  
nausea or vomiting
- Skin contact** : Adverse symptoms may include the following:  
pain or irritation  
redness  
dryness  
cracking  
blistering may occur
- Eye contact** : Adverse symptoms may include the following:  
pain  
watering  
redness

## B. Health hazards

### Acute toxicity

| Product/ingredient name                           | Result                          | Species | Dose                    | Exposure |
|---|---------------------------------|---------|-------------------------|----------|
| 2,2'-dimethyl-4,4'-methylenebis (cyclohexylamine) | LC50 Inhalation Dusts and mists | Rat     | 420 mg/m <sup>3</sup>   | 4 hours  |
|   | LD50 Dermal                     | Rabbit  | >0.2 g/kg               | -        |
|   | LD50 Oral                       | Rat     | >0.32 g/kg              | -        |
| benzyl alcohol                                    | LC50 Inhalation Dusts and mists | Rat     | >4178 mg/m <sup>3</sup> | 4 hours  |
|   | LD50 Dermal                     | Rabbit  | 2000 mg/kg              | -        |
|   | LD50 Oral                       | Rat     | 1.23 g/kg               | -        |
| Methyl ethyl ketone                               | LD50 Dermal                     | Rabbit  | 6480 mg/kg              | -        |
|   | LD50 Oral                       | Rat     | 2737 mg/kg              | -        |
| 2,4,6-tris(dimethylaminomethyl)phenol             | LD50 Dermal                     | Rabbit  | 1.28 g/kg               | -        |
|   | LD50 Dermal                     | Rat     | 1280 mg/kg              | -        |
|   | LD50 Oral                       | Rat     | 1200 mg/kg              | -        |
| N-(3-(trimethoxysilyl)propyl) ethylenediamine     | LD50 Oral                       | Rat     | 2413 mg/kg              | -        |

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

### Irritation/Corrosion

| Product/ingredient name                | Result                  | Species | Score | Exposure | Observation |
|--|-------------------------|---------|-------|----------|-------------|
| 2,4,6-tris(dimethylaminomethyl) phenol | Skin - Visible necrosis | Rabbit  | -     | 4 hours  | 7 days      |

### Conclusion/Summary



## Section 11. Toxicological information

**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

| Product/ingredient name               | Route of exposure | Species    | Result      |
|---------------------------------------|-------------------|------------|-------------|
| 2,4,6-tris(dimethylaminomethyl)phenol | skin              | Guinea pig | Sensitizing |

### 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    |
|---------------------|----------------|-------------------|------------------|
| Methyl ethyl ketone | Category 3     | Not applicable.   | Narcotic effects |

### Specific target organ toxicity (repeated exposure)

| Name   | Classification | Route of exposure | Target organs  |
|--|----------------|-------------------|----------------|
| 2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine) | Category 2     | Not determined    | Not determined |

### Aspiration hazard

| Name           | Result                         |
|----------------|--------------------------------|
| benzyl alcohol | ASPIRATION HAZARD - Category 2 |

### Potential chronic health effects

**General** : May cause 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** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

## Section 11. Toxicological information

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

### Additional information

Trimethoxysilanes are capable of forming methanol if hydrolyzed or ingested. If swallowed, methanol may be harmful or fatal or cause blindness. 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. This product either contains formaldehyde or is capable of releasing formaldehyde above 0.5 ppm under certain conditions. Formaldehyde is a known cancer hazard, a skin sensitizer and a respiratory sensitizer. Avoid contact with skin and clothing. Wash thoroughly after handling. Emits toxic fumes when heated.

| Chemical name                                     | Common name                                   | CAS #     | GHS Classification  |
|---|---|-----------|---|
| 2,2'-dimethyl-4,4'-methylenebis (cyclohexylamine) | 3,3'-Dimethyl-4,4'-diaminodicyclohexylmethane | 6864-37-5 | ACUTE TOXICITY (oral) - Category 4<br><br>ACUTE TOXICITY (dermal) - Category 3<br>ACUTE TOXICITY (inhalation) - Category 3<br>SKIN CORROSION/IRRITATION - Category 1<br>SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1<br>SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2<br>AQUATIC HAZARD (LONG-TERM) - Category 2 |
| benzyl alcohol                                    | BENZYL ALCOHOL                                | 100-51-6  | ACUTE TOXICITY (oral) - Category 4<br>ACUTE TOXICITY (dermal) - Category 4<br>ACUTE TOXICITY (inhalation) - Category 4<br>SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2<br>ASPIRATION HAZARD - Category 2   |
| Methyl ethyl ketone                               | Methyl ethyl ketone                           | 78-93-3   | FLAMMABLE LIQUIDS - Category 2<br>SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2<br>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3   |
| 2,4,6-tris (dimethylaminomethyl) phenol           | 2;4;6 TRIS (DIMETHYLAMINOMETHYL) PHENOL       | 90-72-2   | CORROSIVE TO METALS - Category 1<br><br>ACUTE TOXICITY (oral) - Category 4<br>ACUTE TOXICITY (dermal) - Category 4<br>SKIN CORROSION/IRRITATION - Category 1<br>SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1   |
| N-(3-(trimethoxysilyl)propyl) ethylenediamine     | AMINOMETHOXYSILANE                            | 1760-24-3 | SKIN SENSITIZATION - Category 1<br>ACUTE TOXICITY (inhalation) - Category 4<br><br>SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1  |

## Section 11. Toxicological information

|  |  |   |
|--|--|---|
|  |  | SKIN SENSITIZATION - Category 1<br>AQUATIC HAZARD (LONG-TERM) -<br>Category 3 |
|--|--|---|

## Section 12. Ecological information

### A. Ecotoxicity

| Product/ingredient name                       | Result              | Species | Exposure |
|---|---------------------|---------|----------|
| 2,4,6-tris<br>(dimethylaminomethyl)<br>phenol | Acute LC50 175 mg/l | Fish    | 96 hours |

### B. Persistence and degradability

| Product/ingredient name | Aquatic half-life | Photolysis | Biodegradability |
|-------------------------|-------------------|------------|------------------|
| benzyl alcohol          | -                 | -          | Readily          |

### C. Bioaccumulative potential

| Product/ingredient name                                  | LogP <sub>ow</sub> | BCF | Potential |
|--|--------------------|-----|-----------|
| 2,2'-dimethyl-4,4'-<br>methylenebis<br>(cyclohexylamine) | 2.5                | -   | low       |
| benzyl alcohol   | 1.1                | -   | low       |
| Methyl ethyl ketone                                      | 0.29               | -   | low       |

### D. Mobility in soil

Soil/water partition coefficient (K<sub>oc</sub>) : 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   |
|---------------------------------------|--|---|--|
| <b>A. UN number</b>                   | UN3470   | UN3470  | UN3470   |
| <b>B. UN proper shipping name</b>     | PAINT, CORROSIVE, FLAMMABLE  | PAINT, CORROSIVE, FLAMMABLE                         | PAINT, CORROSIVE, FLAMMABLE  |
| <b>C. Transport hazard class(es)</b>  | 8 (3)  | 8 (3)   | 8 (3)  |
| <b>D. Packing group</b>               | II   | II  | II   |
| <b>Environmental hazards</b>          | Yes. The environmentally hazardous substance mark is not required. | Yes.  | Yes. The environmentally hazardous substance mark is not required. |
| <b>E. Marine pollutant substances</b> | Not applicable.  | (2,2'-dimethyl-4,4'-methylenebis (cyclohexylamine)) | 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.

## Section 15. Regulatory information

### A. Regulation according to ISHA

**ISHA article 37 (Harmful substances prohibited from manufacture)** : None of the components are listed.

**ISHA article 38 (Harmful substances requiring permission)** : None of the components are listed.

**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:

Methyl ethyl ketone

**ISHA Enforcement Regs Annex 11-3 (Exposure standards established for harmful factors)** : None of the components are listed.

## Section 15. Regulatory information

**ISHA Enforcement Regs Annex 11-5 (Harmful factors subject to Work Environment Measurement)** : The following components are listed: Methyl ethyl ketone Preparations containing material at weight ratio of 1% or more

**ISHA Enforcement Regs Annex 12-2 (Harmful Factors Subject to Special Health Check-up)** : The following components are listed: Methyl ethyl ketone

**Standard of Industrial Safety and Health Annex 12 (Hazardous substances subject to control)** : The following components are listed: methyl ethyl ketone

### B. Regulation according to Chemicals Control Act

**CCA Article 20 Toxic Chemicals (K-Reach Article 20)** : Not applicable

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

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

**CCA Article 11 (TRI)** : The following components are listed: Methyl ethyl ketone

**Korea inventory** : All components are listed or exempted.

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

### 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.

**Section 16. Other information**

**B. Date of issue/Date of revision** : 1/15/2020

**C. Version** : 16.01

**Prepared by** : EHS

**D. Other**

**Procedure used to derive the classification**

| <b>Classification</b>   | <b>Justification</b>  |
|-------------------------|-----------------------|
| Flam. Liq. 3, H226      | On basis of test data |
| Met. Corr. 1, H290      | Calculation method    |
| Acute Tox. 4, H302      | Calculation method    |
| Acute Tox. 3, H311      | Calculation method    |
| Acute Tox. 3, H331      | Calculation method    |
| Skin Corr. 1, H314      | Calculation method    |
| Eye Dam. 1, H318        | Calculation method    |
| Skin Sens. 1, H317      | Calculation method    |
| STOT RE 2, H373         | Calculation method    |
| Asp. Tox. 2, H305       | Calculation method    |
| Aquatic Chronic 2, H411 | Calculation method    |

✔ Indicates information that has changed from previously issued version.

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