

CHUGOKU SAMHWA PAINTS Ltd.	MATERIAL SAFETY DATA SHEET	Date Of Issue	2018/10/04
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SECTION 1.CHEMICAL PRODUCT INFORMATION

Product Name	UNY MARINE, Hardener		
Application	THE USE FOR SHIP		
Chemical description			
Hazard	Toxicity / Flammable liquid	Supplier	CHUGOKU SAMHWA PAINTS Ltd.
Manufacturer	CHUGOKU SAMHWA PAINTS, LTD	Telephone NO.	+82-55-340-0777
Address	#322, Gimhae-daero 927beon-gil, Hallim-myeon, Gimhae-si, Gyeongsangnam-do, Korea	Department	Environment & Safety Team

SECTION 2.HAZARDOUS IDENTIFICATION

1.Classification of the substance

- ① FLAMMABLE LIQUIDS - category 3
- ② ACUTE TOXICITY (INHALATION-VAPOR) - category 1
- ③ SKIN CORROSION/IRRITATION - category 2
- ④ SENSITIZATION - SKIN - category 1
- ⑤ ASPIRATION HAZARD - category 1
- ⑥ HAZARDOUS TO THE AQUATIC ENVIRONMENT - ACUTE HAZARD - category 1
- ⑦ HAZARDOUS TO THE AQUATIC ENVIRONMENT - CHRONIC HAZARD - category 1

2.GHS warning label elements. including precautionary statements



① Symbol :

② Signal word : DANGER

③ Hazard statements : Flammable liquid and vapour
May be fatal if swallowed and enters airways
Causes skin irritation
May cause an allergic skin reaction
Fatal if inhaled
Very toxic to aquatic life
Very toxic to aquatic life with long lasting effects

④ Precautionary statements :

PREVENTION - Keep away from heat/sparks/open flames/hot surfaces.- No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/ equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Use only outdoors or in a wellventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
Wear respiratory protection.

COUNTERMEASURE - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
IF ON SKIN: Wash with plenty of soap and water.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/show
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Immediately call a POISON CENTER or doctor/physician.
Specific treatment is urgent (see on this label).
Specific treatment (see on this label).

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④ Precautionary statements :

COUNTERMEASURE - Do NOT induce vomiting.

If skin irritation occurs: Get medical advice/attention.

If skin irritation or rash occurs: Get medical advice/attention.

Take off contaminated clothing and wash before reuse.

In case of fire: Use a suitable fire extinguisher to extinguish the fire.

Collect spillage.

STORE - Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

DISUSE - Dispose of contents/container according to the related law & regulatory.

SECTION 3.CHEMICAL COMPOSITION

Chemical Name	CAS NO.	Portion(%)	Remarks
Hexamethylene Diisocyanate	822-06-0	< 1%	
Solvent naphtha (petroleum), heavy arom.	64742-94-5	51 ~ 60%	
1,3-Butanediol, reaction products with 1,6-diisocyanatohexane	187852-79-5	41 ~ 50%	

SECTION 4.HEALTH HAZARD INFORMATION

1. Eye contact

Wash off immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Call a physician immediately.

2. Skin contact

Remove the contaminated clothes and the skin will be washed with water and soap. Do not use solvents.

3. Inhalation

Move to fresh air and if he/she not breathes perform artificial respiration. Consult a physician if necessary.

4. Ingestion

Do not induce vomiting unless it is indicated by medical personnel.

Never give anything by oral tract to an unconscious. Get medical attention if symptoms appear.

5. Note to physician

Very small quantities of the product reached in lungs may be fatal. Ingestion of the product may cause chemical irritation that may diffuse to lungs and cause edema. Check carefully the victim and apply intubations in all ingestion cases for all important amounts.

SECTION 5.FIRE FIGHTING MEASURES

1. Suitable extinguishing media : Use dry chemical, CO₂ , water spray (fog) or foam

Unsuitable extinguishing media : Do not use water jet.

2. Specific hazards arising from the chemical :

Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides

3. Special protective actions for fire-fighters :

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

4. Special protective equipment for fire-fighters :

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.

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SECTION 6.ACCIDENTAL RELEASE MEASURES

- For non-emergency personnel : 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.
 - For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".
 - Environmental precautions :
Avoid dispersal of spilt 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) sent to incineration.
 - Methods and material 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 the 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 noncombustible,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 spilt product.
- * Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

SECTION 7.HANDLING AND STORAGE

- Precautions for safe handling
 - Protective measures : Put on appropriate personal protective equipment (see Section 8). 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. 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.
- Conditions for safe storage, including any incompatibilities :
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.

SECTION 8.EXPOSURE CONTROLS/PERSONAL PROTECTION

1. Exposure limit values

Chemical Name	Cas No	Interior provision	ACGIH
Hexamethylene Diisocyanate	822-06-0	TWA : 0.005ppm	TWA : 0.005ppm
Solvent naphtha (petroleum), heavy arom.	64742-94-5	No data	No data

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SECTION 8.EXPOSURE CONTROLS/PERSONAL PROTECTION

1. Exposure limit values

Chemical Name	Cas No	Interior provision	ACGHI
1,3-Butanediol, reaction products with 1,6-diiso	187852-79-5	No data	No data

2. 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.

3. Eye/face protection :

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.
If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield.
If inhalation hazards exist, a full-face respirator may be required instead.

4. Skin protection :

- A. Hand protection : Use chemical resistant gloves classified under Standard EN 374: Protective gloves against chemicals and micro-organisms. Recommended: Viton® or Nitrile gloves.
When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to EN 374) is recommended. The user must check that the final choice of type of glove selected for handling this product is the most appropriate and takes into account the particular conditions of use, as included in the user's risk assessment.
* NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to:
Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions / specifications provided by the glove supplier. Barrier creams may help to protect the exposed areas of the skin but should not be applied once exposure has occurred.
- B. 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 glove

SECTION 9.PHYSICAL AND CHEMICAL PROPERTIES

- | | |
|------------------------------------------------|-------------------------------------|
| 1. Appearance : colored and transparent liquid | 9. Explosive properties : 1.2 ~ 15 |
| 2. Odor : solvent specific | 10. Vapor pressure : 1,333 |
| 3. pH : Not applicable | 11. Vapor density : No data |
| 4. Melting point : No data | 12. Solubility : Water-insoluble |
| 5. Boiling point(℃) : 124 ~ 125 | 13. Partition coefficient : No data |
| 6. Flash point : 29.5 ℃ | 14. Specific gravity : 0.995 |
| 7. Evaporation rate : No data | 15. Viscosity(25℃) : 12sec |
| 8. Autoignition temperature : No data | |

SECTION 10.STABILITY AND REACTIVITY

- Reactivity : No specific test data related to reactivity available for this product or its ingredients.
- Chemical stability : The product is stable.
- Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid : Avoid all possible sources of ignition (spark or flame).
- Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions:

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SECTION 10. STABILITY AND REACTIVITY

oxidizing agents, strong alkalis, strong acids.

SECTION 11. TOXICOLOGICAL INFORMATION

1. Toxicity Information

Chemical Name	LD50.Oral	LD50.Skin	LD50.Inhalation (gas)	LD50.Inhalation (vapour)	LD50.Inhalation (mist)
Hexamethylene Diisocyanate	LD50 710 mg/kg Rat (NCIS)	LD50 599 mg/kg rabbit(NCIS)	No data	LC50 0.24 mg/ℓ 4 hr Rat(NCIS)	No data
Solvent naphtha (petroleum), heavy arom.	LD50 > 5000 mg/kg Rat (IUCLID)	LD50 > 2000 mg/ kg Rabbit	No data	No data	LC50 > 0.59 mg/ℓ 4 hr Rat (RTECS)
1,3-Butanediol, reaction products with 1,6-diisocyanatohexane	No data	No data	No data	No data	No data

* Carcinogenic effects : Not Application

SECTION 12. ECOLOGICAL INFORMATION

1. Ecological Information

Chemical Name	LC50.fish	LC50.water fleas	LC50.algae
Hexamethylene Diisocyanate	LC0 ≥ 82.8 mg/ℓ 96 hr 31E4(Danio)	EC50 > 89.1 mg/ℓ 48 hr(ECHA)	EC50 > 77.4 mg/ ℓ 72 hr (ECHA)
Solvent naphtha (petroleum), heavy arom.	LC50 = 45 mg/ℓ 96 hr Pimephales	EC50 = 0.95 mg/ℓ 48 hr Daphnia	EC50 = 2.5 mg/ℓ 72 hr
1,3-Butanediol, reaction products with 1,6-diisocyanatohexane	No data	No data	No data

2. Soil mobility : Not known

3. Persistence and degradability : There is no specific data available on the product itself. The product should not be allowed to enter drains or watercourses or be deposited where they can affect ground or surface waters.

4. Potential bioaccumulation : Be possible.

SECTION 13. DISPOSAL CONSIDERATION

1. 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.

2. Waste removal measures : 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

1. Classification by shipping transportaiton dangerous substance and regulation of storage : Class 3. Flammable

2. Direction for transport

The product must be kept in original container tightly closed and transport at normal temperature.

3. International Martitie Dangerous Goods Code

U.N Number : 1263

Shipping name : Paint, Flammable

Class / Sub: 3

Packing group : III

4. Marine pollutant : Applicable

5. Special precautions for user related to transport or transportation measures :

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<div>15.REGULATORY INFORMATION</div> <div> 1. Article of KOREA OCCUPATIONAL SAFETY _HEALTY AGENCY : Not determined. 2. Article of Harmful Chemical Substance : Not applicable 3. Classify of The Fire Service Act : Fourth grade 2nd.Petroleum </div>	
<div>SECTION 16.OTHER INFORMATION</div> <div> 1. The information on this SDS is based upon the present state of our knowledge and on current law. The purpose of this SDS is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products properties. 2. Issued date : 2018/10/04 3. Revision _date : 1 Times 2023/01/03 4. Others : To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. </div>	