1. Identification

A. Product name : WATER BASED URETHANE TOPCOAT CLEAR (HARDENER)

B. Recommended Use and Restriction on Use
- ○ General use : Top coat for concrete, mortar
- ○ Restriction on use : Restricted to use other than recommended use

C. Manufacturer / Supplier / distributor information
- ○ Company name : NOROO Paint & Coatings Co., Ltd.
- ○ Address : 351,Bakdal-ro, Manan-gu,Anyang-si,Gyeonggi-do,Korea
- ○ Emergency telephone number : +82-31-467-6114
- ○ Synergy Building Supplies
- ○ 236 Planet Street, Welshpool, WA, 6106
- ○ 1300 655 853

2. Hazard identification

A. GHS Classification
Serious eye damage/irritation Category 1
Serious eye damage/irritation Category 2A
Specific target organ toxicity(Single exposure) Category 3
Skin corrosion/irritation Category 2

B. GHS label elements
- ○ Hazard symbols



- ○ Signal words : DANGER
- ○ Hazard statements :

H318 Causes serious eye damage
H319 Causes serious eye irritation
H335+H336 May cause respiratory irritation, May cause drowsiness and dizziness.
H315 Causes skin irritation

- ○ Precautionary statements

- Prevention

P280 Wear protective gloves/protective clothing/eye protection/face protection.
P264 Wash hands thoroughly after handling.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.

- Response

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.
P337+P313 If eye irritation persists, get medical attention / attention.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P321 Specific treatment
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash before reuse.

- Storage

P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store in a locked place.

- Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification : (NFPA Classification)

NFPA grade / Chemical Name	Health	Flammability	Reactivity
1,6-Diisocyanatohexane homopolymer	2	1	1
4-Methyl-1,3-dioxolan-2-one	1	1	0
α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate	1	1	0
Diisopropyl(ethyl)amine	3	3	0
Phosphoric acid butyl ester	3	1	0

3. Composition/information on ingredients

Chemical Name	Trade names and Synonyms	CAS-NO	Content(%)
1,6-Diisocyanatohexane homopolymer	1,6-Diisocyanatohexane homopolymer	28182-81-2	65~75
4-Methyl-1,3-dioxolan-2-one	4-Methyl-1,3-dioxolan-2-one	108-32-7	25~35
α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate	α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate	9046-01-9	1~10
Diisopropyl(ethyl)amine	Diisopropyl(ethyl)amine	7087-68-5	1~10

Phosphoric acid butyl ester	Phosphoric acid butyl ester	12788-93-1	1~10

4. First-aid measures

A. Eye Contact : If irritation, pain, swelling, tears or glaring happens, take medical assistant immediately Flush exposed eyes with plenty of water for more than 15minutes.

B. Skin Contact : Wash off with soap and water for more than 15 minutes. And take medical assistant immediately. If symptoms like irritation or pain occurs, take medical assistant immediately. Remove exposed clothing, and wash off exposed area with soap and water.

C. Inhalation : Take a medical assistant immediately. Remove contaminated clothing and shoes, and isolate it. If hard to breathe, administering oxygen Perform the artificial respiration, using the pocket mask with one way valves or other respiratory medical devices. If inhalated or swallowed, do not perform the inhalation phase of breathing If not breathing, perform the artificial respiration. Avoid from exposure, and move into an area with fresh air.

D. Ingestion Contact : It is need to be considered that early removal of some ingested material by gastric lavage must be weighed against potential complications of bleeding or perforation Take proper medical assistant by symtoms. If ingested large quantity, take medical assistant. Do not try to induce vomiting, if occurs, keep head below hips to prevent swallow into lungs. Inducing vomit.

E. Notes to Physician : There is no specific antidote and take an appropriate medical treatment.

5. Fire-fighting measures

A. Suitable (Unsuitable) extinguishing media
○ Suitable extinguishing media : Powder extinguishing agent, gaseous Extinguishing Agent, and regular foam.
○ (Unsuitable) extinguishing media : Water is not appropriate extinguishing agent
○ Case of big fire : Use appropriate protective device depend on the situation. Stay away more than 800m to avoid tank explosion. Spread large amount of the extinguishing agent as a mist form with staying against wind.

B. Specific hazards arising from the chemical
○ Pyrolysate : Carbon dioxide, toxic carbon compounds/Nitrogen compounds/sulfur compounds
○ Fire and Explosion danger : Vapor may be released to the ignition source and ignited. Aqueous (Exclude water-soluble one) products does not have risk of fire or explosion hazard by itself. Risk of medium-sized fire.

C. Special protective actions for fire-fighters
○ Personal Precautions, protective equipment : Gas mask or air respirator, heat resistant clothing, heat resistant helmet, heat resistant gloves, heat resistant boots
○ Emergency procedures : Block the area except for the fire-suppression personnel. Cooling containers with water long time after extinguish fire. If there is no risk, moving containers away from fire. Use appropriate extinguishing agents to catch fire.

6. Accidental release measures

A. Personal Precautions, protective equipment and emergency procedures
○ Personal Precautions, protective equipment : Gas mask for organic gases, other appropriate protective device / clothing / gloves.
○ Emergency procedures : Do not contact on the bare skin Do work with the personal protected devices such as gas mask for organic gases other appropriate protective devices / clothing / gloves. Spray water to reduce amount of steam. Take an action to block the leakage if there is no risk.

B. Environmental precautions
○ Atmosphere : Using local ventilation to Minimize the exposure to worker. Do install the local ventilations and full ventilation system
○ Soil : Use absorbent to collect the appropriate container. Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers.
○ Under water : Collect spilled material with mechanic devices Use absorbent to collect the appropriate container.

C. Methods and materials for containment and cleaning up
○ Small spill : Move to appropriate container for disposal of spilled material collected. Absorb for use sand or other non-combustible material.
○ Large spill : Notify to central and local government, when emissions are above regulation. Prohibit access of unnecessary people, isolate hazard area to secure.

7. Handling and storage

A. Precautions for safe handling : Use local ventilations and a full ventilation system when handling Seal the container for minimizing the petroleum steam Ground for preventing the static discharge Keep or handle followed by Dangerous goods Safety Management Act

B. Conditions for safe storage, including any incompatibilities : Storage temperature: 25 ~ 35 ℃ Storage temperature: 15 ~ 25 ℃ Storage temperature: 5 ~ 15 ℃ Stored in an isolated place, freezing caution, high temperature body caution. Avoid strong oxidizing agents, acid. Storage temperature: 5 ~ 35 ℃ Avoid direct sunlight while storing outdoor. Because of evaporation and contamination concerns, airtight the container and store in a well-ventilated building.

8. Exposure controls/personal protection

A. Exposure Limits
○ 1,6-Diisocyanatohexane homopolymer
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ 4-Methyl-1,3-dioxolan-2-one
- ACGIH : NO DATA

- Biological exposure indices : NO DATA

○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ Diisopropyl(ethyl)amine
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ Phosphoric acid butyl ester
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

B. Engineering Controls :
▷ Do install the local ventilations and full ventilation system
▷ Using local ventilation to Minimize the exposure to worker.
▷ NO DATA
▷ NO DATA

C. Personal Protective Equipment
○ Respiratory protection : If there is possibility of direct contact or exposure to these substances should wear a authorized dust-proof mask or respirator for organic compounds Respiratory protection is ranked in order from minimum to maximum Respiratory protection may be needed, while frequent use or heavy exposure. Consider warning properties before use. Use the personal protect respirator for organic solvent or higher level of capacity when workers are supposed to be exposed under unsuitable respiratory working condition, or longer period exposure than standard level. Respirators should be authorized by Korea Occupational Safety and Health Agency
○ Eye protection : If there is possibility of direct contact or exposure to these substances should wear authorized safty glasses or mask. Let workers do wear the safety glasses in case hazard caused by mist may be expected. Install washing facilities and an emergency washing facilities close to workplace. Use the respirator for organic solvent or higher level.
○ Hand protection : If there is possibility of direct contact or exposure to these substances should wear authorized safety gloves for chemicals. Wear appropriate protective gloves Wear the chemical protective gloves Do the workers wear the impermeable protective gloves made from rubber/PVC due to skin irritation may be supposed by chronicle and long period exposure.
○ Skin protection : If there is a possibility of direct contact or exposure to the substance Wear protective clothing for chemical substances Wear cleanroom garment or appropriate protective clothing to prevent contamination Wear appropriate chemical protective clothing. Work after wearing the impermeable protective apron made by rubber/PVC in case hazard caused by exposure or spill, wear the impermeable whole body protective clothing if needed.

9. Physical and chemical properties

A. Appearance : clear liquid

B. Odor : low odor

C. Odor threshold : NO DATA

D. PH : NO DATA

E. Melting point/Freezing point(℃) : NO DATA

F. Initial Boiling Point/Boiling Ranges(℃) : NO DATA

G. Flash point(℃) : 100

H. Evaporating Rate : NO DATA

I. Flammability(solid, gas)(℃) : NO DATA

J. Upper/Lower Flammability or explosive limits : NO DATA

K. Vapour pressure : NO DATA

L. Solubility : NO DATA

M. Vapour density : NO DATA

N. Specific gravity : 1.1±0.2

O. Partition coefficient of n-octanol/water : NO DATA

P. Autoignition temperature(℃) : NO DATA

Q. Decomposition temperature(℃) : NO DATA

R. Viscosity : NO DATA

S. Molecular weight : NO DATA

10. Stability and reactivity

A. Chemical stability : NO DATA

B. Possibility of hazardous reactions : Avoid contaminants and friction Do not contact with heat, spark, flame or other flammable sources

C. Conditions to avoid : Oxidation agent, metal and combustable materials

D. Hazardous decomposition products : Thermal decomposition products (carbon etc.,)

11.Toxicological information

A. Information on the likely routes of exposure
- ○ Respiratory tracts : Adverse lung effects, Dyspnoea, Hypothermia, Vomitting
- ○ Oral : Vomitting, Diarrhea, Stomach pain, Irregular heartbeat
- ○ Skin : Irritation, Burn, Adverse nerve effects
- ○ Eye : Irritation, eye damage

B. Delayed and immediate effects and also chronic effects from short and long term exposure
- ○ 1,6-Diisocyanatohexane homopolymer
  - Acute toxicity
    Oral : NO DATA
    Dermal : NO DATA
    Inhalation : NO DATA
  - Skin corrosion/irritation : NO DATA
  - Serious eye damage/irritation : NO DATA
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    IARC : NO DATA
    OSHA : NO DATA
    ACGIH : NO DATA
    NTP : NO DATA
    EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : This risk may be increased by exposure to a case : Respiratory disorders, skin disorders and allergies
  - Aspiration hazard : NO DATA
- ○ 4-Methyl-1,3-dioxolan-2-one
  - Acute toxicity
    Oral : LD50=29100 mg/kg Rat
    Dermal : LD50>20,000 mg/kg Rabbit
    Inhalation : LD50>20,000 mg/kg Rabbit
  - Skin corrosion/irritation : Stimulus to the skin of a person raised in the middle, rabbit skin Irritation test result middle using the Causes o
  - Serious eye damage/irritation : Rabbit skin irritation test results using moderate irritation
  - Respiratory sensitization : NO DATA
  - Skin sensitization : Non-sensitizer (Guinea pig)
  - Carcinogenicity
    IARC : NO DATA
    OSHA : NO DATA
    ACGIH : NO DATA
    NTP : NO DATA
    EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- ○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate
  - Acute toxicity
    Oral : NO DATA
    Dermal : NO DATA
    Inhalation : NO DATA
  - Skin corrosion/irritation : NO DATA
  - Serious eye damage/irritation : NO DATA
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    IARC : NO DATA
    OSHA : NO DATA
    ACGIH : NO DATA
    NTP : NO DATA
    EU CLP : NO DATA
  - Germ cell mutagenicity : NO DATA
  - Reproductive toxicity : NO DATA
  - STOT-single exposure : NO DATA
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- ○ Diisopropyl(ethyl)amine
  - Acute toxicity
    Oral : NO DATA
    Dermal : NO DATA
    Inhalation : NO DATA
  - Skin corrosion/irritation : May cause burns to skin
  - Serious eye damage/irritation : In the eye can cause burns
  - Respiratory sensitization : NO DATA
  - Skin sensitization : NO DATA
  - Carcinogenicity
    IARC : NO DATA

OSHA : NO DATA
ACGIH : NO DATA
NTP : NO DATA
EU CLP : NO DATA
- Germ cell mutagenicity : NO DATA
- Reproductive toxicity : NO DATA
- STOT-single exposure : Inhalation may cause airway burns
- STOT-repeated exposure : NO DATA
- Aspiration hazard : NO DATA

○ Phosphoric acid butyl ester
- Acute toxicity
Oral : NO DATA
Dermal : NO DATA
Inhalation : NO DATA
- Skin corrosion/irritation : 인체 - 심한 자극과 화상
- Serious eye damage/irritation : 인체 - 심한 자극과 화상
- Respiratory sensitization : NO DATA
- Skin sensitization : NO DATA
- Carcinogenicity
IARC : NO DATA
OSHA : NO DATA
ACGIH : NO DATA
NTP : NO DATA
EU CLP : NO DATA
- Germ cell mutagenicity : NO DATA
- Reproductive toxicity : NO DATA
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : NO DATA

12. Ecological information

A. Ecotoxicity

○ 1,6-Diisocyanatohexane homopolymer
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ 4-Methyl-1,3-dioxolan-2-one
- Fish : LC50 > 1000 ㎎/ℓ 96 hr Other
- Crustaceans : EC50 > 1000 ㎎/ℓ 48 hr Daphnia magna
- Algae : EC50 > 900 ㎎/ℓ 72 hr Scenedesmus subspicatus

○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ Diisopropyl(ethyl)amine
- Fish : LC50 21.253 ㎎/ℓ 96 hr
- Crustaceans : LC50 1.641 ㎎/ℓ 48 hr
- Algae : EC50 3.496 ㎎/ℓ 96 hr

○ Phosphoric acid butyl ester
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

B. Persistence and degradability

○ 1,6-Diisocyanatohexane homopolymer
- Persistence : NO DATA
- Degradability : NO DATA

○ 4-Methyl-1,3-dioxolan-2-one
- Persistence : log Kow = -0.41
- Degradability : COD = 1290 BOD5/COD = 0.019

○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate
- Persistence : NO DATA
- Degradability : NO DATA

○ Diisopropyl(ethyl)amine
- Persistence : log Kow 2.35
- Degradability : NO DATA

○ Phosphoric acid butyl ester
- Persistence : NO DATA
- Degradability : NO DATA

C. Bioaccumulative potential

○ 1,6-Diisocyanatohexane homopolymer
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

○ 4-Methyl-1,3-dioxolan-2-one
- Bioaccumulative potential : BCF = 3.162
- Biodegration : Biodegradability = 68 (%) 4 week (89,90%)

○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

○ Diisopropyl(ethyl)amine

- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

○ Phosphoric acid butyl ester
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

D. Mobility in soil
○ 1,6-Diisocyanatohexane homopolymer
▷ NO DATA
○ 4-Methyl-1,3-dioxolan-2-one
▷ NO DATA
○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate
▷ NO DATA
○ Diisopropyl(ethyl)amine
▷ NO DATA
○ Phosphoric acid butyl ester
▷ NO DATA

E. Other adverse effects
○ 1,6-Diisocyanatohexane homopolymer
▷ NO DATA
○ 4-Methyl-1,3-dioxolan-2-one
▷ NO DATA
○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate
▷ NO DATA
○ Diisopropyl(ethyl)amine
▷ NO DATA
○ Phosphoric acid butyl ester
▷ NO DATA

13. Disposal considerations

A. Disposal methods : Disposal material should keep in the airtighted container, and consign according to Waste Mateial Management Act

B. Special precautions for disposal : Discard it followed by appropriate regulations Prohibit the unauthorized disposal and incineration due to adversely affect natural ecosystems

14. Transport information

A. UN number : Non regulated

B. Proper shipping name : N/A

C. Hazard class : Non dangerous goods

D. Packing group : Ⅲ

E. Marine pollutant : N/A

F. Special precautions for user related to transport or transportation measures
○ EmS FIRE SCHEDULE : N/A
○ EmS SPILLAGE SCHEDULE : N/A

15. Regulatory information

○ 1,6-Diisocyanatohexane homopolymer
- Information of EU Classification
▷ Classification : NO DATA
▷ Risk Phrases : NO DATA
▷ Safety Phrase : NO DATA
- U.S. Federal regulations
▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
▷ CERCLA Section 103 (40CFR302.4) : notapplicable
▷ EPCRA Section 302 (40CFR355.30) : notapplicable
▷ EPCRA Section 304 (40CFR355.40) : notapplicable
▷ EPCRA Section 313 (40CFR372.65) : notapplicable
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA

○ 4-Methyl-1,3-dioxolan-2-one
- Information of EU Classification
▷ Classification : NO DATA
▷ Risk Phrases : NO DATA
▷ Safety Phrase : NO DATA
- U.S. Federal regulations
▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
▷ CERCLA Section 103 (40CFR302.4) : notapplicable
▷ EPCRA Section 302 (40CFR355.30) : notapplicable
▷ EPCRA Section 304 (40CFR355.40) : notapplicable
▷ EPCRA Section 313 (40CFR372.65) : notapplicable
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA

○ α-Tridecyl-ω-hydroxypoly(oxy-1,2-ethanediyl)phosphate

- Information of EU Classification
  ▷ Classification : NO DATA
  ▷ Risk Phrases : NO DATA
  ▷ Safety Phrase : NO DATA
- U.S. Federal regulations
  ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
  ▷ CERCLA Section 103 (40CFR302.4) : notapplicable
  ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
  ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
  ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA

○ Diisopropyl(ethyl)amine
- Information of EU Classification
  ▷ Classification : NO DATA
  ▷ Risk Phrases : NO DATA
  ▷ Safety Phrase : NO DATA
- U.S. Federal regulations
  ▷ OSHA PROCESS SAFETY (29CFR1910.119) : notapplicable
  ▷ CERCLA Section 103 (40CFR302.4) : notapplicable
  ▷ EPCRA Section 302 (40CFR355.30) : notapplicable
  ▷ EPCRA Section 304 (40CFR355.40) : notapplicable
  ▷ EPCRA Section 313 (40CFR372.65) : notapplicable
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA

○ Phosphoric acid butyl ester
- Information of EU Classification
  ▷ Classification : NO DATA
  ▷ Risk Phrases : NO DATA
  ▷ Safety Phrase : NO DATA
- U.S. Federal regulations
  ▷ OSHA PROCESS SAFETY (29CFR1910.119) : NO DATA
  ▷ CERCLA Section 103 (40CFR302.4) : NO DATA
  ▷ EPCRA Section 302 (40CFR355.30) : NO DATA
  ▷ EPCRA Section 304 (40CFR355.40) : NO DATA
  ▷ EPCRA Section 313 (40CFR372.65) : NO DATA
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA

16. Other information

A. Reference
This MSDS is based on ‘Industrial safety and health’ Act paragraph 41 and Proclamation of Ministry of Labor and Employment 2016-19, and considered domestic regulations.
This MSDS is based on KOSHA, NITE, ESIS, NLM, SIDS, IPCS, NCIS.

B. Issue date : 2025-11-24

C. Revision number and Last date revised : 2.(2025-11-24)

D. Other : " WWW.NOROO.CO.KR"