1. Identification

A. Product name : CLEANEPOXY DHDC-6400(S) (HARDENER)

B. Recommended Use and Restriction on Use
- ○ General use : for concrete
- ○ 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

2. Hazard identification

A. GHS Classification
Acute toxicity (oral) Category 4
Acute toxicity (dermal) Category 4
Acute toxicity (inhalation: gas) Category 3
Serious eye damage/irritation Category 2
Specific target organ toxicity(Single exposure) Category 3
Skin corrosion/irritation Category 2
Ozone layer hazard

B. GHS label elements
- ○ Hazard symbols



- ○ Signal words : DANGER
- ○ Hazard statements :

H302 Harmful if swallowed
H312 Harmful in contact with skin
H331 Toxic if inhaled
H319 Causes serious eye irritation
H335+H336 May cause respiratory irritation, May cause drowsiness and dizziness.
H315 Causes skin irritation
H420 It destroys the upper layer of the ozone layer and is harmful to public health and environment.

- ○ Precautionary statements

- Prevention

P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P261 Do not breathe dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

- Response

P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P322 Specific measures
P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P311 Call a POISON CENTER or doctor/physician.
P321 Specific treatment
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/attention.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.

- Storage

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

- Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulation
P502 Please refer to the information provided by the manufacturer / supplier on recycling and recycling examples.

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

NFPA grade Chemical Name	Health	Flammability	Reactivity
α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-			

1,2-ethanediyl)]	3	1	0
Dodecylphenol, branched	NO DATA	NO DATA	NO DATA
2-Butoxyethanol	3	2	0
2,4,6-Tris[(dimethylamino)methyl]phenol	3	1	0

3. Composition/information on ingredients

Chemical Name	Trade names and Synonyms	CAS-NO	Content(%)
α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]	α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]	9046-10-0	46～56
Dodecylphenol, branched	Dodecylphenol, branched	121158-58-5	18～28
2-Butoxyethanol	2-Butoxyethanol	111-76-2	15～25
2,4,6-Tris[(dimethylamino)methyl]phenol	2,4,6-Tris[(dimethylamino)methyl]phenol	90-72-2	11～21

4. First-aid measures

A. Eye Contact : Do not rub your eyes. If you wear a contact lenses, remove them first. 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 : Wear gloves while washing the patient and avoid contact with exposed clothes. Wash carefully after handling. If symptoms like redness or irritation occurs, take medical assistant immediately. 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 : Flush mouth with water immediately. 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 : Avoid extinguishing fire with halogenting agent. Avoid use waterjet as fire extinguishing agent. 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 : Irritating and highly toxic gases may produced during the combustion by pyrolysis or combustion itself. 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. Vapors may explode indoors, outdoors, and in drains Leakages may fire / explosion hazard and could be easily ignited by heat, sparks or flames. Container may explode when heating May form explosive mixture at or above ignition point 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 : Do not approach if the tank is on fire. Avoid inhalation of the substance or combustion products. Use an unmanned fire extinguishing device, in case of large-sized fire. If not, leave it to burn. Tell the fire department, location of the fire and the hazardous features. Protect others from access and prohibit access to dangerous areas. 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 : Storing with combustible substances such as stained clothes or paper may cause fire by spontaneous ignition. Thus do not stack it, and keep it in a non-flammable container with cap filled with water and dispose it. Do not take contaminated clothings away from the work area. Avoid contact with heat, sparks, flames or other sources of ignition. Do not inhale vapor for long-term or repeatedly. Do not handle until read and understood all safety precautions. Avoid contact with prohibited materials in mixture. Wash carefully after 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 ℃ Store away from waterworks and sewers. Collect in an airtight container to dispose. Prevent static electricity and do not store near heat sources. Store in original container only. Store in accordance with all current law and regulations. Check periodically for leaks Store in a cool, dry, well-ventilated area. 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
○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ Dodecylphenol, branched
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ 2-Butoxyethanol
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ 2,4,6-Tris[(dimethylamino)methyl]phenol
- 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 : 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. If there is possibility of direct contact or exposure to these substances should wear a authorized dust-proof mask or respirator for organic compounds 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 : Wear appropriate protective gloves If there is possibility of direct contact or exposure to these substances should wear authorized safety gloves for chemicals. 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 : Wear cleanroom garment or appropriate protective clothing to prevent contamination If there is a possibility of direct contact or exposure to the substance Wear protective clothing for chemical substances 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 : Liquid

B. Odor : Specific 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(℃) : 89

H. Evaporating Rate : NO DATA

I. Flammability(solid, gas)(℃) : NON Flammable

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

K. Vapour pressure : NO DATA

L. Solubility : Water Insoluble

M. Vapour density : NO DATA

N. Specific gravity : 1.0 ± 0.3

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
- ○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
  - Acute toxicity
    - Oral : LD50 = 242 mg/kg Rat
    - Dermal : LD50 = 360 mg/kg rabbit
    - Inhalation : LD50 = 360 mg/kg rabbit
  - Skin corrosion/irritation : In case of contact with skin may cause burns
  - Serious eye damage/irritation : Medium using rabbit eye irritation or irritation test results
  - 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 airway irritation
  - STOT-repeated exposure : NO DATA
  - Aspiration hazard : NO DATA
- ○ Dodecylphenol, branched
  - 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
- ○ 2-Butoxyethanol
  - Acute toxicity
    - Oral : LD50 = 1746 mg/kg Rat
    - Dermal : LD50 = 99 mg/kg Rabbit
    - Inhalation : LD50 = 99 mg/kg Rabbit
  - Skin corrosion/irritation : skin Irritation test result Irritation
  - Serious eye damage/irritation : Using the rabbit eye irritation test results - Severe irritation

- Respiratory sensitization : NO DATA
- Skin sensitization : Guinea pig test results negative, human patch test results in negative
- Carcinogenicity
  IARC : Group 3
  OSHA : NO DATA
  ACGIH : A3
  NTP : NO DATA
  EU CLP : NO DATA
- Germ cell mutagenicity : (Using mouse and rat bone marrow cells) Micronucleustest Negative,
- Reproductive toxicity : (Using mouse and rat bone marrow cells) Micronucleustest Negative,
- STOT-single exposure : Throat irritation in humans are being observed. Appears neurotoxicity tests decreased activity decreased in rats and jerk reaction. Appears inhalation exposure test results suppress the central nervous system in rats and rabbits.
- STOT-repeated exposure : The toxic effects appear in the blood (red blood cells) by inhalation exposure in animals.
- Aspiration hazard : NO DATA

○ 2,4,6-Tris[(dimethylamino)methyl]phenol
- Acute toxicity
  Oral : LD50 = 1200 mg/kg Rat
  Dermal : LD50 = 1280 mg/kg Rat
  Inhalation : LD50 = 1280 mg/kg Rat
- Skin corrosion/irritation : severe stimulus
- Serious eye damage/irritation : Severe irritation
- 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

○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ Dodecylphenol, branched
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ 2-Butoxyethanol
- Fish : LC50 = 1250 mg/ℓ 96 hr
- Crustaceans : LC50 = 5.4 mg/ℓ 96 hr
- Algae : NO DATA

○ 2,4,6-Tris[(dimethylamino)methyl]phenol
- Fish : LC50 = 447.821 mg/ℓ 96 hr
- Crustaceans : LC50 = 28.198 mg/ℓ 48 hr
- Algae : EC50 = 34.812 mg/ℓ 96 hr

B. Persistence and degradability

○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
- Persistence : NO DATA
- Degradability : NO DATA

○ Dodecylphenol, branched
- Persistence : NO DATA
- Degradability : NO DATA

○ 2-Butoxyethanol
- Persistence : log Kow = 0.83
- Degradability : NO DATA

○ 2,4,6-Tris[(dimethylamino)methyl]phenol
- Persistence : log Kow = 0.77
- Degradability : NO DATA

C. Bioaccumulative potential

○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

○ Dodecylphenol, branched
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

○ 2-Butoxyethanol
- Bioaccumulative potential : NO DATA
- Biodegration : Biodegradability = 96 (%)

○ 2,4,6-Tris[(dimethylamino)methyl]phenol

- Bioaccumulative potential : BCF = 3.162
- Biodegration : NO DATA

D. Mobility in soil
○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
▷ NO DATA
○ Dodecylphenol, branched
▷ NO DATA
○ 2-Butoxyethanol
▷ NO DATA
○ 2,4,6-Tris[(dimethylamino)methyl]phenol
▷ NO DATA

E. Other adverse effects
○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
▷ NO DATA
○ Dodecylphenol, branched
▷ NO DATA
○ 2-Butoxyethanol
▷ NO DATA
○ 2,4,6-Tris[(dimethylamino)methyl]phenol
▷ NO DATA

13. Disposal considerations

A. Disposal methods : To prevent environmental pollution, dispose it to a licensed waste disposal company. Recycle the recycleable materials, such as organic solvents, and then incinerate the residue at high temperature. Pre-treat with oil-water separation method when it is available. 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 : N/A

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

○ α-(2-Aminomethylethyl)-ω-(2-aminomethylethoxy)poly[oxy(methyl-1,2-ethanediyl)]
- 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

○ Dodecylphenol, branched
- 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

○ 2-Butoxyethanol
- 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

○ 2,4,6-Tris[(dimethylamino)methyl]phenol
- 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

16. Other information

A. Reference
- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability of fitness for a particular purpose is made with respect to the product or the information contained herein.

- This Safety Data Sheet was complied with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date : 2025-11-17

C. Revision number and Last date revised : 9.(2025-11-17)

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