1. Identification

A. Product name : NEW HARDENER PRIMER (BASE) (L/GREEN)

B. Recommended Use and Restriction on Use
- ○ General use : FOR HARDENER PRIMER
- ○ 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
Flammable liquids Category 2
Acute toxicity (inhalation: vapor) Category 3
Acute Toxicity (Inhalation: dust / mist) Category 4
Carcinogenicity Category 1
Chronic aquatic toxicity Category 3
Serious eye damage/irritation Category 2
Specific target organ toxicity(Single exposure) Category 3
Specific target organ toxicity(Repeated exposure) Category 2
Skin sensitization Category 1
Skin corrosion/irritation Category 2
Aspiration hazard Category 1
Ozone Layer Hazards

B. GHS label elements
- ○ Hazard symbols

- ○ Signal words : DANGER
- ○ Hazard statements :

H225 Highly flammable liquid and vapour
H331 Toxic if inhaled
H332 Harmful if inhaled
H350 May cause cancer
H412 Harmful to aquatic life with long lasting effects
H319 Causes serious eye irritation
H335+H336 May cause respiratory irritation, May cause drowsiness and dizziness.
H373 Prolonged or repeated exposure may cause damage to the liver, testes, skin, respiratory system, blood and central nervous system of the body (Refer Section SDS 11)
H317 May cause an allergic skin reaction
H315 Causes skin irritation
H304 May be fatal if swallowed and enters airways
H420 It destroys the upper layer of the ozone layer and is harmful to public health and environment.

- ○ Precautionary statements

- Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. ? No smoking.
P223 Avoid contact with water.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use only non-sparking tools. Flammable liquids (chapter 2.6) 1, 2, 3
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P273 Avoid release to the environment.
P264 Wash hands thoroughly after handling.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.

- Response

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P310 Immediately call a POISON CENTER or doctor/physician.
P321 Specific treatment
P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P308+P313 If exposed or concerned: Get medical advice / attention.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists, get medical attention / attention.
P314 Get medical advice/attention if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash before reuse.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331 Do NOT induce vomiting.

- Storage

P403+P235 Store in a well-ventilated place. Keep cool.
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
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
Limestone	1	0	0
2,2-Bis(4'-glycidyloxyphenyl)propane	2	2	0
Quartz (SiO2)	1	0	0
Talc(Containing no asbestos fibers)	1	0	0
Xylene	NO DATA	NO DATA	NO DATA
2-Butoxyethanol	3	2	0
Dodecylphenol, branched	NO DATA	NO DATA	NO DATA
Ethylbenzene	2	3	0
S1(Trade secrets)	NO DATA	NO DATA	NO DATA
2-Propanol	2	3	0
Naphtha (petroleum), hydrodesulfurized heavy	NO DATA	NO DATA	NO DATA

3. Composition/information on ingredients

Chemical Name	Trade names and Synonyms	CAS-NO	Content(%)
Limestone	Limestone	1317-65-3	25～35
2,2-Bis(4'-glycidyloxyphenyl)propane	2,2-Bis(4'-glycidyloxyphenyl)propane	1675-54-3	18～28
Quartz (SiO2)	Quartz (SiO2)	14808-60-7	13～23
Talc(Containing no asbestos fibers)	Talc(Containing no asbestos fibers)	14807-96-6	12～22
Xylene	Xylene	1330-20-7	5～15
2-Butoxyethanol	2-Butoxyethanol	111-76-2	1～10
Dodecylphenol, branched	Dodecylphenol, branched	121158-58-5	1～10
Ethylbenzene	Ethylbenzene	100-41-4	1～10
S1(Trade secrets)	-	-	1～10
2-Propanol	2-Propanol	67-63-0	1～10
Naphtha (petroleum), hydrodesulfurized heavy	Naphtha (petroleum), hydrodesulfurized heavy	64742-82-1	0.1～4

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. If unconscious, do not induce vomiting. In case of vomiting, keep head down under hip to prevent lung inhalation. 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 : 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 : 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
○ Limestone
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ 2,2-Bis(4'-glycidyloxyphenyl)propane
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ Quartz (SiO2)
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ Talc(Containing no asbestos fibers)
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ Xylene
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ 2-Butoxyethanol
- ACGIH : TWA, 20 ppm (97 mg/m3)
- Biological exposure indices : While urinating - Butoxyacetic acid (BAA)(with hydrolysis) : 200 mg/g (After work)

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

○ Ethylbenzene
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

○ S1 (Trade secrets)
- ACGIH : NO DATA
- Biological exposure indices : NO DATA

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

○ Naphtha (petroleum), hydrodesulfurized heavy
- 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 : 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 : 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 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 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 : 유색 점성 액체

B. Odor : 특취

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(℃) : 20

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 : NO DATA

M. Vapour density : NO DATA

N. Specific gravity : NO DATA

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

P. Autoignition temperature(℃) : NO DATA

Q. Decomposition temperature(℃) : NO DATA

R. Viscosity : 76-98 (KU/25℃)

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
○ Limestone
- 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

○ 2,2-Bis(4'-glycidyloxyphenyl)propane
- Acute toxicity
Oral : LD50 15600 mg/kg Other (Other)
Dermal : LD50 20000 mg/kg Rabbit
Inhalation : LD50 20000 mg/kg Rabbit
- Skin corrosion/irritation : weakstimulus(500mg, rabbit)
- Serious eye damage/irritation : Severe irritation(2mg, 24시간, rabbit)
- Respiratory sensitization : NO DATA
- Skin sensitization : NO DATA
- Carcinogenicity
IARC : Group 3
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

○ Quartz (SiO2)
- 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 : Group 1
OSHA : NO DATA
ACGIH : A2
NTP : K
EU CLP : NO DATA
- Germ cell mutagenicity : in vivo Mutagenictest (Bone Marrow Micronucleus test) result Negative, chromosomal abnormalities testresult Negative, Micronucleus testresult Positive
- Reproductive toxicity : in vivo Mutagenictest (Bone Marrow Micronucleus test) result Negative, chromosomal abnormalities testresult Negative, Micronucleus testresult Positive
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : NO DATA

○ Talc(Containing no asbestos fibers)
- Acute toxicity
Oral : NO DATA
Dermal : NO DATA
Inhalation : NO DATA
- Skin corrosion/irritation : 300㎍/3day(human) : weak stimulus
- Serious eye damage/irritation : NO DATA
- Respiratory sensitization : NO DATA
- Skin sensitization : NO DATA
- Carcinogenicity
IARC : Group 2B
OSHA : NO DATA
ACGIH : A4
NTP : NO DATA
EU CLP : NO DATA
- Germ cell mutagenicity : Salmonella species / Negative
- Reproductive toxicity : Salmonella species / Negative
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : NO DATA

○ Xylene
- Acute toxicity
Oral : LD50=3550 mg/kg rat
Dermal : LD50 4350 mg/kg Rabbit
Inhalation : LD50 4350 mg/kg Rabbit
- Skin corrosion/irritation : Skin irritation test in rabbits Causes moderate irritation.
- Serious eye damage/irritation : Skin irritation test in rabbits Causes moderate irritation.
- Respiratory sensitization : NO DATA
- Skin sensitization : NO DATA

- Carcinogenicity
  IARC : Group 3
  OSHA : NO DATA
  ACGIH : A4
  NTP : NO DATA
  EU CLP : NO DATA
- Germ cell mutagenicity : If three people a voice dynamics, somatic cell mutagenicity tests in vivo (micronucleus test, chromosome test) Voice
- Reproductive toxicity : If three people a voice dynamics, somatic cell mutagenicity tests in vivo (micronucleus test, chromosome test) Voice
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : In the liquid can cause chemical pneumonia if swallowed.

○ 2-Butoxyethanol
- Acute toxicity
  Oral : LD50 1414 ㎎/㎏ Guinea pig (OECD TG 401, GLP)
  Dermal : LD50 >2000 ㎎/㎏ Rat (ECHA)
  Inhalation : Vapor LC50 >7.4 ㎎/ℓ 7 hr Rat (ECHA)
- Skin corrosion/irritation : As a result of skin irritation test using rabbits, it is erythema irritation 2, which is not applicable under the GHS standard, but it is sufficient to determine that it is irritating EU Method B.4 (ECHA)
- Serious eye damage/irritation : Eye irritation test results showed conjunctival irritation index 2.6, iritis 0.56, conjunctival edema 1.8, indicating irritation OECD TG405, GLP (ECHA)
- Respiratory sensitization : NO DATA
- Skin sensitization : Skin sensitization test results using guinea pigs non-sensitization (OECD TG 406, ECHA)
- Carcinogenicity
  IARC : Group 3
  OSHA : NO DATA
  ACGIH : A3
  NTP : NO DATA
  EU CLP : NO DATA
- Germ cell mutagenicity : Reverse mutation test using in vitro microorganisms OECD TG471, chromosomal abnormality test using mammalian cells OECD TG473 result negative, micronucleus test using mammalian bone marrow cells in vivo OECD TG474 result negative (ECHA)
- Reproductive toxicity : 2nd generation reproductive toxicity test (NTP) results, NOAEL (parental toxicity) = 720 mg/kg bw/day due to weight loss, fertility, etc., NOAEL (F1, F2) = 720 mg/kg bw/ due to weight loss of offspring day, no effect on reproductive toxicity was observed, developmental toxicity and teratogenic effects were not observed as a result of developmental toxicity test using rats (OECD TG414) NOAEL (development) = 100 mg/kg bw/day, NOAEL (teratogenicity)> 200 mg/kg bw/day (ECHA)
- STOT-single exposure : As a result of respiratory irritation test using mice, RD50 2818 ppm showed minimal or no sensory stimulation (ECHA)
- STOT-repeated exposure : As a result of a 90-day repeated oral toxicity test in rats, OECD TG408 showed some abnormalities in liver and cytoplasm in histopathological findings, but no adverse effects were observed. NOAEL male <69 mg/kg bw/day, NOAEL female <82 mg/kg bw/day 90-day inhalation repeat toxicity test using mice OECD TG413, GLP Results NOAEC <31ppm (ECHA)
- 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

○ Ethylbenzene
- Acute toxicity
  Oral : LD50 = 3500 ㎎/㎏ Rat
  Dermal : LD50 = 15400 ㎎/㎏ Rabbit
  Inhalation : Steam LC50 = 4000 ppm 4 hr Rat (Equivalents : 17.4 mg/L)
- Skin corrosion/irritation : skin Irritation test result weak Irritation
- Serious eye damage/irritation : Rabbit eye irritation test results in a slight conjunctival irritation, recoverable damage.
- Respiratory sensitization : NO DATA
- Skin sensitization : NO DATA
- Carcinogenicity
  IARC : Group 2B
  OSHA : NO DATA
  ACGIH : A3
  NTP : NO DATA
  EU CLP : NO DATA

- Germ cell mutagenicity : Micronucleustest Negative (7)
- Reproductive toxicity : Micronucleustest Negative (7)
- STOT-single exposure : It causes central nervous system effects in laboratory animals and airway irritation.
- STOT-repeated exposure : NO DATA
- Aspiration hazard : Hydrocarbons. Swallowing the liquid by aspiration may cause chemical pneumonia. Ties seongryul 0.74 mm2 / s (25 ℃)

○ S1 (Trade secrets)
- 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-Propanol
- Acute toxicity
  Oral : LD50 = 4710mg/kg Rat
  Dermal : LD50 = 12870 mg/kg rabbit
  Inhalation : LD50 = 12870 mg/kg rabbit
- Skin corrosion/irritation : (using rabbit) skin Irritation test result weak Irritation and in people non-irritating
- Serious eye damage/irritation : The rabbit eye irritation test results of weak or too irritating impartial
- Respiratory sensitization : NO DATA
- Skin sensitization : Guinea pig test results negative
- Carcinogenicity
  IARC : Group 3
  OSHA : NO DATA
  ACGIH : A4
  NTP : NO DATA
  EU CLP : NO DATA
- Germ cell mutagenicity : (Using mouse bone marrow cells)Micronucleus test - Negative
- Reproductive toxicity : (Using mouse bone marrow cells)Micronucleus test - Negative
- STOT-single exposure : By inhalation exposure in rats decreased the activity is displayed. Stimulation of the digestive tract in humans during acute intoxication, blood pressure, body temperature, such as depression, central nervous system symptoms, renal failure appears.
- STOT-repeated exposure : In mice it was 4 gaewol inhalation exposure experiment reported that the effect on the blood vessels, liver, spleen, kidneys and may impact on the anesthetic action is recognized
- Aspiration hazard : Test mice when administered within 24 hours of the spectacle of death from cardiopulmonary arrest is recognized, an

○ Naphtha (petroleum), hydrodesulfurized heavy
- Acute toxicity
  Oral : LD50 = 5000 mg/kg Rat
  Dermal : LD50 = 3160 mg/kg rabbit
  Inhalation : LD50 = 3160 mg/kg rabbit
- Skin corrosion/irritation : usuallystimulus(rabbit)
- Serious eye damage/irritation : Non-irritating(rabbit)
- Respiratory sensitization : NO DATA
- Skin sensitization : NO DATA
- Carcinogenicity
  IARC : NO DATA
  OSHA : NO DATA
  ACGIH : NO DATA
  NTP : NO DATA
  EU CLP : Carc. 1B
- Germ cell mutagenicity : EU CLP: 1B (case containing less than 0.1% of the benzene in a weight ratio of the material not applied to the present classification)
- Reproductive toxicity : EU CLP: 1B (case containing less than 0.1% of the benzene in a weight ratio of the material not applied to the present classification)
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : NO DATA

12. Ecological information

A. Ecotoxicity

○ Limestone
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ 2,2-Bis(4'-glycidyloxyphenyl)propane
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ Quartz (SiO2)
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ Talc(Containing no asbestos fibers)
- Fish : LC50 > 100000 ㎎/ℓ 24 hr Brachydanio rerio
- Crustaceans : LC50 = 94983.781 ㎎/ℓ 48 hr
- Algae : LC50 = 48545.539 ㎎/ℓ

○ Xylene
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ 2-Butoxyethanol
- Fish : LC50 1474 ㎎/ℓ 96 hr Oncorhynchus mykiss(OECD Guideline 203)
- Crustaceans : EC50 1800 ㎎/ℓ 48 hr Daphnia magna(OECD TG 202)
- Algae : EC50 911 ㎎/ℓ 72 hr Selenastrum capricornutum(OECD TG 201)

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

○ Ethylbenzene
- Fish : LC50 = 9.09 ㎎/ℓ 96 hr
- Crustaceans : LC50 = 0.4 ㎎/ℓ 96 hr
- Algae : NO DATA

○ S1 (Trade secrets)
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

○ 2-Propanol
- Fish : LC50 > 100 ㎎/ℓ 96 hr
- Crustaceans : NO DATA
- Algae : EC50 = 2.2 ㎎/ℓ 96 hr

○ Naphtha (petroleum), hydrodesulfurized heavy
- Fish : NO DATA
- Crustaceans : NO DATA
- Algae : NO DATA

B. Persistence and degradability

○ Limestone
- Persistence : NO DATA
- Degradability : NO DATA

○ 2,2-Bis(4'-glycidyloxyphenyl)propane
- Persistence : NO DATA
- Degradability : NO DATA

○ Quartz (SiO2)
- Persistence : NO DATA
- Degradability : NO DATA

○ Talc(Containing no asbestos fibers)
- Persistence : log Kow = -1.50
- Degradability : NO DATA

○ Xylene
- Persistence : NO DATA
- Degradability : NO DATA

○ 2-Butoxyethanol
- Persistence : 0.81 log Kow (25 ° C, pH=7, BASF standard method)
- Degradability : NO DATA

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

○ Ethylbenzene
- Persistence : NO DATA
- Degradability : NO DATA

○ S1 (Trade secrets)
- Persistence : NO DATA
- Degradability : NO DATA

○ 2-Propanol
- Persistence : NO DATA
- Degradability : NO DATA

○ Naphtha (petroleum), hydrodesulfurized heavy
- Persistence : NO DATA
- Degradability : NO DATA

C. Bioaccumulative potential

○ Limestone
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

○ 2,2-Bis(4'-glycidyloxyphenyl)propane
- Bioaccumulative potential : NO DATA

- Biodegration : NO DATA
○ Quartz (SiO2)
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA
○ Talc(Containing no asbestos fibers)
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA
○ Xylene
- Bioaccumulative potential : NO DATA
- Biodegration : 39 (%)
○ 2-Butoxyethanol
- Bioaccumulative potential : NO DATA
- Biodegration : 90.4 % 28 day (OECD TG 301G)
○ Dodecylphenol, branched
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA
○ Ethylbenzene
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA
○ S1 (Trade secrets)
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA
○ 2-Propanol
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA
○ Naphtha (petroleum), hydrodesulfurized heavy
- Bioaccumulative potential : NO DATA
- Biodegration : NO DATA

D. Mobility in soil
○ Limestone
▷ NO DATA
○ 2,2-Bis(4'-glycidyloxyphenyl)propane
▷ NO DATA
○ Quartz (SiO2)
▷ NO DATA
○ Talc(Containing no asbestos fibers)
▷ NO DATA
○ Xylene
▷ log Kow = 3.12 (measured) (ortho), 3.2 (measured) (meta), 3.15 (measurements) (p) (5)
○ 2-Butoxyethanol
▷ NO DATA
○ Dodecylphenol, branched
▷ NO DATA
○ Ethylbenzene
▷ log Kow = 3.15 (11)
○ S1 (Trade secrets)
▷ NO DATA
○ 2-Propanol
▷ NO DATA
○ Naphtha (petroleum), hydrodesulfurized heavy
▷ NO DATA

E. Other adverse effects
○ Limestone
▷ NO DATA
○ 2,2-Bis(4'-glycidyloxyphenyl)propane
▷ NO DATA
○ Quartz (SiO2)
▷ NO DATA
○ Talc(Containing no asbestos fibers)
▷ NO DATA
○ Xylene
▷ NO DATA
○ 2-Butoxyethanol
▷ Flsh Danio rerio: NOEC14d>100 mg/L OECD TG 204, Crustacean Daphnia magna: NOEC21d=100 mg/L OECD TG 211 (ECHA)
○ Dodecylphenol, branched
▷ NO DATA
○ Ethylbenzene
▷ NO DATA
○ S1 (Trade secrets)
▷ NO DATA
○ 2-Propanol
▷ NO DATA
○ Naphtha (petroleum), hydrodesulfurized heavy
▷ 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 : 1263

B. Proper shipping name : Paint (including paint, lacquer, enamel, colorants, shellac solutions, varnish, polish, liquid filler and liquid lacquer sealer) or related materials (including paint diluent and reductant).

C. Hazard class : 3

D. Packing group : II

E. Marine pollutant : N/A

F. Special precautions for user related to transport or transportation measures
- ○ EmS FIRE SCHEDULE : F-E
- ○ EmS SPILLAGE SCHEDULE : S-E

15. Regulatory information

- ○ Limestone
  - 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
- ○ 2,2-Bis(4'-glycidyloxyphenyl)propane
  - 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
- ○ Quartz (SiO2)
  - 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
- ○ Talc(Containing no asbestos fibers)
  - 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
- ○ Xylene
  - 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) : 45.3599 kg 100 lb
▷ EPCRA Section 302 (40CFR355.30) : notapplicable
▷ EPCRA Section 304 (40CFR355.40) : notapplicable
▷ EPCRA Section 313 (40CFR372.65) : pertinent
- 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) : 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

○ 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

○ Ethylbenzene
- 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) : 453.599 kg 1000 lb
▷ EPCRA Section 302 (40CFR355.30) : notapplicable
▷ EPCRA Section 304 (40CFR355.40) : notapplicable
▷ EPCRA Section 313 (40CFR372.65) : pertinent
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA

○ S1 (Trade secrets)
- 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-Propanol
- 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) : pertinent
- Rotterdam Convention listed ingredients : NO DATA
- Stockholm Convention listed ingredients : NO DATA
- Montreal Protocol listed ingredients : NO DATA

○ Naphtha (petroleum), hydrodesulfurized heavy
- 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
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 : 2000-10-23

C. Revision number and Last date revised : 4.(2020-11-26)

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