

1. Identification

- A. Product name : BODYIAN REACTION ACCELERATOR MA-500
- B. Recommended Use and Restriction on Use
 - General use : Automotive refinsh
 - 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
 - Serious eye damage/irritation Category 1
 - Flammable liquids Category 3
 - Carcinogenicity Category 2
 - Germ cell mutagenicity Category 1B
 - Chronic aquatic toxicity Category 2
 - Serious eye damage/irritation Category 2A
 - Aspiration hazard Category 1

- B. GHS label elements
 - Hazard symbols



- Signal words : DANGER
- Hazard statements :
 - H318 Causes serious eye damage
 - H226 Flammable liquid and vapour
 - H351 Suspected of causing cancer
 - H340 May cause genetic defects
 - H411 Toxic to aquatic life with long lasting effects
 - H319 Causes serious eye irritation
 - H304 May be fatal if swallowed and enters airways
- Precautionary statements
 - Prevention
 - P280 Wear protective gloves/protective clothing/eye protection/face protection.
 - P210 Keep away from heat/sparks/open flames/hot surfaces. ? No smoking.
 - P242 Use only non-sparking tools. Flammable liquids (chapter 2.6) 1, 2, 3
 - P233 Keep container tightly closed.
 - P240 Ground/bond container and receiving equipment.
 - P201 Obtain special instructions before use.
 - P202 Do not handle until all safety precautions have been read and understood.
 - P281 Use personal protective equipment as required.
 - P241 Use explosion-proof electrical/ventilating/lighting/equipment.
 - P273 Avoid release to the environment.
 - P243 Take precautionary measures against static discharge.
 - P264 Wash hands thoroughly after handling.
 - 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.
 - 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).
 - P308+P313 If exposed or concerned: Get medical advice/attention.
 - P310 Immediately call a POISON CENTER or doctor/physician.
 - P391 Collect spillage.
 - P337+P313 If eye irritation persists: 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.
 - P405 Store locked up.
 - 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 | Health | Flammability | Reactivity |
|--|------------|--------|--------------|------------|
| Chemical Name | | | | |
| Solvent naphtha (petroleum), light arom. | | 1 | 2 | 0 |

| | | | |
|-------------------------------|---|---|---|
| Dipropylene glycol | 0 | 1 | 0 |
| Acetone | 1 | 3 | 0 |
| 1,4-Diazabicyclo[2.2.2]octane | 3 | 2 | 0 |

3. Composition/information on ingredients

| Chemical Name | Trade names and Synonyms | CAS-NO | Content(%) |
|--|--|------------|------------|
| Solvent naphtha (petroleum), light arom. | Solvent naphtha (petroleum), light arom. | 64742-95-6 | 79~89 |
| Dipropylene glycol | Dipropylene glycol | 25265-71-8 | 7~17 |
| Acetone | Acetone | 67-64-1 | 1~10 |
| 1,4-Diazabicyclo[2.2.2]octane | 1,4-Diazabicyclo[2.2.2]octane | 280-57-9 | 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 inhaled 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 : 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 °C 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

- Solvent naphtha (petroleum), light arom.
 - ACGIH : NO DATA
 - Biological exposure indices : NO DATA
- Dipropylene glycol
 - ACGIH : NO DATA
 - Biological exposure indices : NO DATA
- Acetone
 - ACGIH : NO DATA
 - Biological exposure indices : NO DATA
- 1,4-Diazabicyclo[2.2.2]octane
 - 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. 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 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 : 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 : transparent liquid
- B. Odor : solvent odor
- C. Odor threshold : NO DATA
- D. PH : NO DATA
- E. Melting point/Freezing point(°C) : NO DATA
- F. Initial Boiling Point/Boiling Ranges(°C) : 56~173
- G. Flash point(°C) : 39
- H. Evaporating Rate : NO DATA
- I. Flammability(solid, gas)(°C) : NON Flammable
- J. Upper/Lower Flammability or explosive limits : NO DATA
- K. Vapour pressure : NO DATA
- L. Solubility : NO DATA
- M. Vapour density : higher than air
- N. Specific gravity : 0.8~1
- O. Partition coefficient of n-octanol/water : NO DATA
- P. Autoignition temperature(°C) : 471
- Q. Decomposition temperature(°C) : 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

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

- Solvent naphtha (petroleum), light arom.
 - Acute toxicity
 - Oral : LD50 = 8400 mg/kg Rat
 - Dermal : LD50 > 2000 mg/kg Rabbit
 - Inhalation : LD50 > 2000 mg/kg Rabbit
 - Skin corrosion/irritation : weakstimulus(rabbit)
 - Serious eye damage/irritation : Mild irritant(rabbit)
 - 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 : 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 : Affecting the central nervous system. Inhalation of high concentrations vapors may cause loss of consciousness.
 - STOT-repeated exposure : NO DATA
 - Aspiration hazard : Harmful aspiration concerns
- Dipropylene glycol
 - Acute toxicity
 - Oral : LD50 = 14850 mg/kg Rat
 - Dermal : LD50 > 5000 mg/kg Rabbit
 - Inhalation : LD50 > 5000 mg/kg Rabbit
 - Skin corrosion/irritation : Slight irritating : This looks a little description of Irritation
 - Serious eye damage/irritation : No stimulation
 - Respiratory sensitization : NO DATA
 - Skin sensitization : Skin sensitization test in the person of 503 people to one person rather than sensitization sensitization appears to be applicable
 - Carcinogenicity
 - IARC : NO DATA
 - OSHA : NO DATA
 - ACGIH : NO DATA
 - NTP : NO DATA
 - EU CLP : NO DATA
 - Germ cell mutagenicity : ames test: Negative (CCRIS), Chromosomal abnormalitiestest: Negative ,1250-5000 µg / ml concentration, with or without metabolic activation system applicable Negative
 - Reproductive toxicity : Fertility : Rabbit: NOEL Parental >1200mg/kg bw Developmental toxicity/Teratogenicity SD Rat , NOEL Maternalt. 800mg/kg bw NOEL Teratogen >5000mg/kg bw Rabbit : NOEL Maternalt.: >1200mg/kg bw NOEL Teratogen: >1200mg/kg bw
 - STOT-single exposure : NO DATA
 - STOT-repeated exposure : Rat 1% ~ 10% negative, 10% of ingested 9-77 days, some animals were killed in the exposed group.
 - Aspiration hazard : NO DATA
- Acetone
 - Acute toxicity
 - Oral : LD50 = 5280 mg/kg Rat (EHC(1990), SIDS(1997))
 - Dermal : LD50 = 12870 mg/kg rabbit (EHC(1990), PATTY(1994), SIDS(1997))
 - Inhalation : LD50 = 12870 mg/kg rabbit (EHC(1990), PATTY(1994), SIDS(1997))
 - Skin corrosion/irritation : (using rabbit) skin Irritation test result non-irritating
 - Serious eye damage/irritation : Irritating to eyes of the person vapor exposure is stopped, but not sustained stimulation. The destruction of the corneal epidermis Restored in 4-6 days.
 - Respiratory sensitization : NO DATA
 - Skin sensitization : negative test result mouse, guinea pig test results negative
 - Carcinogenicity
 - IARC : NO DATA
 - OSHA : NO DATA
 - ACGIH : A4
 - NTP : NO DATA
 - EU CLP : NO DATA
 - Germ cell mutagenicity : Micronucleustest Negative
 - Reproductive toxicity : Micronucleustest Negative
 - STOT-single exposure : People in the nose, airway, bronchial irritation, exposure to high concentrations headaches, dizziness, loss of strength of the leg, causing fainting.
 - STOT-repeated exposure : NO DATA
 - Aspiration hazard : Seongryul tie 0.426 mm² / s (calculated)
- 1,4-Diazabicyclo[2.2.2]octane

- Acute toxicity
 - Oral : LD50 = 700 mg/kg Rat
 - Dermal : LD50 > 2000 mg/kg Rat
 - Inhalation : LD50 > 2000 mg/kg Rat
- Skin corrosion/irritation : Rabbit: Moderately irritating
- Serious eye damage/irritation : Using the rabbit eye irritation test results - Severe irritation
- Respiratory sensitization : NO DATA
- Skin sensitization : No hypersensitivity
- Carcinogenicity
 - IARC : NO DATA
 - OSHA : NO DATA
 - ACGIH : NO DATA
 - NTP : NO DATA
 - EU CLP : NO DATA
- Germ cell mutagenicity : ames test: Negative (OECD TG 471), in vivo using Mouse Micronucleustest: Negative
- Reproductive toxicity : Rat: all new characters toxicity and toxicity NOAELs: 300 mg / kg bw / day. 0, 100, 300 and 1000 mg / kg bw / day to 28 days exposure, 1000 mg / kg bw / day group increased absorption, little reduction in size, weight loss
- STOT-single exposure : NO DATA
- STOT-repeated exposure : NO DATA
- Aspiration hazard : NO DATA

12. Ecological information

A. Ecotoxicity

- Solvent naphtha (petroleum), light arom.
 - Fish : LC50 = 9.22 mg/ l 96 hr Oncorhynchus mykiss
 - Crustaceans : EC50 = 6.14 mg/ l 48 hr Daphnia magna
 - Algae : EC50 = 19 mg/ l 72 hr Selenastrum capricornutum
- Dipropylene glycol
 - Fish : LC50 = 1888.3 mg/ l 96 hr Other
 - Crustaceans : LC50 = 1841.9 mg/ l 48 hr Daphnia magna
 - Algae : EC50 = 1064.8 mg/ l 96 hr Other
- Acetone
 - Fish : LC50 > 100 mg/ l 96 hr
 - Crustaceans : NO DATA
 - Algae : NO DATA
- 1,4-Diazabicyclo[2.2.2]octane
 - Fish : LC50 > 100 mg/ l 96 hr Cyprinus carpio
 - Crustaceans : EC50 > 92 mg/ l 48 hr Daphnia magna
 - Algae : EC50 = 110 mg/ l 72 hr Other

B. Persistence and degradability

- Solvent naphtha (petroleum), light arom.
 - Persistence : log Kow = 2.1 ~ 6 (Estimates)
 - Degradability : BOD5/COD = 0.43
- Dipropylene glycol
 - Persistence : log Kow = -1.07 (Estimates)
 - Degradability : NO DATA
- Acetone
 - Persistence : NO DATA
 - Degradability : NO DATA
- 1,4-Diazabicyclo[2.2.2]octane
 - Persistence : log Kow = -0.49 (Estimated)
 - Degradability : NO DATA

C. Bioaccumulative potential

- Solvent naphtha (petroleum), light arom.
 - Bioaccumulative potential : NO DATA
 - Biodegradation : NO DATA
- Dipropylene glycol
 - Bioaccumulative potential : BCF = 0.3 ~ 1.4
 - Biodegradation : Biodegradability = 16 (%) 28 day
- Acetone
 - Bioaccumulative potential : NO DATA
 - Biodegradation : NO DATA
- 1,4-Diazabicyclo[2.2.2]octane
 - Bioaccumulative potential : BCF = 3.2
 - Biodegradation : NO DATA

D. Mobility in soil

- Solvent naphtha (petroleum), light arom.
 - ▷ NO DATA
- Dipropylene glycol
 - ▷ NO DATA
- Acetone
 - ▷ NO DATA
- 1,4-Diazabicyclo[2.2.2]octane
 - ▷ NO DATA

E. Other adverse effects

- Solvent naphtha (petroleum), light arom.
 - ▷ NO DATA

- Dipropylene glycol
 - ▷ NO DATA
- Acetone
 - ▷ NO DATA
- 1,4-Diazabicyclo[2.2.2]octane
 - ▷ 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 : III
- E. Marine pollutant : be applicable
- F. Special precautions for user related to transport or transportation measures
 - EmS FIRE SCHEDULE : F-E
 - EmS SPILLAGE SCHEDULE : S-E

15. Regulatory information

- Solvent naphtha (petroleum), light arom.
 - 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
- Dipropylene glycol
 - 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
- Acetone
 - 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) : 2267.995 kg 5000 lb
 - ▷ 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
- 1,4-Diazabicyclo[2.2.2]octane
 - 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 : 2013-07-24

C. Revision number and Last date revised : 3.(2019-09-06 오후 4:03:56)

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