

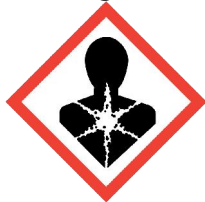
MATERIAL SAFETY DATA SHEET

1. Identification of the substance or mixture and of the supplier

- A. GHS product identifier** RainOK ULTIMATE GLASS CLEAN
- B. Recommended use of the chemical and restrictions on use**
Recommended use windshield of automobile
Restrictions on use Limitation of use for other purpose
- C. Manufacturers**
Company name Bullson
Address 7F, Dabong Tower, 418, Teheran-ro Gangnam-gu, Seoul, 135-839, Korea
Emergency phone number 822-2106-7777
Respondent Han Dong Jin
Fax 822-2106-7911

2. Hazards identification

- A. GHS classification of the substance/mixture**
 Skin corrosion/irritation : Category 3
 Carcinogenicity : Category 2
 Hazardous to the aquatic environment (acute hazard) : Category 3
- B. GHS label elements, including precautionary statements**
Pictogram and symbol :



Signal word : Warning

Hazard statements :

- H316 Causes mild skin irritation.
 H351 Suspected of causing cancer.
 H402 Harmful to aquatic life.

Precautionary statements

Precaution

- 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.
 P281 Use personal protective equipment as required.

Treatment

- P308+P313 If exposed or concerned: Get medical advice/ attention.
 P332+P313 If skin irritation occurs: Get medical advice/ attention.

Storage

- P405 Store locked up.

Disposal

- P501 Dispose the contents/container in accordance with local/regional/national/international regulations.

C. Other hazard information not included in hazard classification (NFPA)

Health 1

Flammability 1

Reactivity Not available

3. Composition/information on ingredients

Chemical Name	Common Name(Synonyms)	CAS number	EC number	Content (%)
Aluminium oxide	Aluminum trioxide	1344-28-1	215-691-6	10~30
2-Butoxyethanol	Butyl Cellosolve	111-76-2	203-905-0	1~10
4-isopropenyl-1-methylcyclohexene	(+)-Limonene	5989-27-5	227-813-5	< 1
Propane-1,2-diol	1,2-Propanediol	57-55-6	200-338-0	1~10
Nonionic surfactant				1~10
Preservatives	2-Methyl-4-isothiazolin-3-one(CAS No. 2682-20-4) +Water(CAS No. 7732-18-5)			< 1
Viscosity modifier				1~10
Water		7732-18-5	231-791-2	50~80

4. First aid measures

A. Eye contact

- Call emergency medical service.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

B. Skin contact

- Call emergency medical service.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.

C. Inhalation

- If exposed or concerned: Get medical advice/ attention.
- Move victim to fresh air.
- Keep victim warm and quiet.

D. Ingestion

- If exposed or concerned: Get medical advice/ attention.
- Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

E. Indication of immediate medical attention and notes for physician

- Exposures require specialized first aid with contact and medical follow-up .
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. Fire fighting measures

A. Suitable (and unsuitable) extinguishing media

- Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
- Use dry sand or earth to smother fire.

B. Specific hazards arising from the chemical

- May decompose at high temperatures into forming toxic gases.
- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.
- Non-combustible, substance itself does not burn but may decompose upon heating, then produce corrosive and/or toxic fumes.

C. Special protective equipment and precautions for fire-fighters

- Rescuers should put on appropriate protective gear.
- Evacuate area and fight fire from a safe distance.
- Substance may be transported in a molten form.
- Dike fire-control water for later disposal; do not scatter the material.
- Move containers from fire area if you can do it without risk.
- Fire involving Tanks; Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Fire involving Tanks; Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks; Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Fire involving Tanks; Always stay away from tanks engulfed in fire.
- Fire involving Tanks; For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

6. Accidental release measures**A. Personal precautions, protective equipment and emergency procedures**

- Clean up spills immediately, observing precautions in Protective Equipment section.
- Eliminate all ignition sources.
- Stop leak if you can do it without risk.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Cover with plastic sheet to prevent spreading.
- Prevent dust cloud.
- Please note that there are materials and conditions to avoid.

B. Environmental precautions and protective procedures

- Prevent entry into waterways, sewers, basements or confined areas.

C. The methods of purification and removal

- Absorb spills with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the area with detergent and water.
- Large Spill; Dike far ahead of liquid spill for later disposal.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
- Powder Spill; Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
- Small Spill; Take up with sand or other non-combustible absorbent material and place into containers for later disposal.

7. Handling and storage**A. Precautions for safe handling**

- Do not handle until all safety precautions have been read and understood.
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- Use carefully in handling/storage.
- Loosen closure cautiously before opening.
- Avoid breathing vapors from heated material.
- Do not enter storage area unless adequately ventilated.
- Please note that there are materials and conditions to avoid.

B. Conditions for safe storage

- Store locked up.

- Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.

8. Exposure controls/personal protection

A. Occupational Exposure limits

Korea regulation

- Aluminium oxide** TWA = 10 mg/m³
- 2-Butoxyethanol** TWA = 20 ppm (97 mg/m³)

ACGIH regulation

- Aluminium oxide** TWA 10 mg/m³ (as Al, Total particulate containing no asbestos and < 1% crystalline silica)
- 2-Butoxyethanol** TWA 20 ppm

Biological exposure index : Not available

OSHA regulation

- Aluminium oxide** TWA = 15 mg/m³ (total), TWA = 5 mg/m³ (respirable fraction)
- 2-Butoxyethanol** TWA = 50 ppm (240 mg/m³)

NIOSH regulation

- Aluminium oxide** TWA = 10 mg/m³
- 2-Butoxyethanol** TWA = 5 ppm (24 mg/m³)

EU regulation

- 2-Butoxyethanol** EU: TWA = 20 ppm (98 mg/m³), STEL = 50 ppm (246 mg/m³)

Other

- Aluminium oxide** Austria: TWA = 5 mg/m³, STEL = 10 mg/m³ Belgium: TWA = 5 mg/m³ (as Al) Denmark: TWA = 5 mg/m³ (total, as Al), 2 mg/m³ (respirable, as Al) Estonia: TWA = 10 mg/m³ (total dust), 4 mg/m³ (respirable dust) France: TWA = 10 mg/m³ Hungary: TWA = 6 mg/m³ [AK](respirable dust) Latvia: TWA = 6 mg/m³ Spain: TWA = 10 mg/m³ Australia: TWA = 10 mg/m³ Canada: TWA = 10 mg/m³ China: TWA = 4 mg/m³ (total dust), STEL = 8 mg/m³ (total dust) Russia: TWA = 6 mg/m³ (aerosol)
- 2-Butoxyethanol** Belgium: TWA = 20 ppm (98 mg/m³), STEL = 50 ppm (246 mg/m³) Italy: TWA = 20 ppm, STEL = 50 ppm, STEL = 50 ppm (246 mg/m³) Australia: TWA = 20 ppm (96.9 mg/m³), STEL = 50 ppm (242 mg/m³) Austria: TWA = 20 ppm (96.9 mg/m³), STEL = 40 ppm (200 mg/m³) Canada-Alberta: TWA = 20 ppm (97 mg/m³)
- D-Limonene** Finland: TWA=25 ppm (140 mg/m³) STEL=50 ppm (280 mg/m³) Germany: TWA=5 ppm (28 mg.m³) Norway: TWA=25 ppm (140 mg/m³) STEL=37.5 ppm (175 mg/m³)
- Propane-1,2-diol** Latvia: TWA = 7 mg/m³ Canada: TWA = 10 mg/m³ TWA = 50 ppm (aerosol and vapor), TWA = 155 mg/m³(aerosol and vapor) Ireland: TWA =150ppm(mg/m³), TWA = 10mg/m³(particulate), TWA = 10mg/m³ (particulate).

B. Appropriate engineering controls

- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

C. Personal protective equipment

Respiratory protection

- Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary.
- In case exposed to gaseous/liquid material, the respiratory protective equipments as follow are recommended. escape full facepiece gas mask (of use for acid gas, in case of acid gas for organic compounds) or escape half facepiece gas mask (of use for acid gas, in case of acid gas for organic compounds) or direct full facepiece gas mask (of use for acid gas, in case of acid gas for organic compounds) half facepiece gas mask (of use for acid gas, in case of acid gas for organic compounds) or powered air-purifying gas mask.
- In lack of oxygen(< 19.5%), wear the supplied-air respirator or self-contained breathing apparatus.oxygen

Eye protection

- Wear enclosed safety goggles to protect from gaseous state organic material causing eye irritation or other disorder.
- An eye wash unit and safety shower station should be available nearby work place.

Hand protection

- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Body protection

- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

9. Physical and chemical properties

A. Appearance

Description Liquid

Color

B. Odor**C. Odor threshold**

D. pH 8.0 ± 1.0

E. Melting point/freezing point 0 °C

F. Initial boiling point and boiling range

G. Flash point

H. Evaporation rate

I. Flammability (solid, gas)

J. Upper/lower flammability or explosive limits

K. Vapor pressure

L. Solubility (ies)

M. Vapor density

N. Specific gravity

O. Partition coefficient: n-octanol/water Not available

P. Auto ignition temperature Not available

Q. Decomposition temperature Not available

R. Viscosity 12,000 +/- 2,000 cp cP

S. Molecular weight Not available

10. Stability and reactivity

A. Chemical stability and Possibility of hazardous reactions:

- May decompose at high temperatures into forming toxic gases.
- Containers may explode when heated.
- Some of these materials may burn, but none ignite readily.
- Non-combustible, substance itself does not burn but may decompose upon heating, then produce corrosive and/or toxic fumes.

B. Conditions to avoid:

- Heat, sparks or flames

C. Incompatible materials:

- Combustibles, reducing agents

D. Hazardous decomposition products:

- Corrosive and/or toxic fume
- Irritating, corrosive and/or toxic gases

11. Toxicological information

A. Information of Health Hazardous:**Acute toxicity**

Oral [Not classified] (ATEmix = 69,284.72 mg/kg bw)

- **Aluminium oxide** : Rat LD₅₀ > 10,000 mg/kg (OECD TG 401)
- **2-Butoxyethanol** : Rat LD₅₀ = 1,746 mg/kg (OECD TG 401)
- **D-Limonene** : Rat LD₅₀ > 2,000 mg/kg (Female)(OECD TG 423, GLP)
- **Propane-1,2-diol** : Rat LD₅₀ = 22,000 mg/kg
- **Preservatives** : Rat LD₅₀ = 2,834 mg/kg (male)

Dermal [Not classified] (ATEmix = 8,176.6 mg/kg bw)

- **2-Butoxyethanol** : Rabbit LD₅₀ = 435 mg/kg (OECD TG 402)
- **D-Limonene** : Rabbit LD₅₀ > 2 mg/kg
- **Propane-1,2-diol** : Rabbit LD₅₀ > 2,000 mg/kg
- **Preservatives** : Rabbit LD₅₀ > 5,000 mg/kg

Inhalation [Not classified] (ATEmix = 110 mg/L)

- **Aluminium oxide** : Rat LC₅₀ > 2.3 mg/L/4hr (OECD TG 403, GLP)
- **2-Butoxyethanol** : Rat LC₅₀ = 2.2 mg/L/4hr (OECD TG 403)
- **Propane-1,2-diol** : Rabbit LC₅₀ > 158.5 mg/m³/4hr (LC50 > 317042 mg/m³ air/2h)

Skin corrosion/ irritation [Category 3]

- **Aluminium oxide** : In skin irritation test with rabbits, skin irritations were not observed. (OECD TG 404)
- **2-Butoxyethanol** : In skin irritation test with rabbits, skin irritations were observed.(EU Method B.4)
- **D-Limonene** : In skin irritation test with rabbits, skin irritations were not observed.(erythema=2, edema=1.33)(OECD TG 404, GLP)
- **Propane-1,2-diol** : In skin irritation test with rabbits, skin irritations were not observed(OECD TG 404).
- **Nonionic surfactant** : Irritating effect.

Serious eye damage/ irritation [Not classified]

- **Aluminium oxide** : In eye irritation test with rabbits, eye irritations were not observed. (OECD TG 405)
- **2-Butoxyethanol** : In eyes irritation test with rabbits, eyes irritations were observed. (OECD TG 405, GLP)
- **D-Limonene** : In eye irritation test with rabbits, eye irritations were not observed.(cornea=0, iris=0, conjunctivae=0.3, chemosis=1)
- **Propane-1,2-diol** : In eyes irritation test with rabbits, eyes irritations were not observed(OECD TG 405).
- **Nonionic surfactant** : Irritating effect.
- **Preservatives** : Rabbit Corrosive

Respiratory sensitization [Not classified]

- **Aluminium oxide** : In respiratory sensitisation test with mice, respiratory sensitisation reactions were not observed.

Skin sensitization [Not classified]

- **Aluminium oxide** : In skin sensitisation test with guinea pig , skin sensitisation were not observed.
- **2-Butoxyethanol** : In maximisation test with guinea pigs, skin sensitizations were not observed. (OECD TG 406, GLP)
- **D-Limonene** : In skin sensitisation test with mice, skin sensitization were observed.(Female)(OECD TG 429, GLP)
- **Propane-1,2-diol** : In skin sensitisation test with guinea pigs, skin sensitisations were not observed(OECD TG 406).

Carcinogenicity [Category 2]

IARC

- **2-Butoxyethanol** : Group 3
- **D-Limonene** : Group 3

ACGIH

- **Aluminium oxide** : A4 (Aluminum insoluble compounds)
- **2-Butoxyethanol** : A3

KOREA-ISHL

- **2-Butoxyethanol** : 2

2-Butoxyethanol : There was limited evidence of a carcinogenic effect, with a low incidence of forestomach tumours in females and hemangiosarcomas in males at the top dose. However, there is substantial evidence to support the conclusion that these effects are not relevant to humans.(OECD TG 451)

D-Limonene : Under the test conditions, there was clear evidence of carcinogenic activity for male F344/N rats, as shown by increased incidences of tubular cell hyperplasia, adenomas, and adenocarcinomas of the kidney. There was no evidence of carcinogenic activity for female F344/N rats.(OECD TG 451, GLP)

Preservatives : From short-term experiments and structural aspect, assumption has been made that it will not be carcinogenic in human body.

Mutagenicity [Not classified]

- **Aluminium oxide** : Negative reactions were observed in in vitro (Ames test (OECD TG 471), mammalian cell gene mutation assay (OECD TG 476)) and in vivo (dominant lethal assay (OECD TG 478), micronucleus assay (OECD TG 474))
- **2-Butoxyethanol** : Negative reactions were observed in both in vitro (mammalian cell gene mutation assay (OECD TG 476), chromosome aberration assay (OECD TG 473), bacterial reverse mutation assay (OECD TG 471)) and in vivo (micronucleus assay (OECD TG 474)).
- **D-Limonene** : Negative reactions were observed with and without metabolic activation in vitro (mammalian chromosome aberration test (OECD TG 473), sister chromatid exchange assay in mammalian cells (OECD TG 479), mammalian cell gene mutation assay (OECD TG 476)).
- **Propane-1,2-diol** : Negative reactions were observed in both in vitro (Mammalian Chromosome Aberration Test (OECD TG 473), bacterial reverse mutation assay) and in vivo (mammalian bone marrow chromosome aberration test).
- **Preservatives** : Non-mutagenic Active ingredient.

Reproductive toxicity [Not classified]

- **Aluminium oxide** : No adverse effects were observed in reproduction/developmental toxicity test with rats.
- **2-Butoxyethanol** : In reproductive toxicity test with mice for 14 weeks, adverse effects were not observed.(GLP)
- **Propane-1,2-diol** : In reproductive/developmental toxicity study with mice, no test material-related adverse effects were observed(OECD TG 414, GLP).

Specific target organ toxicity (single exposure) [null] [null]

- **Aluminium oxide** : In acute inhalation toxicity with rats, No mortality was observed during this study, clinical signs were minor and only one animal showed lung abnormalities on necropsy.(OECD TG 403, GLP)
- **2-Butoxyethanol** : In acute oral toxicity with rats, labored breathing, rapid respiration, anorexia, slight to moderate weakness, tremors, prostration were observed. (OECD TG 403)
- **D-Limonene** : In acute oral toxicity test with rats, acute toxic effects were not observed.(Female)(OECD TG 423, GLP)
- **Propane-1,2-diol** : In acute oral toxicity study (doses: 15~25 mL/kg gw) with rats, hemorrhagic areas in the small intestine, microscopic changes in kidney and slight congestion of the liver were observed.

Specific target organ toxicity (repeat exposure) [Not classified]

- **Aluminium oxide** : No alveolar proteinosis or thickening of alveolar walls was observed in rats, hamsters or guinea pigs exposed to Al₂O₃dust (66%)
- **2-Butoxyethanol** : In repeated oral toxicity study with rats for 90 days, cytoplasmic alterations were observed. but other adverse effects were not observed. (NOAEL < 69 mg/kg/bw) (OECD TG 408, GLP)
- **D-Limonene** : In repeated oral toxicity study with mice, repeated toxicity related effects were not observed.(OECD TG 408, GLP)
- **Propane-1,2-diol** : In subchronic inhalation toxicity study with rats, nasal haemorrhagings were observed.

Aspiration Hazard [Not classified]

12. Ecological information

A. Ecological toxicity

- Acute toxicity : [Category 3] (ATEmix = 25.13105mg/ℓ)
- Chronic toxicity : [Not classified]

Fish

- **Aluminium oxide** : 96hr-LC₅₀ (*Pimephales promelas*) = 44.38 mg/L (GLP, read across; CAS No. 7784-13-6), 7d-NOEC(*Pimephales promelas*) = 56.48 mg/L(GLP, read across; CAS No. 7784-13-6)
- **2-Butoxyethanol** : 96hr-LC₅₀ = 1464 mg/L (OECD TG 203), 21d-NOEC(*Brachydanio rerio*) > 100 mg/L(OECD TG 204)
- **D-Limonene** : 96hr-LC₅₀ = 0.720 mg/L (OECD TG 203, GLP)
- **Propane-1,2-diol** : 96hr-LC₅₀ = 40613 mg/L
- **Preservatives** : 96hr-LC₅₀ = 4.77 mg/L (active ingredient)(OECD TG 203), 96hr-LC50 (*Lepomis macrochirus*) = 10 mg/L (active ingredient)

crustacean

- **Aluminium oxide** : 48hr-LC₅₀ (*Ceriodaphnia dubia*) > 99.6 mg/L (GLP, read across; CAS No. 7784-13-6), 28d-NOEC(*Daphnia magna*) = 1.89 mg/L(GLP, read across; CAS No. 10043-01-3)
- **2-Butoxyethanol** : 48hr-EC₅₀ = 1800 mg/L (OECD TG 202), 21d-NOEC(*Daphnia magna*) = 100 mg/L(OECD TG 211)
- **D-Limonene** : 24hr-EC₅₀ = 0.85 mg/L (20 ~ 21 °C)(OECD TG 202, GLP), NOEC-16d, (*Daphnia magna* or *Daphnia pulex*)=0.115 mg/L
- **Propane-1,2-diol** : 48hr-LC₅₀ = 18340 mg/L ,7d-NOEC(*Ceriodaphnia* sp) = 13020 mg/L

Algae

- **2-Butoxyethanol** : 72hr-EC₅₀ (*Scenedesmus subspicatus*) = 911 mg/L (OECD TG 201), 72hr-NOEC(*Pseudokirchnerella subcapitata*) = 286 mg/L(biomass, OECD TG 201)
- **D-Limonene** : 72hr-EC₅₀ = 150 mg/L (OECD TG 201, GLP), readacross; CAS No. 8028-48-6, NOEC-72hr, (*Desmodesmus subspicatus*)=2.62 mg/L
- **Propane-1,2-diol** : 72hr-EC₅₀ = 19300 mg/L (OECD TG 201, GLP)

B. Persistence and degradability**Persistence**

- **2-Butoxyethanol** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 0.81) (25°C)
- **D-Limonene** : High persistency (log Kow is more than 4 estimated.) (Log Kow = 4.38)
- **Propane-1,2-diol** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = -1.07) (EU Method A.8, GLP)

Degradability

- **Preservatives** : Half life in an aerobic aquatic microcosm: 9 hr

C. Bioaccumulative potential**Bioaccumulation**

- **2-Butoxyethanol** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 3) (estimated)
- **D-Limonene** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 360.5) (Estimated)
- **Propane-1,2-diol** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 0.09)

Biodegradation

- **2-Butoxyethanol** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (= 90.4% biodegradation was observed after 28 days) (OECD TG 301B)
- **D-Limonene** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (= 80% biodegradation was observed after 28 days)
- **Propane-1,2-diol** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (= 106.8% biodegradation was observed after 28 days) (OECD TG 301F, GLP)
- **Nonionic surfactant** : The product is easily biodegradable.

D. Mobility in soil

- **2-Butoxyethanol** : Low potency of mobility to soil. (Koc = 67) (estimated)
- **D-Limonene** : High potency of mobility to soil. (Koc = 6324)
- **Propane-1,2-diol** : Low potency of mobility to soil. (Koc = 2.9)

E. Other hazardous effect

- **Nonionic surfactant** : Do not allow product to reach sewage system or any water course.

13. Disposal considerations

A. Disposal method

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

B. Disposal precaution

Consider the required attentions in accordance with waste treatment management regulation.

14. Transport information

A. UN Number Not applicable

B. UN Proper shipping name Not applicable

C. Transport Hazard class Not applicable

D. Packing group Not applicable

E. Marine pollutant Not applicable

F. Special precautions

in case of fire Not applicable

in case of leakage Not applicable

15. Regulatory information**A. Occupational Safety and Health Regulation**

Aluminium oxide : Administration subject listed

Aluminium oxide : Occupational exposure limits listed

Aluminium oxide : Work environment monitoring listed (6 months)

Aluminium oxide : Health examination agent (12 months)

2-Butoxyethanol : Work environment monitoring listed (6 months)

2-Butoxyethanol : Administration subject listed

2-Butoxyethanol : Health examination agent (12 months)

2-Butoxyethanol : Occupational exposure limits listed

B. Toxic Chemical Control Act

Aluminium oxide : Existing Chemical Substance (KE-01012)

2-Butoxyethanol : Existing Chemical Substance (KE-04134)

D-Limonene : Existing Chemical Substance KE-24397

Propane-1,2-diol : Existing Chemical Substance (KE-29267)

Nonionic surfactant : Existing Chemical Substance ; CAS No. 98283-67-1: KE-35115/ CAS No. 112-53-8: KE-12888

Preservatives : Existing Chemical Substance ; CAS No. 2682-20-4: KE-24316/CAS No. 7732-18-5: KE-35400

Preservatives : Toxic Chemicals ; CAS No. 2682-20-4: 2012-1-645(1% or more in mixtures)

Water : Existing Chemical Substance (KE-35400)

C. Dangerous Material Safety Management Regulation

Aluminium oxide : Dangerous Material Safety Management Regulation Non-dangerous goods

2-Butoxyethanol : Dangerous Material Safety Management Regulation 2000ℓ

Propane-1,2-diol : Dangerous Material Safety Management Regulation 4000L

Nonionic surfactant : Dangerous Material Safety Management Regulation CAS No. 112-53-8; Petroleum class 4-3 (non-water soluble liquid) 2000ℓ

D. Wastes Control Act

Preservatives : Wastes Control Act CAS No. 2682-20-4; Controlled wastes

E. Other regulation (internal and external)

Internal information

Persistent Organic Pollutants Acts Not regulated

External information

EU classification(classification)

Aluminium oxide : Classification Not classified

2-Butoxyethanol : Classification Xn; R20/21/22Xi; R36/38

D-Limonene : Classification R10, Xi;38, R43, N;R50-53

Propane-1,2-diol : Classification Not classified

Nonionic surfactant : Classification Xi

Water : Classification Not classified

EU classification(risk phrases)

Aluminium oxide : Hazard statements Not applicable

2-Butoxyethanol : Hazard statements R20/21/22, R36/38

D-Limonene : Hazard statements R10, R38, R43, R50/53

Propane-1,2-diol : Hazard statements Not applicable

Nonionic surfactant : Hazard statements R36/38

Water : Hazard statements Not applicable

EU classification(safety phrases)

Aluminium oxide : Precautionary statements Not applicable

2-Butoxyethanol : Precautionary statements S2, S36/37, S46

D-Limonene : Precautionary statements S2, S24, S37, S60, S61

Propane-1,2-diol : Precautionary statements Not applicable

Nonionic surfactant : Precautionary statements S26 S37/39 S24/25 S28b

Water : Precautionary statements Not applicable

EU SVHC list Not regulated

EU Authorisation List Not regulated

EU Restriction list Not regulated

U.S.A management information (OSHA Regulation) Not regulated

U.S.A management information (CERCLA Regulation) Not regulated

U.S.A management information (EPCRA 302 Regulation) Not regulated

U.S.A management information (EPCRA 304 Regulation) Not regulated

U.S.A management information (EPCRA 313 Regulation)

Aluminium oxide : EPCRA 313 Regulated

Substance of Roterdame Protocol Not regulated

Substance of Stockholme Protocol Not regulated

Substance of Montreal Protocol Not regulated

Foreign Inventory Status

Aluminium oxide

U.S.A management information Section 8(b) Inventory (TSCA): Present

Japan management information Existing and New Chemical Substances (ENCS): (1)-23

China management information Inventory of Existing Chemical Substances (IECSC): Present

Canada management information Domestic Substances List (DSL): Present

Australia management information Inventory of Chemical Substances (AICS): Present

New Zealand management information Inventory of Chemicals (NZIoC): May be used as a single component chemical under an appropriate group standard.

Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

2-Butoxyethanol

U.S.A management information Section 8(b) Inventory (TSCA): Present

Japan management information Existing and New Chemical Substances (ENCS): (7)-97, (2)-407, (2)-2424

China management information Inventory of Existing Chemical Substances (IECSC): Present

China management information Domestic Substances List (DSL): Present

Australia management information Inventory of Chemical Substances (AICS): present

New Zealand management information Inventory of Chemicals (NZIoC): HSNO Approval: HSR001154

Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

D-Limonene

U.S.A management information Section 8(b) Inventory (TSCA): Present

Japan management information Existing and New Chemical Substances (ENCS): (3)-2245; (3)-2226

China management information Inventory of Existing Chemical Substances (IECSC): Present 19147

Canada management information Domestic Substances List (DSL): Present

Australia management information Inventory of Chemical Substances (AICS): Present

New Zealand management information Inventory of Chemicals (NZIoC): HSNO Approval: HSR002725

Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

Propane-1,2-diol

New Zealand management information Inventory of Chemicals (NZIoC): May be used as a single component chemical under an appropriate group standard.

Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

U.S.A management information Section 8(b) Inventory (TSCA): Present

Canada management information Domestic Substances List (DSL): Present

Australia management information Inventory of Chemical Substances (AICS): Present

Japan management information Existing and New Chemical Substances (ENCS) : (2)-234

Japan management information Industrial Safety and Health Law Substances (ISHL): 2-(8)-321,2-(8)-323

Water

U.S.A management information Section 8(b) Inventory (TSCA): Present

Japan management information Industrial Safety and Health Law Substances (ISHL): 2-(4)-1220

China management information Inventory of Existing Chemical Substances (IECSC): Present 32224

Canada management information Domestic Substances List (DSL): Present

Australia management information Inventory of Chemical Substances (AICS): Present

New Zealand management information Inventory of Chemicals (NZIoC): May be used as a single component chemical under an appropriate group standard.

Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

16. Other information

A. Information source and references

EPISUITE v4.1; <http://www.epa.gov/opt/exposure/pubs/episuitedl.htm>

National Emergency Management Agency-Korea dangerous material inventory management system; <http://www.nema.go.kr/hazmat/main/main.jsp>

Korea Occupational Health & Safety Agency; <http://www.kosha.net>

ECOTOX; <http://cfpub.epa.gov/ecotox/>

National Chemicals Information System; <http://ncis.nier.go.kr/ncis/>

SEPPIC S.A. MSDS

TOMES; <http://www.rightanswerknowledge.com/loginRA.asp>

American Conference of Governmental Industrial Hygienists TLVs and BEIs.

National Institute of Technology and Evaluation(NITE); <http://www.safe.nite.go.jp/english/db.html>

International Chemical Safety Cards(ICSC)(<http://www.hihs.go.jp/ICSC>)

EU CLP; <http://esis.jrc.ec.europa.eu/index.php?PGM=cla>

Wet tissue Preservatives MSDS

International Programme on Chemical Safety(IPCS) International Chemical Safety Cards (ICSCs); <http://www.inchem.org/>

U.S. National library of Medicine(NLM) Hazardous Substances Data Bank(HSDB);

<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>

Emergency Response Guidebook 2008;

http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/erg2008_eng.pdf

U.S. National library of Medicine (NLM) Hazardous Substances Data Bank (HSDB) ;

<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.htm>

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; <http://monographs.iarc.fr>

AKRON; <http://ull.chemistry.uakron.edu/erd>

TOMES-LOLI®; <http://www.rightanswerknowledge.com/loginRA.asp>

Waste Control Act enforcement regulation attached [1]

The Chemical Database -The Department of Chemistry at the University of Akron;

<http://ull.chemistry.uakron.edu/erd/>

National Toxicology Program; http://ntp-apps.niehs.nih.gov/ntp_tox/index.cfm

NIOSH Pocket Guide; <http://www.cdc.gov/niosh/npg/npgdcas.html>

REACH information on registered substances; <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>

SEPPIC S.A.

REACH information on registered substances; <http://apps.echa.europa.eu/registered/registered-sub.aspx>

Korea Maritime Dangerous Goods Inspection Center; <http://www.komdi.or.kr/index.html>

International Uniform Chemical Information Database(IUCLID); <http://esis.jrc.ec.europa.eu/>

UN Recommendations on the transport of dangerous goods 17th

B. Issuing date 30. Oct. 2013

C. Revision number and date

revision number 0

date of the latest revision 30. Oct. 2013

D. Others

- Revised Material Safety Data Sheet based on the amendments made on the Ministry of Employment and Labor Public Notice on Standard for Classification Labeling of Chemical Substance and Material Safety Data Sheet.

- This MSDS is authored in pursuant to the Article 41 of the Occupational Safety and Health Act.

- The content is based on the latest information and knowledge that we currently possess.

- This MSDS was authored to aid buyer, processor or any other third person who handles the chemical of subject in the MSDS; additionally, it does not warrant suitability of the chemical for special purposes or the commercial use of statements that approves the use of it in combination with other chemicals as well as technical or legal liabilities.

- The content of the MSDS may vary depending on the country or the region and may not coincide with the actual regulations. Therefore, the buyer or the processor of the chemical is responsible for observing responsible government's or the region's regulations.