

# MATERIAL SAFETY DATA SHEET

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

**A. GHS product identifier** RainOK SPEED SPRAY

**B. Recommended use of the chemical and restrictions on use**

**Recommended use** Water-repellent coating for windshield

**Restrictions on use** Use only as intended

**C. Supplier**

**Company name** Bullsone

**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**

Flammable liquids : Category 2

Gases under pressure : Liquefied gas

Specific target organ toxicity (single exposure) : Category 3 (narcotic effects)

Hazardous to the aquatic environment (acute hazard) : Category 3

**B. GHS label elements, including precautionary statements**

**Pictogram and symbol :**



**Signal word :** Danger

**Hazard statements :**

H225 Highly flammable liquid and vapour

H280 Contains gas under pressure; may explode if heated.

H336 May cause drowsiness or dizziness.

H402 Harmful to aquatic life.

**Precautionary statements**

**Precaution**

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

**Treatment**

P303+P361+P353 If on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P340 If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312 Call a poison center or doctor/physician if you feel unwell.

P370+P378 In case of fire: Use fire-extinguishing for extinction.

**Storage**

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

P403+P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

P410+P403 Protect from sunlight. Store in a well-ventilated place.

#### **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** 2

**Flammability** 1

**Reactivity** Not available

## **3. Composition/information on ingredients**

Chemical Name	Common Name(Synonyms)	CAS number	EC number	Content (%)
Ethanol		64-17-5		40~50
Iso-propyl alcohol		67-63-0	200-661-7	10~20
Propane		74-98-6	200-827-9	1~10
Butane		106-97-8	203-448-7	1~10
Polysiloxane		63148-62-9	613-156-5	1~5

## **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**

- If on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- Call a poison center or doctor/physician if you feel unwell.
- Call emergency medical service.
- Remove and isolate contaminated clothing and shoes.
- For minor skin contact, avoid spreading material on unaffected skin.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Wash skin with soap and water.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.

### **C. Inhalation**

- If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.

### **D. Ingestion**

- Call emergency medical service.

### **E. Indication of immediate medical attention and notes for physician**

- 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**

- Highly flammable liquid and vapour

- Contains gas under pressure; may explode if heated.
- May violently polymerize and result in fire and explosion.
- Vapors may travel to a source of ignition and ignite.
- May form explosive mixtures at temperatures at or above the flashpoint.
- Containers may explode when heated.
- HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- Spilled material may create fire or explosion hazard.
- May cause vapor explosion hazard indoors, outdoors or in sewers.
- Some of these materials may burn, but none ignite readily.
- Vapors may form explosive mixtures with air.
- Non-combustible, substance itself does not burn but may decompose upon heating, then produce corrosive and/or toxic fumes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Some of these materials, if spilled, may leave a flammable residue after evaporation

### **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.
- Many liquids are lighter than water.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas
- Substance may be transported hot.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Substance may be transported in a molten form.
- Ruptured cylinders may rocket.
- 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; Do not direct water at source of leak or safety devices; icing may occur.
- 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.
- Damaged cylinders should be handled only by specialists.
- Use extinguishing agent suitable for type of surrounding fire.

## **6. Accidental release measures**

### **A. Personal precautions, protective equipment and emergency procedures**

- Avoid breathing dust/fume/gas/mist/vapours/spray.
- The very fine particles may cause a fire or explosion, eliminate all ignition sources.
- Clean up spills immediately, observing precautions in Protective Equipment section.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Do not direct water at spill or source of leak.
- Eliminate all ignition sources.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- All equipment used when handling the product must be grounded.
- Allow substance to disperse
- Ventilate the area.
- Stop leak if you can do it without risk.
- Some of these materials, if spilled, may leave a flammable residue after evaporation
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- A vapor suppressing foam may be used to reduce vapors.
- 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**

- Dike and collect water used to fight fire.
- 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.
- Use clean non-sparking tools to collect absorbed material.
- 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**

- Use explosion-proof electrical/ventilating/lighting equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Use only outdoors or in a well-ventilated area.
- Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition.
- 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.
- All equipment used when handling the product must be grounded.
- Please note that there are materials and conditions to avoid.
- Please work with reference to engineering controls and personal protective equipment.
- Be careful to heat.
- You need measurement of air concentration and ventilation in low, closed and confined areas due to lack of oxygen.

**B. Conditions for safe storage**

- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Store in a well-ventilated place. Keep container tightly closed.
- Store in a well-ventilated place. Keep cool.
- Protect from sunlight. Store in a well-ventilated place.
- Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.
- Containers can build up pressure if exposed to heat (fire).

**8. Exposure controls/personal protection****A. Occupational Exposure limits****Korea regulation**

**Ethanol** TWA = 1000 ppm ( 1900 mg/m<sup>3</sup> )

**Iso-propyl alcohol** TWA = 200 ppm ( 480 mg/m<sup>3</sup> ) , STEL = 400 ppm ( 980 mg/m<sup>3</sup> )

**ACGIH regulation**

**Ethanol** STEL 1000 ppm

**Iso-propyl alcohol** TWA 200 ppm STEL 400 ppm

**Butane** STEL 1000 ppm

**Biological exposure index** : Not available

**OSHA regulation**

**Ethanol** TWA = 1,000 ppm (1,900 mg/m<sup>3</sup>)

**Iso-propyl alcohol** TWA = 400 ppm (980 mg/m<sup>3</sup>)

**Propane** TWA=1000 ppm (1800 mg/m<sup>3</sup>)

**Butane** TWA = 800 ppm, (1900 mg/m<sup>3</sup>)

#### **NIOSH regulation**

**Ethanol** TWA = 1,000 ppm (1,900 mg/m<sup>3</sup>)

**Iso-propyl alcohol** TWA = 400 ppm (980 mg/m<sup>3</sup>), STEL = 500 ppm (1225 mg/m<sup>3</sup>)

**Propane** TWA=1000 ppm (1800 mg/m<sup>3</sup>)

**Butane** TWA = 800 ppm, (1900 mg/m<sup>3</sup>)

**EU regulation** : Not available

#### **Other**

**Ethanol** U.K: TWA = 1,000 ppm Spain: TWA = 1,000 ppm France: TWA = 1,000 ppm Australia: TWA = 1,000 ppm Canada: TWA = 1,000 ppm

**Iso-propyl alcohol** Australia: TWA = 400 ppm (983 mg/m<sup>3</sup>) Belgium: STEL = 400 ppm (1000 mg/m<sup>3</sup>), TWA = 200 ppm (500 mg/m<sup>3</sup>) Canada: STEL = 400 ppm (984 mg/m<sup>3</sup>), TWA = 200 ppm (492 mg/m<sup>3</sup>)

Czech Republic: TWA = 500 mg/m<sup>3</sup> Greece: STEL = 500 ppm (1225 mg/m<sup>3</sup>), TWA = 400 ppm (980 mg/m<sup>3</sup>)

**Propane** Finland:TWA=800 ppm(1500 mg/m<sup>3</sup>) Germany:TWA=1000 ppm(1800 mg/m<sup>3</sup>)

Greece:TWA=1000 ppm(1800 mg/m<sup>3</sup>) Hong Kong:TWA-2500 ppm(4508 mg/m<sup>3</sup>)

**Butane** Germany : TWA=1000ppm(2400 mg/m<sup>3</sup>) Greece : TWA=1000ppm(2350 mg/m<sup>3</sup>) Hong Kong : TWA=800ppm(1900 mg/m<sup>3</sup>)

### **B. Appropriate engineering controls**

### **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** Not available

### **D. pH**

**E. Melting point/freezing point** Not available

**F. Initial boiling point and boiling range** Not available

**G. Flash point** Not available

**H. Evaporation rate** Not available

**I. Flammability (solid, gas)** Not applicable

**J. Upper/lower flammability or explosive limits** Not available

**K. Vapor pressure** Not available

**L. Solubility (ies)** Not available

**M. Vapor density** Not available

**N. Specific gravity****O. Partition coefficient: n-octanol/water** Not available**P. Auto ignition temperature** Not available**Q. Decomposition temperature** Not available**R. Viscosity** Not available**S. Molecular weight** Not available**10. Stability and reactivity****A. Chemical stability and Possibility of hazardous reactions:**

- Highly flammable liquid and vapour
- Contains gas under pressure; may explode if heated.
- May violently polymerize and result in fire and explosion.
- May form explosive mixtures at temperatures at or above the flashpoint.
- Containers may explode when heated.
- HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- Spilled material may create fire or explosion hazard.
- May cause vapor explosion hazard indoors, outdoors or in sewers.
- Some of these materials may burn, but none ignite readily.
- Vapors may form explosive mixtures with air.
- Non-combustible, substance itself does not burn but may decompose upon heating, then produce corrosive and/or toxic fumes.
- Fire will produce irritating, corrosive and/or toxic gases.

**B. Conditions to avoid:**

- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

**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 = 9,877.8 mg/kg bw)

- **Ethanol** : Rat LD<sub>50</sub> = 10,470 mg/kg (OECD TG 401)
- **Iso-propyl alcohol** : Rat LD<sub>50</sub> = 5,840 mg/kg (OECD TG 401)
- **Polysiloxane** : Rat LD<sub>50</sub> > 5,000 mg/kg

**Dermal** Not classified (ATEmix = 18,050.33 mg/kg bw)

- **Ethanol** : Rabbit LD<sub>50</sub> = 17,100 mg/kg
- **Iso-propyl alcohol** : Rabbit LD<sub>50</sub> = 12,792 mg/kg (OECD TG 402)
- **Polysiloxane** : Rabbit LD<sub>50</sub> > 10,000 mg/kg Acute toxicity is very low

**Inhalation** Not classified (ATEmix = 230.42 mg/L)

- **Ethanol** : Rat LC<sub>50</sub> = 116.9 mg/L/4hr (OECD TG 403)
- **Iso-propyl alcohol** : Rat LC<sub>50</sub> > 30.13 mg/L/4hr (OECD TG 403, GLP)
- **Propane** : Rat LC<sub>50</sub> = 280,000 mg/kg/10min
- **Butane** : Rat LC<sub>50</sub> = 1,443 mg/L/15min
- **Polysiloxane** : Rat LC<sub>50</sub> > 535 mg/L Acute toxicity is very low

**Skin corrosion/ irritation** Not available

- **Ethanol** : In skin irritation test with rabbits, skin irritations were not observed. (OECD TG 404, GLP)
- **Iso-propyl alcohol** : In test on skin irritation with rabbits, skin irritations were not observed.
- **Polysiloxane** : In test on skin irritation with rabbits, skin irritations were not observed.

**Serious eye damage/ irritation** Not available

- **Ethanol** : In eyes irritation test with rabbits, moderate irritations were observed. (OECD TG 405, GLP)
- **Iso-propyl alcohol** : In test on eye irritation with rabbits, serious eye irritations were observed. Also

the results demonstrate a trend in reversibility.

- **Polysiloxane** : In test on eyes irritation with rabbits, eyes irritations were not observed.

**Respiratory sensitization** Not available

**Skin sensitization** Not classified

- **Ethanol** : In skin sensitisation test with guinea pigs, skin sensitisation reactions were not observed.

- **Iso-propyl alcohol** : Isopropyl alcohol did not induce sensitization in the guinea pig model.(OECD TG 406, GLP)

- **Polysiloxane** : In skin sensitisation test with animals, skin sensitization were not observed.

**Carcinogenicity** Not classified

**IARC**

- **Ethanol** : Group 1 (in alcoholic beverages)

- **Iso-propyl alcohol** : Group 3

**ACGIH**

- **Ethanol** : A3

- **Iso-propyl alcohol** : A4

**KOREA-ISHL**

- **Ethanol** : 1A

**Iso-propyl alcohol** : In study with mice, there were no nonneoplastic or neoplastic lesions observed that were believed to be related to the isopropanol exposures.(OECD TG 451, GLP)

**Mutagenicity** Not classified

- **Ethanol** : Negative reactions were observed in vitro(bacterial reverse mutation assay (OECD TG 471), mammalian cell gene mutation assay (OECD TG 476)) and in vivo(micronucleus assay (OECD TG 474)).

- **Iso-propyl alcohol** : Negative reactions were observed in both in vitro(Ames test, mammalian cell gene mutation assay, sister chromatid exchange assay) and in vivo micronucleus assay.

- **Propane** : Negative reactions were observed with and without metabolic activation in vitro(mammalian chromosome aberration test(OECD TG 473, GLP), bacterial reverse mutation assay(OECD TG 471, GLP).

- **Butane** : Negative reactions were observed with and without metabolic activation in vitro(mammalian chromosome aberration test(OECD TG 473, GLP), bacterial reverse mutation assay(OECD TG 471, GLP).

- **Polysiloxane** : Ames test results negative

**Reproductive toxicity** Not classified

- **Ethanol** : In reproductive toxicity test with mice, there was no significant evidence for reproductive toxicity. (OECD TG 416)

- **Iso-propyl alcohol** : There was 100% fertility among all rats but evidence of embryotoxicity (i.e., fewer live pups were produced and there was also an increase in pup mortality and a reduction in pup weight gain) at the 2 highest dose-levels. In the group given 2.5% IPA, the dams with litters showed signs of stress.Decreased mean fetal body weight at higher dose levels.(OECD TG 415, OECD TG 414, GLP)

- **Propane** : In reproduction/developmental toxicity screening test, there were no significant adverse effects on reproductive parameters and no evidence of malformations at any doses.(NOAEC = 9000 ppm)(OECD TG 422, GLP)

- **Butane** : In reproduction/developmental toxicity screening test, there were no significant adverse effects on reproductive parameters and no evidence of malformations at any doses.(NOAEC=21641 mg/m<sup>3</sup>)(OECD TG 422, GLP)

**Specific target organ toxicity (single exposure)** Category 3 (narcotic effects)

- **Ethanol** : In acute inhalation toxicity with rats, very low acute toxicity effects were observed. (OECD TG 403)

- **Iso-propyl alcohol** : In the 10000 ppm group, prostration, severe ataxia, decreased arousal, slowed or labored respiration, decreased neuromuscular tone, hypothermia, and loss of reflex function was observed after exposure.(OECD TG 403, GLP)

- **Propane** : In acute inhalation toxicity test with rats, acute toxic effects were not observed.

**Specific target organ toxicity (repeat exposure)** Not classified

- **Ethanol** : In repeated oral toxicity study with rats for 14 weeks, repeated toxicity related effects were not observed. (OECD TG 408, GLP)
  - **Iso-propyl alcohol** : Repeated exposure to IPA for 98 days produced toxic effects only at the highest concentration (5000 ppm) and a kidney change of unknown biological significance. Decreases in absolute body weight and body weight gain, and changes in hematology parameters in animals exposed to 1500 and 5000 ppm of isopropanol, increased relative liver weight in male and female rats exposed to 5000 ppm, as well as increased motor activity for female rats in the 5000 ppm group have been observed.
  - **Propane** : In repeated inhalation toxicity study with rats for 28 days, repeated toxicity related effects were not observed.(OECD TG 422, GLP)
  - **Butane** : In repeated inhalation toxicity study with rats for 28 days, repeated toxicity related effects were not observed.(NOAEC = 9,000 ppm)(OECD TG 422, GLP)
- Aspiration Hazard** Not available

## 12. Ecological information

### A. Ecological toxicity

- Acute toxicity : Category 3 (ATEmix = 43.76077mg/l)
- Chronic toxicity : Not classified

#### Fish

- **Ethanol** : 96hr-LC<sub>50</sub> (*Pimephales promelas*) = 14200 mg/L
- **Iso-propyl alcohol** : 96hr-LC<sub>50</sub> = 9640 mg/L (OECD TG 203)
- **Propane** : 96hr-LC<sub>50</sub> = 27.98 mg/L (Estimated)

#### crustacean

- **Ethanol** : 48hr-LC<sub>50</sub> (other) = 5012 mg/L , 48hr-NOEC(*Daphnia magna*) = 9.6 mg/L
- **Iso-propyl alcohol** : 24hr-LC<sub>50</sub> > 10000 mg/L (OECD TG 202)
- **Propane** : 48hr-LC<sub>50</sub> = 14.22 mg/L (Estimated)

#### Algae

- **Ethanol** : 96hr-LC<sub>50</sub> (*Chlorella vulgaris*) = 675 mg/L (OECD TG 201)
- **Propane** : 96hr-EC<sub>50</sub> = 7.71 mg/L (Estimated)

### B. Persistence and degradability

#### Persistence

- **Ethanol** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = -0.35) (24 °C) (OECD TG 107)
- **Iso-propyl alcohol** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 0.05)
- **Propane** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 2.8) (pH 7)(20 °C)

#### Degradability

 Not available

### C. Bioaccumulative potential

#### Bioaccumulation

- **Ethanol** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF < 10)
- **Iso-propyl alcohol** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 3) (estimated)

#### Biodegradation

- **Ethanol** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (= 96% biodegradation was observed after 20 days)
- **Iso-propyl alcohol** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (BOD/COD = 0.53)
- **Propane** : As not well-biodegraded, it is expected to have high accumulation potential in living organisms (= 50% biodegradation was observed after 2 days) (Q)SAR
- **Butane** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (= 100% biodegradation was observed after 385 hrs)

### D. Mobility in soil

- **Ethanol** : Low potency of mobility to soil. (Koc = 0.13 ~ 0.61)
- **Iso-propyl alcohol** : Low potency of mobility to soil. (Koc = 25) (estimated)

### E. Other hazardous effect

 Not available

## 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** 1950

**B. UN Proper shipping name** AEROSOLS

**C. Transport Hazard class** 2

**D. Packing group**

**E. Marine pollutant** No

**F. Special precautions**

in case of fire F-D

in case of leakage S-U

## 15. Regulatory information

**A. Occupational Safety and Health Regulation**

**Iso-propyl alcohol** : Administration subject listed

**Iso-propyl alcohol** : Occupational exposure limits listed

**Iso-propyl alcohol** : Work environment monitoring listed (6 months)

**Iso-propyl alcohol** : Health examination agent (12 months)

**Butane** : Occupational exposure limits listed

**B. Toxic Chemical Control Act**

**Ethanol** : Existing Chemical Substance (KE-13217)

**Iso-propyl alcohol** : Existing Chemical Substance (KE-29363)

**Polysiloxane** : Existing Chemical Substance (KE-31068)

**C. Dangerous Material Safety Management Regulation**

**Ethanol** : Dangerous Material Safety Management Regulation 400ℓ

**Iso-propyl alcohol** : Dangerous Material Safety Management Regulation 400ℓ

**D. Wastes Control Act**

**Ethanol** : Wastes Control Act Controlled Wastes

**Iso-propyl alcohol** : Wastes Control Act Controlled Wastes

**E. Other regulation (internal and external)****Internal information**

**Persistent Organic Pollutants Acts** Not regulated

**External information****EU classification(classification)**

**Ethanol** : Classification F; R11

**Iso-propyl alcohol** : Classification F; R11 Xi; R36 R67

**Propane** : Classification F+; R12

**Butane** : Classification F+; R12

**EU classification(risk phrases)**

**Ethanol** : Hazard statements R11

**Iso-propyl alcohol** : Hazard statements R11 R36 R67

**Propane** : Hazard statements R12

**Butane** : Hazard statements R12

**EU classification(safety phrases)**

**Ethanol** : Precautionary statements S2 S7 S16

**Iso-propyl alcohol** : Precautionary statements S2 S7 S16 S24/25 S26

**Propane** : Precautionary statements S2, S9, S16

**Butane** : Precautionary statements S2, S9, S16

**EU SVHC list** Not regulated

**EU Authorisation List** Not regulated

**EU Restriction list**

**Propane** : EU Restriction list 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)** Not regulated  
**Substance of Rotterdame Protocol** Not regulated  
**Substance of Stockholme Protocol** Not regulated  
**Substance of Montreal Protocol** Not regulated

#### Foreign Inventory Status

##### Ethanol

U.S.A management information Section 8(b) Inventory (TSCA): Present  
 Japan management information Existing and New Chemical Substances (ENCS): (2)-202  
 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): HSNO Approval:  
 HSR001144  
 Philippines management information Inventory of Chemicals and Chemical Substances (PICCS):  
 Present

##### Iso-propyl alcohol

U.S.A management information Section 8(b) Inventory (TSCA): Present  
 Japan management information Existing and New Chemical Substances (ENCS): (2)-207, Industrial  
 Safety and Health Law Substances (ISHL): 2-(8)-319  
 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): HSNO Approval:  
 HSR001180  
 Philippines management information Inventory of Chemicals and Chemical Substances (PICCS):  
 Present

##### Propane

U.S.A management information Section 8(b) Inventory (TSCA): Present  
 Japan management information Existing and New Chemical Substances (ENCS): (2)-3  
 China management information Inventory of Existing Chemical Substances (IECSC): Present 03571  
 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:  
 HSR001010  
 Philippines management information Inventory of Chemicals and Chemical Substances (PICCS):  
 Present

##### Butane

U.S.A management information Section 8(b) Inventory (TSCA): Present  
 Japan management information Existing and New Chemical Substances (ENCS): (2)-4  
 China management information Inventory of Existing Chemical Substances (IECSC): Present 41372  
 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:  
 HSR000989  
 Philippines management information Inventory of Chemicals and Chemical Substances (PICCS):  
 Present

##### Polysiloxane

U.S.A management information Section 8(b) Inventory (TSCA): Present [XU]  
 Japan management information Existing and New Chemical Substances (ENCS): (7)-476  
 China management information Inventory of Existing Chemical Substances (IECSC): Present 08512  
 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): Inventory of Chemicals  
 (NZIoC): HSNO Approval: HSR003036

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

## 16. Other information

### A. Information source and references

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](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>  
 OECD SIDS: <http://webnet.oecd.org/hpv/ui/Search.aspx>  
 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>  
 IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; <http://monographs.iarc.fr>  
 National Chemicals Information System; <http://ncis.nier.go.kr/ncis/>  
 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](http://ntp-apps.niehs.nih.gov/ntp_tox/index.cfm)  
 NIOSH Pocket Guide; <http://www.cdc.gov/niosh/npng/npgcdcas.html>  
 American Conference of Governmental Industrial Hygienists TLVs and BEIs.  
 REACH information on registered substances : <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>  
 REACH information on registered substances; <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>  
 REACH information on registered substances; <http://apps.echa.europa.eu/registered/registered-sub.aspx>  
 EU CLP; <http://esis.jrc.ec.europa.eu/index.php?PGM=cla>  
 UN Recommendations on the transport of dangerous goods 17th  
 Momentive Performance materials MSDS

**B. Issuing date** 2013.10.01.

### C. Revision number and date

revision number 1

date of the latest revision 2014.07.15.

### 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.