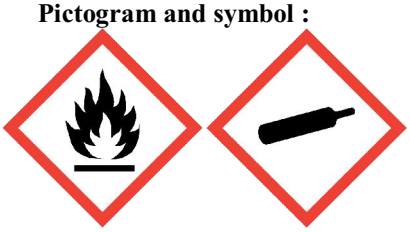
MATERIAL SAFETY DATA SHEET

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

A. GHS product identifier SALADDIN CAR DEODORIZER_AQUA for AC SYSTEM
B. Recommended use of the chemical and restrictions on use
Recommended use Deodorant Spray for Air Heaters
Restrictions on use Please do not use it other than the use.
C. Manufacturers
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
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.
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.
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.
P370+P378 In case of fire: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material for extinction.
Storage
P403+P235 Store in a well-ventilated place. Keep cool.
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

3. Composition/information on ingredients

Chemical Name	Common Name(Synonyms)	CAS number	EC number	Content (%)
Ethanol	Ethyl alcohol	64-17-5		50~60%
GreenTea Extract	Water(CAS No.7732-18-5) + 1,3-Butylene glycol(CAS No.107-88-0) + Camellia sinensis leaf extract(CAS No.84650-60-2)			1~5%
Propane	Dimethylmethan	74-98-6	200-827-9	10~20%
Butane	Butan	106-97-8	203-448-7	20~30%

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 emergency medical service.
- Remove and isolate contaminated clothing and shoes.
- 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.

C. Inhalation
- Move victim to fresh air.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Keep victim warm and quiet.

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.
- 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.
- Ruptured cylinders may rocket.
- 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

- The very fine particles may cause a fire or explosion, eliminate all ignition sources.
- Do not touch or walk through spilled material.
- Eliminate all ignition sources.
- All equipment used when handling the product must be grounded.
- Stop leak if you can do it without risk.
- A vapor suppressing foam may be used to reduce vapors.
- 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 or cover with dry sand, earth or other non-combustible material and transfer to containers.
- 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.
- 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.
- 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.
- Keep container tightly closed.
- Store in a well-ventilated place. Keep cool.
- Protect from sunlight. Store in a well-ventilated place.
- 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/m³)

ACGIH regulation

Ethanol STEL 1000 ppm

Butane STEL 1000 ppm

Biological exposure index : Not available

OSHA regulation

Ethanol TWA = 1,000 ppm (1,900 mg/m³)

Propane TWA=1000 ppm (1800 mg/m³)

Butane TWA = 800 ppm, (1900 mg/m³)

NIOSH regulation

Ethanol TWA = 1,000 ppm (1,900 mg/m³)

Propane TWA=1000 ppm (1800 mg/m³)

Butane TWA = 800 ppm, (1900 mg/m³)

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

Propane Finland:TWA=800 ppm(1500 mg/m³) Germany:TWA=1000 ppm(1800 mg/m³) Greece:TWA=1000 ppm(1800 mg/m³) Hong Kong:TWA-2500 ppm(4508 mg/m³)

Butane Germany : TWA=1000ppm(2400 mg/m³) Greece : TWA=1000ppm(2350 mg/m³) Hong Kong : TWA=800ppm(1900 mg/m³)

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 Yellowish transparent
B. Odor Product-specific odor
C. Odor threshold Not available
D. pH Not available
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) flammable
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 0.8(gas 제외)
O. Partition coefficient: n-octanol/water Not available
P. Auto ignition temperature Not available
Q. Decomposition temperature Not available
R. Viscosity Not applicable
S. Molecular weight Not applicable

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.
- 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:
D. Hazardous decomposition products:
- Irritating, corrosive and/or toxic gases

11. Toxicological information

A. Information of Health Hazardous:

Acute toxicity

Oral [Not classified] (ATEmix = 10,493.75 mg/kg bw)

- **Ethanol** : Rat LD_{50} = 10,470 mg/kg (OECD TG 401)
- **Sodium Benzoate** : Rat LD_{50} = 2,100 mg/kg
- **Preservatives** : Rat LD_{50} = 1,100 mg/kg
- **Chloroxylenol** : Rat LD_{50} = 3,830 mg/kg

Dermal [Not classified] (ATEmix = 17,210.23 mg/kg bw)

- **Ethanol** : Rabbit LD_{50} = 17,100 mg/kg
- **Preservatives** : Rabbit LD_{50} > 2,000 mg/kg
- **Chloroxylenol** : Rat LD_{50} > 2,000 mg/kg

Inhalation [Not classified] (ATEmix = 195.76 mg/L)

- **Ethanol** : Rat LC_{50} = 116.9 mg/L/4hr (OECD TG 403)
- **Propane** : Rat LC_{50} = 280,000 mg/kg/10min
- **Butane** : Rat LC_{50} = 1,443 mg/L/15min

Skin corrosion/ irritation [Not available]

- **Ethanol** : In skin irritation test with rabbits, skin irritations were not observed. (OECD TG 404, GLP)
- **Sodium Benzoate** : In skin irritation test with rabbits, skin irritations were not observed.(OECD TG 404, GLP)
- **Preservatives** : Skin disease patient's dynamic data: Irritation Positive reaction.
- **Chloroxylenol** : In a dermal irritation study with rabbits showed slight irritation lasting less than 48 hours.

Serious eye damage/ irritation [Not available]

- **Ethanol** : In eyes irritation test with rabbits, moderate irritations were observed. (OECD TG 405, GLP)
- **Sodium Benzoate** : In eye irritation test with rabbits, eye irritations were observed.(Draize=7.7, cornea=0, iris=0, conjunctivae=2.7, chemosis=0.7)(female)(OECD TG 405, GLP)
- **Preservatives** : 21 days post-treatment, unwashed rabbit eyes showed severe irritation due to corneal opacity and vascularization.
- **Chloroxylenol** : In eye irritation study in rabbits, mild to severe corneal opacity in unwashed eyes, with irritation that persisted for 14 days were observed.

Respiratory sensitization [Not classified]

Skin sensitization [Not classified]

- **Ethanol** : In skin sensitisation test with guinea pigs, skin sensitisation reactions were not observed.
- **Preservatives** : In patch test between years 1996~1999 in 3168 people, positive results were seen.

Carcinogenicity [Not classified]

IARC

- Ethanol : Group 1 (in alcoholic beverages)

ACGIH

- Ethanol : A3

KOREA-ISHL

- Ethanol : 1A

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)).
- **Sodium Benzoate** : Positive reaction was observed in vitro(mammalian chromosome aberration test(OECD TG 473, GLP))/ Negitive reactions were observed in vitro(bacterial reverse mutation assay(OECD TG 471, GLP)) and in vivo(Mutagenicity Screening Studies).
- **Preservatives** : In in vitro Salmonella typhimurium Ames test, negative genotoxicity was observed (with or without metabolic activation).
- **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).

Reproductive toxicity [Not classified]

- **Ethanol** : In reproductive toxicity test with mice, there was no sigificant evidence for reproductive toxicity. (OECD TG 416)
- **Sodium Benzoate** : In developmental toxicity screening test with rabbits, there were no significant adverse effects on reproductive parameters and no evidence of malformations at any doses.(NOAEL ≥ 250 mg/kg bw/day)(OECD TG 414).
- **Preservatives** : Increased death before implantation, decreasing fetal survival and hollow foot, cardiovascular abnormalities, hydrocephalus, increased rate of hyoid bone occurrence were noted.
- **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/m³)(OECD TG 422, GLP)

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

- **Ethanol** : In acute inhalation toxicity with rats, very low acute toxicity effects were observed. (OECD TG 403)
- **Sodium Benzoate** : In acute oral toxicity test with rats, acute toxic effects were not observed.
- **Preservatives** : When inhaled, induces irritation in respiratory system.
- **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)
- **Sodium Benzoate** : One high dose male died, after hypersensitivity and convulsions. No further clinical signs were reported.Mean body weights of male and female high dose animals were depressed and Changes in organ weights were noted in the mid and high dose groups.(NOAEL=18100 mg/kg)(OECD TG 407)
- **Preservatives** : In repeated dermal toxicity test(NOEL=50mg/kg), and repeated oral toxicity test(NOEL=20mg/kg) with rats for 90 days, clinical manifestation and side-effects such as hepatic and intestinal hyperplasia, cardiomyopathy, etc. were 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 classified]

12. Ecological information

A. Ecological toxicity

- Acute toxicity : [Category 3] (ATEmix = 41.69836mg/ℓ)
- Chronic toxicity : [Not classified]

Fish

- **Ethanol :** 96hr-LC_{50} (*Pimephales promelas*) = 14200 mg/L
- **Sodium Benzoate :** 96hr-LC_{50} > 100 mg/L (pH 6.5 ~ 8.5)(OECD TG 203)
- **Preservatives :** 96hr-LC_{50} = 0.067 mg/L

- **Chloroxylenol :** 96hr-LC_{50} = 0.36 mg/L
- **Propane :** 96hr-LC_{50} = 27.98 mg/L (Estimated)

crustacean

- **Ethanol :** 48hr-LC_{50} (other) = 5012 mg/L , 48hr-NOEC(Daphnia magna) = 9.6 mg/L
- **Sodium Benzoate :** 96hr-LC_{50} > 100 mg/L (OECD TG 202)
- **Preservatives :** 48hr-EC_{50} = 0.160 mg/L
- **Chloroxylenol :** 48hr-EC_{50} = 2.7 mg/L
- **Propane :** 48hr-LC_{50} = 14.22 mg/L (Estimated)

Algae

- **Ethanol :** 96hr-LC_{50} (*Chlorella vulgaris*) = 675 mg/L (OECD TG 201)
- **Sodium Benzoate :** 72hr-EC_{50} > 30.5 mg/L NOEC-72hr (Pseudokirchnerella subcapitata)=0.09 mg/L), (pH 8.0 ~ 8.5, 23.1 ~ 23.4 ℃)(OECD TG 201, GLP)
- **Preservatives :** 96hr-EC_{50} = 1.978 mg/L
- **Propane :** 96hr-EC_{50} = 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)
- **Sodium Benzoate** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = -2.27)
- **Preservatives** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 2.4)
- **Chloroxylenol** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 3.27)
- **Propane** : Low persistency (log Kow is less than 4 estimated.) (Log Kow = 2.8) (pH 7)(20 ℃)

Degradability Not available

C. Bioaccumulative potential

Bioaccumulation

- **Ethanol** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF < 10)
- **Sodium Benzoate** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 3.162)
- **Preservatives** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 36)
- **Chloroxylenol** : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 66) (estimated)

Biodegradation

- **Ethanol** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (= 96% biodegradation was observed after 20 days)
- **Sodium Benzoate** : As well-biodegraded, it is expected to have low accumulation potential in living organisms (≥ 74% biodegradation was observed after 28 days) (OECD TG 301 B)
- **Chloroxylenol** : As not well-biodegraded, it is expected to have high accumulation potential in living organisms (30% ~ 40% biodegradation was observed after 7 days)
- **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)

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
Butane : Occupational exposure limits listed
B. Toxic Chemical Control Act
Ethanol : Existing Chemical Substance (KE-13217)
Water : Existing Chemical Substance (KE-35400)
Sodium Benzoate : Existing Chemical Substance KE-02711
Sorbitan monolaurate : Existing Chemical Substance KE-01795
GreenTea Extract : Existing Chemical Substance ;CAS No.7732-18-5:KE-35400 /CAS No.107-88-0:KE-03787
Preservatives : Existing Chemical Substance ; CAS No. 55406-53-6: KE-21042
Chloroxylenol : Existing Chemical Substance (KE-05943)
C. Dangerous Material Safety Management Regulation
Ethanol : Dangerous Material Safety Management Regulation 400ℓ
Sodium Benzoate : Dangerous Material Safety Management Regulation
GreenTea Extract : Dangerous Material Safety Management Regulation CAS No. 107-88-0;Petroleum class 4-3 (water soluble liquid) 4000ℓ
Chloroxylenol : Dangerous Material Safety Management Regulation
D. Wastes Control Act
Ethanol : Wastes Control Act Controlled Wastes
E. Other regulation (internal and external)
Internal information
Persistant Organic Pollutants Acts Not regulated
External information
EU classification(classification)
Ethanol : Classification F; R11
Water : Classification Not classified
Chloroxylenol : Classification Xn; R22 Xi; R36/38 R43
Propane : Classification F+; R12
Butane : Classification F+; R12
EU classification(risk phrases)
Ethanol : Hazard statements R11
Water : Hazard statements Not applicable
Chloroxylenol : Hazard statements R22 R36/38 R43
Propane : Hazard statements R12
Butane : Hazard statements R12
EU classification(safety phrases)
Ethanol : Precautionary statements S2 S7 S16
Water : Precautionary statements Not applicable
Chloroxylenol : Precautionary statements S(2) S24 S37
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
Chloroxylenol : EU Restriction list Regulated
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)
Preservatives : EPCRA 313 Regulated
Substance of Roterdame 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

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

16. Other information

A. Information source and references

Ecological Structure Activity Relationships(ECOSAR)
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
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/
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; http://monographs.iarc.fr
AKRON; http://ull.chemistry.uakron.edu/erd
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]
TOMES; http://www.rightanswerknowledge.com/loginRA.asp
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
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
EU CLP; http://esis.jrc.ec.europa.eu/index.php?PGM=cla
SIGMA-ALDRICH
UN Recommendations on the transport of dangerous goods 17th

B. Issuing date 2013.10.17

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.
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