

MATERIAL SAFETY DATA SHEET

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

A. GHS product identifier : BULLSONE SHOT - TOTAL FUEL SYSTEM CLEANER FOR GASOLINE ENGINE

B. Recommended use of the chemical and restrictions on use

- o **Recommended use :** fuel additive for gasoline automobile with PFI and GDI engine
- o **Restrictions on use :** use only as intended

C. Manufacturers

- o **Company name :** BULLSONE
- o **Address :** 890-12 Dabong Tower, Daechi-dong Gangnam-gu Seoul Koera
- o **Emergency phone number :** 82 32 874 9950
- o **Respondent :** HONG JONG IN

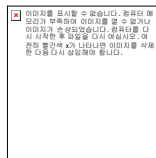
2. Hazards identification

A. GHS classification of the substance/mixture

- o **Flammable liquids : Category 3**
- o **Skin corrosion/irritation : Category 2**
- o **Serious eye damage /eye irritation : Category 1**
- o **Specific target organ toxicity (single exposure) : Category 3 (narcotic effects)**
- o **Specific target organ toxicity (single exposure) : Category 3 (respiratory irritation)**
- o **Aspiration hazard : Category 1**
- o **Hazardous to the aquatic environment (acute hazard) : Category 2**
- o **Hazardous to the aquatic environment (chronic) : Category 2**

B. GHS label elements, including precautionary statements

o **Pictogram and symbol :**



o **Signal word :** Danger

o **Hazard statements :**

- H226 : Flammable liquid and vapour
- H304 : May be fatal if swallowed and enters airways.
- H315 : Causes skin irritation.
- H318 : Causes serious eye damage.
- H335 : May cause respiratory irritation.
- H336 : May cause drowsiness or dizziness.
- H401 : Toxic to aquatic life.
- H411 : Toxic to aquatic life with long lasting effects.

o **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.

P264 : Wash ... thoroughly after handling.

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**

P301+P310 : If swallowed: Immediately call a poison center or doctor/physician.

P302+P352 : If on skin: Wash with plenty of soap and water.

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.

P305+P351+P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 : Immediately call a poison center or doctor/physician.

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

P321 : Specific treatment (see ... on this label).

P331 : Do not induce vomiting.

P332+P313 : If skin irritation occurs: Get medical advice/ attention.

P362 : Take off contaminated clothing and wash before reuse.

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

P391 : Collect spillage.

• **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.

• **Disposal**

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

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

o **Health** : 3

o **Flammability** : 2

o **Reactivity** : Not available

3. Composition/information on ingredients

Chemical Name	Common Name(Synonyms)	CAS number	Content (%)
Detergent	<ul style="list-style-type: none"> • Solvent naphtha (petroleum), light aromatic(CAS No. 64742-95-6; 30-60%) • +Alkylphenolpolyoxyalkylalkylamine(30-60%) • +Benzene, 1,2,4-trimethyl-(CAS No. 95-63-6; 10-19.9%) • +trimethylbenzenes(5-9.9%) • +N-Propylbenzene(CAS No. 103-65-1; 5-9.9%) • +Xylene(CAS No. 1330-20-7; 1-4.9%) • +Cumene(CAS No. 98-82-8; 1-4.9%) • +Benzene, 1,2,3-trimethyl-(CAS No. 526-73-8; 1-4.9%) 		20~30 %

	• +Solvent naphtha (petroleum), heavy aromatic(CAS No.64742-94-5; 0.1-0.5%)		
Friction modifier	• Alkoxy long-chain alkyl amide (60-100%) • +Diethanolamine (CAS No. 111-42-2; 0.5-0.99%)		1~4 %
Naphtha (petroleum), hydrodesulfurized heavy	• Naphtha • petroleum • hydrodesulfurized heavy	64742-82-1	65~85 %

4. First aid measures

A. Eye contact

- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Call emergency medical service.

B. Skin contact

- If on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- If skin irritation occurs: Get medical advice/ attention.
- 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.

C. Inhalation

- Immediately call a poison center or doctor/physician.
- Do not induce vomiting.
- 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

- If swallowed: Immediately call a poison center or doctor/physician.
- Do not induce vomiting.

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

- Flammable liquid and vapour
- May violently polymerize and result in fire and explosion.
- Vapors may travel to a source of ignition and ignite.
- Material may produce irritating and highly toxic gases from decomposition by heat and combustion

during burning

- 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.

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.
- Substance may be transported in a molten form.
- Some may be transported hot.
- 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

- 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.
- Eliminate all ignition sources.
- All equipment used when handling the product must be grounded.
- Stop leak if you can do it without risk.
- 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

- Avoid release to the environment.
- Prevent entry into waterways, sewers, basements or confined areas.

C. The methods of purification and removal

- Collect spillage.

- 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.
- Wash ... thoroughly after handling.
- 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.
- Avoid prolonged or repeated contact with skin.
- 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 high temperature.
- 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.
- 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

o Korea regulation

- **Detergent** :CAS No.1330-20-7;TWA:100ppm(435mg/m³)/CAS No.526-73-8;TWA:25ppm(125mg/m³)
- **Friction modifier** :CAS No.111-42-2;TWA : 0.46 ppm (2 mg/m³)

o ACGIH regulation

- **Detergent** :Benzene, 1,2,4-trimethyl- : (USA, 1999)-TWA: 25 ppm / trimethylbenzenes : (USA, 1999)-TWA: 25 ppm / Xylene : (USA, 1996)-TWA: 100 ppm,STEL: 150 ppm / Cumene : (USA, 1994).Absorbed through the skin.-TWA: 50 ppm / Benzene, 1,2,3-trimethyl- : (America, 1999)-TWA: 25 ppm

o Biological exposure index : Not available

o OSHA regulation

- **Detergent** :

- Xylene : (USA)-TWA: 100 ppm
- Cumene : (USA, 1989).Absorbed through skin.-TWA: 50 ppm

o NIOSH regulation : Not available

o EU regulation : Not available

o Other

- **Detergent** :

- Benzene, 1,2,4-trimethyl- : EH40 (UK) (Europe)-TWA: 25 ppm
- trimethylbenzenes : EH40 (UK) (Europe)-TWA: 25 ppm
- Xylene : EH40 (UK) (Europe,2002).Absorbed through the skin.-TWA: 50 ppm(8 hours),STEL: 100 ppm(15 min.) / NOHSC (Australia, 2003)-STEL: 80 ppm(15 min.)
- Cumene : EH40 (UK) (Europe).Absorbed through the skin.-TWA: 25 ppm(8 hours) / EH40 (UK)(Europe,2002).Absorbed through the skin.-TWA: 125 mg/m³(8 hours),STEL: 250 mg/m³(15 분) / NOHSC (Australia, 2003).Absorbed through the skin.-TWA: 25 ppm(8 hours),STEL: 75 ppm(15 min.)

B. Appropriate engineering controls

- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
- If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the recommended exposure limit.
- Facilities for storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

C. Personal protective equipment

o 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

o 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.

o Hand protection

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

o Body protection

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

9. Physical and chemical properties

A. Appearance :

- o **Description :** Liquid
- o **Color :** amber and transparent liquid

B. Odor : amines and hydrocarbon 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 :** > 43 °C**H. Evaporation rate :**Not available**I. Flammability (solid, gas) :**Not available**J. Upper/lower flammability or explosive limits :**Not available**K. Vapor pressure :**0.02 @37.8°C mmHg**L. Solubility (ies) :**below 0.1wt% of water**M. Vapor density :**Not available**N. Specific gravity :**0.816**O. Partition coefficient: n-octanol/water :**Not available**P. Auto ignition temperature :**Not available**Q. Decomposition temperature :**Not available**R. Viscosity :**5.3 cSt**S. Molecular weight :**Not available

10. Stability and reactivity

A. Chemical stability and Possibility of hazardous reactions :

- Flammable liquid and vapour
- 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 :

- Material may produce irritating and highly toxic gases from decomposition by heat and combustion during burning
- Corrosive and/or toxic fume
- Irritating and/or toxic gases

11. Toxicological information

A. Information of Health Hazardous

o Acute toxicity

- **Oral** : Not classified (26.9% of this product consists of ingredients of unknown toxicity)
 - Naphtha (petroleum), hydrodesulfurized heavy : Rat, LD₅₀ > 5,000 mg/kg (OECD TG 401, GLP)
- **Dermal** : Not classified (26.9% of this product consists of ingredients of unknown toxicity)
 - Naphtha (petroleum), hydrodesulfurized heavy : Rabbit, LD₅₀ > 2,000 mg/kg (OECD TG 402, GLP)
- **Inhalation** : Not classified (26.9% of this product consists of ingredients of unknown toxicity)
 - Naphtha (petroleum), hydrodesulfurized heavy : Rat, LC₅₀ > 5.16 mg/L/4hr (OECD TG 403, GLP)

o Skin corrosion/ irritation : Category 2 (24.3% of this product consists of ingredients of unknown toxicity)

- Friction modifier : No skin irritation.
- Naphtha (petroleum), hydrodesulfurized heavy : In skin irritation test with rabbits, skin irritations were observed.(OECD TG 404, GLP)

o Serious eye damage/ irritation : Category 1

- Detergent : - Causes eyes irritations. - EU R37 or R 36 classification : Not applicable.
- Friction modifier : Irritating to eyes. It is not applicable to the classification EU R41 or R36 Criteria.
- Naphtha (petroleum), hydrodesulfurized heavy : In test on eyes irritation with rabbits, eyes irritations were net observed.(OECD TG 405, GLP)

o Respiratory sensitization : Not classified (73.1% of this product consists of ingredients of unknown toxicity)

- Detergent : - In contact with skin : Causes skin irritations.
- Friction modifier : Irritating to respiratory system. It is not applicable EU R37 classification.

o Skin sensitization : Not classified (26.9% of this product consists of ingredients of unknown toxicity)

- Naphtha (petroleum), hydrodesulfurized heavy : In sensitisation test with guinea pigs, skin sensitisation were not observed.(OECD TG 406, GLP)

o Carcinogenicity : Not classified

- **IARC** :
 - Friction modifier : 2B ;CAS No.111-42-2
- **ACGIH** :
 - Friction modifier : A3 ;CAS No.111-42-2
- **KOREA-ISHL** :
 - Friction modifier : 2 ;CAS No.111-42-2
- **EU** :
 - Naphtha (petroleum), hydrodesulfurized heavy : Carc. 1B
- Naphtha (petroleum), hydrodesulfurized heavy : In a carcinogenicity with mouse, unleaded gasoline is not expected to display carcinogenic properties.(OECD TG 451)

o Mutagenicity : Not classified (26.9% of this product consists of ingredients of unknown toxicity)

- Naphtha (petroleum), hydrodesulfurized heavy : Negative reactions were observed in vitro test(Bacterial gene mutation assay and mammalian cell gene mutation assay)and in vivo test(Erythrocyte Micronucleus Assay(GLP) and Mammalian Bone Marrow Chromosome Aberration Test(OECD TG 475)).

o Reproductive toxicity : Not classified (26.9% of this product consists of ingredients of unknown toxicity)

- Naphtha (petroleum), hydrodesulfurized heavy : In developmental inhalation toxicity study with rats, unleaded gasoline vapors did not produce evidence of developmental toxicity.(OECD TG 414, GLP)

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

- Detergent : - Target organ : Contain substances that can cause damage in blood, kidney, lung, liver, spleen, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), nose / pyorrhoea (sinuses). - Inhaled : Causes respiratory system irritation. - Swallowed : If swallowed, can induce dyspnoea due to damage to the lungs. EU R37 classification : Not applicable. Causes stomach irritations and diarrhea.
- Friction modifier : Target Organs: It is include the material that may cause damage to the following organs: kidneys, liver, gastrointestinal tract, upper respiratory tract, eyes. Side Effects: This product is include a low level of diethanolamine (DEA). DEA caused cancer in laboratory one type of animals.
- Naphtha (petroleum), hydrodesulfurized heavy : In acute inhalation toxicity study with rats, There were no remarkable clinical signs noted during the course of treatment and no mortality.(OECD TG 403, GLP)

o Specific target organ toxicity (repeat exposure) : Not classified (2.7% of this product consists of ingredients of unknown toxicity)

- Detergent : - In contact with skin : Repeated exposure can induce the dry, cracked skin. - Side effect : With low-level of maternal toxicity in rats, exposure to light aromatic naphtha(curde) solvent by inhalation induced fetal toxic effects to progeny. This product contains Trimethylbenzene. According to literature, long-term inhalation exposure caused blood effects in laboratory animals. Through inhalation, it can increase heart rate and cause irregular hearbeats(arrhythmia) and damage in central nervous system (CNS), liver, kidney and blood. Excessive exposure to Xylene, maternal tocity-level, induced fetal toxic effects to progeny in the several tests with animals. No severe effects to human. Vapor of Xylene may causes skin irritation to human as an occupational disease. When exposed to 1,800 PPM Xylene vapors, rats experience difficulty in hearing intermediate frequency region.
- Naphtha (petroleum), hydrodesulfurized heavy : In repeated dose inhalation toxicity study with rat and mouse, No compound-related changes were seen in mortality, hematology or clinical chemistry parameters in either species.(OECD TG 453)

o Aspiration Hazard : Category 1

12. Ecological information

A. Ecological toxicity

- Acute toxicity : Category 2 (ATEmix= 2.50000mg/l) (100% of this product consists of ingredients of unknown toxicity)
- Chronic toxicity : Category 2

o Fish : Not available

- Naphtha (petroleum), hydrodesulfurized heavy : 96hr-LC₅₀ = 2.5 mg/L

o crustacean :

- Naphtha (petroleum), hydrodesulfurized heavy : 96hr-LC₅₀ (other) = 4.3 mg/L (Crangoncrangon)

o Algae : Not available

B. Persistence and degradability

o Persistence :

- Detergent : This product contains components that can be persistent in the environment
- Friction modifier : This product contains components that can be persistent in the environment
- Naphtha (petroleum), hydrodesulfurized heavy : High persistency (log Kow is more than 4 estimated.) (Log Kow =2.1 ~ 6)

o Degradability : Not available

C. Bioaccumulative potential

o Bioaccumulation :

- Naphtha (petroleum), hydrodesulfurized heavy : Bioaccumulation is expected to be high according to the $BCF \geq 500$ ($BCF = 10 \sim 2500$)

o Biodegradation :

- Naphtha (petroleum), hydrodesulfurized heavy : As well-biodegraded, it is expected to have low accumulation potential in living organisms (77.05% biodegradation was observed after 28 day) (OECD TG 301F, GLP)

D. Mobility in soil :

- Naphtha (petroleum), hydrodesulfurized heavy : High potency of mobility to soil. ($K_{oc} = 80030$) (estimated)

E. Other hazardous effect :

- Environmental Hazards: High poisonous to aquatic organisms. May cause long-term adverse Detergent : effects in the aquatic environment. According to the calculation method. German Water quality(class): 2

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 : UN 1993

B. UN Proper shipping name : FLAMMABLE LIQUID, N.O.S.

C. Transport Hazard class : Class 3

D. Packing group : III

E. Marine pollutant : YES

F. Special precautions

in case of fire : F-E

in case of leakage : S-E

15. Regulatory information

① **KOREA Regulatory information**

A. Occupational Safety and Health Regulation :

o Detergent : Occupational exposure limits listed CAS No. 1330-20-7 / CAS No. 526-73-8

o Friction modifier : Work environment monitoring listed (6 months);CAS No.111-42-2

Administration subject listed ;CAS No.111-42-2

Occupational exposure limits listed ;CAS No.111-42-2

B. Toxic Chemical Control Act :

o Detergent : Toxic Chemicals ; CAS No. 1330-20-7: 97-1-275 (85% or more in mixtures)

Existing Chemical Substance ; CAS No. 64742-95-6: KE-31662/CAS No. 95-63-6: KE-34410/CAS No. 103-65-1: KE-29781/CAS No. 1330-20-7: KE-35427/CAS No. 98-82-8: KE-23957/CAS No. 526-73-8: KE-34409/CAS No. 64742-94-5: KE-31656

o Naphtha (petroleum), hydrodesulfurized heavy : Existing Chemical Substance KE-25620

C. Dangerous Material Safety Management Regulation :

- o **Detergent** : CAS No. 95-63-6; Petroleum class 4-2 (non-water soluble liquid) 1000ℓ/ CAS No. 1330-20-7; Petroleum class 4-2 (non-water soluble liquid) 1000ℓ/ CAS No. 98-82-8; Petroleum class 4-2 (non-water soluble liquid) 1000ℓ/ CAS No. 526-73-8; Petroleum class 4-2 (non-water soluble liquid) 1000ℓ

D. Wastes Control Act :

- o **Detergent** : CAS No. 64742-95-6; Controlled wastes/ CAS No. 1330-20-7; Controlled wastes/ CAS No. 64742-94-5; Controlled wastes

② Foreign Regulatory Information

o External information

- **EU classification(classification) :**
 - * **Detergent :**
 - * **Naphtha (petroleum), hydrodesulfurized heavy :** Carc. Cat. 2; R45 Muta. Cat. 2; R46 Xn; R65
- **EU classification(risk phrases) :**
 - * **Detergent :** R10 R41 R37 R66 R67 R50/53
 - * **Naphtha (petroleum), hydrodesulfurized heavy :** R45 R46 R65
- **EU classification(safety phrases) :**
 - * **Detergent :** S16 S23 S26 S36/37/39 S57
 - * **Naphtha (petroleum), hydrodesulfurized heavy :** S53 S45
- **EU SVHC list :** Not regulated
- **EU AuthorisationList :** Not regulated
- **EU Restriction list :**
 - * **Naphtha (petroleum), hydrodesulfurized heavy :** 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 RoteradameProtocol :** Not regulated
- **Substance of StockholmeProtocol :** Not regulated
- **Substance of Montreal Protocol :** Not regulated

③ Foreign Inventory Status

- **Detergent :**
 - U.S. : SARA Title III Section 311/312 hazard classification : SARA 311/312 MSDS distribution ? Chemical substance list - Hazard Identification : fire risk, acute health risk, chronic health risk.
 - U.S. : State - California law : The product Contains substances that can cause carcinogenesis, congenital abnormality, hypogonadism. California has a legal obligation to provide to warn. : Cumene, Ethylbenzene, Naphthalene, Toluene, Benzene
 - Canada : WHMIS(Classification) : B-3 Class : Combustible liquids. (The flash point: 37.8°C-93.3 °C) / D-2 Class : Substances which cause toxicity effect. (Highly toxic)
 - U.S.A management information : Section 8(b) Inventory (TSCA): Present
 - Japan management information : Existing and New Chemical Substances (ENCS): Present
 - China management information : Inventory of Existing Chemical Substances (IECSC): Present
 - Canada management information : Substances List : Present
 - Philippines management information : Inventory of Chemicals and Chemical Substances (PICCS): Present

- **Friction modifier :**

- U.S. : SARA Title III Section 311/312 hazard classification : SARA 311/312 MSDS distribution
- Chemical substance list - Hazard Identification : acute health risk
- Canada : WHMIS(Classification) : D-2 AClass : Substances which cause toxicity effect.
(Highly toxic/ D-2 BClass : Substances which cause toxicity effect. (Toxic)
- Canada : HMIRC Registry Number : 8465
- Canada : Approved the request.: January 31, 2013
- U.S.A management information : Section 8(b) Inventory (TSCA): Present
- Japan management information : Existing and New Chemical Substances (ENCS): Present
- China management information : Inventory of Existing Chemical Substances (IECSC): Present
- Canada management information : Substances List : Present
- Australia management information : Inventory of Chemical Substances (AICS): Present
- Philippines management information : Inventory of Chemicals and Chemical Substances (PICCS): Present
- New Zealand management information : Inventory of Chemicals (NZIoC): Present

- **Naphtha (petroleum), hydrodesulfurized heavy :**

- U.S.A management information : Section 8(b) Inventory (TSCA): Present
- Japan management information : Existing and New Chemical Substances (ENCS): (9)-1698
- 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

16. Other information

A. Information source and references

Afton MSDS

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

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

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

Waste Control Act enforcement regulation attached [1]

UN Recommendations on the transport of dangerous goods 17th

Emergency Response Guidebook 2008;

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

Afton Chemical MSDS

SAMSUNG Total Co., Ltd. MSDS

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

OECD SIDS; <http://webnet.oecd.org/hpv/ui/Search.aspx>

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

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

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

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

American Conference of Governmental Industrial Hygienists TLVs and BEIs.

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

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

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

B. Issuing date :01. Jul. 2013.

C. Revision number and date

revision number : 2

date of the latest revision : 2014.07.16

D. Others

- Since the user's working conditions are not known by us, the information supplied on this safety data sheet is based on our current level of knowledge and on national and community regulations.
- The product must not be used for any purposes other than those specified under heading 1 without first obtaining written handling instructions.
- It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations.
- The information given on this safety data sheet must be regarded as a description of the safety requirements relating to our product and not a guarantee of its properties