

SDS(Safety Data Sheet)

Product	Aviation Gasoline 100LL(Blue Dye)		
MSDS Number	List No.	Issuing date	Last revised date
-	PD1137	2013-11-12	2024-01-17

1. IDENTIFICATION

1) Product name

Aviation Gasoline 100LL(Blue Dye)

2) Recommended use of the chemical and restriction on use

- Recommended use Fuels and additives
- Restrictions on use Do not use for any other purpose.

3) Details of the supplier of the safety data sheet

○ Manufacturer

- Company name GS Caltex Corporation
- Address GS Tower, 508, Nonhyeon-ro, Gangnam-gu, Seoul, Korea
- Emergency telephone number 1544-5151

2. HAZARDS IDENTIFICATION

1) Classification of the product

- FLAMMABLE LIQUIDS : Category 1
- SKIN CORROSION/IRRITATION : Category 2
- CARCINOGENICITY : Category 1A
- GERM CELL MUTAGENICITY : Category 1B
- TOXIC TO REPRODUCTION : Category 2
- SPECIFIC TARGET ORGAN TOXICITY FOLLOWING REPEATED EXPOSURE : Category 2
- ASPIRATION HAZARD : Category 1
- LONG-TERM HAZARDS TO THE AQUATIC ENVIRONMENT : Category 3

2) Label elements

○ Hazard pictograms



○ Signal word

Danger

○ Hazard statements

- H224 Extremely flammable liquid and vapour.
- H304 May be fatal if swallowed and enters airways.
- H315 Causes skin irritation.
- H340 May cause genetic defects.(inhalation)

- H350 May cause cancer.(oral)
- H361 Suspected of damaging fertility or the unborn child.(Suspected of damaging the unborn child) (inhalation)
- H373 May cause damage to organs through prolonged or repeated exposure. (inhalation)
- H412 Harmful to aquatic life with long lasting effects.

○ **Precautionary statements**

1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233 Keep container tightly closed.
- P240 Ground and bond container and receiving equipment.
- P241 Use explosion-proof [electrical/ventilating/lighting] equipment.
- P242 Use non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P264 Wash ... thoroughly after handling.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

2) Response

- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P302 + P352 IF ON SKIN: Wash with plenty of water/cleansing agent.
- P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P308 + P313 IF exposed or concerned: Get medical advice/attention.
- P314 Get medical advice/attention if you feel unwell.
- P321 Specific treatment (see section 5).
- P331 Do not induce vomiting.
- P332 + P313 If skin irritation occurs: Get medical advice/attention.
- P362 + P364 Take off contaminated clothing and wash it before reuse.
- P370 + P378 In case of fire: Use manufacturer/supplier or the competent authority to specify appropriate media for extinction.

3) Storage

- P403 + P235 Store in a well-ventilated place. Keep cool.
- P405 Store locked up.

4) Disposal

- P501 Dispose of contents/container to

3) Other hazards

○ **Product NFPA Level**

(※ 0-Lack, 1-Low, 2-Moderate, 3-High, 4-Very High)

Product name	Health	Flammable	Reaction
Aviation Gasoline 100LL(Blue Dye)	2	4	0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	Trade names and Synonyms	CAS No.	EC No.	Contain Ratio(%)
Gasoline		86290-81-5	289-220-8	85 ~ 95
Toluene	1-Methylbenzene; Methacide ; Methylbenzol	108-88-3	203-625-9	5 ~ 15
Benzene	1,3,5-Cyclohexatriene ; Benzine ; Benzole	71-43-2	200-753-7	0 ~ 0.2
Tetraethyl lead	Lead tetraethyl ; Lead, tetraethyl- ; Plumbane, tetraethyl-	78-00-2	201-075-4	0.06

4. FIRST AID MEASURES

- 1) Eye contact**
- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes.
 - If eye irritation persists: Get medical advice/attention.
- 2) Skin contact**
- In case of contact with substance, immediately flush skin with running water for at least 20 minutes.
 - In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
 - If skin irritation occurs: Get medical advice/attention.
 - Take off immediately all contaminated clothing and wash it before reuse.
- 3) Inhalation**
- Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
 - Administer oxygen if breathing is difficult.
 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
 - IF exposed or concerned: Get medical advice/attention.
 - Do not induce vomiting.
- 4) Ingestion**
- Do not use mouth-to-mouth method if victim ingested the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
- 5) Indication of any immediate medical attention and special treatment needed**
- Exposures require specialized first aid with contact and medical follow-up.
 - Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. FIRE FIGHTING MEASURES

- 1) Suitable (and unsuitable)** - Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this

- extinguishing media** material.
 - Use dry sand or earth to smother fire.
 - High-pressure water (Unsuitable extinguishing media)
 - Direct water (Unsuitable extinguishing media)
- 2) Special hazards arising from the substance or mixture**
 - Can form explosive mixtures at temperatures at or above the flashpoint.
 - Fire may produce irritating, corrosive and/or toxic gases.
 - Extremely flammable liquid and vapour.
 - Heating may cause a fire or explosion.
- 3) Special protective equipment and precautions for firefighters**
 - Rescuers should put on appropriate protective gear.
 - Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
 - In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.
 - Eliminate all ignition sources if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

- 1) Health considerations and protective equipment**
 - Clean up spills immediately, observing precautions in Protective Equipment section.
 - ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
 - All equipment used when handling the product must be grounded.
 - Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
 - Please note that materials and conditions to be avoided.
- 2) Environmental precautions**
 - Large spill: Prevent entry into waterways, sewers, basements or confined areas.
 - Avoid release to the environment.
- 3) Methods and material for containment and cleaning up**
 - Dike and collect water used to fight fire.
 - Absorb spill 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.
 - Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.

7. HANDLING AND STORAGE

- 1) Precautions for safe handling**
 - 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.
 - Avoid prolonged or repeated contact with skin.
 - Avoid breathing vapors from heated material.
 - All equipment used when handling the product must be grounded.
 - Please note that materials and conditions to be avoided.

- Handling refer to engineering control/personal protection section.
 - Wash thoroughly after handling.
 - Use only outdoors or in a well-ventilated area.
- 2) Conditions for safe storage (including any incompatibilities)**
- Please note that materials and conditions to be avoided.
 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
 - Store in a well-ventilated place. Keep container tightly closed.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Control parameters

Chemical name	Exposure limits	ACGIH TLV	OSHA PEL	Biological limit values(BLV)
Gasoline	Not available	Not available	Not available	Not available
Toluene	TWA : 50 ppm STEL : 150 ppm	Not available	PEL: 200 ppm, C 300 ppm mg/m ³	0.02 mg/L Medium: blood Time: prior to last shift of workweek Parameter: Toluene; 0.03 mg/L Medium: urine Time: end of shift Parameter: Toluene; 0.3 mg/g creatinine Medium: urine Time: end of shift Parameter: o-Cresol with hydrolysis (background)
Benzene	TWA : 0.5 ppm STEL : 2.5 ppm	Not available	Not available	25 µg/g creatinine Medium: urine Time: end of shift Parameter: S-Phenylmercapturic acid (background); 500 µg/g creatinine Medium: urine Time: end of shift Parameter: t,t-Muconic acid (background)

Tetraethyl lead	TWA : 0.075 mg/m ³	TWA 0.1 mg/m ³ , as Pb, Vapor and Aerosol	PEL: 0.075 mg/m ³ mg/m ³	Not available
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2) Appropriate engineering controls

- Install local exhaust ventilation system.
- Check legal suitability of exposure level.

3) Personal protection equipment

- **Respiratory protection**
 - If exposure concentration of the material is lower than 100 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate material ; such
 - If exposure concentration of the particle material is lower than 250 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate material
 - If exposure concentration of the particle material is lower than 500 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate materia
 - If exposure concentration of the particle material is lower than 10000 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate mater
 - If exposure concentration of the material is lower than 100000 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate material ; su
 - If exposure concentration of the material exceeds the permitted exposure standards, Wear European Standard EN 149 approved full or half face piece (with goggles) respireatory protective equipment.
- **Eye protection**
 - An eye wash unit and safety shower station should be available nearby work place.
 - Wear breathable safety goggles to protect from vapour state organic material causing eye irritation or other disorder.
- **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

Item	Input Value
Apperance	Liquid
Color	No Data

Smell	석유냄새
Smell Threshold	No Data
pH (Numerical value)	No Data
Melting/Freezing Point	-58 °C
Boiling Point	25 ~ 170 °C
Flash Point	-43 °C
Evaporating Rate	No Data
Flammability(Solid, Gas)	No Data
Explosibility Range	1.2~7.6 %
Steam Pressure	No Data
Solubility	No Data
Vapor Density	No Data
Specific Gravity	0.665~0.735 g/cm ³ at 15°C
Distribution Coefficient	2.7~6
Selfignition Temperature	280 ~456 °C
Pyrolysis Temperature	No Data
Viscosity	0.75 mm ² /s (at 40°C)
Molecular Weight	No Data

10. STABILITY AND REACTIVITY

- 1) Chemical Stability and hazardous reactivity** - Can form explosive mixtures at temperatures at or above the flashpoint.
- HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- Fire may produce irritating, corrosive and/or toxic gases.
- 2) Conditions to avoid** - Ignition source(heat, spark, flame, friction, shock, contamination)
- 3) Incompatible materials** - Combustibles
- 4) Hazardous decomposition products** - During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

11. TOXICOLOGICAL INFORMATION

1) Information on the likely routes of exposures

- **Inhalation**
 - No inhalation effects through respiratory system.
- **Skin contact**
 - Causes skin irritation.
 - Absorbable through the skin

○ **Eye contact**

- Causes serious eye irritation.
- Possible exposure through the eye

○ **Ingestion**

- May be fatal if swallowed and enters airways.
- Absorbable through the inhalation

2) Health hazard information

○ **Acute toxicity**

* **Oral - Not classified (ATEmix > 2000 mg/kg)**

- Gasoline : rat; no deaths; LD50 > 5000 mg/kg (read-across: Premium unleaded gasoline) (OECD TG 401, GLP) (ECHA)
- Toluene : rat(male); LD50 = 5580 mg/kg bw (EU Method B.1) (ECHA)
- Benzene : Rat(Male); LD50 > 2000 mg/kg (OECD TG 401)(ECHA)
- Tetraethyl lead : rat(male/female); LD50 = 14.18 mg/kg bw (ECHA)

* **Dermal - Not classified (ATEmix > 2000 mg/kg)**

- Gasoline : rabbit; no deaths; LD50 > 2000 mg/kg (read-across: Premium unleaded gasoline) (OECD TG 402, GLP) (ECHA)
- Toluene : rabbit(male); LD50 > 5000 mg/kg bw (ECHA)
- Benzene : Rabbit(Male); LD50 > 9400 mg/kg (OECD TG 402)(ECHA)
- Tetraethyl lead : Not available

* **Inhalation(Gas) - Not applicable**

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Not applicable

* **Inhalation(Vapour) - Not classified (ATEmix > 20 mg/L)**

- Gasoline : rat; inhalation: vapour; LC50 > 7.63 mg/L (OECD TG 403, GLP) (ECHA)
- Toluene : rat; inhalation: vapours; LC50 = 28.1 mg/L air/4h (OECD TG 403) (ECHA)
- Benzene : Rat(Male); inhalation: Vapours, LC50 = 43.767 mg/L 4h (OECD TG 403)(ECHA)
- Tetraethyl lead : rat; LC50 = ca. 0.85 mg/L air/1h (-> conversion value by 4-hour exposure : ca. 0.425 mg/L air/4h) (ECHA)

* **Inhalation(Dust, mist) - Not classified (ATEmix > 5 mg/L)**

- Gasoline : Not available
- Toluene : Not available
- Benzene : Not available
- Tetraethyl lead : Not available

○ **Skin corrosion/Irritation : Category 2 (SKIN IRRITATION Cat.2)**

- Gasoline : rabbit; irritating (OECD TG 404, GLP) (ECHA)
- Toluene : rabbit; irritating (EU Method B.4, GLP) (ECHA)
- Benzene : Rabbit; Irritating (OECD TG 404)(ECHA)
- Tetraethyl lead : The substance is irritating to the skin. (INCHEM)

○ **Serious eye damage/irritation : Not classified**

- Gasoline : rabbit; not irritating (OECD TG 405, GLP) (ECHA)

- Toluene : rabbit; slightly irritating (OECD TG 405, GLP) (ECHA)
- Benzene : Rabbit; irritating (ECHA)
- Tetraethyl lead : Irritating to eyes. (HSDB)

○ **Respiratory sensitization : Not classified**

- Gasoline : Not available
- Toluene : Not available
- Benzene : Not available
- Tetraethyl lead : Not available

○ **Skin sensitization : Not classified**

- Gasoline : guinea pig; not sensitising (OECD TG 406, GLP) (ECHA)
- Toluene : guinea pig; not sensitising (EU Method B.6, GLP) (ECHA)
- Benzene : Guinea pig; not sensitizing (OECD TG 406)(ECHA)
- Tetraethyl lead : Not available

○ **Carcinogenicity : Category 1A**

- Gasoline : EU CLP 1272/2008 : Carc. 1B (Note P : The classification as a carcinogen need not apply if it can be shown that the substance contains less than 0,1 % w/w benzene(EINECS No 200-753-7).
- Toluene : IARC : 3 (Not Classifiable)
ACGIH : A4 (Not Classifiable as a Human Carcinogen)
Inhalation studies in rats and mice (Huff, 1990; Gibson and Hardisty 1983) and a supporting study in mice using skin application (Broddle et al, 1996), are considered relevant for the risk assessment. Inhalation exposures for 6 or 6.5 h/day, 5 days/week for up to 2 years at concentrations up to 1200 ppm (4522 mg/m³) were used. The dermal application study involved application of 50 µL toluene twice a week for up to 2 years. No statistically significant increase in any tumour type was seen in any study. (ECHA)
- Benzene : IARC : Group 1
EU CLP 1272/2008 : Car. 1A
ACGIH : A1
NTP : K
- Tetraethyl lead : IARC : Group 3 (Not Classifiable)
NTP : Reasonably Anticipated To Be A Human Carcinogen (listed under Lead and lead compounds)
ACGIH : A4 (Not Classifiable as a Human Carcinogen)

○ **Germ cell mutagenicity : Category 1B**

- Gasoline : EU CLP 1272/2008 : Muta. 1B : (Note P : The classification as a mutagen need not apply if it can be shown that the substance contains less than 0,1 % w/w benzene(EINECS No 200-753-7).
- Toluene : in vitro; Bacterial reverse mutation test : negative (EU Method B.13/14) (ECHA)
In vitro Mouse Lymphoma cell Gene Mutation Test: negative (OECD TG 476) (ECHA)
In vivo mouse(male); rodent dominant lethal assay : negative (OECD TG 478) (ECHA)

- Benzene : In vitro bacterial reverse mutation assay: negative (OECD TG 471) (ECHA); in vitro Chinese Hamster lung fibroblast cell Chromosome Aberration Test (EPA OPPTS 870.5375): positive (ECHA)
in vivo Mouse(Male) Erythrocyte Micronucleus test: positive (OECD TG 474) (ECHA); in vivo Mouse Bone Marrow Chromosome Aberration Test (OECD TG 475) and Germ cell Chromosome Aberration test (OECD TG 483): both positive (ECHA)
- Tetraethyl lead : In vitro bacterial reverse mutation assay : negative (EPA OPPTS 870.5265) (ECHA)
In vivo chromosome aberration assay : negative (ECHA)

○ **Reproductive toxicity : Category 2**

- Gasoline : rat; two-generation reproductive toxicity; No adverse effects on reproductive parameters (OECD TG 416, GLP) (ECHA)
rat; developmental toxicity; No evidence of teratogenicity was observed in fetues from pregant dams exposed to the test material (OECD TG 414) (ECHA)
- Toluene : rat; inhalation; reproductive toxicity study; 600, 2000 ppm; Toluene showed no effects on fertility in rats, however, decreased sperm count was reported at 2000 ppm. The NOAEC for this effect was 600 ppm. (ECHA)
rat; inhalation; developmental toxicity; Animal studies indicate that toluene is not teratogenic however there is evidence of developmental toxicity (lower birth weight, delayed vaginal opening) at exposures = 1000 ppm in the presence of slight maternal toxicity; the NOAEC for developmental and maternal effects is 600 ppm (2261 mg/m³). Findings suggestive of an increased risk of late spontaneous abortions associated with exposure to toluene at levels around 88 ppm (330 mg/m³) were considered by the Commission Group of Specialised Experts in the fields of Carcinogenicity, Mutagenicity and Reprotoxicity to require confirmation, while the EU Scientific Committee on Occupational Exposure Limits SCOEL (2001) noted that abortions have not been reported upon accidental high exposure or toluene abuse by pregnant women. (ECHA)
- Benzene : rat(male/female); inhalation : vapor; one-generation reproductive toxicity; 0, 3.2, 32, 320, 960 mg/m³; NOAEC = 960 mg/m³ air; No treatment related effects were seen in pup survival or at gross post mortem on postnatal day 21 (OECD TG 415)(ECHA)
- Tetraethyl lead : rat; developmental toxicity; Maternal toxicity was observed and foetal resorption and general retardation of development was encountered at the higher dose levels. It is concluded that lead as TEL is not teratogenic to the mouse or rat. NOAEL reported as 0.1 mg/kg bw/day, LOAEL reported as 1.0 mg/kg bw/day. (ECHA)

○ **Specific target organ toxicity (single exposure) : Not classified**

- Gasoline : oral; rat; Loose stools and incoordination were the only clinical effects seen and there was observed only on the day after the dosing (OECD TG 401, GLP) (ECHA)
inhalation: vapour; rat; There were no remarkable clinical signs noted during the course of treatment (OECD TG 403, GLP) (ECHA)
- Toluene : Toluene is rapidly absorbed mainly through inhalation and acts on the central nervous system. Toluene causes fatigue, sleepiness, dizziness and mild

respiratory irritation at 50-100 ppm, excitement associated with paresthesia and nausea at 200-400 ppm and central nervous system suppression leading to drunkenness, delirium and abnormal gait at 500-800 ppm (NITE)

- Benzene : Not available
- Tetraethyl lead : oral; rat(male/female); All animals displayed neurological signs including lethargy, irritability and ataxia from day 2. LD50 = 14.18 mg/kg bw (ECHA)
inhalation; rat; Hyperexcitability and continuous body tremours were observed at doses below the lethal dose. LC50 = ca. 0.425 mg/L air/4h (ECHA)

○ **Specific target organ toxicity (repeated exposure) : Category 2, 구분 2**

- Gasoline : oral; rat; kidney effects are specific to male rats and are not considered to be of biological relevance to humans (read-across: unleaded gasoline) (ECHA)
dermal; mouse; Unleaded gasoline did not display chronic dermal toxicant properties in this study (read-across: unleaded gasoline) (OECD TG 453, GLP) (ECHA)
inhalation: vapour; rat; no consistent, compound-related changes were seen in mortality, hematology or clinical chemistry parameters in either species (OECD TG 453) (ECHA)
- Toluene : rat; oral; 90days; 312, 625, 1250, 2500, 5000 mg/kg/day; Absolute or relative weight increase; NOAEL = 625 mg/kg bw/day (EU method B.26, GLP) (ECHA)
rat; inhalation; 103weeks; 0, 2261, 4522 mg/m³; Toluene caused local toxicity to rat nasal epithelium at concentrations of 600 ppm (2250 mg/m³) and above. (OECD TG 453, GLP) (ECHA)
rat; inhalation; 90days; 100, 625, 1250, 2500 and 3000 ppm; Toluene exposure at concentrations = 1250 ppm, 6h/day, 5 days per week for 15 weeks induced adverse clinical signs, lower bodyweight and changes in haematology and organ weights. NOAEC = 925 ppm (EU method B.29, GLP) (ECHA)
Affects the central nervous system, liver, hearing, kidneys and lungs
- Benzene : After repeated dose exposure via oral or inhalation routes, benzene causes adverse effects on the haematopoietic system of animals and humans. ECHA)
- Tetraethyl lead : oral; rat(male); 0, 0.2, 2 mg/kg bw/day; 13 Weeks; Repeat oral toxicity study carried out on groups of male rats, concluded that the first signs of toxicological effects due to TEL were observed at a dose rate of 0.2 mg/kg bw/d. (ECHA)
inhalation; rat(male/female); 12, 22, 46 mg/m³ air; 35 Weeks; An NOEL of greater than 12 mg/m³ air was reported and a LD100 value of 22 mg/m³ quoted. (ECHA)

○ **Aspiration hazard : Category 1**

- Gasoline : If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis (NITE)
EU CLP 1272/2008 : Asp. Tox 1
- Toluene : viscosity : 0.64 mm²/s (40°C) & hydrocarbons (ECHA)
- Benzene : 0.604 mPas (25.0 °C, dynamic) & Hydrocarbons (ECHA)
The direct aspiration of liquid benzene into the lungs causes immediate pulmonary oedema and haemorrhage at the site of contact with the pulmonary tissue (OECD SIDS)

- Tetraethyl lead : At 40°C = 0.382 cSt (ECHA) & not hydrocarbons

12. ECOLOGICAL INFORMATION

1) Ecotoxicity

- Acute toxicity : Not classified (ATEmix>1mg/L)
- LONG-TERM HAZARDS TO THE AQUATIC ENVIRONMENT : Category 3

○ Acute (short-term) aquatic hazard:

Fish

- Gasoline : 96h-LL50(Pimephales promelas) = 10 mg/L (OECD TG 203, GLP) (ECHA)
- Toluene : 96h-LC50(Oncorhynchus kistutch) = 5.5 mg/L (ECHA)
- Benzene : 96h-LC50(Oncorhynchus mykiss) = 5.3 mg/L (OECD TG 203)(ECHA)
- Tetraethyl lead : 96h-LC50(Pleuronectes platessa) = 0.23 mg/L (ECHA)

Invertebrates

- Gasoline : 48h-EL50(Daphnia magna) = 4.5 mg/L (OECD TG 202, GLP) (ECHA)
- Toluene : 48h-LC50(Ceriodaphnia dubia) = 3.78 mg/L (US EPA 600/4-91-003) (ECHA)
- Benzene : 48h-EC50(Daphnia magna) = 10 mg/L (OECD TG 202)(ECHA)
- Tetraethyl lead : 48h-LC50(Artemia salina) = 0.085 mg/L (ECHA)

Aquatic algae

- Gasoline : 72h-ErL50(Pseudokirchneriella subcapitata) = 3.1 mg/L (OECD TG 201, GLP) (ECHA)
- Toluene : 72h-EC50(Chlamydomonas angulosa) = 134 mg/L (ECHA)
- Benzene : 72h-ErC50(Pseudokirchneriella subcapitata) = 100 mg/L (OECD TG 201, GLP)(ECHA)
- Tetraethyl lead : Not available

○ Chronic (Long-term) aquatic hazard:

Fish

- Gasoline : Not available
- Toluene : 40d-NOEC(Oncorhynchus kisutch) = 1.39 mg/L (ECHA)
- Benzene : 32d-LOEC(Pimephales promelas) = 1.6 mg/L (ASTM 1984)(ECHA)
- Tetraethyl lead : Not available

Invertebrates

- Gasoline : 21d-NOELR(Daphnia magna) = 2.6 mg/L (OECD TG 211, GLP) (ECHA)
- Toluene : 7d-NOECreproduction(Ceriodaphnia dubia) = 0.74 mg/L (US EPA 600/4-91-003)(ECHA)
- Benzene : 7d-NOEC(Ceriodaphnia dubia) = 3 mg/L (US EPA 600/4-91-003)(ECHA)
- Tetraethyl lead : Not available

Aquatic algae

- Gasoline : 72h-NOELR(Pseudokirchneriella subcapitata) = 0.5 mg/L (OECD TG 201, GLP) (ECHA)
- Toluene : Not available
- Benzene : Not available
- Tetraethyl lead : Not available

2) Persistence and degradability

○ Persistence

- Gasoline : log Kow = 4.2 (estimated) (EPISUITE)
- Toluene : log Kow = 2.73 (20 °C) (ECHA)

- Benzene : log Kow = 2.13 (ECHA)
- Tetraethyl lead : log Kow = 4.62 (20 °C) (ECHA)

○ **Degradability**

- Gasoline : The lack of a suitable leaving group renders compounds resistant to hydrolysis (ECHA)
- Toluene : Calculated phototransformation half-life in air : 2.59 days (ECHA)
- Benzene : calculated phototransformation half-life in air : 13.4days (ECHA)
- Tetraethyl lead : Half-life in air : 12.7 h (ECHA) Half-life for hydrolysis : 7.3 d (ECHA)

3) Bioaccumulative potential

○ **Bioaccumulation**

- Gasoline : BCF = 272.9 (estimated) (EPISUITE)
- Toluene : BCF = 90 (ECHA)
- Benzene : BCF = 13 (ECHA)
- Tetraethyl lead : BCF = 92 (ECHA)

○ **Biodegradation**

- Gasoline : 77.05% degradation after 28 days; readily biodegradable (read-across: CAS No. 64741-78-2) (OECD TG 301 F, GLP) (ECHA)
- Toluene : 80% degradation after 20days; readily biodegradable (ECHA)
- Benzene : 96% degradation after 28days; readily biodegradable (ECHA)
- Tetraethyl lead : 50 % degradation after 5d; Not readily biodegradable (ECHA)

4) Mobility in soil

- Gasoline : Koc = 4413 (estimated) (EPISUITE)
- Toluene : Koc = 205 (calculated) (ECHA)
- Benzene : Koc = 134 (ECHA)
- Tetraethyl lead : Koc = 3994 (EPISUITE)

5) Hazard to the ozone layer

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Not applicable

6) Other adverse effects

- Gasoline : Not available
- Toluene : Not available
- Benzene : Not available
- Tetraethyl lead : Not available

13. DISPOSAL CONSIDERATIONS

1) Disposal methods

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

2) Special precaution for disposal

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

14. TRANSPORT INFORMATION

1) UN No.

- 1203

2) Proper shipping name

- MOTOR SPIRIT or GASOLINE or PETROL

3) Transport hazard class(es)

- 3

4) Packing group

- II

5) Marine pollutant

- Not applicable

6) Special safety response for transportation or transportation measure

- Types of Emergency Measures in Case of Fire : F-E

- Types of Emergency Measures in Leakage : S-E

15. REGULATORY INFORMATION

EINECS(or ELINCS)

- Gasoline : European EINECS phase-in substance
- Toluene : European EINECS phase-in substance
- Benzene : European EINECS phase-in substance
- Tetraethyl lead : European EINECS phase-in substance

EU CLP (CLASSIFICATION) - PRODUCT : Not applicable

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Not applicable

Substances restricted under REACH

- Gasoline : Substances restricted under REACH
- Toluene : Substances restricted under REACH
- Benzene : Substances restricted under REACH
- Tetraethyl lead : Substances restricted under REACH

Substances subject to authorization under REACH

REACH SVHC List

Korea

○ Occupational Safety and Health Act

- Gasoline : Substance subject to submission of process safety reports
- Toluene : Substance subject to occupational exposure limits, Substance subject to permissible exposure limits, Hazardous substance subject to control, Harmful agents subject to work environment monitoring, Harmful agents subject to workers requiring health examination, Substance subject to submission of process safety reports
- Benzene : Substance subject to occupational exposure limits, Substance subject to permissible exposure limits, Special management substance, Harmful agents subject to work environment monitoring, Harmful agents subject to workers requiring health examination, Substance subject to submission of process safety reports
- Tetraethyl lead : Substance subject to occupational exposure limits, Substance subject to permissible exposure

limits, Harmful agents subject to work environment monitoring, Harmful agents subject to workers requiring health examination

○ **K-REACH**

- Gasoline : Not applicable
- Toluene : Phase-in Substances subject to Registration
- Benzene : Phase-in Substances subject to Registration, Substance subject to intensive control (2019)
- Tetraethyl lead : CMR substance, Substance subject to intensive control (2019)

○ **Chemical Control Act in Korea**

- Gasoline : Not applicable
- Toluene : Toxic substance, Substance requiring preparation for accidents, List of substance subjected to the PRTR
- Benzene : Toxic substance, Substance requiring preparation for accidents, List of substance subjected to the PRTR
- Tetraethyl lead : Toxic substance, List of substance subjected to the PRTR

○ **Safety Control of Dangerous Substances Act**

- Gasoline : Not applicable
- Toluene : Dangerous substance
- Benzene : Dangerous substance
- Tetraethyl lead : Dangerous substance

U.S.A

○ **US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Not applicable

○ **CERCLA Designation of hazardous substances (40 CFR 302.4)**

- Gasoline : Not applicable
- Toluene : US management information(CERCLA regulation)
- Benzene : US management information(CERCLA regulation)
- Tetraethyl lead : US management information(CERCLA regulation)

○ **CERCLA Section 302 regulation**

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : US management information(CERCLA Section 302 regulation)

○ **CERCLA Section 304 regulation**

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : US management information(CERCLA Section 304 regulation)

○ **CERCLA Section 313 regulation**

- Gasoline : Not applicable
- Toluene : US management information(CERCLA Section 313 regulation)
- Benzene : US management information(CERCLA Section 313 regulation)
- Tetraethyl lead : US management information(CERCLA Section 313 regulation)

International Convention on Environment

○ Rotterdam Convention list

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Rotterdam Convention list

○ Stockholm Convention list

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Not applicable

○ Montreal Protocol list

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Not applicable

National Inventory

○ Korea

- Gasoline : Not applicable
- Toluene : Not applicable
- Benzene : Not applicable
- Tetraethyl lead : Not applicable

○ U.S.A

- Gasoline : Not applicable
- Toluene : US TSCA phase-in substance
- Benzene : US TSCA phase-in substance
- Tetraethyl lead : US TSCA phase-in substance

○ China

- Gasoline : Not applicable
- Toluene : China phase-in substance
- Benzene : China phase-in substance
- Tetraethyl lead : China phase-in substance

○ Japan

- Gasoline : Not applicable
- Toluene : Japan ENCS phase-in substance
- Benzene : Japan ENCS phase-in substance
- Tetraethyl lead : Not applicable

16. OTHER INFORMATION

1) Reference

- Sources of information used in preparing this SDS included one or more of the following: Internal technical data, data from OECD eChemPortal, ECHA, NITE, TOXNET, IPCS and KOSHA search results.

2) Issue Date

- 2013-11-12

3) Revision number and Last date revised

Number of revised

- 5

Date of last revision

- 2024-01-11

Last Revision History

- Reviewed the hazards based on the latest notification and updated GHS database, but no change in hazard classification.

4) Other

- The information contained in the Safety Data Sheet is at the date of its issuance to the best of our knowledge correct according to the data available to us. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.