SDS(Safety Data Sheet)

Product	LCO		
MSDS Number	List No.	Issuing date	Last revised date
-	PD1052	2008-07-25	2024-01-17

1. IDENTIFICATION

1) Product name

LCO

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

SKIN CORROSION/IRRITATION : Category 2

CARCINOGENICITY : Category 1B

SPECIFIC TARGET ORGAN TOXICITY FOLLOWING SINGLE EXPOSURE : Category 3(Narcotic effects)

ASPIRATION HAZARD : Category 1

ACUTE HAZARDS TO THE AQUATIC ENVIRONMENT : Category 1

LONG-TERM HAZARDS TO THE AQUATIC ENVIRONMENT : Category 1

2) Label elements

○ **Hazard pictograms**

○ **Signal word**

Danger

○ **Hazard statements**

- H304 May be fatal if swallowed and enters airways.
- H315 Causes skin irritation.
- H336 May cause drowsiness or dizziness.
- H350 May cause cancer.(dermal)
- H400 Very toxic to aquatic life.
- H410 Very toxic 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.
- 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/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.
- P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
- P308 + P313 IF exposed or concerned: Get medical advice/attention.
- P312 Call a POISON CENTER or doctor/physician 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.
- P391 Collect spillage.

3) Storage

- P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
- 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
LCO	2	2	0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	Trade names and Synonyms	CAS No.	EC No.	Contain Ratio(%)
Distillates (petroleum), light catalytic cracked		64741-59-9	265-060-4	100

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. - 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) extinguishing media	- Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this 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	- Fire may produce irritating, corrosive and/or toxic gases. - Heating may cause a fire or explosion.
3) Special protective equipment and precautions for firefighters	- Rescuers should put on appropriate protective gear. - 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). - 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

- 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

- 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.
- 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)
Distillates (petroleum), light catalytic cracked	Not available	Not available	Not available	Not available

2) Appropriate engineering controls

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

3) Personal protection equipment

○ **Respiratory protection**

- If exposure consentration 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 exposured particulate material ; such
- If exposure consentration of the paticle 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 exposured

particulate material
- If exposure consentration 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 exposured particulate materia
- If exposure consentration 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 exposured particulate mater
- If exposure consentration 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 exposured particulate material ; su
- If exposure consentration 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	독특한 냄새
Smell Threshold	No Data
pH (Numerical value)	No Data
Melting/Freezing Point	-1~13 ℃
Boilling Point	150 ~ 600 ℃
Flash Point	120 ℃
Evaporating Rate	No Data
Flammability(Solid, Gas)	No Data
Explosibility Range	LEL : 1% - UEL : 6%
Steam Pressure	≥5 hPa (at 40℃)

Solubility	No Data
Vapor Density	No Data
Specific Gravity	1.01~1.07 (15℃) IUCLID
Distribution Coefficient	2.7~6 (추정치) IUCLID
SelfIgnition Temperature	250~537 ℃
Pyrolysis Temperature	No Data
Viscosity	1.0 mm2/s (at 40℃)
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.
- 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)**

- Distillates (petroleum), light catalytic cracked : rat(male/female); LD50(f) = 3200 mg/kg bw (OECD TG 401, GLP) (ECHA)

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

- Distillates (petroleum), light catalytic cracked : rabbit(male/female); LD50 > 2000 mg/kg bw (OECD TG 402, GLP) (ECHA)

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

- Distillates (petroleum), light catalytic cracked : Not applicable

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

- Distillates (petroleum), light catalytic cracked : Not available

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

- Distillates (petroleum), light catalytic cracked : rat(male/female); inhalation: aerosol; LC50 > 4.98 mg/L air /4h, no deaths (OECD TG 403, GLP) (read across : F-139, FCC light cycle oil) (ECHA)

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

- Distillates (petroleum), light catalytic cracked : rabbit; irritating (OECD TG 404, GLP) (ECHA)

○ Serious eye damage/irritation : Not classified

- Distillates (petroleum), light catalytic cracked : rabbit; not irritating (OECD TG 405, GLP) (ECHA)

○ Respiratory sensitization : Not classified

- Distillates (petroleum), light catalytic cracked : Not available

○ Skin sensitization : Not classified

- Distillates (petroleum), light catalytic cracked : guinea pig; not sensitising (OECD TG 406, GLP) (ECHA)

○ Carcinogenicity : Category 1B

- Distillates (petroleum), light catalytic cracked : EU CLP 1272/2008 : Carc. 1B

○ Germ cell mutagenicity : Not classified

- Distillates (petroleum), light catalytic cracked : In vitro Bacterial Reverse Mutation Assay : positive (OECD TG 471) (read across: coker gas oil) (ECHA), In Vitro Mammalian Cell Gene Mutation Test : negative without metabolic activation/positive with metabolic activation (OECD TG 476, GLP) (read across: 265-060-4) (ECHA)
  In vivo Mammalian Bone Marrow Chromosome Aberration Test : negative (OECD TG 475, GLP) (read across: 265-060-4) (ECHA)

○ Reproductive toxicity : Not classified

- Distillates (petroleum), light catalytic cracked : rat(female); 0, 1, 50, or 250 mg/kg/day; Reproduction / Developmental Toxicity Screening Test; A NOAEL of 50 mg/kg body weight/day was determined for effects of light coker gas oil on foetal/pup development (reduced body weight of live pups/ litter) after administration to pregnant rats on gestational days -7 to 20. There were no effects on reproductive parameters, but maternal animals showed signs of dermal irritation even with the lowest dose tested. The maternal NOAEL for toxicity to reproduction is greater than or equal to 250 mg/kg bw/day. (OECD TG 421, GLP) (read across: 64741-82-8) (ECHA)
  rat; 1, 50, 250 mg/kg; developmental toxicity; The NOEL for maternal toxicity is 1 mg/kg/day. The NOEL for developmental toxicity is 50 mg/kg/day. (OECD TG 414, GLP) (read across: F-277, light coker gas oil) (ECHA)

○ Specific target organ toxicity (single exposure) : Category 3(Narcotic effects),구분 3(마취 영향)

- Distillates (petroleum), light catalytic cracked : oral; rat(male/female); No significant findings were reported. LD50(f) = 3200 mg/kg bw (OECD TG 401, GLP) (ECHA)

dermal; rabbit(male/female); No abnormal gross pathology was reported. LD50 > 2000 mg/kg bw (OECD TG 402, GLP) (ECHA)

inhalation: aerosol; rat(male/female); All ten animals were lethargic and had wet coats. One animal had ocular discharge during first four hours of observation. LC50 > 4.98 mg/L air /4h, no deaths (OECD TG 403, GLP) (read across : F-139, FCC light cycle oil) (ECHA)

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

- Distillates (petroleum), light catalytic cracked : dermal; rat(male/female); 0, 8, 25, 125, and 500 and 1,250 mg/kg/day; 90 days; Severe erythema and edema was also reported. Histopathologic evaluation was limited to control animals and those dosed at 500 mg/kg/day. A NOEL was calculated as 25 mg/kg/day for males and 125 mg/kg/day for females. (OECD TG 411) (ECHA)

  inhalation; rat(male/female); 0, 0.35, 0.88, 1.71 mg/L; 13 weeks; The sub-chronic inhalation study of diesel fuel (read-across to cracked gas oils) resulted in a conservative sub-chronic NOAEC of 0.88 mg/L determined for local effects on the lung (increased relative wet weight in the absence of histopathological change). A NOAEC of greater than or equal to 1.71 mg/L was established for systemic effects, based on no significant findings at this level. (OECD TG 413) (read across: Diesel fuel) (ECHA)

○ **Aspiration hazard : Category 1**

- Distillates (petroleum), light catalytic cracked : 1.1 ? 4.5 mm2/s at 40°C (ECHA) & hydrocarbons

12. ECOLOGICAL INFORMATION

1) Ecotoxicity

- ACUTE HAZARDS TO THE AQUATIC ENVIRONMENT : Category 1
- LONG-TERM HAZARDS TO THE AQUATIC ENVIRONMENT : Category 1

○ **Acute (short-term) aquatic hazard:**

Fish

- Distillates (petroleum), light catalytic cracked : 96h-LC50(Oncorhynchus mykiss) > 0.21 mg/l (OECD TG 203, GLP) (ECHA)

Invertebrates

- Distillates (petroleum), light catalytic cracked : 48h-EL50(Daphnia magna) = 0.32 mg/l (OECD TG 202, GLP) (ECHA)

Aquatic algae

- Distillates (petroleum), light catalytic cracked : 72h-ErL50(Pseudokirchneriella subcapitata) = 0.51 mg/l (OECD TG 201, GLP) (ECHA)

○ **Chronic (Long-term) aquatic hazard:**

Fish

- Distillates (petroleum), light catalytic cracked : Not available

Invertebrates

- Distillates (petroleum), light catalytic cracked : 21d-NOEC(Daphnia magna) = 0.038 mg/L (OECD TG 211, GLP) (ECHA)

Aquatic algae

- Distillates (petroleum), light catalytic cracked : 72h-NOErLR(Pseudokirchneriella subcapitata) = 0.05 mg/l (OECD TG 201, GLP) (ECHA)

2) Persistence and degradability

○ **Persistence**

- Distillates (petroleum), light catalytic cracked : log Kow = 3.30 (experimental) (EPISUITE)

○ **Degradability**

- Distillates (petroleum), light catalytic cracked : Not available

3) Bioaccumulative potential

○ **Bioaccumulation**

- Distillates (petroleum), light catalytic cracked : BCF = 69.88 (estimated) (EPISUITE)

○ **Biodegradation**

- Distillates (petroleum), light catalytic cracked : 56.32 % degradation after 28d; not readily biodegradable (OECD TG 301F, GLP) (ECHA)

4) Mobility in soil

- Distillates (petroleum), light catalytic cracked : Koc = 730.6 (ECHA)

5) Hazard to the ozone layer

- Distillates (petroleum), light catalytic cracked : Not applicable

6) Other adverse effects

- Distillates (petroleum), light catalytic cracked : Not classified

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.

- 1993

2) Proper shipping name

- FLAMMABLE LIQUID, N.O.S.

3) Transport hazard class(es)

- 3

4) Packing group

- III

5) Marine pollutant

-

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)

- Distillates (petroleum), light catalytic cracked : European EINECS phase-in substance

EU CLP (CLASSIFICATION) - PRODUCT : Not applicable

- Distillates (petroleum), light catalytic cracked : Not applicable

Substances restricted under REACH

- Distillates (petroleum), light catalytic cracked : Substances restricted under REACH

Substances subject to authorization under REACH

REACH SVHC List

Korea

○ **Occupational Safety and Health Act**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **K-REACH**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **Chemical Control Act in Korea**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **Safety Control of Dangerous Substances Act**

- Distillates (petroleum), light catalytic cracked : Not applicable

U.S.A

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

- Distillates (petroleum), light catalytic cracked : Not applicable

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

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **CERCLA Section 302 regulation**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **CERCLA Section 304 regulation**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **CERCLA Section 313 regulation**

- Distillates (petroleum), light catalytic cracked : Not applicable

Interntional Convention on Environment

○ **Rotterdam Convention list**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **Stockholm Convention list**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **Montreal Protocol list**

- Distillates (petroleum), light catalytic cracked : Not applicable

National Inventory

○ **Korea**

- Distillates (petroleum), light catalytic cracked : Not applicable

○ **U.S.A**

- Distillates (petroleum), light catalytic cracked : US TSCA phase-in substance

○ **China**

- Distillates (petroleum), light catalytic cracked : China phase-in substance

○ **Japan**

- Distillates (petroleum), light catalytic cracked : 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

- 2008-07-25

3) Revision number and Last date revised

○ **Number of revised**

- 8

○ **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.