

Material Safety Data Sheet (MSDS)

1. IDENTIFICATION

A. Product Name

GT Turbo CNG SAE 15W-40 API CF-4

B. Recommended use of the chemical and restrictions on use

Engine Oil

C. Information of manufacturer, supplier

1) Company

Hanval INCORPORATED.

2) Address

Head Office : 13th Floor KSCFC Bldg., 15, Boramae-ro-5-gil, Dongjak-gu, Seoul

Factory : 375 Gongdan-Ro, Onsan-Eup, Ulju-Gun, Ulsan, Korea

3) Emergency Telephone No

82-2-3284-3400

82-52-711-6501

4) Departments

Technical & Marketing Dept.

Technical R&D Center

2. HAZARD IDENTIFICATION

A. Classification

None : None

B. Label element, including precautionary statements

1) Symbols

None

2) Signal word(s) : None

3) Hazard statement(s):

None

4) Precautionary statement(s)

○ Prevention

- None

○ Response

- None

- Storage
 - None
- Disposal
 - None

C. Other hazards which do not result in classification

1) NFPA Code : Health: 0, Flammability: 1, Reactivity: 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical identity	Common name, synonym	Cas No.	Percentages(%)
Distillate, Hydrotreated Heavy Paraffinic	Highly refined mineral oil	64742-54-7 / KE-12546	70 ~ 80
Mineral Oil		Not determined	~ 20
Alkaryl amine		Confidential	~ 5
Zinc alkyldithiophosphate		84605-29-8	~ 5

4. FIRST AID MEASURES

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15minutes and call a doctor/physician.

B. Skin contact

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Laundering enough contaminated clothing before reuse.

C. Inhalation

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.

D. Ingestion

- About whether I should induce vomiting Take the advice of a doctor.
- Rinse your mouth with water immediately.

E. Most important symptoms/effect, acute and delayed

- Not available

F. Indication of immediate medical attention and special treatment needed, if necessary

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. FIRE-FIGHTING MEASURES

A. Flash Point

No data available.

B. Suitable extinguishing media

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

C. Specific hazards arising from the chemical

- Not available

D. Special protective equipment and precautions for firefighters

- Keep unauthorized personnel out.
- Notify your local firestation and inform the location of the fire and characteristics hazard.
- Using a unattended and water devices in case of large fire and leave alone to burn if you do not imperative.
- Avoid inhalation of materials or combustion by-products.
- Do not access if the tank on fire.
- Keep containers cool with water spray.
- Vapor or gas is burned at distant ignition sources can be spread quickly.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures:

- Ventilate closed spaces before entering.
- Must work against the wind, let the upwind people to evacuate.
- Remove all sources of ignition.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Do not direct water at spill or source of leak.

B. Environmental precautions:

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up:

- Large spill : Stay upwind and keep out of low areas.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.

- Small leak: sand or other non-combustible material, please let use absorption.
- Wipe off the solvent.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Wash thoroughly after handling.
- Avoid contact with incompatible materials.
- Operators should wear antistatic footwear and clothing.
- Do not inhale the steam prolonged or repeated.

B. Conditions for safe storage. including incompatibilities

- Check regularly for leaks.
- Do not use damaged containers.
- Do not apply direct heat.
- Save applicable laws and regulations.
- Keep in the original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits in the air of the workplace, biological limit values:

<Mineral oil mist>

OSHA TWA: 5 mg/m³

ACGIH TWA: 5 mg/m³, STEL: 10 mg/m³

NIOSH TWA (10hr): 5mg/m³,STEL 10mg/m³

B. Appropriate engineering controls:

- A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.

C. Individual protection measures:

○ Respiratory protection:

- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- Respiratory protection is ranked in order from minimum to maximum.
- Consider warning properties before use.
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any air-purifying respirator with a full facepiece and an organic vapor canister.

- For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
 - Eye protection:
 - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
 - Provide an emergency eye wash station and quick drench shower in the immediate work area.
 - Hand protection:
 - Wear appropriate glove.
 - Body protection:
 - Wear appropriate clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance (physical state, color etc.)

Transparent brown liquid

B. Odor

Mild mineral oil odor

C. Odor threshold

No data available.

D. pH

No data available.

E. Melting point/freezing point

No data available.

F. Initial boiling point and boiling range

More than 300°C

G. Boiling point(°C)

No data available.

H. Evaporation rate

No data available.

I. Flammability(solid, gas)

No data available.

J. Upper/lower flammability or explosive limits

No data available.

K. Vapor pressure

Less than 0.1kPa at 20°C

L. Solubility

No data available.

M. Vapor density

More than 5 (Air =1)

N. Specific gravity

No data available.

O. Partition coefficient: n-octanol/water

No data available.

P. Auto-ignition temperature

No data available.

Q. Decomposition temperature

No data available.

R. Viscosity

14.00 ~ 15.40 cSt at 100°C

10. STABILITY AND REACTIVITY

A. Chemical stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactivity

- Hazardous Polymerization will not occur.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.

- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit flammable vapor if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposures

- Inhalation : No data
- Ingestion : No data
- Skin contact : No data
- Eye contact : No data

B. Delayed and immediate effects and also chronic effects from short and long term exposure

- Acute toxicity:

* Oral

- [Distillates (petroleum), hydrotreated heavy paraffinic] : LD50 > 15000 mg/kg Rat
- * Dermal
- [Distillates (petroleum), hydrotreated heavy paraffinic] : LD50 > 5000 mg/kg Rabbit
- * Inhalation
- [Distillates (petroleum), hydrotreated heavy paraffinic] : LC50 >5.53 mg/l Rat
- o Skin corrosion/irritation:
 - Not available
- o Serious eye damage/irritation:
 - Not available
- o Respiratory sensitization:
 - Not available
- o Skin sensitization:
 - Not available
- o Carcinogenicity:
 - * IARC
 - Not available
 - * OSHA
 - Not available
 - * ACGIH
 - [Distillates (petroleum), hydrotreated heavy paraffinic] : A4
- * NTP
 - Not available
- * EU CLP
 - [Distillates (petroleum), hydrotreated heavy paraffinic] : Carc.1B
 - o Germ cell mutagenicity:
 - Not available
 - o Reproductive toxicity:
 - Not available
 - o Specific target organ systemic toxicity-single exposure:
 - Not available

C. Numerical measures of toxicity(such as acute toxicity estimate)

No data available.

12. ECOLOGICAL INFORMATION

A. Aquatic, terrestrial organisms toxicity

- o Fish
 - [Distillates (petroleum), hydrotreated heavy paraffinic] : LC50 > 5000 mg/l 96 hr Oncorhynchus

mykiss

- [Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts] : LC50 1 ~ 5 mg/l 96 hr Pimephales promelas

Crustaceans

- [Distillates (petroleum), hydrotreated heavy paraffinic] : EC50 > 1000 mg/l 48 hr Daphnia magna

- [Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts] : EC50 1 ~ 1.5 mg/l 48 hr Daphnia magna

Algae

- [Distillates (petroleum), hydrotreated heavy paraffinic] : EC50 > 1000 mg/l 96 hr Scenedesmus subspicatus

- [Phosphorodithioic acid O,O-dialkyl(C=1-14) esters zinc salts] : EC50 1 ~ 5 mg/l 96 hr Selenastrum capricornutum

B. Persistence and degradability

Persistence

- [Distillates (petroleum), hydrotreated heavy paraffinic] : log Kow = 3.9 ~ 6 (Estimates)

Degradability

- Not available

C. Bio-accumulative potential

Bioaccumulative potential

- Not available

Biodegradation

- [Distillates (petroleum), hydrotreated heavy paraffinic] : Biodegradability = 6 (%) 28 day (Aerobic, Domestic wastewater, does not decompose easily)

D. Mobility in soil

- Not available

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- Since more than two kinds of designed waste is mixed, it is difficult to treat separately, then can be reduction or stabilization by incineration or similar process.

- If water separation is possible, pre-process with Water separation process.

- Dispose by incineration.

- Incinerate the oil by separating the oil and water

- The remainder of the water after separation will be processed in a water pollution prevention facilities.

- Do incineration or stabilization of the residue after disposal as the method of evaporation and concentration.

- Do incineration of the residue after disposal as the method of agglomeration and precipitation.

B. Disposal considerations(Specify disposal container and methods)

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.

- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN Number

- Not available

B. UN Proper Shipping Name

- Not available

C. Transport hazard class

- Not available

D. Packing group, if applicable

- Not available

E. Environmental hazards

- Not available

F. Special precautions for user

- Local transport follows in accordance with Dangerous goods Safety Management Law.

- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.

- EmS FIRE SCHEDULE : Not available

- EmS SPILLAGE SCHEDULE : Not available

15. REGULATORY INFORMATION

A. Safety, health and environmental regulations

○ POPs Management Law

- Not applicable

○ Information of EU Classification

* Classification

- [Distillates (petroleum), hydrotreated heavy paraffinic] : Carc. Cat. 2 R45

* Risk Phrases

- [Distillates (petroleum), hydrotreated heavy paraffinic] : R45

- * Safety Phrase
 - [Distillates (petroleum), hydrotreated heavy paraffinic] : S53, S45
- U.S. Federal regulations
 - * OSHA PROCESS SAFETY (29CFR1910.119)
 - Not applicable
 - * CERCLA Section 103 (40CFR302.4)
 - Not applicable
 - * EPCRA Section 302 (40CFR355.30)
 - Not applicable
 - * EPCRA Section 304 (40CFR355.40)
 - Not applicable
 - * EPCRA Section 313 (40CFR372.65)
 - Not applicable
- Rotterdam Convention listed ingredients
 - Not applicable
- Stockholm Convention listed ingredients
 - Not applicable
- Montreal Protocol listed ingredients
 - Not applicable

16. OTHER INFORMATION

A. References and sources for data

- 1) HANVAL Technical R&D Center
- 2) Globally Harmonized System of classification and labelling of chemicals(GHS), first revised edition, United Nations.
- 3) United States National Library of Medicine.
- 4) EINECS (European Inventory of Existing Commercial chemical Substances)
- 5) IARC(International Agency for Research on Cancer.)
- 6) NIOSH (The National Institute for Occupational Safety and Health)
- 7) IUCLID Dataset
- 8) ACGIH (American Conference of Governmental Industrial Hygienists.)
- 9) Transport of Dangerous Goods-UN
- 10) U.S Department of Health and Human Services
- 11) MSDS of raw material from supplier

B. Originated date

2017. 05. 31

C. Revision number and date

Rev No : 0

Date of last Rev : 2017. 05. 31



- 1) Revision number: 0
- 2) Final revision data : 2017. 05. 31

D. Etcetera

This data is written on the basis of knowledge in our R&D center. The purpose of this is providing health and environment-related information. (It does not mean the physical properties and warranty of product.)