1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 CHEMICAL PRODUCT IDENTIFICATION

AVIATION FUEL

CAS Number : 91770-15-9
EINECS Number : 294-799-5
Use: Fuel of special specifications, used as a military fuel and by Civil Aviation in airplane turbines.

1.2 COMPANY IDENTIFICATION

MOTOR OIL (HELLAS), Corinth Refineries S.A.
Agioi Theodoroi, Corinthia, P.O. BOX 23, 20100 Corinth
Contact numbers: 0030 27410 48602, 0030 27410 48702
Emergency telephone: 0030 27410 48602

2. HAZARDS IDENTIFICATION

CLASSIFICATION/LABELING OF PRODUCT: (According to ΑΧΣ 378/94, ΦΕΚ 705Β, 20-9-94)

Indications of danger

Flammable	F
Harmful	Xn^
Dangerous for the environment	N

Symbols

Risk Phrases*
R10, R65, R51/53

SAFETY

- Flammable liquid, hazard of formation of explosive mixture of the vapors with air.
- Hazardous vapor concentrations may accumulate in inadequately ventilated areas with relatively increased temperature.
- Vapors overlay on soil, spread along large distances depending on the wind direction, and it is possible to meet ignition sources.
- Hazard of electrostatic charge accumulation in the liquid, which may cause ignitive electrical discharge.

HEALTH

- Aviation Fuel, under conditions of normal use and practice, is not regarded to be harmful, provided that vapor inhalation and skin contact are avoided.
- At ambient temperature, there is no exposure hazard to Aviation Fuel vapours, due to the relatively low volatility.
- When suitable precautions are taken, health hazards are minimized given that the storage and handling of the product are carried out in closed systems.

ENVIRONMENT

- Pollution of aquatic receiver with Aviation Fuel may induce mortality to aquatic organisms.
- Pollution of soil with large quantities of Aviation Fuel may induce penetration of part of the product into aquatic aquifers.

^ If the benzene concentration is <0.1 %
* According to annex III of ΑΧΣ 378/94

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Mixture of paraffinic, naphthenic and aromatic hydrocarbons consisted of 8 to 16 carbon atoms in their molecules. It is possible for the preservation of mixture stability to contain additives at low concentrations, such as anti-frosting, antioxidant, antistatic and corrosion decelerator. May also contain several additives at <0.1% v/v each.

Hazardous ingredients*: - Aromatics, % v/v : 25 (max)
- Naphthalenes, % v/v : 0 - 3 (max)

CLASSIFICATION OF THE MOST IMPORTANT HAZARDOUS INGREDIENTS (According to the Annex III of ΑΧΣ 378/94)
Indicatively, the following are mentioned:

- Naphthalene — CAS number: 91-20-3, EINECS number 202-049-5
  Indications of danger: Category 3 Carcinogen, Xn, N
  R-Phrases: R40, R22, R50/53
- Trimethylbenzene 1, 2, 4 — CAS number: 95-63-6, EINECS number 202-436-9
  Indications of danger: Xn, Xi, N
  R-Phrases: R10, R20, R36/37/38, R51/53
- Trimethylbenzene 1, 3, 5 — CAS number: 108-67-8, EINECS number 203-604-4
  Indications of danger: Xi, N
  R-Phrases: R10, R37, R51/53
- n-propylbenzene — CAS number: 103-65-1, EINECS number 203-132-9
  Indications of danger: Xn, Xi, N
  R-Phrases: R10, R37, R51/53, R65
- i-propylbenzene — CAS number 1330-20-7, EINECS number 215-535-7
  Indications of danger: Harmful Xn, Irritant Xi, Dangerous for the environment N.
  R Phrases: R10, R65, R37, R51/53.
- Ethylbenzene — CAS number 100-41-4, EINECS number 202-849-4
  Indications of danger: Highly flammable F, Harmful Xn.
  R Phrases: R11, R20.

4. FIRST AID MEASURES

GENERAL INFORMATION

- First Aid must be supplied by specially trained personnel.
- The isolation of the area from all potential sources of ignition is necessary.
- The area where the casualty is transferred must be well ventilated.
- Drench contaminated clothing with water before removing to avoid risk of spark from static electricity.

INHALATION

Take the casualty to a quiet, cool and well ventilated place.
If the casualty is conscious:

- Place the casualty in the recovery position with legs slightly raised.
- Loose tight clothing, collar, belt, cover with a blanket.
- Obtain medical advice.

If the casualty is unconscious or conscious but breathes with difficulty:

- Obtain medical advice immediately.
- Place the casualty in the recovery position with legs slightly raised.
- Loose tight clothing, collar, belt, cover with a blanket.
- Provide oxygen.
- If necessary, give external cardiac massage.

If the casualty does not breathe:

- Give Artificial Respiration.
- Seek medical advice immediately.
- Place the casualty in the recovery position with legs slightly raised.
- Loose tight clothing, collar, belt, cover with a blanket.
- When the respiration recurs, provide oxygen.
- If necessary, give external cardiac massage.

SKIN CONTACT
- Remove the casualty from the area of the incident.
- Remove contaminated clothing.
- Wash thoroughly the affected skin area, using cold water and soap.
- If the skin is simply dry, apply carefully lanolin ointment.
- If the skin has blisters and seems irritated (chemical burn), wash cautiously with sterilized water.
- Obtain medical advice immediately - treatment as in thermal burns.

EYE CONTACT
- Remove the casualty from the area of the incident.
- Wash thoroughly the eyes with copious amount of water for 15 min with the eyelids open.
- Obtain medical advice– Refer to the specialist if the pain or irritation persists after washing.
- Do not administer eye drops or other liquid without medical approval.

INGESTION
- Take the casualty to a quiet, cool and well ventilated environment.
- Do not induce vomiting (hazard of pneumonic complications).
- Place the casualty in the recovery position with legs slightly raised.
- Loose tight clothing, collar, belt, cover with a blanket.
- Obtain medical advice.

RECOMMENDATION: As antidote, a spoon of paraffin oil followed by a glass of water in which a spoon of magnesium sulfate or sodium sulfate has been added, in order to reduce the absorption rate through the gastrointestinal route.
If a gastric lavage is necessary, this must be carried out only after endotracheal tubage due to hazard of aspiration into lungs and cause of pulmonary edema.

5. FIRE-FIGHTING MEASURES

During fire fighting, keep safety distances. The emergency exits must be left free.

5.1 FIRE EXTINGUISHING MATERIALS
- Small scale fires are handled using foam, dry powder, carbon dioxide or sand.
- Large scale fires are handled by specially trained personnel, using foam.

5.2 UNSUITABLE EXTINGUISHING MEDIA
- Use of water only for cooling of fire exposed tanks and vessels.

5.3 SPECIFIC HAZARDS
Containers, which are exposed to high temperatures (due to fire), should be cooled with water in order to avoid the rise of internal pressure, which may lead to a rupture of the container. Overheated surfaces may induce ignition, even without spark or naked flame. Vapors may accumulate and spread along long distances resulting in ignition.

5.4 SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING
- In case of large fire, use of fire-resistant protecting clothing and self-contained breathing apparatus is required.

6. ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PROTECTION MEASURES
- Use of suitable protective clothing and breathing apparatus during handling of the released quantity (see Personal Protective Equipment, section 8).

6.2 ENVIRONMENTAL PROTECTION.
- Isolate the leak.
- Do not use flammable materials, such as shavings, filings or cloth pieces.
- Transfer the contaminated materials to suitable sealed vessels, until their disposal.
- The access to drains, ditches and aquatic receivers must be avoided.
- In case of large spillages, alert the neighborhood estimated to be in greater danger for fire or explosion depending on the wind direction. Evacuate the area from the non-involved personnel and alert the local authorities.
- If the product is mixed with soil, water or vegetation, inform the local authorities.
- In case of release into the sea, alert the coast guard, the nearest ports, the local authorities as well as the ship-owner company regarding the event.

6.3 CLEANING METHODS

LAND SPILLAGE

- Absorb the spilled product using sand or another inert material, and wash with water.
- In case of leak or stagnation without fire, use water spray for the dispersion of the released vapors and the protection of the personnel handling the incident.

SPILLAGE AT THE SEA

- The release into the sea from ships is handled according to the Annex of the Protocol of 1978 of the International Convention of 1973 «Prevention of marine pollution from ships» (MARPOL 73/78) and its amendments.
- The released quantity is confined using floating barriers.

7. HANDLING AND STORAGE

Loading / unloading / storage temperature, °C: Ambient temperature

7.1 HANDLING

- Production and distribution are carried out through closed systems in order to avoid hazards of safety, health and environment.
- Proper labeling as well as keeping the vessels sealed and out of the reach of children, earthing of the storage and transfer systems as well as the precautionary control for detection of possible leaks are necessary.
- Avoid using Aviation Fuel as a cleaning agent or solvent.
- Installation of general/local ventilation systems whenever there is the possibility of high concentrations of Aviation Fuel mist/vapors and when modifications for their maintenance at acceptable levels are not possible.
- In case of release of high concentration vapors (at elevated temperatures) air measurements are required in order to ensure that the maximum exposure limits are not exceeded.

7.2 STORAGE

- Storage in specially designed vessels according to the relevant Legislation in well ventilated areas, away from oxidizing agents, heat sources or other sources that may induce ignition and be protected from physical damage.
- The storage areas of large quantities of Aviation Fuel must be equipped with special fire fighting systems and Emergency plans according to the relevant Legislation (KYA 5697/590/2000. ΦΕΚ 405Β/29-3-2000).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

- American Conference of Governmental Industrial Hygienists (ACGIH), 2002:

The establishment of an 8-hr exposure limit is under study : 200 mg/m^3

- ΠΔ 127/2000, ΦΕΚ 111Α/6-4-2000

Benzene	8-hr exposure limit	: 1 ppm

- ΠΔ 90/99, ΦΕΚ 94Α/13-05-99

Naphthalene	8-hr exposure limit	: 10 ppm
Isopropylbenzene	8-hr exposure limit	: 50 ppm
	Maximum exposure limit	: 75 ppm
Trimethylbenzene	8-hr exposure limit	: 25 ppm
(and isomers)	Maximum exposure limit	: 50 ppm
Ethylbenzene	8 hr exposure limit	: 100 ppm
	Maximum exposure limit	: 125 ppm

8.2 EXPOSURE CONTROL

- Avoid swallowing, eye and skin contact, as well as inhalation of Aviation Fuel vapors. The most important exposure route is considered to be the prolonged skin contact.
- Under normal working conditions, an exposure to mist/vapors of Aviation Fuel generating an inhalation hazard is unlikely, due to its relative low volatility.
- Indirect exposure of the public may occur in cases of product vapor inhalation (mainly near emission sources), water pollution (after a prolonged leak) and accumulation to the food chain.

8.2.1 OCCUPATIONAL EXPOSURE CONTROLS

- Cleaning, inspection and maintenance of the Aviation Fuel storage tanks require specific procedures and precautions, such as the issue of work permits, emptying the tanks from gases (gas freeing), use of safety belts and personal breathing apparatus.
- Measurements are required to be carried out for the quantitative determination of the occupational exposure, and the hazard assessment (according to article 4 of ΠΔ 338/2001).

- Exposure can be minimized by the application of suitable control measures depending on the case, such as establishment of procedures, installation of ventilation systems, use of personal protective equipment.
- The design of working methods and organizational measures must comply with article 5 of ΠΔ 338/2001.
- Strict compliance with the personal hygiene rules and health inspection are necessary according to the article 10 of ΠΔ 338/2001.
- Installation of showers and eye washers at workplaces.

PERSONAL PROTECTIVE EQUIPMENT (according to the Directive 89/686/EEC)
- In case of skin contact, the use of nitrile or neoprene impermeable gloves and suitable protective clothing is necessary.
- Use of goggles or face shields is necessary for the protection of the eyes.
- Use of full face masks with hydrocarbon filters in case of small leakages.
- During cleaning and inspection of equipment, as well as in incidents of great release use self-contained breathing apparatus and full suit (impermeable uniform, boots, gloves).

ATTENTION!
Contaminated protective clothing must be thoroughly washed after each use. Footwear impregnated with product must be disposed of.

8.2.2 ENVIRONMENTAL EXPOSURE CONTROLS
- Emissions of Aviation Fuel components to the atmosphere may be due to possible release of the most volatile ones, during production and distribution processes, as well as during supply and maintenance of airplanes at the airports.
- Possible Aviation Fuel release to aquatic receiver is due to an extended leak incident or losses from tanks. The less volatile components will remain in the aquatic environment for long periods, floating on the surface.
- Large scale releases may pollute soil for long periods, because the absorption process delays the biodegradation of hydrocarbons.

9. PHYSICAL AND CHEMICAL PROPERTIES

Clear and straw-colored liquid, insoluble in water.

▪ Distillation*:	
Initial Boiling Point, °C	: report
10% v/v Recovered, °C	: 205 (max)
50% v/v Recovered, °C	: reported
90% v/v Recovered, °C	: reported
End point, °C	: 300 (max)
▪ Residue, % v/v	: 1.5 (max)
▪ Losses, % v/v	: 1.5 (max)
▪ Density* at 15°C, kg/m^3	: 775 - 845
▪ Flash point*, °C	: 35 (min)
▪ Freezing point*, °C	:– 45 (max)
▪ Existent gum (washed) *, mg/100ml	: 7 (max)
▪ Corrosion Copper Strip * (2hrs,100°C) No	: 1 (max)

Detail information on physical and chemical properties can be provided upon request.

10. STABILITY AND REACTIVITY

Stable product.

10.1 CONDITIONS THAT MUST BE AVOIDED
Heat sources, bare flames and other ignition sources.

10.2 MATERIALS TO AVOID
Strong acids, halogens, alkali metals, strong oxidizing agents (liquid chlorine, concentrated oxygen).

10.3 HAZARDOUS DECOMPOSITION PRODUCTS
- Hazardous decomposition products: It is not decomposed at ambient temperature.
- Hazardous products during thermal decomposition: Carbon monoxide, carbon dioxide, nitrogen oxides, sulphur dioxide, incombustible hydrocarbons, particles.

* According to current specifications ΦΕΚ 1284/B/5.10.2001, ΦΕΚ 410/B/11-4-2001, ΦΕΚ 319B.

11. TOXICOLOGICAL INFORMATION

Direct toxicity of Aviation Fuel is not considerably high.
Indicative values reported:

Oral	LD50	>	5000 mg/lt.
Inhalation (4hr)	LC50	>	5,2 mg/lt.
Skin	LD50	>	2000 mg/lt.

INHALATION

- Inhalation of Aviation Fuel vapors causes irritation of the upper respiratory system and cough.
- Exposure to high concentrations of Aviation Fuel mist/vapors even for a few minutes causes dizziness, headache, nausea, vertigo.
- Prolonged exposure to very high vapor concentrations rapidly causes narcotic effect that leads to loss of consciousness, while in severe cases death can be induced from suffocation due to paralysis of the Central Nervous System.

SWALLOWING

- It is slowly absorbed from the digestive system and induces irritation to the mouth, the throat and the gastrointestinal system.
- In case of swallowing of large Aviation Fuel quantities (due to mishandling), disorders to the gastrointestinal system are induced, followed by spasms and coma.
- Vomiting may be induced, however this should be avoided.
- Aspiration into lungs (directly or after vomiting) may induce pneumonic edema or pneumonia.

SKIN CONTACT

- Repeated or prolonged contact induces irritation, followed by peeling off, chemical burn and possible dermatitis due to de-fating of the skin.

EYE CONTACT

- Eye contact with the liquid induces temporary irritation.
- Exposure to Aviation Fuel mist also induces temporary irritation, while prolonged exposure to high vapor concentrations may induce conjunctivitis.

12. ECOLOGICAL INFORMATION

- When Aviation Fuel reaches aquatic receiver, a hydrocarbon layer is generated that floats on the surface. The most important process is the evaporation of the lighter ingredients, while it is possible that some hydrocarbons of higher molecular weight to be absorbed as sediment.
- The biodegradation in water is considered to be a secondary process.
- In air, the hydrocarbons that are Aviation Fuel ingredients react rapidly with hydroxylic radicals, with half-life time ranging from 0.1 to 0.7 days.
- In case of large extent of Aviation Fuel pollution of aquatic receiver mortality to aquatic organisms and long-term adverse effects to aquatic environment may be induced. Its toxicity is mainly due to cycloparaffins and secondarily to the presence of alkylbenzenes. There is a bioaccumulation tendency, even though it is possible that the metabolic processes reduce bio-concentration.

  Typical acute toxicity values for aquatic organisms:

Fish (96hr)	LL50	: 6,8 - 34 mg/lt
Daphnia (48hr)	EL50	: 1 - 89 mg/lt
Algae (72hr)	IrL50	: 5.9 - 11 mg/lt

- logKow[1] values range between 3.3 and >6. Due to bioaccumulation, paraffins of high molecular weight may be found in vegetables growing in contaminated soil.
- In case of contact of soil with small Aviation Fuel quantities, a significant percentage will be evaporated, while the remaining quantity is absorbed by the upper aerobic soil layers, where it exhibits a low mobility.
- In case of soil pollution with large quantities of Aviation Fuel, a significant percentage will penetrate into anaerobic soil layers, with the possibility of entering the underground aquifers. Due to the groundwater flow there is the possibility of polluting the drinkable water. It is unlikely that these components will be maintained for long periods as to generate a hazard for the public health.

[1] Kow: Octanol/Water partition coefficient

13. DISPOSAL CONSIDERATIONS

- If the product must be disposed of/eliminated, this will be conducted by combustion, according to the relative Legislation and the approval of the local authorities.
- Greatly contaminated materials must be incinerated.
- It must not be disposed of to sewers.

14. TRANSPORT INFORMATION

Usual means of transport: Tank liners, trains, trucks.

Transport temperature, ^{o}C: Ambient temperature
Road/Rail Transport: ADR/RID 2003, ΠΔ 104/99 and its amendments (ΦΕΚ 509Β/2000 and 1232Β/2001), Directives 94/55/EEC and 96/49/EEC and their amendments.

- Class : 3
- Classification code : F1
- Packing group : III
- Transport group : 3
- Label : 3
- Hazard Information Number : 30
- UN number : 1223
- Shipping : IMDG – IMO Code 2002 and ΠΔ 405/96
- Class : 3.3
- Packing number : III
- Categories of special risks : 1, 2, 4, 7, 8, 16 (ΠΔ 405/96 , ANNEX II)

15. REGULATORY INFORMATION

Instructions for Safe Use~

- S2 Keep out of the reach of children.
- S16 Keep away from sources of ignition - No smoking
- S23 Do not breathe vapours
- S24/25 Avoid contact with skin and eyes
- S29 Do not empty into drains
- S43 In case of fire, use foam/dry powder/CO2. Never use water.
- S36/37 Wear suitable protective clothing and gloves.
- S61 Avoid release to the environment. Refer to special instructions/safety data sheet.
- S62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

16. OTHER INFORMATION

RISK PHRASES R

- R10 Flammable (1,2,4- and 1,3,5-trimethylbenzene, n- and i-propylbenzene, product).
- R11 Highly flammable (ethylbenzene).
- R20 Harmful by inhalation (1,2,4-trimethylbenzene, ethylbenzene).
- R22 Harmful if swallowed (naphthalene).
- R36/37/38 Irritating to eyes, respiratory system and skin (1,2,4-trimethylbenzene)
- R40 Limited evidence of a carcinogenic effect (naphthalene)
- R65 Harmful. May cause lung disease if swallowed (n- and i-propylbenzene, product)
- R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment (naphthalene).
- R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment (1,2,4- and 1,3,5-trimethylbenzene, n- and i-propylbenzene, product).

INFORMATION ABOUT TRAINING

The information of the present Safety Data Sheet can be used for training purposes.

RECOMMENDED LIMITATIONS OF USE

- To be used exclusively as a military fuel and in civil aviation in airplane turbines.
- Aviation Fuel must not be used as a cleaning agent or a solvent.

~ Instructions for safe use according to the Annex IV of ΑΧΣ 378/94

MAIN SOURCES FOR THE PREPARATION OF THE PRESENT SHEET

ΑΧΣ 47/ΦΕΚ431Β/95, SYSTEM CHECK LIST ISSUE 21, DEF STAN 91-91/5, NATO Code F-35, 14.6.2002, Y.A. 265/2002/2002 (ΦΕΚ 1214/Β/19.9.2002), Y.A. 195/2002/2002 (ΦΕΚ 907/Β/17.7.2002), Y.A. 378/94/1994 (ΦΕΚ 705/Β/20.9.1994), Decision 508/91/1991 (ΦΕΚ 886/Β/30.10.1991).

ADDITIONAL INFORMATION

Revision 5: July 2009, Original publication: January 1995. Amendments in the present Material Safety Data Sheet, in reference to the previous publication, mainly in points 1, 2, 3 and 9.

Note: MOTOR OIL (HELLAS) – CORINTH REFINERIES S.A. specifies that the above information refers only to the specific product, as described above and only when not used in combination with another product, or used differently than specified. The information is accurate according to our current state of knowledge and experience of the product up and until the above mentioned date of issue.
MOTOR OIL (HELLAS) – CORINTH REFINERIES S.A. specifies that it is exempts from all legal responsibility and losses or damage caused from the use of the product described above.
The above information and guidelines are at the disposal of users to assess as satisfactory according to the use of any particular substance. For further information, please contact the company at the above telephone numbers or address.