

# Material Safety Data Sheet

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## Jet A-1

### 1. Chemical Product & Company Identification

A. Product Name : **Jet A-1**

B. Intended Use : Jet fuel

C. Manufacturer/Supplier :

1) Manufacturer :

HanwhaTotal Petrochemicals Co.,Ltd			
103, Dokgot2-Ro, Daesan-Eup, Seosan-Si, Chungnam, 31900, Korea			
T e l e p h o n e	82-41-660-6415	F a x	82-41-660-6637

2) Supplier : (Product information: 041-660-6180)

HanwhaTotal Petrochemicals Co.,Ltd			
17~20F Hanwha Finance Plaza, 92, Sejong-daero, Jung-gu, Seoul 04525, Korea			
T e l e p h o n e	82-2-3415-9363	F a x	82-2-3415-9370

### 2. Hazard Identification

A. Hazard Category :

1) Physicochemical Hazards - Flammable Liquid : Category 3

2) Health Hazards - Skin corrosion/irritation : Category 2

Carcinogenicity : Category 2

Specific target organ toxicity(Single exposure) : Category 3 (Narcotic,  
Respiratory tract irritation)

3) Environmental Hazards - Not Classified

B. Precautionary Statement(s) & Warning Label

1) Symbol :



2) Signal Word : Warning

3) Hazard Statement(s) : H226 Flammable liquid and vapour

H315 Causes skin irritation

H335 May cause respiratory irritation.

H336 May cause drowsiness and dizziness.

H351 Suspected of causing cancer



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### 4) Precautionary Statement(s) :

#### ■ 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/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. Flammable liquids (chapter 2.6) 1, 2, 3
- P243 Take precautionary measures against static discharge.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P281 Use personal protective equipment as required.

#### ■ Response

- 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.
- 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
- 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 Suitable extinguishing media for extinction(Refer Section MSDS 5).

#### ■ 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 of contents/container in accordance with local/regional/national/international regulation



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### C. Other hazards

NFPA ratings : Health=2, Fire=2, Reactivity=0

### 3. Composition / Information on ingredients

Chemical Name	Other Name	CAS No. or EU No.	(%)
Kerosene	Jet A-1 Fuel	8008-20-6 (EU No.232-366-4, 481-670-5)	100%

### 4. First Aid Measures

A. Eye Contact : Flush thoroughly with water at least 15minutes.

Get medical assistance.

Do not rub your eyes.

B. Skin Contact : Wash contact areas with soap and water.

Get medical attention if irritation develops and persists.

Flush thoroughly with water at least 15minutes.

Wash thoroughly after handling.

C. Inhalation : If inhaled, remove to fresh air.

If not breathing give artificial respiration.

If breathing is difficult, give oxygen.

D. Ingestion : If swallowed, wash out mouth with water provided person is conscious.

Call a physician.

E. Likely Acute or Delayed Symptoms/Effects : skin irritation, respiratory irritation

1) Inhalation

- Short term exposure : Not available

- Long term exposure : Not available

2) Skin contact

- Short term exposure : Not available

- Long term exposure : Not available



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### 3) Eye contact

- Short term exposure : Not available
- Long term exposure : Not available

### 4) Ingestion

- Short term exposure : Not available
- Long term exposure : Not available

F. Emergency measure / Notes to physician : Give to oxygen.

Give to consider of active carbon slurry.

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

If exposed or concerned, get medical attention/advice.

## 5. Fire Fighting Measures

### A. Extinguishing media :

- 1) Suitable extinguishing media : Extinguish with dry chemical powder, carbon dioxide, foam
- 2) Unsuitable extinguishing media : Avoid use of water jet for extinguishing
- 3) Unusual fire(big fire) : Do use extinguishing media with water spray or fog.

### B. Unusual fire & Explosion hazard :

- 1) Hazardous combustion product : Carbon oxides  
(carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>))
- 2) Fire & Explosion hazard : Static electricity will cause to fire or explosion.  
Vapor is more heavier than air.  
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.  
Liquid and vapour are highly flammable.  
Vapour may travel a considerable distance to source of ignition.

### C. Special fire fighting procedure / protection of firefighters :

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Move containers from fire area, if you can do without the risk.

Using a unattended and water devices in case of large fire and leave alone to burn if you do not imperative.

Do not access if the tank on fire.

Use appropriate extinguishing measure suitable for surrounding fire



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Vapor or gas is burned at distant ignition sources can be spread quickly.  
The extremely low flash point made by fire-fighters may be less effective at digesting weeks.  
Prevent, by any means available, spillage from entering drains or water course.  
Fight fire from a safe distance, with adequate cover.  
If safe, switch off electrical equipment until vapour fire hazard removed.  
Do not approach containers suspected to be hot.  
If safe to do so, remove containers from path of fire.

### 6. Accidental Release Measures

#### A. Personal precautions :

- Shut off all sources of ignition.
- Wear self-contained breathing apparatus.
- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Ventilate closed spaces before entering.
- Must work against the wind, let the upwind people to evacuate.
- Move container to safe area from the leak area.
- Keep unauthorized people away, isolate hazard area and deny entry.

#### B. Environmental precautions :

- 1) atmosphere release : Not available
  - 2) soil release : Not available
  - 3) underwater release : Not available
- Prevent runoff and contact with waterways, drains or sewers.  
If large amounts have been spilled, inform the relevant authorities.

#### C. Spill cleanup methods :

- 1) Small liquid spill : Use a non-combustible material like sand to soak up the product and place into a container for later disposal.  
Wipe off the solvent. Dike for later disposal.  
Do not use plastic containers.
- 2) Large spillages : Isolate hazard area. Keep unnecessary and unprotected personnel from entering.  
Stay upwind and keep out of low areas. Dike for later disposal.  
Notification to central government, local government. When emissions at



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Dispose of waste in accordance with local regulation.  
Appropriate container for disposal of spilled material collected.

### 7. Handling and Storage

- A. Handling : Avoid inhalation or contact with the eye or skin.  
Grounding and bonding required.  
Keep away from heat, sparks, and open flame.  
Use only with adequate ventilation.  
Avoid breathing vapor. Use non-sparking type tools and equipment.  
Comply with all applicable laws and regulations for handling  
Do not inhale the steam prolonged or repeated.
- B. Storage : Store in a well-ventilated place.  
Keep container tightly closed.  
Keep away from oxidizing agent.  
Store and use with adequate ventilation.  
There must be no sources of ignition.  
All electrical equipment in storage areas must be explosion-proof.

### 8. Exposure Controls / Personal Protection

- A. Exposure limit value :
- 1) ACGIH :
    - TLV-TWA : Kerosine 200 mg/m<sup>3</sup>
    - TLV-STEL : Not available
  - 2) OSHA : Not available
- B. Engineering control : Adequate ventilation(localize ventilation) should be provided in workplaces. Use non sparking tools.  
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.



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### C. Personal protective equipment

1) Respiratory protection : Prevent inhalation of the solvents.

If required to control exposure, use only suitable respirators and components tested and approved under appropriate government standards such as NIOSH.

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 vapor cartridge(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.

2) Eye protection - Wear approved chemical safety glasses or goggles where eye exposure is reasonably probable.

Eye wash fountain is recommended.

3) Hand protection - Wear appropriate chemical resistant glove.

Butyl rubber gloves are recommended.

4) Skin / Body protection - Wear appropriate chemical resistant protective clothing.

### 9. Physical and Chemical Properties

A. Appearance(physical state, color etc.) : Colorless liquid

B. Odor : hydrocarbon smell (Petroleum odor)

C. Odor Threshold : Not available

D. pH : Not available

E. Melting point/Freezing point : below -47°C

F. Boiling point/range : 149~300°C

G. Flash point : Min 40°C

H. Evaporation rate : Not available

I. Flammability (solid, liquid): Not available

J. Flammability Limit (lower/upper) : 0.6% ~ 3.7%

K. Vapor pressure : 0.1mmHg(@20°C ↓)

L. Solubility in water : below 0.1wt% of water

M. Vapor density : 4.5

N. Specific gravity : 0.775~0.840(@15°C)



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- O. Partition Coefficient(n-Octanol/water) : Not available
- P. Auto-ignition temperature : 230°C
- Q. Thermal decomposition : Not available
- R. Viscosity : max 8.0 cst(@-20°C)
- S. Molecular weight : Not available

### 10. Stability and Reactivity

- A. Stability : Stable under recommended storage and handling conditions
- B. Possibility of hazardous reaction : Polymerization – No
- C. Conditions to avoid : Avoid heat, flame, spark and other ignition source.  
Avoid contact with incompatible materials and condition.
- D. Incompatible material : Oxidizing agents, halogen
- E. Hazardous decomposition products : Hydrocarbon compounds, Carbon oxides  
(carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>))

### 11. Toxicological Information

- A. Route of exposure
  - 1) Inhalation : May cause respiratory irritation.  
May cause drowsiness and dizziness.
  - 2) Ingestion : Not available
  - 3) Skin contact : Causes skin irritation
  - 4) Eye contact : Not available
- B. Delayed and immediate effects and also chronic effects from short and long term exposure
  - 1) Acute toxicity :
    - Oral : LD50 2835mg/kg rabbit
    - Dermal : LD50 > 2000mg/kg rabbit
    - Inhalation : LC50 > 5.28 mg/ℓ 4hr rat
  - 2) Skin corrosion/irritation : appear at skin irritation to human.
  - 3) Serious eye damage/irritation : appear at non-stimulated to eyes.
  - 4) Respiratory sensitization : Not available
  - 5) Skin sensitization : guinea pig test – negative
  - 6) Carcinogenicity :
    - MOL Notice : Carcinogenicity 2
    - OSHA : Not available
    - NTP : Not available





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- IARC(GROUP) : Not available
- ACGIH : A3
- EC : Not available
- 7) Germ cell mutagenicity :
  - in vivo mutagenicity test using somatic cell(chromosomal aberration test of marrow cell)  
: negative, Micronucleus test using marrow with mouse : negative, dominant lethal assay  
: negative
- 8) Reproductive toxicity : Not available
- 9) STOT-single exposure :
  - : It appear at enters airways and narcotic effects.
- 10) STOT-repeated exposure :
  - : It was reported on chemical pneumonia to human.
- 11) Aspiration hazard : Not available

### 12. Ecological Information

#### A. Ecotoxicity :

- 1) Fishes : LC50 5mg/l 96 hr
- 2) Crustacea : Not available
- 3) Seaweeds : Not available

#### B. Persistence and Degradability :

- 1) Persistence : Not available
- 2) Degradability : Not available

#### C. Bio accumulation potential :

- 1) Biodegradation : Not available
- 2) Accumulation : Not available

#### D. Mobility in soil : Not available

#### E. Hazardous to the ozone : Not available

#### F. Other adverse effects : Not available

### 13. Disposal Consideration

#### A. Disposal method : Dispose in accordance with all applicable regulations.

Since more than two kinds of designaed waste is mixed, it is difficult to



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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.

Will be pre-processed by the separation of oil and water.

### B. Disposal instruction :

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.

### C. Waste code : Not available

## 14. Transportation Information

A. UN classification : UN1863

B. Proper shipping name : Fuel, Turbine Engine

C. Class/division : 3

D. Packing group : III

E. Marine pollutant : Not available

F. Special precautions for user related to transport or transportation measures

- 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 : F-E (Non-water-reactive flammable liquids)
- EmS SPILLAGE SCHEDULE : S-D (Flammable liquids)

## 15. Regulatory Information

A. Additional national and/or international regulatory information

Information of EU Classification :

- Classification :
  - [Kerosine] : Xn; R65
- Risk Phrases :
  - [Kerosine] : R65
- Safety Phrase :
  - [Kerosine] : S2, S23, S24, S62 -

U.S. Federal regulations :

- OSHA PROCESS SAFETY (29CFR1910.119) : Not available
- CERCLA Section 103 (40CFR302.4) : Not available



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- EPCRA Section 302 (40CFR355.30) : Not available
- EPCRA Section 304 (40CFR355.40) : Not available
- EPCRA Section 313 (40CFR372.65) : Not available
- Rotterdam Convention listed ingredients : Not available
- Stockholm Convention listed ingredients : Not available
- Montreal Protocol listed ingredients : Not available

### 16. Other Information

This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability on completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

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B. Last revision : 2020. 8. 19, Rev 2.